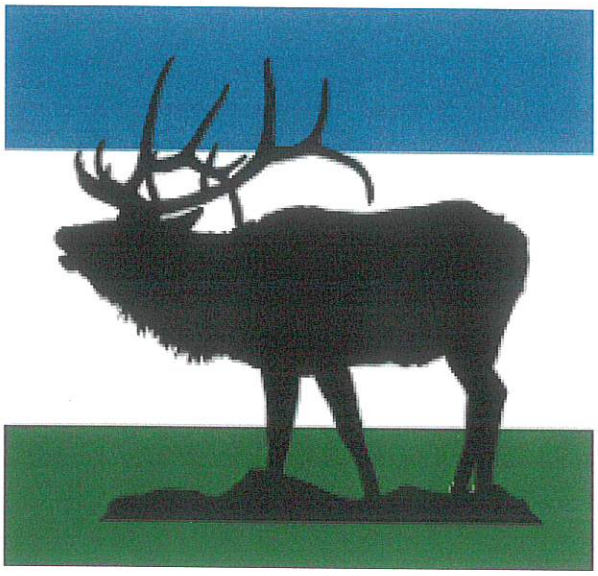
ELK RIDGE CITY, UTAH

TRANSPORTATION MASTER PLAN



JANUARY 2024

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1 INTRODUCTION

1.1 Background

Elk Ridge, nestled into the mountains of southeast Utah County, was incorporated as a town in 1976. Elk Ridge officially became a city in November 2000. The residents of Elk Ridge enjoy long, snowy winters and beautiful, warm summers. The city overlooks Utah Lake, and residents enjoy the benefits of living in a small and quiet community while remaining close to bigger cities to the north.

1.2 Need for an Updated Transportation Element

Elk Ridge is a mostly residential city with a few scattered commercial and public facility zones. Because of its location, the city is somewhat limited in development potential, and the city's location on the hillside prevents construction of a large, gridded roadway network. The city consists of mostly winding local residential corridors. Continued development in the city is anticipated to continue following this pattern of growth, and this Transportation Master Plan (TMP) has been established to ensure that this development is able to occur within the bounds of a functional transportation network. Roadway functional classification, future corridor, and capital project planning are essential in ensuring that the transportation network continues to provide for the needs of the expanding community.

1.3 Transportation Planning Purpose

The existing general plan for Elk Ridge City contains a transportation element that was adopted in 2018. The Utah Department of Transportation (UDOT) recommends that transportation master planning documents be updated every five years to ensure that all transportation planning remains up to date with the changing demands of a city's transportation network. Additionally, the City seeks to expand the existing transportation element by adding a more in depth analysis of the existing network. This TMP has been established for three key purposes:

1. Analyze existing traffic and roadway conditions with traffic counters to establish an expanded roadway network inventory and determine likely growth patterns and future transportation-related needs,

2. Plan for future development, roadway maintenance and construction projects, and funding acquisition,

3. Create maps of analysis and planning that will be included in the TMP.

1.3.1 Analyze Existing Traffic and Roadway Conditions

The analysis of existing traffic and roadway conditions is included in Section 2 of this document, and includes the following information:

- Existing land use data and maps,
- Existing demographic and socioeconomic data and future population growth estimates,
- Existing funding sources and opportunities, and
- An inventory of the existing roadway network, including:

- Functional classification of vehicle roadways,
- Vehicle crash data and patterns,
- ADTs and associated speed and vehicle classification data.

1.3.2 Plan for Future Development

Future planning addresses the transportation needs of the city as determined by the analysis of existing traffic and roadway conditions. Planning for future growth in Elk Ridge City is analyzed and described in Section 3. These needs include, but are not limited to:

- Future roadway functional classification map,
- Roadway Level of Service (LOS) analysis,
- Statewide Transportation Improvement Plan (STIP) and Mountainland Association of Governments (MAG) projects, and
- Elk Ridge Transportation Improvement Plan (TIP).

Future roadway capital projects have been separated into three categories: STIP projects, MAG projects, and TIP projects.

1.3.3 Create Maps

The following maps are included in the TMP:

- Existing Transportation Network
  - Existing Functional Class Map
  - Traffic Crash Heat Map
  - Existing Average Daily Traffic Map
- Future Transportation Network
  - Future Functional Class Map
  - Transportation Improvement Plan Map
  - Future Level of Service Map

1.4 Study Goals

Some of the benefits of a reliable and effective transportation network include improved mobility, citizen health, connectivity, and economy. These benefits are the four cornerstones of the Utah Department of Transportation's (UDOT) quality of life framework.[1] Elk Ridge seeks to comply with

[1] Utah Department of Transportation, "2022 UDOT Strategic Direction," Utah Department of Transportation, 2022, https://www.udot.utah.gov/strategic-direction/index.html#missionSection.

UDOT's quality of life framework and establish these factors as the framework for its transportation planning. This section will explain how Elk Ridge City seeks to integrate this quality of life framework into its transportation planning.

1.4.1 Better Mobility

Elk Ridge City seeks to improve mobility within the city by prioritizing established corridor preservation techniques, access management principles, functional classification standards, and other development standards. Mobility improves when roadways are designed by functional classification type (see Section 2.3). This ensures that mobility and access are balanced throughout the city. Elk Ridge City commits to finding the most cost-effective and efficient alternatives to future roadway design. Future planning ensures the network mobility is preserved. Elk Ridge City seeks to address, where possible, mobility deficiencies in the existing roadway network caused by undermaintained roads, unpaved roads, under signalized roads, or network areas with a lack of redundancies.

1.4.2 Good Health

Elk Ridge City seeks to improve citizen health by expanding its active transportation network. Elk Ridge seeks to coordinate with UDOT, the County, and other transportation planning authorities in establishing active transportation networks. Elk Ridge City also seeks to improve citizen health by seeking safety- and sustainability-focused alternatives in planning, construction, and maintenance of transportation facilities. These alternatives will allow the City to lessen its environmental impacts further improving the ability of residents to enjoy the community's natural beauty and environment. Elk Ridge City wants its residents to live with the benefits of safer roadways, cleaner air, and more expanded active transportation opportunities.

1.4.3 Connected Communities

Elk Ridge City seeks to improve its interconnectedness with other cities, the county, and the rest of the state. The City also seeks to foster connectivity within the city through promoting beneficial development, public amenities, and an effective transportation network. The City seeks to maintain and expand existing roadways that connect internal and external communities while planning new roadways which will further connect the city. The City will do this through proper application of corridor preservation techniques, access management principles, and establishment of transportation improvement plans. The City continually seeks the input of transportation and roadway professionals, residents, and other local and regional officials to ensure that the concerns and needs of every community are voiced.

1.4.4 Strong Economy

Elk Ridge City seeks to strengthen its economy through transportation network planning that will encourage economic-boosting development consistent with desires and needs of the community. Establishing future road network planning is greatly beneficial for the City in preventing future unnecessary expenditures and ensuring only that which is needful is constructed. This supports the local economy and allows the City to expend resources in a way that maximizes benefit to the community.

