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Chapter 6 Functional Classification

6.1 Importance of Functional Classification

The classification of roadways by their function is an important component of the 2030 HC-TSP. The classification imparts the relative importance of the road, and it defines how the road is envisioned to function within the overall system of metropolitan roads and local streets.

Functional classification reflects an emphasis of how a roadway will be treated now and in the future. The roadway of interest may not possess all the attributes nor meet the entire criterion for its classification type today - however, current improvement decisions should anticipate that the road will meet most of these criteria to the greatest extent possible in the future after considering the location context of the road.

6.2 What is Functional Classification?

Roadway functional classification is the process by which roadways and streets are grouped into classes, or systems, according to the character of the service they are intended to provide. Basic to this process is the recognition that roads and streets are interdependent in how they serve transportation needs, as well as the communities and neighborhoods they serve.

The purpose of this categorization is to ensure that a system of roadways and streets provides a balanced relationship between mobility and land access. Mobility is the ability to efficiently travel along the roadway system, while land access is the ease of being able to connect to a particular development or parcel of land.
The functional classification categories are:

- Principal Arterials
- Minor Arterials
- Collectors
- Locals

These classifications signify differing levels of accommodation for mobility and land access. The classification is hierarchical by the amount of travel mobility provided. Principal arterials primarily provide mobility, while local streets focus on providing land access.

### 6.2.1 Background

Functional classification affects a number of other decisions which are made concerning the road, including:

- The proper assignment of jurisdiction responsibility of the roadway
- The nature and spacing of access connections allowed to the roadway
- The amount of right-of-way needed for the road and related elements
- What types of uses are allowed in the right-of-way
- The types of traffic controls used at intersections
- Whether or not on-street parking is allowed
- The distance for building set-backs required when developing near the roadway right-of-way
- Design guidelines and standards which apply to any improvements on the roadway
- The accrual of needs for state aid funding
- The eligibility of the road to use other available funding sources (such as state or federal monies)

These elements need to be looked at in the context of the location, physical setting, and condition of the corridor (urban, suburban, ex-urban).

This chapter documents the process of classifying roadways, shows the criteria by road type, and illustrates how the county road system is classified today. A mapped functional classification system is also presented that will be used to guide planning, design and operations decisions.

Hennepin County’s functional classification system is consistent with the classification as approved by the Metropolitan Council. The system reflects recent revisions proposed by the county and adopted by the Metropolitan
Council as part of an update effort for the complete metropolitan area (May 2011). The functional class map (Map D) is included in the report map pocket located at the end of the document.

### 6.3 Concept of Functional Classification

Functional Classification defines roadways according to the type of service they provide. Roads can function in two ways: they may provide *access* to properties and they provide mobility, the ability to get from one place to another. Access to properties is needed at both ends of a trip. Mobility involves the travel time and freedom of movement along the path of each trip. The degree to which a roadway provides land access and mobility determines its functional class.

Table 6-1 shows the four levels of functional classification and some of their attributes:

<table>
<thead>
<tr>
<th>Level of Classification</th>
<th>Access</th>
<th>Mobility</th>
<th>Percent of Mileage</th>
<th>Percent of All Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Arterials</td>
<td>No direct access to property</td>
<td>Highest</td>
<td>5 to 10%</td>
<td>40 to 65%</td>
</tr>
<tr>
<td>Minor Arterials</td>
<td>Limited access to property</td>
<td>High</td>
<td>15 to 25%</td>
<td>15 to 40%</td>
</tr>
<tr>
<td>Collectors</td>
<td>Access to properties is common</td>
<td>Moderate</td>
<td>5 to 10%</td>
<td>5 to 10%</td>
</tr>
<tr>
<td>Local Streets</td>
<td>High level of access to property</td>
<td>Low</td>
<td>65 to 80%</td>
<td>10 to 30%</td>
</tr>
</tbody>
</table>

*Principal arteries* include interstate highways and certain major state trunk highways. Principal arteries serve major centers of activity, the corridors having the highest traffic volumes, and the longest trip lengths. They have little or no direct land access and access to these roads is strictly controlled – often by purchased access control. Principal arteries are spaced approximately every two to three miles in fully developed areas and every six to 12 miles in rural areas.
For a typical metropolitan roadway system, principal arterials comprise only 5 to 10 percent of the total roadway system mileage, however they carry from 40 to 65 percent of all traffic. Principal arterials span all natural and man-made barriers, typically they provide grade separated interchanges with other roads, and they have strict controls of access. In most cases, Mn/DOT has jurisdiction of these types of highways.

**Minor arterials** make up the class of roadways including a few minor state highways, most county roads, and some major city streets. These roads primarily provide mobility, carrying short to medium length trips (two to six miles), and have controlled land access that is usually regulated through a permitting process.

Minor arterials as a group account for about 15 to 25 percent of the total mileage and carry roughly one-fourth of all traffic for the metropolitan roadway system. Minor arterials generally are given the traffic right-of-way over local streets and they usually have traffic signals at intersections with other minor arterials and some collector streets.

