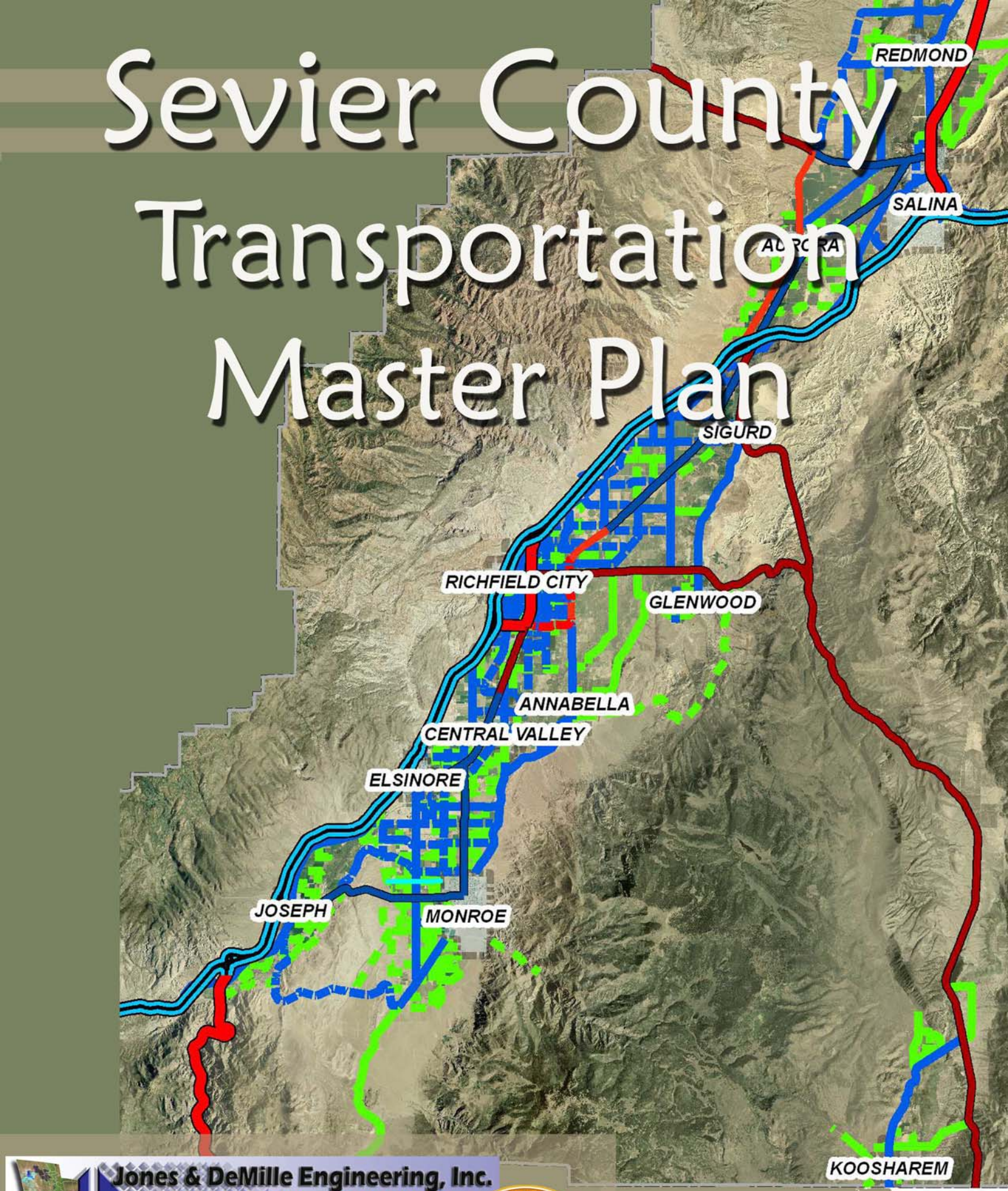
Sevier County Transportation Master Plan



Jones & DeMille Engineering, Inc.
CIVIL ENGINEERING ENVIRONMENTAL
G.I.S. SURVEYING
MATERIALS TESTING
LOCATED IN CENTRAL UTAH SERVING THE INTERMOUNTAIN WEST SINCE 1982
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ENGINEERING HOSKINS DEVELOPMENT

SEVIER COUNTY ROAD DEPARTMENT

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1 INTRODUCTION

1.1 Background

Sevier County is located in the heart of one of the most scenic places on earth and is midway between Los Angeles and Denver. Just a few hours away are seven national parks: Zion, Bryce, Arches, Canyonlands, Great Basin, Capitol Reef, and the North Rim of the Grand Canyon. Part of Sevier's Cathedral Valley lies in Capitol Reef National Park. The Indians called it the "Land of the Sleeping Rainbow." Sevier County has over 50,000 acres of cropland. Important businesses include livestock raising, coal and rock salt mining, gypsum manufacturing, bentonite and clay mills, turkey processing, trucking, and tourism. Sevier County residents and visitors enjoy a wholesome environment, abundant natural beauty, and numerous recreational opportunities.

1.2 Need for a Study

The primary purpose of a transportation system is to move people and goods in a safe and efficient manner. A variety of different travel demands needs to be considered in order to fulfill this purpose, including travel within the County, passing through the County, and between rural parts of the County and the County's cities. The movement of people and goods also involves various transportation modes, including vehicular, rail, pedestrian and bicycle, to provide for a high degree of mobility to all segments of the population. The County roadway system is currently the key element of the transportation system in that it accommodates the majority of the travel needs outside the County limits.

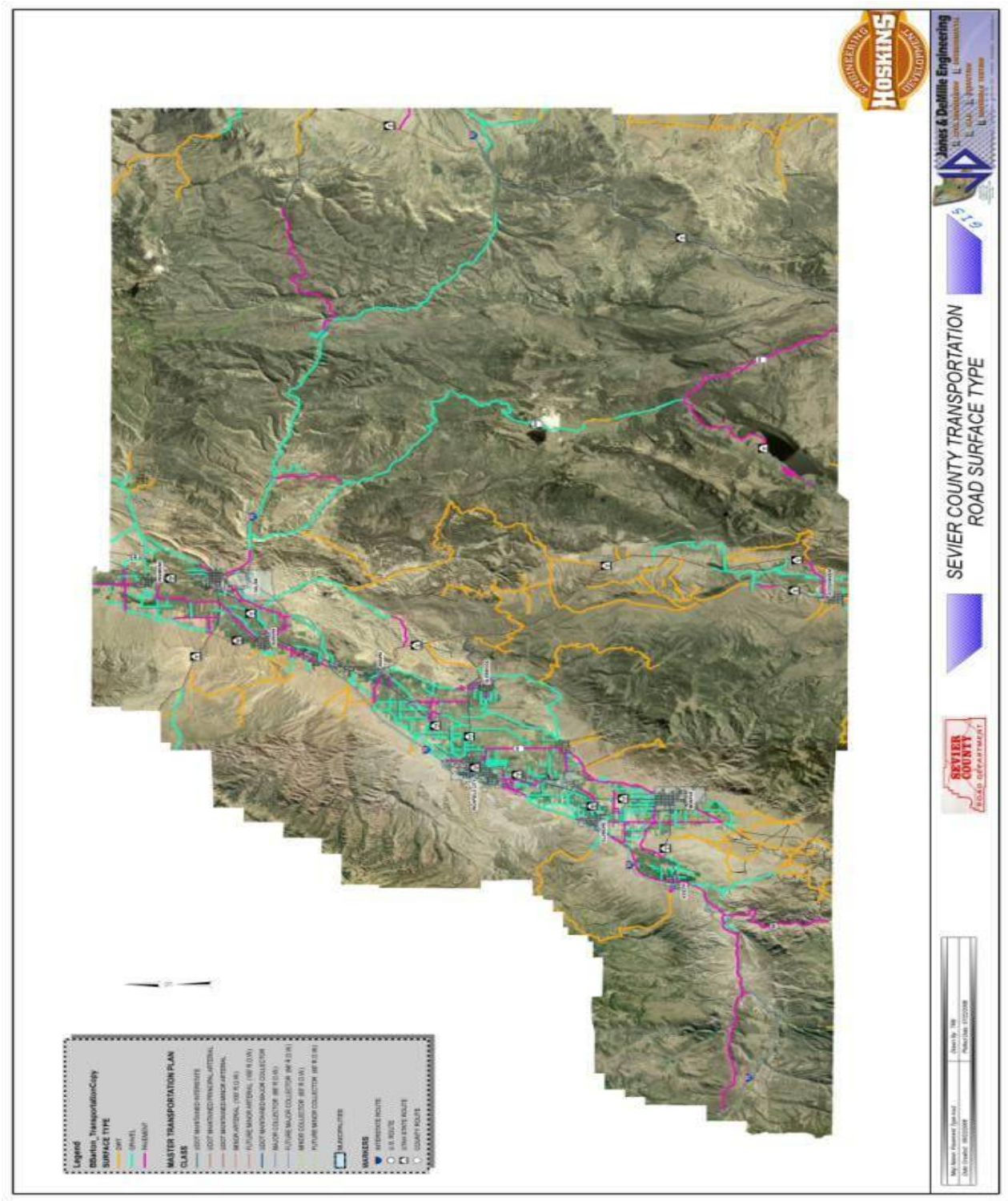
The County's ability to construct roads is constrained due to lack of funding. A majority of the county's roads and bridges budget is currently used for maintenance and repair of existing roads. These maintenance costs are directly attributable to the high number of road miles serving a large geographic area of somewhat low density and scattered developments. As a result, the main purpose of this transportation plan is to coordinate existing zoning and proposed developments with the future transportation needs of the County.

Sevier County's population continues to increase with no apparent slowdown in the future. Along with the anticipated growth comes an increase in seasonal traffic. Ongoing growth and development in the county is creating an increase in traffic demands on this roadway network that are not easily accommodated. Transportation facilities not designed to accommodate the increase in traffic volumes can create safety problems, congestion, and delay for both motorized and non-motorized travel. In order to preserve the unique character in Sevier County and build a stronger economy, proactive planning of the transportation network is essential. Completing a transportation plan will be paramount to assessing the county's roadway needs and preserving those future corridors and right–of-way to facilitate the anticipated traffic demand. Transportation concerns identified in Sevier County:

- Safety
- Mobility
- Street Classification
- Access Management
- Future Land Use

The study area for the plan is shown in **Figure 1**.

Figure 1 – Study Area



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1.3 Transportation Planning Purpose

The purpose of this study is to develop a transportation master plan for Sevier County that will be used as a guideline for future planning and development in the County. Sevier County recognizes the need and the benefits of developing this plan. The primary objective of the study is to establish a reliable transportation network to guide future developments and ensure a functional transportation system. Most transportation plans are used to support an impact fee system to assess developers for necessary roadway improvements to accommodate the proposed development. The transportation master plan includes several major components as outlined below:

- Analysis of existing conditions
- Analysis of future 20 year conditions
- Short range transportation plan
- Long range transportation plan
- Access management guidelines
- Corridor preservation guidelines

Analysis of existing conditions establishes a baseline that can be used as a gauge for future development. Short range improvements focus on specific projects to improve deficiencies in the existing transportation system and account for projects that are currently being planned. The short range plan identifies improvements to accommodate immediate future growth and development. The long range plan will identify those projects which require significant advance planning and funding to implement, and which are needed to accommodate future traffic demand. Access management principles introduced in this plan will balance the need for roadway access with the importance of maintaining mobility on the roadways. The next section describes the planning process for developing the plan.

1.3.1 Community Planning

The planning process requires a target or goal. The community vision as outlined in the County's General Plan serves as this target and defines the planning process. This includes a master planning process that helps overall community planning and enhances the understanding of the relationship between individual community elements. The best example of this is the interrelationship between transportation and land use. An expensive cycle of incremental road improvements and land use changes will occur unless these two elements are planned in a coordinated fashion. Proper planning allows early implementation of the ultimate transportation facilities necessary to accommodate the ultimate land use adjacent to the roadway.

1.3.2 Economic Viability

Traffic congestion is bad for economic development. Raw material and product shipping costs increase proportionally with congestion. Customers will avoid stores that are difficult or dangerous to reach. The transportation system is the lifeline for economic viability; much like the human body's circulatory system provides blood to organs and muscles. Arterial blood clots can be fatal to the body and roadway traffic congestion can be fatal to a county's economic health. For this reason, efficient transportation mobility is vital to a county's economic growth and sustainability.

1.3.3 Safety to Citizens

Transportation safety is a major goal of good planning. The integration of automobiles, agricultural equipment, bicyclists, equestrians, pedestrians, and wheelchairs must occur in a safe and equitable manner. Traffic congestion leads to dangerous driving behavior and increased accident rates for vehicles and pedestrians. Approximately 40,000 people die every year in vehicular accidents in the United States, which makes traffic accidents the third leading cause of death in the country. It is the leading cause of death for people under the age of 30. Utah averages about one fatal car accident per day as reported by the Utah Highway Safety Office. Roadways that are planned and designed correctly can reduce the accident rate by as much as 30%. This plan considers areas of high accident frequency in Sevier County and recommends a strategy to improve these areas.

1.3.4 Health of Citizens

Quality of life includes many factors. Some of the factors that are important to the citizens in Sevier County include: work commute time, the preservation of rural environment and scenic views, air quality, safety, architectural uniqueness, and recreational facilities development. A poorly planned transportation system diminishes all of these elements. There are three reasons why planning improvements to the roadway system should be made:

1. Mobility – Alleviate existing or anticipated traffic congestion
2. Safety – Improve safety for drivers and pedestrians
3. Access – Provide efficient access routes to newly developed portions of the County

1.3.5 Legal Basis for Development Exaction

Due to the decrease in funding available from federal and state sources, local governments are asking land developers to pay for the infrastructure necessary to support proposed development projects. A long range plan is the legal basis for these exactions and impact fees. Legal challenges will be minimized if the estimated roadway construction costs are based on the county vision and system plans that support the vision. The County does not currently have a street impact fee that is assessed developers at commencement of development. It is recommended that the county consider an impact fee that will offset the infrastructure costs associated with new development.

1.3.6 UDOT Coordination

The Utah Department of Transportation (UDOT) is responsible for the safe and efficient operation of state roads. Coordination with UDOT is essential in obtaining federal and state monies to construct transportation facilities. This coordination will also help the county put planned projects in the State Transportation Improvement Program (STIP). Lack of overall planning and coordination with UDOT often leads to haphazard results and poor circulation along transportation corridors supported by the State. This coordination will also ensure that improvement projects in the county that affect UDOT will be included in the STIP. The county should also consider a method to coordinate with UDOT on all subdivision and development projects in the county that could possibly impact the state highway system. This could be accomplished by including, in the current development process, a need to contact UDOT and discuss the project with them to determine if any mitigation is necessary.

1.4 Study Process

The study process for the Sevier County Transportation Master Plan is depicted in **Figure 2**. The goal of this procedure is to identify the needs, opportunities, and constraints for both establishing

and implementing the transportation plan. This process involves the participation of the county and public for guidance, review, evaluation and recommendations in developing the transportation plans.