1.5 Coordination with Local, State, and Federal Governments

Elk Ridge City recognizes the benefits of coordinating with other local, regional, state, and federal agencies. This coordination and collaboration allows each entity to plan for all needs of their

respective transportation networks. This collaborative effort also ensures that the differing needs of each community are addressed. The City is dependent on functional state and county transportation networks, which function as most of the arterial and major collector roadways in the region. Elk Ridge City wants to ensure that these roads are capable of providing for the changing needs of the city. The City also seeks to assist the county and state in their development planning by coordinating roadway improvement projects.

Where possible and necessary, Elk Ridge City seeks to inform and be informed by local, state, and federal entities about transportation-related planning, development, and standards.

1.6 Land Use

Land use is used to direct development and growth within the city. The land use map (2024) for Elk Ridge City is included as Figure 1. The future land use/annexation map (2024) is included as Figure 2. Land use designation is an important aspect of transportation planning. Land use mapping should correlate with roadway functional classification and access management design. By coordinating with planning and zoning, transportation planning and development can occur consistent with city growth and development. Zoning and annexations are planned by the city so that the city is able to guide growth in a direction most suitable to the needs of the community.

Zoning Map

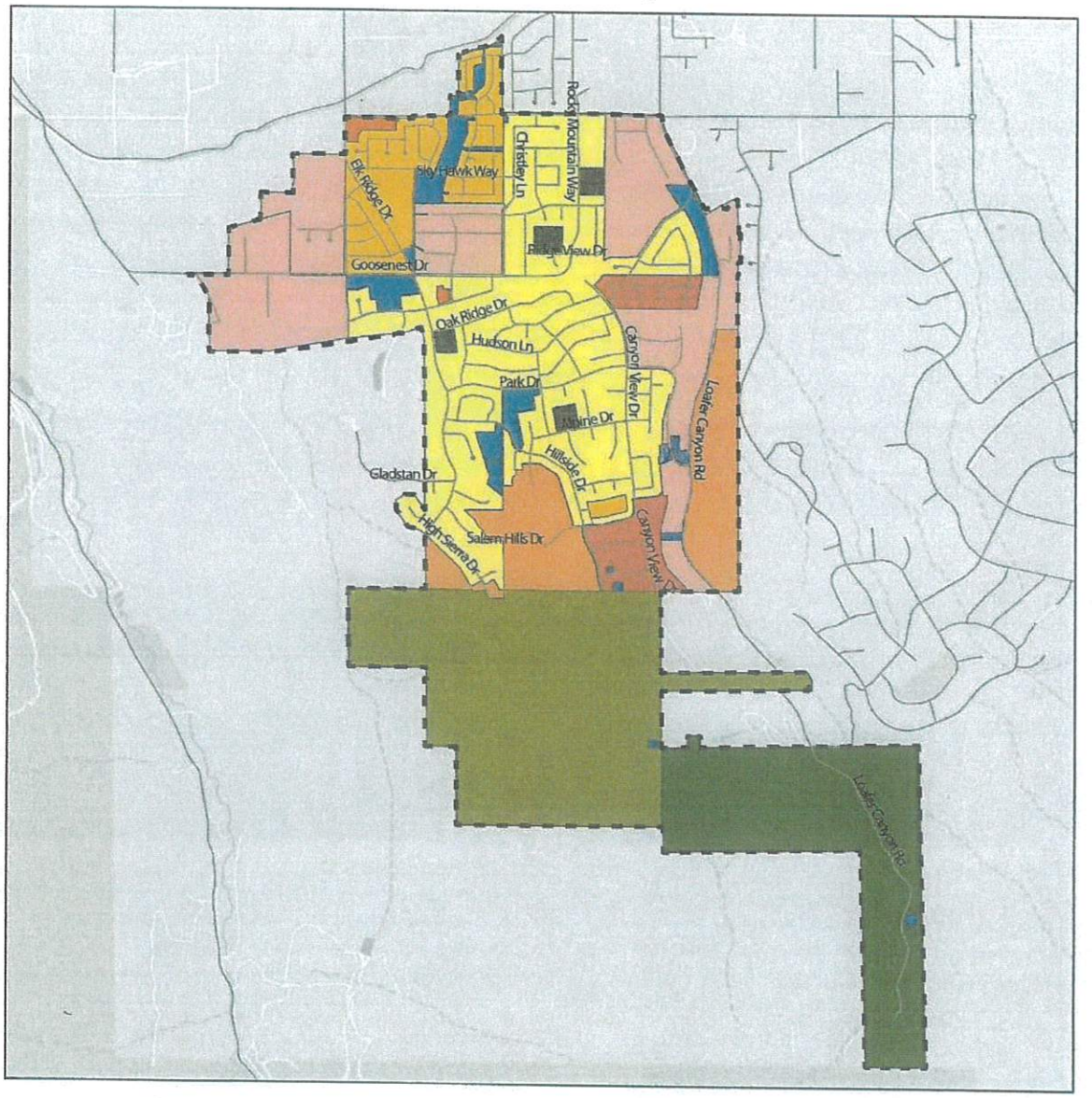

Figure 1 – Elk Ridge City Zoning Map

Future Land Use / Annexation Map

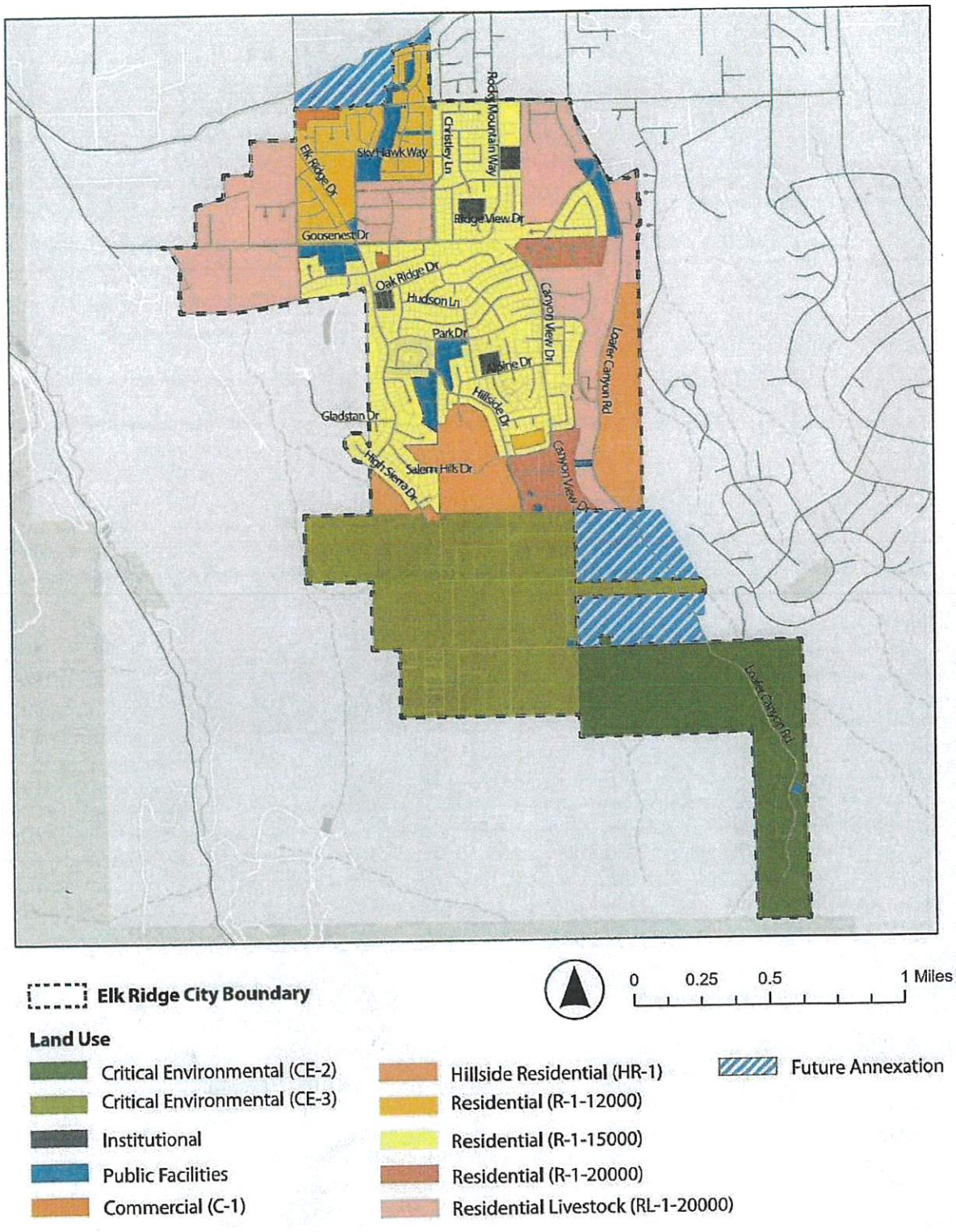

Figure 2 – Elk Ridge City Zoning Map

2 EXISTING CONDITIONS

An inventory of existing conditions was created to assist in determining future expansion, development, and maintenance needs.

2.1 Demographic & Socioeconomic Data

Table 1 shows the 2021 estimated population and housing data for Elk Ridge City. Table 2 compares the population growth for Elk Ridge City, Utah County, and the State of Utah from 2000 to 2020. Demographic and socioeconomic data was used in determining future growth patterns for Elk Ridge City. Estimates were based on existing growth trends. Future roadway ADT and LOS was determined based on an assumed growth rate determined in the demographic analysis.

Table 1 – Elk Ridge City Population and Housing Data (2021 Estimate)[2]

Population	Housing Units	Area (Sq. Mi.)	Population Density (Persons / Sq. Mi.)	Housing Density (Housing Units / Sq. Mi.)
4,687	437	2.82	1,662	155

Table 2 – Population Growth Trends

Year	State of Utah[3]	Utah County[4]	Elk Ridge City
2000	2,233,169	368,536	1,865
Average Annual Growth (2000-2010)	2.13%	3.37%	2.67%
2010	2,763,885	516,564	2,436
Average Annual Growth (2010-2020)	1.69%	2.44%	6.54%
2020	3,271,616	659,399	4,687
Average Annual Growth (2000-2020)	2.14%	2.91%	4.61%

Table 3 shows a population growth estimate for the next 40 years based on values provided by estimates included in the General Plan. Growth in Elk Ridge City has grown more rapidly in recent years compared to the county and the state (ranging from 3 to 12 percent in recent years). It is anticipated that this growth will gradually slow over the upcoming 40 years, however, due to limitations caused by adjoining municipalities and topography. The City's population is still anticipated to approximately double by 2060, though. Based on existing and future estimates, a traffic growth rate of 3.0 percent was used for Level of Service (LOS) analysis (see Section 2.5 and Section 3.3.2).

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[2] American Community Survey, "ACS Demographic and Housing Estimates," United States Census Bureau, https://data.census.gov/table?q=Elk+Ridge,+Utah+2000.

[3] United States Census Bureau, "Historical Population Change Data (1910-2020)," United States Department of Commerce, https://www.census.gov/data/tables/time-series/dec/popchange-data-text.html.