**Collector streets** provide a balance between land access and mobility. Their primary function is to move traffic from the local street system to the arterial system. When collectors intersect with arterials, traffic signals generally control traffic. Intersections with local streets are usually under stop sign control with collector streets having the right-of-way.
Local streets provide local land access with limited emphasis on mobility. Local streets account for 65 to 80 percent of the total road system mileage but carry only 10 to 30 percent of the total traffic. In a residential setting, a high level of access is allowed to private properties.

Individual driveways are permitted and intersections of local streets are often uncontrolled. Stop signs are usually installed where traffic control is required such as at intersections with collector streets.

In an efficient roadway network, these four types of roadways function together to serve the needs of the traveling public. Exhibit 6-1 on the following page shows examples of an idealized street network in urban, suburban, and rural settings. The proportion of arterials, collectors and local streets must be of a proper balance to achieve a roadway system that operates effectively. A system comprised of all local streets, for example, would not move traffic very well. Conversely, a system of too many arterials would not provide adequate land access.

Transportation planners have recognized specific characteristics for the four functional classes, based on the observation and analysis of actual roadway systems. Norms have been established for each functional class with regard to spacing, average trip length, system connections, type of intersection controls, daily traffic volumes, speed limits and several other criteria. Separate criteria are used for urban systems and rural systems because of the inherent differences attributable to land use and population density. ¹

¹ Metropolitan Council will be undertaking a functional classification study for the region. Changes/revisions to the classification system as well as funding eligibility will be looked at through this study.
Exhibit 6-1 Idealized Classification Schemes

Typical Rural Classification

Suburban Classification

Urban Classification
6.4 Uses of Functional Classification

Functional classification can be applied in planning roadway system development or to determine the appropriate jurisdictional responsibility for roadways. It is also used as a guide for developing design standards for various types of roadways. Functional classification is frequently used in transportation fiscal planning.

Transportation planners use functional classification to guide them in planning the development of roadway systems. The functional class map shows the desired system and represents a plan of how certain streets and roads will be emphasized.

Functional classification also helps to determine the proper jurisdictional responsibility for roads. Jurisdiction of roadways is logically linked to the geographic area the roadway serves and to the level of government capable of administering and operating the road. There is a natural correlation between governmental jurisdiction of roads and the functional class since it directly relates to the geographic limits of the agencies themselves.

The primary responsibility of each governmental level is:

<table>
<thead>
<tr>
<th>Classification</th>
<th>Responsible Entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Arterials</td>
<td>State of Minnesota</td>
</tr>
<tr>
<td>Minor Arterials</td>
<td>County, Some City, Some State</td>
</tr>
<tr>
<td>Collectors</td>
<td>City or Township, Some County</td>
</tr>
<tr>
<td>Local Street</td>
<td>City or Township</td>
</tr>
</tbody>
</table>
Exhibit 6-2 illustrates the relationships between the jurisdictional classification, design type, and possible construction / maintenance funding sources that differ by functional classification.

**Exhibit 6-2 Relationship of Functional Classification to Jurisdiction, Design Type and Funding**

<table>
<thead>
<tr>
<th>FUNCTIONAL CLASSIFICATION</th>
<th>PRINCIPAL ARTERIALS</th>
<th>MINOR ARTERIALS</th>
<th>COLLECTORS</th>
<th>LOCALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>JURISDICTIONAL CLASSIFICATION</td>
<td>STATE</td>
<td>COUNTY</td>
<td>MUNICIPALITY</td>
<td></td>
</tr>
<tr>
<td>DESIGN TYPE</td>
<td>FREEWAY</td>
<td>EXPRESSWAY</td>
<td>MULTI-LANE ROADS</td>
<td>MAJOR TWO-LANE ROADS</td>
</tr>
<tr>
<td>POSSIBLE FUNDING SOURCE</td>
<td>F.A. INTERSTATE</td>
<td>STATE HIGHWAY USER FUNDS</td>
<td>FEDERAL S.T.P. FUNDS</td>
<td>COUNTY STATE-AID HIGHWAY</td>
</tr>
</tbody>
</table>

6.5 The A-Minor Arterial System

The 1960s and 1970s were watershed years for highway travel. The federal government made a massive investment in construction of the Interstate Highway System, which provided a new framework of high-speed routes throughout the nation. Hennepin County also was building the Crosstown Highway (CSAH-62) and CSAH-18 freeways during this period. These routes became part of the backbone of the principal arterial system in the Twin Cities region.

This era also experienced several dramatic changes in demographics, work patterns and auto ownership that greatly increased highway travel. Traffic volumes grew rapidly and much of this traffic used the new freeway systems.
As the regional highway system has matured, Twin Cities area freeways have experienced increasing levels of congestion. Recent funding limitations as well as the limited ability to expand existing roadway facilities due to right-of-way constraints caused by fully developed communities, have made it necessary to place priority on the preservation and maintenance of existing highway facilities with lower priorities being placed on new expanded highway construction. Efforts to increase traffic system capacity has shifted from adding lanes to that of implementing traffic management methods, such as ramp metering, HOV carpool lanes, and HOT lanes. A greater focus on improving overall mobility is influencing infrastructure investments. Transit, bicycle and pedestrian infrastructure is a vital element in improving the mobility of the transportation system.