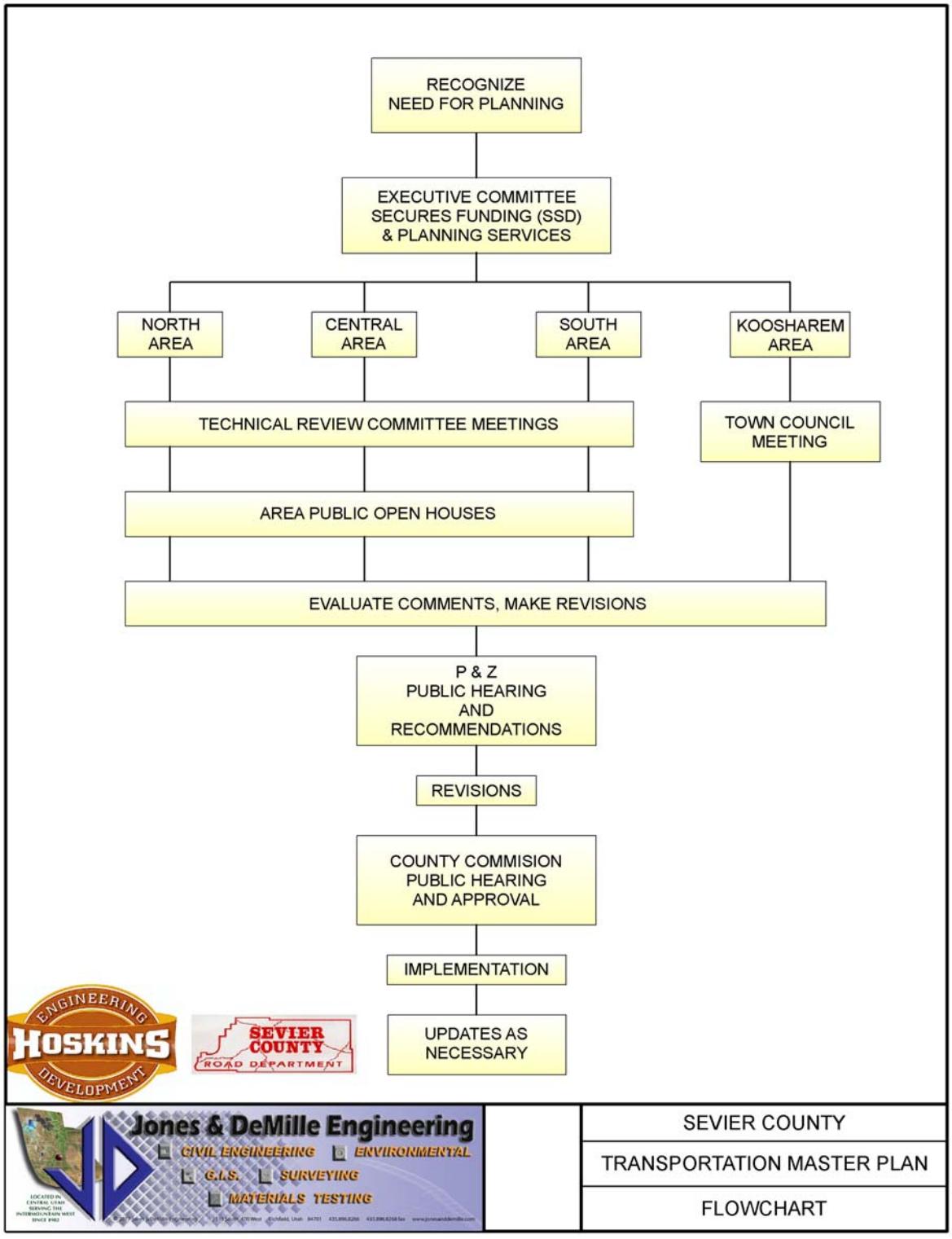
The first component of the study process is to evaluate the existing and future traffic conditions, roadway infrastructure, and population and employment conditions. The county was broken up into four sections in order to better address the needs of each section of the county. Technical review committees were established for each section and the public was invited to attend open house meeting to provide input.

The second component of the study process is obtaining public input and making revisions to the plan based on the comments. This component is used to help identify problems being experienced by the general public so the transportation system can be thoroughly evaluated. This input also helps to prioritize the transportation issues. Sevier County citizens were informed of the plan through public meetings in an "open house" format that was held on several different occasions. Project information was displayed and public comments were recorded for use and incorporation into the plan as necessary. **Appendix 7** contains the attendees list and comments received from the public during this meeting. (In addition to this meeting, maps were available at the front counter of the County Offices and on the project website for review and comment by the public. The report was available for several weeks during the Planning and Zoning and County Commission's review and approval).

The third component of the study process is to present and obtain approval from the Planning Commission and County Council. This was accomplished with meetings with both the Sevier County Planning Commission and County Council. Comments from these bodies and the public were incorporated into the final document. Transportation projects that were recommended for the short term and long range needs were discussed and finalized. After which, the master plan is adopted and implemented.

The study process solicits the input from the public on several different occasions. This public participation element has been included in the study process to ensure that any decisions made regarding this study are acceptable to the county. In addition, the Planning Commission holds their regular meetings to take input on the plan before it is adopted by the County Commission.

Figure 2 - Transportation Master Plan Study Process



1.5 Study Goals

Sevier County's transportation policy recommendations are described in the *Sevier County General Plan* (Adopted: February 2, 1998).

- A balanced transportation system which appropriately serves the cultural, economic, mobility, recreational and social interests of county residents and visitors
- A reliable transportation system
- A transportation system that promotes orderly growth, travel and tourism
- Sevier county shall seek effective access management
- Maintain acceptable levels of roadway efficiencies, protect county and community culture and promote aesthetic, pleasing design features
- Coordinate provisions of the General plan with county, federal and state transportation managers in assuring that interrelated transportation systems serve residents in the County efficiently and safely
- Coordinate with Richfield County officials to maintain threshold requirements on lands surrounding the Richfield County Airport
- Ensure that access management principles are implemented and that landscaping and parking provide aesthetic and accessible transportation and mobility features
- Encourage on-going input from citizens and collaboration between affected local and state entities
- Recognize the importance of access to public lands and base access to public lands and road management policy decisions on input from local citizens
- Ensure that County Officials and other affected and interested individuals or group in Sevier County shall be included in decisions related to RS-2477 roadway closure and modification proposals
- Ensure continued use and expand through appropriate procedures, RS-2477 designated roadways throughout the County
- Work closely with native American Tribal leaders to maintain appropriate access to and through Tribal properties
- Maintain the historical and continuing use of trail ways, byways, highways, roadways and rights-of-way established by agriculturalists, herders, and livestock owners in the county
- Achieve flexibility through conditional us permits, variances, and waivers, provided that they are consistent with rural design principles and sound land us planning
- Implement and equitably administer transportation design and access standards through its zoning and subdivision ordinances
- Work cooperatively with community leaders and citizens to encourage optimal design, landscape, and gateway features that identify commercial and residential developments in Sevier County
- Expand the County's transportation and trails systems

- Emphasize the preservation of air quality, open spaces and freedom of movement that is characteristic of living in or visiting Sevier County
- Encourage the adoption and enforcement of ordinances that maintain prudent and reasonable noise levels throughout Sevier County
- Support the Piute ATV Trail system and the designation of ATV routes within communities in the county that allow ATV riders access to necessary and required services in Sevier County communities and resort areas

This Transportation Master Plan has addressed and upheld these goals.

2 EXISTING CONDITIONS

An inventory and evaluation of existing conditions was conducted to identify current transportation infrastructure and land use problems and uses which influence the local and area wide transportation facilities and area wide system. This information was then used as a baseline to identify and measure improvements.

2.1 Land Use

It is essential to analyze and forecast traffic volumes with an understanding of the land uses within the study are. Land along transportation corridors develops and typically follows future land use plans identified by the County.

2.2 Demographic & Socioeconomic Data

Table 1 shows the 2000 census population and housing data for Sevier County.

Table 1 – 2007 County Estimate

Population	Housing Units	Area (sq mi)	Population Density (pop/sq mi)	Housing Density (HU/sq mi)
20,442	7,778	1,978	10.3	3.93

Table 2 compares the population growth for the State of Utah and Sevier County. The table shows a decline in population in Sevier County from 1950 to 1970 then an increase in population from 1970 to 2005. Sevier County has averaged 2.1% growth per year from 1970 to 2000 and a 1.4% growth rate from 2000 to 2005. These annual average growth rates are below the statewide average growth rates of 2.5% per year from 1970 to 2000 and 2.6% per year from 2000 to 2005.

Table 2 – Population Growth Trends

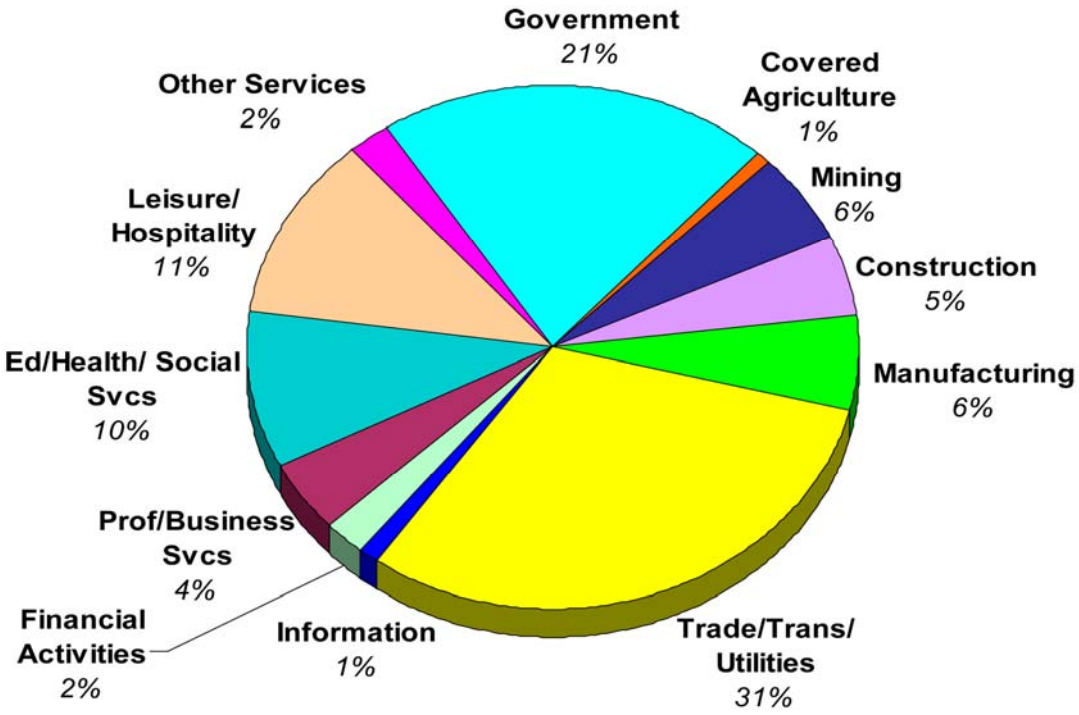
Year	State of Utah	Sevier County
1950	688,862	12,072
1960	890,627	10,565
1970	1,059,273	10,103
1980	1,461,037	14,727

1990	1,722,850	15,431
2000	2,233,169	18,842
Average Annual Growth (1970-2000)	2.5%	2.1%
2005	2,615,870	20,117
Average Annual Growth (2000-2005)	3.2%	1.4%

Sevier County has some unique demographic characteristics when compared with the State, particularly with respect to age demographics. In the 20 to 24 year old category, the State is at 10.1% and the County is at 6.5%. In the 45 to 54 year old category, the State is at 10.6 % and the County is at 11.2%. For the 65+ year old category, the State is at 8.7% and the County is at 12.6%. The median age for the population in the State of Utah and for Sevier County is 27.1 years and 30.3 years old respectively. The race demographics show a trend that is different from the state as well. The State has a smaller Non-Hispanic White population at 85.3%, compared to the County's 95.6%. Sevier County is more typical of the rural parts of the State, which tends to have a smaller minority population.

The 2000 median income in Sevier County is $35,822 compared to the State median household income of $46,706. The unemployment rate in the State was 3.4% and in Sevier County it was 3.8% in 2000. According to the Governor's Office of Planning and Budget, in 2000 there were approximately 8,053 employees working in Sevier County, which is 63.8 % of Sevier County's total population. **Figure 3** shows the 2005 job distribution by industry in Sevier County.

Figure 3 – Employment Data



2.3 Roadway Network Inventory

A wide variety of traffic and roadway data was collected in order to develop the Master Transportation Plan. This data was used to analyze the existing conditions and to help develop the future conditions.

The following information was gathered for the existing roadway network:

- Number of lanes
- Roadway Segment Lengths
- Daily traffic counts, speeds, and classifications on selected roadway segments
- Planned and funded roadway improvement projects
- Vehicle accident information

The County roadway network provides the dominant means of transportation for this area, with the state highway system serving as the backbone for this network. Vehicular travel relies heavily on a well maintained and complete roadway network.

2.4 Functional Classification

A roadway network is comprised of a hierarchy of roadways whose functional classifications are defined by their usage. In general, streets serve two functions; they provide access and mobility. The relative degree to which a road serves these functions defines its functional classification. In order of their ability to provide mobility, the roadway functional types are more thoroughly described as follows:

2.4.1 State and U.S. Highway System

Much of the primary regional roadway system in Sevier County consists of roads that are maintained by the federal and state governments:

- Interstate 70 (I-70) is the county's only Freeway, defined by high speeds and access provided by widely spaced, grade-separated interchanges.
- US-89 is the other federal highway with segments within the county. This highway provides regional mobility functions to and through the county.
- State Highways in the county include segments of SR-10, SR-24, SR-25, SR-50, SR-62, SR-72, SR-118, SR-119, SR-256, SR-258, and SR-260. These roads generally serve collector and minor arterial roadway functions.

2.4.2 Arterials

Arterials carry longer-distance traffic flow for regional, intercommunity and major commuting purposes. Arterials have a limited number of at-grade intersections and, only when other alternatives do not exist, direct property access. Arterials can carry significant traffic volumes at higher speeds for longer distances, and accesses are seldom spaced at closer than one-mile intervals.

2.2.3 Major Collectors

Major collectors are the next highest classification and are higher speed roadways where mobility still takes precedence over access. This designation is also used for rural primary facilities where the arterial classification is not warranted by lanes or volumes.

2.2.4 Minor Collectors

Minor collectors serve as main connectors between communities and neighborhoods. They distribute traffic between arterials/major collectors and local roads. Most of the traffic on minor collectors has an origin or a destination within the community. Also known as rural secondary facilities, this classification includes most county roads that are numbered and are not classified as major collectors or arterials.

2.2.5 Local Roads

The primary function of local roads is to provide access to adjacent land uses, whether it is residences, businesses, or community facilities. Local streets generally are internal to or serve an access function for a single neighborhood or development. Traffic using local roads should have a close-by origin or destination. Typically, county numbered roadways with a local classification are limited in length and continuity. This study primarily focuses on arterial and collector roadways and local roads are left to developers to define in their respective developments.

2.2.6 Vehicle Miles of Travel (VMT)

The VMT for each roadway was calculated from two different sources. The first source was counts that were conducted on each of the listed roadways as part of this study. The second source was counts that were obtained from UDOT as part of their on-going counting procedures. The VMT was calculated by taking the daily traffic for each specific roadway and multiplying that by the length of that segment of roadway. The VMT was then used in determining the functional classification of each roadway in the study area.

Federal Guidelines limit the percentage of road miles and VMT on functionally classified highways. The allowable percentages for each classification are shown below in **Table 3.**

Table 3 – Allowable Percentage of Road Miles and VMT

Functional Classification	Rural		Urban	
	Mileage	VMT	Mileage	VMT
Principal Arterial	2%-4%	30%-55%	5%-10%	40%-65%
All Arterials	6%-12%	45%-75%	15%-25%	65%-80%
Collectors	10%-25%	20%-35%	5%-10%	5%-10%
Local Roads	65%-75%	5%-20%	65%-80%	10%-30%

2.5 Roadway Conditions

The current condition of each roadway is explained in this section. The condition of each roadway in the county serves as a basis for how well the transportation system functions.

2.5.1 Travel Lanes

The majority of the roads that fall under Sevier County jurisdiction consist of two travel lanes. Various roadway segments, particularly in the mountainous portion of the County consist of three lanes, with the third lane acting as a climbing or passing lane. Several unpaved roads in the

mountainous areas consist of a single travel lane.

