

## Appendix D: Functional Classification Criteria

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Functional classification involves determining what function each roadway should perform before determining street widths, speed limits, intersection control or other design features. Functional classification ensures that nontransportation factors, such as land use and development, are taken into account in planning and design of streets and highways.

A major purpose of functional classification is to determine which routes should be on the metropolitan highway system. Functional classification is also used to decide which roads to use for transit service. Once function is established, appropriate or desirable design and operational characteristics can be used as further guidelines for implementation.

The criteria of the functional classification system are presented in Tables D-1, D-3 and D-5. Tables D-2, D-4 and D-6 list typical characteristics for roadways. The criteria are intended to be the primary tool for determining the function of a roadway. The characteristics are intended to be guidelines when plans are developed for a given classified route. However, if the guidelines are significantly different for a given highway, they may be used to supplement the criteria in making final decision on the function of that given highway.

The functional classification system consists of four classes of roadways within the seven-county metropolitan area: principal arterials (which include Interstate freeways), minor arterials, collector streets and local streets. The region has defined a sub-set of minor arterials as a means to supplement the Metropolitan highways and to establish priorities in federal funding. The four “A” minor arterial categories are: Expander, Reliever, Connectors and Augmentors. The roadways are the publicly provided elements of a land transportation system.

- Metropolitan Highways
  - Principal Arterials
    - Interstate freeways
    - Other principal arterials
- Other Regionally Important Highways
  - “A” minor arterials
- Local Highways and Roads
  - “B” minor arterials
  - Collector streets
  - Local streets

## **Principal Arterials**

The metropolitan highway system is made up of the principal arterials in the region. Principal arterials include all Interstate freeways. Interstate freeways connect the region with other areas in the state and other states. Principal arterials connect the metro centers to regional business concentrations. The emphasis is on mobility as opposed to land access. They connect only with other Interstate freeways, other principal arterials and select minor arterials and collectors. Principal Arterials provide for the longest trips in the region and express bus service.

Spacing of principal arterials will vary from two to three miles in the fully developed area, to six to 12 miles in the rural area. Where urban level development is planned, spacing of principal arterials or future principal arterials may be 2 to 3 miles. Principal arterials other than interstate freeway provide land access somewhat more frequently than Interstate freeways.

## **Minor Arterials**

The minor arterial system connects the urban service area to cities and towns inside and outside the region. They interconnect the rural growth centers in the region to one another as well as to similar places just outside the region. They provide supplementary connections between the two metro centers and the regional business concentrations. They connect major generators within the central business districts (CBDs) and the regional business concentrations.

The emphasis of minor arterials is on mobility as opposed to access in the urban area; only concentrations of commercial or industrial land uses should have direct access to them. The minor arterial should connect to principal arterials, other minor arterials and collectors. Connection to some local streets is acceptable. Minor arterials should service medium-to-short trips. Both local and limited-stop transit will use minor arterials.

The spacing of minor arterials in the metro centers and regional business concentrations will vary from one-fourth to three-fourths mile. Typically, in the fully developed area, spacing would range from one-half mile to one mile. In the developing area, one-to-two-mile spacing is adequate, but to accommodate urban development in the future, one-half to two mile spacing will be needed. (The region has subdivided minor arterials into two classes for administrative purposes. "A" minor arterials are eligible to compete for federal funding.) The criteria and characteristics of minor arterials apply to all minor arterials. The "A" minor arterials are described below and the characteristics of the four types of "A" minor are given in Table D-7.

## **Collector Streets**

The collector system provides connection between neighborhoods and from neighborhoods to minor business concentrations. It also provides supplementary interconnections of major traffic gen-

erators within the metro centers and regional business concentrations. Mobility and land access are equally important. Direct land access should predominately be to development concentrations. Collector connections are predominately to minor arterials.

Typically, collectors serve short trips of one to four miles. Local transit service uses these streets. Spacing in the metro centers and regional business concentrations may vary between one-eighth to one-half mile. In the fully developed area, collectors are needed one-fourth to three-fourths mile apart. In the developing area, spacing may range from one-half to one mile may service existing development, but one-fourth to three-fourth mile spacing may be required in the future.

## **Local Streets**

Local streets connect blocks and land parcels. The primary emphasis is on land access. In most cases, local streets will connect to other local streets and collectors. In some cases, they will connect to minor arterials. Local streets serve short trips at low speeds. In the urban area, local streets will occur every block. In the rural area, one-mile spacing may be adequate.