[4] United States Census Bureau, "QuickFacts: Utah County, Utah," United States Department of Commerce, https://data.census.gov/table?q=utah+county,+Utah+2020.

Table 3- Population Growth Estimates

Year	Population
2020	4,687
2030	5,755
2040	7,015
2050	8,500
2060	10,382

2.2 Roadway Network Inventory

A roadway network inventory organizes all City roadways by functional classification and includes relevant data for selected roadways. A visual representation of various data for the roadway network inventory can be found in maps included in this TMP.

The following information was gathered for the existing roadway network:

- Functional classification data;
- Pavement characteristics of roadways;
- Roadway average daily traffic (ADT) and level of service (LOS) data;
- Volumes, speeds, and vehicle classification percentages of selected roadways;
- Historical funding allocation;
- Vehicle crash information.

The City roadway network provides the dominant means of transportation for this area, with the county and state highway system serving as the main accesses to this network. Vehicular travel relies heavily on a well-maintained and efficient roadway network. The data gathered for the existing Elk Ridge City roadway network inventory is included in the following sections.

2.3 Functional Classification

Roadway functional classification is used by the United States Department of Transportation (USDOT) and UDOT to categorize highways and other roadways. This categorization assists planners and designers in creating roadways compatible with intended needs of the roadway network. The American Association of State Highway and Transportation Officials (AASHTO) describes functional classification as the process of "[defining] the role of each roadway in serving motor-vehicle movements within the overall transportation system."[5] It is an organized system with established parameters.

Roadway networks can be categorized into rural and urban. Elk Ridge City's roadway network functions as a rural network. Functional classification is defined in a hierarchical structure based upon factors including roadway design volume, speed, access, and mobility.

Existing and future functional classification maps are included in Appendix 1. The existing functional classification map matches the existing functional classification map standardized by UDOT. The future functional classification map was created by Mountainland Association of Governments (MAG)

[5] American Association of State Highway and Transportation Officials, *A policy on Geometric Design of Highway and Streets*, 7th Edition, 2018.

as part of its regional planning effort. It is not intended to show roadways that will be classified into UDOT's future functional classification map but is intended to guide development and road design in the city. Road design is based on functional classification. Typical road sections are in Appendix 4.

Functional classifications are now listed in hierarchical order from highest mobility and lowest accessibility to lowest mobility and highest accessibility.

2.3.1 Freeways

Freeways (Federal Highways) are highways included in the national Interstate Highway System. Freeways are maintained by state transportation departments. Freeways are designed with high speed limits and are created to serve high mobility needs with limited access. Access on these highways is limited to ensure that the greatest level of mobility possible can be achieved. These highways have grade-separated interchanges. There are no freeways within Elk Ridge.

2.3.2 State Highways

State highways are designed similar to freeways with emphasis given to high mobility and high speed. These highways, however, are not generally grade-separated at intersections and can have traffic-control at intersections, particularly within municipalities. These are toll-free state-controlled highways. They are generally designed as arterials and major collectors throughout counties within the state.