2.5.2 Surface Conditions

All State Highways in the County are paved. The study roadway segments for the County are paved. Many of the rural and mountainous roads are unpaved. In the Appendix is included a map showing the surface condition of all the roadways that were included in the study.

2.5.3 Travel Lanes

Traffic volumes are on indicator of the relative importance of a roadway in an area. When compared to roadway capacity estimates, traffic volumes also reveal generally how a road is functioning (level of service) and if improvements to increase capacity are necessary.

The most commonly used measurement of traffic volume is average daily traffic (ADT). ADT is defined as the total number of vehicles passing a certain point in both directions in a 24-hour period. **Figure 4** shows the existing Average Daily Traffic (ADT) on the major roadways in the county. This number represents the total number of vehicles traveling that roadway in both directions over an average day. These ADT's were not adjusted for the average day of the week and month of the year because there is limited data available to use for adjustment.

A complete list of traffic volumes on the study roadway segments is included in **Appendix 8**.

2.6 Roadway Capacities

A roadway's capacity can be defined as the maximum traffic volume that can be accommodated at desired levels of service (LOS). LOS is commonly used to define the quality of traffic flow on various roadway types based on a comparison of traffic volumes with roadway characteristics. A LOS scale ranging from A to F is used to define the quality of flow, with LOS A representing an essentially free-flow situation and LOS F representing the highest levels of congestion, with traffic volumes exceeding the intended capacity of the roadway It is standard engineering practice to assume that a facility with LOS A through LOS D is within an acceptable range for most users. For the purpose of this study, LOS guidelines for the study roadways are LOS C or better. **Table 4** provides the resulting daily capacities based on number of lanes.

Table 4 – Rural LOS "C" Daily Traffic Capacity Estimates

Travel Lanes	Freeway	Arterial	Collector
2	NA	12,000	7,500
3	NA	13,000	8,500
4	50,000	20,500	16,000
5	NA	22,000	18,000
6	72,000	30,500	NA
7	NA	33,000	NA
8	NA	NA	NA

Source: Spanish Valley Transportation Study, July 2005

The 2007 analysis indicates that all of the study roadway segments are operating at LOS A. A spreadsheet showing the 2007 LOS for the study roadway segments is found in **Appendix 9**.

2.7 Volume to Capacity Ratios

One operational measure that is used to define operational characteristics is volume to capacity ratio (v/c). This is the daily traffic volume on a given roadway divided by the daily capacity of that roadway. LOS analysis was performed for on the study roadway segments. The traffic growth projection produces daily traffic volumes (V) for roadway segments and each segment has a maximum capacity (C), which is assumed to be the LOS "C" threshold. The volume to capacity ratio (V/C) is used to measure traffic density on any given road segment. A V/C equal to 1 or more means that the road is carrying as many vehicles as possible so it is very crowded and there isn't much room to maneuver or change speeds. This typically classified as LOS "F" conditions. A V/C ratio less than 0.6 mean that the road is carrying very few vehicles so it is not crowded and there is plenty of room to maneuver or change speeds. This is typically classified as LOS "A" conditions. V/C ratios between 0.6 and 1.0 generally fall within the LOS ratings from "B" to "E".

The LOS analysis is based on roadway segments excluding the intersections. On a typical roadway, the intersections are the limiting factor to the operation of the roadway segment. Hence, the LOS of the intersection is the controlling factor in determining the overall LOS for the roadway. The spreadsheet produced for roadway LOS is included in **Appendix 9**.

Figure 4 – Existing 2007 ADT & LOS

Sevier County Existing ADT and Level of Service (LOS)

ROADWAY	2007 ADT	2012 ADT	2017 ADT	2027 ADT	2007 LOS	2012 LOS	LOS LOS	2027 LOS
1200 S SALINA LOST CREEK RD	199	249	312	489	A	A	A	A
1650 WEST SALINA	174	218	273	428	A	A	A	A
2200 NORTH AUSTIN EAST	129	162	202	317	A	A	A	A
2200 NORTH AUSTIN WEST	207	259	325	509	A	A	A	A
ACORD LAKES	928	1162	1455	2283	A	A	A	A
ANNABELLA ROAD	1234	1545	1935	3035	A	A	A	A
BLACK KNOLL	184	230	289	453	A	A	A	A
BROOKLYN ROAD SOUTH	1074	1345	1684	2642	A	A	A	A
BROOKLYN ROAD NORTH	397	497	623	976	A	A	A	A
BROOKLYN ROAD SOUTH 118	177	222	278	435	A	A	A	A
BROWNS LANE KOOSHAREM	216	271	339	531	A	A	A	A
EAST SIGURD ROAD	630	789	988	1550	A	A	A	A
EAST VENICE ROAD	349	437	547	858	A	A	A	A
FLAT CANYON	257	322	403	632	A	A	A	A
HEPLER LANE	33	41	52	81	A	A	A	A
HONKY TONK ROAD	713	893	1118	1754	A	A	A	A
INTERCHANGE ROAD	1223	1532	1918	3008	A	A	A	A
JONES RD	164	205	257	403	A	A	A	A
LANDSLIDE RD	348	436	546	856	A	A	A	A
LOST CREEK ROAD	37	46	58	91	A	A	A	A
OLD 89 SOUTH ELSINORE	516	646	809	1269	A	A	A	A
SALINA PIONEER CEMETERY RD	173	217	271	426	A	A	A	A
SALT MINE RD	353	442	554	868	A	A	A	A
SAULS MEADOW RD	93	116	146	229	A	A	A	A
SEEGMILLER LANE	52	65	82	128	A	A	A	A
SEVIER RIVER RD	500	626	784	1230	A	A	A	A
SHEEP LANE	126	158	198	310	A	A	A	A
SOUTH VENICE	309	387	485	760	A	A	A	A
SR-25	731	915	1146	1798	A	A	A	A
WASHBURNVILLE ROAD	603	755	946	1483	A	A	A	A

2.8 Traffic Accident Data

Traffic Accident Data was gathered from Sevier County for the 3 year period from 2005 to 2007. Included in **Appendix 5** is a map showing the location of each crash. This map was reviewed along with the data to determine a course of action to mitigate safety issues in the county. Most of the crashes were random in nature and no major patterns were found that needed to be mitigated. There was one section of roadway on the north area map that had a couple of fatalities on the same roadway that was a cause of concern. The roadway was Sheep Lane and has been suggested for improvement as part of this plan. Data was also gathered from UDOT to determine any hot spot or high crash frequency locations. The table below is a summary of their data.

Waiting for data from UDOT to plug into this table.

Table 4 – Roadway Segment Accident Rates

	Data from UDOT					
Intersection	**From:**	**To:**	**Total Accidents (2003-2005)**	**3 Year Ave.ADT**	**Length (miles)**	**Annual Accidents per 100 million vehicle miles**
SR-118 at SR-119	Milepost 24.00	Milepost 24.17	0	0	0	0.00
SR-24 at SR-50	Milepost 0.00	Milepost 0.142	0	0	0	0.00
	Data from UDOT					
Roadway	**From:**	**To:**	**Total Accidents (2003-2005)**	**3 Year Ave.ADT**	**Length (miles)**	**3 Year Ave. Annual Accidents per 100 million vehicle miles**
SR-24	Milepost 0.00	Milepost 37.12	0	0	0	0
SR-119	Milepost 0.00	Milepost 8.78	0	0	0	0

The actual and expected crash rate values for SR-24 from milepost 0.00 to milepost 0.00: 3 Year Average Actual Crash Rate = 0.00, 3 Year Average Expected Crash Rate = 0.00. The actual and expected severity rate values for SR-119 are: 3 Year Average Actual Severity Rate = 0.00, 3 Year Average Expected Severity Rate = 0.00.

Accident Rate is a means in traffic engineering, used by UDOT, to gauge drivers' exposure to accidents. UDOT compares the actual accident rate verses the expected rate, which is the five year average of accident rates for the last five years of available data. Severity rate is a measure of the seriousness of an accident, with #1 being property damage only, going all the way to #5, which is a fatality. Both the accident rate and the severity index are the best indicators of how well or how bad an intersection or segment of roadway is performing with regards to safety.

2.9 Revenue Sources

Funding for the maintenance and construction of the existing transportation facilities comes primarily from revenue sources that include the Sevier County general fund, federal funds, transportation impact fees, and State Class B and C funds. Funding for local transportation projects consists of a combination of federal, state and local revenues. However, this total is not entirely available for transportation improvement projects since annual operating and maintenance costs must be deducted from the total revenue. In addition, the County is limited in the ability to subsidize the transportation budget from general fund revenues. The County also has access to mineral lease monies that are administered through the Special Service District and come from the Community Impact Board.

2.9.1 State Class B and C Program

The distribution of Class B and C Program monies is established by state legislation and is administered by the State Department of Transportation. Revenues for the program are derived from state fuel taxes, registration fees, driver license fees, inspection fees, and transportation permits. Seventy-five percent of the funds derived from the taxes and fees are kept by the Utah Department of Transportation for their construction and maintenance programs. The remaining twenty-five percent is made available to counties and cities.

Class B and C funds are allocated to each County and county by a formula based on population, road mileage, and land area. Class B funds are given to counties, and Class C funds are given to cities and towns. **Table 6** below identifies the method used to allocate B and C funds.

Table 6 – Apportionment Method of Class B and C Funds

Based on	Of
50%	Roadway Mileage
50%	Total Population

Class B and C funds can be used for maintenance and construction of highways; however thirty percent of the funds must be used for construction or maintenance projects that exceed $40,000. Class B and C funds can also be used for matching federal funds or to pay the principal, interest, premiums, and reserves for issued bonds.

2.9.2 Federal Funds

Federal funds are available to cities and counties through the federal aid program. The funds are administered by the Utah Department of Transportation. In order to be eligible, a project must be listed on the five-year Statewide Transportation Improvement Program (STIP).

The Surface Transportation Program (STP) provides funding for any road that is functionally classified as a collector street or higher. STP funds can be used for a range of projects, including rehabilitation and new construction. Fifty percent of the 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. The remaining twenty percent must be spent on highway safety and enhancement projects. Transportation enhancements include ten categories, some of which are historic preservation, bicycle and pedestrian facilities, and water runoff mitigation.

The amount of money available for projects specifically in the study area varies each year depending on the planned projects in UDOT's Region Four. As a result, federal aid program money is not listed as part of the study area's transportation revenue.

2.9.3 Local Funds

Sevier County, like most cities, has used general fund revenues in its transportation program. Other options available to improve the County's transportation facilities could involve some type of bonding arrangement, either through the creation of a redevelopment district or a special improvement district. These districts are organized for the purpose of funding a single, specific

project that benefits an identifiable group of properties. Another source is through general obligation bonding arrangements for projects felt to be beneficial to the entire entity issuing the bond.

2.9.4 Private Sources

Private interests often provide sources of funding for transportation improvements. Developers construct the local streets within the subdivisions and often dedicate right-of-way and participate in the construction of collector or arterial streets adjacent to their developments. Developers can also be considered as a possible source of funds for projects because of the impacts of the development on the county. Some of these impacts include the addition of traffic signals and/or street widening.

2.10 Bicycle Facilities

The Federal Highway Administration uses three general categories of bicycle user types to help determine what type of facility may be appropriate for a specific plan. Advanced riders are typically using a facility for convenience and speed in getting to specific destinations and are comfortable operating their bicycles as they would a motor vehicle. Basic riders also desire convenience and speed but lack the confidence and experience to comfortably ride on busy arterials. They tend to stick to lower volume roadways with wide shoulders. Children may ride with or without an adult, but also need connections to school, friends, convenience stores and parks. They tend to ride on low volume residential roads.

Along with these three types of riders there are three types of bicycle facilities that can be used to accommodate them. These bicycle facilities are sometimes referred to as Type 1, 2, or 3.

A Type 1 bicycle facility is one in which the bicycle rider uses a designated shared use path or trail that is completely separated from the roadway. A shared use path generally serves as a recreational opportunity that is integrated into an area wide system of trails. Common applications are along rivers, canals, utility rights-of-way and railroad rights-of-way. Type 1 facilities serve all three types of riders, but primarily Basic Riders and Children.

Type 2 bicycle facilities refer to designated bicycle lanes. Bike lanes are delineated by appropriate pavement markings and signs along roads where there is sufficient pavement width to accommodate a safe four to five foot wide lane for bicyclists only. Type 2 facilities typically serve Advanced Riders. Basic Riders and sometimes Children will use them if they are on low volume roads.

Type 3 bicycle facilities are also referred to as shared roadway bike routes. These are bike routes that may be designated in an overall bicycle facility plan, but do not provide any physical separation between bicycles and motorized vehicles. In rural areas unsigned Type 3 facilities serve mostly Advanced Riders and are used to connect major destinations. Signed Type 3 facilities indicate to motorists that they should be aware of bicycles in the roadway and should treat them as they would another motorized vehicle.

In **Appendix 3** is included a countywide plan for pedestrian and bicycle facilities. Some of these facilities are already in place but a majority of them are not. As new corridors are planned and existing corridors upgraded the bicycle and pedestrian facilities that fall within this plan can be accommodated as part of the improvements to the facilities. The type of bicycle facility is not given for each part of the countywide plan. The type of facility will depend upon the availability of right-of-way to house the facility, amount of funding available to construct the facility, potential users that will use the facility, and roadway characteristics such as speed, shoulder width, availability of

additional asphalt width, etc. If high speeds are present with little shoulder separation to adjacent vehicles then a Type 1 facility is recommended. The hierarchy for deciding which type of facility should be constructed for a given roadway should start with a Type 1 facility as being the preferred with a Type 3 being used only if a Type 1 and Type 2 cannot be accomplished.

2.11 Rail System

Proposed rail lines in the county are shown in **Appendix 1** on the North Area map. The rail lines are only proposed to extend to just south of Salina. This rail line will primarily service the hauling of coal and oil out of the county and resources to extract the coal and oil into the county.

Rural railroad crossings are typically controlled by stop or yield signs so that drivers are responsible to look down the track for oncoming trains. Train operators are also required to sound their horns when approaching these types of crossings. This is acceptable in undeveloped rural areas. As development occurs around these crossings, especially residential development, the County should coordinate with UDOT and the appropriate railroad company to install gated crossings to eliminate the noise from the train horns.

3 FUTURE GROWTH

3.1 Land Use and Transportation

Coordination between land use and transportation is critical for the future development of Sevier County. Street classification and development can guide both desirable and undesirable land uses. The same holds true for land use development. Land use development without transportation planning may result in roadways being classified in opposition to the overall goals of the transportation plan. Therefore, it is imperative that the goals of land use and of transportation are coordinated with each other to support and augment rather than oppose each other.

The Sevier County future land use plan identifies areas for growth and non-growth. The new developing residential areas will have the greatest impact on the transportation system because of daily trip traffic. The projected growth for Sevier County will be primarily residential with some commercial to supplement the residential.

Traffic data from selected roadway segments on SR-24, SR-89, SR-118, SR-256, SR-258, and SR-260, gathered by UDOT from the AADT History published by UDOT, was used to calculate a traffic growth rate for each roadway section. The average of all the growth rates was calculated and a growth rate of 4.5% was used to forecast the future traffic volumes for the study roadways. This growth rate was discussed and approved by UDOT. The spreadsheet showing the traffic growth rate is found in **Appendix 8**.

3.2 Roadway Network and Traffic Forecast

Existing traffic volumes shown in **Figure 4** were grown at 4.5 % annual rate for five, ten and twenty years to determine the future traffic volumes on Sevier County roadways. **Figure 5** shows the 2027 forecast ADT, LOS, Functional Classification for the study roadways. Spreadsheets showing the VMT, LOS, and Roadway Functional Classification are found in **Appendix 8**.

3.2.1 Operational Characteristics

A LOS analysis of the future roadway network was conducted for each of the horizon years in order to evaluate future operational needs.

