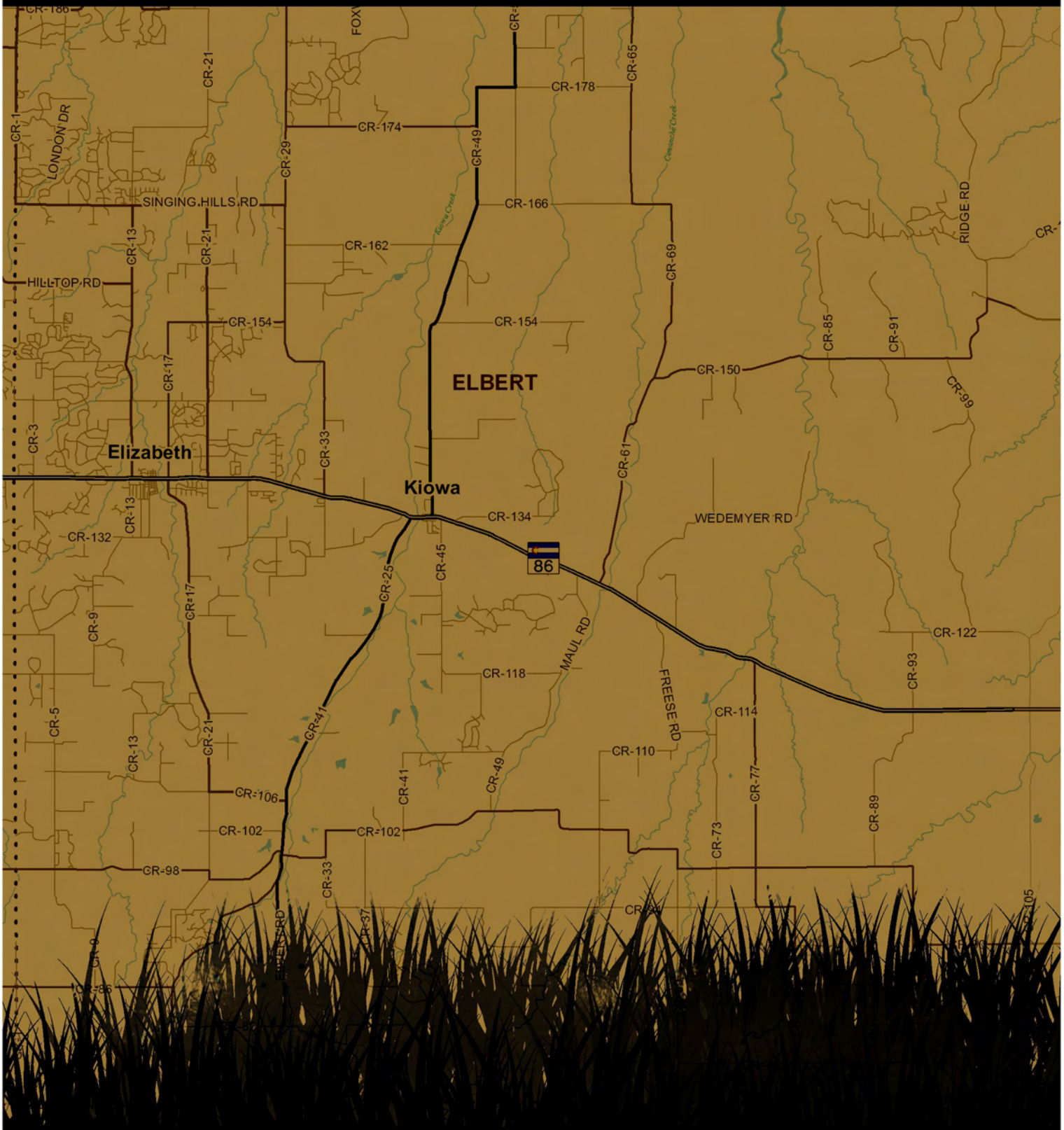
West Elbert County
Transportation Master Plan



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West Elbert County
Transportation Master Plan

Prepared for:
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September 2008

Acknowledgements

Numerous people in Elbert County contributed many hours and significant insight in helping guide the development of this Master Transportation Plan for west Elbert County. Special recognition goes to the citizens of Elbert County who attended public meetings and created the vision statement, volunteers who formed citizen committees, and the staff and County Commissioners of Elbert County.

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CHAPTER 1. INTRODUCTION

Incorporated in 1874, Elbert County was named after Samuel Hitt Elbert, the Governor of the Territory of Colorado from 1873 to 1874. Elbert County encompasses 1,854 square miles and has one of the fastest growing populations in the country[1]. The eastern portion of Elbert County remains rural, whereas the western portion is becoming increasingly urbanized. A majority of residents in the western part of the County commute to the Denver-Aurora metropolitan area for work. The Towns of Elizabeth, Kiowa, and Simla are the only incorporated towns in Elbert County. Other smaller settlements, such as Agate, Elbert, and Matheson, remain unincorporated.

Elbert County is typical of rural counties along the Front Range located just beyond the fringe of the large urban areas of Denver and Colorado Springs. Travel patterns and population growth are greatly affected by the metropolitan area. Elbert County (specifically Western Elbert County, bordered by Douglas County, Arapahoe County and the City of Aurora) is experiencing rapid population growth, a diminishing rural character, and increasing transportation system demands.

Safety and mobility are high priorities for residents of Elbert County. Addressing these priorities will rely on creating a well-balanced, well-maintained transportation system. A transportation network functions best when it helps form vital social and economic connections. This is especially true for Elbert County where distance and a scattered population make these connections important. Elbert County's Transportation Master Plan is essential to planning for Elbert County's long-term future. It must consider preserving Elbert County's desirable rural character and provide strategies that sustain the high standard of living now enjoyed by Elbert County residents.

[1] Based on growth rate during the 1990s. http://www.epodunk.com/cgi-bin/genInfo.php?locIndex=9453

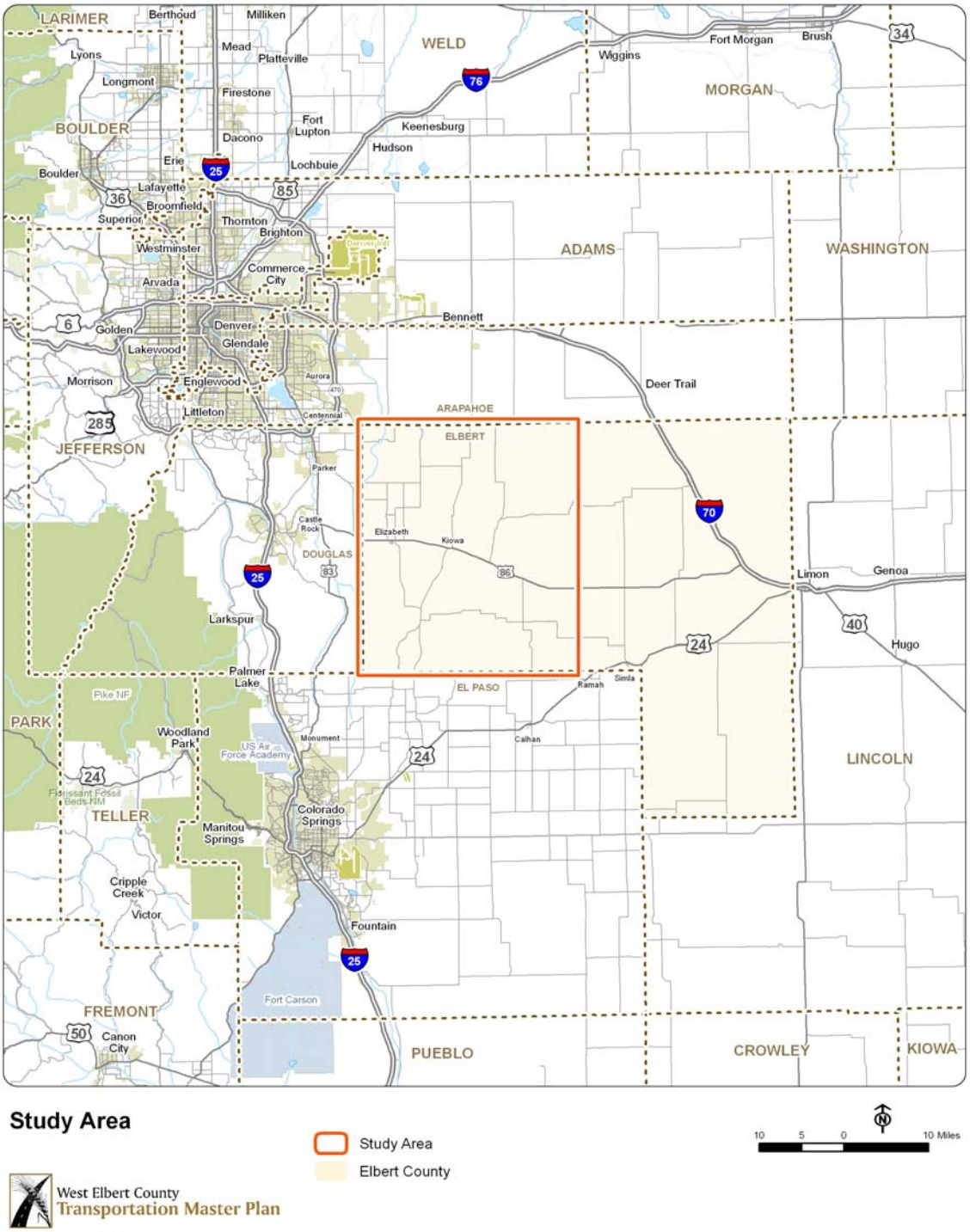
This *West Elbert County Transportation Master Plan* addresses these socioeconomic trends through the planning horizon year of 2030. The plan recommends policy, funding, roadway development, and multimodal strategies for West Elbert County. This document provides a summary of the considerable research, analysis, and public participation that have contributed to the preparation of this plan. This West Elbert County Transportation Master Plan serves as an integral part of the Elbert County Master Plan.

1.1 STUDY AREA

Elbert County covers a large area southeast of the Denver region and northeast of the Colorado Springs region. Typically, a countywide transportation plan would be just that – countywide. However, because of the of the vast geography of Elbert County and the current trend of rapid development growth along Elbert County's northwestern border, the issues and limitations facing the western half of the County are, and will continue to be in the foreseeable future, much different than those of the eastern half*. As such, this plan focuses on the western half of the County to better address the issues of critical and imminent concern. **Figure 1-1** illustrates the study area for this plan and shows the regional context of Elbert County's geography. From this point forward, "study area" and "County" are used in the context of the study area.

*A transportation master plan for Eastern Elbert County will consider a much different socio-economic forecast because of the sparsely populated land area, the types of employment (and lack of diversity in employment opportunities) in that area and the paucity of retail or mixed use developments. As distances are greater between points of travel and the road system has even less connectivity in the eastern part of the County, the transportation planning will differ significantly from that of the western part of the County. More miles of roadway exist in the east region; most local roads are unpaved. Stakeholders in the eastern region are anticipated to be long time residents of Elbert County; it is likely many citizen concerns will be different than those voiced by citizens living in the western portion of the County.

Figure 1-1. Study Area Map



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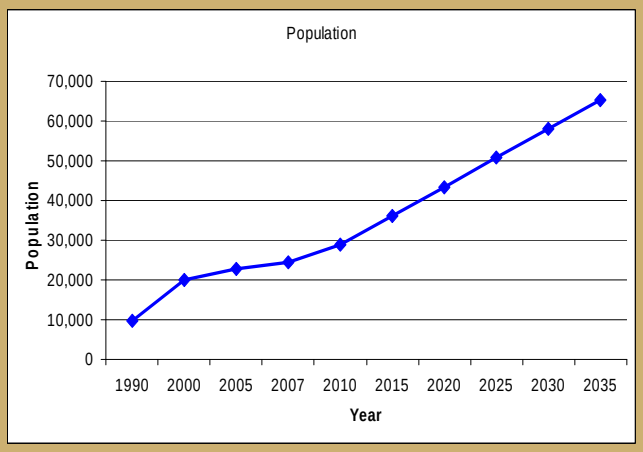
CHAPTER 2. PURPOSE AND GOALS

2.1 PURPOSE

Beautiful, rural Elbert County, ideally situated within an hour's drive from most locations within the metropolitan areas of both Denver and Colorado Springs, with relatively easy and timely access to Denver International Airport, finds itself a desirable location for new and expanding development, resulting in record growth. The existing transportation system was built to serve historical rural characteristics of the County. This system was based on very low density with primarily agricultural uses and activities. Many of the County roads are substandard from a safety and engineering perspective and are not suited to serving the higher traffic volumes now experienced in Elbert County, nor are they suited to the travel patterns of the long distance commuting of many Elbert County residents.

Why does Elbert County need a plan?

Elbert County is experiencing a population explosion. Current (2007) population estimates are slightly more than 24,000. By 2030, the population is expected to balloon by 170%.



U.S. Census and Colorado State Demographics Office

Quality of life and a vital economy rely on an efficient, safe, comprehensive, and coordinated transportation system that provides choices for the movement of people and goods. To provide a high level of mobility to all segments of the population, a variety of travel demands need to be considered along with various transportation modes, including vehicular, transit, pedestrian and bicycle.

Responding to citizen concerns for planning and preparing for future growth and its associated travel demands, the Elbert County Board of County Commissioners initiated this *West Elbert County Transportation Master Plan*. This plan serves as a long-range (30-year) planning document, considering improvements to existing roadways, construction of new roadways, and safety improvements. The planning process includes travel demand forecasting to the year 2035. Both current and future needs are identified.

This document is a compilation of the data collection, analysis, and extensive public participation that was completed during 2007. This plan serves as a guidance document for the future roadway system of western Elbert County. It is intended to be a planning resource for policy makers, citizens, and developers. This West Elbert County Transportation Master Plan serves as an integral part of the Elbert County Master Plan.

This plan is not intended to be a detail-oriented document. The roadway proposals in this document identify what the community, County staff, and elected officials see as solutions to the existing and future mobility needs. Future improvements will come about only after much evaluation, public participation, and technical analysis. Specific projects, roadway designs, and impacts will be handled on a project by project basis. The *Elbert County Construction Standards and Specifications* are the guidelines to be followed for producing construction documents for specific projects.

2.2 Goals and Objectives

Transportation planning is most effective when it establishes "top down" policy goals for the transportation system. These goals provide the overall umbrella under which the transportation system is developed, operated, and maintained. To be most useful, the goals should be specific enough to guide the development of the plan, but flexible enough to respond to changing conditions and community implementation policies. This plan addresses transportation needs, fiduciary constraints, and a vision that is representative of Elbert County's community values. The overall policy goals and objectives for the *West Elbert County Transportation Master Plan* are described in the box on the next page.

Policy Goals and Objectives

The transportation plan should establish a balanced and integrated transportation system that:

- Promotes safe and efficient travel.
- Considers community values and preserves quality of life.
- Supports good land use and planning policies.
- Is sensitive to environmental concerns.
- Considers multimodal transportation.
- Coordinates with other local and regional transportation plans.
- Seeks public input and endorsement.

The following tasks represent the scope of the extensive qualitative and quantitative information that was used throughout the process to develop this plan:

- Review of the existing roadway network.
- Review of road and bridge maintenance issues.
- Review of traffic data.
- Review of accident data.
- Preparation of socio-economic forecasts, including subdivision inventory, employment, and population projections.
- Preparation of traffic forecasts.
- Identification of necessary improvements, including connections, new roads, and safety concerns.
- Identification of strategies to enhance multimodal opportunities.
- Identification of traffic calming techniques and locations.
- Identification of traffic impacts of three-mile municipal annexations.
- Identification of transportation impacts of any large-scale roadway project.

- Identification of conceptual costs for improvements.
- Identification of funding strategies.
- Inclusion of public input throughout the process.

CHAPTER 3. PUBLIC INVOLVEMENT PROCESS

In 2007, the Elbert County Board of County Commissioners in collaboration with the Towns of Elizabeth and Kiowa, applied for and were awarded a Colorado Heritage Planning Grant from the Department of Local Affairs to develop a regional transportation master plan for the western portion of Elbert County that would:

- Identify existing demographics, traffic volumes, and operating conditions in the designated region.
- Summarize current travel-shed data with a safety review of accident statistics.
- Forecast socio-economic growth, travel, and operating conditions.
- Identify roadway projects and conceptual costs of these projects.
- Identify requirements for any such transportation infrastructure project proposed in Elbert County.
- Provide for public involvement and receive public input.

Community involvement and public input is deemed critical for guiding public policy decisions in creating a safe, efficient, multimodal transportation system for the next 30 years. Transportation master plans drive a community's development, mobility, economic health, and quality of life. Community participation insures the creation of a transportation master plan that reflects the community vision, addresses citizen concerns, and builds support for strategic policy decisions affecting the community far into the future.

The process for this plan follows the *Transportation Action Model (TAM): A Local Input Model to Engage Community Transportation Planning*. The TAM guidelines and protocol were published by the Iowa State University Press and have been used in numerous locations around the country. The model defines a decision-making process that utilizes public dialogue and technical information to develop transportation solutions. The model uses a public input committee and a technical committee that are described as follows:

Public Input Committee

This committee consists of individuals who are interested in keeping the community engaged in the Transportation Action Model. This committee is charged with creating public dialogue, identifying transportation issues and developing citizen endorsed solutions.

Technical Committee

This committee consists of individuals who have the expertise necessary to assist the planning process. The members of this committee are viewed as professionals and experts. These individuals provide community participants with information about community trends and characteristics and information about the transportation system. The goal for this committee is to assist community participants to make informed decisions.

In July 2007, a technical task force and a citizen's outreach task force were created to prepare for the transportation master planning process. This model is particularly geared toward communities with varying values and perspectives. This is the case with Elbert County, a county changing from a rural ranching community to a community that increasingly expects a blend of rural and urban amenities.

3.1 Transportation Action Model

The premise of the Transportation Action Model (TAM) is to combine technical information with a decision-making process. The decision-making process represents the rural values, while the technical process addresses specific safety, capacity, and mobility needs. The process, by design, creates public dialogue that identifies transportation issues and community supported solutions. Successful completion of this program provides a blueprint for local action.

The Steps of the Transportation Action Model

- Understand socio-economic trends in the community
- Assess the current local transportation system
- Identify critical issues
- Create consensus
- Envision the future
- Create implementation strategies
- Recommend funding and policy considerations

The TAM relies on a series of general public input meetings. In Elbert County, these public meetings were held at project milestone dates in three different locations of the study area.

3.2 Public Meeting Overview

The first public meeting, held August 16, 2007, focused on **the existing transportation system challenges**. This meeting began with a brief synopsis of the planned public process and a timeline for the development of the *West Elbert County Transportation Master Plan*. Technical information, such as the County's transportation needs, demographic trends, and existing area/regional transportation plans, were discussed.

Elbert County's 3 Top Issues of Concern

- Funding
- Connectivity and network improvements
- Improvement of roads/road base

The primary goal of this first meeting was to provide interested citizens with pertinent information facing the County. Participants worked together to come to consensus on three top issues of concern for transportation in Elbert County.

The second public meeting held September 17, 2007, focused on **creating a community 'vision' for Elbert County transportation in 2035.** Participants spoke about what they envisioned as an "ideal" 2035 vision. Beyond recognition of perceived transportation shortcomings, the vision represents the collective desires of the community while considering surrounding community elements that affect the transportation system. The vision is described on the next page.

Community Vision for Transportation in 2035 for Elbert County

- Major thoroughfares to collect traffic and get traffic moving for longer distances across the County. North-south and east-west connections will alleviate traffic on SH 86.
- A high speed bypass of SH 86 around Elizabeth.
- Hazardous material routed around towns rather than through neighborhoods.
- Park-and-rides located throughout the County, as well as transit service including light rail (to Parker and Franktown), with bus service that connects to light rail.
- Seniors and special needs populations will have transportation options.
- Pedestrian, bicycle, and horse trails with inter-connectivity included within developments.
- Parkway-style streets rather than the traditional highway design, with streetscape amenities that represent the rural nature of the community.
- Access to a thoroughfare within a mile of approved communities.
- Cluster developments with large areas of open space between developments will maintain character.
- Commercial, retail, and community services in logical locations; thus retaining revenue within Elbert County.
- Better employment opportunities will exist within the County.
- More schools built within neighborhoods and within walking distances.
- Roads built with state-of-the-art technology including sewer, water, and utility conduit within the right-of-way easement. Central water and sewer connections considered during the development process and planned appropriately. Planning will be ahead of growth and plans will be well published and communicated.
- Senior centers and services incorporated within the planned communities and neighborhood, allowing people to be lifelong residents of Elbert County.
- Emergency centers strategically located.
- Community colleges located within the County, which will have the effect of creating jobs and small businesses within the community.
- Colorado's premier equestrian county with an extensive horse trails system. The rural way of life is preserved and valued, embracing a slower pace, 4-H, and elbow room.
- Preserved wildlife corridors making Elbert County an eco-tourism destination.
- Property rights consideration for landowners, and creative ways to compensate landowners for land.
- No congestion because Elbert County citizens and policy makers were thoughtful in how they planned for the future.

