LAKE POINT

Transportation Master Plan

DRAFT: May 2025

Lake Point
Est. 1854

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ACKNOWLEDGEMENTS

Lake Point City

Jamie Olson, City Recorder

Chaelea Allred, Commission Secretary

Lake Point City Council

Ryan Zumwalt, *Chair*

Kirk Pearson, *City Council*

Jonathan Garrard, *City Council*

Kathleen VonHatten, *City Council*

Alexis Wheeler, *City Council*

Lake Point Planning Commission

Bryan Coulter, *Chairman*

Lillian Erickson, *Commissioner*

Marylinn Sharp, *Commissioner*

James Simko, *Commissioner*

Gino Garcia, *Commissioner*

Rickey Lloyd, *Commissioner*

Lori Chigbrow, *Commissioner*

Consultant Team – Hales Engineering

Josh Gibbons, PE, PTOE, RSP1

Joseph Browning, PE, PTOE

Cory Ward, EIT

Ryan Hales, PE, PTOE, AICP

Consultant Team – Ensign Engineering

Brady Morris, PE

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INTRODUCTION

OVERVIEW

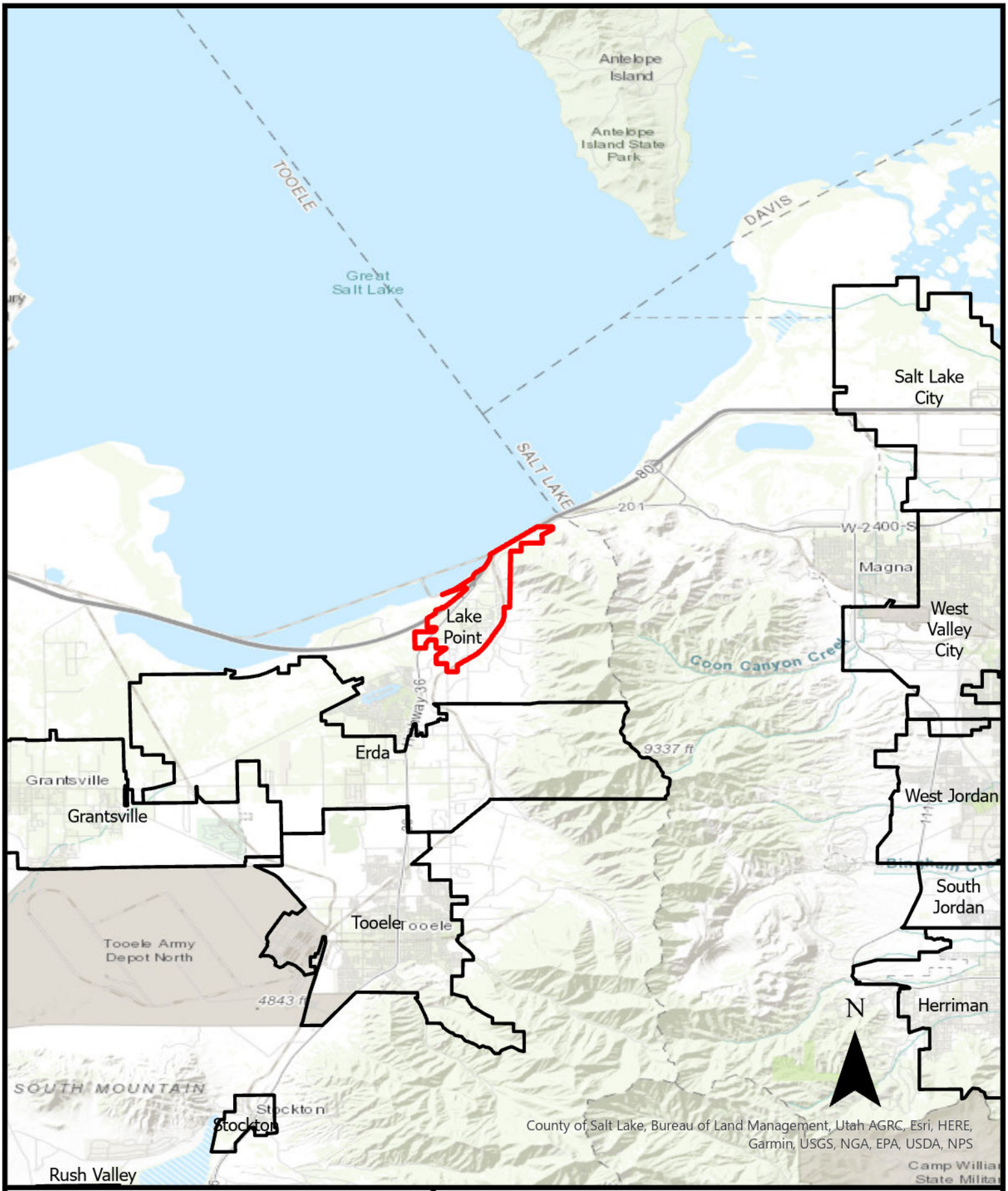
With history back to the 1854, Lake Point has been an important location on the shores of the Great Salt Lake and a connection between Tooele and Salt Lake Counties. The population increased to approximately 2,600 residents in 2021 and continues to grow. With this growth comes many challenges and opportunities to provide safe and efficient transportation for the citizens of Lake Point.

Lake Point continues to see residential growth with the development of more neighborhoods in the area. With a high number of residents traveling in and out of the city to commute to work during peak hours, there are existing challenges with transportation in the city. The purpose of this Transportation Master Plan (TMP) is to plan for the multi-modal transportation needs of Lake Point, accounting for the projected future growth.

Lake Point is in Tooele County, Utah, about 10 miles north of Tooele and 25 miles west of downtown Salt Lake City – bordered by Stansbury Park to the south, the Great Salt Lake to the North, and the Oquirrh Mountains to the east, as shown in Figure 1.

While numerous traffic studies have been done in or around the Lake Point, this will be the first edition of the transportation master plan. The Lake Point TMP is being written with the most current land use plans. Because growth can be unpredictable, it will be necessary to update this TMP periodically.

Key to planning for Lake Point's transportation needs is an understanding of the City's goals and policies related to transportation. The General Plan includes future land use and development plans and goals in the city and how those will be achieved. This TMP provides details regarding the community's transportation needs, including future demand and improvements, to meet the goals outlined by the City. The TMP expands the vision for the General Plan into actionable mobility-related goals and objectives to guide Lake Point's near- and long-term transportation investments.



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Lake Point Vicinity Map

Lake Point - Transportation Master Plan | *Figure 1*

DEMOGRAPHICS

This section discusses the demographics of Lake Point and provides helpful information about how people live, work, and play. These characteristics have a direct impact on the transportation needs of the city. The existing demographics data come primarily from U.S. Census data, including the American Community Survey results.

POPULATION

The population in Lake Point City, according to the U.S. Census 2023 estimate, was 2,938. The median age of the population is approximately 29 years, and approximately 35 percent of the population is 18 years or younger.

Population (2023):
2,938

HOUSEHOLDS

Similar growth has occurred for the number of households in Lake Point. According to the U.S. Census, the estimate for households is approximately 871 in 2023. It is estimated that there are approximately 3.37 persons per household.

Approximately 99 percent of homes are single-family detached units and 1 percent are duplexes. Related to transportation demand, approximately 98 percent of workers have at least one vehicle available for use in their household, and approximately 73 percent of workers have at least three vehicles within their household.

Households (2023):
871

EMPLOYMENT & JOURNEY TO WORK

As of 2023, nearly 1,700 Lake Point residents were employed, and the median household income was $133,175. Unlike population, the employment opportunities within the city have not seen significant growth until the last few years. Data were collected from the U.S. Census American Community Survey results for Lake Point to determine the mode split in the city. The recent mode split in the city based on survey results from 2022 is shown in Figure 2.

As shown, just under 60 percent of workers drive alone in a personal vehicle to work. Approximately 12 percent carpool and 2.5 percent ride transit. The average commute time to work for Lake Point City residents is 30.8 minutes.

Avg. Commute:
31 min.

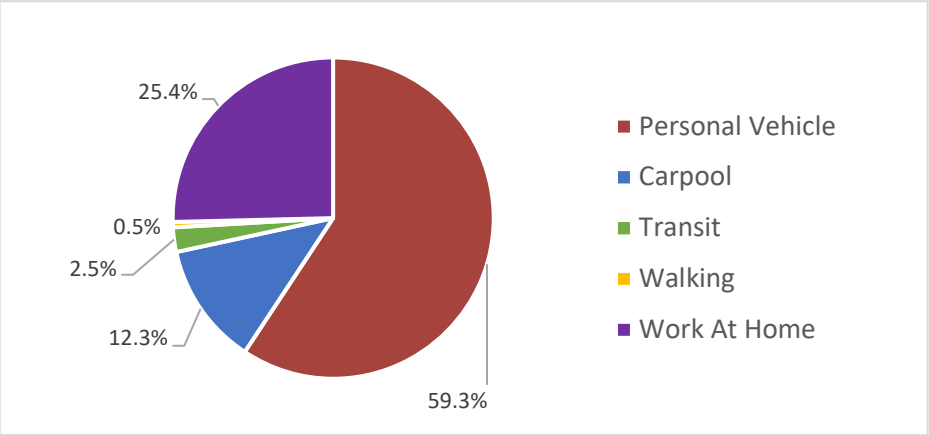


Figure 2: Lake Point mode split

LAND USE

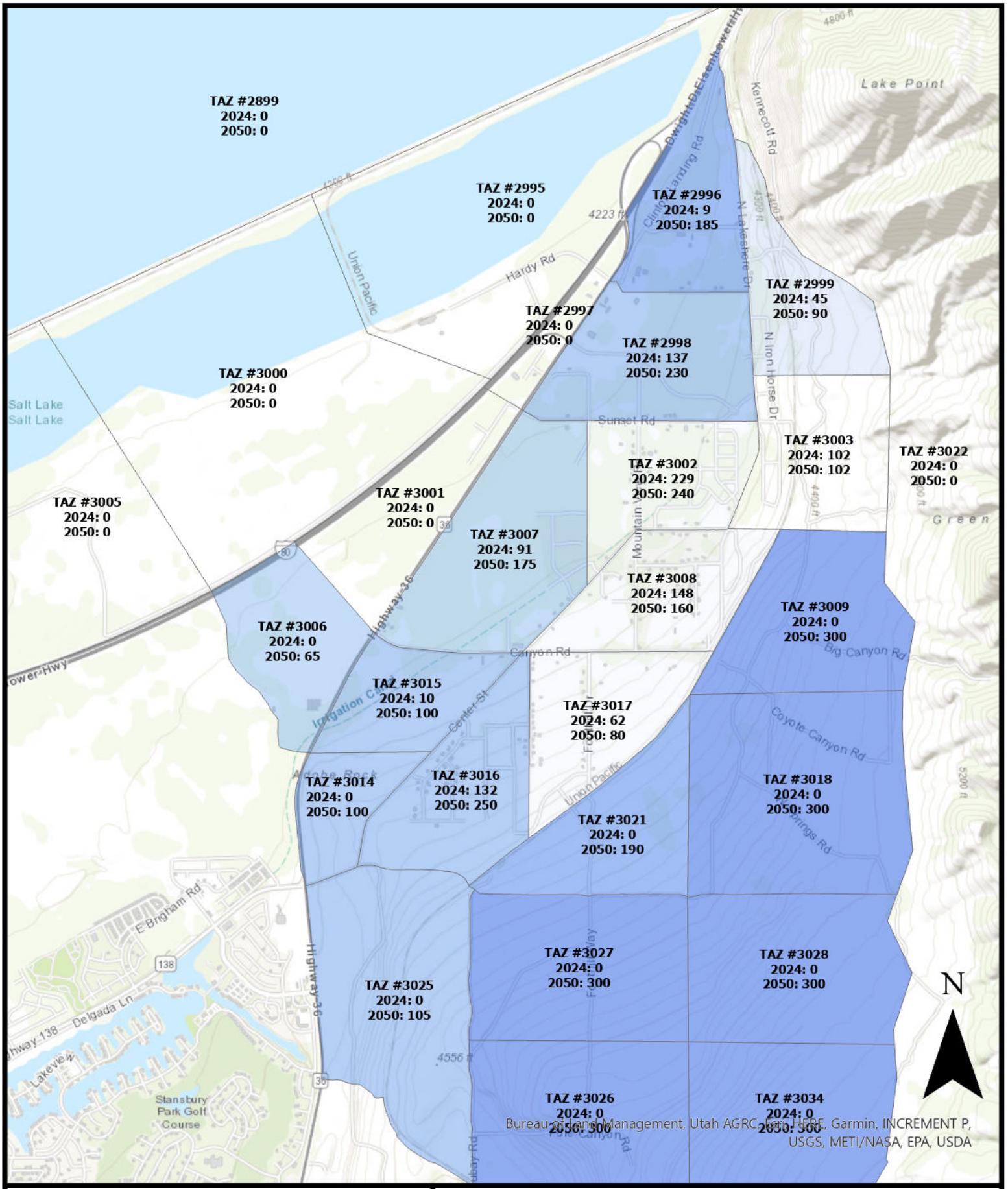
This section discusses existing and future land use in Lake Point City. Land use is a good predictor of transportation trends and demand. Therefore, it is important to identify land use when planning for transportation needs. There are several parcels within the city limits that are anticipated to experience development in the near future. Other areas that already have some developed land will experience in-fill development projects that will increase the density of land uses.

Much of Lake Point City currently consists of residential uses with approximately 965 current households in the city. Some commercial developments are primarily located along the SR-36 corridor. In preparation to complete this TMP, Lake Point City staff summarized the projects and land uses that are expected to develop by 2050 to help determine future transportation demand in Lake Point.

The baseline (2024) and future job and employment numbers by year are summarized in Table 1. The population data is based on a household size of 3.37 persons per household. This data was used in the Utah Statewide Travel Model (USTM) to estimate future traffic volume demand. The USTM breaks up each area of the city in a traffic analysis zone (TAZ), where land use is assigned. Adjustments were made to the model based on input from the City. Detailed TAZ data is proved in the Appendix. Graphical representations of the household and population growth are provided in Figure 3 and Figure 4.

Table 1: Lake Point TAZ summary

Year	Population	Households	Jobs
2024	3,252	965	741
2050	5,254	1,559	4,126
Note: Some TAZs contain area outside Lake Point City boundaries			



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Lake Point Household Growth

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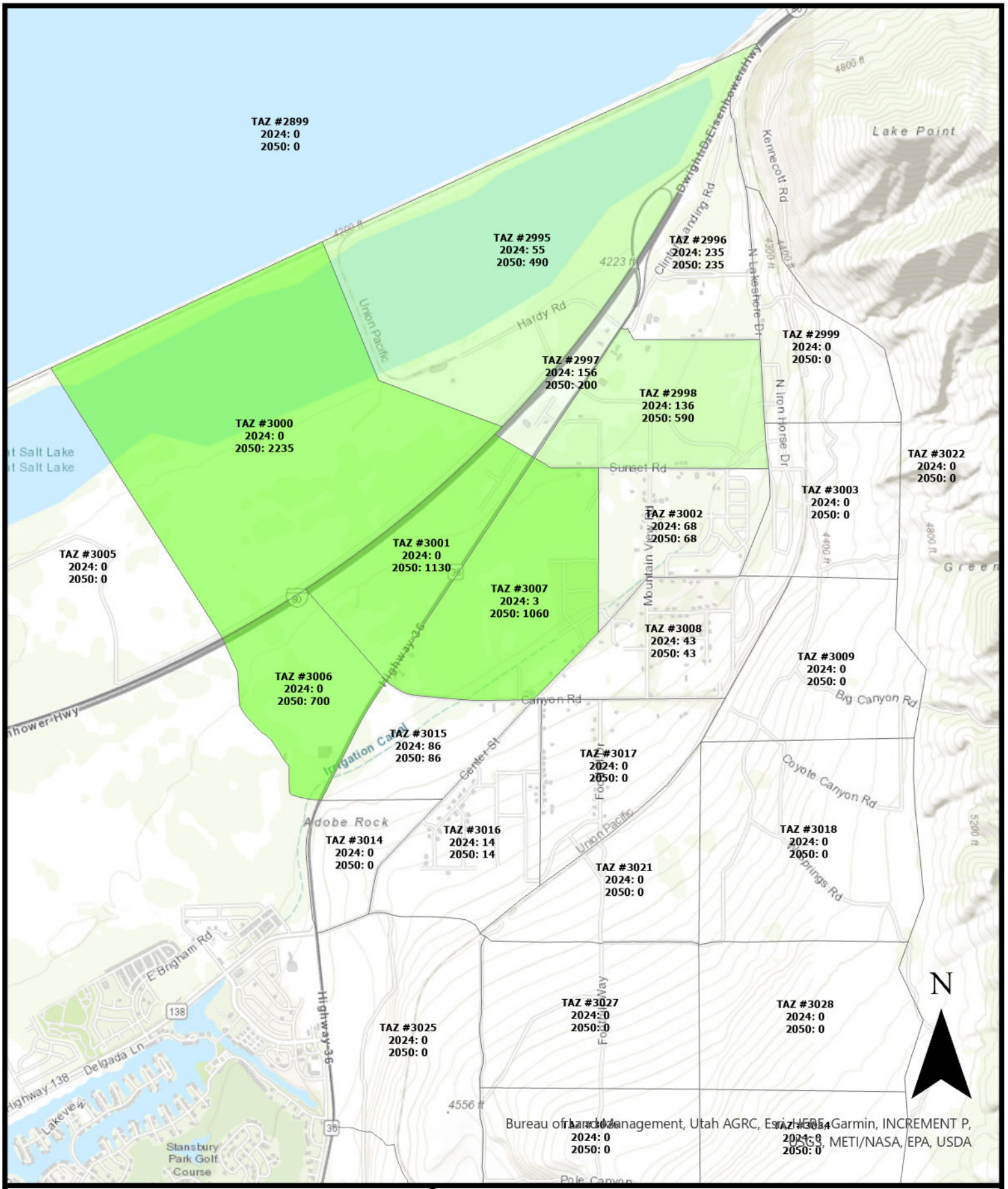
Figure 3



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Lake Point Employment Growth

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Figure 4

TRAVEL DEMAND FORECASTING

Hales Engineering obtained the USTM (version 3.0) to predict future travel volumes in Lake Point. Based on the socioeconomic data within that model, various adjustments were made to be in line with the data and assumptions provided by Lake Point City staff. The future LU assumptions, as summarized above in Table 1, were applied to the Lake Point City Travel Demand Model to estimate future roadway volumes throughout the city for the future year 2050.

Based on the results of the no-build future (2050) volume projections, Hales Engineering determined deficiencies in roadway capacity under no-build conditions, which were then used as a factor in determining future roadway projects. The future travel demand models were then adjusted accordingly based on these projects to obtain future (2050) build conditions. The underlying assumptions, future projects, and results of these analyses are summarized later in this document.