The analyses indicate that all of the study roadways will operate at LOS A for the 2012, 2017, and 2027 conditions.

3. Future Sevier County Roadway System

Roadway projects are selected based on the analysis provided in the previous sections. The recommended system includes projects that were determined to have geometric issues, safety issues, or in need of additional capacity. The recommendations are shown in terms of functional classifications.

- Arterial
- Collector
- Minor collector

In **Appendix 1** are 4 maps that are labeled North Area, Central Area, South Area, and Koosharem Area that shows the proposed future roadway system in the county. Theses figures are schematic in nature and do not show actual road alignments or curves. The focus of the plan is arterial, major collector and minor collector roadways. No detail is shown for residential standard and residential private roadways to allow flexibility as development occurs between the collectors. It is the intention of the plan for side road collectors to be spaced no closer that one-quarter mile. Minimum acceptable traffic signal spacing on a minor arterial is typically one-quarter mile, but varies based on the UDOT classification of the roadway. At some locations, additional right-of-way may be necessary on roadways above and beyond what is shown on the proposed future roadway system maps to accommodate for future auxiliary lanes, such as acceleration, deceleration, and turn lanes.

Frontage roads (or access roads) are an important element of access control in areas with limited access right of way and plenty of open space. The Frontage roads provide access from collector roadways coming off arterials. This is the best way to allow commercial development frontage on the arterial while limiting access directly on the arterial.

In developing the proposed future roadway maps, discussions and meetings were held with UDOT to obtain their thoughts and approval. The maps have been revised to include their comments.

3.3.1 UDOT's Statewide Transportation Improvement Program

UDOT's **S**tatewide **T**ransportation **I**mprovement **P**rogram (STIP) is a five-year plan of highway and transit projects for the State of Utah. The STIP is maintained daily and includes transportation projects on the state, County and county highway systems as well as projects in the national parks, national forests and Indian reservations. These projects use various federal and state funding programs.

UDOT has programmed funds in the Statewide Transportation Improvement Plan (STIP) for the following roadways in Sevier County:

- SR-118; Richfield to Monroe – construction of turn lanes
- SR-118; Milepost 5 – replace box culvert
- Seven Mile to Gooseberry; East of Salina – pavement reconstruction

- Elsinore to Sevier Road – Roadway Reconstruction and Bike/Pedestrian Path
- Sevier County; Sevier Junction to Joseph Phase 2 – Bike/Pedestrian Path

Figure 5 – ADT, VMT, LOS, and Functional Classification for Study Roadways

Sevier County VMT, ADT, Level of Service (LOS), and Functional Classification

ROADWAY	LENGTH (ft)	Miles	VMT	VMT ratio	2007ADT	2012 ADT	2017 ADT	2027 ADT	2007 V/C ratio *	2012 V/C ratio *	2017 V/C ratio *	2027 V/C ratio *	2007 LOS +	2012 LOS +	LOS 2017 +	2027 LOS +	Study Recommended Classification
1200 S SALINA LOST CREEK RD	9,970.91	1.89	375.8	0.937	199	249	312	489	0.0265	0.0332	0.0416	0.0652	A	A	A	A	**Minor Collector**
1650 WEST SALINA	8,358.15	1.58	275.4	0.687	174	218	273	428	0.0232	0.0291	0.0364	0.0571	A	A	A	A	**Minor Collector**
2200 NORTH AUSTIN EAST	5,507.58	1.04	134.6	0.335	129	162	202	317	0.0172	0.0216	0.0269	0.0423	A	A	A	A	**Minor Collector**
2200 NORTH AUSTIN WEST	5,327.79	1.01	208.9	0.521	207	259	325	509	0.0276	0.0345	0.0433	0.0679	A	A	A	A	**Minor Collector**
ACORD LAKES	50,609.62	9.59	8895.0	22.172	928	1162	1455	2283	0.1237	0.1549	0.1940	0.3044	A	A	A	A	**Arterial**
ANNABELLA ROAD	14,959.64	2.83	3496.2	8.715	1234	1545	1935	3035	0.1645	0.2060	0.2580	0.4047	A	A	A	A	**Arterial**
BLACK KNOLL	22,113.86	4.19	770.6	1.921	184	230	289	453	0.0245	0.0307	0.0385	0.0604	A	A	A	A	**Minor Collector**
BROOKLYN ROAD SOUTH ELSINORE	7,740.97	1.47	1574.6	3.925	1074	1345	1684	2642	0.1432	0.1793	0.2245	0.3523	A	A	A	A	**Arterial**
BROOKLYN ROAD NORTH	11,963.93	2.27	899.6	2.242	397	497	623	976	0.0529	0.0663	0.0831	0.1301	A	A	A	A	**Major Collector**
BROOKLYN ROAD SOUTH 118	13,354.05	2.53	447.7	1.116	177	222	278	435	0.0236	0.0296	0.0371	0.0580	A	A	A	A	**Minor Collector**
BROWNS LANE KOOSHAREM	12,993.87	2.46	531.6	1.325	216	271	339	531	0.0288	0.0361	0.0452	0.0708	A	A	A	A	**Minor Collector**
EAST SIGURD ROAD	2,541.09	0.48	303.2	0.756	630	789	988	1550	0.0840	0.1052	0.1317	0.2067	A	A	A	A	**Major Collector**
EAST VENICE ROAD	5,969.73	1.13	394.6	0.984	349	437	547	858	0.0465	0.0583	0.0729	0.1144	A	A	A	A	**Major Collector**
FLAT CANYON	17,970.67	3.40	874.7	2.180	257	322	403	632	0.0343	0.0429	0.0537	0.0843	A	A	A	A	**Minor Collector**
HEPLER LANE	26,404.70	5.00	165.0	0.411	33	41	52	81	0.0044	0.0055	0.0069	0.0108	A	A	A	A	**Minor Collector**
HONKY TONK ROAD	15,744.91	2.98	2126.2	5.300	713	893	1118	1754	0.0951	0.1191	0.1491	0.2339	A	A	A	A	**Major Collector**
INTERCHANGE ROAD	12,951.02	2.45	2999.8	7.478	1223	1532	1918	3008	0.1631	0.2043	0.2557	0.4011	A	A	A	A	**Arterial**
JONES RD	7,977.24	1.51	247.8	0.618	164	205	257	403	0.0219	0.0273	0.0343	0.0537	A	A	A	A	**Minor Collector**
LANDSLIDE RD	11,736.01	2.22	773.5	1.928	348	436	546	856	0.0464	0.0581	0.0728	0.1141	A	A	A	A	**Major Collector**
LOST CREEK ROAD	36,429.55	6.90	255.3	0.636	37	46	58	91	0.0049	0.0061	0.0077	0.0121	A	A	A	A	**Minor Collector**
OLD 89 SOUTH ELSINORE	30,839.38	5.84	3013.8	7.512	516	646	809	1269	0.0688	0.0861	0.1079	0.1692	A	A	A	A	**Major Collector**
SALINA PIONEER CEMETERY RD	20,825.35	3.94	682.3	1.701	173	217	271	426	0.0231	0.0289	0.0361	0.0568	A	A	A	A	**Minor Collector**
SALT MINE RD	11,404.35	2.16	762.4	1.901	353	442	554	868	0.0471	0.0589	0.0739	0.1157	A	A	A	A	**Major Collector**
SAULS MEADOW RD	37,722.23	7.14	664.4	1.656	93	116	146	229	0.0124	0.0155	0.0195	0.0305	A	A	A	A	**Minor Collector**
SEEGMILLER LANE	16,940.86	3.21	166.8	0.416	52	65	82	128	0.0069	0.0087	0.0109	0.0171	A	A	A	A	**Minor Collector**
SEVIER RIVER RD	11,373.35	2.15	1077.0	2.685	500	626	784	1230	0.0667	0.0835	0.1045	0.1640	A	A	A	A	**Major Collector**
SHEEP LANE	5,821.01	1.10	138.9	0.346	126	158	198	310	0.0168	0.0211	0.0264	0.0413	A	A	A	A	**Minor Collector**
SOUTH VENICE	9,988.59	1.89	584.6	1.457	309	387	485	760	0.0412	0.0516	0.0647	0.1013	A	A	A	A	**Major Collector**
SR-25	37,997.14	7.20	5260.6	13.113	731	915	1146	1798	0.0975	0.1220	0.1528	0.2397	A	A	A	A	**Major Collector**
WASHBURNVILLE ROAD	17,659.25	3.34	2016.8	5.027	603	755	946	1483	0.0804	0.1007	0.1261	0.1977	A	A	A	A	**Major Collector**
			40117.8	100.000													

3.3.2 Traffic Signal Needs

A traffic signal needs study should be conducted for all new proposed signals for the base year. If the warrants are not met for the base year, they should be evaluated for each year in the five-year horizon. Traffic signal needs studies should be conducted by a method pre-approved by the County and address the following:

- **Speed Considerations**

  Vehicle speed is used to estimate safe stopping and cross corner sight distances. In general, the posted speed limit represents the 85th percentile speed. The design speed of the roadway should be used to calculate safe stopping and cross corner sight distances.

- **Improvement Analysis**

  The roadways and intersections within the study area should be analyzed, with and without the proposed development, to identify any projected impacts in regard to LOS and safety.

  Where the highway will operate at LOS C or better without the development, the traffic impact of the development on the roadways and intersections within the study area should be mitigated to LOS D for arterial and collector streets and LOS C on all other streets during peak hours of travel. Mitigation to LOS D on other streets may be acceptable with the concurrence of the County.

3.3.3 Schedule of Intersection Signalization

There are currently no signalized intersections in the county. Based on the development plan, it is anticipated that there will be a few intersections that will need to be signalized in the next 20 years. Because the majority of the highest ADT roadways in the county are owned by UDOT, more than likely the potential signalized intersections will be on the state highways. These locations are governed by UDOT and the timing and construction of these improvements will be handled by UDOT.

Two ways exist to improve operations at intersections with two-way stop control. First, four-way stop control is used to improve operations at a two-way stop control intersection with equal traffic volumes on all approaches, given the traffic volumes are within the county. Second, signalization is used to improve operations of intersections where two legs have the majority of traffic, but traffic is high on the opposing two legs. No specific recommendations are suggested in this area as part of this plan at this time.

3.3.4 Special Intersection Considerations

The intersection of Interchange Road & SR-260 is proposed to be realigned to provide a more efficient intersection. This will require a discussion between UDOT and Sevier County as to the jurisdiction of the realigned roads. SR-258 will be realigned at the intersection with SR-118. This realignment will make SR-118 be free flowing with stops and SR-258 will be realigned to become a T-intersection.

4 TRANSPORTATION GUIDELINES AND POLICIES

Sevier County may require a Traffic Impact Study (TIS) for any new development when the following guidelines indicate that a TIS is needed. The following sections are to be used to establish uniform guidelines for when a TIS is required and how the study is to be conducted, based on suggested guidelines established by the Institute of Transportation Engineers (ITE).

A TIS is a specialized study of the impacts that a certain type and size of development will have on the surrounding transportation system. It is specifically concerned with the generation, distribution, and assignment of traffic to and from the "new development". The term "new development" also includes properties that are being redeveloped.

4.1 TIS Requirements

A complete TIS shall be performed if any of the following situations are proposed:

- All new developments or additions to existing developments, which are expected to generate more than 100 new peak hour vehicle trips
- In some cases, a development that generates less than 100 new peak hour trips should require a TIS if it affects local "problem" areas. These would include high accident locations, currently congested areas, or areas of critical local concern
- All applications for rezoning when there is a significant increase in traffic volume
- All applications for annexation
- Any change in the land use of density that will change the site traffic generation by more than 15 percent, where at least 1000 new peak hour trips are involved.
- Any change in the land use that will cause the directional distribution of site traffic to change by more than 20 percent.
- When the original TIS are more than 2 years old, access decisions are still outstanding, and changes in development have occurred in the site environs.
- When development agreements are necessary to determine "fair share" contributions to major roadway improvements.

The specific analysis requirements and level of detail are set forth in the following sections.

4.2.1 Category I

A Category I TIS should be required for all developments which generate one hundred (100) or more new peak hour trips, but less than five hundred (500) trips, during the morning, afternoon or Saturday peak hour. Peak hour trips will be determined by the latest edition ITE *Trip Generation* Manual. In addition to the above threshold requirements, a Category I TIS may also be required by the County for any specific traffic problems or concerns such as:

- Proposed or existing offset intersections,
- Situation with a high number of traffic accidents,
- Driveway conflicts with adjacent developments,
- Nearby intersections that have reached their capacity,
- Proposed property rezones when there is a significant potential increase in traffic volumes, and
- When the original TIS is more than two years old, or where the proposed traffic volumes in the original TIS increase by more than twenty percent.

For a Category I TIS, the study horizon should include the opening year of the development, and

build-out of the entire development, if applicable. The minimum study area should include site access drives, affected signalized intersections and major unsignalized street intersections.

4.2.2 Category II

A Category II TIS should be required for all developments, which generate from five hundred (500) to one thousand (1,000) peak hour trips during the morning, afternoon or Saturday peak hour. The study horizon should include the opening year of the development, year of completion for each phase of the development, if applicable, and five years after the development's completion. The minimum study area should include the site access drives and all signalized intersections and major unsignalized street intersections within one-half mile of the development.

4.2.3 Category III

A Category III TIS should be required for all developments, which generate above one thousand (1,000) peak hour trips during the morning, afternoon or Saturday peak hour. The study horizon shall be for the year of completion for each phase of the development, the year of its completion, five years after the development's completion and ten years after the development's completion. The minimum study area shall include the site access drives and all signalized intersections and major unsignalized street intersections within one-half mile of the development.

4.2.4 Initial Work Activity

A developer, or their agent, should first estimate the number of vehicular trips to be generated by the proposed development to determine if a TIS may be required and if so, to determine the applicable category. The County must give concurrence on the number of trips to be generated by the proposed development. The developer may, if desired, request that the County assist in estimating the number of trips for the purpose of determining whether a TIS is required for the proposed development.

The County or designated representative shall make the final decision on requiring a TIS and determining whether the study falls within Category I, II or III.

If a study is determined to be required by the County, the developer should prepare for submittal to the County, for review and approval, a draft table of contents for the TIS. The table of contents will be sufficiently detailed to explain the proposed area of influence for the study, intersections and roadways to be analyzed, and level of detail for gathering of traffic volume information and preparation of level of service analyses. There should also be included in the draft a proposed trip distribution for site traffic. After approval of the draft table of contents and trip distribution by the County, the actual TIS work activities may begin.

The Traffic Impact Study Scope of Work agreement between the developer and his/her traffic engineer should conform to the pre-approved draft table of contents. The findings, conclusions and recommendations contained within the TIS document should be prepared in accordance with appropriate professional Civil Engineering Canons.

4.2.5 Qualifications for Preparing TIS Documents

The TIS should be conducted and prepared under the direction of a Professional Engineer (Civil) licensed to practice in the State of Utah. The subject engineer should have special training and experience in traffic engineering and be a member of the Institute of Transportation Engineers (ITE). The final report shall be sealed, signed and dated.

4.2 Analysis Approach and Methods

The traffic study approach and methods should be guided by the following criteria:

4.2.1 Study Area, Horizon and Time Period

The minimum study area should be determined by project type and size in accordance with the criteria previously outlined. The extent of the study area may be either enlarged or decreased, depending on special conditions as determined by the County. The study horizon years should be determined by project type and size, in accordance with the criteria outlined in Sections 4.1.1 – 4.1.3.

Both the morning and afternoon weekday peak hours should be analyzed, unless the proposed project is expected to generate no trips, or a very low number of trips, during either the morning or evening peak periods. If this is the case, the requirement to analyze one or both of these periods may be waived by the County.