At the public meeting held on October 29, 2007, a **community vision statement was crafted**. Implementation goals were set, and policy recommendations were created. These goals and recommendations are detailed in Chapter 8.

Community Vision Statement

Provide an efficient and well-maintained multimodal transportation system that complements and enhances an adopted land use plan, emphasizes public safety and efficient mobility, identifies roadway network improvements, encourages economic vitality, and respects and fosters the rural quality of life so important to Elbert County residents.

3.3 Issues Committees Meetings

At the first public meeting, four distinct "issues" committees were formed with self-selected citizens comprising the membership. These volunteers participated in lengthy discussions at numerous meetings focusing on **Funding Challenges**, **Road Connections and Network Improvements**, **Road Base and Infrastructure Improvements**, and **Policy Recommendations**. Their charge was to define the problems related to each of the issues, analyze the current situation, identify influencing factors, and brainstorm strategies to reach the desired outcomes. Their goal and policy recommendations are found in Chapter 8.

3.4 Citizen Surveys

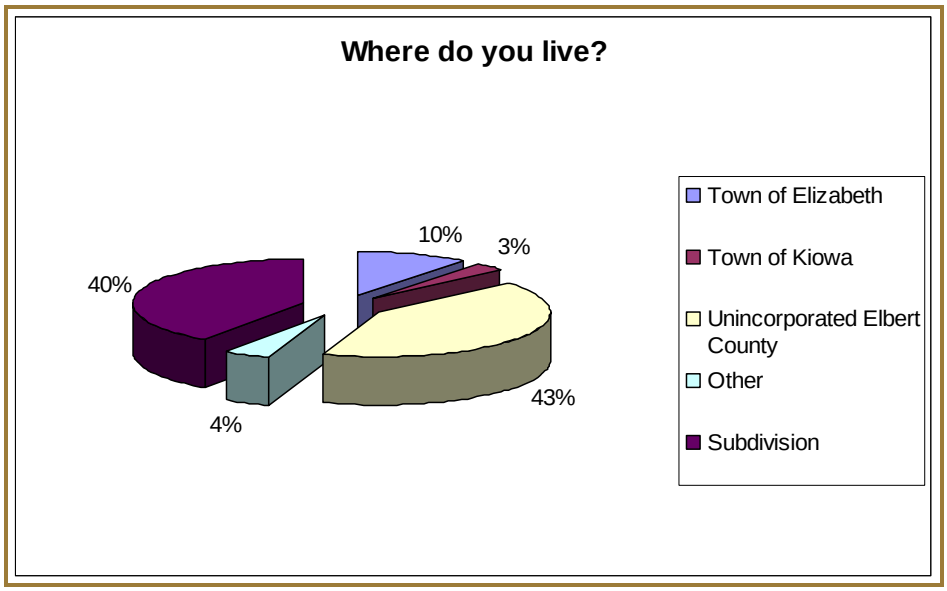
Citizen survey forms were available at all the public meetings and at the County administration building throughout the process. (See **Appendix A** for the survey questionnaire sheet). While the survey was not intended to be statistically significant, it provides anecdotal information that gives insight into the people who participated in the process, where they live within Elbert County, how long they have lived in Elbert County, and which transportation issues have the greatest effect on their families. Approximately 200 people completed the survey.

Reference and Resource Materials Given to Citizens Committees

- A pamphlet commissioned by the Colorado Department of Transportation entitled *Transportation Revenue Options Study*
- The Colorado Department of Transportation *Estimated FY 2007-2008 Financing System-Distribution* by investment categories
- The *2008-13 STIP Project Priority Programming Process for Elbert County* listing CDOT accomplishments and major project updates
- A listing of possible funding sources for local transportation projects
- The Colorado Department of Transportation *Estimated FY 2007-2008 Financing System-Distribution* by investment categories
- Asphalt costs
- Gravel Comparison Trip Time to Cost
- *Elbert County Road Totals – August 2007*
- Existing Intergovernmental Agreements (IGAs) with Douglas County, Arapahoe County, Town of Elizabeth, Town of Kiowa.
- Overview of the 1041 Powers (HB74-1041)
- Overview of the Intermodal Surface Transportation Efficiency Acts (ISTEA)
- Colorado State Statute pertaining to the adoption of master plans (CRS §30-28-106)

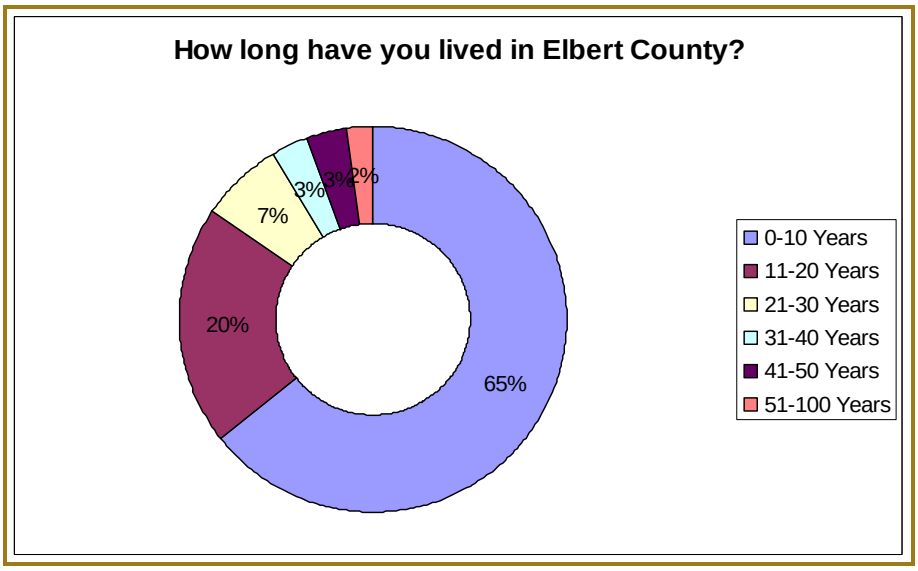
The survey results are displayed in **Figure 3-1** through **Figure 3-7**.

Figure 3-1. Place of Residence



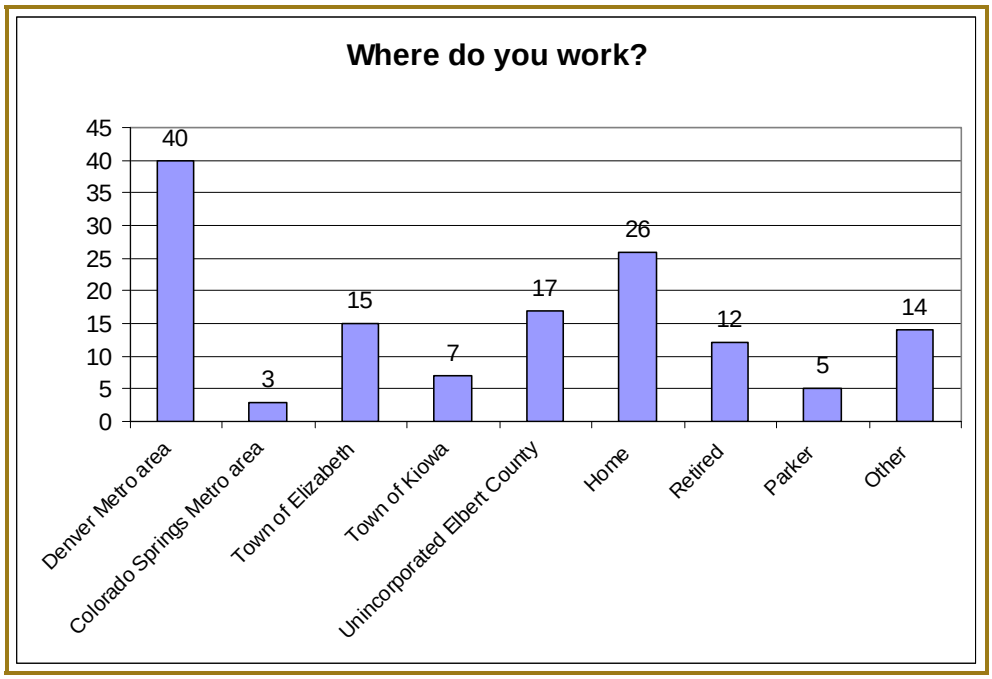
The majority of the survey respondents live in unincorporated Elbert County or in a subdivision; with just 13% living in either Elizabeth or Kiowa.

Figure 3-2. Years in Elbert County



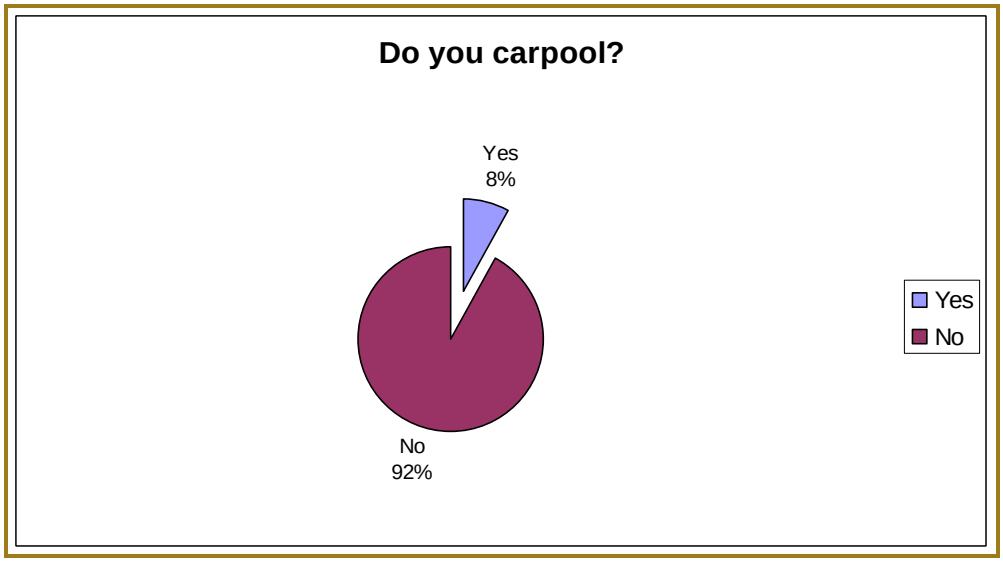
A total of 85% of the survey respondents have lived in Elbert County less than 20 years.

Figure 3-3. Employment



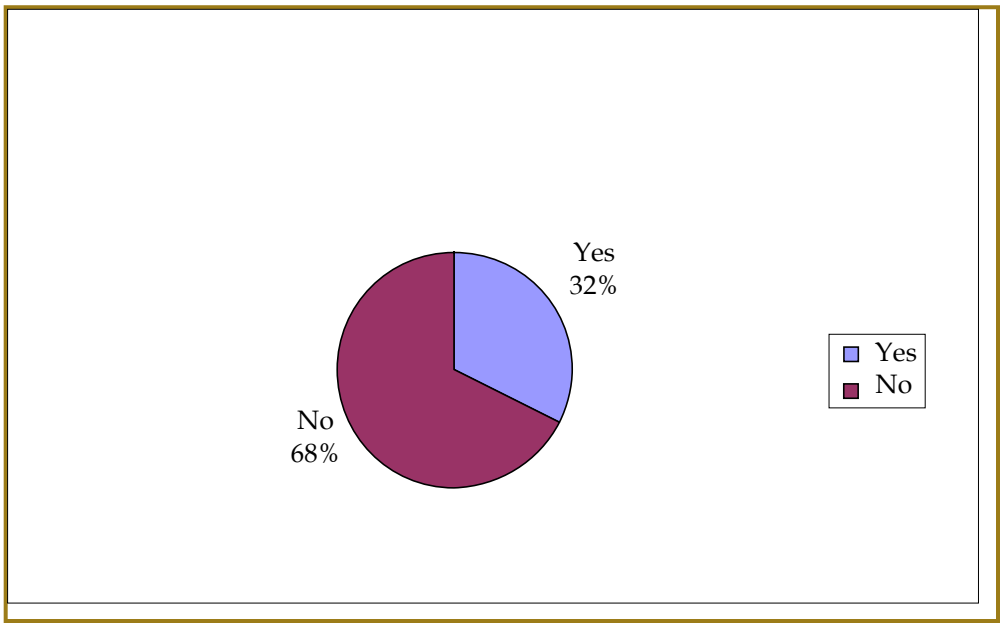
Forty survey respondents reported that their place of work is the Denver metropolitan area, and just three worked in Colorado Springs. A relatively high number of respondents (26) worked at home.

Figure 3-4. Carpooling



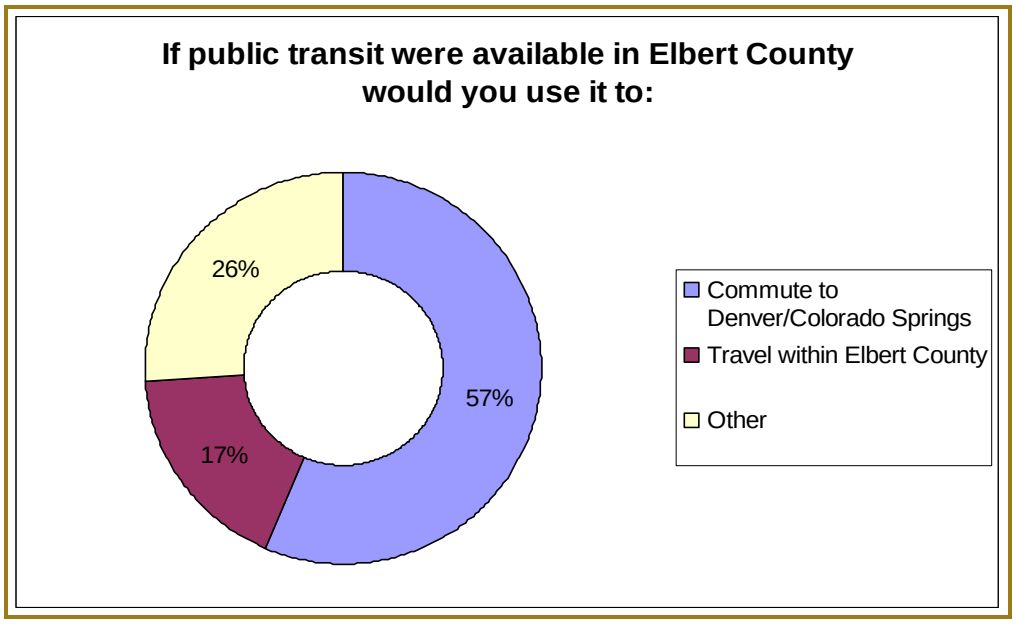
The vast majority of survey respondents do not carpool.

Figure 3-5. Telecommute



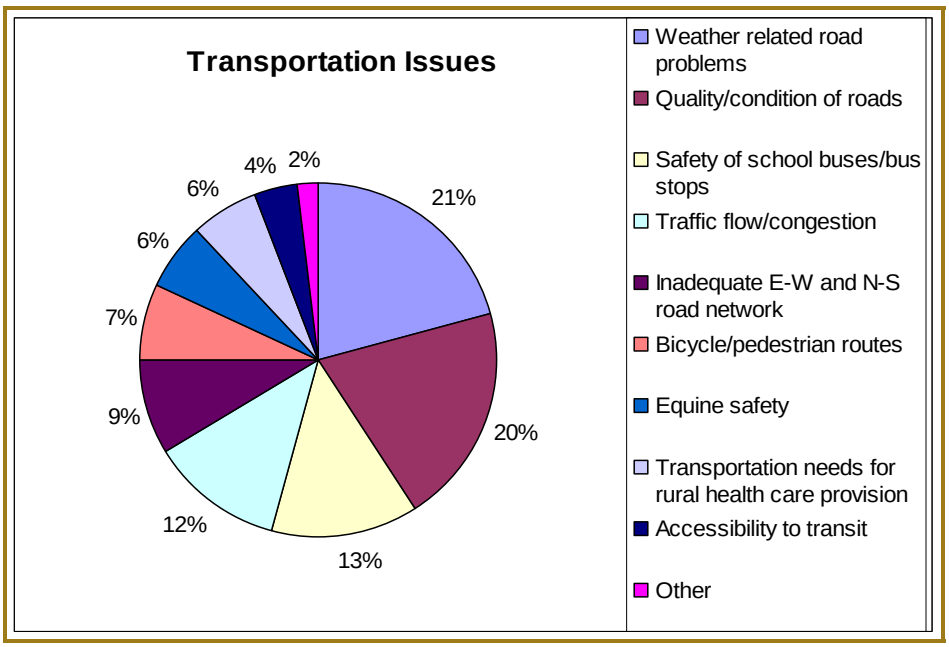
About one-third of survey respondents reported telecommuting at least occasionally.

Figure 3-6. Public Transit



If public transit service were provided, most would use it for commuting to the metropolitan areas.

Figure 3-7. Issues



Regarding transportation issues in Elbert County, survey respondents most frequently identified weather conditions or road maintenance conditions. Safety of school buses and traffic congestion were also commonly identified.

CHAPTER 4. EXISTING CONDITIONS

An inventory was conducted of the following existing conditions:

- Roadways (road and bridge conditions, traffic volumes, safety, missing links, connectivity and regional access).
- Public or quasi-public transportation (public transit, special transit, school bus routes, emergency services routes).
- Non-motorized transportation (bicycle pathways, pedestrian trails, equestrian trails).
- Land use and population.
- Plans of other agencies and jurisdictions.

4.1 EXISTING ROADWAY SYSTEM

The Elbert County roadway network was designed to serve rural and regional needs based on typical rural development of low-density and long distances between population centers. Arterial and local roads were constructed in conjunction with low-density development patterns. This development pattern resulted in a disjointed roadway network that has connectivity gaps and areas of less-than-satisfactory safety.

Roadways in the historic towns of Elizabeth, Kiowa, and Elbert are aligned in a grid pattern with small blocks. Much of the recent growth, which has occurred in the northwest section of the County, is reflective of post-World War II subdivision design. That is, few of the streets are designed as through-streets, rather, there are curving roads and cul-de-sacs. This design contributes to a lack of route options, as few connections exist both north/south and east/west.

Elbert County's ability to construct new roads or make improvements to existing roads is severely fiscally constrained. A majority of the County's road and bridge budget is currently used for maintenance and repair of existing roads, rather than enhancing the existing network system.

Somewhat unique to Elbert County is the effort spent maintaining unpaved roads. Unpaved roads are economically logical when traffic volumes are very low. As the traffic on these roads has increased, the cost of maintenance and upkeep has surpassed the availability of crews and dollars. In the interim, between being resurfaced and repaired, serious safety conditions exist as the road becomes rutted, wash boarded, and uneven. Soft, muddy shoulders are a safety hazard, and excessive dust clouds can obscure driver visibility. The poor road conditions of unpaved roads are exacerbated by severe weather conditions.

To quantify the amount of the roadway system that is currently paved and unpaved, roadway centerline data was obtained from Elbert County. As summarized in **Table 4-1**, approximately 80 percent, or 740 miles, of the roadway centerline mileage in the study area is classified as unpaved roads.