As the principal arterial system has become congested, efforts have been made to encourage drivers to use minor arterials for short to medium-length trips (2 to 6 miles). In theory this strategy could result in principal arterials with more capacity to carry the longer, regional type trips. For this strategy to succeed, the county and cities need to provide a good system of minor arterials that are a reliable alternative to using the principal arterial system. The need is increasing for an adequate system of minor arterials to support the principal arterial system.

Because minor arterials support the function of the principal arterials, there is a need to both prioritize and fund their development. Nearly all principal arterials are under the jurisdiction of Mn/DOT. In contrast, minor arterials are under the jurisdiction of counties, cities, and Mn/DOT, making coordination more difficult.

In 1989, the Metropolitan Council and Mn/DOT along with representatives of city and county governments reexamined the role of the minor arterial system in the region and developed federal funding policies. Although all minor arterials are needed to support the metropolitan highway system, it was recognized that some minor arterials are regionally significant. Minor arterials were sub-classified based on their regional importance and their relationship to principal arterials. Minor arterials were divided into A and B classes, with A-Minor Arterials being those that have highest importance to regional travel (and hence worthy of federal funding eligibility).

A-Minor Arterials were further divided into four groups:

- Relievers
- Expanders
- Augmenters
- Connectors
**Relievers:** Minor arterials that provide direct relief for principal arterials. This class includes the closest routes parallel to the principal arterials with the urban areas.

**A minor Reliever routes**

**Expanders:** Those routes needed to provide a connection between developing areas outside the interstate ring. They serve areas that are not reasonably served by the principal arterial system.

**A minor Expander routes**

**Augmenters:** Are located in areas within the interstate ring, where the network of principal arterials is fully developed but inadequate relative to the density of development it serves. These minor arterials serve many long trips.

**A minor Augmenter routes**
Connectors: Roads that provide good, safe connections among town centers in the developing and rural areas within and near the seven county metropolitan area. Connectors also link rural areas to principal arterials and other minor arterials. Due to their location in predominantly rural areas that are not intended for future urbanization, A-Minor Connector improvements typically focus on safety and access management instead of capacity enhancements.

A minor Connector routes

The Metropolitan Council has developed functional classification criteria specifically for the Twin Cities region as part of its Regional Development Framework / Transportation Policy Plan (TPP). Hennepin County supports and utilizes these criteria in determining the proper functional classification of a roadway. Appendix D from the latest TPP is included in the Support Documents CD included in the map pocket of this report.

As the Minor Arterial Study in 1989 was being concluded, Congress was drafting a new federal highway act. The new act, signed into law in 1991 and called the Intermodal Surface Transportation Efficiency Act (ISTEA, pronounced ice-tea), radically altered the federal highway funding programs.

One new program under ISTEA was the Surface Transportation Program (STP). ISTEA required that 50 percent of the funds allocated under the STP be distributed to areas within the state based on the relative share of urban versus rural population. In the Twin City metropolitan area, participants agreed that this funding would be limited for expenditure on A-minor arterials and some principal arterials only. This provided a significant new source of revenues to carry out the A-minor arterial program. In addition, ISTEA provided the Enhancement and Congestion Mitigation for Air Quality (CMAQ) categories that allowed funds to be specifically earmarked toward pedestrian and bicycle improvements.

Since 1991, ISTEA has evolved into the 1998 TEA-21 (Transportation Equity Act for the 21st Century), and most recently in 2005 as SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users). Many of the original initiatives and programs were retained under these subsequent transportation acts.
6.6 Future Functional Classification System Considerations

In response to FHWA data collection needs, in 2009 the Metropolitan Council decided to maintain two types of functional classification systems – one map reflecting current conditions, and another map showing future roadway functions and non-existent segments proposed for future construction.

Currently, the Hennepin County functional classification system still is consistent with the original definition and is represented on one map, with dashed segments representing non-existent segments. In the future this map may be split into the existing / future maps to maintain consistency with the Metropolitan Council.

6.6.1 City Comprehensive Plans

All city and county comprehensive plans were due for submittal to the Metropolitan Council by the end of 2008. The various functional classification systems of the cities were reviewed for consistency with the approved system.

In addition, Hennepin County reviewed its city plans and the adjacent county plans to ensure the functional classification systems are consistent.

6.6.2 Functional Classification Impact on Roadway Design

Recently, some advocacy groups have come to view functional classification as a roadblock to design flexibility that could allow for increased pedestrian and bicycle accommodations and streetscaping elements. It is true that functional classification does highlight the priorities for a roadway’s function affecting the balance of how various design elements are integrated. However, considerable flexibility exists, as is apparent by how recent county road projects have responded to the diverse transportation needs.