Where the peak traffic hour in the study area occurs during a different time period than the normal morning or afternoon peak travel periods (for example mid-day), or occurs on a weekend, or if the proposed project has unusual peaking characteristics, these additional peak hours should also be analyzed.

4.2.2 Seasonal Adjustments

When directed by the County, traffic volumes for the analysis hours should be adjusted for the peak season, in cases where seasonal traffic data is available.

4.2.3 Data Collection Requirements

All data should be collected in accordance with the latest edition of the ITE *Manual of Traffic Engineering Studies*, or as directed by the County.

Turning Movement Counts: Manual turning movement counts should be obtained for all existing cross-street intersections to be analyzed during the morning, afternoon and Saturday peak periods (as applicable). Turning movement counts may be required during other periods as directed by the County. Turning movement counts may be extrapolated from existing turning movement counts, no more than two years old, with the concurrence of the County.

Daily Traffic Volumes: The current and projected daily traffic volumes should be presented in the report. If available, daily count data from the local agencies may be extrapolated to a maximum of two years with the concurrence of the County. Where daily count data is not available, mechanical counts will be required at locations agreed upon by the County.

Roadway and Intersection Geometrics: Roadway geometric information should be obtained. This includes, but is not limited to, roadway width, number of lanes, turning lanes, vertical grade, location of nearby driveways, and lane configuration at intersections.

Traffic Control Devices: The location and type of traffic controls should be identified at all locations to be analyzed.

4.2.4 Trip Generation

The latest edition of ITE's Trip Generation Manual should be used for selecting trip generation rates. Other rates may be used with the approval of the County in cases where Trip Generation does not include trip rates for a specific land use category, or includes only limited data, or where local trip rates have been shown to differ from the ITE rates. Site traffic should be generated for daily, AM,

PM and Saturday peak hour periods (as applicable). Adjustments made for "pass-by", "diverted-link" or "mixed-use" traffic volumes shall follow the methodology outlined in the latest edition of the ITE Trip Generation Manual or the ITE Trip Generation Handbook. A "pass-by" traffic volume discount for commercial centers should not exceed twenty-five percent unless approved by the County. A trip generation table should be prepared by phase showing proposed land use, trip rates, and vehicle trips for daily and peak hour periods and appropriate traffic volume adjustments, if applicable.

4.2.5 Trip Distribution and Assignment

Projected trips should be distributed and added to the projected non-site traffic on the roadways and intersection under study. The specific assumptions and data sources used in deriving trip distribution and assignment should be documented in the report and reviewed with the County. Future traffic volumes should be estimated using information from transportation models, or applying an annual growth rate to the base-line traffic volumes. The future traffic volumes should be representative of the horizon year for project development. If the annual growth rate method is used, the County must give prior approval to the growth rate used. In addition, any nearby proposed development projects currently under review by the County ("on-line") should be taken into consideration when forecasting future traffic volumes. The increase in traffic from proposed "on-line" projects should be compared to the increase in traffic by applying an annual growth rate.

If modeling information is unavailable, the greatest traffic increase from either the "on-line" developments, the application of an annual growth rate or a combination of an annual growth rate and "on-line" developments, should be used to forecast the future traffic volumes.

The site-generated traffic should be assigned to the street network in the study area based on the approved trip distribution percentages. The site traffic should be combined with the forecasted traffic volumes to show the total traffic conditions estimated at development completion. A "figure" should be prepared showing daily and peak period turning movement volumes for each traffic study intersection. In addition, a "figure" should be prepared showing the base-line volumes with site-generated traffic added to the street network. This "figure" should be prepared showing the base-line volumes with site-generated traffic added to the street network. This "figure" will represent site specific traffic impacts to existing conditions.

4.2.6 Capacity Analysis

Level of service (LOS) shall be computed for signalized and unsignalized intersections in accordance with the latest edition of the *Highway Capacity Manual*. The intersection LOS should be calculated for each of the following conditions (if applicable):

- Existing peak hour traffic volumes ("figure" required)
- Existing peak hour traffic volumes including site-generated traffic ("figure" required)
- Future traffic volumes not including site traffic ("figure" required)
- Future traffic volumes including site traffic ("figure" required)
- LOS results for each traffic volume scenario ("table" required)

The LOS table should include LOS results for AM, PM and Saturday peak periods, if applicable. The table shall show LOS conditions with corresponding vehicle delays for signalized intersections, and LOS conditions for the critical movements at unsignalized intersections. For signalized intersections, the LOS conditions and average vehicle delay shall be provided for each approach

and the intersection as a whole. If the new development is scheduled to be completed in phases, the TIS will, if directed by the County, include an LOS analysis for each separate development phase in addition to the TIS for each horizon year. The incremental increases in site traffic from each phase should be included in the LOS analysis for each preceding year of development completion. A "figure" will be required for each horizon year of phased development.

4.3 TIS Report Format

This section provides the format requirements for the general text arrangement of a TIS. Deviations from this format must receive prior approval of the County.

I. INTRODUCTION AND SUMMARY

1. Purpose of Report and Study Objectives
2. Executive Summary
   - Site Location and Study Area
   - Development Description
   - Principal Findings
   - Conclusions
   - Recommendations

II. PROPOSED DEVELOPMENT

1. Off-Site Development
2. Description of On-Site Development
   - Land Use and Intensity
   - Location
   - Site Plan
   - Zoning
   - Development Phasing and Timing

III. STUDY AREA CONDITIONS

1. Study Area
   - Area of Significant Traffic Impact
   - Influence Area
2. Land Use
   - Existing Land Use and Zoning
   - Anticipated Future Development
3. Site Accessibility
   - Existing and Future Area Roadway System
   - Traffic Volumes and Conditions
   - Access Geometrics
   - Other as applicable

IV. ANALYSIS OF EXISTINC CONDITIONS

1. Physical Characteristics
   - Roadway Characteristics
   - Traffic Control Devices
   - Pedestrian/Bicycle Facilities
2. Traffic Volumes

- Daily, Morning, Afternoon and Saturday Peak Periods (as applicable)

3. Level of Service
   - Morning, Afternoon and Saturday Peak Hour (as applicable)
4. Safety

V. PROJECTED TRAFFIC

1. Site Traffic Forecasts (each horizon year)
   - Trip Generation
   - Mode Split
   - Pass-by Traffic (if applicable)
   - Trip Distribution
   - Trip Assignment
2. Non-Site Traffic Forecasting (each horizon year)
   - Projections of Non-site (Background) Traffic (methodology for the projections shall receive prior approval of County)
3. Total Traffic (each horizon year)

VI. TRAFFIC AND IMPROVEMENT ANALYSIS

1. Site Access
2. Capacity and Level of Service Analysis
   - Without Project (for each horizon year including any programmed improvements)
   - With Project (for each horizon year, including any programmed improvements)
3. Roadway Improvements
   - Improvements Programmed to Accommodate Non-site (Background) Traffic
   - Additional Alternative Improvements to Accommodate Site Traffic
4. Traffic Safety
   - Sight Distance
   - Acceleration/Deceleration Lanes, Left-Turn Lanes
   - Adequacy of Location and Design of Driveway Access
5. Pedestrian Considerations
6. Speed Considerations
7. Traffic Control Needs
8. Traffic Signal Needs (base plus each year, in five-year horizon)
9. Site Circulation and Parking

VII. FINDINGS

1. Site Accessibility
2. Traffic Impacts
3. Need for Improvements
4. Compliance with Applicable Local Codes

VIII. RECOMMENDATIONS/CONCLUSIONS

1. Site Access/Circulation Plan
2. Roadway Improvements
   - On-Site
   - Off-Site
   - Phasing (as applicable)

3. Transportation System Management Actions (as applicable)
4. Other

IX. APPENDICES

1. Existing Traffic Volume Summary
2. Trip Generation/Trip Distribution Analysis
3. Capacity Analyses Worksheets
4. Traffic Signal Needs Studies
5. Accident Data and Summaries

X. FIGURES AND TABLES

1. The following items shall be documented in the text or Appendices
   - Site Location
   - Site Plan
   - Existing Transportation System
   - Existing Peak Hour Turning Volumes
   - Estimated Site Traffic Generation
   - Directional Distribution of Site Traffic
   - Site Traffic
   - Non-Site Traffic
   - Total Future Traffic
   - Projected Levels of Service
   - Recommended Improvements

(For Category 1, many of the items may be documented within the text. For other categories the items shall be included in figures and/or tables that are legible.)

XI. DESIGN STANDARD REFERENCE

1. Design in accordance with current *AASHTO standards*.
2. Conduct capacity analysis in accordance with the latest edition of the *Highway Capacity Manual*.

4.4 Roadway Standards

All streets shall be designed to conform to the Engineering standards and technical design requirements adopted by Sevier County. These standards can be supplemented by this master plan, and include AASHTO (American Association of State Highways Transportation Officials), *A Policy on Geometric Design of Highways and Streets,* and the MUTCD (Manual on Uniform Traffic Control Devices). In cases of conflict, a determination shall be made by the County, whose determinations shall be final.

Sevier County has adopted these design standards for roadways to ensure that the facilities provide the necessary safety and capacity elements. The requirements for the street cross-section configurations are shown in **Table 6.** These requirements are based on traffic capacity design speed, projected traffic, system continuity and overall safety. All new developments shall use street cross-sections with fifty-foot (50') or more of right-of-way. Access to multi-family or commercial development shall use street cross-sections with sixty feet (60') or more of right-of-way. In **Appendix 2** is included a map that shows the surface type for all roadways in the county. In **Appendix 6** is included the typical sections that the county uses for their collector roadways in the county. The local roads are left to developers and the arterial roadways are under UDOT

jurisdiction.

Table 6 - Street Cross-Section Configurations

Classification	Minimum ADT or [D.U.'s]	Traffic Index	Right-of-Way (ft)	Pavement Width[1] (ft)	Sidewalk Width (contiguous feet)
Minor Collector	1,260 to 2,000 [126 to 200]	5.5	60	35	5
Major Collector[2]	2,010 to 6,000 [201 to 600]	6	66	39	5
Arterial[2]	6,000 to 20,000	7	80	53	5

NOTES:
1. Pavement width measured from lip of curb to lip of curb.
2. Configuration of major collector and higher classifications may be adjusted with proper justification and approval of County.
3. The minimum right-of-way and pavement width is shown. Each may be increased when required by a traffic impact study.

4.5 Safe Transportation System

A goal of Sevier County is to maintain a safe transportation system. This should be a high priority and the County should work diligently to meet applicable safety standards. This can be best accomplished by the following recommendations.

- Require all major developments to provide adequate access for emergency vehicles.
- Provide safe pedestrian street crossings, particularly near schools and recreation areas.
- Encourage development of school routing and recreation plans that minimize vehicle/pedestrian conflicts.
- Establish speed limits based on traffic engineering analysis. Enforce speed limits, especially near schools, in residential areas and downtown commercial areas.
- Provide guidance for vehicles on streets through striping, raised medians and islands, reduction of roadside obstructions, and other traffic engineering solutions.
- Require all roadway features to meet minimum design standards established by the *American Association of State Highway and Transportation Officials* (AASHTO). All signs, pavement markings and traffic signals must meet standards established by the *Manual of Uniform Traffic Control Devices* (MUTCD). Exceptions can be granted by the County on a case-by-case basis for those designs that demonstrate innovative superiority over the existing standards.
- Maintain optimal walkway conditions for walking, wheelchairs and strollers by:
  - Repairing cracks and bumps
  - Minimizing slopes
  - Maintaining visibility at corners

- Avoiding abruptly ending walkways
- Reducing speed and traffic
- Keeping walkways clear of poles and other objects
- Avoiding poor drainage and standing water on sidewalks
- Providing curb cuts and ramps that comply with the Americans with Disabilities Act (ADA)
- Provide adequate emergency access and/or turnarounds on all dead-end streets or cul-de-sacs

4.2.1 Roadway Network Design

New roadway networks shall be designed in accordance with the general planning concepts, guidelines, and objectives provided in this section. The "Quality of Life" for residents should be a primary concern when designing a residential roadway network with safety as the overriding factor in design. An emphasis on proper street hierarchy should be adhered to, namely, local streets should access collectors; collectors should access arterials; etc. An emphasis on access management should provide careful control of the location, design, and operation of all driveways, median openings, and street connections to a roadway. For more information on access management, refer to the Access Management section of this document.

Residential streets should be designed in a curvilinear method in order to reduce or eliminate long straight stretches of residential roadways, which encourage speeding and cut-through traffic. Substantial increases in average daily traffic due to development on adjacent property on established streets not originally designed to accommodate such increases should be avoided. Drainage methods should concentrate on meeting the drainage needs while not impeding the movement of traffic. Roads should be designed to lie within existing topographic features without causing unnecessary cuts and fills.

A reduction in the use of cul-de-sacs should be emphasized in order to provide greater traffic circulation. Cul-de-sacs should only be allowed where topography and/or natural barriers prohibit the design of through streets. Circulation is of the utmost importance; long blocks and excessive dead-end streets should be avoided. Stopping sight distance must be considered at all intersections and curves to ensure the safety of the public, in accordance with AASHTO standards. Pedestrian and bicycle traffic should be considered in the planning and design of all developed streets.

Roadways should be planned to accommodate the traffic demand associated with adjoining developments and commercial areas. The capacity of these roadways can be established by following LOS criteria that has been established by various governmental agencies across the country. **Table 4** shows the LOS thresholds for various roadway types.

It is recommended that the county continue to improve upon their regular maintenance program of chip sealing existing roadways to maintain roadway integrity. In **Appendix 4** is included a map showing a list of the chip seal projects that county has done over the last 8 years.

4.2.2 Improvement Requirements

All improvements, including but not limited to the following, shall be constructed in accordance with standard specifications and drawings unless otherwise approved:

- Required curb, gutter and sidewalk shall be constructed
- Driveways shall be constructed in approved locations only
- All streets, public or private, shall be surfaced to grade, with double chip seal or asphalt

concrete pavement to the required minimum width and thickness

- No cross gutters shall be allowed across major collector or major and minor arterial streets. On commercial and industrial streets, cross gutters are generally not allowed and require approval by the County for use
- When new construction occurs, handicap ramps shall be constructed at all street intersections, unless otherwise approved, in accordance with the standard drawings. In addition, when a project occurs where existing improvements are in place, handicap ramps shall be upgraded to meet current standards
- Raised medians on public roadways shall be approved by the County. Design and construction shall be in accordance with applicable standards
- Developments shall construct the minimum number of accesses needed to adequately address the needs of the development and only at approved locations, and
- Adequate drainage facilities shall be installed to properly control runoff from the roadway. Sub-drains and surface drainage facilities shall be designed in accordance with the approved drainage study.

The above required improvements are not all inclusive. Other improvements needed to complete the development in accordance with current engineering and planning standard practice may be required by the County.

5 SHORT RANGE TRANSPORTATION IMPROVEMENT PLAN (TIP)

- Consider developing an impact fees system for roadways to assess necessary roadway improvements on future development
- Track accidents in the county on a GIS database to help identify problem areas
- Update this master plan every 5 years
- Continue a routine chip seal maintenance program for old asphalted roads to keep them in good working condition
- Reconstruct Sheep Lane to fix roadway geometric deficiencies and mitigate an unsafe road that has caused fatalities
- Construct sections of the pedestrian and bicycle plan to further develop a countywide system and get bicyclists on appropriate roadways
- Modify the existing process or add a process to include UDOT in subdivision and development approvals that affect state highways
- Work with each of the cities in the county to monitor their transportation plans and update this plan as a working document
- Turn jurisdiction of County Route 2570 over to UDOT with the realignment of this roadway as shown on the north area map, and
- Construct as many roadway improvements as possible as shown on the attached area maps.