Table 4-1. Existing Roadway Classification

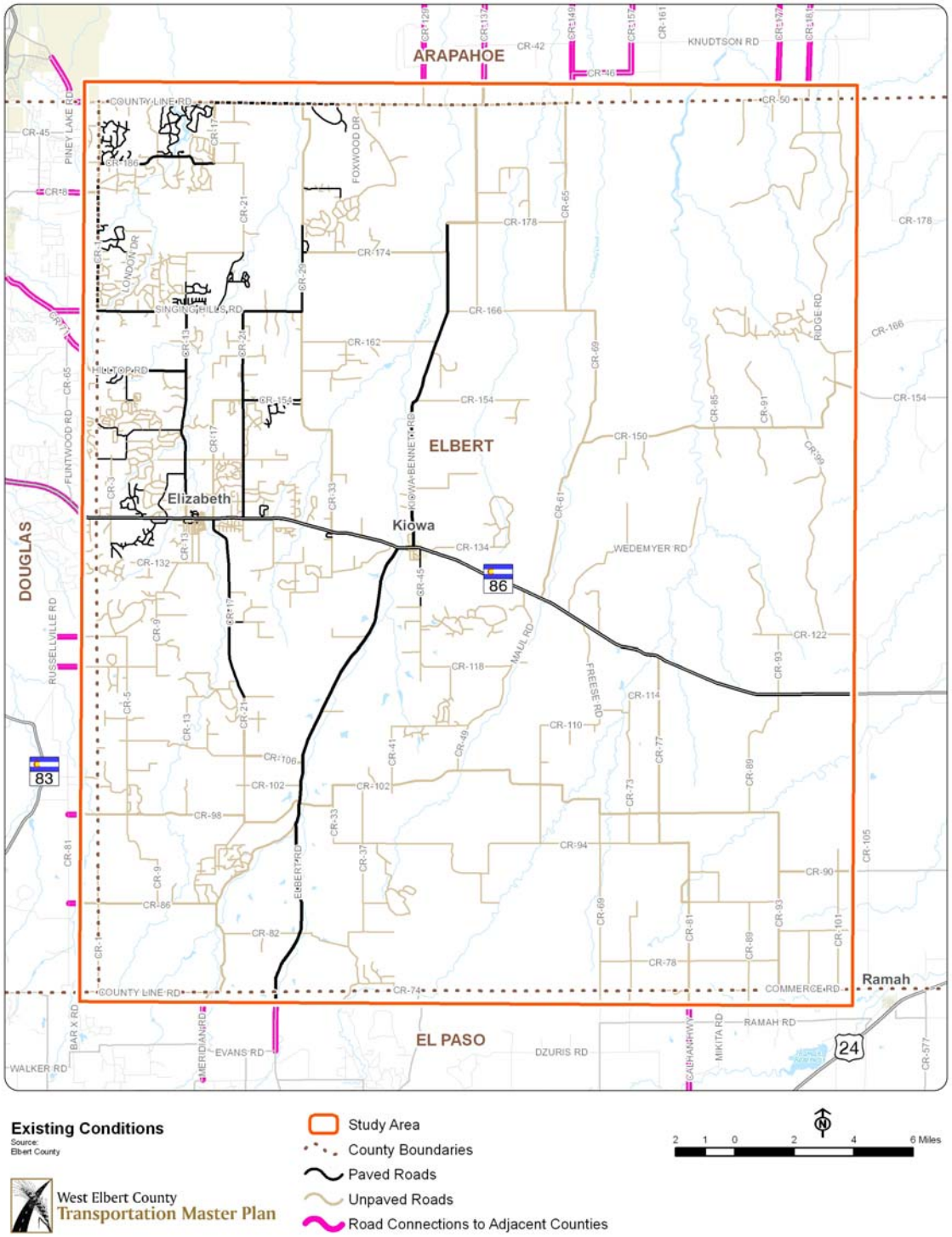
Classification	Paved Miles	Unpaved Miles
Total	170	740
Percentage	21%	79%

Source: Elbert County

Based on geographical conditions in Elbert County, the experience of the County road and bridge crews, and guidelines of neighboring counties, a road with more than 200 vehicles on an average weekday should be paved. Approximately 138 miles of unpaved road in Elbert County currently carry more than 200 vehicles per day. These routes have been identified as critically needing pavement as soon as financially possible. Road paving will be prioritized according to traffic volume and classification of the road. **Figure 4-1** displays the paved and unpaved roads in Elbert County.

Figure 4-1 also highlights the connections between the study area and the surrounding area. These connections are limited in number, and are critical for residents commuting to work on a daily basis to the Denver and Colorado Springs metropolitan areas. The surrounding counties also provide medical, commercial, and retail services to Elbert County residents.

Figure 4-1. Existing Conditions



What existing issues were identified for Elbert County?

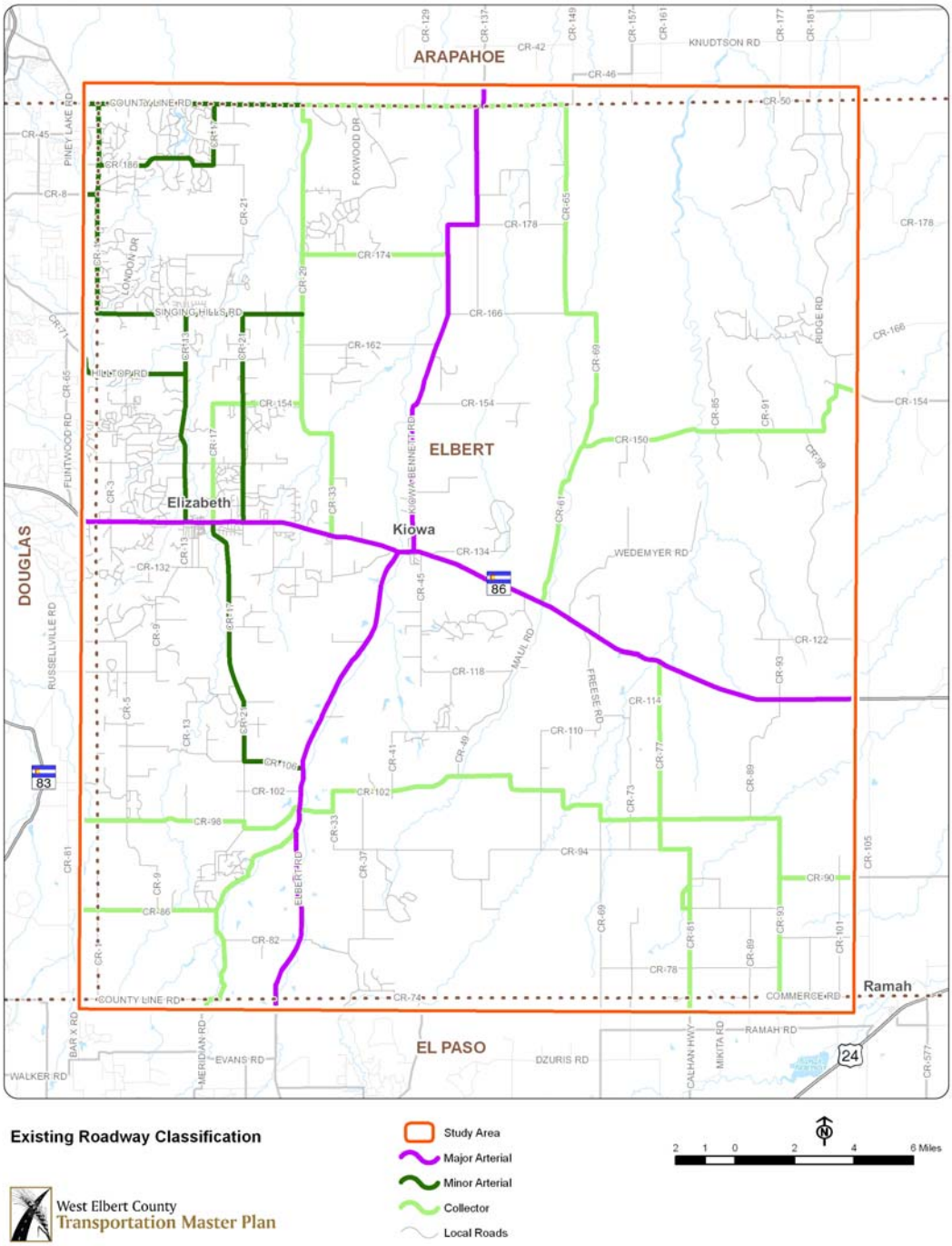
Road Conditions – Many unpaved roads need improvement to their base some of which was put down twenty years ago. Approximately 138 miles now need paving because of increased vehicle use.
Road Connectivity –There are significant gaps in the existing roadway network and a need for connectivity between developments.
Transportation Improvements Funding – Increasing costs for improvements and maintenance are not adequately funded.

Beyond classifying roads as either paved or unpaved, assigning a roadway classification is important for the purposes of planning future right-of-way, access standards, and design standards. The primary function of a roadway is to provide either a high level of mobility or to provide a high level of accessibility. Primary determinants of functional classification are length of trip, average travel speed, frequency of access points, and continuity. Traffic volumes do not by themselves determine roadway function. The hierarchy used for Elbert County is:

- Local Roads
- Collectors
- Minor Arterials
- Major Arterials

The different functional classifications of streets reflect the trade-off between mobility and access. **Local roads**, those roads within neighborhoods and commercial areas, provide virtually unlimited access to private properties. **Collectors** provide frequent land access but are typically interconnected and continuous within communities. **Arterial streets** typically serve major traffic movements for travel between major points. **Arterials** function primarily to move travelers through a community, thus access should be limited to safely and efficiently accommodate traffic. **Figure 4-2** illustrates the existing roadway hierarchy identified for Elbert County.

Figure 4-2. Existing Roadway Classification



4.2 EXISTING BRIDGE CONDITIONS

Conditions on America's surface transportation systems – roads, highways and bridges are deteriorating. In some cases, the physical infrastructure itself is showing signs of age. Nationally, more scrutiny has been placed on the condition of bridges.

Elbert County has a significant number of aging bridges and culverts. They were inventoried in 2007 during a countywide evaluation of Elbert County bridges prepared by Lonco, Inc. for CDOT. This Bridge Inventory evaluated the safety of the bridges and provided the County a planning and programming tool for long-term improvements.

Two of the most common metrics in the report for evaluating the condition of bridges are the Sufficiency Rating and Classification. These measures can be used to determine if the bridge is structurally deficient, functionally obsolete, or in need of urgent repairs. Definitions of structurally deficient and functionally obsolete are in the accompanying boxes.

Review of the Bridge Inventory for Elbert County illustrated some urgent repair and maintenance needs; however, none of these needs are within the current study area of the western portion of the County. The most urgent needs were found in the areas east of the study area. Future funding and studies will need to identify how to address the bridge replacement and maintenance needs identified by the Lonco evaluation.

What is a "structurally deficient" bridge?

Bridges are classified as "structurally deficient" if they have a general condition rating for the deck, superstructure, substructure or culvert as "poor" (4 or less). Examples of poor condition include corrosion that has caused significant section loss of steel support members, movement of substructures, or advanced cracking and deterioration in concrete bridge decks.

The fact that a bridge is structurally deficient *does not* imply that it is unsafe. While there is not an imminent safety concern, a structurally deficient bridge typically needs short-term maintenance and repair before eventual rehabilitation or replacement to address deficiencies.

What is a "functionally obsolete" bridge?

A functionally obsolete bridge is one that was built to standards that do not meet the minimum federal clearance requirements for a new bridge. These bridges are not automatically rated as structurally deficient, nor are they inherently unsafe.

4.3 ENVIRONMENTAL CONDITIONS

An environmental overview was conducted for this *Transportation Master Plan*. The purpose of this review was to identify areas or elements where projects could encounter fatal flaws or major obstacles as they progress from the planning to the implementation stage. The environmental elements considered include:

- Farmland
- Environmental Justice
- Schools
- Parks and Recreation Facilities
- Cultural Resources
- Historic Properties
- Parks and Recreational Properties
- Vegetation, Wildlife, Threatened, Endangered, or Sensitive Species
- Floodplains
- Wild and Scenic Rivers
- Hazardous Materials
- Water Resources and Water Quality
- Wetlands

Why are Environmental Elements Important?

Environmental science is an interdisciplinary science overlapping the Natural sciences, Engineering sciences and Social sciences. Professionals involved in this work influence transportation decisions and many other aspects of the built environment. Generally the considerations are broad, considering pollution, impact on biodiversity, sustainability, and degradation of the environment related to human activities. Increasingly, the public expectation is for projects to consider, and be conscience of, long-term environmental impacts.

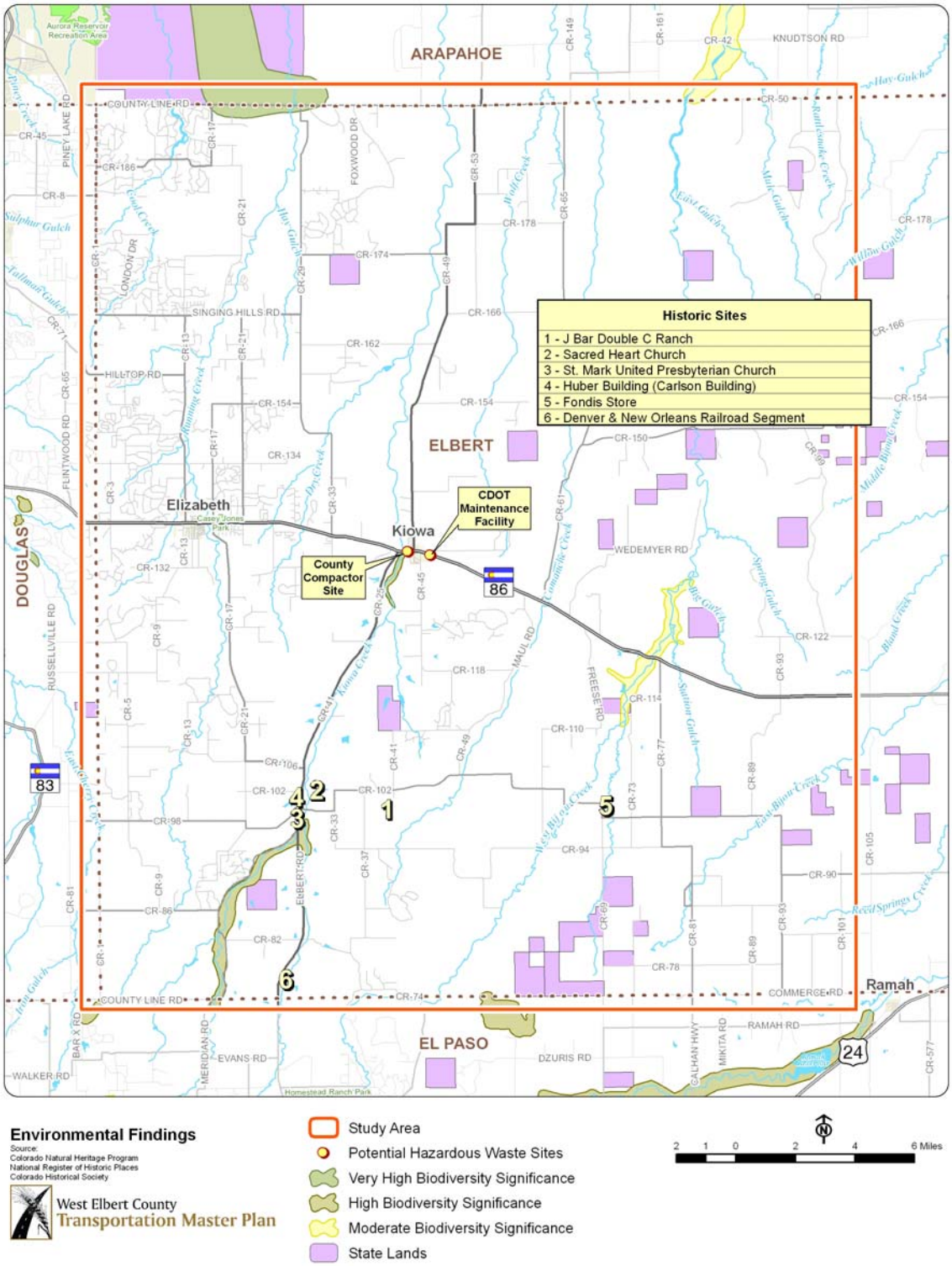
No major environmental impacts were identified that could potentially impact the direction of future transportation projects. Identified Environmental

concerns are shown on **Figure 4-3** and a more in-depth summary is in **Appendix B**. As specific transportation improvement projects are pursued, they may require a more focused environmental analysis. For example, in West Elbert County there are occurrences of protected wildlife and plant species, including the Preble's Meadow Jumping Mouse. After a site study for a specific transportation improvement project and coordination with the U.S. Fish and Wildlife Service, appropriate mitigation measures may be identified.

Key Environmental Issues

- Generally, no significant environmental elements were found in the study area.
- The area near the unincorporated Town of Elbert has the highest number of registered historic sites, though such sites likely exist in Elizabeth and Kiowa that are not registered.
- The southwestern portion of the study area contains the most biodiversity.

Figure 4-3. Environmental Impacts



4.4 EXISTING LAND USE

Elbert County includes a variety of land uses ranging from agricultural to commercial. Some retail, manufacturing, and other businesses exist within the County boundaries, but are concentrated in Kiowa and Elizabeth.

The existing land uses within Elbert County are summarized below:

Agricultural/Ranching: This is the most predominant land use in the County. Lands characterized by this land use designation include open space, forest, general farming, ranching, and agricultural-related uses.

Institutional: This designation includes schools, public facilities, and churches. Public and governmental uses are generally located in Kiowa and Elizabeth. Public schools are located throughout the County and are managed by the school districts.

Non-residential: This designation includes retail, commercial, industrial, and utilities. Non-residential uses make up a small portion of the total land area in Elbert County. Much of this land use within the study area is concentrated near Kiowa and Elizabeth.

Residential: Low-density residential uses are the most prevalent land use within the study area. Residential development currently consists of single-family dwelling units. New residential development is most rapidly occurring in the northwestern section of the County. From a traffic standpoint, Elbert County faces increased transportation infrastructure needs because of the predominance of this type of land use.

Key Land Use Issues

- The prevalent land use in the study area is low-density residential. Currently, Elbert County planners are proposing an updated Comprehensive Plan that will consider a variety of housing options that are compatible with and complement the existing rural character of the County while making transportation improvements more economical on a per residence basis.
- Currently, the County lacks a variety of retail services, particularly in the northwest corner. Strategic planning for these types of land uses is encouraged for future economic benefits and the reduction of driving distances for basic household goods and services.

4.5 SAFETY

Safety is an important consideration in the design and operation of streets and highways. Transportation engineers and planners, in combination with law enforcement officials, are continually working to ensure that street and highway systems are designed and operated so that accident rates are as low as possible.

Many factors contribute to the safety of a roadway. The most common safety factors include:

- Roadway Design
- Signage
- Driver Profile/Behavior
- Average Daily Traffic
- Weather

These factors can be influenced by active and/or passive measures. Roadway design and signage can be directly influenced with active measures, such as reconstruction. Change in driver behavior or education on weather conditions are passive safety measures.

One of the first steps in addressing safety issues is to identify problem issues and locations. While Elbert County does not maintain a systemized database of accidents on County roads, CDOT manages accident data for state routes. CDOT's reporting system includes an indexing of accident type, location, time of day, weather conditions, etc.

Within the study area, SH 86 is under CDOT's jurisdiction. Accident data was analyzed for this corridor.

The CDOT accident data for SH 86 was collected and analyzed for the 2002 to 2004 two-year period, the most recent data available. Several key findings can be extracted from the accident data. These are:

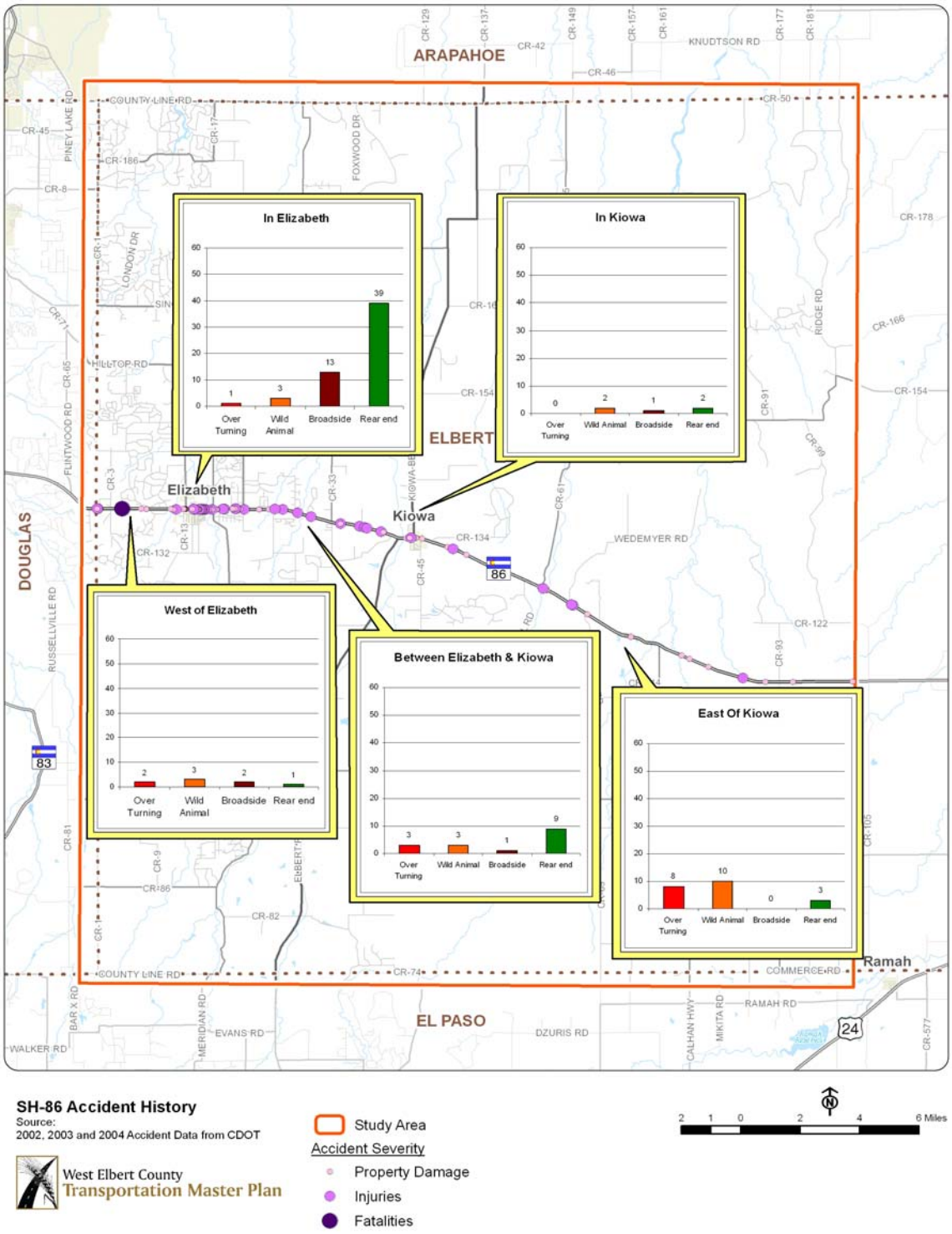
- A relatively high portion of the accidents involve wildlife.
- Elizabeth and Kiowa have a high percentage of encounters classified as rear-end accidents, but this is common in town environments.
- Turning conflicts also predominate in vehicular accidents.