**Table D-1: Functional Classification System Criteria for Principal Arterials**

Criterion	Principal Arterial			
	Freeway		Other Principal Arterial	
	Urban	Rural	Urban	Rural
Place Connections	Interconnect the metro centers and regional business concentrations, important transportation terminals and large institutional facilities within the MUSA (see Figure D-1).	Connect the MUSA with urban areas and major cities in Minnesota and other states.	Interconnect the metro centers and regional business concentrations, important transportation terminals and large institutional facilities within the MUSA.	Connect the MUSA with major cities in Minnesota and other states.
Spacing	Developed Planning Area: 2-3 miles Developing Planning Area: Spacing should vary in relation to density of travelshed development, 2-6 miles.	Rural Planning Area: 6-12 miles. Closer spacing may be required to connect portions of Urban Planning Areas to each other or to Rural Centers.	Developed Planning Area: 2-3 miles. Developing Planning Area: Spacing should vary in relation to density of development, 2-6 miles.	Rural Planning Areas: 6-12 miles. Closer spacing may be required to connect portions of Rural Planning Areas to each other or to Rural Centers.
Management	Maintain at least 40-mph average speed during peak-traffic periods.	Retain ability to meet urban speed objective if and when area urbanizes.	Maintain at least 40-mph average speed during peak- traffic periods.	Retain ability to meet urban speed objective if and when area urbanizes.
System Connections and Access Spacing*	To other Interstate freeways, other principal arterials and selected minor arterials. Connections between principal arterials should be of a design type that does not require vehicles to stop. Access at distances of 1-2 miles.	To other Interstate freeways, principal arterials, selected minor arterials and major collectors. Access at distances of 2-6 miles.	To Interstate freeways, other principal arterials, selected minor arterials and selected collectors. Connections between principal arterials should be of a design type that does not require vehicles to stop. Intersections should be limited to one-half mile with 1-2 miles desired.	To Interstate freeways, other principal arterials, selected minor arterials and selected major collectors. Intersections should be limited to several miles.
Trip-Making Service	Trips greater than 8 miles with at least 5 continuous miles on principal arterials. Express transit trips.		Trips greater than 8 miles with at least 5 continuous miles on principal arterials. Express transit trips.	
Mobility vs. Land Access*	Emphasis is placed on mobility rather than land access. No direct land access should be allowed.	Emphasis is placed on mobility rather than land. No direct land access should be allowed.	Greater emphasis is placed on mobility than on land access. Little or no direct land access within the urban area.	Greater emphasis is placed on mobility than on land access. Little or no direct land access.

\*The key objective is stated under “Management” heading in this table.

**Table D-2: Functional Classification System Characteristics for Principal Arterials**

Characteristics	Principal Arterial			
	Freeway		Other Principal Arterial	
	Urban	Rural	Urban	Rural
System Mileage	Suggested limits for Interstate and other principal arterials at 5-10% of system.	Suggested limits for Interstate and other principal arterials at 2-4% of system.	See "Freeway."	See "Freeway."
Percent of Vehicle Miles Traveled	Suggested limits for Interstate and other principal arterials at 40-65% of system.	Suggested limits for Interstate and other principal arterials at 30-55% of system.	See "Freeway."	See "Freeway."
Intersections	Grade separated.	Grade separated.	Grade separated desirable. At a minimum, high-capacity controlled at-grade intersections.	Grade separated desirable. At a minimum, high-capacity controlled at-grade intersections.
Parking	None.	None.	None.	None.
Large Trucks	No restrictions.	No restrictions.	No restrictions.	No restrictions.
Management Tools	Ramp metering, preferential treatment for transit, interchange spacing.	Interchange spacing.	Ramp metering, preferential treatment for transit, access control, median barriers, traffic signal progression, staging of reconstruction, intersection spacing.	Interchange spacing, access control, intersection spacing.
Vehicles Carried	25,000-200,000	5,000-50,000	15,000-100,000	2,500 - 25,000
Posted Speed Limit	45-55 mph	55-65 mph	40-50 mph	Legal limit
Right-of-Way	300 feet	300 feet	100 - 300 feet	100 - 300 Feet
Transit Accommodations	Priority access and movement for transit in peak periods where needed.	None.	Priority access and movement for transit in peak periods where possible and needed.	None.