6 LONG RANGE TRANSPORTATION IMPROVEMENT PLAN (TIP)

- Start planning for proposed interchanges on I-70 and preserving right-of-way in these area for future construction
- Annabella Road be evaluated in the future for arterial status
- Most of the new proposed corridors and realigned roadways on the area plans will fall in this category – specific projects that are more relevant to quickly developing areas need to be addressed first after which the remainder can be done, and
- Target specific projects at longer range horizons that the county can focus its resources on – such as constructing Hepplers Pond Road in 2020.

7 ACCESS MANAGEMENT

This section will define and describe some of the aspects of Access Management for roadways and why it is so important. Uncoordinated growth along some of the region's major travel corridors has resulted in strip development and a proliferation of access points. In most instances, each individual development along the corridor has its own access driveway. Numerous access points along the corridor create conflicts between turning and through traffic which causes delays and accidents.

A good access management program will accomplish the following:

- Limit the number of conflict points at driveway locations
- Separate conflict areas
- Reduce the interference of through traffic
- Provide sufficient spacing for at-grade, signalized intersections
- Provide adequate onsite circulation and storage.

Though Access Management is generally used on roads that are larger and have more volume, it can have impacts on those roads that are defined as residential as well.

7.1 Definition

Access management involves providing (or managing) access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety, capacity, and speed. (Source: Policy on the geometric Design of highways and Streets, AASHTO, 2001).

7.2 Access Management Techniques

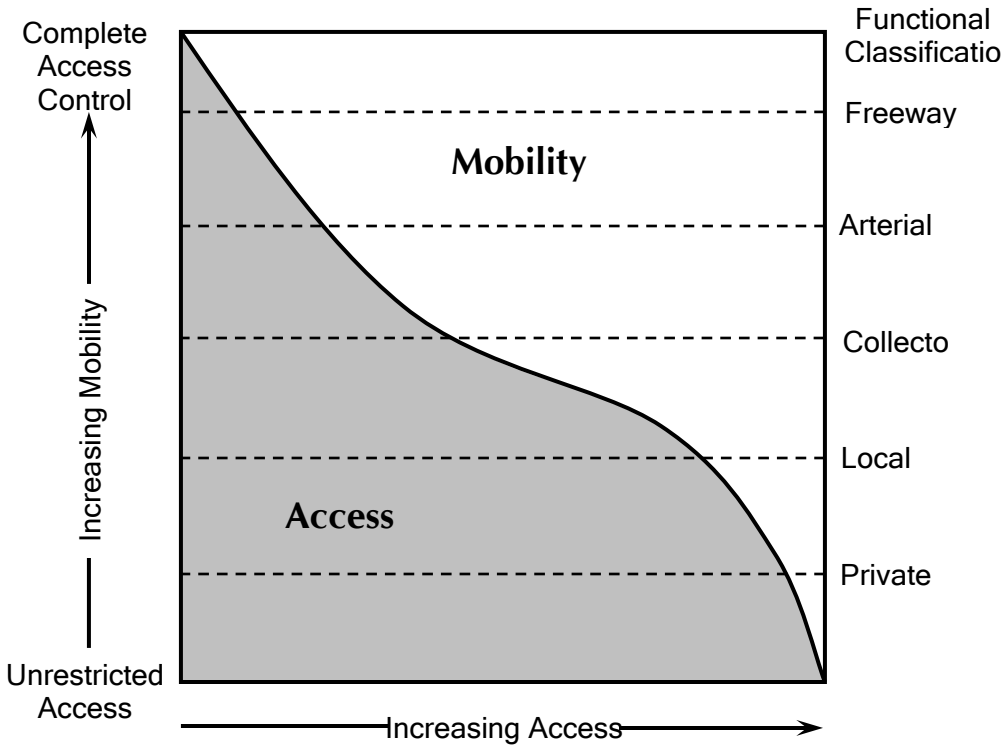
There are many techniques that can be used in access management. The most common techniques are signal spacing, street spacing, access spacing, and interchange to crossroad access spacing. There are various distances for each spacing, dependant upon the roadway type being accessed and the accessing roadway. The Utah Department of Transportation has developed an access management program. More information can be gathered from the UDOT website and from the Access Management Program Coordinator.

7.2.1 Access Management

Safety, capacity, and speed are determining factors on how land development is accessed by a roadway. Managing access is achieved by controlling the location, design, and operation of driveways, median openings, and street connections. In addition, auxiliary lanes (turn lanes or by-pass lanes) are also used to divert traffic out of the through traffic stream to improve the traffic flow and improve safety.

Roadways are classified for access control based upon their importance to local and regional mobility. No facility can move traffic well and provide unlimited access at the same time. **Figure 6** shows the relation ship between mobility, access and the functional classification of streets. For example, the strictest access control is applied to roadways that serve through traffic or regional trips. The least access control is given to local streets and residential areas that serve local traffic and short trips. In many cases, accidents and congestion are the result of streets trying to serve both mobility and access at the same time.

Figure 6 - Access vs. Mobility



7.2.2 Benefits of Access Management

The American Association of State Highway and Transportation Officials (AASHTO) states "the number of accidents is disproportionately higher at driveways than at other intersections... thus their design and location merits special consideration." Fewer direct accesses, greater separation of driveways, and better driveway design and location are the basic elements of access management. With good access management, the following are some of the recognizable benefits:

- Improving overall roadway safety

- Reducing the total number of vehicle trips
- Decreasing interruptions in traffic flow
- Minimizing traffic delays and congestion
- Maintaining roadway capacity
- Extending the useful life of roads
- Avoiding costly highway projects
- Improving air quality
- Encouraging compact development patterns
- Improving access to adjacent land uses
- Enhancing pedestrian and bicycle facilities

7.2.3 General Access Management Principles

The following access management guidelines and policies shall be adhered to within Sevier County.

- Conflicts at intersections and driveways should be separated and the number reduced as much as possible.
- A "time-space" perspective should guide (a) the location, timing, and coordination of traffic signals; (b) the placement of access; and (c) the design and operation of intersections. Optimum progressive travel speeds along arterial roadways should be determined and maintained.
- Signal cycles should be as short as possible but consistent with capacity, pedestrian clearance, and coordination requirements. A cycle length range of 60 to 120 seconds is appropriate. Cycle lengths should not exceed 150 seconds.
- Unsignalized access should be located so as not to interfere with queues or maneuvering areas of signalized intersections and positioned to take advantage of gaps in, or less dense, traffic flows.
- Interference between through traffic and site traffic should be addressed by incorporating additional traffic lanes to accommodate turning vehicles and through vehicles. Adequate on-site storage and driveway dimensions should be designed to accommodate the traffic demand entering and exiting the site. Fewer, properly placed, and adequately designed driveways are preferable to a larger number of inadequately designed driveways, especially when spaced at least 500 feet apart. In all cases, the integrity of mainline traffic operations must not be compromised

7.2.4 Number of Access Points

Controlling the number of access points or driveways from a site to a roadway reduces potential conflicts between vehicles, pedestrian, and bicycles. Each parcel should normally be allowed one access point, and shared accesses are preferred where possible.

7.2.5 Signalized Intersections

Uniform or near uniform spacing of signals is essential for efficient traffic flow. As a minimum, signals should be spaced no closer that one-quarter mile (1,320 feet).

7.2.6 Unsignalized Driveways

Unsignalized driveways are much more common than signalized driveways. Sound traffic engineering criteria indicates that 500 feet or more should be provided between full movement unsignalized accesses.

7.2.7 Right-In/Right-Out Accesses

Restricted access movement can provide for additional access to promote economic development with minimal impact to the facility. This type of access should be spaced to allow for a minimum of traffic conflicts and provide distance for deceleration and acceleration of traffic in and out of the access.

7.2.8 Residential Lots

The number of accesses on residential lots shall be based on the following:

- Number of Driveways: residential lots shall not have more than two (2) driveways, unless approved by the County Engineer.
- Distance, width: No driveway shall be planned right next to another driveway nor be more than 32 feet in width, unless approved by the County Engineer. In no event shall the combined width of such driveways exceed 46 feet or 50% of the entire lot frontage, whichever is less.
- Corner Lots: In not event shall a driveway be placed on any corner lot within the distance of twenty 25 feet from the point of the intersection of property lines nearest the intersection, whichever is further from the intersection.

7.2.9 Commercial Lots

Commercial lots or developments are not limited to one access per lot and should be addressed on a case-by-case basis but not to exceed the access frontage requirements listed in the next sections. Additional accesses must be approved by the County upon completion of a circulation plan or Traffic Impact Study provided to the County indicating that more than one access is required to adequately handle the developments traffic volumes and further indicating that the additional access will not be detrimental to traffic flow on the adjacent street network. Circular driveways are considered one access. If a lot has a circular driveway then only a maximum of one more additional access may be granted.

Table 7 shows the spacing requirements based on the functional class of the roadway facility for street intersection spacing. **Table 8** shows the requirements based on the functional class of the roadway facility for driveway access spacing.

Table 7 – Street Intersection Separation Distances Based on Functional Class			
Functional Class	Minimum Signal Spacing (ft)	Minimum Unsignalized Full Movement (ft)	Minimum Right-In/ Right-Out (ft)
Private	1320	150	-
Residential Local	1320	150	-
Minor Collector	1320	250	150
Major Collector	1320	250	250
Arterial	1320	500	250
Commercial Local	1320	400	200
Industrial Local	2640	500	250

Table 8 – Driveway Access Separation Distances Based on Functional Class		
Functional Class	Minimum Full Movement (ft)	Minimum Right-In/Right-Out (ft)
Private	75	-
Residential Local	75	-
Minor Collector	125	-
Major Collector	250	125
Arterial	660	330
Commercial Local	400	200
Industrial Local	500	250

Access spacing shall be measured for center of access to center of access.

Collector and Arterial roadways will have limited access. Where multiple parcels are consolidated, accesses shall also be consolidated according to County design and spacing standards. Temporary access may be granted to undeveloped property prior to completion of a final development plan if access is needed for construction or preliminary site access. Temporary accesses are subject to removal, relocation, or redesign after final development plan approval.

7.2.10 Offset Distance

Offset distance is the distance from the center of an access to the center of the next access on the opposite side of the road. On undivided roadways, access on opposite sides of the road should be aligned. Where alignment is not possible, driveways should be offset based on the values set in **Table 9** below.

Table 9 – Minimum Offset Distance between Driveways on opposite sides of Road	
Functional Class	Minimum Offset* (feet)
Private	-
Residential Local	-
Minor Collector	150
Major Collector	200

Arterial	600 ft. for speed of 45 or greater, 300 for all other speeds
Commercial Local	200
Industrial Local	220

* Distance in table is measured from center to center of driveway

7.2.11 Corner Spacing

Providing adequate corner spacing improves traffic flow and roadway safety by ensuring that the traffic turning into the driveway does not interfere with the function of the intersection. Access to corner lots should be from the lesser-classified road at the greatest distance possible from the intersection, and should not be less than the distances shown in Table 10. This distance is measured from the PC (point of curve) of the corner curve. A 25-foot radius is considered the minimum where the existing radius is less than 25 feet.

Table 10 – Access Distance From Corner According to Facility Type

Facility Type	Upstream Distance on Major Roadway (feet)	Downstream Distance on Major Roadway (feet)
Residential Private	50 [2]	50 [2]
Residential Local	50 [2]	50 [2]
Minor Collector	100	75
Major Collector	175	150
Arterial[1]	200	185
Commercial Local	100	-
Industrial Local	100	-

NOTES:

1. All access points shall be approved by the County. Distances shown may be adjusted by the County on a case-by-case basis. Exceptions can only be approved by the County upon submittal of proper traffic justification.
2. Distances shown are preferred.

7.2.12 Medians

Medians are used to control and manage left turns and crossing movements as well as separating traffic moving in opposite directions. Restricting left turning movements reduces the conflicts between through and turning traffic, resulting in improved safety. Studies have shown that the installation of a non traversable median will reduce crashes by 30% over that of a two way left turn lane (TWLTL).

The need for a median can be identified through an engineering review (a traffic study assessing the impact of a proposed project) and should be considered on any roadway that has a speed limit greater than 40 mph. Medians can improve pedestrian safety by providing a refuge area for the pedestrian.

Medians can also add to the overall aesthetics of a roadway corridor or a development by incorporating landscaping or other items of visual interest. However, care should be taken to maintain sight distance around the intersection/access locations. Ground cover plantings should be planted within 350 feet of an intersection/access opening. Care should be taken to select landscape material that will not intrude into the roadway and to locate materials such that they will not cause a safety problem. Trees should be selected that will not be larger than 4 inches in diameter when

mature.

Two way left turn lanes should only be used to retrofit areas of existing development and should be limited to roadways with less than 18,000 ADT. In areas with greater than ADT, consideration should be given to raised median with appropriately spaced median openings. **Table 11** shows typical guidelines for spacing of unsignalized restricted medial openings.

Table 11 – Guidelines for Spacing of Unsignalized Restricted Median Openings

Functional Classification	Spacing of Median Openings (ft)*		
	Urban	Suburban	Rural
Collector	330	500	660
Arterial	500	660	800

*Values are for estimating, exact values shall be based on an engineering study
*Values based on UDOT State Highway Access Management Standards. Table 7.4-1

A 14-foot median is desirable in order to provide for an adequate left turn lane at intersections.

7.2.13 Width of Access Points

In addition to limiting the number of access points, the width of the access point should be restricted based on the use of the site. Residential lot driveways should be limited to a maximum throat width of 32 feet at the back of the dive approach. The maximum width for a commercial or industrial site entrance with two-way traffic should be limited to 44 feet. The width includes 12 feet for right out, 12 feet for left out, 16 feet for an ingress lane, and two-2 foot shoulders. The width of the entrance should be determined based on the type of use for the site, the type of traffic (cars vs. 18 wheel trucks), and the projected volume of traffic.

7.2.14 Turning Radius

The turning radius of a driveway or access road affects both the flow and safety of through traffic as well as vehicles entering and exiting the roadway. The size of the turning radius affects the speed at which vehicles can exit the flow of traffic and enter a driveway. The large the turning radius, the greater the speed at which a vehicle can turn into a site.

The speed of the roadway, the anticipated type and volume of the traffic, pedestrian safety, and the type of use proposed for the site should be considered when evaluating the turning radius. **Table 12** shows the turning radii for accesses based on vehicle type.

Table 12 - Turning Radius at Access Locations

Vehicle Type	Turning Radius
Passenger Cars	15 to 30 feet
18 Wheel Trucks	30 to 50 feet

7.2.15 Throat Length

Throat length is the length of the driveway that is controlled internally from turning traffic, measured from the intersection with the road. Driveways should be designed with adequate throat length to accommodate queuing of the maximum number of vehicles as defined by the peak period of operation in the traffic study. This will prevent potential conflicts between traffic entering the site and internal traffic flow. **Table 13** shows the minimum driveway throat length at signalized a signalized access.

Table 13 – Minimum Driveway Throat Length at Signalized Accesses

Number of Egress Lanes	Minimum Throat Length
2	75 feet
3	200 feet
4	300 feet

7.2.16 Shared Access

Access points can be shared between adjacent parcels to minimize the potential for conflict between turning and through traffic. Interconnections between sites can eliminate the need for additional curb cuts, thereby preserving the capacity of the roadway. This is particularly important for commercial/industrial sites and should be used to encourage the development of interconnectivity between parcels. Future roadway rights-of-way should also be preserved to promote interconnected access to vacant parcels.

7.2.17 Alignment of Access Points

Accesses represent points of conflict for vehicles, bicycles, and pedestrians. To minimize the potential conflicts and improve safety, intersections and driveways shall be aligned opposite each other wherever possible and roadways intersect at a 90 degree angle.