A summary of this accident data is shown on **Figure 4-4**.

Key Safety Issues

- During the winter months, many roadways become very treacherous and dangerous. Paving many of the roads and implementing a snow clearing program should be a priority.
- Many of the roadways do not have a consistent width, grade, or curvature design. These issues should be addressed.
- Street signage throughout the County is sparse. Street names, caution areas, speed limits, school zones, etc., need to be clearly and strategically identified.

Figure 4-4. Accident History



4.6 EXISTING TRAVEL PATTERNS

What do the travel patterns in Elbert County mean for transportation planning?

- The highest traffic volumes are on the fringe of the County. These areas present the greatest planning challenge.
- Congestion outside the jurisdiction of Elbert County will affect County commuters. Inter-governmental agreements can address these issues.
- Many travelers are making long-distance trips and spending a larger portion of their day on the road.

Understanding travel patterns of County residents is important in determining areas in need of improvement. The U.S. Census Bureau provides work trip travel information for all counties in the nation in the U.S. Census Bureau 'Journey to Work' profiles. Work trips are a critical trip for individuals, as well as the economic well-being of the community. Thus, in the absence of a local travel survey, the *Census 2000* 'Journey to Work' data is an important source of data for planning purposes.

Elbert County residents, typical of rural county residents on the fringe of major metropolitan areas, commute to higher-density counties for work and basic services. As many as 70 percent of Elbert County work trips are made to locations outside the County. The statistics are summarized for a two-decade period in **Figure 4-5.**

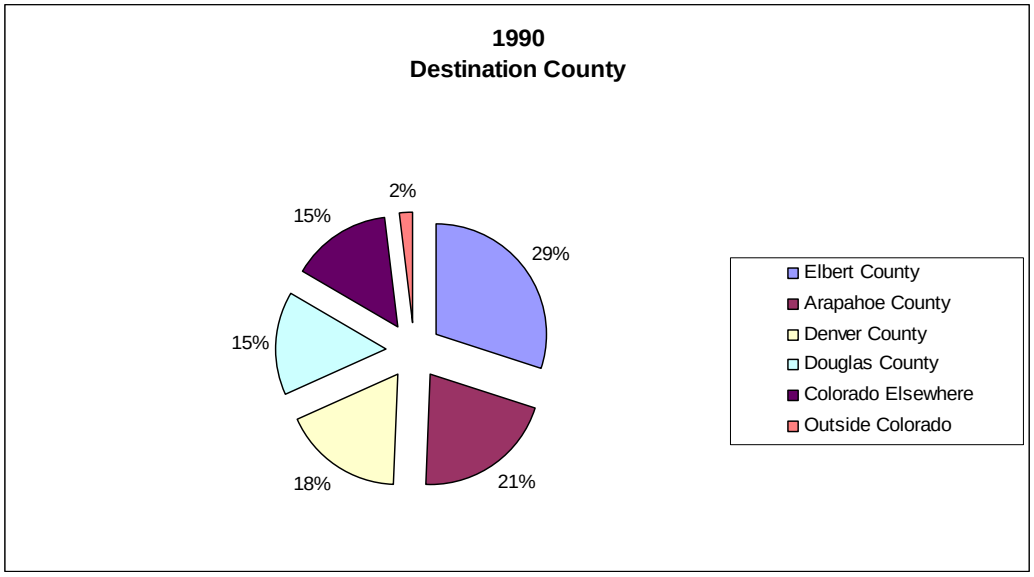
4.7 TRAFFIC VOLUMES

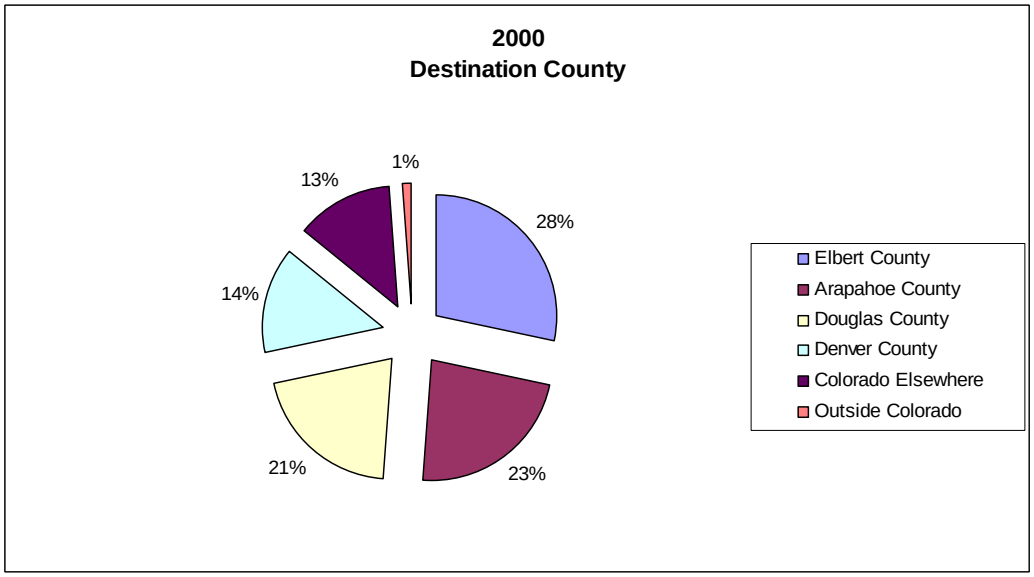
Management of the transportation infrastructure requires knowledge of existing average daily traffic (ADT) flows. When collected over multiple years, this data provides a historic perspective and an indication of likely future trends. Existing and historical traffic volumes are also useful when comparing current to future traffic forecasts.

Existing 2007 traffic volumes for Elbert County were collected from the following sources:

- Elbert County Road and Bridge Department
- Colorado Department of Transportation
- Eastern Colorado Transportation Plan

Figure 4-5. Elbert County Work Trip Patterns





Source: U.S. Census Bureau, 1990 and 2000

Figure 4-6 shows existing traffic volumes. Currently SH 86 is the most highly traveled road in the study area. Existing traffic volumes on this road are as high as 12,000 vehicles per day (vpd) on the west end of the County, but drop to less than 1,500 vpd on the east side. In general, high-volume traffic roads in the County include:

East/West Routes

SH 86

- 4,700 vpd (west of Kiowa)
- 12,000 vpd (west of Elizabeth)

CR 166 (Singing Hills Road)

- 4,400 vpd (east of CR 13)
- 8,850 vpd (east of CR 1)

CR 158

- 3,300 vpd (east of CR 1)

CR 194

- 1,100 vpd (east of CR 29)

North/South Routes

CR 1 (Delbert Road)

- 2,700 vpd (north of CR 146)
- 4,300 vpd (north of CR 166)

CR 13

- 5,200 vpd (north of SH 86)

CR 17

- 1,900 vpd (south of SH 86)

CR 21

- 2,200 vpd (south of CR 166)

CR 29

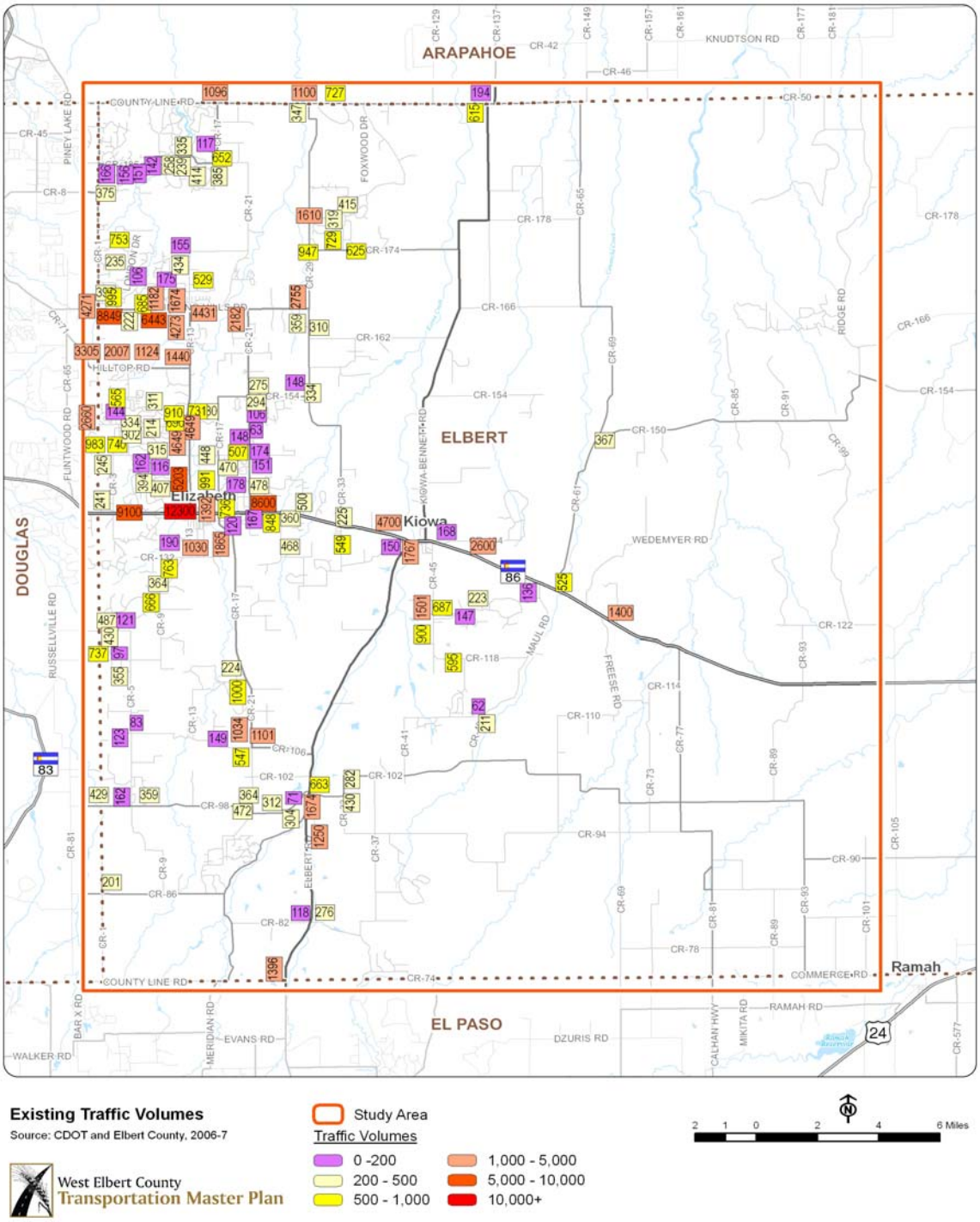
- 2,800 vpd (north of CR 166)

What is important to know about traffic volumes?

A continuous count of traffic at a particular point along a road will show that traffic volumes vary from hour to hour, day to day, and month to month. These characteristics of traffic volumes should be taken into consideration when traffic counts are being collected.

It should also be noted that adjacent land uses can have a significant impact on the daily traffic patterns. For example, the roadway next to a school will have different peak traffic periods than one next to a movie theater.

Figure 4-6. Existing Traffic Volumes



Traffic volume monitoring is of specific interest to Elbert County because many of the roads under County jurisdiction are gravel or unpaved. These unpaved roads require continual maintenance to address excessive rutting or washboarding. As indicated by the Elbert County Department of Road and Bridge, an unpaved roadway can no longer be economically maintained once the traffic volume is above 200 to 250 vpd. There are numerous unpaved roads with daily traffic of over 500 vpd, such as CR 21 (near CR 106); CR 106 (near CR 21), CR 45 (near CR 118), CR 9 (near Stage Run Trail), and CR 53/Kiowa Bennett Road (near CR 144).

4.8 EXISTING LEVEL OF SERVICE

Current roadway level of service has been estimated for the collector and arterial routes in the study area. The Highway Capacity Manual 2000 (HCM) was the basis for this analysis. HCM methodology measures level of service (LOS) for multi-lane and two-lane highways. All of the routes in the study area are currently two lanes, so this measurement is most applicable. The LOS for two-lane highways is measured based on the percent of time spent following another vehicle and travel speed. LOS ranges from A to F, with LOS 'A' representing free-flow or unobstructed travel and LOS 'F' representing slowed conditions due to other vehicles on the roadway.

Though HCM was the basis for this analysis, the HCM thresholds were adjusted to better reflect roads in western Elbert County. As stated above, HCM provides LOS for multi-lane and two-lane highways. The multi-lane criteria fit best for urban and suburban roadways, whereas the two-lane methodology is most applicable to rural routes. Elbert County's travel patterns currently are not suited well to either classification; augmenting the need for adjustments. Travel profiles are very similar to those found on urban routes, yet the roadway design is more conducive to rural routes. For this reason, an empirical method was developed to determine LOS on these highways. This method utilized volumes and conditions on other similar routes along the Colorado Front Range to adjust those volumes provided by HCM. These volumes have been used and applied on other planning studies in Colorado. See **Appendix C** for a detailed description of this process.

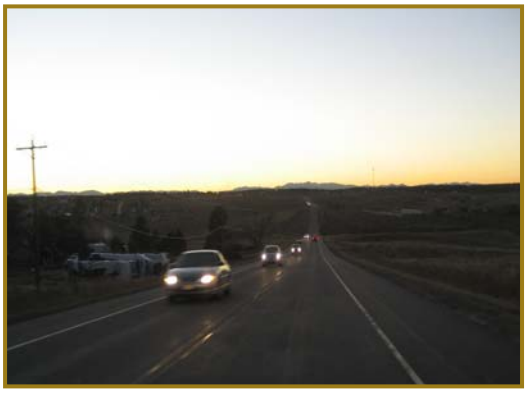


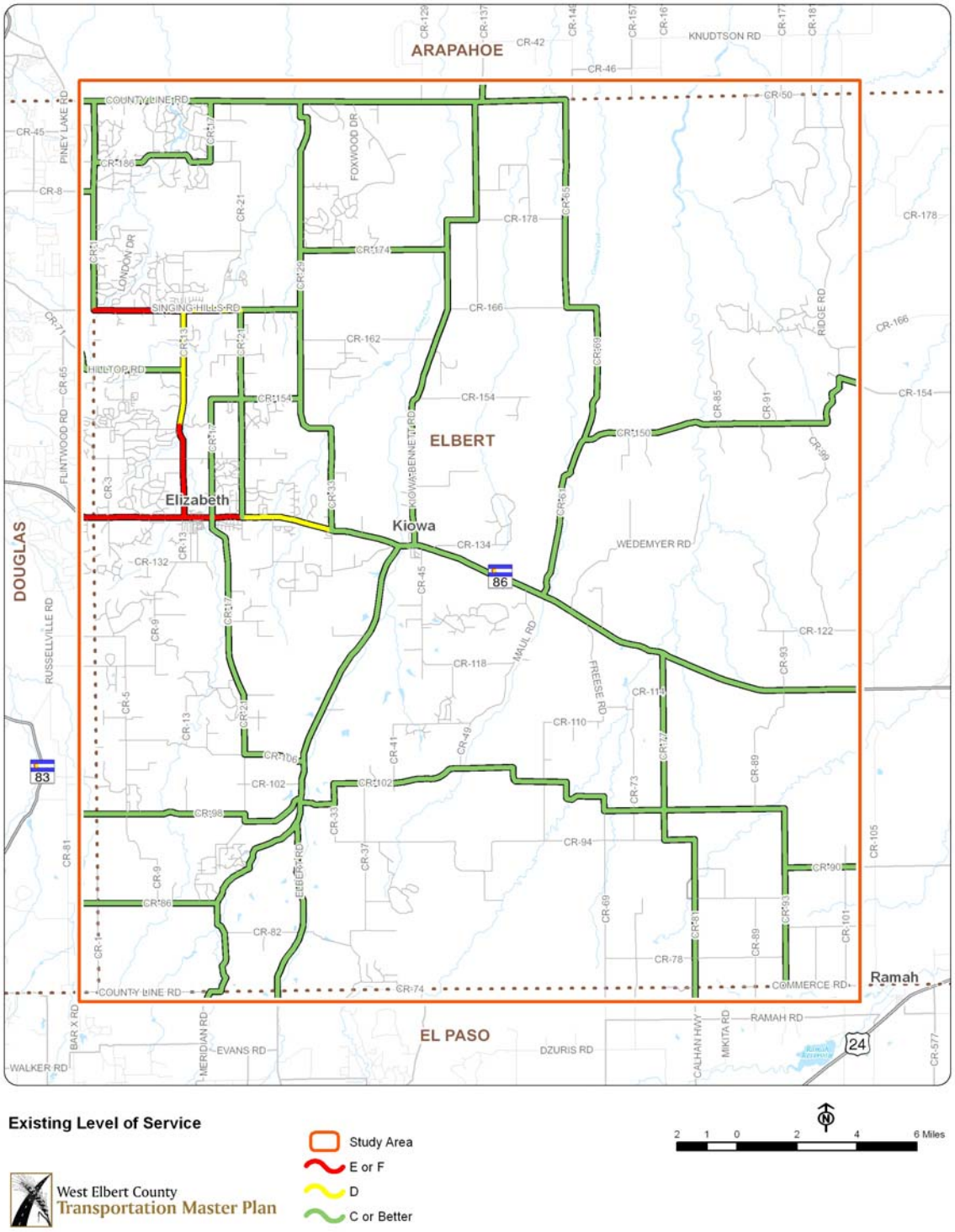
Table 4-2 depicts the Average Daily Traffic (ADT) volumes developed for western Elbert County. The volumes listed are intended to reflect near-capacity or capacity traffic levels for the types of roads, which means during peak hours there are conditions of tolerable delay and queuing at intersections.

Table 4-2. LOS Volume Range

Type	ADT Range		Typical Characteristics (may include some or all)
	Low End	High End	
2-lane minor collector	4,000	8,000	Poor access control, 25 mph to 35 mph, almost no turn lanes at intersections
2-lane collector	8,000	10,000	Poor access control, 30 mph to 35 mph, some turn lanes at intersections, on street parking
2-lane minor arterial	10,000	16,000	Fair access control, 35 mph to 40 mph, expanded lanes at intersections, continuous median
2-lane highway	16,000	24,000	Excellent access control, 45 mph to 55 mph, good turn lanes at intersections
4-lane minor arterial	24,000	32,000	Fair access control, 35 mph to 40 mph, limited continuity, intermittent medians
4-lane arterial	32,000	40,000	Good access control, 40 mph to 45 mph, good turn lanes at intersections
4-lane expressway	40,000	45,000	Excellent access control, 45 mph to 55 mph, maximized intersection turn lanes, some interchanges

The above volumes were used to reflect LOS C or better (green), LOS D/E (yellow), and LOS F (red). **Figure 4-7** displays the existing LOS conditions.

Figure 4-7. Existing Traffic LOS



4.9 PUBLIC TRANSIT

Public transportation refers to all passenger transportation options other than driving alone. About 38 percent of the nation's rural residents live in areas without public transportation options. Less than 10 percent of federal spending for public transportation goes to rural communities. Typical options for transit in rural areas include, demand respond transit for the elderly and disabled, bus service and car and vanpooling. Passenger transportation in rural areas is usually provided by private sector, not-for-profit organizations, and various public agencies.