PUBLIC ENGAGEMENT

Local stakeholder involvement and engagement in any TMP is critical to understanding current conditions of the transportation network and to identifying needs for future improvement. The involvement and engagement included a community survey and multiple meetings with the Lake Point City Council to involve key stakeholders throughout the process. The following sections are summaries of these efforts.

ONLINE COMMUNITY SURVEY

Lake Point City posted a survey on Facebook that was open for responses in September and October 2024. The information about the survey was also posted physically at the Lake Point Fire Station. The survey closed on October 18, 2024, and gathered information from 135 survey participants. The location of the comments made in the community survey are show in Figure 5.

The following TMP-related questions were asked in the survey:

1. Which of the following best describes you?
    a. Live, Work, Shop, Recreate, and/or Own Property in Lake Point
2. How important are the following transportation modes to your personal travel in Lake Point?
    a. Personal Vehicles, Transit, Bicycle, Walking, Equestrian, OHV
        i. Five options ranging from “Not Important” to “Very Important”
3. How would you rate your experience with the following modes of transportation?
    a. Personal Vehicles, Transit, Bicycle, Walking, Equestrian, OHV
        i. Five options ranging from “Poor” to “Excellent”
4. How would you rate your current travel time in the morning peak hour through Lake Point on an average day?
    a. Three options ranging from “Congested and Slow,” “As Expected,” “Faster than Expected”
5. How would you rate your current travel time in the morning peak hour
    a. Three options ranging from “Congested and Slow,” “As Expected,” “Faster than Expected”

6. How long is your commute to work? (optional)
    a. Slider with 15-minute increments
7. How many days a week do you commute to work?
    a. Free response in days
8. How often do you currently ride transit (including on-demand)?
    a. "3+ days per week," "1-2 days per week," "Rarely or never"
9. Any other ideas/observations for the Master Transportation Plan do you feel need further addressing?
    a. Free response
10. How would you improve the roads in Lake Point
    a. Free Response

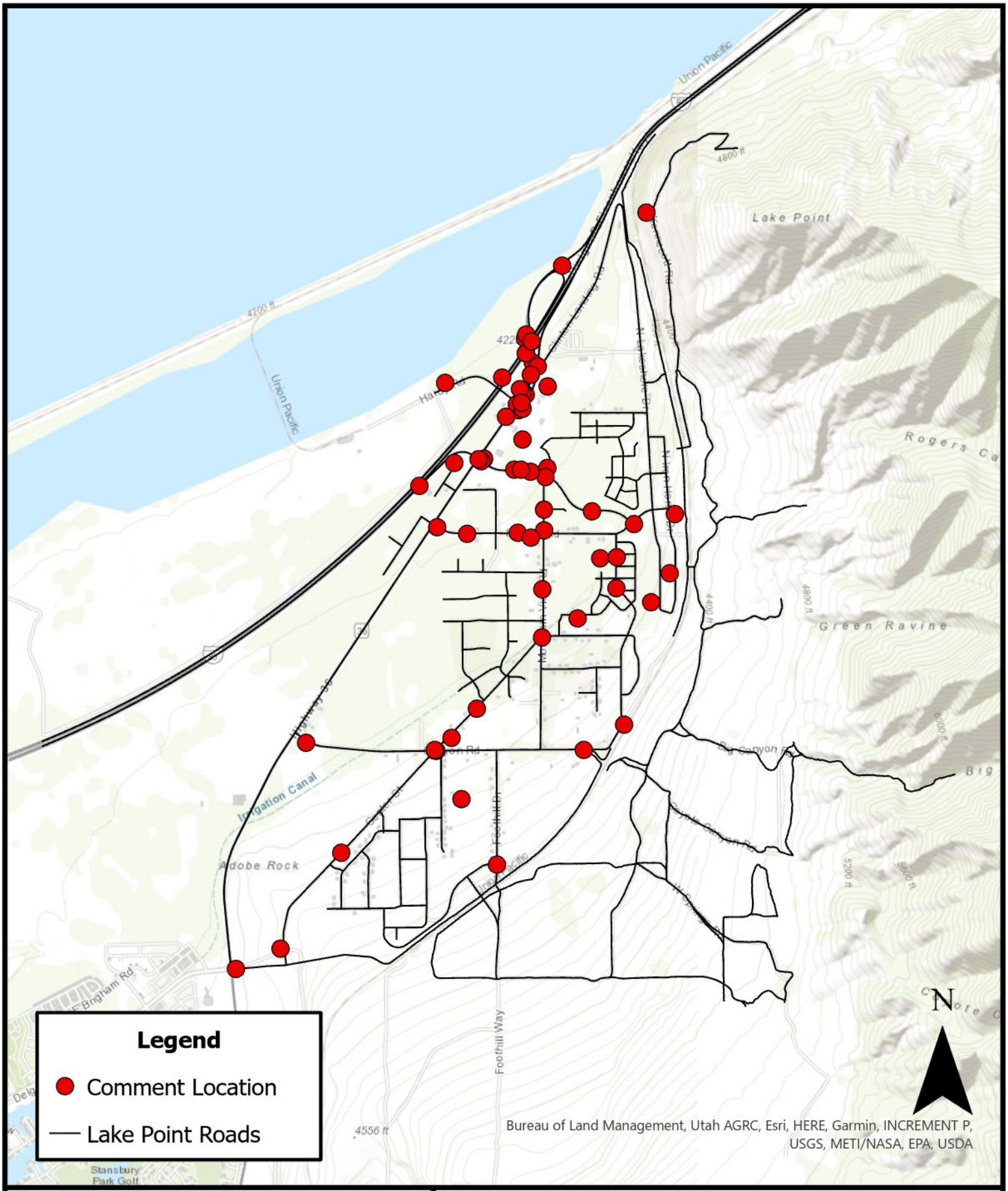
    How would you improve the transit system in Lake Point? If more bus service were provided to and from Lake Point, would you ride transit more
    b. Free Response

    How would you improve the sidewalk and trail/equestrian network in Lake Point?
    c. Free Response
11. Would you be in favor of a transit park-and-ride in Lake Point?
    a. "Yes," "No," "Maybe"
12. From your experience, what is a location with heavy congestion or a safety issue?
    a. (select on map)
13. Do you feel that infrastructure funding should prioritize roads, or sidewalks and trails?
    a. Slider with sidewalk and trails on one side and roads on the other
14. Alternative routes to enter and exit the county are currently being proposed. Would you be in favor a new road to the west of SR-36? Would you be in favor of a new road east of the railroad tracks?
    a. Free Response

General satisfaction for the roadway network was expressed by the survey respondents. 55% of respondents said their experience is good or excellent. The average work commute of respondents matched the 31 minutes from the American Community Survey and 30% of respondents commute 45 minutes or longer. Common topics of response include congestion and safety issues at and near SR-36.

Other key insights of the survey results include a strong preference for an investment in prioritizing both personal vehicle travel and active transportation options. Walking, cycling, and horse-riding are important priorities for respondents and sidewalks and trails are important to most respondents. A majority of respondents favor a park and ride location to improve access to the existing transit service, which is only used by less than 5% of respondents, but deemed important by many more.

A copy of the summarized responses from the online survey is provided in Appendix C.



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Community Survey Locations

Lake Point - Transportation Master Plan

Figure 5

Steering Committee and City Council Meetings

To aid the direction of the plan, Hales Engineering and the City organized a steering committee composed of City staff, elected officials, planning commissioners, and UDOT staff. Meetings were held with this group regularly throughout the process. Some additional meetings were held with the entire City council to gain additional input from the other elected officials.

The following individuals were committee members that were part of the steering committee for this transportation master plan:

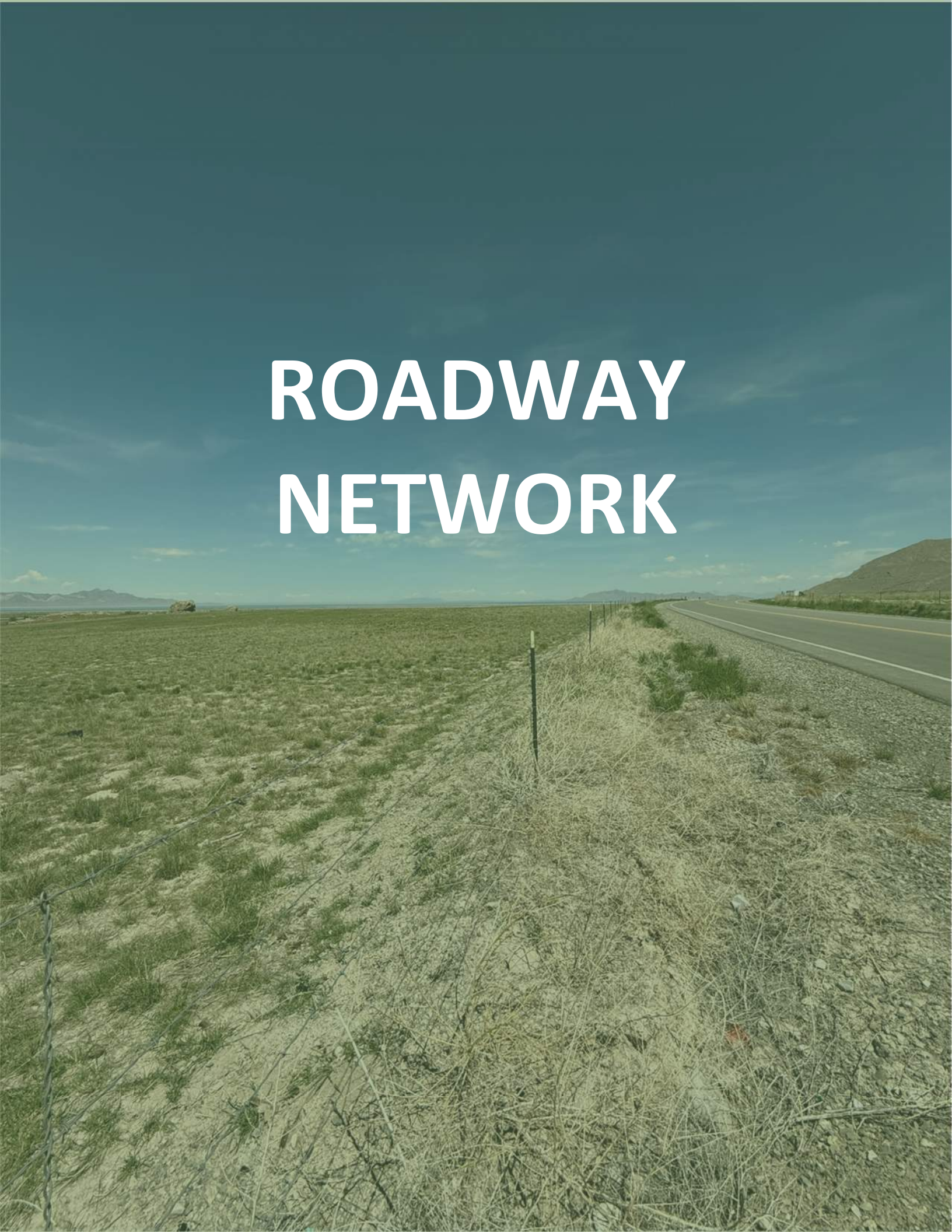
- Ryan Zumwalt, *City Council Chair*
- Kirk Pearson, *City Council*
- Jonathan Garrard, *City Council*
- Kathleen VonHatten, *City Council*
- Bryan Coulter, *Planning Commission Chairman*
- Lori Chigbrow, *Commissioner*
- Jamie Olson, *City Recorder*
- Chaelea Allred, *Commission Secretary*
- Geoff Dupaix, *UDOT Planning Manager*

The following meetings were held between the Hales Engineering Consultant Team and the Steering Committee or Lake Point City Council:

- July 1, 2024 – Kickoff Meeting
- August 5, 2024 – Steering Committee Coordination
- September 9, 2024 – Steering Committee Coordination
- October 7, 2024 - Steering Committee Coordination
- November 6, 2024 – City Council / Planning Commission Meeting
- December 16, 2024 – Steering Committee Coordination
- January 22, 2025 – City Council Meeting
- February 12, 2025 – City Council meeting
- April 14, 2025 - Steering Committee Coordination
- May 14, 2025 – City Council Meeting
- May 19, 2025 – Steering Committee Coordination
- May 28, 2025 – City Council Work Session

ArcGIS StoryMap

Hales Engineering also created an interactive ArcGIS StoryMap online to report on existing conditions for the survey phase of the project and to provide mapping along with the draft master plan document. This StoryMap includes interactive maps of exhibits shown in this document to make it easier to learn about the plan process and deliverables.



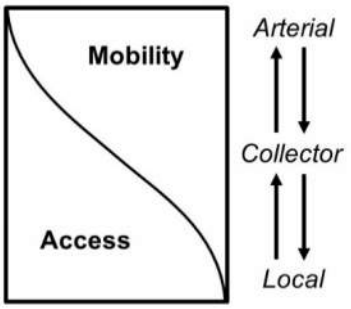
ROADWAY NETWORK

PURPOSE

The purpose of this chapter is to discuss the characteristics and needs of the existing and future roadway network. Recommendations for future improvements are discussed as well, based on the future projections. The analysis methodologies and models that were used are also discussed.

FUNCTIONAL CLASSIFICATION

Roads are categorized into a hierarchal system and given a functional classification based on right-of-way (ROW) width. The higher a street classification, the more mobility it provides with limited access. Lower street classifications have less mobility, but more access. The three classifications defined in the Lake Point City code are arterials, collectors, and local streets.



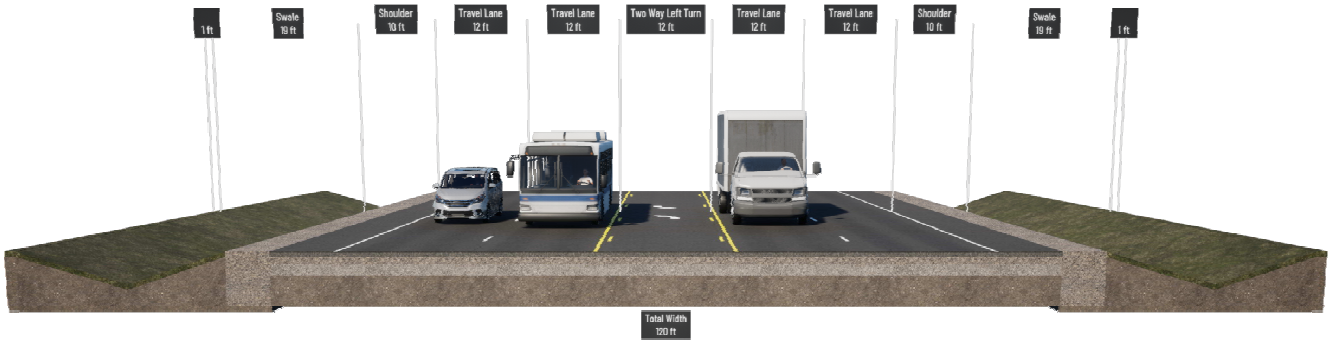
The following are the three typical street classifications for Lake Point City roadways:

- Arterial – Arterials are designed to have greater mobility and connect traffic between population centers and regional attractions. Because of their increased mobility, arterials typically have higher speeds and a high degree of access control, with the exception of some historical sections. Major arterials have a ROW of 120 or more feet while minor arterials have a ROW of 90 feet to 120 feet.
- Collector – Collector roads are designed to connect with and augment the arterial system and provide access control. Generally, these streets are intended to carry traffic for shorter distances than arterials and have lower speeds. Collectors have a ROW of 90 feet. A commercial collector road is also designed for greater mobility than local streets as they are generally wider and as a result have less side friction with on-street parking. Commercial collectors also have a ROW of 90 feet and have a curb and gutter with a sidewalk.
- Local Street – Local streets are designed for accessibility and have less mobility than any other functional classification. The primary purpose of these is to provide access to surrounding properties and carry low-speed traffic. Some local streets may be designed to discourage through-traffic in neighborhoods. Local streets have a ROW of 60 feet. A local neighborhood street has the same ROW and has a curb and gutter with a sidewalk.

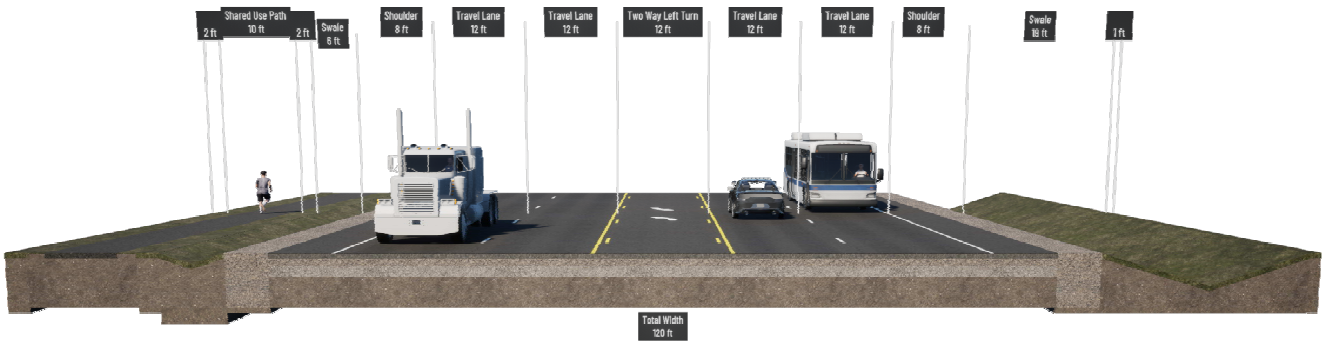
A summary of the Lake Point roadway classifications is shown in Table 2. Arterials and collectors are separated into two categories to fit the setting and vehicle flow capacity. Typical cross-sections were designed for each of the Lake Point street classifications primarily based on the existing City cross-section standards and standard engineering practice. These are shown in Figure 6, Figure 7, and Figure 8. These cross-sections do not necessarily match existing roadway cross-sections but are recommended cross-sections for new and improved roadways in the future. An addition of a multi-use trail may also be included in these concepts and may require additional ROW and/or pavement. The colors shown in Table 2 correspond to colors shown in both the cross-section figures and the roadway network figures shown later in the document.