7.2.18 Sight Distance

Sight distance is the length of the road that is visible to the driver. A minimum safe sight distance should be required for access points based on the roadway classification. It is essential to provide sufficient intersection sight distance at the driveway point for vehicles using a driveway to see oncoming traffic and judge the gap to safely make their movement. Intersection sight distance varies depending on the design speed of the roadway to be entered and assumes a passenger car can turn right or left into a two-lane highway and attain 85 percent of the design speed without being overtaken by an approaching vehicle that reduces speed to 85 percent of the design speed. **Table 14** gives intersection sight distance requirements for passenger cars.

Table 14 – Intersection/Driveway Sight Distance

Posted Speed Limit	Sight Distance Required * (feet)					
	Left Turn			Through and Right Turn		
MPH	2 lanes	3 lanes	5 lanes	2 lanes	3 lanes	5 lanes
30	335	355	375	290	310	335
35	390	415	440	335	365	390
40	445	475	500	385	415	445
45	500	530	565	430	465	500
50	555	590	625	480	515	555
55	610	650	690	530	570	610
60	665	710	750	575	620	665
65	720	765	815	625	670	720

*Driver eye is 15 feet measured from the traveled way

7.2.19 Turning Lanes

Turning lanes remove the turning traffic from the through travel lanes. Left turning lanes are used to separate the left turning traffic from the through traffic. Right turn lanes reduce traffic delays caused by the slowing of turning vehicles. These lanes are generally used in high traffic areas on arterial and collector roadways. A traffic impact study will determine the need for turning lanes or tapers. **Table 15** shows the minimum guidelines for storage length of turning lanes based on speed.

Table 15 – Turning Lanes Storage Length (100 feet minimum)

Intersection	Length
Unsignalized Intersection	2 times the number of cars likely to arrive in a 2 minute period during peak hour*
Signalized Intersection	10% of the peak hour design year volume expressed in feet*

*Assumes 25 feet per vehicle

* 2004 AASHTO Geometric Design of Highways and Streets

Turning lanes shall normally be a minimum of 12 feet in width. Any exception will require approval from the County Engineer. Right turn lanes require an additional 12 feet of pavement to accommodate the lane.

The provision for left turn lanes is important from both capacity and safety perspective, where left turns would otherwise share the use of a through lane. Shared use of a through lane will dramatically reduce capacity, especially when opposing traffic is heavy. Left turn lanes shall be provided at signalized intersections.

Right turn lane remove the speed differences in the main travel lanes. This helps to reduce the number and severity of rear-end collisions. Right turn lanes also increase capacity of signalized intersections and may allow more efficient traffic signal phasing. **Table 16** provides typical warrants, based on posted speed and traffic volumes for when auxiliary lanes are to be installed.

A separate turning lane consists of a taper plus a full width auxiliary lane. Taper length will vary based on speed. A length of 90 feet for speeds below 45 mph, 140 feet for speeds of 45 and 50 mph, and 180 feet for speeds over 50 mph. If a two lane turn lane is to be provided, it is

recommended that a 10:1 taper be used to develop the dual lanes. The taper will allow for additional storage during short duration surges in traffic volumes.

Table 16 – Guidelines for Left Turn and Right Turn Lanes on Two Lane Highways

Minimum levels for installation auxiliary lanes on rural two lane roads (farm access excluded)

Speed	Left Turn Lane	Right Turn Lane	Right Turn Acceleration Lane	Left Turn Acceleration Lane
40 mph and less	25 vph	50 vph	-	-
45 mph and greater	10 vph	25 vph	50 vph	*

* Optional for 50 mph and less; for 55 mph as required by the County Engineer
vph = vehicles per hour in any one hour period in passenger car equivalents

7.2.20 Pedestrian and Bicycle Access

All new development and redevelopment of existing sites should address pedestrian and bicycle access to and within the site.

7.2.21 Roundabouts

Several communities in the United States are beginning to embrace the concept of "roundabouts". A roundabout is an intersection control measure used extensively in Europe for many years. A roundabout is composed of a circular, raised, center island with deflecting islands on the intersecting streets to direct traffic movement around the circle. Traffic circulates in a counter-clockwise direction making right turns onto the intersecting streets. There are no traffic signals; rather, entering traffic yields to vehicles already in the roundabout.

Roundabouts can reduce delays because the stop signal phase (when vehicles entering the intersection are unable to move) is eliminated. Roundabouts can also improve safety because the number of potential impact points and the numb of conflict points at a four-way intersection.

Development of a roundabout should occur as a result of an intersection study by a qualified Traffic Engineer and when the minimum capacity and design criteria can be met. The Federal Highway Administration (FHWA) has prepared a design guide for modern roundabouts in the United States. A single-lane roundabout can accommodate up to 1,800 vehicles per hour.

7.2.22 Where to Use Access Management

Access management shall be used on all roadways within Sevier County. Roadway access management strategies extend the useful life of roads at little or no cost to taxpayers. Access management can be used as an inexpensive way to improve performance on a major roadway that is increasing in volume. Access management should be used on new roadways and roadways that are to be improved so as to prolong the usefulness of the roadway.

8 TRANSPORTATION CORRIDOR PRESERVATION

This chapter identifies and evaluates techniques that can be used to preserve defined corridors for future transportation facilities.

8.1 Introduction

Several recent research efforts have addressed the issue of corridor preservation. The 1990 Report of the American Association of State Highway and Transportation Officials (AASHTO) Task Force on Corridor Preservation provided an identification and evaluation of various techniques. Subsequent efforts of the Federal Highway Administration (FHWA) and Transportation Research Board (TRB) have added to the literature. Drawing from these documents and a brief review of relevant Utah law, this chapter provides a discussion of potential techniques that may have applicability to Sevier County. A bibliography of the relevant publications is included.

8.2.1 Definitions

For purposes of this discussion, a "corridor" is defined as "the path of a transportation facility that already exists or may be built in the future". The AASHTO report defines corridor preservation as "a concept utilizing the coordinated application of various measures to obtain control of or otherwise protect the right-of-way for a planned transportation facility". The AASHTO report further defines the objectives of corridor preservation as follows:

- Prevent inconsistent development
- Minimize or avoid environmental, social, and economic impacts
- Reduce displacement
- Prevent the foreclosure of desirable location options
- Allow for the orderly assessment of impacts
- Permit orderly project development
- Reduce costs

8.2 Corridor Preservation Techniques

Techniques for corridor preservation fall into the following three major categories: (1) acquisition, (2) exercise of police powers, and (3) voluntary agreements and governmental inducements. The various issues associated with each corridor are unique. Therefore, one preservation technique cannot be recommended as the best for all situations. The purpose of this chapter is to provide a "toolbox" of techniques available, a brief summary of each is provided below.

8.2.1 Acquisition

This technique involves the purchase of fee simple or lesser interests in property to bank or preserve it for the corridor location. This could be accomplished using federal funds or by using state funds where a project would be implemented without federal participation. The use of state funds could generally be accomplished with more flexibility and fewer requirements. If federal funds are used, or expected to be used for future elements of the project, certain federally required procedures must be followed. Acquisition can be accomplished in the following ways.

8.2.2 Advance Purchase and Eminent Domain

Undeveloped property is acquired, either by direct purchase or eminent domain, and "banked" until needed for construction. Such a method may systematically acquire the entire right-of-way or it may strategically acquire only selected parcels.

Under Utah statutes, acquisition of property by eminent domain is authorized if (a) the use is authorized by law, (b) the taking is necessary for such use, (c) the construction and use of property will commence within a reasonable time, and (d) fair compensation is paid. Fair value must be paid for interests taken and damages which accrue to the remainder of adjacent property not taken (Utah Code Annotated §78-34-1).

Before property may be taken for a corridor the acquiring agency must identify the corridor location, general route and termini. If the acquiring agency, without reasonable justification, does not commence or compete construction and use of a roadway within the corridor within the time specified, additional damages might be payable to a property owner (Utah Code Annotated §27-12-96).

8.2.3 Hardship Acquisition

Property is acquired to alleviate a particular hardship to a property owner. The hardship must occur as a result of an inability to sell the property due to public awareness of the pending project. Applies only to limited parcel-by-parcel actions in extraordinary or emergency situations (Utah Code Annotated §27-12-96).

8.2.4 Purchase Options

A conditional contract or option is executed that gives the public agency the right but not the obligation to buy the property at a future date. The contract would specify the terms and conditions of the future purchase (Utah Code Annotated §27-12-96). A related concept involves the use of rights of first refusal under which the government entity obtains the first right to purchase the property when a landowner determines to sell its property.

8.2.5 Development Easements

The government agency purchases development rights or a development easement. The agreement would specify the uses that would be allowed on the land. The public agency would purchase the property owner's right to develop the land, leaving the owner with all other rights of ownership. Thus, intensification of and use or development would be precluded.

Existing Utah law provides for conservation easements to maintain land or water areas predominantly in a natural scenic, or open condition, or for recreational, agricultural, cultural, wildlife habitat or other use or condition consistent with the protection of open land. Such easements must be granted to a tax-exempt organization or government agency and cannot be obtained by eminent domain. The easement may be terminated pursuant to conditions set forth in the easement document (Utah Code Annotated §47-18-1).

8.2.6 Public Land Exchanges

Surplus government land is exchanged as compensation for private property needed for right-of-way.

8.2.7 Private Land Trusts

Private land trusts play an increasingly important role in land conservation where public objectives are aligned with private trust objectives. Where government budgets are insufficient to acquire critical tracts in a given time frame, private land trusts may acquire the tracts and hold them for future acquisition by the government.

8.2.8 Exercise of Police Powers

Regulatory controls under the police power can be used to control the development of private property in order to preserve the transportation corridor. These measures impose requirements with no compensation to the landowner. Land use and development controls are typically administered by local governments (36 A.L.R.3d 751).

8.2.9 Impact Fees and Exactions

This method involves a mandatory property or monetary contribution by a developer to the local jurisdiction as a condition of a land use approval or permit. These approvals or permits could be associated with a contract zoning, site plan approval, proposed subdivision, special use permit, or other development permission. In most cases, impact fees and exactions can be assessed only after a jurisdiction makes an individualized determination that the required dedication is "roughly proportional "in both nature and extent to the impact of the proposed development. Impact fees and exactions include the following variations (Utah Code Annotated §11-36-201).

In-kind contributions – Land owners and developers construct improvements or dedicate land for public facilities or right-of-way within or abutting the development site.

Monetary payments in lieu of contributions – Developers pay money in lieu of or in addition to in-kind contributions. This method may be used where the pooled contributions of numerous small developments is more effective than individual dedications of small parcels of land. The money is then used to acquire right-of way or make other improvements.

Impact fees – This method applies to a broader range of improvements whose need is generated by a new development. The effected jurisdiction charges developers for a pro rata share of capital funding for the improvements based on relative contributions to the impacts of the development by newly developed property and existing developments.

Constitutional standards of reasonableness govern the validity and amount of impact fees and exactions. To be constitutional, an impact fee or exaction must be a fair contribution in relation to contributions by others. Thus, an impact fee or exaction must not require newly developed properties to bear more than their equitable share of the capital costs in relation to the benefits conferred.

Seven factors must be considered in analyzing the fairness of an impact fee or exaction (Utah Code Annotated §11-36-201):

- The cost of existing facilities;
- The manner of financing existing capital facilities (such as user charges, special assignments, bonded indebtedness, general taxes, or federal grants);
- The relative extent to which the newly developed properties and other properties in the jurisdiction have already contributed to the cost of existing capital facilities (by such means

as user charges, special assignments, or payment from the proceeds of general taxes);

- The relative extent to which the newly developed properties in the jurisdiction will contribute to the cost of existing capital facilities in the future;
- The extent to which the newly developed properties are entitled to a credit because the jurisdiction is requiring their developers or owners (by contractual arrangement or otherwise) to provide common facilities (inside or outside the proposed development) that have been provided by the jurisdiction and financed through general taxation or other means (apart from user fees) in other parts of the jurisdiction;
- Extraordinary costs, if any, in servicing the newly developed properties; and
- The time-price differential inherent in fair comparisons of amounts paid at different times.

In addition to constitutional limitations, in 1995 the Utah legislature in special session adopted stringent controls on the ability of local government to adopt impact fees to finance development growth. The new act requires that prior to the imposition of an impact fee, a government entity must do the following (Branberry Development Corporation v South Jordan County).

- Prepare a capital facilities plan that establishes that impact fees are necessary to achieve an equitable allocation to the costs borne in the past and to be borne in the future in comparison to the benefits already received and yet to be received.
- Prepare a written analysis of the impact fee identifying the impact on the system caused by the development activity, demonstrate how those impacts are reasonably related to the development activity, estimate the proportionate share of the impact cost that are reasonably related to the new development activity, and identify how the impact fee was calculated.
- Find that an impact fee is reasonably related to the new development based on analyses of specific factors.
- Calculate the impact fee based on a list of defined criteria.
- Hold public hearings on the adoption of the impact fee ordinance.
- Establish a service area within which the jurisdiction calculates and imposes impact fees for various land use categories and either adopts a schedule of such fees by use category or establishes the formula for calculating such fees by use category.

The new act contains other requirements relating to environmental mitigation fees, definitions of public facilities and in some cases detailed standards governing the adoption and administration of impact fees.

8.2.10 Setback Ordinances

A local ordinance establishes a certain distance from a curb, right-of-way, property line, or structure within which construction is prohibited. These requirements may be contained within subdivision ordinances, zoning ordinances or building codes.

Setback requirements do not constitute a compensable taking (Hargraves v Young). But if setbacks or minimum lot sizes have the effect of prohibiting all economic use of property for otherwise permitted uses, a taking may occur.

8.2.11 Official Maps or Maps of Reservation

Development is prohibited within proposed right-of-way in areas covered by an official master street plan adopted by the jurisdiction. The official map may be used to plat future as well as existing streets. Generally, prohibition of development must not exceed a reasonable period after the implementing agency is advised of proposed development.

Prior to 1992, Utah law permitted the adoption of an official street map by municipalities and counties. Under prior law, the official street map had the legal effect of prohibiting development within the boundaries of the proposed street unless approved by the legislative body. Beginning in July of 1992, counties and municipalities were specifically prohibited from adopting an official map. Moreover, current law provides that an official map adopted under prior law does not require the municipality or county to acquire the property designated for eventual use as a public street. Utah law also expressly provides that an official map may not be used to unconstitutionally prohibit development of property (Utah Code Annotated §§17-27-7, 10-9-23).

Some courts have held that statutes permitting government to impose a development moratorium on property, located in a proposed transportation corridor during a period of reacquisition planning, unconstitutionally permits the taking of property without just compensation. Other courts have held that where the purpose of the government action is the prevention of development of land, that would increase the cost of planned future acquisition of such land by government, is unconstitutional. Some courts have found official maps unconstitutional if they also include compensation for the property owner for the period of temporary deprivation of the right to develop. Other statutory schemes have been validated when they allow development to proceed to avoid substantial damage to a property owner (Utah Code Annotated §§17-27-307, 10-9-306).

8.2.12 Adequate Public Facilities and Concurrency Requirements

Some communities address infrastructure needs by adopting ordinances that require a concurrency program intended to ensure that public facilities such as transportation systems are either in place, planned for, or provided as impacts occur from new development. Tools for implementation include carrying capacity limits, development caps, phasing systems, growth rate control, and other similar tools. This concept does not necessarily require developer's pay for improvement, but does require that such improvements be made when development occurs.

9 OTHER FUTURE ACTIONS

In addition to the long and short-term action items, the following actions should also be considered.

9.1 Interagency Agreement with UDOT

After adoption, it will be necessary to complete an agreement with UDOT regarding access to the state highways. This will help the County by providing a framework for future access permit applications related to private development. It also helps UDOT by providing enough overall county information so that individual access points can be reviewed with an understanding of future adjacent needs.

It is important that the County understand UDOT's requirements for traffic signals and the access points within the operational sphere of a signalized intersection. An understanding of UDOT's access permitting requirements is important also and should be a part of the county's subdivision

and development process. It is recommended that the county coordinate with UDOT on every new development that could impact the state highway system. This will ensure that the new development will share its burden of impact on that system.