Elbert County is not included within the Denver Regional Transportation District (RTD) that provides public transit through bus and light rail service for the Denver metropolitan area. The 38 municipalities and 8 counties within the RTD service area impose a 1.20% sales tax for RTD services.

Currently, the sparse population and large geographic area of Elbert County make it economically infeasible to support scheduled commuter buses and taxi services for this area.

Demand-responsive service is available to Elbert County residents. The Outback Express is a scheduled demand-responsive system offering service to older adults, persons with disabilities, and the general public in the sparsely populated but large geographic area of Cheyenne, Elbert, Kit Carson and Lincoln Counties on the central plains. All vehicles are white with blue stripes and are clearly marked "Outback Express." A combination of 19 standard vans and wheelchair accessible mini-buses provide transit services Monday thru Friday, from 8 am to 5 pm. Vans are allocated to areas based on demand.

FAQ: Outback Express?

Q: Who can use it and how is it used?
A: Anyone within Elbert County can use the service. Pick-up is scheduled by calling them directly.

Q: What is their phone number?
A: Toll Free – 1-800-825-0208

Q: What is their email?
A: publictransit@prairiedevelopment.com

Q: What are the hours of operation?
A: Monday – Friday, 8 am to 5 pm

This system is funded with a federal grant from the Federal Transit Administration through the Colorado Department of Transportation and with local government support.

Fares are based on a minimal per-mile fee. The round-trip fare is charged from the pick-up location to the destination and back. One-way trips can be accommodated (such as to DIA). Destinations throughout the Front Range

area allowed. Discounted fares subsidized by Older Americans Act Title III funds through the Area Agency on Aging are offered to persons over the age of 60.

4.10 Bicycle and Pedestrian Facilities

A bicycle and pedestrian plan or network does not currently exist for Elbert County. Furthermore, current design standards for Elbert County roads lack provisions for pedestrian and bicycle facilities. All roads in the County lack minimal shoulders for safe bicycling and walking. The lack of roadway connectivity, signage, and miles of unpaved road base further limits pedestrian and bicycle activities within Elbert County. A more specific bicycle and pedestrian plan is suggested to better address the specific issues, identify viable corridors, and prioritize improvements.

Key Transit, Bicycle, and Pedestrian Issues

- Mass transit requires a land use density that is higher than what is desired by Elbert County at this time. Opportunities do exist to provide ride sharing and other multimodal options.
- Investments should be made to explore the feasibility of park-and-ride facilities. These facilities would be strategically located throughout the County, coordinating travel options to areas of high employment, and/or connect to the RTD network outside of Elbert County.
- Good walking and bicycle facilities extend the reach of transit systems, provide mobility options, improve accessibility for all persons, and help encourage people to have active lifestyles. These facilities should be included in future developments, and a county-wide plan should be created.
- Equestrian activities are popular in Elbert County. Multimodal planning should include equestrian trails and crossings along with accommodations for pedestrians and bicyclists.

4.11 Summary of Existing Transportation Issues

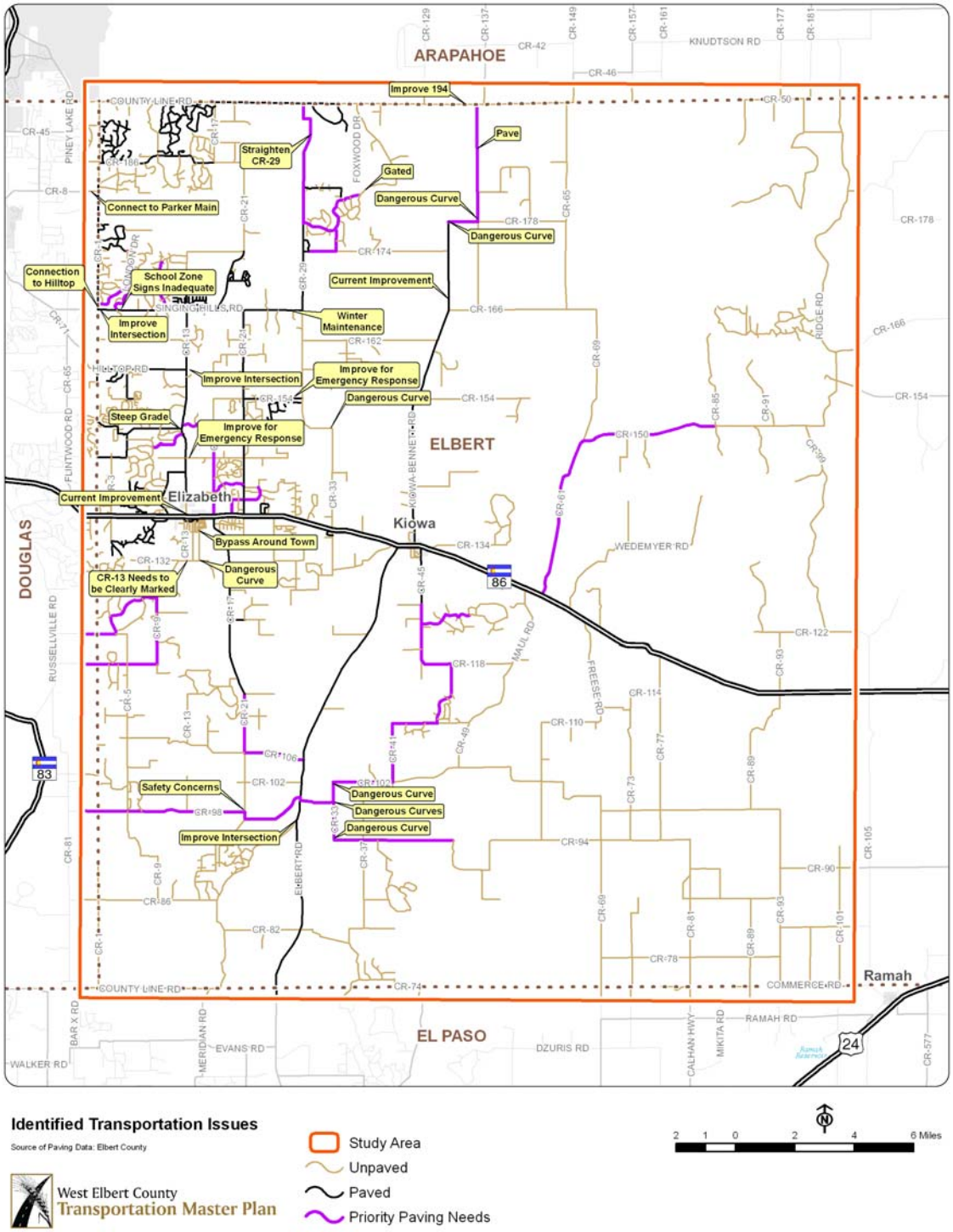
Elbert County is at the tipping point for transportation improvements. Rapid residential growth over the last decade has burdened the existing transportation system. What was once primarily rural land area is experiencing significant urban spillover. The necessary maintenance and infrastructure improvements are not currently keeping pace with the increasing traffic demands of new development. Safety improvements need to be addressed as soon as funding is available.

The existing conditions analysis provided the following findings:

- The community has a 2035 vision that is not consistent with current planning.
- There is a lack of funding to provide a hard surface for many of the roadways.
- Missing connections exist in the County. These missing connections increase travel time and limit travel options for commuters. Existing road networks are overburdened as a result.
- No bicycle, pedestrian and equestrian plans exist for the County.
- There are several transportation-related safety issues throughout the County.

Issues identified from the public input received are summarized and displayed in **Figure 4-8**.

Figure 4-8. Summary of Transportation Issues



CHAPTER 5. FUTURE CONDITIONS

A careful balance of the identified goals described in the opening sections of this report is critical to developing a successful *Transportation Master Plan* for West Elbert County. These goals include:

- Maintaining a rural character.
- Prioritizing projects.
- Providing policy recommendations for any privately funded super infrastructure projects.
- Establishing funding plans and options.
- Garnering public support for the Plan.

5.1 FUTURE LAND USE GROWTH

Elbert County is in the process of updating its County Master Plan. The County Master Plan, in conjunction with updated zoning codes, influences the type, intensity, and location of growth which directly affects travel patterns.

How is population forecasting done?

Though actual population forecasting models are much more complex, basic population forecasting considers birth rates, in-migration, death rate, and out-migration. The relation between these factors in determining population can be described with the following function:

FP = BP + ((B + IM) – (D + OM))

Where:

FP – Future Population
BP – Base Population
B – Births
IM – In migration
D – Deaths
OM – Out migration

This model can look at a short planning horizon or many years out. The further the forecast reaches into the future, the less reliable it becomes.

Increases in population are closely followed by the need for more local jobs, retail centers, and the necessary infrastructure. Economic factors and land use planning policies dictate the way an area grows, influencing both density numbers and the locations of urban centers. "Best practices" land use planning may reduce the transportation infrastructure needs, making a more economically efficient system.

5.1.1 Socio-Economic Forecasts

Population projections consider birth rates, in-migration, and out-migration. Projections start at the macro level (country, region, state) then at micro levels (metropolitan area, county, and city). The Colorado Department of Local Affairs includes the state Demography office. The Demography office is a resource for modeling of demographic trends for Colorado. This office forecasts population at the state, county, and metropolitan level. The Demography office recently published population forecasts for Elbert County. These forecasts, in addition to historic U.S. Census trends, were the basis of the 2035 socio-economic forecast for this *Transportation Master Plan*. **Table 5-1** is a summary of the historic, existing, and future socio-economic forecast for Elbert County.

Table 5-1. Socio-Economic Projections

Elbert County Population and Employment Projections						
	1990*	**2000****	**2005*****	**2007*****	**2035*****	**% Change 2005 to 2035**
Population	9,696	19,872	22,784	24,450	65,350	187%
% in Study Area		*91%***			*95%*	
Total Study Area Pop.		17,992		22,005	62,050	
Average Household Size		2.93		2.93	2.75	
Households in Study Area		7,113		8,344	22,575	

* Census 1990
** Census 2000
*** Colorado Department of Local Affairs. State Demography Office. Population and Economic Forecast 2007

By 2035, 41,000 new residents are projected to move to Elbert County, which will increase the population to approximately 65,000. A majority of these new residents are expected to locate in the northwestern portion of the County. This represents a nearly 200 percent increase from the current population, and is estimated to result in approximately 14,200 additional households.

It is worth noting that east of the study area the remaining portion of the Elbert County is expected to have a 2035 population of less then 3,500. This area of Ebert County will continue to have a different level of needs than the western portion.

The future pattern of growth is expected to follow current trends. The most active growth area is the northwest corner of the County closest to the Denver metropolitan area. As Front Range population growth continues, it is expected that development activity will continue to spread south and east of the northwest corner of Elbert County.

Into the future, growth in the Colorado Springs metropolitan area will also influence growth patterns in Elbert County. This trend is graphically illustrated in **Figure 5-1**.

5.1.2 Land Use

Elbert County zoning regulations designate zoning for a variety of land use types. A majority of existing and pending plans identify single-family development with large lot sizes. This trend is supported by the current real estate market and County policies, which favor lower-density residential use. Recently, Elbert County planning staff, in conjunction with the Planning Commission, have embarked on revising goals of the County Master Plan to include language that encourages a variety of housing options (duplexes, townhouses and senior housing complexes) that will accommodate people of all ages and a variety of income levels, while remaining compatible with the rural environment of Elbert County. It is therefore anticipated that a greater mix of land use types and densities will likely exist in 2035. This mixture and higher density will lessen improvement needs.

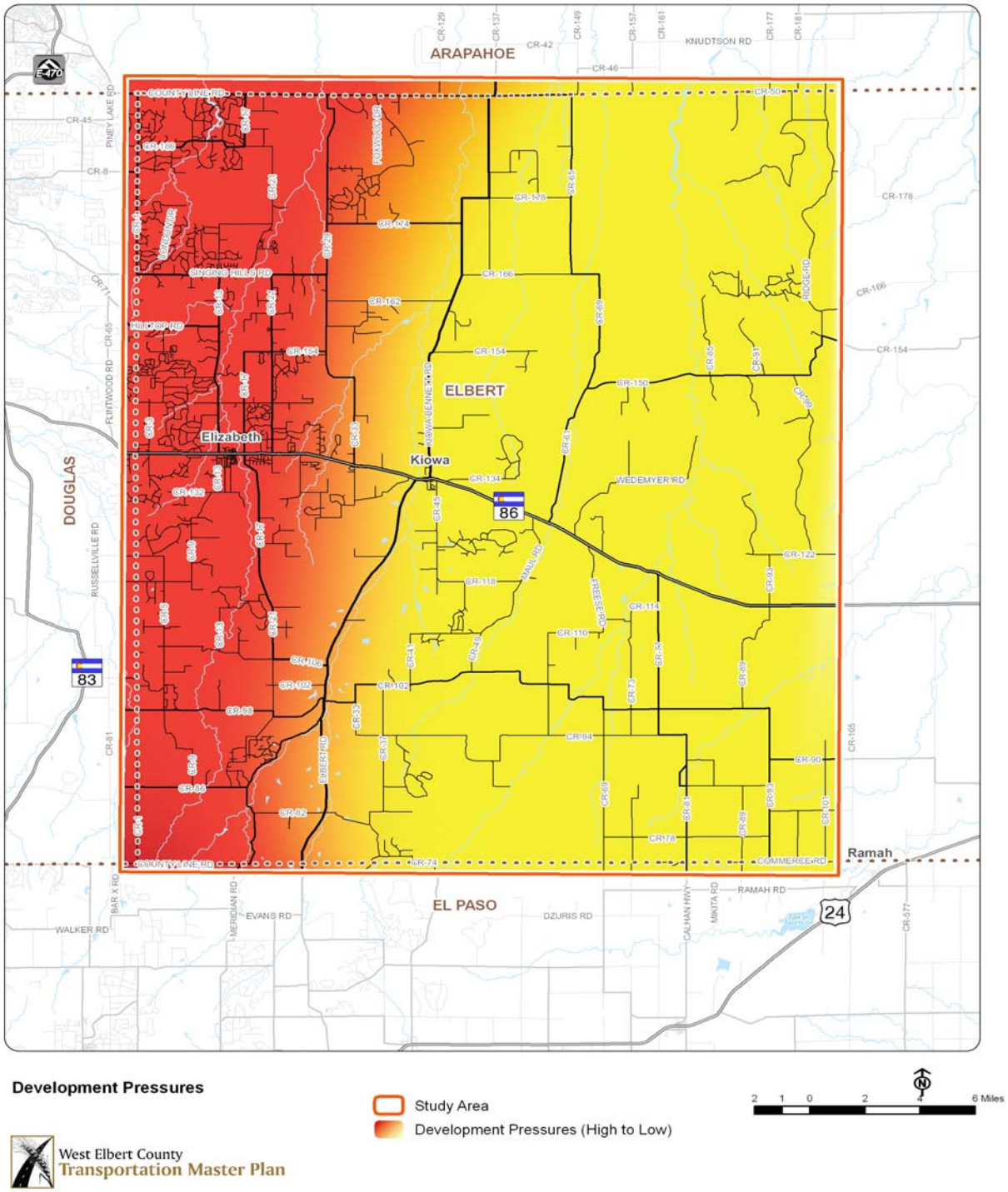
Cluster or Conservation Subdivisions

The primary difference between Cluster/Conservation Subdivisions and conventional subdivisions involves the location of housing in clustered units, while preserving large amounts of common open space. The clustering of housing units reduces the amount of infrastructure, shortens the linear distance of roadways, reduces the associated costs of road maintenance and snow removal, allows for shortened utility runs, and maintains the rural character.

Planned Unit Developments (PUDs)

PUDs anticipate future right-of-way needs and require developers to pay a proportionate share of future improvements to adjacent roads, intersections, and right-of-way acquisition. PUD subdivisions require a coordinated multiple circulation system that has internal roads, access, equestrian trails, and pedestrian/ bicycle trails within the subdivision.

Figure 5-1. Development Pressures



5.2 FUTURE TRAVEL

As outlined in Section 5.1.1, approximately 14,200 new homes are forecasted to be in the study area by 2035. These new homes will put increasing demands on the transportation system beyond those that exist today. Also, additional retail and commercial services are expected. To evaluate the future growth in traffic, a three-step forecasting method was followed. The traffic forecasting process used a spreadsheet-based model, which is described in further detail in **Appendix C**. The process includes the three following major steps:

1. Land Use Allocation
2. Trip Generation
3. Trip Distribution / Trip Assignment

Each step is described as follows.

Step 1: Land Use Allocation
There is a direct relationship between land use and transportation. Areas with higher levels of activity can expect higher levels of traffic. This *Transportation Master Plan* is designed to reflect and support forecasted land use for 2035. For example, Singing Hills Road and SH 86 are expected to serve a large amount of commercial and retail services by 2035. These routes also provide connections to other important regional facilities. As such, they will carry large amount of traffic and will require additional right-of-way for necessary travel capacity.

To provide adequate capacity for the future, future real estate (residential and commercial) was allocated geographically throughout the County based on a current understanding of existing and future land use trends. The northwestern area of the County is expected to have stronger pressures for development, which diminishes to the south and east. This was reflected in **Figure 5-1**, which shows future growth pressures between now and 2035.

Step 2: Trip Generation
Total daily trips were calculated for the County using average rates provided by the Institute of Transportation Engineers (ITE). These statistics are based on a large sampling of various land uses throughout the country, providing a numeric relationship between the amount of a particular land use and the number of vehicle trips

generated. This results in the following daily trip rates[2] used for the area:

- 9.57 trips per/household
- 44.32 trips per 1,000 square feet commercial

Step 3: Trip Distribution / Trip Assignment
Vehicle trips were routed on the future transportation system based on an understanding of existing traffic volumes, *Census 2000* Journey to Work data, citizen surveys, and agency input. Routing was managed using a spreadsheet model.

This process was first developed to replicate existing conditions. Once existing conditions were replicated within reasonable levels, the process was applied for future conditions. This state of the practice travel forecasting methodology is appropriate for rural areas lacking a more sophisticated computer model.

The resulting 2035 daily traffic volume projections are displayed in **Figure 5-2**. Chapter 6 describes the future roadway system that is proposed to serve the future traffic demand.

Figure 5-3 displays the resulting traffic LOS projections in 2035. These LOS estimates were prepared using the same methodology as described in the Existing Condition section of this report. As shown, the recommended future roadway plan addresses travel demand on western Elbert County roadways. Most roadways are shown to have LOS D or better. It should be noted that some of the future routes show a LOS E or F. These conditions, depicted in red on the map, indicate that isolated occurrences of delay likely during peak periods in 2035. Roads with this LOS condition are still highly functional, with vehicles moving at posted speeds. The majority of the road segment would not experience congestion.

[2] Trip Generation, 7th Edition. Institute of Transportation Engineers. 2003.