There are no state highways within Elk Ridge. The closest state highway to Elk Ridge is SR-198.

2.3.3 Arterials

Arterials are classified and designed to function as the "spine" of transportation networks. All other roadways of the transportation network should function to provide access to arterials. Arterials are roadways that function as the main access road for municipalities. Mobility is the primary function of arterials. Within cities, some mobility may be sacrificed for accessibility, but priority should be given to arterials at all intersections. Arterials can be classified as both principal and minor. There are currently no arterials classified in Elk Ridge. The closest state-classified arterial to Elk Ridge is SR-198.

2.3.4 Major Collectors

Major collectors, like arterials, prioritize mobility. However, they typically transport lower traffic volumes than arterials. These roadways connect local roads and minor collectors to arterials or highways. Access to residential developments and rural facilities is more common in major collectors than with arterials. Intersections between major collectors and lower-classified roadways should give priority to the major collector. This is done to ensure that major collectors provide increased mobility. Existing major collectors in Elk Ridge City include the following:

- Goosenest Drive (west of 1600 West)
- 1600 West
- 11200 South

2.3.5 Minor Collectors

Minor collectors provide access by connecting communities and neighborhoods. These roads funnel

traffic from major collectors or arterials to local roads. Minor collectors are intended to balance mobility and access. They are often stop controlled and have lower speed limits. They provide increased mobility over local roads yet still have residential access. Existing minor collectors in Elk Ridge City include the following:

- Goosenest Drive (from 1600 West to Elk Ridge Drive)
- Elk Ridge Drive (from Goosenest Drive to Park Drive)
- Park Drive
- Loafer Canyon Road (from Park Drive to 11200 South)

2.3.6 Local Roads

Local roads connect residential areas and sacrifice mobility to provide the highest level of accessibility. It is preferable that accesses be placed on local roads where possible, rather than arterials and collectors. Placing accesses on arterials and collectors requires frequent access points and intersections which leads to frequent stops and delays. Placing accesses on local roads can help to prevent these potential delays and stops. Local roads are designed to have lower speed limits and span shorter distances. They tend to have higher pedestrian traffic and are often built in a manner to discourage high amounts of through traffic. All unclassified roadways within Elk Ridge City are local roads or private roads.

2.3.7 Vehicle Miles of Travel (VMT)

Vehicle Miles of Travel (VMT) is a method established federally to determine the amount of vehicular usage for a specified roadway. VMT is calculated as the total miles of vehicular travel for a specified roadway over a specified period of time. This characteristic and roadway mileage are useful in determining roadway functional classification. The Federal Highway Administration (FHWA) specifies the allowable percentages of roadway mileage and VMT per functional classification type. These limitations are specified to provide balance within the roadway network and ensure an appropriate number of arterials, collectors, and local roads throughout the system.

Federally established guidelines should be referenced in determining changes to classification of the roadway network. The allowable percentages for each classification are shown in Table 4.

Table 4 – Allowable Percentage of Road Miles and VMT[6]

Functional Classification	Rural		Urban	
	Mileage	VMT	Mileage	VMT
Major Collectors	8%-19%	10%-23%	10%-17%	12%-24%
Minor Collectors	3%-15%	1%-8%	5%-13%	3%-10%
Local Roads	62%-74%	8%-23%	66%-74%	7%-20%

[6] Federal Highway Administration, "Planning Processes: Statewide Transportation Planning," United States Department of Transportation, September 27, 2017, https://www.fhwa.dot.gov/planning%20/processes/statewide/related/highway_functional_classifications/section03.cfm

2.4 Roadway Conditions

The current condition of each roadway is explained in this section. The condition of roadways serves as a basis for how well the transportation system functions and provides guidance for future roadway capital project planning and changes to future functional classification.

2.4.1 Travel Lanes and Surface Conditions

All roadways in Elk Ridge City consist of two travel lanes (one in each direction). Almost all roadways are unstriped except for a few roadways designed as collector roads, such as Elk Ridge Drive, Goosenest Drive, Park Drive, and Loafer Canyon Road. Almost all roads in Elk Ridge are paved with asphalt with very few exceptions. Unpaved roads are either private or on mountainous terrain.

2.4.2 Traffic Volumes

Traffic volumes indicate the travel demand of existing roadways and their relative importance to the functionality of the transportation network. Roadways with the greatest impact generally have the highest traffic volumes. Traffic volumes, road capacities, and level of service (LOS) are used to determine how well a road is functioning. The average daily traffic (ADT) is one of the most common metrics used to assess the amount of traffic a road experiences. ADT is calculated as the number of vehicles passing a certain point on a roadway in either direction on an average day. Traffic data is generally collected for 7 to 10 days and averaged to create an ADT. Table 5 lists the ADTs for all of the roadways studied as part of the TMP analysis. It also includes the anticipated ADT for the 20-year scope based on future population and traffic growth estimates. Peak hour volume (PHV) for 2023 is also included in this table. PHV is calculated as the 60-minute period of the day with the highest amount of vehicular traffic for a roadway. PHV is also used in determining the LOS for a road instead of ADT because it often functions as the controlling factor in peak traffic. It represents a smaller time frame that may have a much higher peak relative to ADT and, as such, may be used in determining a more accurate LOS. For future LOS analysis on these roadways, see Section 3.2.2. An existing ADT map is included in Appendix 2. Traffic count reports with detailed ADT analysis are in Appendix 6.

Table 5 – 2023 ADT for Selected Elk Ridge Roadways

Roadway	2023 Peak Hour Volume	2023 ADT	2028 ADT	2033 ADT	2038 ADT	2043 ADT
Canyon View Drive	84	571	664	772	897	1043
Elk Ridge Drive (near Gladstan Drive)	137	1180	1371	1593	1851	2151
Elk Ridge Drive (to Salem Canal Road)	515	5397	6271	7286	8466	9837
Gladstan Drive	83	426	495	576	670	779
Sunbrook Drive (Gladstan RV Entrance)	8	31	37	43	50	59
Goosenest Drive	206	1792	2083	2421	2813	3269
Hillside Drive	128	944	1097	1275	1482	1722
Loafer Canyon Road	131	986	1146	1332	1548	1799
Park Drive	307	1800	2092	2431	2825	3283
Rocky Mountain Way	55	396	461	536	623	724
Sky Hawk Drive	60	460	535	622	723	841

2.4.3 *Speed Data*

Speed data was collected from traffic counts performed as part of this study. Included in Table 6 is average speed, high speed, 85th percentile speed, and speed limit data. Generally, in transportation planning and design the 85th percentile speed is used as a key factor in determining roadway speed limit. Other important factors in roadway speed limit determination include traffic patterns, ADT data, vehicle crash history, access management and spacing, intersection controls, and existing safety concerns such as clear zone obstructions, limited sight triangle distances, and bridge and culvert crossings. It is recommended that the City assess the speed data to assist in determining any potential speed limits alterations. All required geometric design, safety, and other standards required by both the City and AASHTO must be followed when adjusting roadway speed limits. In Table 6, all 85th percentile speeds at least 5 miles per hour greater than the existing speed limit have been bolded. There were no roadways studied that had an 85th percentile speed more than 10 miles per hour greater than the existing speed limit. Traffic count reports with detailed speed data analysis are included in Appendix 6.