Major Arterial Roads

Major Arterial Road
120' ROW



Major Arterial Road with Trail
120' ROW



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Major Arterial Roads

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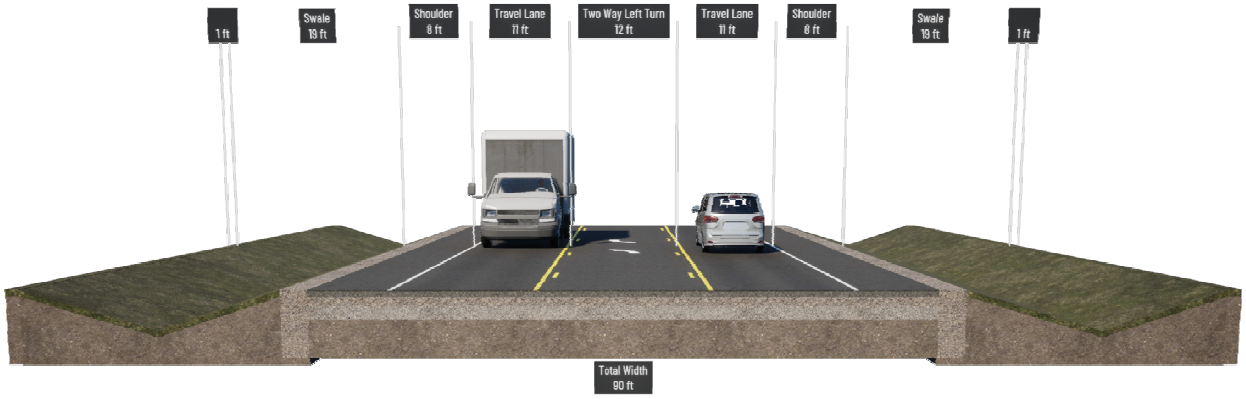
PROJECT UT24-2791

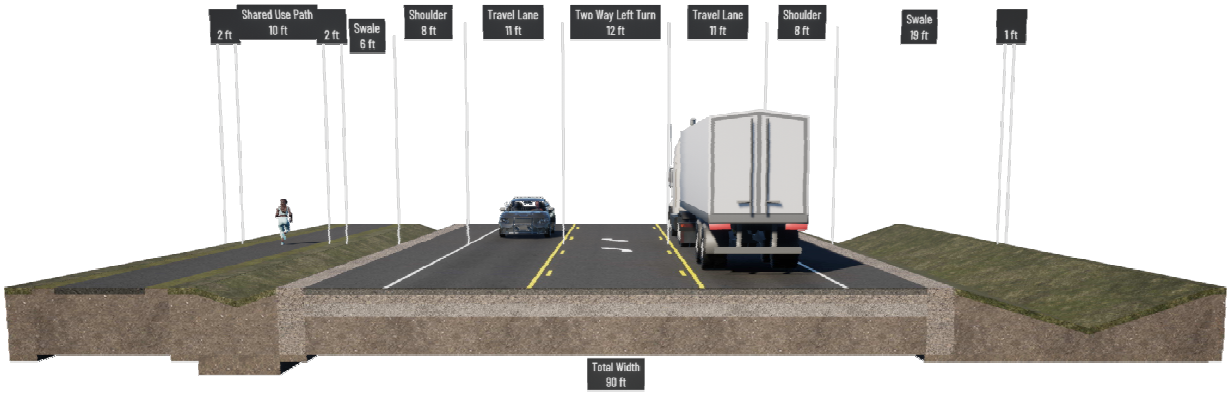
Figure #6a

Minor Arterial Roads (3 Lanes)

Minor Arterial Road (3 Lanes)
90' ROW



Minor Arterial Road (3 Lanes) with Trail
90' ROW



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Minor Arterial Roads (3 Lanes)

Lake Point Transportation Master Plan

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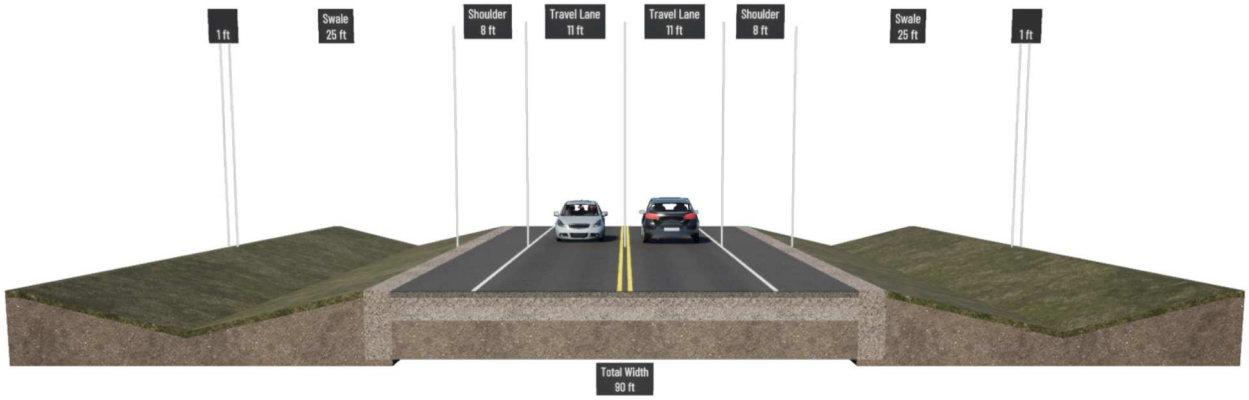
PROJECT UT24-2791

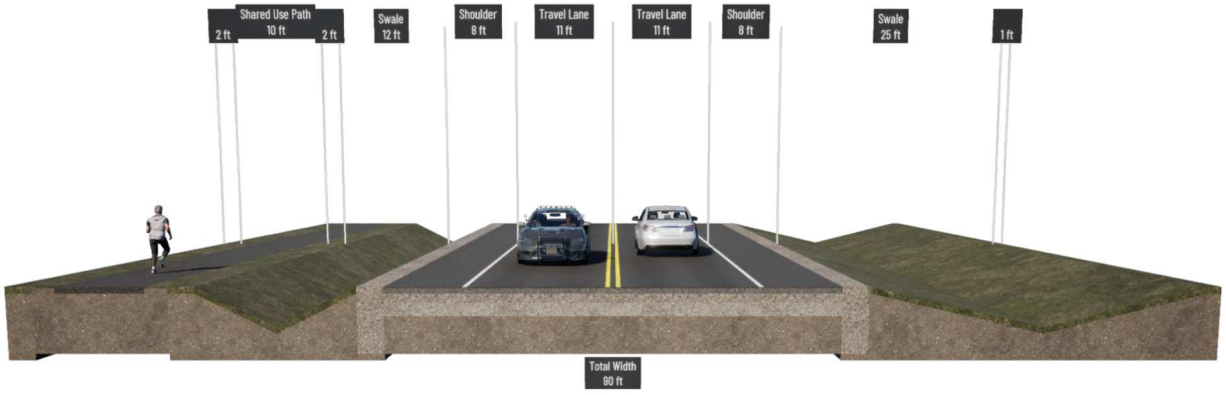
Figure #6b

Minor Arterial Roads (2 Lanes)

Minor Arterial Road (2 Lanes)
90' ROW

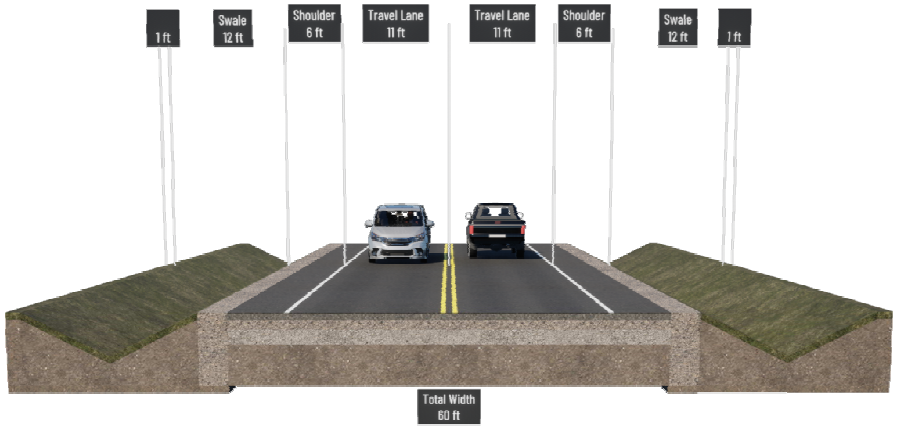


Minor Arterial Road (2 Lanes) with Trail
90' ROW

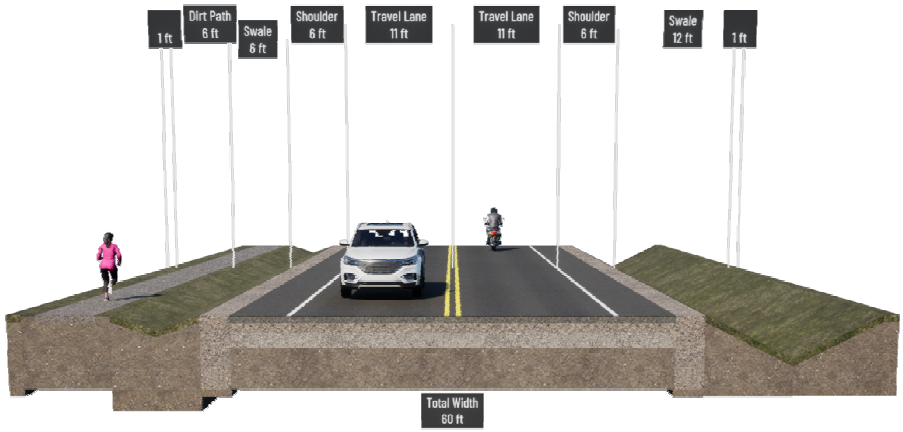


Collector Roads

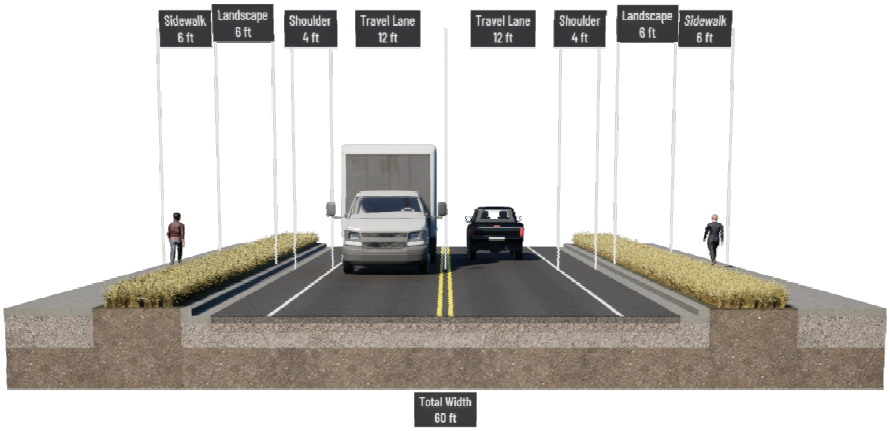
Collector Road
60' ROW



Collector Road with Trail
60' ROW



Commercial Collector Road
60' ROW



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Collector Roads

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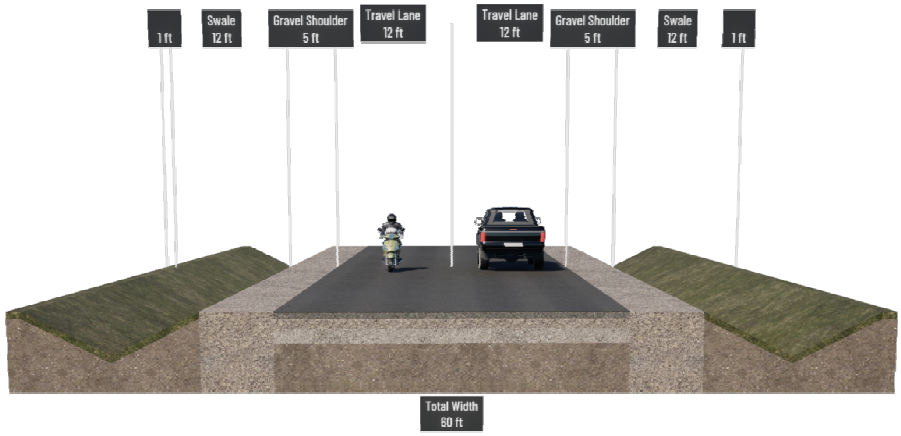
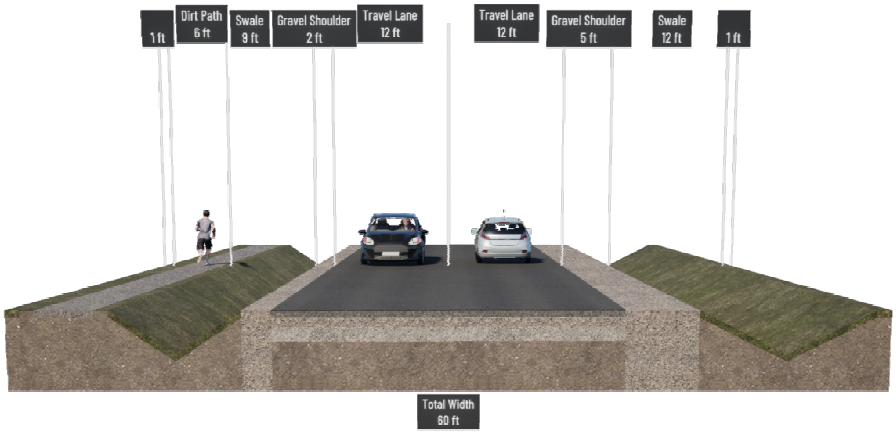
Figure #7

Local Roads

Local Road
60' ROW



Local Road with Trail
60' ROW



Local Neighborhood Road
60' ROW

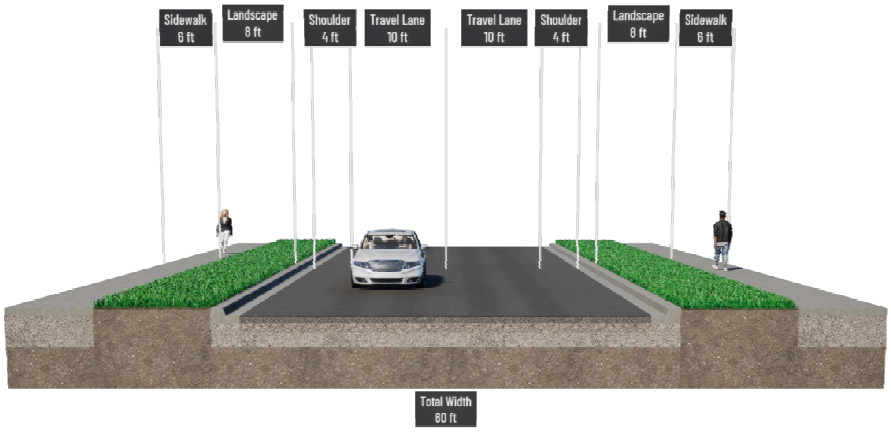


Table 2: Roadway Classifications

Mobility

Access

Lake Point Roadway Classifications	
Classification	**Characteristics**
Major Arterial	ROW: 120 feet 5 lanes
Minor Arterial	ROW: 90-120 feet 2-3 Lanes
Commercial Collector	ROW: 60 feet 2 Lanes
Collector	ROW: 60 feet 2 Lanes
Local Street	ROW: 60 feet 2 Lanes

ACCESS MANAGEMENT

Access spacing should vary by functional classification type. As a general rule, the greater the mobility on a roadway, the lower the accessibility. Arterials and major collectors are typically designed as major routes to allow vehicles greater ease of travel with few interruptions. These roads should have limited access points so as not to disrupt flow of traffic. In contrast, local streets experience comparatively little traffic and are designed to allow access to individual properties, which should keep the speed down.

Based on recommendations from the literature and from state-of-the-practice of other municipalities and DOTs, recommendations for minimum signalized, public street, and private access spacing have been compiled and are shown in Table 3. If access standards cannot be met, the plans will need to be ran through engineering for approval.

When possible, streets and accesses should line up with the street or access across the intersection. Offset intersections are categorized as either positive or negative, depending on the orientation. Negative offsets occur when left-turning movements off the major street conflict with each other. This is especially a safety concern where two-way left-turn lanes (TWLTL) exist as these become lanes to move left-turning vehicles out of the through lanes, and they are typically used to slow down over a distance of several feet. Negative offsets create potential for head-on collisions, as shown Positive offsets are preferred over negative ones, but the ideal option is to have streets line up.

Table 3: Access Management Spacing Standards

Street Classification	Minimum Signal Spacing (feet)[1]	Minimum Street Spacing (feet)[1, 4]	Minimum Commercial Access Spacing (feet)[1, 4]	Minimum Residential Access Spacing (feet)[1]
Major Arterial	2,640	660	330[2]	n/a[3]
Minor Arterial	1,320	660	330	150
Collector	1,320	330	150	150
Local Street	1,320	150	150	50

Notes:
1. Measured centerline to centerline
2. Access to an arterial should only be granted when other reasonable access is not available to a collector or local street. If granted, the access should be limited to right-in/right-out only if possible.
3. Residential access should not be granted on major arterials.
4. Minimum Street Spacing refers to unsignalized intersection spacing; if a traffic signal is present, a traffic impact study should determine if the minimum street spacing should be longer.