Figure 5-2. Future Traffic Volumes 2035 Forecasts

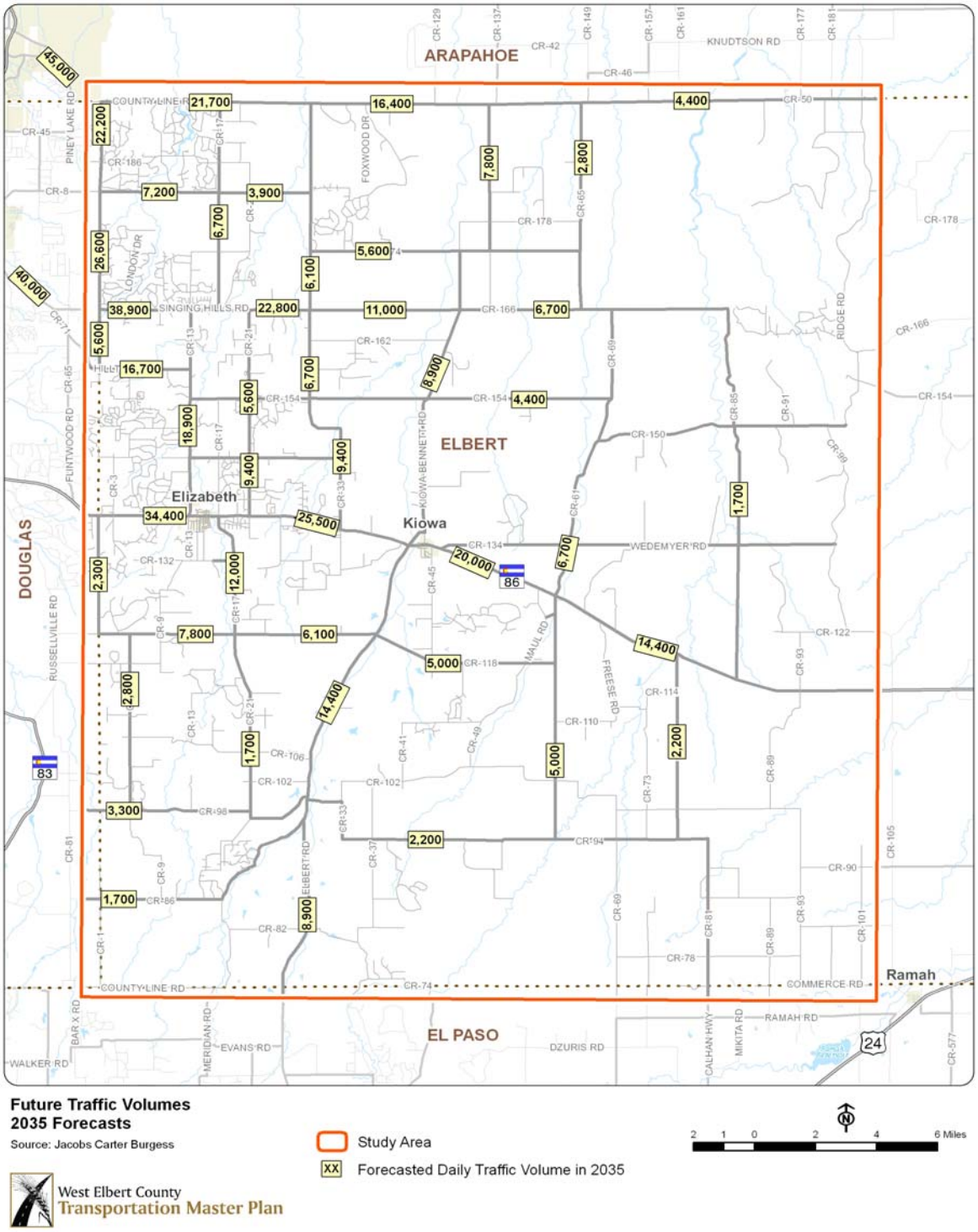
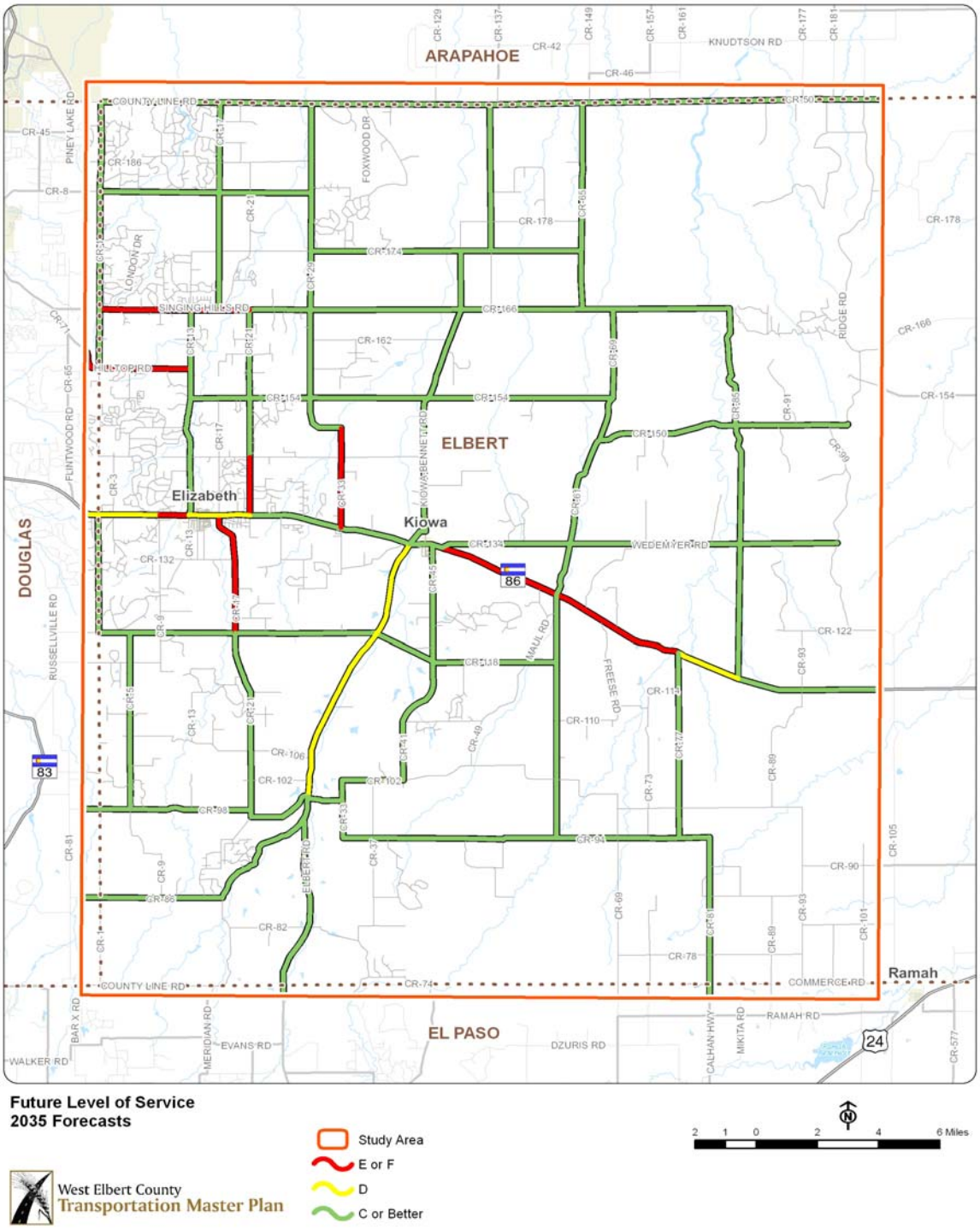


Figure 5-3. Future Level of Service



CHAPTER 6. RECOMMENDED IMPROVEMENT PLAN

The recommended transportation plan for western Elbert County consists of roadway system recommendations, multimodal recommendations, pedestrian/bicycle/ equestrian recommendations, and other policy elements. Recommended policies in support of the system plan are in Chapter 8.

6.1 FUTURE ROADWAY IMPROVEMENT PLAN

Determination of future improvements follows a careful process of evaluating existing deficiencies, future development plans, and forecasted levels of congestion. However, issues for Elbert County are more complex than those of growth and congestion. For Elbert County, connectivity, maintaining character, safety, environmental constraints, protective policies, and private property rights all had to be considered in order to develop a community supported plan. The development of this roadway plan balances pragmatism with community desires for the future system.

How was the future road system determined?

The future road system was developed considering the forecasted travel demand, while also considering the goals and values of the community. Public participation created the Transportation Vision Statement for the *West Elbert County Transportation Master Plan*.

6.1.1 Improvement Criteria

Because of the addition of more than 40,000 new residents and more than 14,000 new homes by 2035, significant new roadway infrastructure investments are needed. The development of a recommended roadway system considered the following criteria identified during the public involvement process and subsequent technical travel forecast:

- **Improve Connectivity and Regional Access –** Many new Elbert County residents live in the northwestern area of the County and commute to larger employment centers along the Front Range. A barrier to these travel patterns is a lack of roadway connectivity. Improvements should address these connectivity challenges, and establish commuting alternatives that reduce traffic congestion.

- **Maintain the Rural Character of the Community –** A high-density roadway grid pattern is not appropriate for Elbert County given the desire of the community to maintain the rural character. Roads need to be spaced at greater distances and should follow the contours of the land. A road network must be created in harmony with natural features and existing neighborhoods.

- **Consider Safety –** Many existing roads have unsafe grades, side-slopes, and dangerous curvature. Improvements must be made to bring roads in Elbert County up to safety standards. Future roads should be designed, located and connected using the highest engineering standards for safety.

- **Accommodate Future Traffic Volumes –** As development continues in Elbert County, many roads and intersections will need to be improved so that there is sufficient roadway capacity available to meet the future demands.

- **Minimize Environmental Impacts –** Elbert County is relatively arid with sparse vegetation. This minimizes the amount of environmentally sensitive lands in the study area. However, where environmental elements exist, road alignments should avoid significant impacts.

- **Avoid Condemnation –** Many Elbert County residents expect a lifestyle that promotes solitude and the peacefulness of the rural experience. Individualism and the protection of private property rights are important. The use of eminent domain or property condemnation should be avoided.

- **Coordination with the County's Master Plan Update –** The County's Master Plan is currently being updated. There is a strong linkage between the Master Plan and the transportation plan. Land use patterns reflect the transportation system; and the transportation system is shaped by land use patterns. The respective plans need to be coordinated so they are consistent with each other.

- **Regional Coordination –**The Town of Elizabeth recently completed an update to its Street Plan, and the future plans of Arapahoe, Douglas, and El Paso Counties were reviewed in preparation of this plan. These jurisdictions also provided input to the draft plan. (Coordination with these adjacent communities and their future roadway plans should continue).

All of these criteria were taken into account by the technical team as the future roadway improvement plan was developed. After an initial draft plan was prepared, the plan was presented for review to a variety of stakeholders, including County staff, emergency service providers, other agencies and governments, and the public. Revisions to the draft plan were made to incorporate comments received.

6.1.2 Recommended System Plan

Figure 6-1 displays the future roadway system plan for western Elbert County. It defines the proposed road classification system of major and minor arterials, collectors, and local roads throughout the western part of Elbert County. The number of lanes and the associated right-of-way width are also defined. Some of the system roadways are new roads that address gaps in connectivity. **Figure 6-2** highlights these new connections in the future roadway plan.

The *West Elbert County Transportation Master Plan* recognizes and refers to the three-mile planning areas of the Town of Kiowa and the Town of Elizabeth. The Town of Elizabeth Street Plan is contained in **Appendix E**. The County recognizes that as Elizabeth continues to grow, improvements to SH 86 will become necessary within the Town area. The County looks forward to cooperating with the Town and CDOT on this issue.

Figure 6-1. Future Roadway System

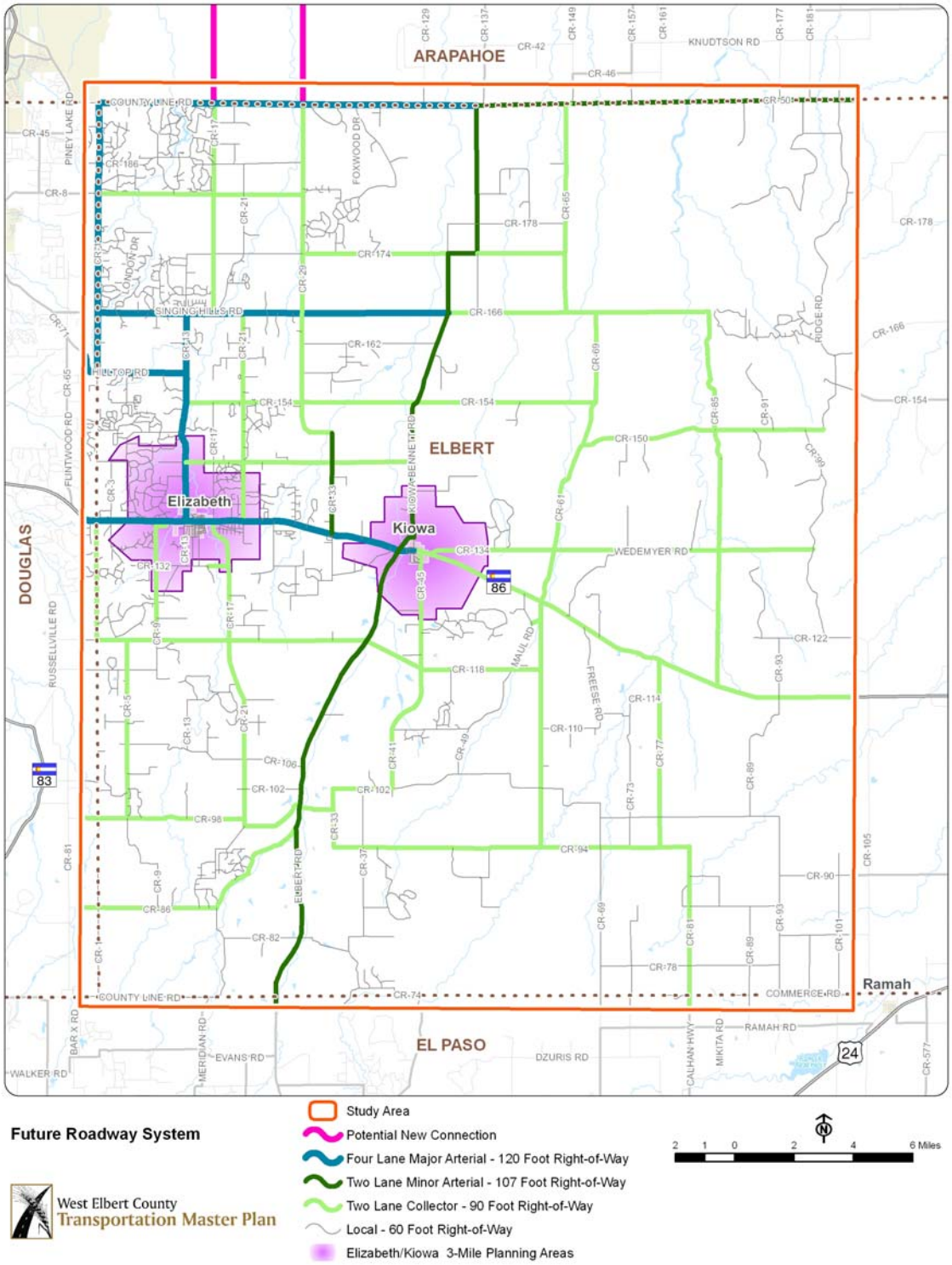
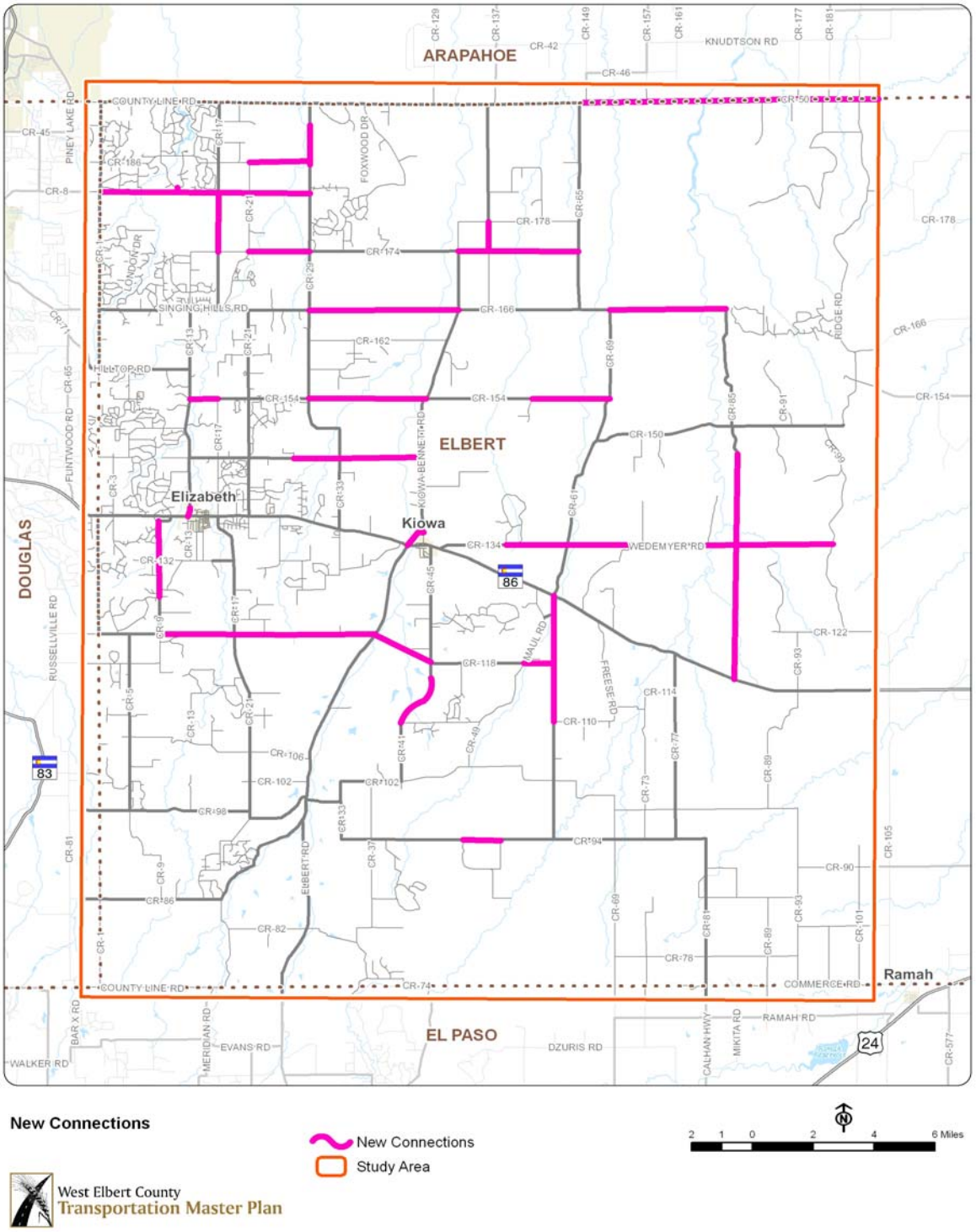


Figure 6-2. New Connections



Cross-sections of the proposed road types are illustrated in **Figure 6-3** through **Figure 6-7**. These display the proposed cross-section of each type of road, along with the associated pedestrian/bicycle/equestrian pathway.

Intersection Control

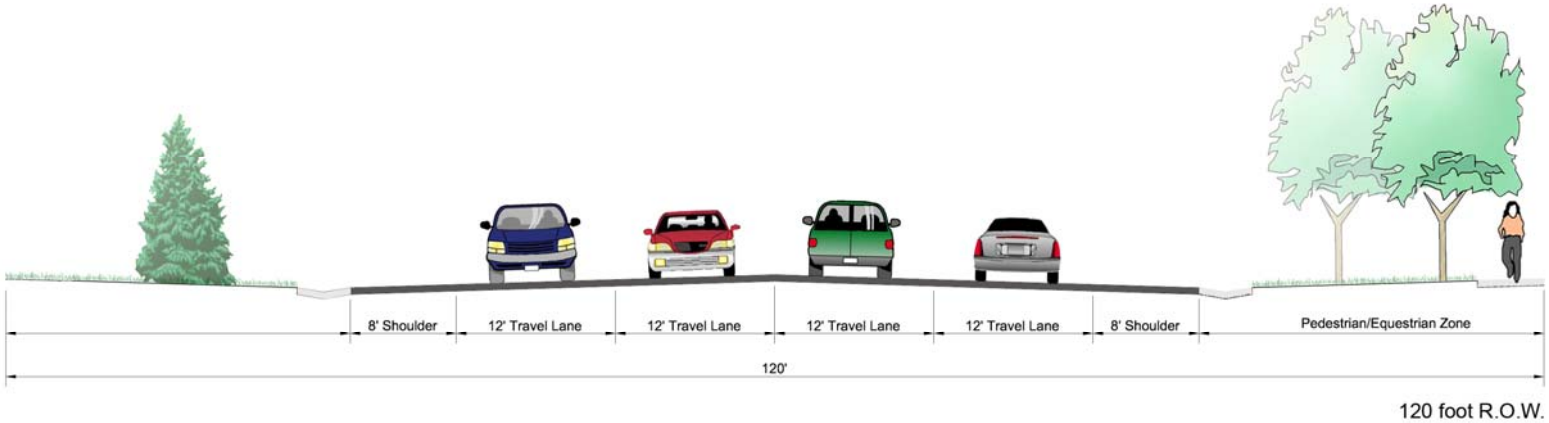
Intersections are a key element of any roadway network. Currently, most intersections throughout the County are 2-way or 4-way stop-controlled. As traffic volumes increase in the future, improved intersection control will need to be considered to facilitate operations. The most likely traffic control options for Elbert County are roundabouts and signalization.

Roundabouts offer distinct benefits over traffic signals. A primary benefit is improved vehicular safety. Roundabouts have been shown to be safer than traffic signals because they eliminate conflicting turning movements that occur at a stop controlled or signalized intersection. Roundabouts also reduce the delay for vehicles and typically increase the capacity of an intersection, as compared to traffic signals. For these beneficial reasons, roundabouts are becoming the intersection design choice among many communities in the United States, including Colorado.