**Table D-3: Functional Classification System Criteria for Minor Arterials**

Criterion	Minor Arterial (“A” or “B”)	
	Urban	Rural
Place Connections	Provide supplementary connections to metro centers and regional business concentrations within the MUSA. Provide interconnection of major traffic generators within the metro centers and regional business concentrations.	Connect the MUSA with cities and towns in Minnesota outside the Twin Cities region. Interconnect rural growth centers inside the Twin Cities region and comparable places near the Twin Cities region.
Spacing	Metro centers and regional business concentrations: 1/4-3/4 mile. Fully developed area: 1/2-1 mile. Developing area: 1-2 miles.	Permanent Rural and Agricultural Areas: As needed, in conjunction with the major collectors, provide adequate interconnection of places identified in “Place Connections” criterion.
System Connections	To most Interstate freeways and other principal arterials, other minor arterials and collectors and some local streets.	To most Interstate freeways and other principal arterials, other minor arterials and collectors, and some local streets.
Trip-Making Service	Medium-to-short trips (2-6 miles depending on development density) at moderate speeds. Longer trips accessing the principal arterial network. Local and limited-stop transit trips.	
Management	Maintain the following minimum average speed during peak-traffic periods:  Metro centers and regional business concentrations - 15 mph.  Fully developed area - 20 mph.  Developing area - 30 mph.	Retain ability to meet urban speed objective if and when area urbanizes.
Mobility vs. Land Access*	Emphasis on mobility rather than on land access. Direct land access within the MUSA restricted to concentrations of commercial/industrial land uses.	Emphasis on mobility rather than on land access.

\*The key objective is stated under “Management” heading in this table.

**Table D-4: Functional Classification System Characteristics for Minor Arterials**

Characteristics	Minor Arterial (“A” or “B”)	
	Urban	Rural
System Mileage	Suggested limits for principal arterials and minor arterials at 15-25% of system.	Suggested limits for principal arterials and minor arterials at 6-12% of system
Percent of Vehicle Miles Traveled	Suggested limits for principal arterials and minor arterials at 65-80% of system.	Suggested limits for principal arterials and minor arterials at 45-75% of system.
Intersections	Traffic signals and cross-street stops.	Cross-street stops.
Parking	Restricted as necessary.	Restricted as necessary.
Large Trucks	Restricted as necessary.	Restricted as necessary.
Management Tools	Traffic signal progression and spacing, land access management/control, preferential treatment for transit.	Land access management/control.
Vehicles Carried Daily	5,000-30,000	1,000-10,000
Posted Speed Limit	35-45 mph	Legal limit
Right-of-Way	60-150 feet	60-150 feet
Transit Accommodations	Preferential treatment where needed.	None.

**Table D-5: Functional Classification System Characteristics for Collectors and Local Streets**

Criterion	Collector		Local	
	Urban	Rural	Urban	Rural
Place Connections	Interconnect neighborhoods and minor business concentrations within the MUSA. Provide supplementary interconnection of major generators within the metro centers and regional business concentrations.	Provide supplementary interconnection among rural growth centers inside the Twin Cities region and comparable places near the Twin Cities region.	Interconnect blocks within residential neighborhoods and land parcels within commercial/industrial developments.	
Spacing	Metro centers and regional business concentrations: 1/8 - 1/2 mile.  Fully developed area: 1/4 - 3/4 mile.  Developing area: 1/2 - 1 mile	Permanent Rural and Agricultural Areas: As needed in conjunction with minor arterials, to provide adequate interconnection of places identified in "Place Connections" criterion. In addition, minor collectors should be designated at an average spacing of not less than 4 miles.	As needed to access land uses.	As needed to access land uses.
System Connections	Sometimes to Interstate freeways and other principal arterials. To minor arterials, other collectors and local streets.	To minor arterials, other collectors and local streets.	To a few minor arterials.  To collectors and other local streets.	To a few minor arterials.  To collectors and local roads.
Trip-Making Service	Short trips (1-4 miles depending on development density) at low-to-moderate speeds. Longer trips accessing the arterial network. Local transit trips.		Short trips (under 2 miles) at low speeds. Longer trips accessing the collector or collector and arterial network.	
Mobility vs. Land Access	Equal emphasis on mobility and land access. Direct land access predominantly to development concentrations.		Emphasis on land access, not on mobility. Direct land access predominantly to residential land uses.	Emphasis on land access, not on mobility. Direct land access predominantly to agricultural land uses.