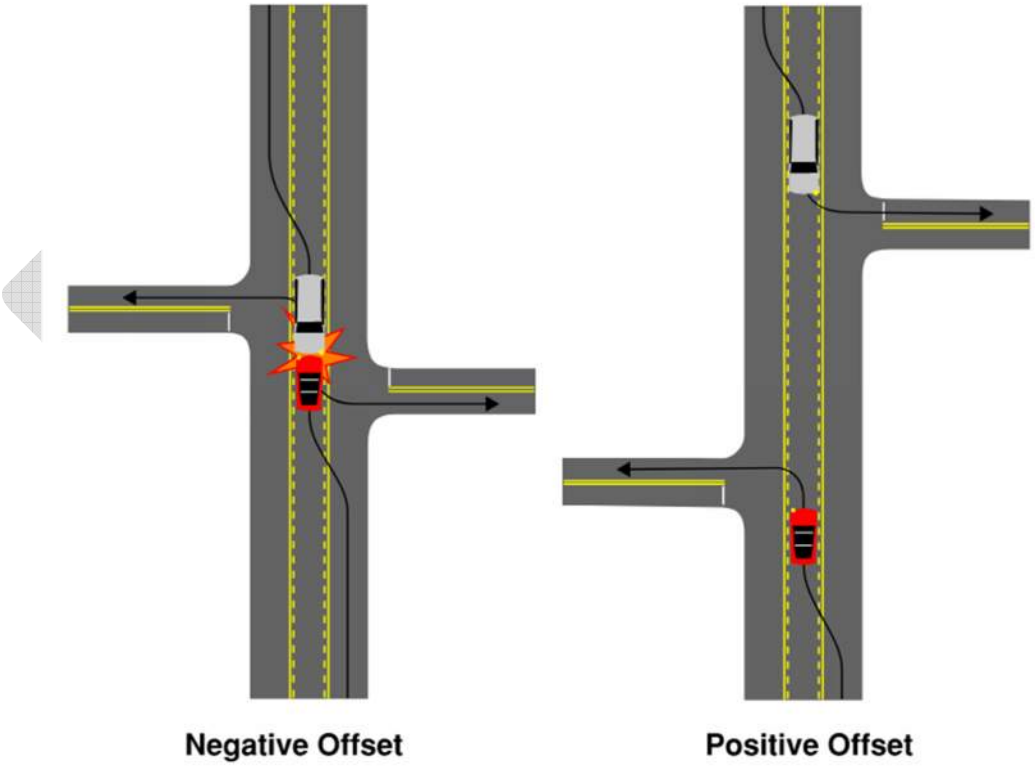


Figure 9: Offset diagram

TRUCK ROUTES

In order to minimize the impact of trucks on most city streets, truck routes have been designated for existing and future roadways. These truck routes are primarily located on roadways that serve commercial or industrial areas, including all state-maintained arterials located in Lake Point. The following public streets are designated as truck routes:

- SR-36
- Pole Canyon Road
- Saddleback Boulevard
- Canyon Road (future west extension)
- Mountain View Road (future north extension)
- SR-36 East Frontage Road (future)
- SR-36 West Frontage Road (future Commerce Way extension)
- Business Center Drive (future)
- Hardy Way (and future extension)

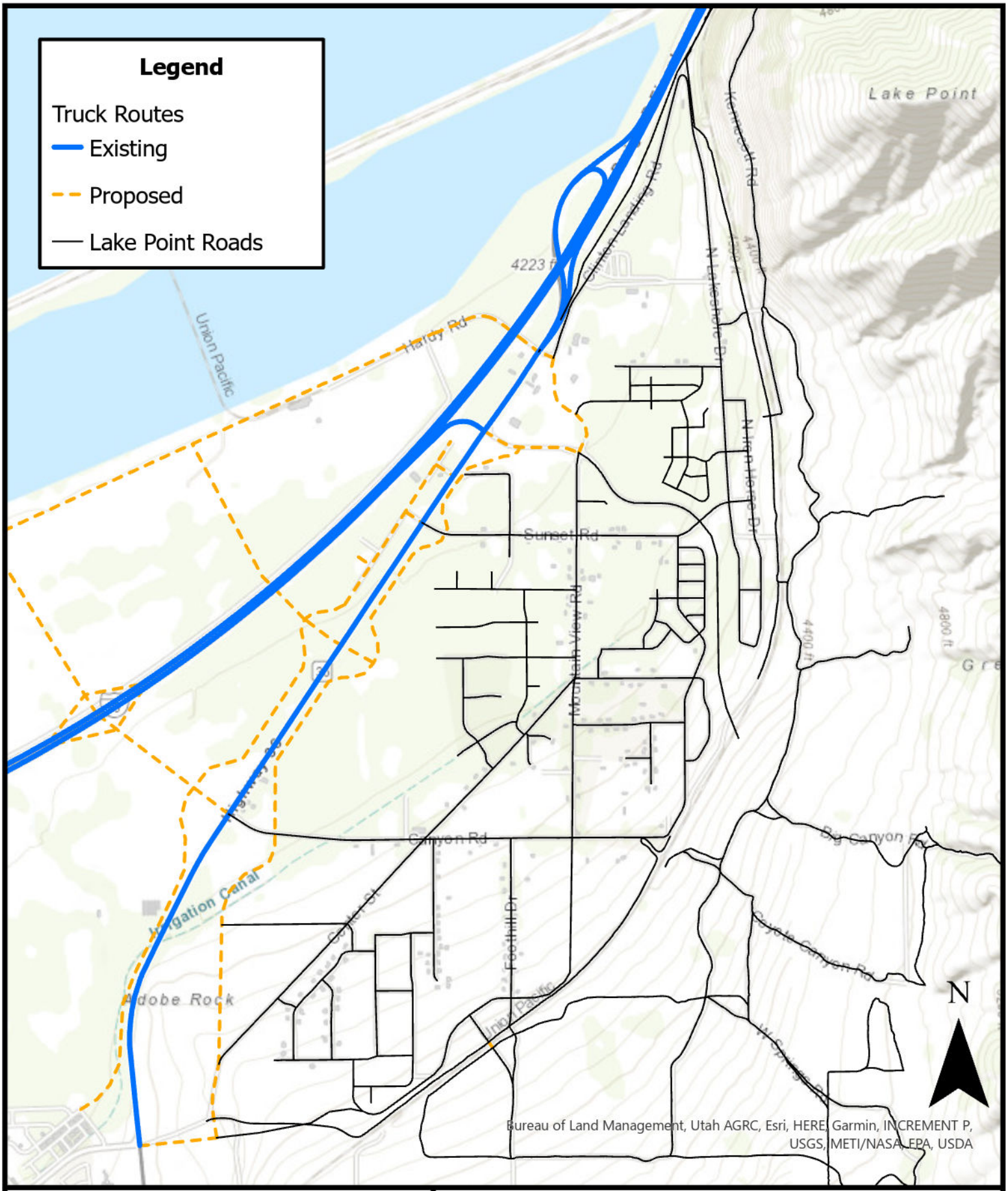
Figure 10 shows designated truck routes within Lake Point. Construction companies should be encouraged to have trucks follow these routes as much as possible. Truck restrictions may be enforced by weight limit signs at bridges over canal crossings. Currently SR-36 experiences approximately 5 to 6 percent truck traffic through Lake Point.

LEVEL OF SERVICE ANALYSIS

Level of service (LOS) is a term that describes the operating performance of an intersection or roadway. LOS is measured quantitatively and reported on a scale from A to F, with A representing the best performance and F the worst. Calculating a planning-level LOS for a roadway segment is completed based on volume-to-capacity (v/c) ratios. The volume is the average daily traffic (ADT) for the given roadway segment and the capacity is based on factors such as lane count and traffic signal spacing.

Table 4. provides a brief description of each LOS letter designation and the accompanying range of v/c ratios. A visual representation of the various levels of service is shown in Figure 11.

For the purposes of this TMP, a minimum overall performance for each of the study roadways and intersections was set at LOS D. A LOS D threshold is consistent with “state-of-the-practice” traffic engineering principles. Improvements are recommended when a roadway or intersection functions at LOS is E or F.



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Truck Routes

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Figure 10

Table 4: Level of Service Descriptions

Level of Service	Description of Traffic Conditions	Volume / Capacity Ratio
A	Extremely favorable progression and a very low level of control (intersection) delay. Individual users are virtually unaffected by others in the traffic stream.	≤ 0.30
B	Good progression and a low level of control delay. The presence of other users in the traffic stream becomes noticeable.	> 0.30 - 0.50
C	Fair progression and a moderate level of control delay. The operation of individual users becomes somewhat affected by interactions with others in the traffic stream.	> 0.50 - 0.75
D	Marginal progression with relatively high levels of control delay. Operating conditions are noticeable more constrained.	> 0.75 - 0.85
E	Poor progression with unacceptably high levels of control delay. Operating conditions are at or near capacity.	> 0.85 - 1.00
F	Unacceptable progression with forced or breakdown operating conditions.	> 1.00

Source: *Highway Capacity Manual* (HCM) 7th edition (Transportation Research Board, 2022).

Figure 11: Visual representation of LOS

Level of Service (LOS)
 **LOS A** – Free Flow, Insignificant Delays
 **LOS B** – Stable Flow, Minimum Delays
 **LOS C** – Stable Flow, Acceptable Delays
 **LOS D** – Approaching Unstable Flow, Tolerable Delays
 **LOS E** – Unstable Flow, Significant Delays
 **LOS F** – Forced Flows, Excessive Delays

ROADWAY CAPACITIES

The capacities for each roadway type were identified using Transportation Research Board (TRB) *Highway Capacity Manual,* 7th Edition, 2022 methodologies and based on common practice in Utah. Key factors that influence the capacity of a roadway include the number of travel lanes, presence of a two-way left-turn lane (TWLTL) or turn pockets, level of access management, and signal spacing. The assumed LOS E/F capacity thresholds for Lake Point City roadways are shown in Table 5, reported as vehicles per day (vpd).

Table 5: Roadway Capacities

Functional Classification	Number of Lanes	Capacity (vpd)
Local or Collector	2	12,500
Minor Arterial	2-3	12,500 – 18,300
Major Arterial	5	36,800
Principal Arterial	7	50,700

INTERSECTION LOS

Intersection LOS looks at individual intersections and provides a microscopic view of a roadway network. LOS at intersections can be broken down into directions and respective movements (left-turns, through movements, or right-turns). A detailed look at intersections should occur as frequently as necessary since they are a source of bottlenecks. The Highway Capacity Manual has divided intersections into two types, signalized and un-signalized. The methodology to calculate the delay per vehicle at an intersection is outlined in the *Highway Capacity Manual* (HCM), 7th Edition, 2022 and the subsequent delay criteria and corresponding LOS. A LOS D for intersection delay has been determined to be the acceptable limit for Lake Point City. The delay thresholds for each LOS for both signalized and unsignalized intersections can be found in Table 6.

The levels of service for signalized, all-way stop-controlled (AWSC), and roundabout intersections are calculated as a weighted average of all movements. The LOS for a two-way stop-controlled (TWSC) intersection is equal to the LOS of the worst movement. Failing LOS conditions are typically experienced during the peak hours (morning and/or evening). It is not uncommon for a side street or access on busy arterials to experience LOS worse than D during the peak hours due to high traffic volumes on the major roadway. Vehicles generally learn to re-route to signalized intersections in these cases.

Table 6: Intersection LOS Criteria

LOS	LOS Delay Criteria (sec. / vehicle)	
	Signalized Intersections	TWSC, AWSC, & Roundabout Intersections
A	≤ 10	≤ 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

Source: *Highway Capacity Manuel, 7th Edition, 2022*

EXISTING CONDITIONS

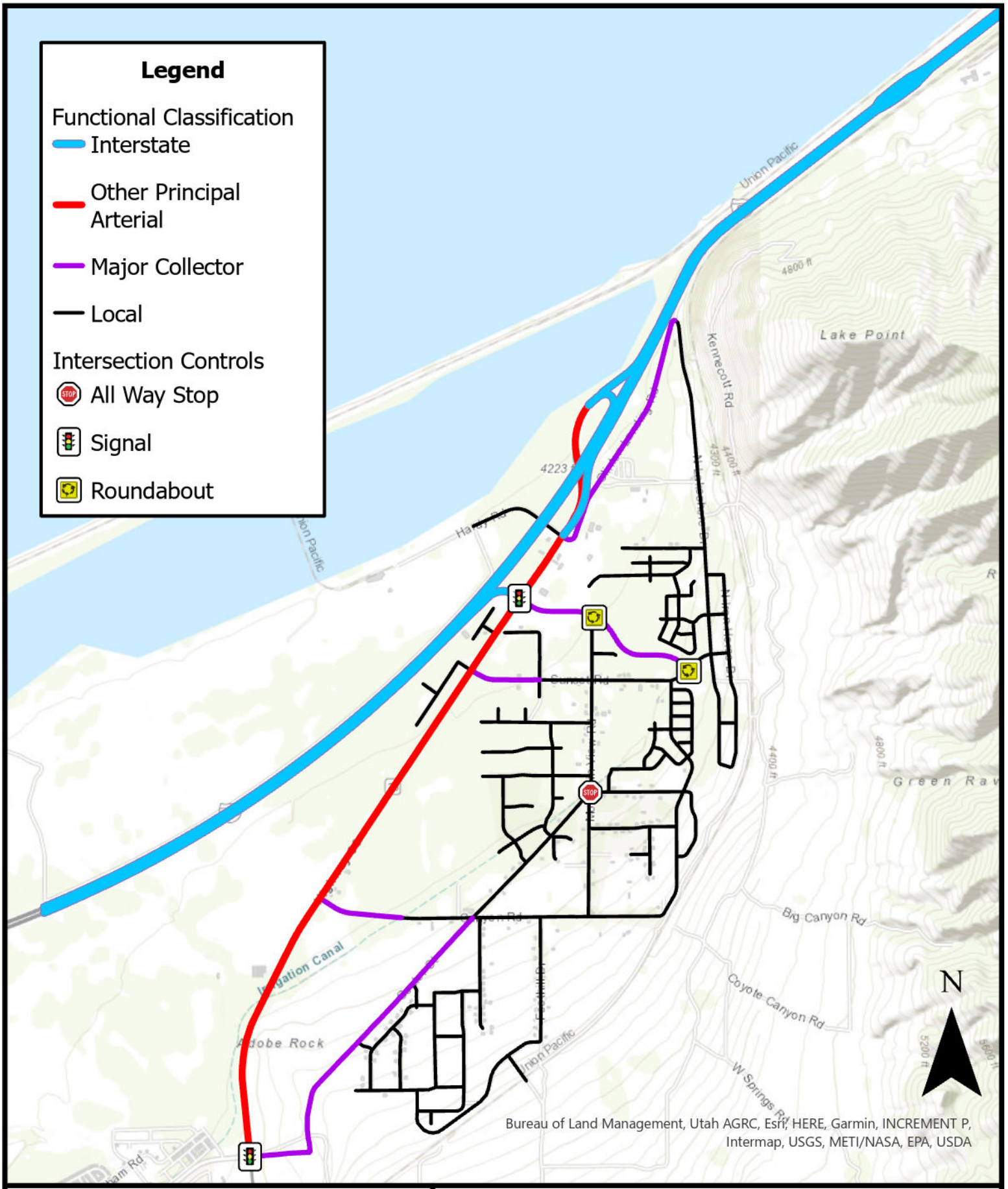
This section discusses the existing roadway and intersection conditions in Lake Point. The current LOS for each of the major roadways and intersections in Lake Point were analyzed. It is important to analyze the existing conditions as this serves as a baseline with which future conditions and alternatives can be compared.

EXISTING ROADWAY NETWORK

SR-36 is the city's principal arterial through town. Other major north-south collector roadways include Center Street and Mountain View Road. Saddleback Boulevard, Sunset Road and Canyon Road are the primary east-west collector roadways. Pole Canyon Road is another important east-west connection to Center Street.

Local roadways in Lake Point are a mixture of unconnected roads with cul-de-sacs in other areas. Discontinuous local road systems can lead to unnecessary congestion and delay on collector and arterial roads, as vehicles are forced to take those routes even for short trips. Therefore, it is recommended that the grid system be followed as much as possible as areas develop.

The functional classifications discussed previously were assigned to the roadways in Lake Point based on existing designations found in the Lake Point general plan. The existing roadway network map that shows the functional classifications is shown in Figure 12. Most roadways in Lake Point are maintained by the City. SR-36 is a state roadway maintained by the Utah Department of Transportation (UDOT). State and City roadway jurisdictions. The locations of traffic signals, stop signs, and other traffic control devices are shown in Figure 12.



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Existing Roadway Network

Lake Point - Transportation Master Plan

Figure 12

EXISTING VOLUMES AND LOS

Data Collection

To accurately identify existing conditions on the roadway network in Lake Point, the consultant team gathered traffic data. Existing traffic volumes were obtained from various sources, including the following:

- Consultant Team Data – Where UDOT data were not available, the consultant team used data collected for this and previous projects in the area. These data were collected in the form of two-way roadway counts or turning movement counts at intersections and are included in Appendix B. A map showing the data collection locations is shown in Figure 13.
- UDOT - Many of the traffic volume values on State roads and other federal aid roads were obtained from UDOT's *Traffic on Utah Highways* database, Automatic Signal Performance Metrics (ATSPM) website, or from previous studies completed on UDOT roads.

Roadways

The volumes from these sources were compiled to have a comprehensive volume map of major roadways. LOS values were assigned to each roadway segment based on the volume and the LOS criteria for roadways that was described previously. The existing traffic volumes are reported as ADT in vpd along with the LOS of each roadway segment in Figure 14.

As shown, the roadways in Lake Point are currently operating within capacity, but two of the major intersections are currently operating at a poor LOS.

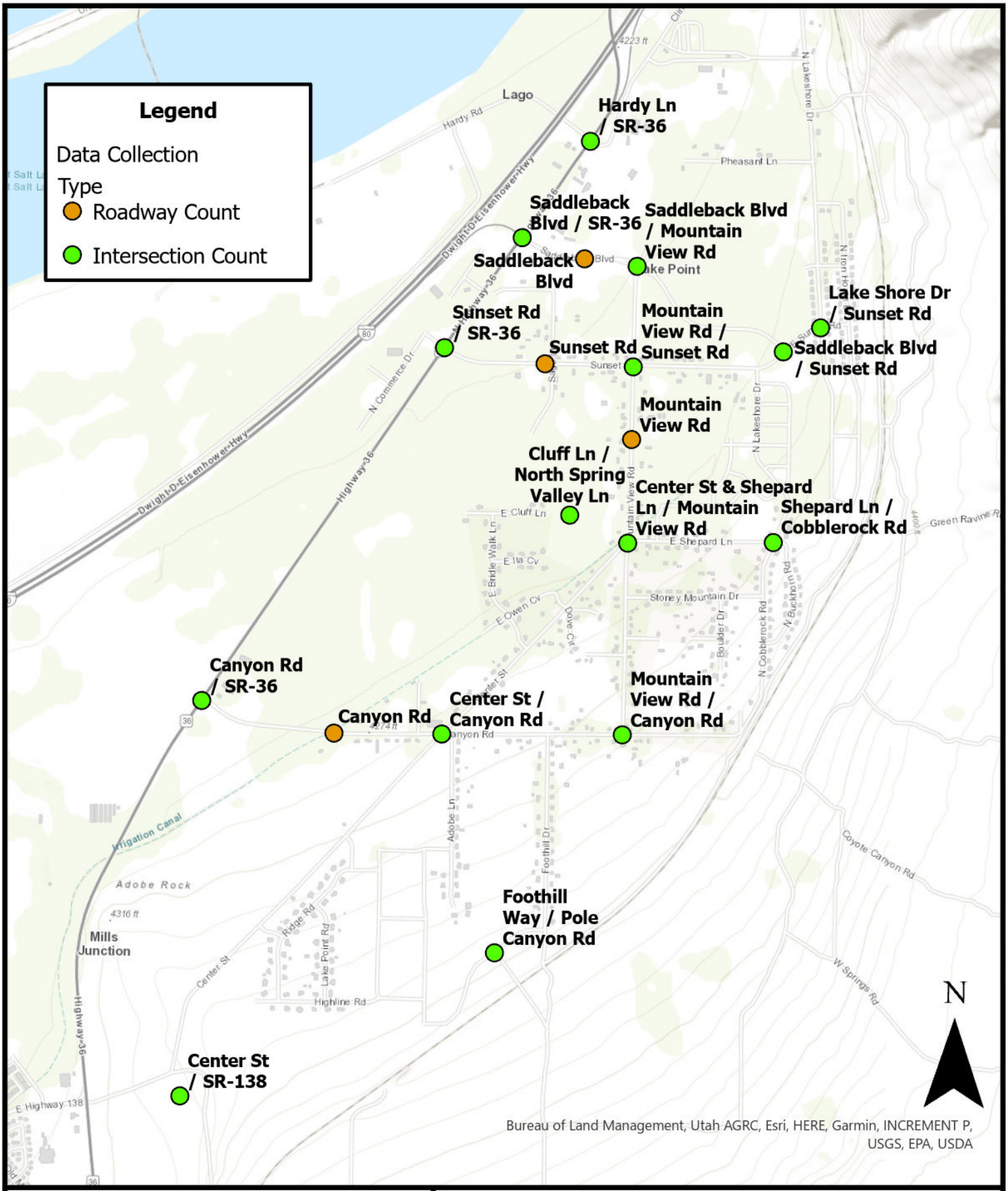
Intersections

Evening peak hour turning movement count data were collected for several major intersections within the city. Hales Engineering completed morning evening peak hour turning movement counts between 7:00 and 9:00 a.m. and 4:00 and 6:00 p.m. at the following intersections on Wednesday, July 10, 2024, and Thursday, July 11, 2024:

- Hardy Road / SR-36
- Saddleback Boulevard / SR-36
- Mountain View Road / Saddleback Boulevard
- Lake Shore Drive / Sunset Road
- Sunset Road / Mountain View Road
- Sunset Road / SR-36
- Spring Valley Lane / Cluff Lane
- Shepard Lane & Center Street / Mountain View Road
- Cobblerock Road / Shepard Lane
- Canyon Road / Center Street
- Mountain View Road / Canyon Road
- Canyon Road / SR-36
- Center Street / Pole Canyon Road
- Foothill Drive / Pole Canyon Road

Volume data at the following intersections was estimated based on counts from nearby intersections:

- Cluff Lane / Mountain View Road
- Spring Valley Lane / Center Street



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Data Collection Locations

Lake Point - Transportation Master Plan

Figure 13

An intersection LOS analysis was completed for all major intersections in the Lake Point. This analysis was completed for the evening peak hour using Synchro / SimTraffic traffic modeling and simulation software, which follows HCM methodology. The evening peak hour LOS was computed for each study intersection. Multiple runs of SimTraffic were used to provide a statistical evaluation of the interaction between the intersections. LOS results are provided in Table 7 and visually in Figure 14. LOS and queueing reports are shown in Appendix D.

