Chapter 5

FUNCTIONAL CLASSIFICATION

Functional classification is a system by which streets and roadways may be distinguished by types according to their function within the entire transportation network. A four-level classification is typically used to designate major streets as Freeway, Principal Arterial, Minor Arterial, or Collector types. A fifth level, Local Streets, is also recognized, but is not the primary subject of transportation planning.

Functional classification refers to the different types of classes of highways that comprise a complete system. A complete highway system includes fully access-controlled facilities, arterial highways, collector roads and local roads. The nature and types of trips that occur, the basic purpose of the road, and general traffic volume considerations characterize the classes. Figure 3 illustrates the basic trade-offs with access and mobility associated with different functional classes of highways. Higher classes provide a higher degree of service with limited access to adjacent land uses. Local roads primarily serve as access to adjacent land uses, and are not intended to carry higher volumes at higher speeds.

Figure 9 – Functional Class Attributes
Published descriptions for each element of the functional class system are often similar, but descriptions published by Garber and Hoel in their reference work *Traffic and Highway Engineering* seem particularly appropriate for Teller County and are repeated below. It is these system element definitions that guided several aspects of our review of the current system, including current class descriptions.

The Rural Principal Arterial System consists of a network of highways that serves most of the interstate trips and a substantial amount of intrastate trips. Trips between urbanized areas are made on this system. Rural Principal Arterials are further divided into Freeways and other Principal Arterials not classified as freeways.

The Rural Minor Arterial System augments the principal arterial system in the formation of a network of roads that connect cities, large towns, and their traffic generators such as large resorts. Travel speeds on the minor arterial system roads can be as high as those on the principal arterial system. Design of minor arterial routes should provide for relatively high travel speeds and minimum interference to through movement.

Rural Collector System roads primarily carry traffic within individual counties, and trip distances are usually shorter than those on the arterial roads. This system of roads is sometimes subdivided into major and minor collector roads.

Rural Major Collector Roads primarily carry traffic to and from County seats and large cities that are not directly served by the arterial system. This system also carries the main intra-county traffic and serves other traffic generators of equivalent intra-county importance, such as schools, shipping points, County parks, and important mining and agricultural areas.

Rural Minor Collector Roads consist of routes that collect traffic from local roads and convey it to other facilities. Minor collector roads should be spaced at intervals consistent with population density to accumulate traffic from local roads and bring all developed areas within reasonable distance of collector roads. One important function of minor collector roads is that they provide linkage between rural hinterland and locally important traffic generators such as small communities.

The Rural Local Road System consists of all roads within the rural area not classified within the other systems. These roads serve trips of relatively short distances and connect adjacent lands with the collector and arterial roads.

Teller County currently utilizes a four-level system of functional classification, designating County maintained roadways as either Principal Arterial, Minor Arterial, Collector or Local roads.

As part of the Transportation Plan development process, the functional class system was examined and descriptions of each functional class and maintenance implications tied to each designation were reviewed. This section of the report documents that review and contains recommendations where changes are warranted.
Overview Of Existing Functional Class System

The Teller County Geographic Information System (GIS) database was acquired and used to develop map graphics and tabulate statistics of the existing functional class designation for County roads. The GIS coverage contained roadway centerline files with an associated database. Functional classification was already a field within the centerline file data and contained information for the current classification of all County roads.

The database was utilized to develop a statistical profile of the existing classification system. The statistical profile is useful for comparison to statistics from other rural counties throughout the United States. For rural areas of the United States, classification studies show considerable consistency in relative extents of the functional systems.

Table 4 shows the distribution of roadway miles by functional classification within the County. Shown are data for the current Teller County system, data for all roadways regardless of jurisdiction, and data for a “typical” distribution of rural functional systems throughout the United States. The higher values of typical ranges given in Table 3 apply to states having less extensive total road networks relative to the population density (like Teller County). Areas having an extensive regular grid pattern of roads usually have a smaller percentage of collectors than areas within which geographic conditions have imposed a restricted or less regular pattern of road development (like Teller County).