**Table D-6: Functional Classification System Characteristics for Collectors and Local Streets**

Criterion	Collector		Local	
	Urban	Rural	Urban	Rural
System Mileage	Suggested federal limitations: 5-10%.	Suggested federal limitations: 20-25%.	Suggested federal limitations: 65-80%.	Suggested federal limitations: 63-75%
Percent of Vehicle Miles Traveled	Suggested federal limitations: 5-10%.	Suggested federal limitations: 20-35%.	Suggested federal limitations: 10-30%.	Suggested federal limitations: 5-20%.
Intersections	Four-way stops and some traffic signals.	Local street traffic should be required to stop.	As required.	As required.
Parking	Restricted as necessary.	Unrestricted.	Permitted as necessary.	Permitted as necessary.
Large Trucks	Restricted as necessary.	Restricted as necessary.	Permitted as necessary.	Permitted as necessary.
Management Tools	Number of lanes, traffic signal timing, land access management.	Land access management.	Intersection control, cul-de-sacs, diverters.	
Vehicles Carried Daily	1,000-15,000	250-2,500	Less than 1,000	Less than 1,000
Posted Speed Limit	30-40 mph	35-45 mph	Maximum 30 mph	Maximum 30 mph
Right-of-Way	60-100 feet	60-100 feet	50-80 feet	50-80 feet
Transit Accommodations	Cross-sections and geometrics designed for use by regular-route buses.	None.	Normally used as bus routes only in nonresidential areas.	None.

**Table D-7: Characteristics of “A” Minor Arterials**

Characteristics	“A” Minor Arterial Categories			
	Relievers	Augmentors	Expanders	Connectors
Use	Provide direct relief for traffic on Metropolitan Highway Principal Arterials	Augment the PA within the Beltway	Provide connection between developing areas outside the beltway, connect principal arterials	Provide connection between rural town centers in the urban reserve and rural area
Location	Developed and developing areas within the MUSA and 2040 Urban Reserve	Within the I-494 / I-694 Beltway	Outside the I-494 / I-694 Beltway with the 2020 MUSA or 2040 Urban Reserve	In or near the seven county area, one end may be in the urban area
Trip Length	Medium length Trips less than 8 miles	Medium to long trips	Medium to long trips	Medium to long trips
Problem Addressed	Relief of parallel congested Principal Arterials	Serve Principal Arterial function where PAs don't exist	Accommodate added urban development	Improve the safety and directness of routes without continuous lane adds
Existing System	400 miles	200 miles	650 miles	680 miles

**Table D-8: Generalized Summary of Mn/DOT Recommended Public Street Spacing Access  
in the Twin Cities Metropolitan Area \***

	Area or Facility Type	Public Street Spacing		Signal Spacing
		Primary Full-Movement Intersection	Secondary Intersection	
<b>Principal Arterials</b>				
in the Twin Cities Metropolitan Area and Primary Regional Trade Centers (Non-IRCs)	Interstate Freeways	Interchange Access Only		None
	Non-Interstate Freeway	Interchange Access Only		None
	Rural	1 mile	1/2 mile	Only at Primary Intersections
	Urban/Urbanizing	1/2 mile	1/4 mile	Only at Primary Intersections
	Urban Core	300-600 feet, dependent upon block length		1/4 mile
<b>Minor Arterials</b>				
	Rural	1/2 mile	1/4 mile	Only at Primary Intersections
	Urban/Urbanizing	1/4 mile	1/8 mile	Only at Primary Intersections
	Urban Core	300-600 feet, dependent upon block length		
<b>Collectors</b>				
	Rural	1/2 mile	1/4 mile	Only at Primary Intersections
	Urban/Urbanizing	1/8 mile	Not Applicable	1/4 mile
	Urban Core	300-600 feet, dependent upon block length		1/8 mile

\* This table is intended to provide a summary of Mn/DOT Access Guidance for the Metropolitan Area. This chart does not reflect all the facets of Mn/DOT guidance. Agencies should work with Mn/DOT, the appropriate county highway authority and the local land use authority when planning new or modified access.