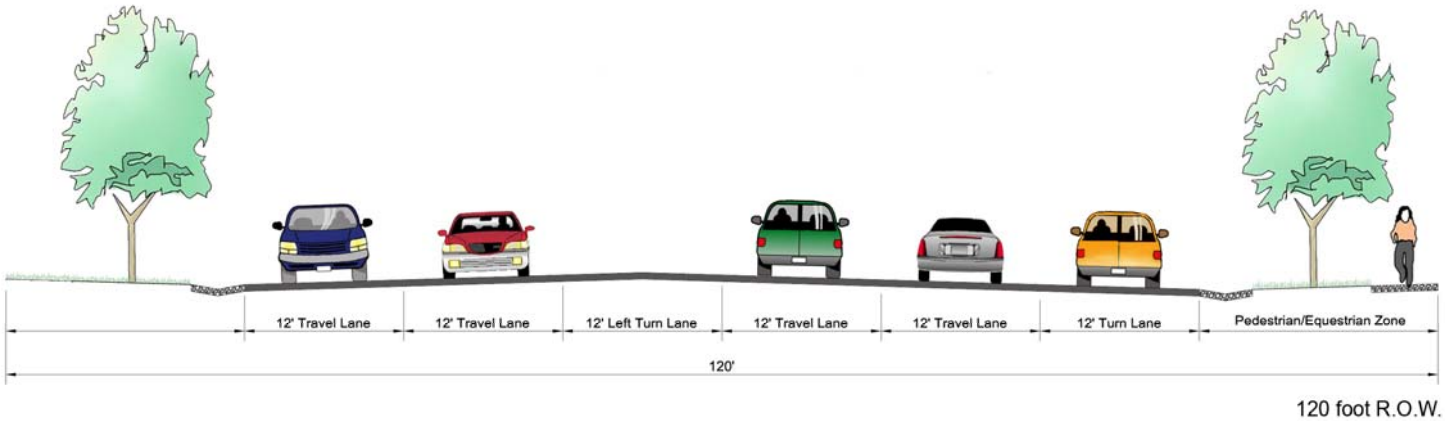
Like any facility, roundabouts need to be appropriately designed to function properly. A well-designed roundabout can easily accommodate emergency vehicles, horse trailers, tractor-trailers, and other large vehicles. Pedestrians are accommodated safely as long as the roundabout is designed to meet requirements of the Americans with Disabilities Act (ADA). Design guidelines and standards for roundabouts should reference the Federal Highway Administration publication dated June 2004, *Roundabouts: An Informational Guide*.

For these reasons, upon warrant of traffic control at an intersection, a roundabout should be considered as the preferred traffic control design. It is recognized that site-specific factors may preclude a roundabout at some locations.

Figure 6-3. Four Lane Major Arterial Proposed 120 foot R.O.W.

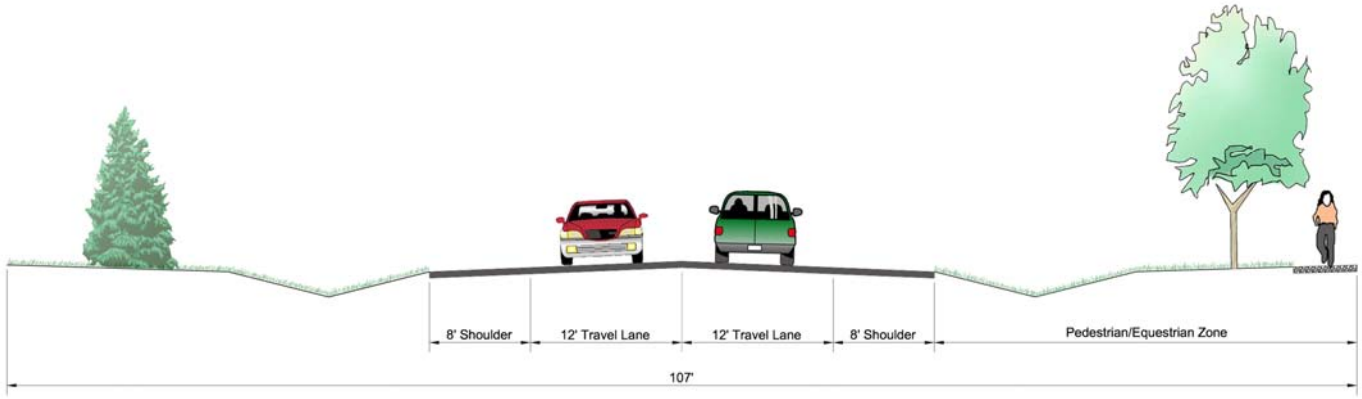


Mid-block



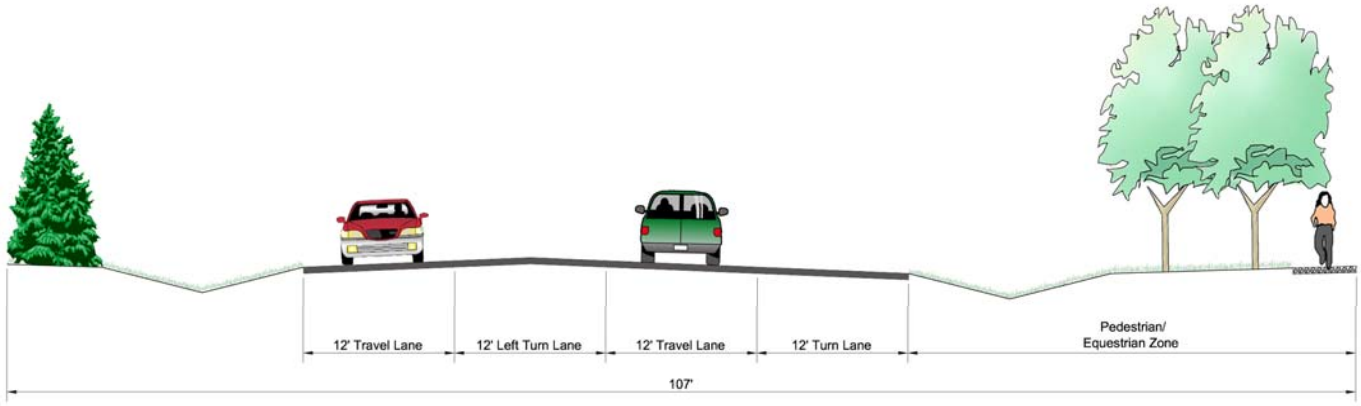
At Intersection

Figure 6-4. Two Lane Minor Arterial Proposed 107 foot R.O.W.



107 foot R.O.W.

Mid-block



107 foot R.O.W.

At Intersection

Figure 6-5. Two Lane Collector Proposed 90 foot R.O.W.

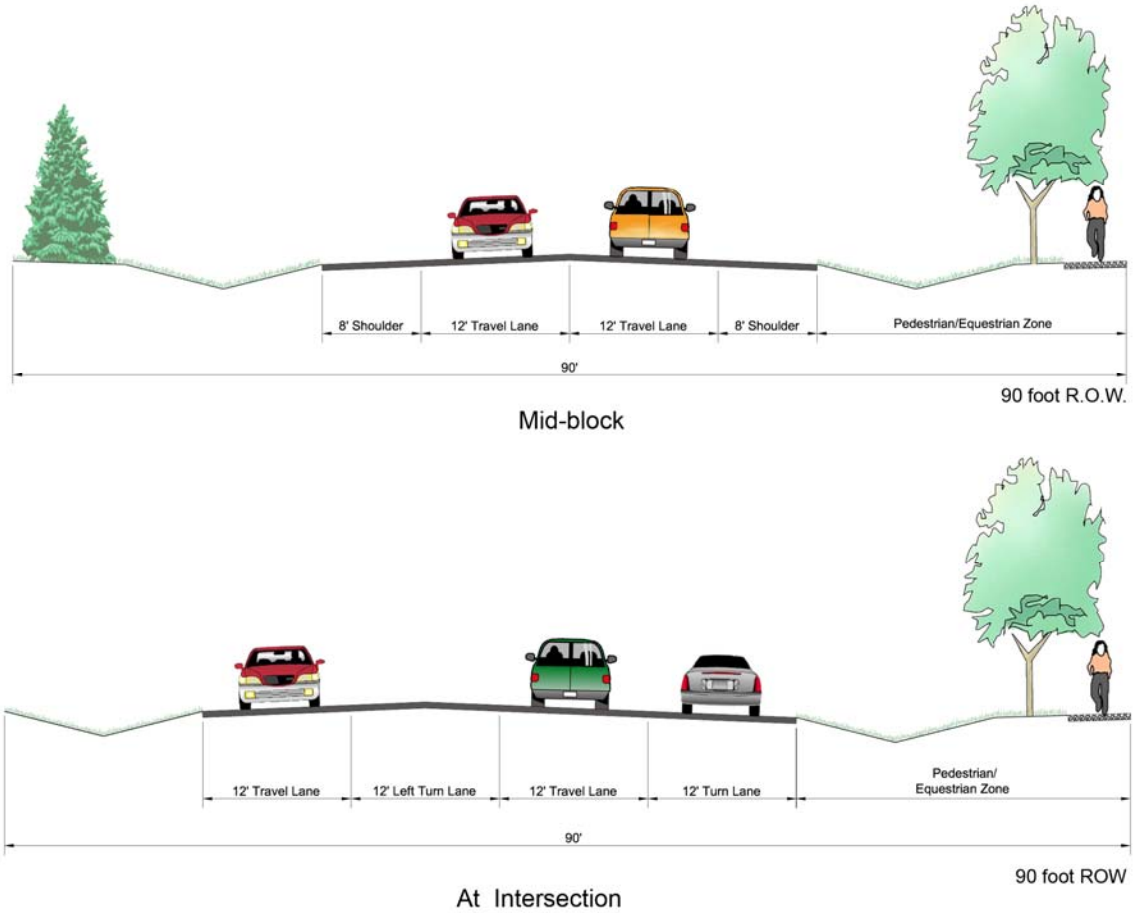


Figure 6-6. Urban Local Proposed 60 foot R.O.W.

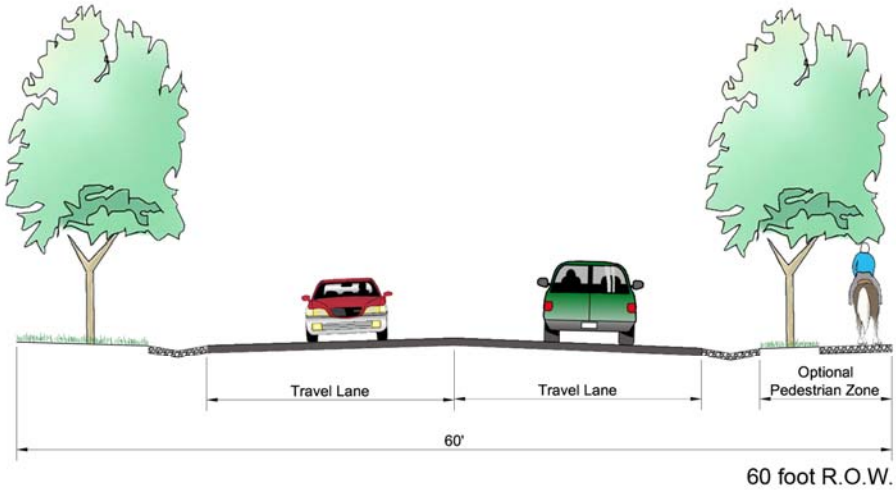
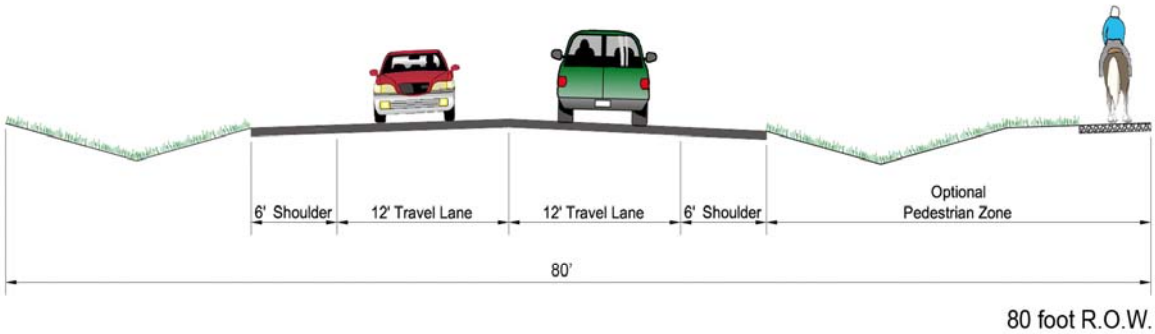


Figure 6-7. Rural Local Proposed 80 foot R.O.W.



Evacuation Routes

From the public and agency outreach process, it was found that there is an awareness in the Elbert County community of the potential need for an emergency evacuation of the metropolitan area east through Elbert County. In such an event, roads in Elbert County as well as other outlying counties would need to serve as evacuation routes. The Denver metropolitan area has a Homeland Security Planning Support Group that is in the process of preparing a draft regional evacuation plan. Only interstates are specified as evacuation routes in the draft plan. However, for the purpose of emergency planning, Elbert County evacuation routes are identified as SH 86, CR 194, and Kiowa-Bennett Road. These roads are planned to have the capacity and regional connectivity that could reasonably accommodate an evacuation.

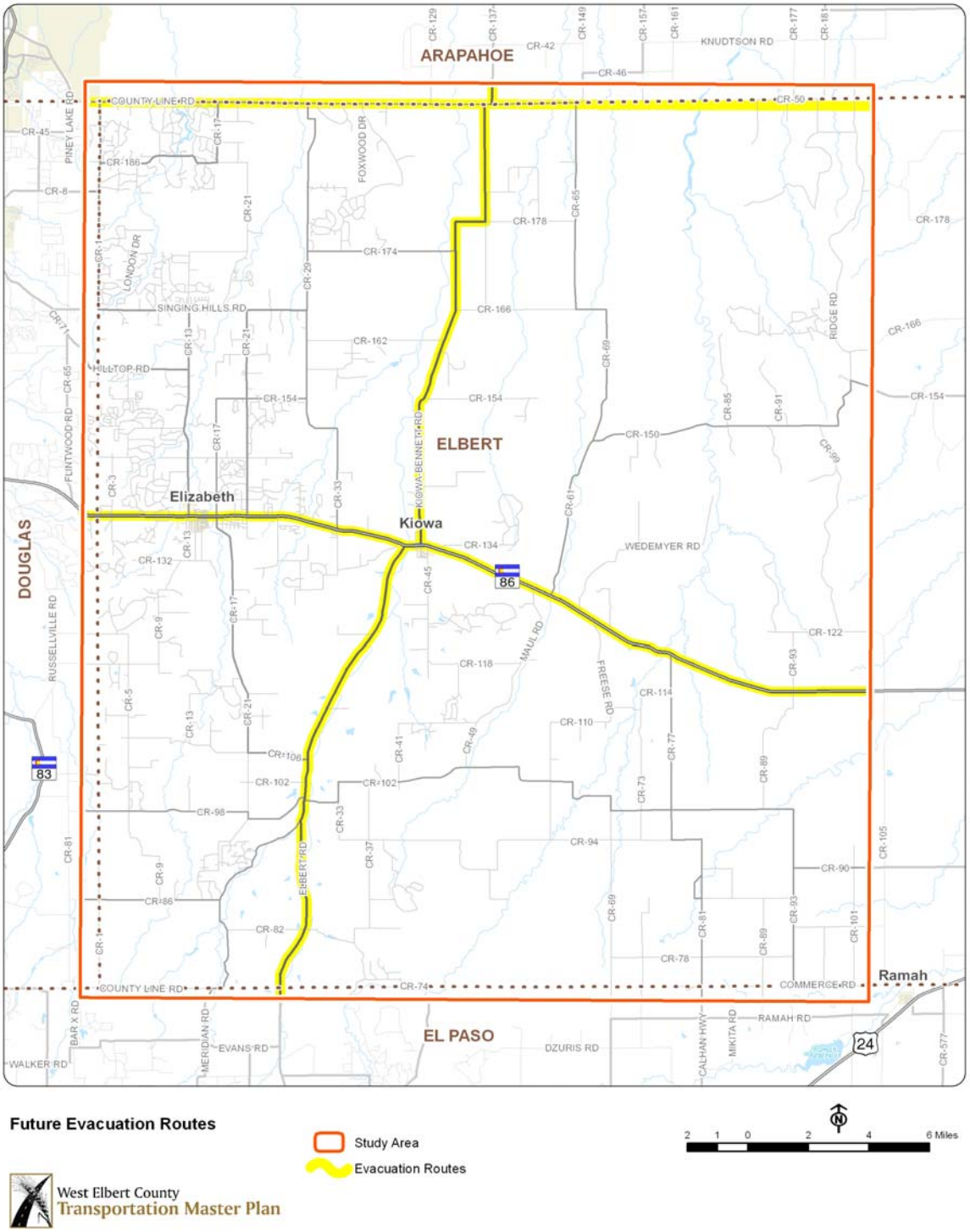
Figure 6-8 depicts the designated future evacuation routes in Elbert County.

6.1.2.1 Roadway System Plan Cost Estimates

The primary purpose of the future roadway plan is to define a system so that as development occurs roads can be properly sized and built. In order to gain an understanding of the scale of magnitude of system improvements needed in Elbert County, an estimate of total costs for the entire roadway system was prepared. The estimate represents planning-level conceptual costs. The cost estimating procedure used for this plan assumed current average unit costs. The estimates include general costs of pavement, road foundation embankment and excavation, bridges, drainage, engineering, right-of-way, and other costs. As such, they represent a conservative estimate before more detailed analysis can be undertaken for specific improvement projects. The costs are prepared in 2007 dollars. Full details of the cost assumptions are in **Appendix F**.

It is important to recognize that western Elbert County is a large area with extensive needs. There are approximately 350 miles of roads on the system plan, the majority of which need to be upgraded and improved to current design standards. Full build-out of the roadway system will take a significant amount of time, even beyond the year 2035. The total cost in 2007 dollars of the future roadway system is **$**1.1 billion dollars. A breakdown of the costs by segment is included in **Appendix F**.

Figure 6-8. Future Evacuation Routes



6.1.2.2 Improvement Prioritization

The prioritization plan identifies the most needed improvement projects. The needed transportation improvements in western Elbert County are numerous, and current funding levels are relatively low. For this reason, some improvements may occur after the planning horizon year of 2035. It is recognized that some project selection will be made in conjunction with the onset of specific developments.

The prioritization plan categorizes improvement projects into short-, medium-, and long-term priority levels. The general method used for project prioritization involved assessing safety needs, capacity needs for current and forecast traffic volumes, connectivity improvements, and maintenance concerns. Projects in developing areas were usually given priority over projects in areas with slower growth rates.

Short-term priority projects were identified based on one of four reasons:

- Improvement of dangerous curves and intersections.
- Pavement of unpaved roads with current traffic volumes of over 500 vehicles per day.
- Improvement of roads with current traffic volumes of over 5,000 vehicles per day.
- New connections in high growth areas.

In a similar fashion, medium-term priority projects were generally identified as follows:

- Pavement of unpaved roads with current traffic volumes of over 300 vehicles per day.
- Improvement of roads that have a forecast traffic volume of over 8,000 vehicles per day in 2035.
- New connections on roads that have a forecasted traffic volume of over about 10,000 vehicles per day in 2035.

Longer-term projects were identified as the remaining projects to complete the roadway system plan.

Figure 6-9 displays the prioritization of improvement projects.

6.1.3 Multimodal Recommendations

6.1.3.1 Transit and Carpooling Improvements

Many people living in the towns and neighborhoods in rural Elbert County have voiced a desire for local transit connections to regional services. Current population numbers and the land use density are not conducive to supporting traditional fixed-route transit services. Operation of a comprehensive fixed-route transit service requires a level of development density and population beyond the planning horizon of this study.

However, the flexible and demand-responsive transit service provided by Outback Express is suitable and appropriate for Elbert County.

In the long term, as density develops, transit services could involve smaller buses and vans providing circulation services between and within communities and along primary corridors. These smaller circulating vehicles could also provide connections to routes that serve the Denver metropolitan region, key activity centers, and timed transfers to transit centers outside of Elbert County.