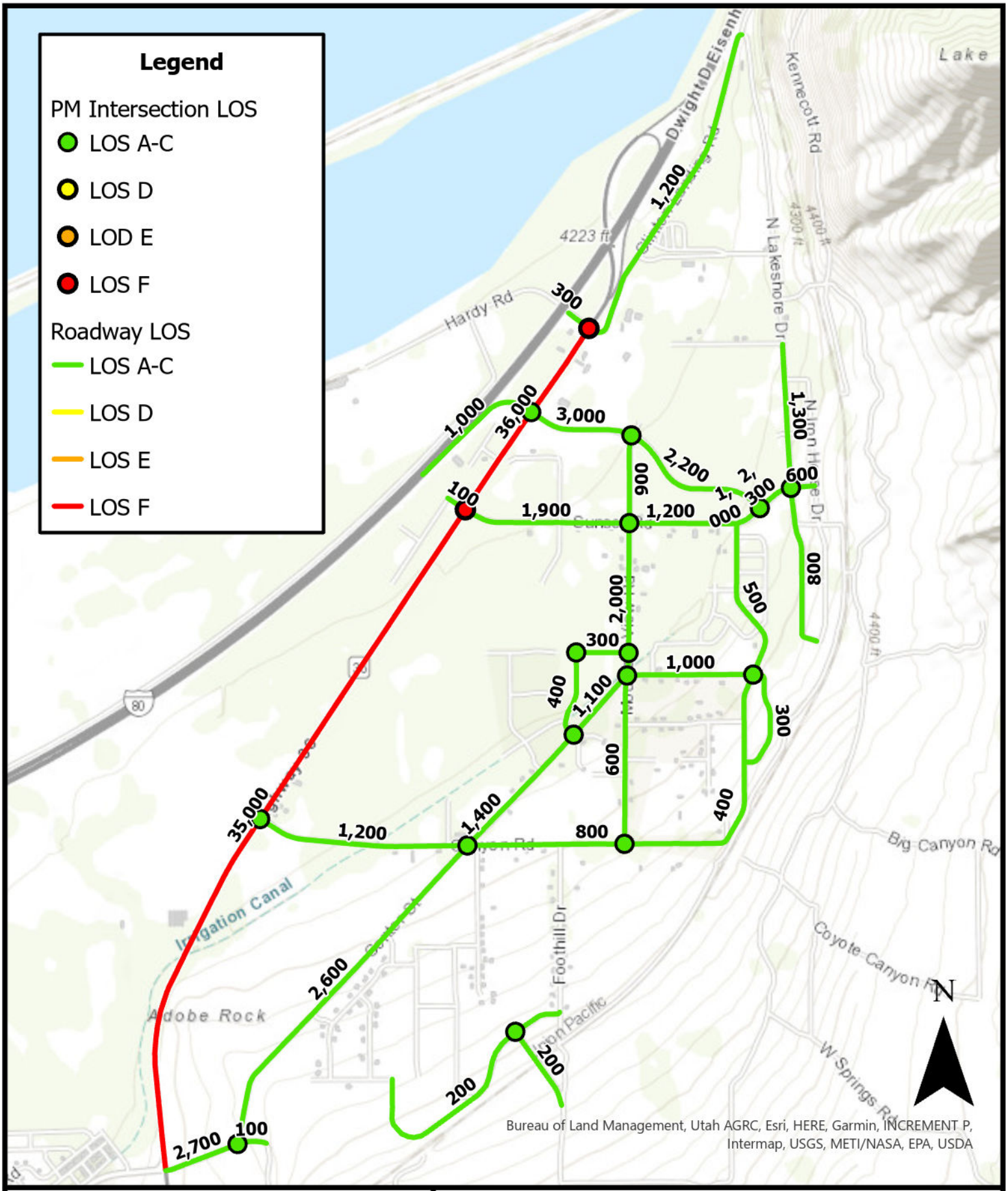
The major intersections in Lake Point with two exceptions are all operating at acceptable levels of service during the evening peak hour, as shown in Table 7.

Table 7: Existing Evening Peak Hour Intersection Level of Service

Intersection		Level of Service		
Description	Control	Movement[1]	Aver. Delay (Sec/Veh)	LOS[2]
Hardy Road / SR-36	EB/WB Stop	SET	>50	f
Saddleback Boulevard / SR-36	Signal	-	13.3	B
Mountain View Road / Saddleback Boulevard	Roundabout	-	1.6	A
Sunset Road / Saddleback Boulevard	Roundabout	-	1.9	A
Lake Shore Drive / Sunset Road	EB/WB Stop	WBL	5.7	a
Sunset Road / Mountain View Road	NB/SB Stop	SBT	6.3	a
Sunset Road / SR-36	EB/WB Stop	WBL	>50	f
Spring Valley Lane / Cluff Lane	EB/WB Stop	EBT	5.3	a
Cluff Lane / Mountain View Road	EB Stop	EBL	5.6	a
Shepard Lane & Center Street / Mountain View Road	AWSC	-	3.8	A
Cobblerock Road / Shepard Lane	AWSC	-	2.9	A
Spring Valley Lane / Center Street	SEB Stop	NEL	3.4	a
Canyon Road / Center Street	SWB/NEB Stop	SWT	7.8	a
Mountain View Road / Canyon Road	EB/WB Stop	SBL	6.1	a
Canyon Road / SR-36	WB Stop	WBL	18.6	c
Center Street / Pole Canyon Road	SB Stop	SBR	2.4	a
Foothill Drive / Pole Canyon Road	NWB Stop	NWL	3.1	a

1. Movement indicated for unsignalized intersections where delay and LOS represents worst movement. SBL = Southbound left movement, etc.
2. Uppercase LOS used for signalized, roundabout, and AWSC intersections. Lowercase LOS used for non-AWSC unsignalized intersections.

Source: Hales Engineering, May 2025



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Existing Level of Service

Lake Point - Transportation Master Plan

Figure 14

FUTURE (2050) CONDITIONS

Future ADT roadway volumes were projected based on the anticipated development in the City. This was done based on future land use plans discussed previously in this report. These tasks were completed to determine roadway ADT volumes, which were then converted to turning movement counts at key intersections.

TRAFFIC VOLUMES AND LOS

Future traffic volumes were estimated using the USTM and future land use projections. First, a no-build analysis was completed to determine LOS results without any additional City projects or connections. However, regional projects that included the Mid Valley Highway and SR-36 widening to 3 lanes per direction were assumed. The future volumes were calibrated using existing traffic counts to improve accuracy. The future (2050) no-build traffic volumes and LOS are shown in Figure 15.

TRANSPORTATION IMPROVEMENT PROGRAM

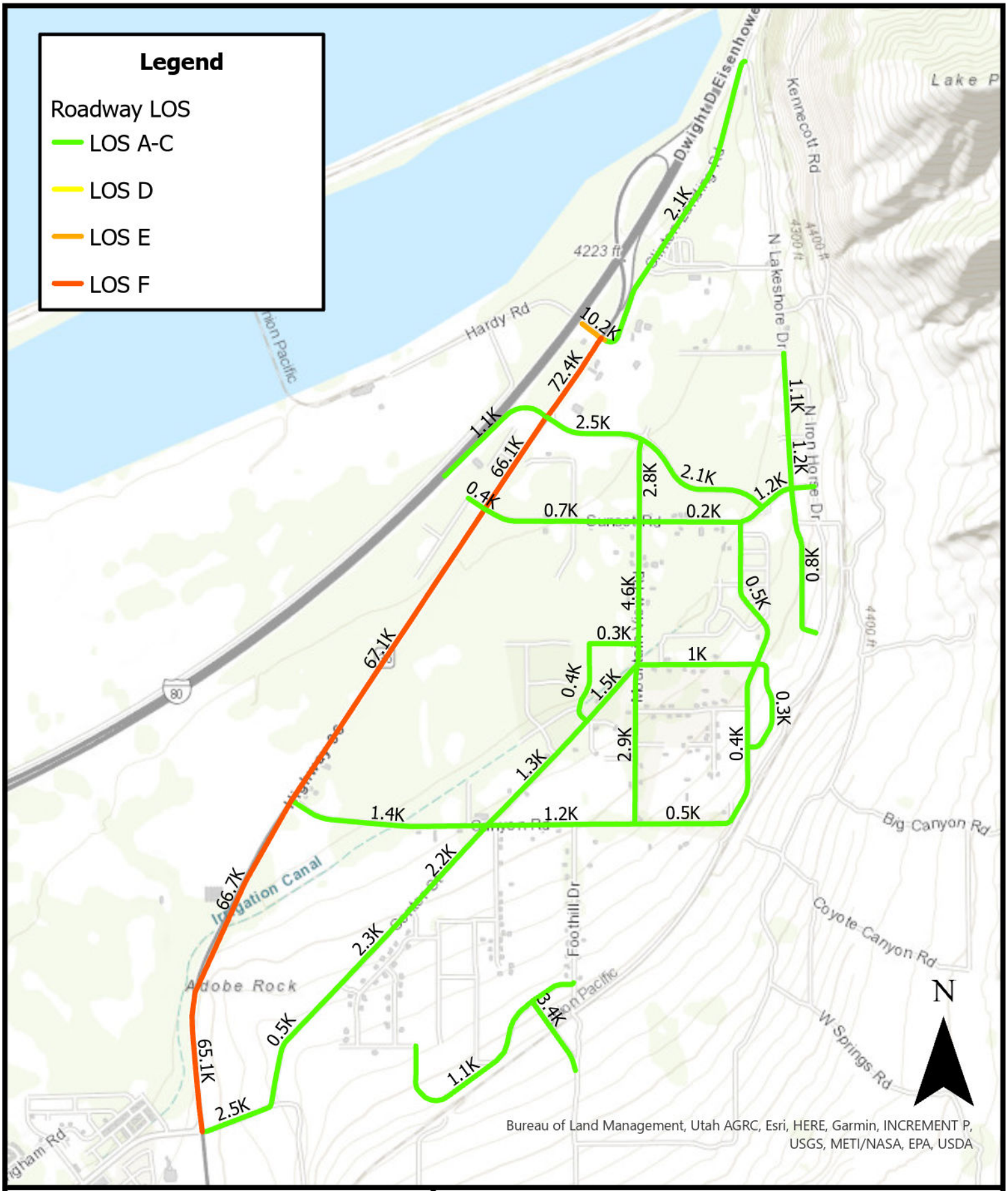
Based on the level of service results, discussions with the City, and previous plans, Hales Engineering developed a Transportation Improvement Program (TIP) for roadway projects in the City. Projects were broken up into the following two categories:

- Programmed: Projects that are recommended to be completed by 2050 to mitigate existing and/or future (2050) transportation congestion.
- Vision: Projects to be considered at a future date to complete the City grid network as future development occurs.

A list of projects can be found in Table 8. SR-36 is the principal arterial that moves vehicles in and out of Lake Point. Future UDOT plans are anticipated to widen the arterial to a 7-lane cross section. Several roadway expansion projects serve to develop a minor arterial through Lake Point created from piecing together Pole Canyon Road, Mountain View Road, and Saddleback Boulevard. The cross section of the arterial would vary from a 5-lane to a 2-lane cross section. New connections are proposed to connect Pole Canyon Road with Mountain View road.

The addition of commercial collector frontage roads east and west of SR-36 are aimed at serving the future commercial corridor of Lake Point City. Other important collector roads include the Mountain View Rd from Saddleback Blvd to Clinton Landing connection and a Canyon Road flyover road that could eventually tie into a future interchange at I-80. It is anticipated that this would occur in conjunction with the proposed SR-201 extension which would provide people traveling in and out of Tooele Valley with a secondary roadway. It is recommended that the City coordinate with UDOT on the timing of these roadway improvements in conjunction with future widening plans on SR-36.

New local roads are also proposed to connect the proposed collector roads, such the Center Street with the east SR-36 frontage road. Other local roads are proposed west of SR-36, such as the west Saddleback flyover and the connection with Hardy Lane. The programed roadway projects are shown in Figure 16a and the vision projects in 16b. A map of the recommended future (2050) roadway network and intersection control is shown in Figure 17.



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Future (2050) No Build Level of Service

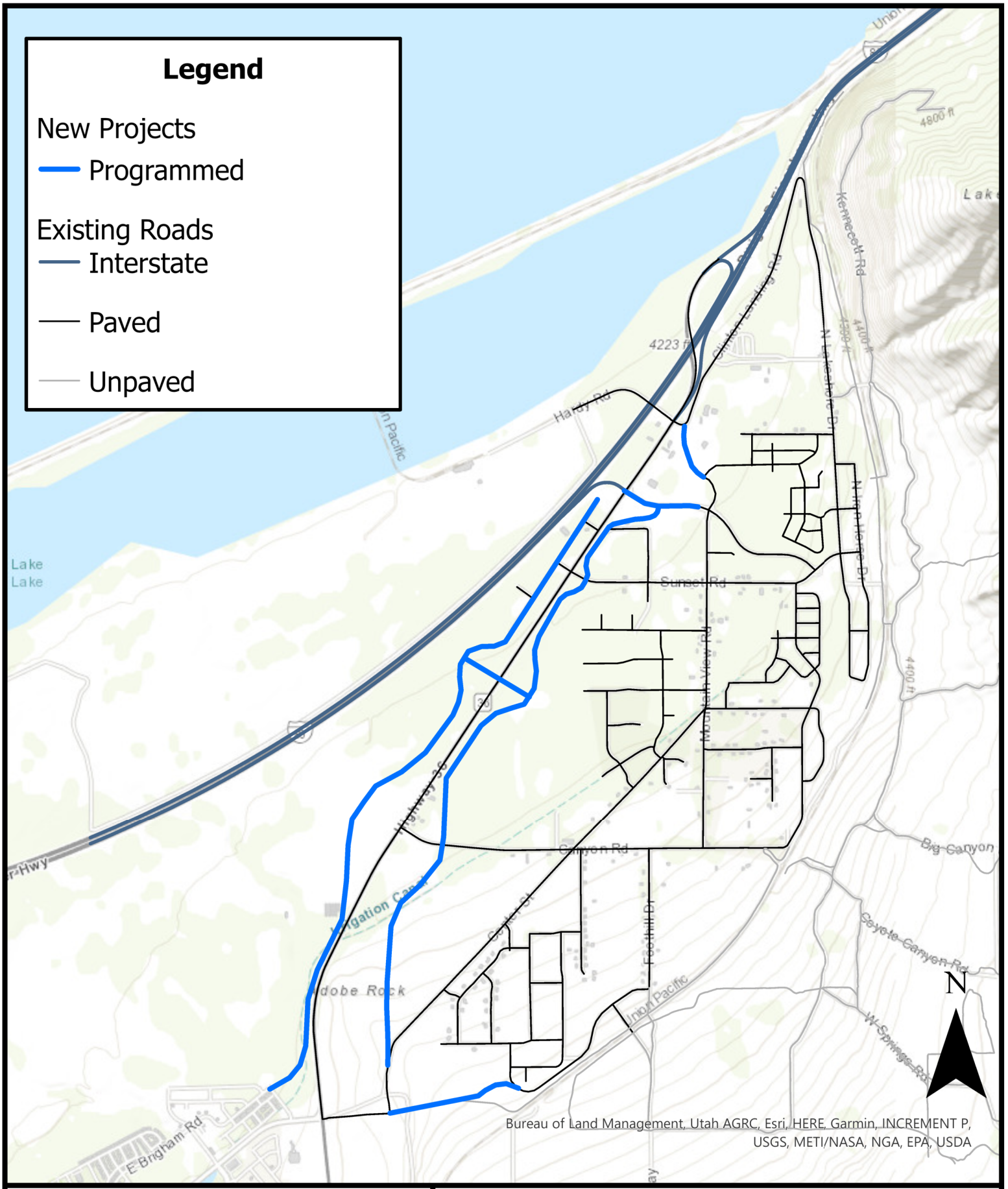
Lake Point - Transportation Master Plan | *Figure 15*

Table 8: Recommended Phased Improvement Projects

#	Location	Type	Description	Jurisdiction	Cost
Programmed Projects					
1	Mountain View Road from Saddleback Boulevard to Clinton Landing	New	2-Lane Collector	Lake Point	$###,###
2	Pole Canyon Road Connection	New	3-Lane Minor Arterial	Lake Point	$###,###
3	SR-36 East Frontage Road	New	2-Lane Commercial Collector	Lake Point	$###,###
4	SR-36 West Frontage Road (Commerce Drive Extension)	New	2-Lane Commercial Collector	Lake Point	$###,###
5	Business Center Drive	New	2-lane Local Road	Lake Point	$###,###
6	Saddleback Blvd From SR-36 to Mountain View Rd	Restripe	3-Lane Arterial	Lake Point	$###,###
Vision Projects					
7	SR-36 East Frontage Road to Center Street Connection	New	2-Lane Local Road	Lake Point	
8	Canyon Road Extension and I-80 Interchange	New	3-Lane Collector and Interchange	UDOT/Lake Point	
9	Hardy Road Extension	New	2-Lane Collector Road	Lake Point	
10	Pole Canyon Connection to Mountain View Rd	New	2-Lane Minor Arterial	Lake Point	
11	Business Center Drive I-80 Flyover*	New	2-lane Collector Road	Lake Point	
12	Saddleback Blvd Southeast Connection	New	2-Lane Collector	Lake Point	
**To be completed only if Canyon Road interchange is not built*					

Pavement and Drainage Assessment

Hales Engineering worked with Ensign Engineering to complete a pavement and drainage assessment of existing City roadways. This can be found in Appendix E.