As the data in Table 4 indicate, Teller County has more miles of Principal Arterial roads than would be expected. Collector roads in Teller County comprise about 5-10% less system miles than would be “typical”, and publicly maintained Local roads make up less than half of what would be expected when considering all roads within Teller County. When roads classified as “NCM” (Not County Maintained) are included within the Local road classification, Teller County more closely follows national statistics.

Table 4 – Functional Class System

<table>
<thead>
<tr>
<th>Functional Class</th>
<th>All Roads</th>
<th>County Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length Miles**</td>
<td>% of Total**</td>
</tr>
<tr>
<td>Principal Arterial System</td>
<td>116.9</td>
<td>11.8%</td>
</tr>
<tr>
<td>Minor Arterial System</td>
<td>75.1</td>
<td>7.6%</td>
</tr>
<tr>
<td>Principal plus Minor Arterial System</td>
<td>192.0</td>
<td>19.4%</td>
</tr>
<tr>
<td>Collector Road System</td>
<td>149.2</td>
<td>15.1%</td>
</tr>
<tr>
<td>Local Road System (public maintenance)</td>
<td>263.2</td>
<td>26.6%</td>
</tr>
<tr>
<td>Local Road System (not publicly maintained)</td>
<td>385.8</td>
<td>39.0%</td>
</tr>
<tr>
<td>Total Local Road System</td>
<td>649.0</td>
<td>65.5%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>990.2</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

*AASHTO, 1990
Functional classification in Teller County also carries weight of policy where roadway maintenance is concerned. Maintenance frequency (including snow removal priority), construction standards and right of way widths are all in some way tied to functional classification. The Teller County web page provided published information to establish current maintenance policy tied to designated functional classification. Maintenance policy calls for twice-per-week scheduled maintenance for principal arterial roads, once every two week maintenance for minor arterial roads, and a once a month frequency for collector roads. Local roads have scheduled maintenance once every two months. Snow removal and winter maintenance schedules are also influenced by functional class designation. Policy is to give priority to main County roads and school bus routes, even to the extent of delaying plowing of other routes. Snow removal and sanding for the arterial system is scheduled to be completed within 24 hours after snowfall has ended. Local roads are scheduled for completion of snow removal and sanding operations within 48 hours after snowfall has ended. Maintenance frequency will be the subject of other sections of the Teller County Transportation Plan.

**Functional Classes Defined For Use In Teller County**

Highway facilities outside urban areas form the rural road system. These highways are typically divided into the major classes of freeway, arterial, collector, and local roads. The current functional class system in Teller County uses a four-level classification system; principal arterial roads, minor arterial roads, collector roads, and local roads. Roads not maintained by Teller County are classified separately. Current descriptions of each classification (listed on Teller County web site) were reviewed for adherence to generally accepted principals, but also with consideration of the particular circumstances and geography of Teller County.

Based on guidelines listed in industry publications, many communities have developed written definitions for functional classes more specifically tailored to meet their conditions and needs. Teller County is one such jurisdiction. Review of the existing class definitions revealed them to contain many of the same elements offered in numerous publications. Although mostly general and policy-oriented, the descriptions also contain some very specific references (e.g. to address surfacing of collectors). Suggested revisions for each class description are offered in the sections that follow. Revised or added text is indicated with **bold**.

**Principal Arterial Roads**
Serves the major traffic movements within **and through** areas of the County such as between business districts and outlying residential areas, or between major suburban rural centers. Provides continuity for all rural arterial roads which intersect the urban areas of the County. **Principal Arterial Roads are intended to provide a high level of mobility, favoring mobility functions over land access functions.**

The words “and through” are added to support the notion of traffic through the County as well as within the County. The last sentence was added to support the philosophy of serving major traffic movements.
Due to the far-reaching impacts of changing an adopted functional classification system, our review was somewhat limited to the existing system. Consideration should be given to recognizing a functional class distinction between “freeway” and non-freeway principal arterial roads. With past, current and expected growth along the US24 corridor, it follows that this corridor warrants a special functional class on par with freeway conditions. Added as a sub-class, language of existing regulatory and operational documents can remain valid, while new provisions can easily be added that pertain solely to the US24 corridor.