Table 6 – Roadway Speed Analysis for Selected Roadways

Roadway	Average Daily Traffic	Speed Average	Speed High	85th Percentile Speed	Speed Limit
Canyon View Drive	571	22	48	27	25
Elk Ridge Drive (near Gladstan Drive)	1180	29	55	34	30
Elk Ridge Drive (to Salem Canal Road)	5397	34	57	**39**	30
Gladstan Drive	426	27	65	**33**	25
Sunbrook Drive (Gladstan RV Entrance)	31	14	38	19	25
Goosenest Drive	1792	31	59	**37**	30
Hillside Drive	944	26	58	**30**	25
Loafer Canyon Road	986	29	52	**34**	25
Park Drive	1800	19	52	23	25
Rocky Mountain Way	396	26	50	**31**	25
Sky Hawk Drive	460	26	51	**31**	25

2.4.4 *Heavy Truck Traffic Data*

Heavy truck traffic can also be determined with the traffic counts. A heavy truck traffic percentage is included in Table 7. There were not any roads in Elk Ridge that had a heavy truck traffic percentage greater than 10 percent. There was only one road studied that had a percentage greater than 5 percent, and this was a minor roadway with very low ADT (less than 50). The 6.3 percent heavy truck traffic on this road represents 2 heavy trucks per day. None of the roadways studied are anticipated to experience more than 100 heavy trucks per day, and almost every roadway studied is expected to receive 25 or less heavy trucks per day (excl. Elk Ridge Drive and Goosenest Drive). Traffic count reports with detailed vehicle classification data analysis are included in Appendix 6.

Table 7 – Heavy Truck Percentages for Selected Roadways

Roadway	Average Daily Traffic	Heavy Truck Percentage	Average Number of Heavy Trucks per Day
Canyon View Drive	571	1.7	10
Elk Ridge Drive (near Gladstan Drive)	1180	1.3	15
Elk Ridge Drive (to Salem Canal Road)	5397	1.6	86
Gladstan Drive	426	0.6	3
Sunbrook Drive (Gladstan RV Entrance)	31	6.3	2
Goosenest Drive	1792	2.5	45
Hillside Drive	944	1.6	15
Loafer Canyon Road	986	2.5	25
Park Drive	1800	1.4	25
Rocky Mountain Way	396	1.9	8
Sky Hawk Drive	460	0.9	4

2.5 Level of Service

Traffic volumes and traffic flow of each roadway are used to determine a level of service (LOS) rating. LOS is a measurement of a road's ability to meet the traffic demand. LOS classifications are categorized with a letter rating "A," "B," "C," "D," "E," and "F." Free-flowing traffic is considered LOS "A," and maximum levels of vehicle congestion are considered LOS" F." A lower LOS rating (such as LOS "E" and LOS "F") indicates that the roadway is not functioning effectively and may cause mobility, congestion, and safety concerns. A LOS "A" through "D" is considered acceptable for most applications. LOS "F" and LOS "E" roadways should be given highest priority for improvement. Some common roadway LOS improvement methods include:

- Adding turn lanes at congested intersections,
- Adding signalization at congested intersections,
- Adding extra travel lanes,
- Adjusting existing roadway geometrics such as lane width and roadway design,
- Adjusting speed limits,
- Establishing alternative roadways to function as redundancies, and
- Improving mobility at accesses by either removing accesses or adding slip or merge lanes.

A visual representation of the LOS categories is included as Figure 3.

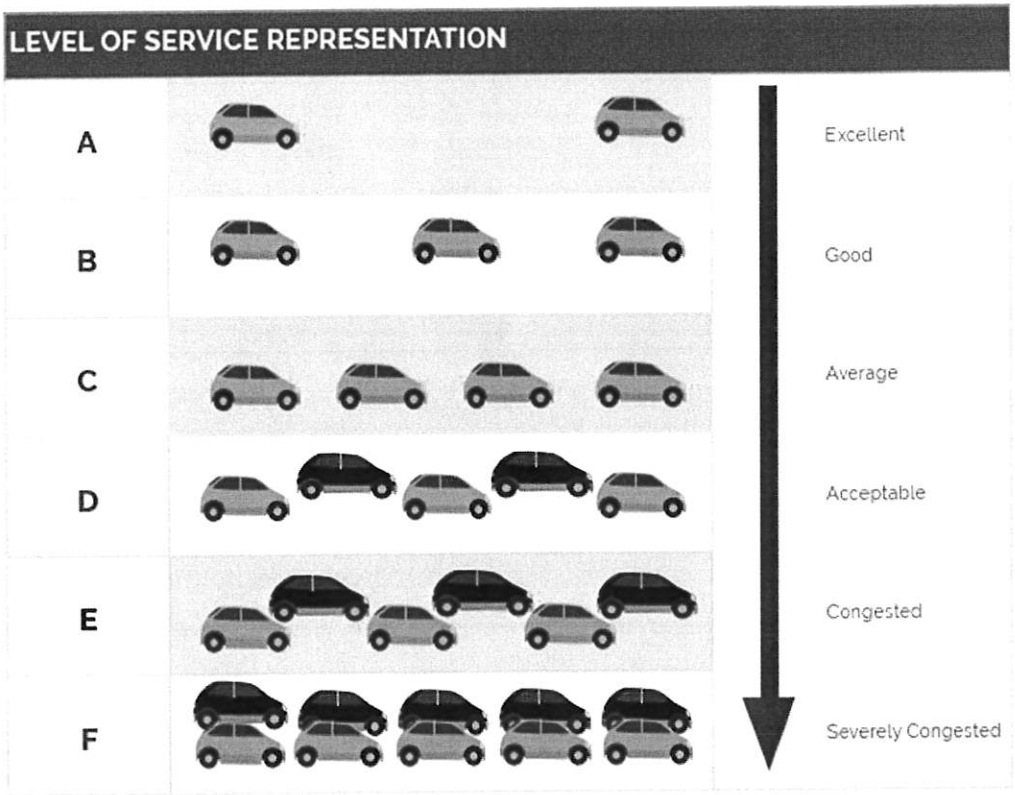

Figure 3 – Roadway Level of Service Representation

LOS is determined differently for highways and for intersections. Often on a rural road or freeway, the LOS will be determined based on highway travel patterns. On urban roads, which normally have more intersections and access points, intersection LOS will often be the controlling LOS factor. For rural and small urban roads, roadway level of service will often be the controlling LOS factor. There were no intersections analyzed as part of this study. The LOS analysis was performed using equations provided in the Institute of Transportation Engineers' *Highway Capacity Manual*. Highway and roadway LOS is measured in terms of volume to capacity (V/C) ratios, and intersection LOS is measured in terms of vehicle delay (in seconds/vehicle).