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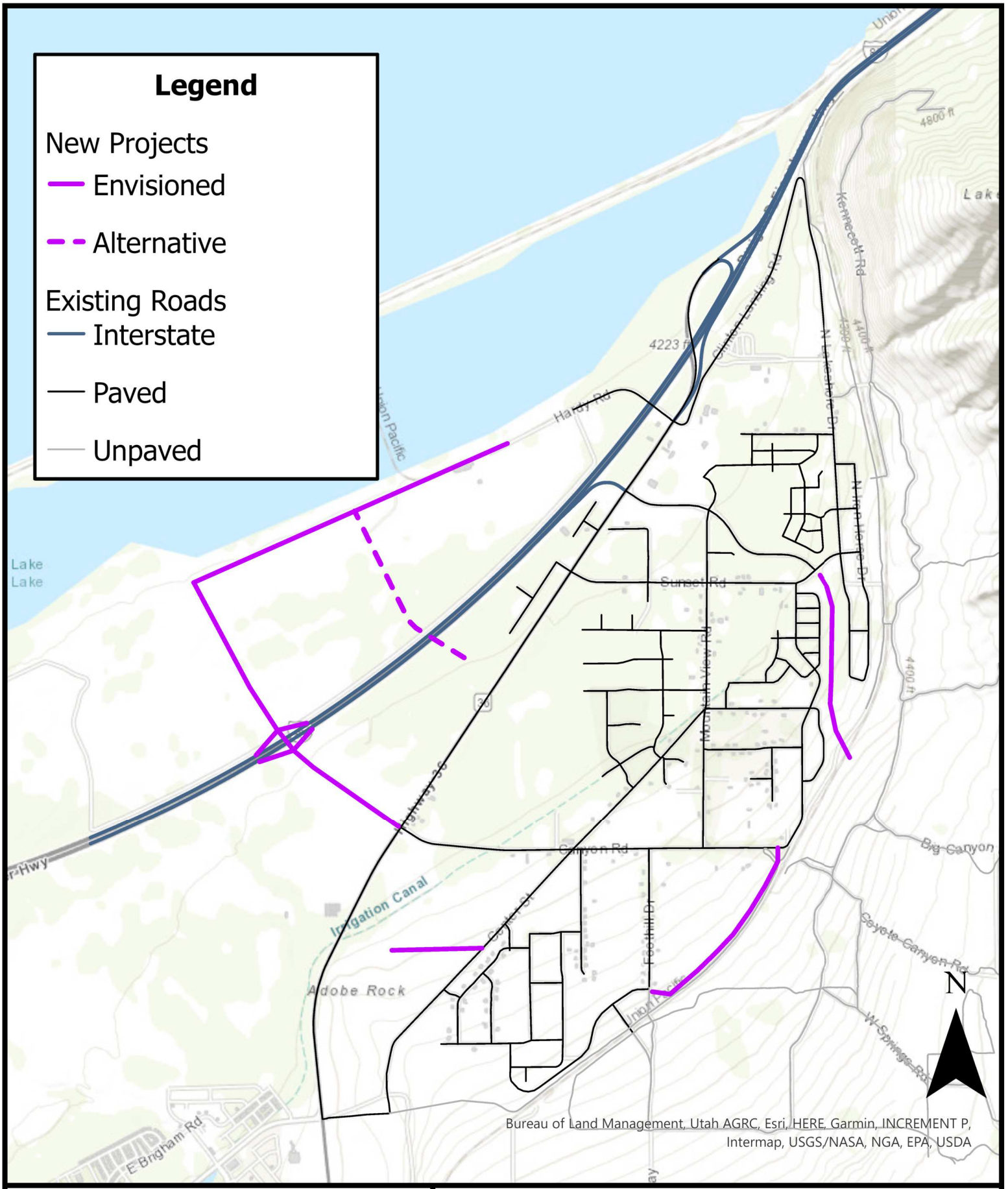
Future (2050) Programmed Projects

Lake Point - Transportation Master Plan

Figure 16a



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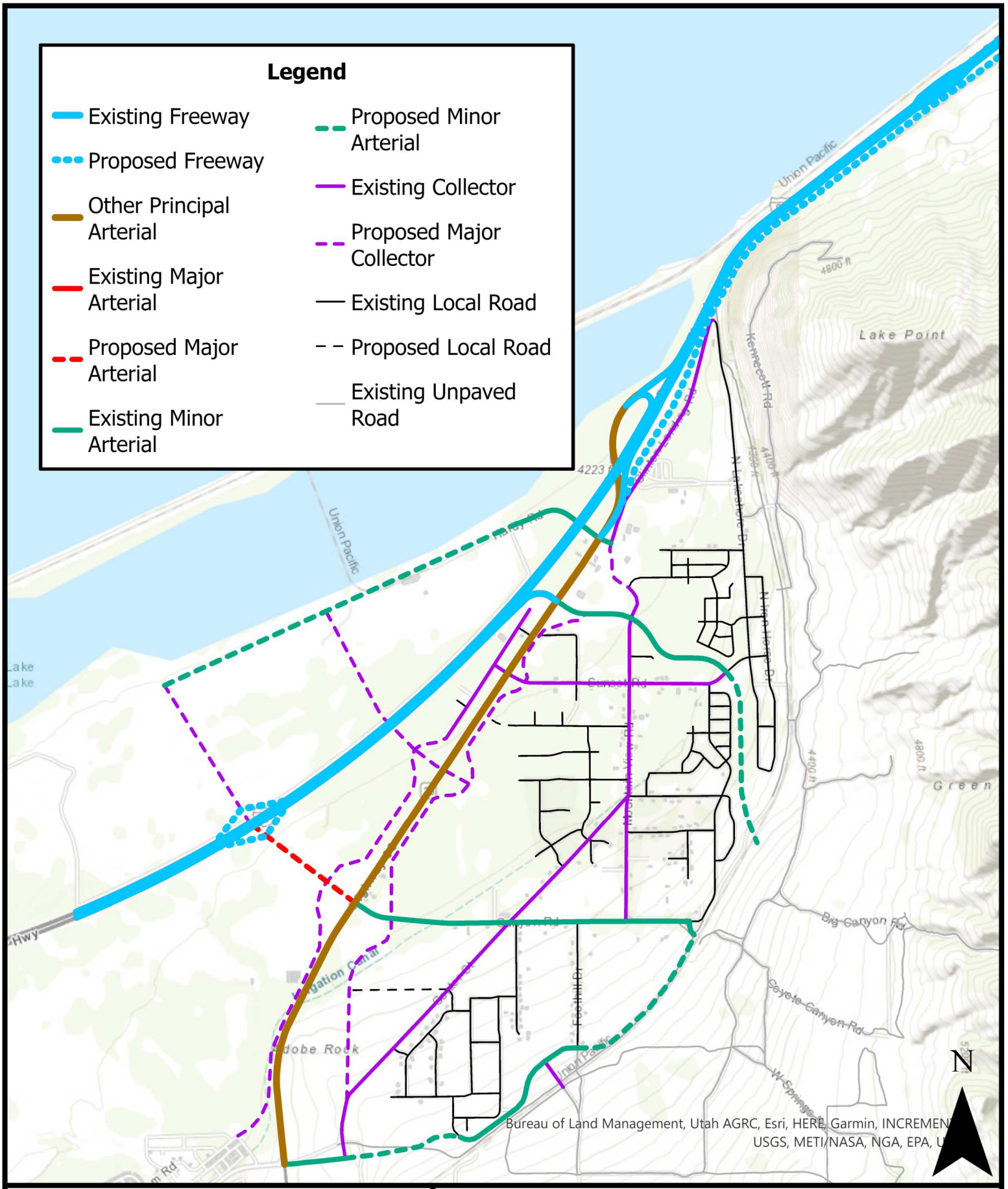
Future (2050) Vision Projects

Lake Point - Transportation Master Plan | *Figure 16b*



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Future Functional Classification

Lake Point - Transportation Master Plan

Figure 17

BUILD LOS

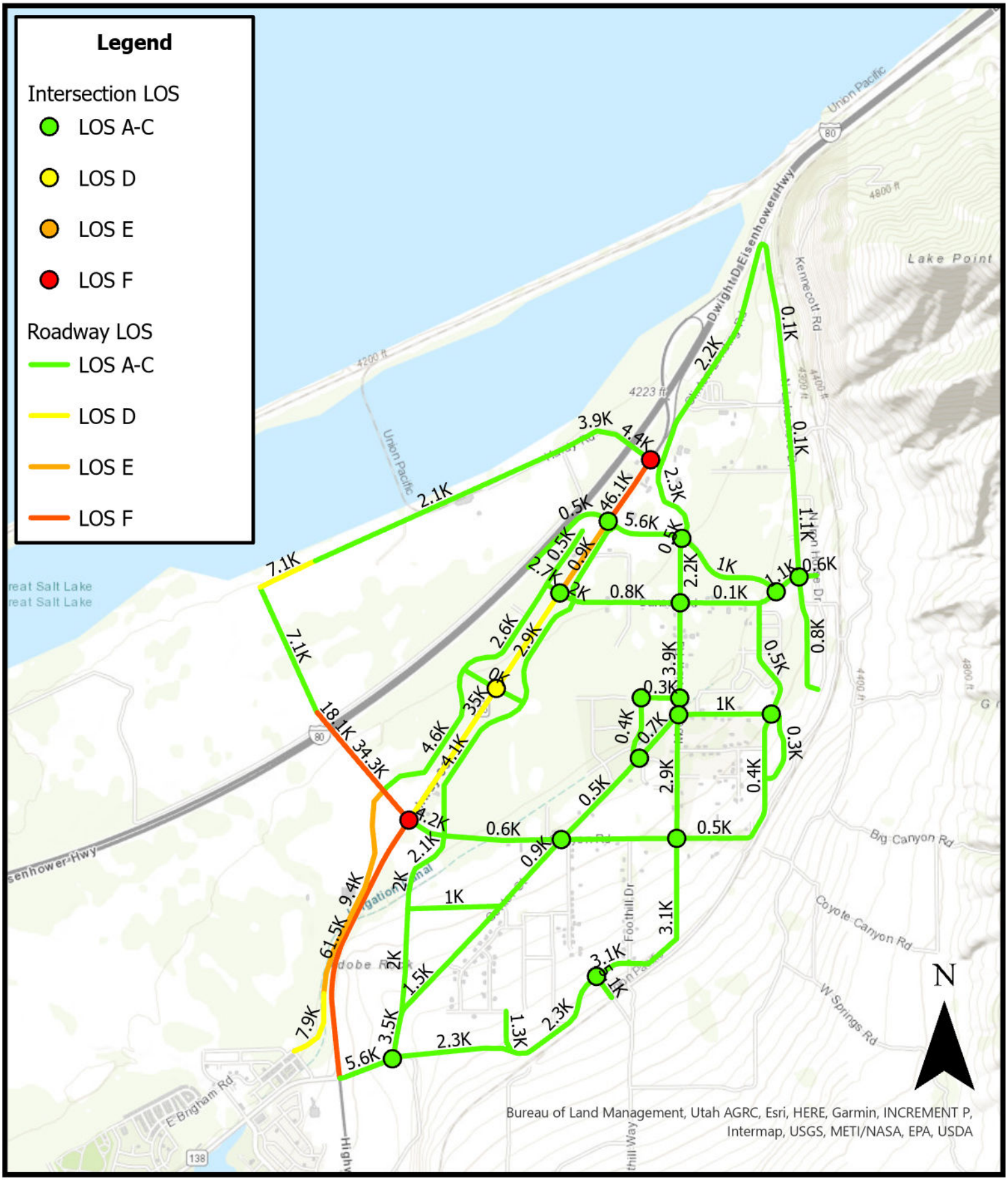
With the proposed improvements, all Lake Point City roadways are anticipated to operate at LOS D or better, as shown in Figure 18. The remaining intersections with a poor LOS are located along the UDOT facility, SR-36. Future (2050) evening peak hour LOS results are shown in Table 9. It is likely that an innovative intersection of some type, such as a continuous flow intersection (CFI), may be needed at the Canyon Road / SR-36 intersection if a new interchange is constructed at Canyon Road.

Table 9: Future (2050) Build Evening Peak Hour Level of Service

Intersection		Level of Service		
Description	Control	Movement [1]	Aver. Delay (Sec/Veh)	LOS[2]
Hardy Road / SR-36	EB/WB Stop	SER	>50	f
Saddleback Boulevard / SR-36	Signal	-	16.9	B
Mountain View Road / Saddleback Boulevard	Roundabout	-	1.9	A
Sunset Road / Saddleback Boulevard	Roundabout	-	2.1	A
Lake Shore Drive / Sunset Road	EB/WB Stop	EBT	5.9	a
Sunset Road / Mountain View Road	NB/SB Stop	SBT	7.5	a
Sunset Road / SR-36	Signal	-	9.5	A
Spring Valley Lane / Cluff Lane	EB/WB Stop	WBT	5.0	a
Business Center Road / SR-36	Signal	-	44.3	D
Cluff Lane / Mountain View Road	EB Stop	EBL	6.1	a
Shepard Lane & Center Street / Mountain View Road	AWSC	-	4.6	A
Cobblerock Road / Shepard Lane	AWSC	-	3.0	A
Spring Valley Lane / Center Street	SEB Stop	SEL	3.9	a
Canyon Road / Center Street	SWB/NEB Stop	SWT	7.5	a
Mountain View Road / Canyon Road	EB/WB Stop	WBT	5.8	a
Canyon Road / SR-36	Signal	-	>80	F
Center Street / Pole Canyon Road	SB Stop	SBL	6.4	a
Foothill Drive / Pole Canyon Road	NWB Stop	NWL	6.7	a

1. Movement indicated for unsignalized intersections where delay and LOS represents worst movement. SBL = Southbound left movement, etc.
2. Uppercase LOS used for signalized, roundabout, and AWSC intersections. Lowercase LOS used for non-AWSC unsignalized intersections.

Source: Hales Engineering, February 2025



HALES ENGINEERING innovative transportation solutions	Future (2050) Level of Service	
	Lake Point - Transportation Master Plan	*Figure 18*

PUBLIC TRANSIT & ACTIVE TRANSPORTATION

PURPOSE

A transportation system is composed of more than roadways. It also includes provisions for other modes of transportation including public transit, cycling, and walking. The purpose of this section is to discuss these modes and how Lake Point City can improve the infrastructure that facilitates these modes.

PUBLIC TRANSIT

Public transportation in Lake Point is served by the Utah Transit Authority (UTA). Currently, public transportation within city limits includes two bus routes. There is one existing UTA bus stop that services Lake Point City on Saddleback Boulevard, which is served by Route 451 and F453. Route F453 has headways of approximately 1 hour between 7 AM and 3 PM and travels between Tooele Main Street and the Salt Lake City North Temple Frontrunner Station via SR-36, I-80, Lake Point Center Street, and North Temple. Route 451 follows a nearly identical route and has headways of 30 minutes towards Salt Lake City from 5 AM to 8 AM and from Salt Lake City from 4 PM to 7PM to serve commuters with regular office hours.

Future transit projects could include adding an internal route on Mountain View and Center Street to better serve Lake Point residents. Adding a park and ride lot at the LDS Church parking lot on Center Street would provide residents with an easier way to use the bus. Similar park and ride arrangements with the church have been made in Tooele and throughout the UTA service area. In the long run, moving the bus route to the proposed SR-36 frontage road would serve a commercial corridor would be ideal. A park and ride near Canyon Road could also serve Lake Point residents. Figure 19 shows the existing and some potential bus routes to consider in Lake Point.

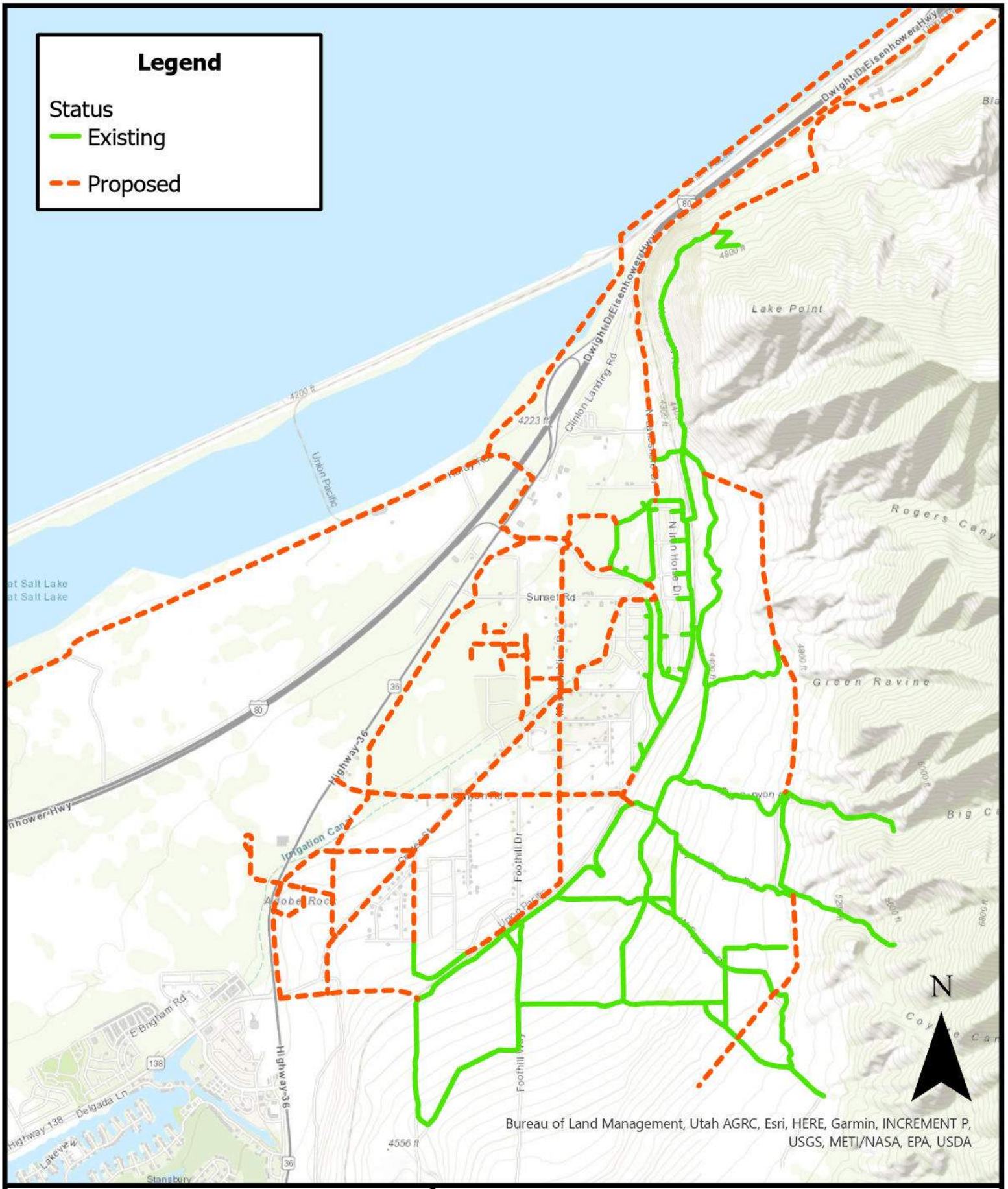
ACTIVE TRANSPORTATION

Providing safe and convenient facilities for pedestrian, bicycle, and equestrian modes in Lake Point is critical to maintaining beautiful scenery and promoting active transportation. If citizens have easy access to these facilities, use of the non-motorized modes of travel will increase. Lake Point has many existing trails. However, there are also some additions that could be made to improve the system.