**Minor Arterial Roads**
Serves trip of moderate length at a somewhat lower level of travel mobility than Principal Arterial roads. Provides access to geographic areas smaller than those served by the higher system. These roads connect to rural collector roads to facilitate the movement of vehicles from rural subdivisions and areas. **Minor Arterial Roads are intended to provide an increased level of mobility, encouraging mobility functions over land access functions.**

The last sentence was added to support the philosophy that arterial roads should be designed favoring a mobility function over an access function.

**Collector Roads**
Collector roads collect traffic from local subdivision areas and channel it into the arterial system. These roads provide both land access and traffic circulation within and between residential neighborhoods.

A collector designation carries implications of surfacing and level of mobility. Although still providing good mobility, collector roads in Teller County also need to provide good land access function as well. Access control specifics as well as specifics of surfacing requirements are better addressed through other means and should be deleted from the description of the functional classification.

**Local Roads**
The local street system is comprised of roads within local subdivisions that provide access by residents to the collector and arterial systems. Provides direct access to abutting land and residential driveways. Through traffic is deliberately discouraged.

**Other Roads**
Roads designated on plats filed with the County or dedicated for public use, but were not constructed to County standards or accepted for maintenance. Until such time that these roads are upgraded the County will only provide emergency access and maintenance.

**Opportunities For System Improvements**
The process of developing a street classification system must consider many items. These items vary not only for different urban areas, but also between segments within an urban area. Basic items of consideration include:

- Travel demands (volume) and the level of transportation service (LOS) to be provided
The urban form and system continuity
Environmental and urban impacts/constraints
Traffic operations and control
Political and financial reality

This examination will consider, to one degree or another, all of these elements. Although projections of future traffic are not yet available, County maintained facilities are estimated to experience few capacity constraints. Maps showing the current classification scheme and current traffic volumes were generated to assist with system continuity and capacity reviews. Connections to adjacent political boundaries and implications of financial constraint were considered in a qualitative sense for this initial review.

Based on the previous comparison of Teller County functional class system elements to national trends, and based on an examination of functional class designations currently used throughout the County, suggestions for changes to the existing system have been developed. Suggested system changes are discussed in general within the sub-sections below.

Principal Arterial Elements
Principal arterial facilities are intended to serve the major traffic movements within and through the County. Total roadway miles of arterial facilities in Teller County is significantly above national trends for rural counties. Based on these issues, a reduction in the number of roadway links classified as principal arterial is proposed. A special “freeway” designation for US24 through Teller County is also proposed.

Most proposed changes are a reduction of classification from principal arterial to minor arterial. Changes to the system result with creation of 21.1 miles of “freeway” classification and a re-classification of 26 miles of principal arterial roads to minor arterial or collector designation. Specific principal arterial roads suggested for reclassification to minor arterial are as follows:

- Ridge Drive & CR51 west of CR5 (north of US24) (2.9 mi)
- CR42/Lower Twin Rock Road, from US24 to CR1 (5.7 mi)
- CR3/CR31, from US24 to Arapahoe Creek Trail (2.5 mi)

Specific principal arterial roads suggested for reclassification to collector designation are as follows:

- CR82, CR83 & CR821 between SH67 and CR81 (4.4 mi)
- CR25 & Trout Creek Road, from US24 to US24 (west of Woodland Park) (6.1 mi)
- CR5 from Ridge Dr (CR51) to North Road (4.2 mi)

Minor Arterial Elements
Much like principal arterial roads, minor arterial roads also serve mobility need to provide access to geographic areas “smaller than those served by the higher system”. Minor arterial system elements facilitate movement of vehicles from rural subdivisions to other areas of the County, and place less emphasis on serving major traffic movements and through traffic.

Examination of the current roadways classified as minor arterial showed several areas where a collector classification would be more appropriate based on connectivity and
 Proposed changes would re-classify 62.4 miles of minor arterial streets as collector facilities. Specific facilities re-classified under this proposal are as follows:

- CR21/South Woodland Ave., from Crystola Canyon Rd. to East Laura Lane (2.4 mi)
- CR231 from US24 to Woodland Park City Limit (Corral Ln) (0.6 mi)
- CR28 from US24 to CR281 (1.6 mi)
- CR46/CR46Q/Wagon Tongue Rd., from US24 to Teller County Line (2.8 mi)
- CR12/Eagle Dr., from CR1 to Teller County Line (4.0 mi)
- CR88 from SH67 to Teller County Line (8.9 mi)
- CR86 from CR861 to Teller County Line (6.0 mi)
- CR861 from SH67 southeast to end of County maintenance (6.7 mi)
- CR82 from CR81 to CR81 (1.5 mi)
- CR8 from CR81 to east County Line (16.5 mi)
- CR61 from CR61 to SH67 (8.1 mi)
- CR421 from CR42 to CR1 (3.3 mi)

**Collector Elements**

Serving primarily as roads to “collect” traffic from local roads and channel it into the arterial system, collector system elements serve both a land access function and a mobility function. Collector class coverage in Teller County is very comprehensive; the total portion of County roads classified as collectors falls within the range of the national trends for rural counties. Traffic volume on roadways currently classified as collectors varies from less than 50 vpd to over 1,400 vpd.

Changes to collector class roads mainly involved reducing classification from collector to local status for facilities directly serving abutting land uses and used primarily by residents to access the primary County roadway system. Decisions for classification reduction were formulated considering primarily roadway continuity, service area and traffic volume. Generally speaking, roadways, or sections of roadways with average traffic volumes of less than 200 per day should not be collectors unless they serve a clear function of continuity and connectivity. Specific changes are too numerous to list, but can be identified on the attached graphics.

**Results of System Changes**

Following revisions to functional class and correction of minor errors in the database provided for this project, total system miles and total roadway miles by functional class were changed. Table 4 presented summary statistics for the roadway system in Teller County before revisions made by this Transportation Plan. Table 5 tabulates the same statistics for the revised roadway system. The recommended functional classification is shown on Figure 10.

**Table 5 – Revised Functional Class System**

<p>| Distribution of Roadway Miles by Classification, Teller County Revised Conditions |
|---------------------------------|------------------|------------------|------------------|------------------|
| All Roads                      | Length Miles**   | % of Total**     | County Roads     | Length Miles***  | % of Total***    | Typical Rural Functional Class Distribution* |
| Principal Arterial System****  | 71.4             | 7.2%             | 37.3             | 5.9%             | 2-4%             |
| Minor Arterial System          | 24.3             | 2.5%             | 24.3             | 3.9%             | N/A              |
| Principal plus Minor Arterial System | 95.7             | 9.7%             | 61.6             | 9.8%             | 7-10%            |</p>
<table>
<thead>
<tr>
<th>Road System</th>
<th>99.7</th>
<th>10.1</th>
<th>98.0</th>
<th>15.6%</th>
<th>20-25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Road System (public maintenance)</td>
<td>389.2</td>
<td>39.3%</td>
<td>386.9</td>
<td>61.5%</td>
<td>N/A</td>
</tr>
<tr>
<td>Local Road System (not publicly maintained)</td>
<td>383.9</td>
<td>38.8%</td>
<td>82.2</td>
<td>13.1%</td>
<td>N/A</td>
</tr>
<tr>
<td>Total Local Road System</td>
<td>773.1</td>
<td>78.1%</td>
<td>469.1</td>
<td>74.6%</td>
<td>65-75%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>989.6</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>628.7</strong></td>
<td><strong>100.0%</strong></td>
<td></td>
</tr>
</tbody>
</table>

* AASHTO, 1990
** Total miles of all roads within Teller County regardless of jurisdiction or classification
*** Total miles of Teller County Roads (including County roads not maintained by Teller County)
**** Does not include roadway miles now classified as “Freeway” (21.1 miles)

As the results indicate, the total system miles of roadways have changed very little (only changes are due to corrections of “errors” in database), however the distribution of roadway miles by functional class has changed significantly. County maintained Principal & Minor Arterial roadway miles have been reduced by over 55% and now more closely match national averages. Total mileage of County maintained Collector roadways has been reduced by 34%, reducing the total miles of Collector roads by just over 50 miles. Since most roads previously classified as Collector facilities were reduced to Local class facilities, the total mileage of Local facilities has increased. County maintained Local roadway mileage increased by almost 130 miles, a 50% increase. The total local road system also more closely matches national averages following suggested revisions.
Figure 10
Functional Classification