2.5.1 Volume to Capacity Ratios

The volume to capacity ratio (V/C) measures the traffic density of a road segment by comparing a road's traffic volume to the road's capacity. A V/C ratio of 1.0 signifies that the road is at its maximum capacity of traffic volume which leads to serious congestion and typically operates at a LOS "F." The closer a roadway V/C is to 1.0, the more congested the roadway will be. The capacity of a roadway is determined based on several factors including number of travel lanes, number of turn lanes, lane width, shoulder width, speed limit, road gradation, and percentage of heavy truck traffic.

2.5.2 Existing LOS Analysis

The existing LOS for the studied roadways is included in Table 8. All roadways studied currently function at an acceptable LOS. All roadways except Elk Ridge Drive (LOS "B") are a LOS "A," meaning that the roads are generally free-flowing.

For more information about future LOS analysis, see Section 3.2.2.

Table 8 – 2023 LOS for Selected Tooele County Roadways

Roadway	2023 Peak Hour Volume	2023 ADT	2023 LOS
Canyon View Drive	84	571	A
Elk Ridge Drive (near Gladstan Drive)	137	1180	A
Elk Ridge Drive (to Salem Canal Road)	515	5397	B
Gladstan Drive	83	426	A
Sunbrook Drive (Gladstan RV Entrance)	8	31	A
Goosenest Drive	206	1792	A
Hillside Drive	128	944	A
Loafer Canyon Road	131	986	A
Park Drive	307	1800	A
Rocky Mountain Way	55	396	A
Sky Hawk Drive	60	460	A

2.6 Traffic Crash Data

The Utah Department of Public Safety (UDPS) records all reported vehicular crashes throughout the state. Online records include all crash data since 2010. Crash data has been organized into Figure 4 and Table 9. This data includes all crash data from 2010 to 2022. A heat map of traffic crashes is included in Appendix 5, as well as a UDPS report including key crash statistics and data.

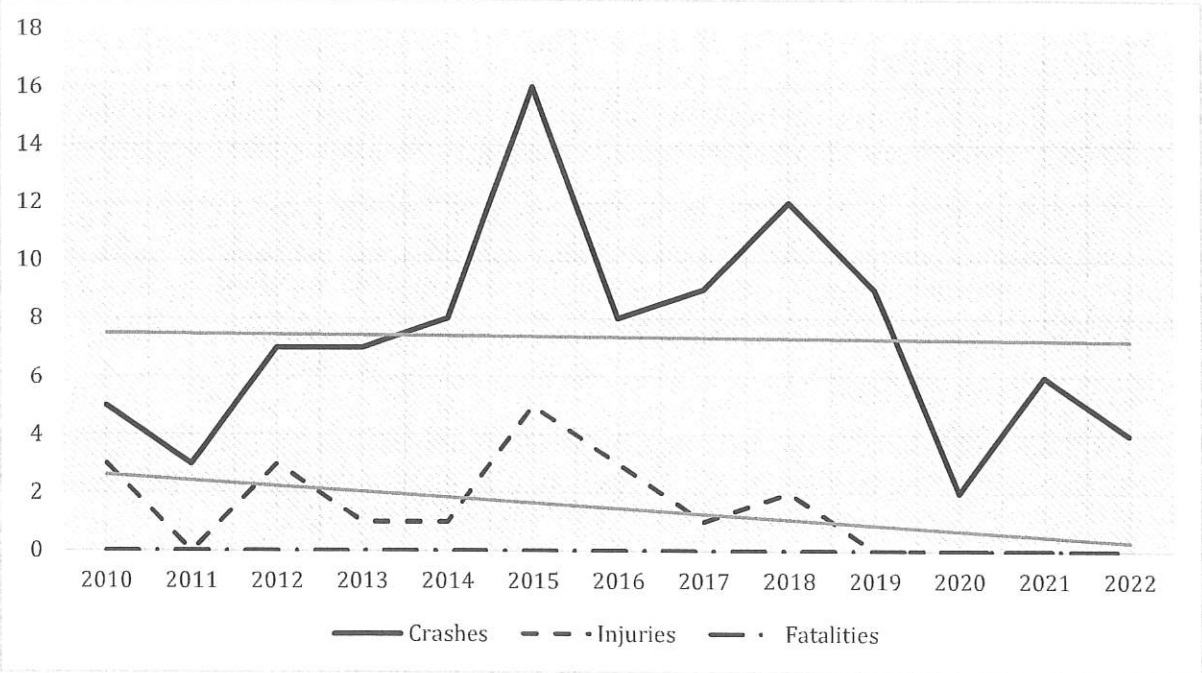

Figure 4 - Traffic Crash Data[7]

Table 9 – Traffic Crash Data[7]

Year	Total Crashes	Total Injuries	Total Fatalities
2010	5	3	0
2011	3	0	0
2012	7	3	0
2013	7	1	0
2014	8	1	0
2015	16	5	0
2016	8	3	0
2017	9	1	0
2018	12	2	0
2019	9	0	0
2020	2	0	0
2021	6	0	0
2022	4	0	0
Total	**96**	**19**	**0**
Average	**7.4**	**1.5**	**0**

Both traffic crashes and injuries currently have a decreasing trendline. Both attributes peaked in 2015 and have continued a downward trend since that time. There are no reported fatalities on Elk Ridge roadways since 2010. These trendlines can be seen in Figure 3.

2.7 Revenue Sources

Funding for the maintenance and construction of the existing transportation facilities comes primarily from revenue sources which include the Elk Ridge City general fund, federal funds, and State Class B and C funds. Funding for local transportation projects consists of a combination of federal, state and local revenues. However, this funding total is not entirely available for transportation improvement projects because annual operating and maintenance costs must be deducted from the total revenue. In addition, the City is limited in its ability to subsidize the transportation budget from general fund revenues.

2.7.1 Federal Funds

Federal funds are available to cities and counties through the federal aid program. These 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) can provide funding for any road functionally classified as a collector street or higher. STP funds may 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

[7] Utah Department of Public Safety's Highway Safety Office, *Utah Crash Summary*, Utah Department of Public Safety, Accessed July 14, 2022, https://udps.numetric.net/utah-crash-summary#/.

and enhancement projects. Transportation enhancements include ten categories, some of which are historic preservation, bicycle and pedestrian facilities, and water runoff mitigation.

Elk Ridge City is in UDOT's Region Three. Money for specific projects in the study area varies depending on what is planned for UDOT's Region Three each year. As a result, federal aid program money is not listed as part of the study area's transportation revenue.

2.7.2 State Class B and C Program

The distribution of Class B and C Program monies is established by state legislation and is administered by UDOT. Revenues for the program are derived from state fuel taxes, registration fees, driver license fees, inspection fees, and transportation permits. Seventy-five percent of funds derived from the taxes and fees are kept by the Utah Department of Transportation for 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 city 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. **Error! Reference source not found.** identifies the method used to allocate class B and C road funds.