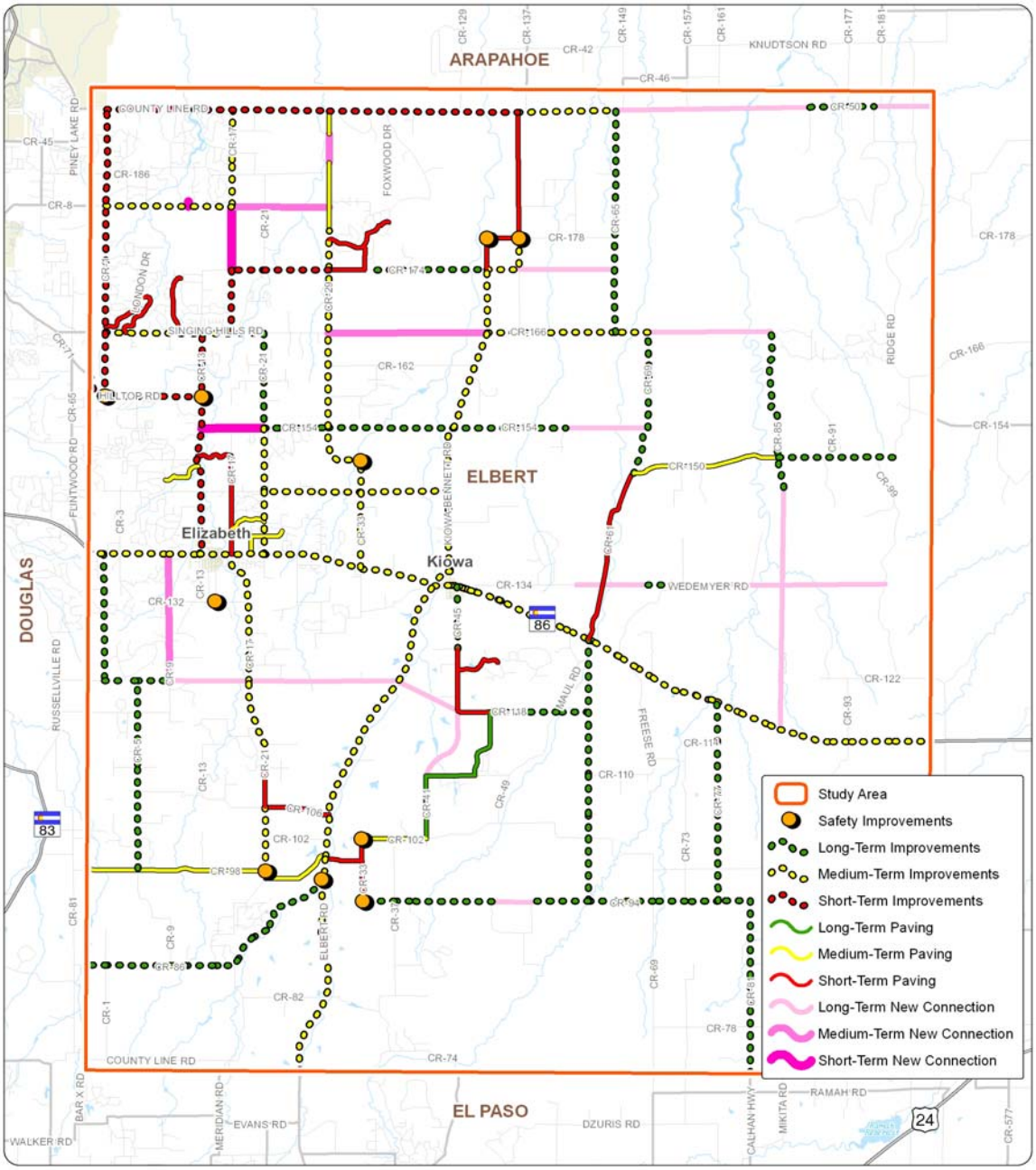
Transit Planning Principles

- The level of service for local transit service should reflect land use densities.
- Transit service should be travel market based to reflect traveler origins and destinations.
- Consideration of operating costs and financing is critical; labor is a major cost for transit service and requires a designated annual revenue source to support it.
- A quality access system to the transit service should accommodate a variety of modes.
- A transit system of more than one route requires transfers between routes.
- Transit and land development should be designed to complement each other.

Carpooling is an alternative mode that may function well for some residents of Elbert County for work trips or other trip purposes to the metropolitan area. This alternative can be supported by the establishment of carpool parking lots for those sharing a ride.

Specific carpool lot locations can be identified, purchased, and signed. Establishments of lots could be part of agreements with developers. Shared use agreements with churches that have parking lots with a low amount of utilization on typical weekdays could be an option. A low-level marketing effort could help advertise the carpool lots and the advantages of carpooling. A carpool matching service could further promote and support the mode of carpooling.

Figure 6-9. Prioritization of Improvement



Improvement Prioritization

2 1 0 2 4 6 Miles

West Elbert County
Transportation Master Plan

6.1.3.2 Pedestrian, Bicycle, and Equestrian Improvements

Approximately 131 million Americans bike or walk for a variety of reasons, including transport to and from work or school, recreation and health. But, according to many experts, bicycling and walking are often the "forgotten modes" of transportation planning – especially in rural areas.

1999 Elbert County Open Lands, Parks and Trails Plan

- Recommends parks locations and areas for open space acquisition
- Recommends a trail development process
- Identifies environmentally sensitive areas
- Addresses funding

No official trails or routes are identified in Elbert County currently, and road facilities do not safely accommodate pedestrians, bicyclists, or equestrians.

The 1999 *Elbert County Open Lands, Parks and Trails Plan* noted that as Elbert County continues to grow, the need for publicly accessible hiking and equestrian trails will become increasingly apparent. The 1999 Plan was cautious about casually delineating trail corridors on a map, and instead recommended that a trail planning committee be established as a subset to the Open Lands Advisory Board to further explore the issues and opportunities for trail development in Elbert County.

During the public outreach process, significant mention was made of the public's desire to incorporate pedestrian, bicycle, and equestrian trails in the transportation master planning process.

It is important that future designs of roads and streets accommodate pedestrians, bicyclists, and equestrians. As development occurs, the need for a trail network is only expected to increase. To accommodate this increased demand, the recommended roadway cross-sections provide additional right-of-way to accommodate pedestrian, bicycle, and equestrian functions. These amenities can enhance the rural lifestyle of Elbert County and protect and support community investment in the rural environment.

One way to provide funding for bicycle and pedestrian improvements is the Safe Routes to School program, a federally funded program that supports behavioral and infrastructure projects to improve the safety and appeal of the pedestrian environment in the vicinity of schools.

CHAPTER 7. FUNDING SOURCES AND STRATEGIES

The price tag for the recommended transportation improvements in this 20 year planning horizon is a hefty one. The costs far exceed current transportation funding sources at the state or local level. A number of funding resources are identified below. It is anticipated that transportation improvements will be carried out over time, at the direction of the elected body, and that funding for those improvements will require a funding strategy that looks at a combination of the resources identified here and others that may be available in the future. Most of these tools are a tax or fee increase or initiative that will require a Board of County Commissioners policy decision and a populace vote to implement. All of the funding sources and strategies listed here are informational and in no way imply an endorsement or approval for implementation by Elbert County.

Even before the *West Elbert County Transportation Master Plan* process was initiated, a movement to create a sales tax initiative in Elbert County that would be dedicated to transportation funding had begun. Discussions in the citizen committees indicated strong support for the initiative and subsequently, in November 2007, the sales tax initiative passed with a 52 percent vote of approval. This 1.0 percent sales and use tax will be deposited into a special road and bridge capital expenditures fund and will grow as retail activity in Elbert County grows.

The capital costs for the recommended transportation improvements in Elbert County far exceed the amount of money available through this initiative and the money allocated to Elbert County through state and federal agencies. A toolbox of strategies needs to be developed and customized for Elbert County that includes grant pursuits as well as innovative partnerships. An aggressive advocacy for Elbert County transportation needs is imperative.

7.1 REGIONAL PLANNING PROCESS

Colorado has been divided into 15 Transportation Planning Regions (TPRs) to plan for, prioritize, and fund needed transportation improvements. Elbert County is part of the Eastern Transportation Planning Region (Eastern TPR). TPRs are responsible for identifying a range of transportation needs to meet the vision of their regions over a 20-year-plus timeframe. These regional visions are then incorporated into the *Statewide*

Transportation Plan. Only projects contained in the regional transportation plans can be included in the statewide plan, which makes them eligible for state and federal funding through the statewide planning process.

7.2 OTHER FUNDING SOURCES

7.2.1.1 Surface Transportation Program (STP):

The funds from this program may be spent on any road that is functionally classified as a collector or arterial for urban streets or as a major collector or arterial for rural areas. The types of projects may range from rehabilitation to new construction. Fifty percent of a state's STP funds are allocated to urban and rural areas of the state based on population. Thirty percent can be used in any area of the state at the discretion of the State Transportation Commission. For the remaining 20 percent of the funds, 10 percent must be spent on highway safety projects, and 10 percent must be spent on Transportation Enhancements. Enhancement projects can range from historic preservation and bicycle and pedestrian facilities to landscaping and water runoff mitigation.

7.2.1.2 Federal Discretionary Funds

Federal appropriations funding is a complicated process; competition for this type of funding is fierce and generally requires lobbying in Washington, D.C. to receive a Congressional earmark. This funding has been diminishing instead of increasing, but Colorado's Congressional delegation has had good success bringing these funds to projects within the state. Additionally, Colorado Congressmen have been receptive to these sorts of funding requests. Typically, any earmark requires matching funds usually at least 20 percent of the earmark, although historically greater matching ratios improve the chances of getting the requested earmarks.

7.2.1.3 Rural Transportation Authority (RTA)

An RTA is a regional, multi-jurisdictional entity that becomes a separate subdivision of the state, but which operates pursuant to an intergovernmental agreement adopted by its member governments. RTAs are able to impose a $10 annual vehicle registration fee and, with voter approval, may levy a sales tax of up to one percent and/or a visitor benefit fee of up to two percent of the price of overnight lodging (fee added to the lodging rate within a specified area). Local governments have considerable flexibility in

designing the boundaries of an RTA, which may include all or a portion of the area's participating jurisdictions. The funding potential from this source may be too small to have a significant impact on the needs of Elbert County, although it could be used in addition to other funding sources.

7.2.1.4 Transportation Impact Fee

Impact fees are legislatively created, generally applicable, one-time fees applied to all new development that will be served by the public improvements or services for which the fee is collected. In general, when a local government imposes an impact fee, it need only show that the fee is reasonably related to the overall cost of the service or improvement to be provided by the governing body (referred to as a rough proportionality). A transportation impact fee could only be levied for local road improvements. Elbert County currently has an impact fee structure in place. The non-residential fee has recently been revised. The residential fee is under review and will be revised in the near future.

7.2.1.5 Lodging Tax and Specialized Sales Tax

Typically, a lodging tax is used in conjunction with marketing and promotion efforts for general tourism. In some resort areas, lodging taxes and other specialized taxes have been used for transit or transportation improvements. This tax is only paid by overnight visitors so the revenue generation is small.

7.2.1.6 Special District Tax

Colorado local governments may create a variety of local districts, including special districts, service authorities, and municipal general improvement districts. In general these districts are funded from fees or property taxes.

7.2.1.7 Colorado Heritage Planning Grants

This funding grant source is administered by DOLA and requires more than one jurisdiction to collaborate on the grant request. Awards are typically for master planning/transportation master planning and require a 50 percent match. Usually, grants are awarded for not more than $50,000, although in a recent award cycle a transportation master planning grant was awarded for $75,000. It is anticipated that Elbert County will apply for this grant again to complete the east half of Elbert County's Transportation Master Plan.

7.2.1.8 Safe Routes to School

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A legacy for users (SAFETEA) federal funding legislation includes a new national Safe Routes to School program. Each state receives a portion of the funds. The program funds projects to create safe and appealing pedestrian and bicycle environments near primary and secondary schools. CDOT administers the grant process in Colorado.

7.2.2 Additional Possibilities

Governor Ritter convened a Blue Ribbon Panel in 2007 to determine the state of transportation needs in Colorado, provide policy recommendations, and recommend a variety of transportation funding mechanisms for the state. This panel was tasked with thinking of innovative methods for bringing increased transportation funding to CDOT. The panel came up with four transportation funding options with associated revenue sources: $500 million, $1 billion, $1.5 billion and $2 billion. Each package amount includes a base $500 million per year for repaving, bridge repairs and local street maintenance. Each of these options has a specified revenue package suggested to fund it.

The panel recommended the $1.5 billion level as the most effective option for meeting needs while still being politically possible. That option would be funded by a revenue package that includes a statewide sales tax hike of 0.35 percent, a gas tax hike of 12 cents a gallon, and a 1.7 percent increase in the severance tax paid by the gas and oil industry. All these hikes would have to go to the voters for approval. (Currently, the state gas tax is 22 cents a gallon and the sales tax is 2.9 percent.) This option would also include an average $100 jump in annual auto registration fees and a new $6 daily visitor fee on hotel rooms and car rentals. No action has yet (as of early 2008) been taken on these recommendations.

Further information on the Blue Ribbon Panel is available at its Web site (http://www.dot.state.co.us/StateWidePlanning/PlansStudies/blueribbon.asp).

7.2.3 Public Private Partnerships (PPPs)

With traditional funding methods falling short of meeting the needs for Colorado's transportation infrastructure and improvements funding challenge, consideration for new ways to finance, construct, and operate highways should include public private partnerships (PPPs). PPPs are contractual agreements between public and private sector partners that allow more private sector participation than is traditional. PPPs can provide greater flexibility in the design, construction and maintenance of transportation facilities through the use of innovative financing, design, construction, and management techniques, resulting in potential reduction of project costs within a more

expedient timeframe. PPPs can be a means to a more efficient risk allocation between the public sector and the private sector, reduce public capital investment, and maximize the use of each sector's strengths. With the goal of enhancing Colorado's transportation system, the use of public private partnerships will require informed stakeholders to have adequate opportunity to develop both technical and public policy analysis of this option. Possibilities for PPPs range from very large infrastructure projects to small transit and roadway improvements.

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CHAPTER 8. RECOMMENDED POLICIES

The citizen committees felt very strongly that the Board of County Commissioners (BOCC) should establish a citizen transportation advisory committee whose charge would be to recommend policies for priorities and expenditures.

In looking at the County budget, the citizen committees also recommended that the current transportation budget format be revised to more specifically reflect funding sources and expenditures to facilitate better public comprehension of the County's transportation investments. Committee members agreed that more needs to be done to encourage citizens to attend annual budget hearings, and that information about transportation projects should be available on the County's Web site with periodic updates.

There is an expectation within the citizen participants that, once the *West Elbert Transportation Master Plan* is adopted, amendments or revisions to the plan will require an adequately posted public notice that will encourage citizen comments on said proposed amendments or revisions.

Ideally, this plan should be updated every five to eight years.

8.1 GOALS AND POLICIES

Goal 1: **Creation of a long-range plan to determine funding needs and opportunities for transportation projects that include existing road network expansion; road surface improvements; maintenance; connectivity; safety improvements; transit, pedestrian and bike trails; and a planning toolbox for new subdivision approvals.**

Rationale

Western Elbert County has a current population of approximately 25,000 with an expected population of 60,000 in 2035. Elbert County is approximately 1,800 square miles and is one of the least populated counties adjacent to the Denver metropolitan area. The 2007 Elbert County budget was $31 million, with much of that amount encumbered. Funding for transportation needs has historically been inadequate and much needed maintenance has been deferred year after year.

Policy Recommendations

- Keep all transportation revenue funds for transportation operations and maintenance.
- Increase transportation impact fees and establish a separate fund for deposit of these fees for use as improvements are needed.
- Enhance economic development outreach.
- Consider funding options from CDOT's SH 83/86 Corridor Optimization Plan (http://www.dot.state.co.us/8386/sh83_86corridoroptimizationplan.pdf) and the Governor's Transportation Task Force recommendations.
- Pursue grant funds and provide a dedicated budget line for matching funds.
- Pursue federal funding.

***Goal 2:* Creation of a long-range plan that addresses road network connectivity and identifies and prioritizes the types of road categories for improvements based on trip origins and destinations that exist in Elbert County.**

Rationale

In the past 30 years, Elbert County has experienced the challenges of large subdivisions without connecting road networks, increased traffic, issues of private land ownership, inefficient land planning, and inadequate funding that has resulted in significant gaps in the roadway network. Inefficient traffic flow, unsafe driving conditions and the degradation of quality of life have all been related concerns voiced by Elbert County residents.

Policy Recommendations

- Designate major corridors on a long-range plan.
- Identify road networks based on land use and vehicle miles traveled.
- Design road networks for sensible mobility.

- Design road networks that provide best practices for improvements and safety (shoulders, access, guardrails, etc.).
- Require County standards right-of-way dedication of all new development.
- Prioritize road improvements based on traffic volume.

Goal 3: **Make all roads in Elbert County safe and efficient to travel by establishing standards for roads in new subdivisions, creating a maintenance plan based on written criteria, and establishing guidelines for road classifications related to traffic volumes.**

Rationale

Many roads in Elbert County are substandard with road base put down more than 20 years ago. Many of these roads are now only bladed. No true gravel is available in Elbert County. Blading tears up the road base and weather conditions, including flooding, further erode the road base. There are over 2,000 culverts in Elbert County and many of those are inadequate or damaged. Roads in older subdivisions were built without accepted engineering standards. There has been an increased volume of traffic without funding increases for operations and maintenance.

Policy Recommendations

- Realizing there is a significant funding cost to this, PUBLIC SAFETY in Elbert County is the top transportation priority.
- Require new development to provide adequate right-of-way.
- Require compliance with County standards for road design.
- Require utilities be placed in dedicated easements on all new roads.
- Outsource some maintenance.
- Establish thresholds for road surface improvements.

Goal 4: **Consider policies that promote transportation planning in coordination with land use planning and proactively work with adjacent jurisdictions and regional and state agencies to encourage regional roadways that have adequate capacity for traffic.**

Rationale

Land use and transportation planning must be coordinated. A strong transportation system that provides good access and traffic flow is a key to good economic development and community vitality. The design of the transportation network should also support the community's character and image.

Regional transportation planning efforts are critical for securing regional, state, or federal funds. Regional collaboration provides access to information about the priorities of neighboring jurisdictions and facilitates opportunities for timely coordination.

Policy Recommendations

- The Transportation Master Plan should be consistent and not in conflict with the County's updated Master Plan.
- Review and revise if necessary current Inter-Governmental Agreements to identify consistent use of best practices where roads cross jurisdictions.
- Encourage transportation sub-area plans to provide consistency throughout the County.

8.1.1.1 Roadway System Plan Policy Recommendations

- New public roads should be paved.
- Future developments will need to make on-site, adjacent, and off-site roadway improvements as appropriate.
- Future developments will need to dedicate rights-of-way easements for long-range needs.
- As intersections warrant traffic control, roundabouts are considered as the first choice of control design unless specific circumstances require traffic signalization.
- The three-mile areas surrounding the Towns of Elizabeth and Kiowa are recognized for detailed roadway plans.

8.1.1.2 Transit and Carpooling Policy Recommendations

- Identify specific locations of parking lots for carpools and vanpools.

- Establish shared "park and ride" parking lots with churches or other land owners.
- Consider a "park and ride" parking lot impact fee as part of the development process, to be collected and used to address future needs.
- Increase County support for special transit services for elderly and disabled residents.
- Consider a "ride arrangers" carpooling agency.
- Encourage and expand public-private transit services.
- Periodically reevaluate the possibility/feasibility of belonging to the Denver RTD system every five years.

8.1.1.3 Pedestrian, Bicycle, and Equestrian Policy Recommendations

- Design new roads to accommodate pedestrian and bicycle use.
- Create safe trails and crossings for equestrian use along appropriate corridors.
- Standardize trail design and criteria to accommodate regional travel within inter-jurisdictional boundaries.
- Standardize signage.
- Complete gaps in connectivity from neighborhoods to adjoining neighborhoods.
- Consider Safe Routes to School enhancements.
- Consider maintenance costs and funding sources.

8.2 Policy on Potential New Multi-lane Transportation Corridors

It is the stated goal of this countywide transportation plan to anticipate **all** potential transportation impacts in the County and to suggest appropriate mitigation, planning or infrastructure improvement measures to accommodate these impacts.

In the event any large-scale, multimodal transportation, rail or utility project that significantly impacts Elbert County is proposed, such project will require grade-separated interchanges where they intersect State highways or County roads. All other existing and planned roadways identified on the County system plan will remain intact with grade-separated crossings. Local roads severed by a proposed project would need to be connected to the grade-separated crossings via frontage roads. A maximum of two miles between grade separated crossings will be required.

Any proposed project would need to adhere to all 1041 regulations in Elbert County, as well as other regulatory requirements imposed by the County. The cost of all improvements will be required to be borne by the project.

8.3 Transportation Master Plan Amendment Policy

As an integral part of the Elbert County Master Plan, all amendments and revisions to this *West Elbert County Transportation Master Plan* will be formally adopted by the Elbert County Planning Commission.

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