This section is a supplement to the parks and recreation element of the General Plan. Lake Point City currently has a growing network of these Multi-use trails facilities. A Multi-use trail is a separate path designed for non-motorized traffic such as pedestrians, bicycles, and horses. Other names for these facilities include “shared-use paths.”

Future multi-use trails were identified based primarily on the Lake Point City General Plan (November 2022), the Tooele County transportation master plan, and the UDOT Trail network proposals.

Existing and proposed multi-use trail facilities are shown in Figure 20. The purpose of the proposed facilities is to connect existing facilities and to plan for facilities in developing areas.



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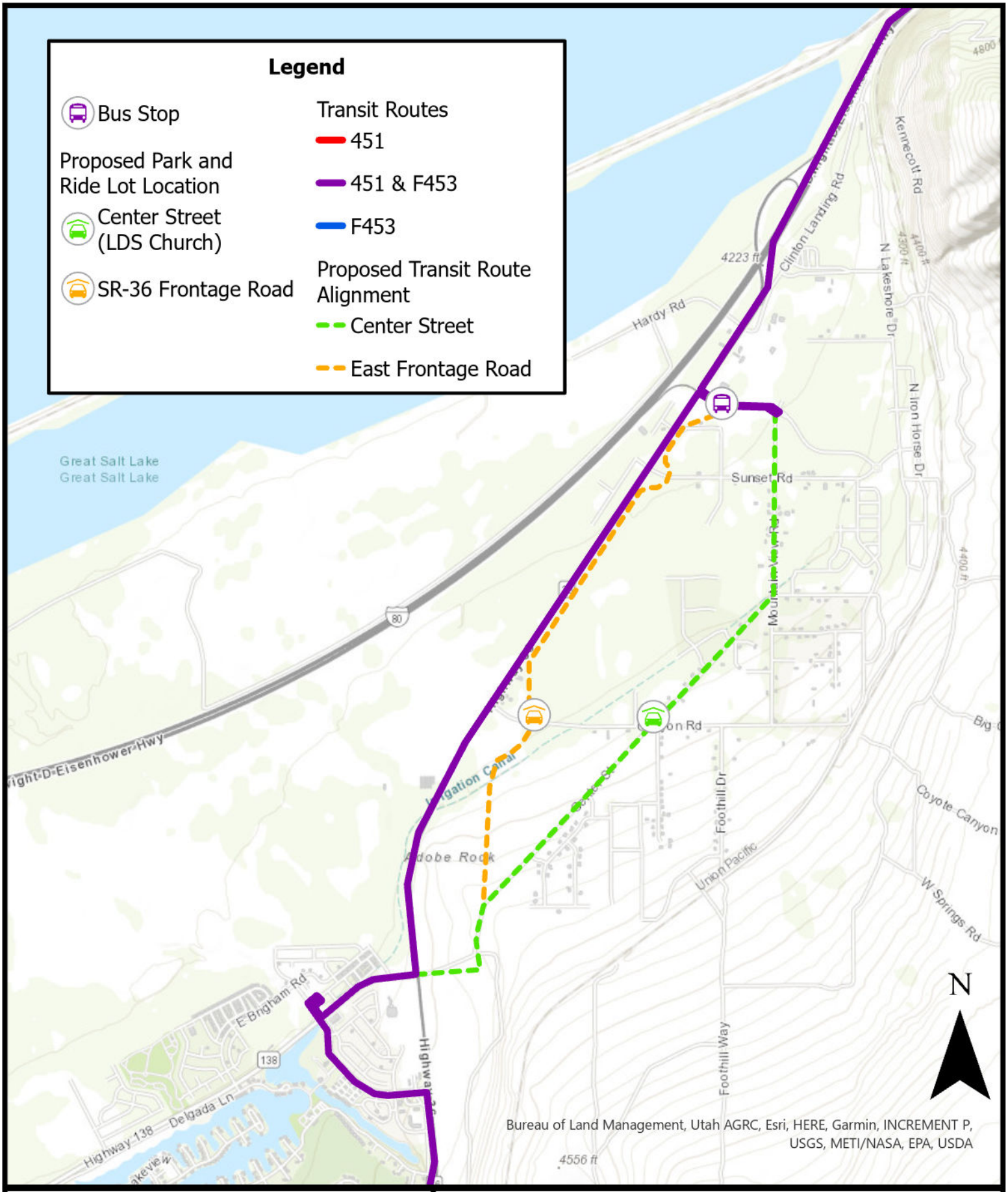
Active Transportation Map

Lake Point - Transportation Master Plan

Figure 20



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Public Transit Route Map

Lake Point - Transportation Master Plan

Figure 19

TRANSPORTATION SAFETY & POLICY

PURPOSE

The purpose of this chapter is to analyze the safety of the existing road network in Lake Point and to recommend improvements. In addition, potential traffic calming measures and access management strategies are presented.

SAFETY HOTSPOTS

This section addresses safety concerns at existing intersections in Lake Point City. Factors including crash history, sight distance, and intersection offset were examined to determine if any mitigations are needed to improve safety. Crash data are protected under 23 USC 409.

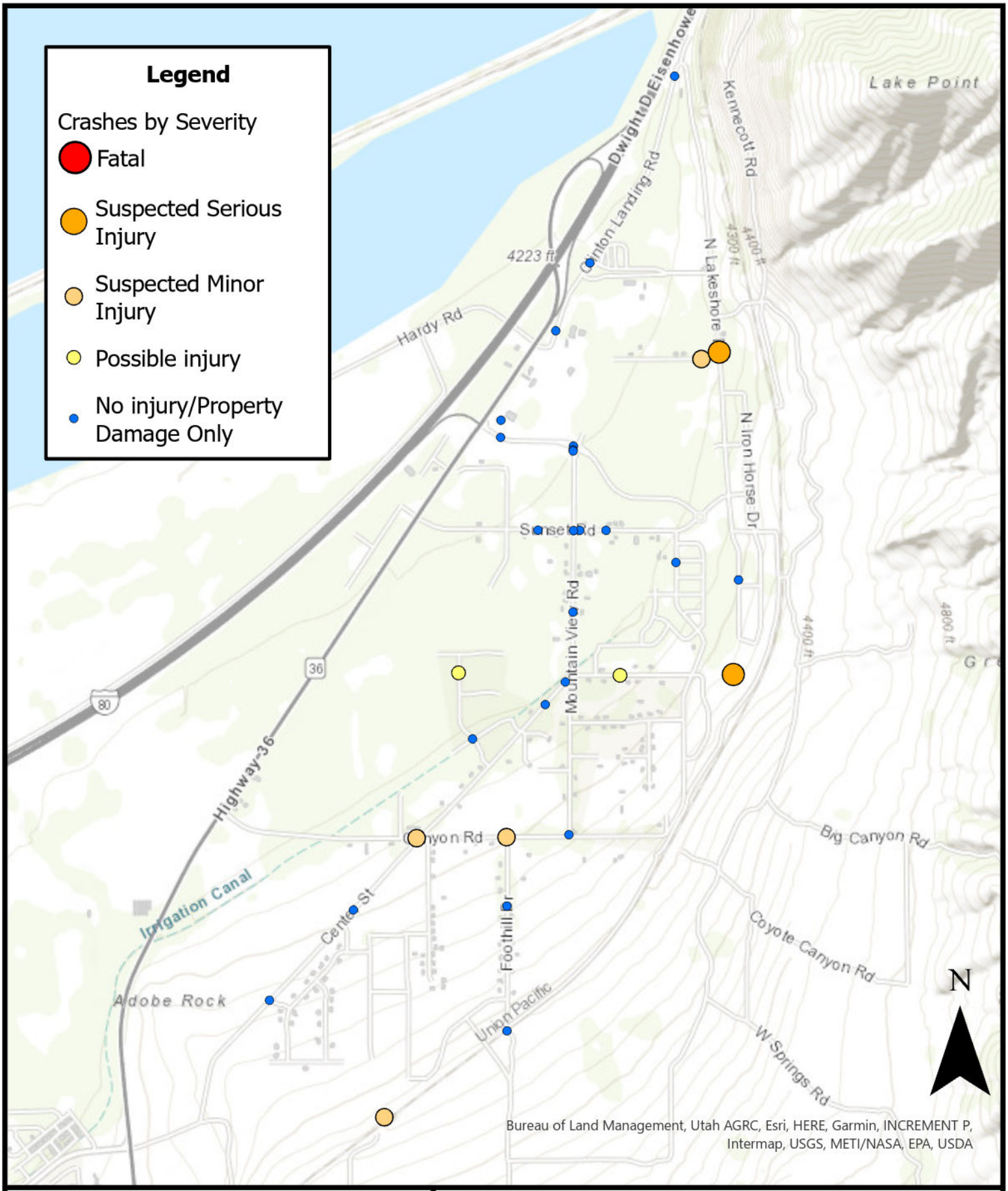
Most of the crashes reported within the limits of Lake Point are centered on SR-36 and its cross-streets. The intersections of Hardy Drive and Saddleback Boulevard have the most crashes reported. Sunset Road and Canyon Road are also common locations for crashes. Rear end crashes are common crash types on SR-36.

Outside of the SR-36 corridor, the number of crashes is too low to draw clear crash trends. However, many of these crashes share common characteristics. A number of crashes include ATVs and off-roading vehicles driving on dirt roads. A number of crashes include collisions with objects such as fences, poles , mailboxes, parked vehicles, trailers, wildlife, and domestic animals. Some of these crashes were a results of impaired driving, disregarding stop signs, or improper yielding in roundabouts. A map of the crashes from the previous 5 years within Lake Point, excluding the SR-36 corridor, is shown in Figure 21.

TRAFFIC CALMING

Traffic calming can involve measures to influence behavior or reduce the speed of vehicles on a given road or intersection. These can take the form of physical or non-physical measures, and a few examples are outlined below:

- Speed Enforcement
    - Targeted speed enforcement by local law enforcement agencies can have a significant impact on the prevailing speed in certain locations. Enforcement efforts can be targeted at specific locations at certain times of the day to encourage drivers to comply with the posted speed limit.
- Driver Feedback Signs
    - Driver feedback signs, can help drivers be more aware of their speed in relation to the posted speed limit. Driver feedback signs can be permanently mounted, temporary installations, or mounted on a trailer. In each case the current speed of the approaching vehicles is detected and shown on a digital display, along with the posted speed limit on a static display.



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Crash Analysis Map

Lake Point - Transportation Master Plan

Figure 21

- Lane Striping
    - Lane striping not only delineates the lane of travel but can also create a narrow feel on the roadway without narrowing the paved surface. The narrow feeling can encourage some drivers to reduce speeds. Lane striping can also be used to create bicycle lanes, parking spaces, or delineate other uses.

- Signage
    - The placement of signage such as speed limit signs or signs dictating various restrictions can be used for traffic calming purposes. Restriction type signs can include signs prohibiting trucks, turning movements, through movements, or others.
- Speed Legends
    - Speed legends consist of letters and numbers painted on the roadway surface, usually in conjunction with roadside mounted signs, indicating the posted speed limit.

- Traffic Circles
  - Traffic circles are raised islands, usually circular in shape, that are constructed in the center of an intersection. The presence of these features requires that vehicles slow down to navigate around the traffic circle.

- Roundabouts
  - A roundabout is like a traffic circle in that it features a circular center island. However, roundabouts are generally much larger and have raised islands on the approaches to divert traffic in the direction of the travel in the roundabout. Vehicles approaching a roundabout yield to traffic already in the roundabout. Due to the large footprint required to construct a roundabout, this traffic calming measure is generally unfeasible in established neighborhoods.

- Chicanes
  - Chicanes are short curb extensions or “edge islands” that alternate from one side of the road to the other on a roadway segment. These features required vehicles to “zig zag” slightly as they travel on the roadway, resulting in reduced speeds.

- Lateral Shifts
  - Like a chicane, a lateral shift requires traffic to shift to one side. However, with this countermeasure the lanes only shift once, and it usually occurs near an intersection approach.

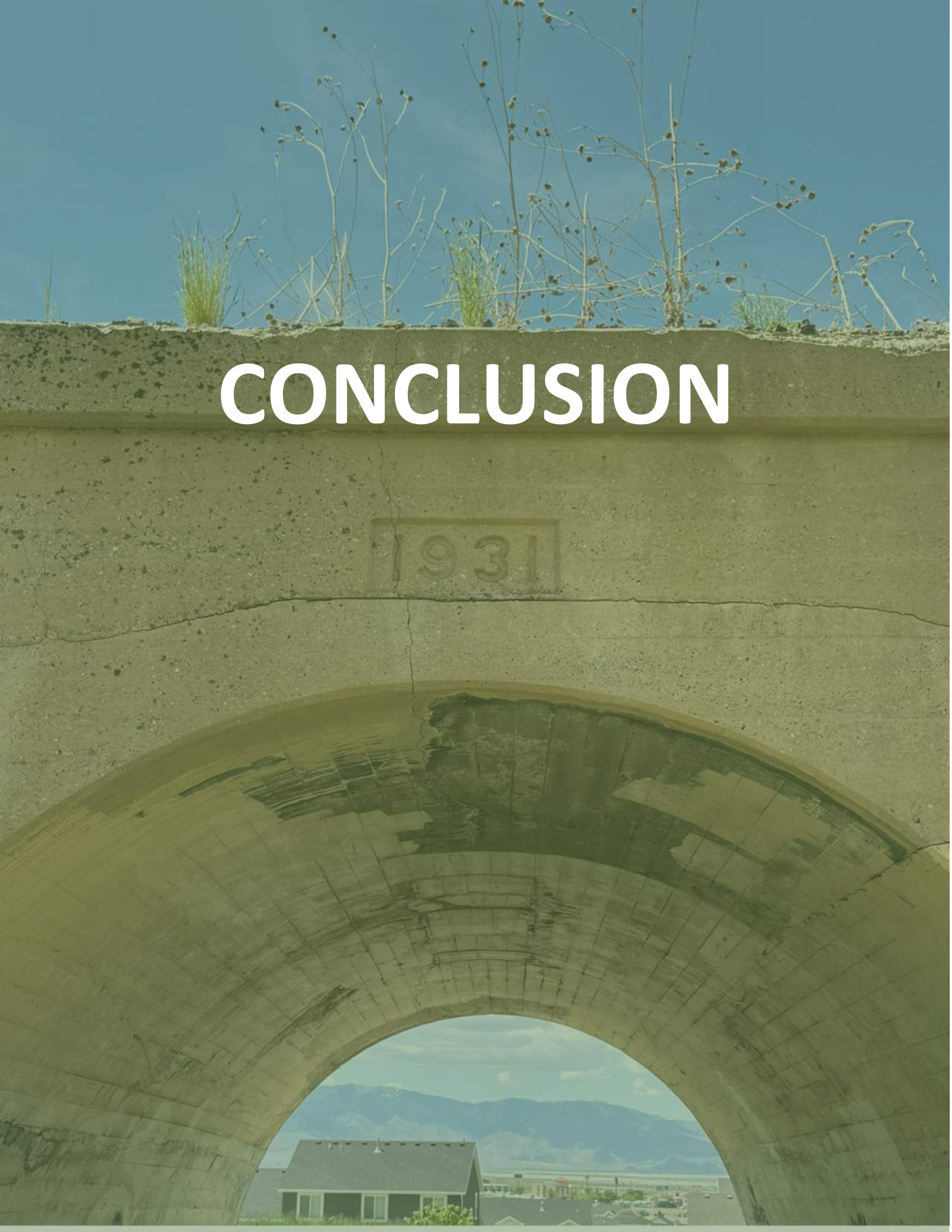
- Bulb-outs / Neckdowns
    - Bulb-outs / neckdowns are curb extensions at intersection approaches. These curb extension narrows the lane at the approach, shortens the curb radius, and results in lower speeds. Bulb-outs also shorten crossing time and distances for pedestrians.

- Chokers
    - Chokers are curb extensions that occur midblock, as opposed to bulb-outs / neckdowns which occur at intersections. Chokers create a narrowed traveled way, resulting in lower speeds.

- Raised Pedestrian Crossings
    - A raised pedestrian crossing is similar to a speed hump, but they are intended to be wide enough to allow for a pedestrian crossing. Their function is to slow traffic, decrease volumes and increase visibility of pedestrians.

TRAFFIC IMPACT STUDIES

Hales Engineering has developed traffic impact study (TIS) guidelines for Lake Point City to use going forward. While this TMP provides a high-level overview of transportation needs and projects, a traffic impact study provides greater detail for intersection operations and improvements near new development. By requiring these studies for future development, the City will know how a certain project will impact traffic flow and what improvements the developer may need to complete for their project to be built. The TIS guidelines are found in Appendix F.



CONCLUSION

OVERVIEW

The purpose of this TMP for Lake Point City is to plan for the future multi-modal transportation needs of Lake Point residents. The following tasks were completed as a part of this TMP:

- The land use and socioeconomic characteristics were reviewed and summarized.
- The functional classification of roadways was redefined.
- Data were collected to summarize the existing traffic volume conditions.
- Future volumes in full-build conditions were projected using development predictions from Lake Point City and standard rates published by ITE.
- A LOS analysis was performed to identify existing and future transportation needs.
- Improvements were recommended to support future growth.
- Locations for future roadways were identified.
- Truck routes on existing and future roadways were identified.
- The public transit opportunities of the City were discussed.
- Recommendations were given regarding active transportation facilities.
- Several transportation safety management strategies were outlined.