Table 10 – 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 roadways; however, thirty percent must be used for construction or maintenance projects that exceed $40,000. Class B and C funds may also be used to match federal funds or to pay the principal, interest, premiums, and reserves for issued bonds. Table 11 identifies B & C funds allocated to Elk Ridge City for the fiscal years 2019 to 2023.

Table 11 - Class B & C Roadway Funds Allocated by Fiscal Year[8]

Year	1st Payment	2nd Payment	3rd Payment	4th Payment	5th Payment	6th Payment	TOTAL
2019	$23,722.07	$31,375.31	$30,297.86	$25,109.78	$29,174.23	$37,871.24	$177,550.50
2020	$22,512.21	$36,272.78	$30,475.58	$26,716.69	$32,777.73	$31,709.28	$180,464.28
2021	$27,324.68	$33,328.89	$30,195.76	$31,188.32	$34,952.55	$46,837.98	$203,828.19
2022	$27,082.14	$35,209.49	$36,299.59	$34,215.20	$35,306.79	$49,221.18	$217,334.38
2023	$27,196.07	$40,615.32	$36,737.97	$32,142.98	$41,479.51	$54,670.97	$232,842.82

[8] Utah Department of Transportation, "Local Government Program Assistance," Utah Department of Transportation, 2022, https://udot.utah.gov/connect/business/public-entities/local-government-program-assistance/.

2.7.3 Local Funds

Elk Ridge City, like most cities, may use general fund revenues in its transportation program. Other local funding sources, such as impact fees, may also be used.

2.7.4 Private Sources

Private interests often provide sources of funding for transportation improvements. Developers construct local streets within new subdivisions and commercial buildings. They often dedicate right-of-way and participate in the construction of collector or arterial streets adjacent to their developments as well. This may include paying partial or complete costs for a traffic signal, turn lane, or median, among other improvements. Due to the impacts of the development on the city, developers can also be considered as potential sources of funding for projects.

Elk Ridge City, if electing to do so, may require new commercial and residential developments to perform a Traffic Impact Study (TIS). This study is used to determine the necessity of additional roadway improvements and the impact of the development on the roadway network. Other new developments may be required to perform a TIS as well.

3 FUTURE GROWTH

3.1 Land Use and Transportation

Elk Ridge City recognizes the importance of continuing coordination between land use and transportation planning. The City's future functional classification map, adopted with this TMP has been established in part to ensure that the future roadway network has the capacity to meet the demand of development.

For additional information on future land use planning and requirements, see the City's municipal code and future planning documents accessible through the City's website.

3.2 Future Elk Ridge City Roadway System

Roadway projects are selected in part based on the analysis provided in this document. The recommended project list includes projects that were determined based on the following key factors:

- Improving roadways with geometric issues;
- Improving roadways with safety concerns;
- Improving roadways with additional capacity needs;
- Constructing new roadways needed to add redundancies and provide alternatives to the transportation network;
- Incorporating new and existing roadways into other local, regional, and state networks; and
- Expanding the City's active transportation network.

3.2.1 Elk Ridge Future Functional Classification Map

Included in Appendix 1 is the roadway future functional classification map. This map shows the proposed future roadway system in the City delineated by roadway functional classification. These figures are schematic in nature and do not represent actual road alignments or curves. The primary focus of the plan is on improving arterial, major collector and minor collector roadways. As such, little detail is shown for future residential local roadways. This has been done to allow flexibility as development occurs between the collectors.

The roadway future functional classification map has been designed as a guideline for Elk Ridge, not the region or the state. Because of this, there are arterial and collectors classified on this map that may never be classified on UDOT's functional classification network. Due to Elk Ridge City's unique location, it is not anticipated that regional collectors and arterials will traverse Elk Ridge anytime within the scope of this plan. As such, the collectors and arterials defined in Elk Ridge City's future functional classification map have been delineated for development occurring in Elk Ridge City specifically. Typical sections have been created as part of this TMP to specify pavement design for roadways identified on the map. Roadway typical sections are included in Appendix 4.

3.2.2 Future Level of Service Analysis

A future LOS analysis was performed on all roadways that were counted as part of this TMP. The LOS of each roadway for every five years within the twenty-year scope is included in Table 12. Traffic growth rates were based on a 3.0 percent annual growth rate.

Table 12 – Roadway Level of Service for Selected Roadways

Roadway	2023 ADT	2023 LOS	2028 LOS	2033 LOS	2038 LOS	2043 LOS
Canyon View Drive	571	A	A	A	A	A
Elk Ridge Drive (near Gladstan Drive)	1180	A	A	A	A	A
Elk Ridge Drive (to Salem Canal Road)	5397	B	C	C	C	**D**
Gladstan Drive	426	A	A	A	A	A
Sunbrook Drive (Gladstan RV Entrance)	31	A	A	A	A	A
Goosenest Drive	1792	A	A	A	A	B
Hillside Drive	944	A	A	A	A	A
Loafer Canyon Road	986	A	A	A	A	A
Park Drive	1800	A	B	B	B	B
Rocky Mountain Way	396	A	A	A	A	A
Sky Hawk Drive	460	A	A	A	A	A

3.2.2.1 Recommendations

Based on existing growth estimates, there are no roadways anticipated to function at a failing LOS (LOS "E" or LOS "F") within the twenty-year scope. There is only one roadway anticipated to function at LOS "D" within the twenty-year scope (Elk Ridge Drive north of Goosenest Drive), and it has been bolded. It is recommended that this roadway receive an additional in-depth study within five years of becoming LOS "D" to determine necessary alterations. LOS "D" does not indicate a failing roadway, but LOS E is considered unacceptable and should be avoided where possible. Roadways functioning at LOS "D" or lower may also be considered for intersection signalization, as discussed in the following section.

An existing ADT map and an existing and future LOS map are included in Appendix 2.

3.2.3 Traffic Signalization

As the City continues to develop and expand, it may become necessary to incorporate traffic signals at specified intersections. Current roadway use does not signify a need for any traffic signals. Based on current data for future level of service (LOS) analysis and traffic volumes, there are no intersections in Elk Ridge City that will require traffic signals by 2043. However, there are additional warrants that may necessitate a need for traffic signals. The Manual on Uniform Traffic Control Devices (MUTCD) identifies 9 warrants: Eight-Hour Vehicular Volume, Four-Hour Vehicular Volume, Peak Hour Volume, Pedestrian Volume, School Crossing, Coordinated Signal System, Crash Experience, Roadway Network, and Intersection Near a Grade Crossing. If any of these warrants are met at any time, it is recommended that the City require a Traffic Signal Needs study to be carried out. Traffic Signal Needs study requirements for developers may also be established by the City if it is deemed necessary.

3.2.3.1 Traffic Signal Needs Studies

The following are recommendations for requirements regarding traffic signal needs studies.

A traffic signal needs study should be conducted for all new proposed signals for the base year. If

warrants are not met for the base year, they should be evaluated for each year in the five-year horizon. Studying traffic signal needs should be conducted by a method pre-approved by the City 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.