9.2 Land Use Planning Integration

The County's current Zoning Plan calls for growth adjacent to existing corridors. This is similar to the development pattern in other rural communities, like the communities in Sevier County. Traffic studies in such rural communities indicate that this centralized commercial development land use pattern has negative traffic impacts as the county grows. Residents from the outskirts of town must travel downtown or to the central corridor to go shopping, which creates a lot of traffic from the outlying areas into the CBD. These communities have considered placing small commercial clusters around the outside of town to create convenient locations for people to purchase goods and services, while minimizing travel distances. This could be accomplished in Sevier County with simple rezoning or through planned unit developments. It is recommended that the County consult with an urban planner to discuss this concept in more detail.

APPENDIX 1

Area Specific Roadway Classification Maps

APPENDIX 2

Countywide Road Surface Type Map

APPENDIX 3

Countywide Bike & Pedestrian Plan Map

APPENDIX 4

Countywide Chipseal Projects 2001-2008

APPENDIX 5

Countywide Traffic Accidents 2005-2007

APPENDIX 6

County Roadway Typical Sections

APPENDIX 7

Public Meeting Minutes/Public Comments

APPENDIX 8

Traffic Volumes

Sevier County ADT and Functional Classification

Growth Rate 4.50%
5
20

Roadway	2007 ADT	2012 ADT	2017 ADT	2027 ADT	2007 Classification by volumes	2012 Classification by volumes	2017 Classification by volumes	2027 Classification by volumes	UDOT Classification	Study Recommended Classification
1200 South - Chris's Auto	199	249	312	489	Minor Collector	Minor Collector	Minor Collector	Minor Collector	FAR 2565 - Major Collector	Minor Collector
1650 West, Salina	174	218	273	428	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector
2200 North Austin	129	162	203	317	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
2200 North West Austin	207	259	324	509	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Accord Lakes Road	1870	2342	2933	4599	Arterial	Arterial	Arterial	Arterial		Arterial
Annabella Road	1234	1545	1935	3035	Major Collector	Major Collector	Arterial	Arterial	FAR 2536 - Major Collector	Arterial
Black Knoll Road	184	230	288	453	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Brooklyn Road. S. Elsinore	1074	1345	1684	2642	Major Collector	Major Collector	Major Collector	Arterial	Minor Collector	Arterial
Brooklyn Road	397	497	622	976	Minor Collector	Minor Collector	Minor Collector	Major Collector	Minor Collector	Major Collector
Brooklyn Road South	177	222	278	435	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector
Browns Lane - Brown Brown	216	271	339	531	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector
East Sigurd Road	630	789	988	1550	Minor Collector	Major Collector	Major Collector	Major Collector		Major Collector
East Venice Road - Center	349	437	547	858	Minor Collector	Minor Collector	Minor Collector	Major Collector	Minor Collector	Major Collector
Flat Canyon Road	257	322	403	632	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Guy Lewis Lane	256	321	402	630	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Hepplers Lane - Hepplers Pond	33	41	51	81	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector
Honky Tonk Road	713	893	1118	1754	Major Collector	Major Collector	Major Collector	Major Collector		Major Collector
Interchange Road - SAPP	1223	1532	1919	3008	Major Collector	Major Collector	Arterial	Arterial	FAR 2570 - Minor Arterial	Arterial
Jones Road	164	205	257	403	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Landslide Road	348	436	546	856	Minor Collector	Minor Collector	Minor Collector	Major Collector	Minor Collector	Major Collector
Lost Creek Road	37	46	58	91	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Nebeker Lane	113	142	178	278	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Old 89 S Elsinore - US Hwy 89	516	646	809	1269	Minor Collector	Minor Collector	Major Collector	Major Collector	FAR 2528 - Major Collector	Major Collector
Salina Pioneer Cem Rd. - Slaughter House Road	173	217	272	426	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Salt Mine Road	353	442	554	868	Minor Collector	Minor Collector	Minor Collector	Major Collector		Major Collector
Sauls Meadow Road	93	116	145	229	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Secgmilller Lane	52	65	81	128	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Sevier River Road	500	626	784	1230	Minor Collector	Minor Collector	Major Collector	Major Collector	Major Collector	Major Collector
Sheep Lane	126	158	198	310	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
South Venice Road	309	387	485	760	Minor Collector	Minor Collector	Minor Collector	Major Collector	Minor Collector	Major Collector
SR 25	731	915	1146	1798	Major Collector	Major Collector	Major Collector	Major Collector	Major Collector	Major Collector
Washburnville Road	603	755	946	1483	Minor Collector	Minor Collector	Major Collector	Major Collector	Minor Collector	Major Collector

Roadway Classification	ADT Range
Minor Collector	<650
Major Collector	650-1800
Arterial	1800>

Sevier County Transportation Growth Rate

Traffic On Utah Highways

SR-24 Mile Post	**2005**	**2004**	**2003**	Average Growth 2004 to 2006
5.30 to 7.71	2,870	2,735	2,745	
	4.9%	-0.4%		2.3%
8.17 to 10.71	1,500	1,450	1,385	
	3.4%	4.7%		4.1%
10.71 to16.01	930	900	860	
	3.3%	4.7%		4.0%
37.01 to 39.09	760	735	700	
	3.4%	5.0%		4.2%
SR-89				
227.12 to 227.78	9,470	9,515	9,110	
	-0.5%	4.4%		2.0%
227.78 to 232.67	8,265	8,305	7,951	
	-0.5%	4.5%		2.0%
SR-118				
10.04 to 12.53	4,900	4,745	4,540	
	3.3%	4.5%		3.9%
14.68 to 15.05	6,500	6,000	5,960	
	8.3%	0.7%		4.5%
SR-256				
1.18 to 2.26	685	660	630	
	3.8%	4.8%		4.3%
SR-258				
0.98 to2.02	2,445	2,365	2,135	
	3.4%	10.8%		7.1%
SR-260				
0.00 to 0.59	2,550	2,475	2,365	
	3.0%	4.7%		3.8%
0.59 to 1.39	1,545	1,495	1,430	
	3.3%	4.5%		3.9%
				Average of all Growth Rates
				3.8%

Growth Rate used for TMP Study - 4.5%

APPENDIX 9

Level of Service Analysis

Sevier County VMT, ADT, Level of Service (LOS), and Functional Classification

ROADWAY	LENGTH (ft)	Miles	VMT	VMT ratio	2007ADT	2012 ADT	2017 ADT	2027 ADT	2007 V/C ratio *	2012 V/C ratio *	2017 V/C ratio *	2027 V/C ratio *	2007 LOS +	2012 LOS +	LOS 2017 +	2027 LOS +	Study Recommended Classification
1200 S SALINA LOST CREEK RD	9,970.91	1.89	375.8	0.937	199	249	312	489	0.0265	0.0332	0.0416	0.0652	A	A	A	A	**Minor Collector**
1650 WEST SALINA	8,358.15	1.58	275.4	0.687	174	218	273	428	0.0232	0.0291	0.0364	0.0571	A	A	A	A	**Minor Collector**
2200 NORTH AUSTIN EAST	5,507.58	1.04	134.6	0.335	129	162	202	317	0.0172	0.0216	0.0269	0.0423	A	A	A	A	**Minor Collector**
2200 NORTH AUSTIN WEST	5,327.79	1.01	208.9	0.521	207	259	325	509	0.0276	0.0345	0.0433	0.0679	A	A	A	A	**Minor Collector**
ACORD LAKES	50,609.62	9.59	8895.0	22.172	928	1162	1455	2283	0.1237	0.1549	0.1940	0.3044	A	A	A	A	**Arterial**
ANNABELLA ROAD	14,959.64	2.83	3496.2	8.715	1234	1545	1935	3035	0.1645	0.2060	0.2580	0.4047	A	A	A	A	**Arterial**
BLACK KNOLL	22,113.86	4.19	770.6	1.921	184	230	289	453	0.0245	0.0307	0.0385	0.0604	A	A	A	A	**Minor Collector**
BROOKLYN ROAD SOUTH ELSINORE	7,740.97	1.47	1574.6	3.925	1074	1345	1684	2642	0.1432	0.1793	0.2245	0.3523	A	A	A	A	**Arterial**
BROOKLYN ROAD NORTH	11,963.93	2.27	899.6	2.242	397	497	623	976	0.0529	0.0663	0.0831	0.1301	A	A	A	A	**Major Collector**
BROOKLYN ROAD SOUTH 118	13,354.05	2.53	447.7	1.116	177	222	278	435	0.0236	0.0296	0.0371	0.0580	A	A	A	A	**Minor Collector**
BROWNS LANE KOOSHAREM	12,993.87	2.46	531.6	1.325	216	271	339	531	0.0288	0.0361	0.0452	0.0708	A	A	A	A	**Minor Collector**
EAST SIGURD ROAD	2,541.09	0.48	303.2	0.756	630	789	988	1550	0.0840	0.1052	0.1317	0.2067	A	A	A	A	**Major Collector**
EAST VENICE ROAD	5,969.73	1.13	394.6	0.984	349	437	547	858	0.0465	0.0583	0.0729	0.1144	A	A	A	A	**Major Collector**
FLAT CANYON	17,970.67	3.40	874.7	2.180	257	322	403	632	0.0343	0.0429	0.0537	0.0843	A	A	A	A	**Minor Collector**
HEPLER LANE	26,404.70	5.00	165.0	0.411	33	41	52	81	0.0044	0.0055	0.0069	0.0108	A	A	A	A	**Minor Collector**
HONKY TONK ROAD	15,744.91	2.98	2126.2	5.300	713	893	1118	1754	0.0951	0.1191	0.1491	0.2339	A	A	A	A	**Major Collector**
INTERCHANGE ROAD	12,951.02	2.45	2999.8	7.478	1223	1532	1918	3008	0.1631	0.2043	0.2557	0.4011	A	A	A	A	**Arterial**
JONES RD	7,977.24	1.51	247.8	0.618	164	205	257	403	0.0219	0.0273	0.0343	0.0537	A	A	A	A	**Minor Collector**
LANDSLIDE RD	11,736.01	2.22	773.5	1.928	348	436	546	856	0.0464	0.0581	0.0728	0.1141	A	A	A	A	**Major Collector**
LOST CREEK ROAD	36,429.55	6.90	255.3	0.636	37	46	58	91	0.0049	0.0061	0.0077	0.0121	A	A	A	A	**Minor Collector**
OLD 89 SOUTH ELSINORE	30,839.38	5.84	3013.8	7.512	516	646	809	1269	0.0688	0.0861	0.1079	0.1692	A	A	A	A	**Major Collector**
SALINA PIONEER CEMETERY RD	20,825.35	3.94	682.3	1.701	173	217	271	426	0.0231	0.0289	0.0361	0.0568	A	A	A	A	**Minor Collector**
SALT MINE RD	11,404.35	2.16	762.4	1.901	353	442	554	868	0.0471	0.0589	0.0739	0.1157	A	A	A	A	**Major Collector**
SAULS MEADOW RD	37,722.23	7.14	664.4	1.656	93	116	146	229	0.0124	0.0155	0.0195	0.0305	A	A	A	A	**Minor Collector**
SEEGMILLER LANE	16,940.86	3.21	166.8	0.416	52	65	82	128	0.0069	0.0087	0.0109	0.0171	A	A	A	A	**Minor Collector**
SEVIER RIVER RD	11,373.35	2.15	1077.0	2.685	500	626	784	1230	0.0667	0.0835	0.1045	0.1640	A	A	A	A	**Major Collector**
SHEEP LANE	5,821.01	1.10	138.9	0.346	126	158	198	310	0.0168	0.0211	0.0264	0.0413	A	A	A	A	**Minor Collector**
SOUTH VENICE	9,988.59	1.89	584.6	1.457	309	387	485	760	0.0412	0.0516	0.0647	0.1013	A	A	A	A	**Major Collector**
SR-25	37,997.14	7.20	5260.6	13.113	731	915	1146	1798	0.0975	0.1220	0.1528	0.2397	A	A	A	A	**Major Collector**
WASHBURNVILLE ROAD	17,659.25	3.34	2016.8	5.027	603	755	946	1483	0.0804	0.1007	0.1261	0.1977	A	A	A	A	**Major Collector**
			40117.8	100.000													

Sevier County ADT and Functional Classification

Growth Rate 4.50%
5
20

Roadway	2007 ADT	2012 ADT	2017 ADT	2027 ADT	2007 Classification by volumes	2012 Classification by volumes	2017 Classification by volumes	2027 Classification by volumes	UDOT Classification	Study Recommended Classification
1200 South - Chris's Auto	199	249	312	489	Minor Collector	Minor Collector	Minor Collector	Minor Collector	FAR 2565 - Major Collector	Minor Collector
1650 West, Salina	174	218	273	428	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector
2200 North Austin	129	162	203	317	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
2200 North West Austin	207	259	324	509	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Accord Lakes Road	1870	2342	2933	4599	Arterial	Arterial	Arterial	Arterial		Arterial
Annabella Road	1234	1545	1935	3035	Major Collector	Major Collector	Arterial	Arterial	FAR 2536 - Major Collector	Arterial
Black Knoll Road	184	230	288	453	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Brooklyn Road. S. Elsinore	1074	1345	1684	2642	Major Collector	Major Collector	Major Collector	Arterial	Minor Collector	Arterial
Brooklyn Road	397	497	622	976	Minor Collector	Minor Collector	Minor Collector	Major Collector	Minor Collector	Major Collector
Brooklyn Road South	177	222	278	435	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector
Browns Lane - Brown Brown	216	271	339	531	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector
East Sigurd Road	630	789	988	1550	Minor Collector	Major Collector	Major Collector	Major Collector		Major Collector
East Venice Road - Center	349	437	547	858	Minor Collector	Minor Collector	Minor Collector	Major Collector	Minor Collector	Major Collector
Flat Canyon Road	257	322	403	632	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Guy Lewis Lane	256	321	402	630	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Hepplers Lane - Hepplers Pond	33	41	51	81	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector	Minor Collector
Honky Tonk Road	713	893	1118	1754	Major Collector	Major Collector	Major Collector	Major Collector		Major Collector
Interchange Road - SAPP	1223	1532	1919	3008	Major Collector	Major Collector	Arterial	Arterial	FAR 2570 - Minor Arterial	Arterial
Jones Road	164	205	257	403	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Landslide Road	348	436	546	856	Minor Collector	Minor Collector	Minor Collector	Major Collector	Minor Collector	Major Collector
Lost Creek Road	37	46	58	91	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Nebeker Lane	113	142	178	278	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Old 89 S Elsinore - US Hwy 89	516	646	809	1269	Minor Collector	Minor Collector	Major Collector	Major Collector	FAR 2528 - Major Collector	Major Collector
Salina Pioneer Cem Rd. - Slaughter House Road	173	217	272	426	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Salt Mine Road	353	442	554	868	Minor Collector	Minor Collector	Minor Collector	Major Collector		Major Collector
Sauls Meadow Road	93	116	145	229	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Secgmilller Lane	52	65	81	128	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
Sevier River Road	500	626	784	1230	Minor Collector	Minor Collector	Major Collector	Major Collector	Major Collector	Major Collector
Sheep Lane	126	158	198	310	Minor Collector	Minor Collector	Minor Collector	Minor Collector		Minor Collector
South Venice Road	309	387	485	760	Minor Collector	Minor Collector	Minor Collector	Major Collector	Minor Collector	Major Collector
SR 25	731	915	1146	1798	Major Collector	Major Collector	Major Collector	Major Collector	Major Collector	Major Collector
Washburnville Road	603	755	946	1483	Minor Collector	Minor Collector	Major Collector	Major Collector	Minor Collector	Major Collector

Roadway Classification	ADT Range
Minor Collector	<650
Major Collector	650-1800
Arterial	1800>