3.2.4 Active Transportation

Elk Ridge City seeks to coordinate with the County and UDOT in creating an active transportation network that provides residents and visitors with the ability to safely enjoy the area. Section 3.3 discusses several capital projects focused on expanding the existing active transportation (trails) network. These projects are locally, regionally, and state funded. Included in Appendix 1 is a proposed trails network map for the City.

3.3 Transportation Improvement Plans

This section includes transportation improvement plans for UDOT, Utah County, and Elk Ridge City. Each plan includes scheduled or planned projects with estimated costs and timelines.

3.3.1 UDOT's Statewide Transportation Improvement Program

UDOT's Statewide Transportation Improvement Program (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, city, and county highway systems as well as projects in the national parks, national forests, and tribal lands. These projects use various federal and state funding programs. UDOT has programmed funds in the Statewide Transportation Improvement Plan (STIP) for the following roadways within or adjacent to Elk Ridge City. These projects are listed in Table 13.

Table 13 – STIP Projects Within or Adjacent to Elk Ridge[9]

Project Name	Estimated Start Year	Estimated Project Value	Project Primary Concept	Project Start Location	Project End Location
SR-198 and Elk Ridge Drive	2022	$375,000	New Traffic Signal	SR-198 and Elk Ridge Drive	SR-198 and Elk Ridge Drive
Salem Canal Trail	2023	$10,581,600	Bike Path	Woodland Hills Drive	Elk Ridge Drive

3.3.2 MAG's Utah County Transportation Improvement Plan

The Mountainland Association of Governments (MAG) is a planning organization that specializes in community and transportation development planning for Utah, Summit, and Wasatch counties. They have established a regional transportation master plan for Utah County through 2050. This plan, "2023 Transplan 50," can be found on MAG's website.[10] Projects near connecting to Elk Ridge are included in Table 14.

Table 14 – MAG Projects Within or Adjacent to Elk Ridge[11]

Project Name	Project Cost (2023)	Phased Cost	Project Primary Concept	Project Start Location	Project End Location
Elk Ridge Drive – New Construction and Road Widening	$32,500,000	$68,300,000	Widen Elk Ridge Drive to 5 Lanes from 11200 South to SR-198, New Construction from SR-198 to 6400 South	11200 South	6400 South
11200 South – Road Widening	$16,200,000	$38,300,000	Widen Elk Ridge Drive to 5 Lanes	Elk Ridge Drive	Woodland Hills Drive
Nebo Belt Road – New Construction	$23,400,000	N/A	New 3-Lane Corridor Connecting Elk Ridge Drive to SR-198	SR-198	Elk Ridge Drive

[9] Utah Department of Transportation, "STIP Workshop Application," Accessed December 21, 2023, https://www.udot.utah.gov/stip/.

[10] Mountainland Association of Governments, "2023 Transplan50," 2023, https://mountainland.org/rtp/.

[11] Mountainland Association of Governments, "2023 Regional Transportation Plan Map," 2023, https://experience.arcgis.com/experience/2572562782c0469490fc727327eb56a0/?data_id=dataSource_5-1889baee446-layer-24-18a43a6e91f-layer-37%3A69.

3.3.3 *Elk Ridge Short-Range Transportation Improvement Plan*

A short-range transportation improvement plan (SRTIP) encompasses improvements to be completed within the next 10 years. City personnel will work with UDOT and other relevant agencies to ensure compatibility between transportation networks. The SRTIP is to be updated periodically to reflect the City's transportation goals. To utilize the SR TIP effectively, the City should:

- Update master plan every 5 years.
- Continue a routine chip seal maintenance program for old, asphalted roads to ensure longevity of pavements.
- Work with each of the cities in the County to monitor their transportation plans and update this plan as needed in accordance with the attached maps.
- Construct as many suggested roadway improvements as possible.

Projected costs and completion dates are provided for some projects. Appendix 3 contains all of the full cost estimates created for this TMP. The following table (Table 15) of projects are included in the short-range TIP with cost estimates.

Table 15 - Short-range Transportation Improvement Plan

Project Name	Estimated Start Year	Estimated Project Value	Project Primary Concept	Project Start Location	Project End Location
Elk Ridge Drive – Widening	2024	$366,000	Extend 3 Lane Segment of Elk Ridge Drive with Curb and Gutter and Bike/ Pedestrian Trail on the East Side	Sky Hawk Way	11200 South
Elk Ridge Drive – Widening	2024	$732,000	Widen Shoulders on Loafer Canyon Road with Sidewalk, Curb and Gutter, and Bike/Pedestrian Trail	Canyon View Drive	11200 South

3.3.4 *Elk Ridge Long-Range Transportation Improvement Plan*

A long-range transportation improvement plan (LRTIP) consists of transportation projects that are to be completed within 10 to 30 years. The City does not currently have any projects included in LRTIP. This section is included as a placeholder. As the TMP is updated and long-range projects are designated, they can be included here.

3.4 Other Future Actions

Along with the long- and short-term action items, the following actions should also be considered.

3.4.1 Land Use Planning Integration

Elk Ridge City does not currently have centralized commercial development, and residents must travel to other cities for shopping and other commercial needs. This places a higher burden on the regional road network and requires residents to increase vehicular travel. If desired by the City, additional internal commercial development could be encouraged through zoning changes. This may be undesirable to the City or its citizens, however, and in such cases, public input should be considered.

3.4.2 Updates to Transportation Master Plan

The transportation master plan adopted by Elk Ridge City should be updated at least every five years. It should be reviewed more frequently. Transportation improvement plans (TIP) should be updated at least every five years to ensure that all City transportation projects to be completed within any five year period are included on the TIP. This is done to ensure that the City is always aware of future expenditures and construction and maintenance needs.

3.4.3 Updates to Development and Planning Standards

As mentioned in Section 3.2.3, Elk Ridge City may require developers to study traffic impacts and/or pay for the cost of traffic improvements simultaneous or prior to the construction of developments. The City should look into establishing traffic impact study standards, traffic signal needs standards, access management standards, and impact fee requirements. These standards help to ensure that future development occurs in a consistent manner that is most beneficial to the needs of the City. This also helps to ensure that City funds are spent cost-effectively.

4 CLOSURE

The purpose of the transportation master planning effort is to create a general guideline for transportation-related growth and development and increase the quality of life for residents and visitors of Elk Ridge City. The transportation master plan is to act as a guide for future decisions in all City departments. The plan addresses the key components of a master plan by outlining projects that meet the goals of the City. These projects are economically viable, provide safer mobility for residents, focus on improving quality of life, and improve integration between local and regional transportation networks.

This plan identified the purposes of transportation planning and network maintenance through establishing quality of life principles (see Section 1). This plan also inventoried the existing conditions of the City's transportation system, including roadway functional classification data, pavement characteristics of roadways, roadway average daily traffic and level of service data, speeds and vehicle classification percentages of selected roadways, historical funding allocation, and vehicle crash information (see Section 2). Based on this data, this plan provided an analysis of growth and plan for development within the City. This plan included future functional classification, future level of service analysis, and future roadway capital project plans (see Section 3).

For more information regarding the transportation network or the transportation requirements, see the City's website. City officials are available to answer questions as needed.