NEXT STEPS

It is recommended that the following steps be taken to implement the proposed improvements and recommendations of this study:

- Implement this TMP and pursue funding for roadway projects as needed.
- Require that the trip generation for all new developments be calculated to determine its impact on City roadways. With each new development that generates at least 100 peak hour trips, require that a traffic impact study be completed to analyze nearby intersections to determine needed improvements.
- Continue to communicate regularly with UDOT on current and future roadway improvement needs within the city.
- Work with UTA to extend public transportation options
- Work with the State's Office of Outdoor Recreation, Bike Utah, and other agencies to apply for grant funding to increase the number of trails and active transportation/recreation options for Lake Point City residents. Install bicycle and pedestrian friendly facilities (bike racks, water stations, etc) at key locations for public access.

APPENDIX A

Lake Point TAZ Data

APPENDIX B

Traffic Volume Data Collection

APPENDIX C

Public Survey Results

APPENDIX D

LOS and Queueing Results

APPENDIX E

Pavement and Drainage Assessment

ENSIGN
THE STANDARD IN ENGINEERING

Structural Engineering
Municipal Services
Civil Engineering
Land Surveying

December 13, 2024

Josh Gibbons
Hales Engineering
1220 North 500 West, Ste 202
Lehi, Utah 84043

RE: Pavement and Drainage Assessment
Lake Point Transportation Master Plan– Project No. 13334
Lake Point, Utah 84074

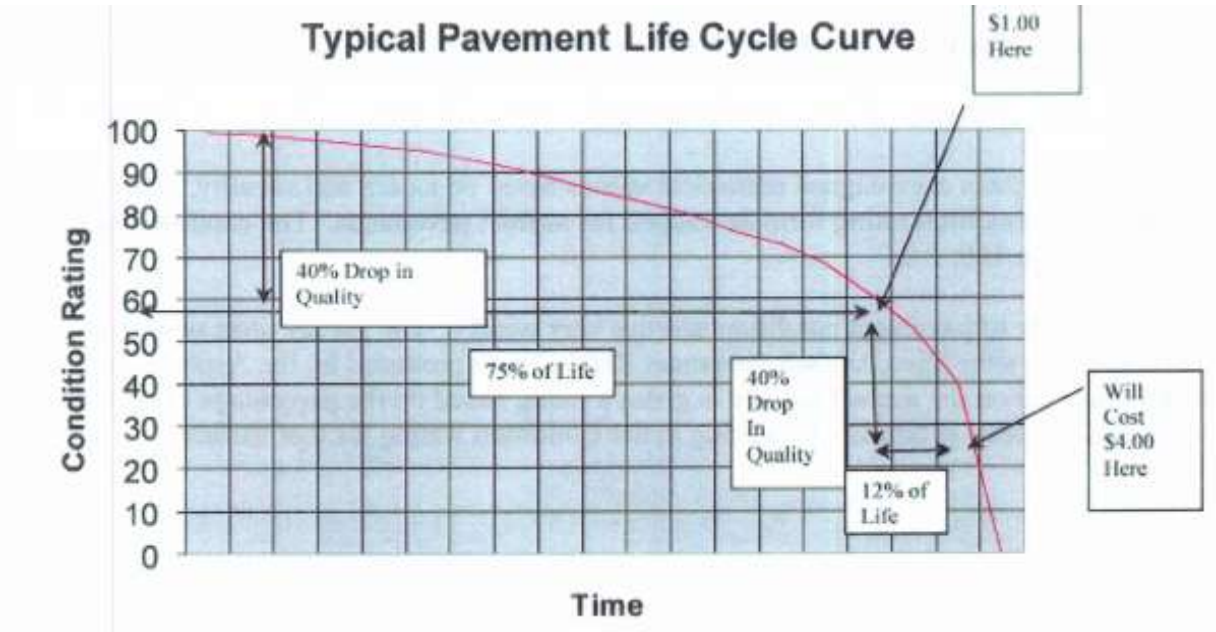
Dear Josh,

A pavement and drainage assessment were performed on September 30 and October 1, 2024 by Ensign Engineering. These evaluations were part of the project scope for the Master Transportation Plan, in conjunction with Hales Engineering. The assessment was an overview of all city roads within Lake Point City limits. The assessments were performed by observation of the condition of the asphalt pavement and drainage grading features.

Pavement Assessment

Ensign Engineering utilizes a Pavement Condition Index (PCI) numerical scale that rates pavement from 100 (best condition) to 0 (worst condition). This rating scale follows the Federal Highway Administration rating scale with some adaptation, based on our experience, that has proven over the years to show closer life cycles to pavements typically evaluated in the state of Utah. A pavement with a rating of 100 would be newly placed asphalt and a pavement with a rating of 0 would be an asphalt pavement with very little or no binder content (essentially gravel). Attached to this letter are the Asphalt Pavement Condition Rating for each street. The weighted average PCI for the City of Lake Point was 82.

The deterioration of typical pavement systems is graphically illustrated in Figure 1.



In general, pavements perform well for the first 75% of their life cycle, and then deteriorate rapidly for the remainder of the life cycle. The length of time a pavement remains above the "good" condition level depends on the quality and timing of maintenance. Theoretically, given consistent loading patterns, a pavement system can be maintained at a "good" condition level indefinitely by properly timed and qualitatively rehabilitation and maintenance operations.

Pavements fail in a variety of ways, and depending on their failure, a separate maintenance strategy should be performed. Table 1 illustrates pavement failures and the causes of those failures.

Table 1. Root Causes of Pavement Deterioration

DISTRESS TYPE	CAUSES				PROBABLE SOLUTION
	Structural/ Load	Durability/ Climate	Moisture/ Drainage	Construction Procedures/ Materials	
Alligator cracking	X		X		Deep patching
Shrinkage cracks		X			Crack seal
Rutting	X			X	Deep patching
Corrugations	X			X	Skin patching
Raveling		X			Seal Coat

Weathering/Oxidation		X		X	Rejuvenating agent Seal Coat
Shoving	X				Deep patching
Pot holes	X		X	X	Deep patching
Polished aggregate	X				Slurry seal
Bleeding				X	Surfacing
Swell		X	X		Deep patching
Depressions		X	X	X	Patching

Statistically, maintaining facilities at levels at or above the routine maintenance limit (refer to Figure 1); cost 3 to 4 times less than rehabilitating facilities which slip into the overlay/patch or reconstruction levels.

A map of the City streets and their associated rating has been included at the end of this report. It identified the road sections that were rated and is color coded to signify their associated rating. Each road section was rated separately. Those rating sheets are also included at the end of this report. The Roads with condition ratings less than 65 will be further described.

Cobble Rock North of Stoney Mountain Dr. – Major concerns in this roadway included Alligator Cracking and Raveling. This may be due to poor base course compaction. A sealcoat could be applied to help bind the pavement together, but this may be a temporary solution and sawcut and patch may be the long-term solution.

Foothill Dr. – Major concerns in this roadway included Alligator Cracking and some other smaller failures. Due to the age of this road, it is difficult to determine a cause associated with this failure. A sealcoat could be applied to help bind the pavement together, but this may be a temporary solution and sawcut and patch may be the long-term solution.

Saddleback Blvd from SR-36 to Second Roundabout – Major concerns in this roadway included Alligator Cracking, Shrinkage, Transverse and Longitudinal Cracking and some other smaller failures. This is likely due to the high volume and heavy loaded traffic on this road. A crack seal and sealcoat could be applied to help bind the pavement together, but this may be a temporary solution and sawcut and patch or complete repave may be the long-term solution.

Sage Lane, Meadowlark Ln. – Major concerns in this roadway included overall poor performance. An exact reason for these failures is not known, but could be due to the initial road construction being insufficient. It is possible that the pavement section is multiple layers of chip seals and the necessary base course was never placed. A sealcoat could be applied to help bind the pavement together, however as development occurs on this roadway it is recommended that they be required to repave the sections of the road as they are developed.

Boulder Dr., Pebble Cir. – Major concerns in this roadway included Overall poor performance. Because this is not a primary roadway, it could have been a low priority road for maintenance. A crack seal and sealcoat could be applied to help bind the pavement together. The road will have to be further evaluated for ongoing repair.

Shepard Ln. – Major concerns in this roadway included overall poor performance. An exact

reason for these failures is not known, but could be due to the initial road construction being insufficient. It is possible that the pavement section is multiple layers of chip seals and the necessary base course was never placed. A sealcoat could be applied to help bind the pavement together. The road will have to be further evaluated for ongoing repair.

Center Street north of Canyon Rd. – Major concerns in this roadway included overall poor performance. The failure of this roadway is likely due to heavier traffic loading than its original design intended. Since Center Street acts as a bypass road when SR-36 fails, a significant amount of traffic is seen on this roadway that probably was not anticipated. A sealcoat could be applied to help bind the pavement together. The road will have to be further evaluated for ongoing repair, but it may be necessary to completely demolish and rebuild this roadway.

Drainage Assessment

Our project scope also included a high-level drainage analysis related to the roadways. We did not review the overall drainage system of the city and would anticipate that would be covered in a stormwater master plan. Our drainage assessment was looking at roadway drainage. Pavement that does not have adequate drainage perform poorly over time as the sub-surface materials break down and erode away.

Roadways are generally designed with a crown or high point in the middle with a 2% to 4% slope down to the shoulders. At the shoulders this is where the variety of drainage options is implemented. The roadway drainage systems identified in Lake Point included the following three drainage options. 1. curb & gutter with catch basins and storm drain pipe; 2. Roadways with swells and driveway culverts; and 3. roadways without swells along them. Where there were catch basins and storm drain pipes, we did not evaluate the catch basin or pipe quality or capacity. We will further describe each drainage system below and the current performance and associated future maintenance and risks.

1. The typical curb and gutter systems observed were generally on new roadway areas. In these locations, the pavement systems proved to have no major drainage issues visible. The drainage in subdivision with curb and gutter appeared to have little to no major pooling on road surfaces. These roads appeared to have adequate cross slopes to properly convey storm water runoff. Drainage systems for these roadway types should be reviewed annually to make sure that gutters and catch basins are not blocked by debris. Catch basins should also be visually inspected and cleaned as necessary. Over time they can fill with sediment. Storm drain piping should also be visually inspected. This may have to be done by a specialty company with the appropriate video equipment. Storm drain pipe outlets should be kept clear so they are not blocked or restricted.
2. Roadways with swells along them were on both newer roadways and older roadways. Our observation identified some areas to have poor drainage conveyance from the edge of the pavement to the swells. The lack of adequate forward slope grading from the shoulder of the road may cause pooling on the edge of asphalt. The integrity of the swells throughout the city appeared to be adequate but as mentioned it appears storm runoff may not reach the swells in some areas. The majority of the roads appeared to be properly crowned to shed storm runoff and very few appeared to have little to no crown. Our observation of the roads with swells conclude insufficient shoulder grade will prematurely deteriorate the edge of asphalt. Non paved shoulder areas should have a cross slope of 4% to 10% slope. These shoulders need to be periodically reviewed to make sure the shoulder material is not eroding away from the pavement. This condition will cause edge failure of the pavement. There may be locations where the swells along roadways do not have

sufficient slope to direct water to retention ponds or away from roadways. Specifically, where retention ponds are on private lots with easements, such as the Bridlewalk Acres subdivision. These shoulder conditions and retention ponds should be reviewed periodically to make sure they are not altered by the lot owner.

3. Roadways without swells along them were isolated to older roadway areas. These roadways included the drainage conditions that were the highest risk of failure. Some of these roadways also did not have adequate crown or cross slope in the roadways. In conditions where water did run off of the pavement to the shoulders, water potentially will pool or run along the edges of the roadway. Pooling of water will cause a breakdown and erosion of sub surface pavement sections. This is potentially the biggest concern on roads with little running slope of the roadway. Water running along the edges of the roadway will erode and break down the edges of the road. This is potentially the biggest concern in areas where the running slope of the road is moderate or high. Consideration should be given to adding drainage swells along the edge of these roadways. A positive slope (4% minimum) should be maintained for at least 5 feet away from the edge of the roadway and verify that standing water will not pool in isolated areas. Also, the shoulders need to be maintained so that aggregate and soil adjacent to the road does not erode away. This can cause instability along the edge of the pavement and can cause the pavement along the edge to fail.

Road shoulder on Sunset Road

The following pages include the Asphalt Conditions Rating. These could be used to plan, budget and schedule for roadway maintenance. If you have any questions concerning the information noted above, feel free to contact us at any time.

Sincerely,

Jared Cid, EIT
Assistant Project Manager

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER
12-13-2024
5150016-2202
BRADEN D. MORRIS
STATE OF UTAH

Brady Morris, PE
Principal / Project Manager

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LAKE POINT CITY

Asphalt Pavement Condition Rating

LOCATION:	Cobble Rock South of Stoney Mnt Dr
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	4
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	3
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	1
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	0
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	4
	Sum of Defects:	**12**
Comments:		
	Condition Rating:	**88**

SALT LAKE CITY
45 West 10000 South, Suite 500
Sandy UT 84070
P 801.255.0529 F 801.255.4449

LAYTON
1485 W Hillfield Road Ste 204
Layton UT 84041
P 801.547.1100 F 801.593.6315

CEDAR CITY
1870 North Main Street
Cedar City UT 84721
P 435.865.1453 F 435.865.7318

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Tooele UT 84074
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LAKE POINT CITY

Asphalt Pavement Condition Rating

LOCATION:	Cobble Rock North of Stoney Mnt Dr
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	15
Shrinkage, Transverse and Longitudinal Cracking	0-10	0
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	10
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	5
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	5
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	5
	Sum of Defects:	**40**
Comments:		
	Condition Rating:	**60**

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LAKE POINT CITY

Asphalt Pavement Condition Rating

LOCATION:	Foothill Dr
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	15
Shrinkage, Transverse and Longitudinal Cracking	0-10	3
Rutting	0-100	0
Corrugation	0-10	2
Raveling	0-10	4
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	5
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	6
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	10
	Sum of Defects:	**45**
Comments:		
	Condition Rating:	**55**

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Sandy UT 84070
P 801.255.0529 F 801.255.4449

LAYTON
1485 W Hillfield Road Ste 204
Layton UT 84041
P 801.547.1100 F 801.593.6315

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1870 North Main Street
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Asphalt Pavement Condition Rating

LOCATION:	Adobe Rock Rd
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	4
Shrinkage, Transverse and Longitudinal Cracking	0-10	5
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	5
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	6
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	5
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**25**
Comments:		
	Condition Rating:	**75**

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Sandy UT 84070
P 801.255.0529 F 801.255.4449

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1485 W Hillfield Road Ste 204
Layton UT 84041
P 801.547.1100 F 801.593.6315

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P 435.865.1453 F 435.865.7318

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Asphalt Pavement Condition Rating

LOCATION:	Canyon Rd
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	6
Shrinkage, Transverse and Longitudinal Cracking	0-10	2
Rutting	0-100	0
Corrugation	0-10	3
Raveling	0-10	1
Shoving	0-100	0
Potholes	0-100	3
Polished Aggregate	0-10	2
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	3
Depressions	0-10	2
Deficient Drainage	(0-5,10,15)	4
	Sum of Defects:	**26**

Comments: Road condition changes as you approach SR-36, more alligator cracking.

Condition Rating: 74

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Layton UT 84041
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Asphalt Pavement Condition Rating

LOCATION:	1200 East, Ridge Rd, Black Rock Rd, Lake Point Rd, Highline Rd,
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	4
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	4
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	5
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	5
Depressions	0-10	3
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**21**
Comments:		
	Condition Rating:	**79**

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Sandy UT 84070
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Asphalt Pavement Condition Rating

LOCATION:	Adobe Rock Dr, Canyon View Rd, Lake View Dr, Blue Moon Dr, Carlson Ct
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	1
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	1
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	5
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	4
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**11**
Comments:		
	Condition Rating:	**89**

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Sandy UT 84070
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1485 W Hillfield Road Ste 204
Layton UT 84041
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Asphalt Pavement Condition Rating

LOCATION:	Sunset Rd
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	6
Shrinkage, Transverse and Longitudinal Cracking	0-10	2
Rutting	0-100	9
Corrugation	0-10	0
Raveling	0-10	4
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	5
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	3
Depressions	0-10	2
Deficient Drainage	(0-5,10,15)	3
	Sum of Defects:	**34**
Comments:		
	Condition Rating:	**66**

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45 West 10000 South, Suite 500
Sandy UT 84070
P 801.255.0529 F 801.255.4449

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1485 W Hillfield Road Ste 204
Layton UT 84041
P 801.547.1100 F 801.593.6315

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P 435.865.1453 F 435.865.7318

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Asphalt Pavement Condition Rating

LOCATION:	Tram Rock, Mine Rock, Rich Rock, Monument Rock, High Rock, Round Rock, Rock Hollow, Park Meadow
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	3
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	0
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	2
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	6
Oxidation (aging)	0-10	1
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**12**
Comments:		
	Condition Rating:	**88**

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Sandy UT 84070
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1485 W Hillfield Road Ste 204
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P 801.547.1100 F 801.593.6315

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LAKE POINT CITY

Asphalt Pavement Condition Rating

LOCATION:	Clinton Laning Rd
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	2
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	8
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	7
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	2
Oxidation (aging)	0-10	3
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	1
	Sum of Defects:	**23**
Comments:		
	Condition Rating:	**77**

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LAKE POINT CITY

Asphalt Pavement Condition Rating

LOCATION:	Lakeshore Extra North
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	4
Rutting	0-100	0
Corrugation	0-10	2
Raveling	0-10	5
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	7
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	8
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	2
	Sum of Defects:	**28**
Comments:		
	Condition Rating:	**72**

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45 West 10000 South, Suite 500
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P 801.255.0529 F 801.255.4449

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LAKE POINT CITY

Asphalt Pavement Condition Rating

LOCATION:	Lakeshore North
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	0
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	1
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	2
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	2
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**5**

Comments: New Road; seal coat needed.

Condition Rating: 95

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45 West 10000 South, Suite 500
Sandy UT 84070
P 801.255.0529 F 801.255.4449

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LAKE POINT CITY

Asphalt Pavement Condition Rating

LOCATION:	Lakeshore South
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	2
Rutting	0-100	0
Corrugation	0-10	1
Raveling	0-10	2
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	1
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	2
Oxidation (aging)	0-10	1
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**9**

Comments:

Condition Rating:	**91**

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Asphalt Pavement Condition Rating

LOCATION:	Iron Horse Dr. South
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	3
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	2
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	2
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	1
Oxidation (aging)	0-10	2
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**10**

Comments:

Condition Rating: 90

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Asphalt Pavement Condition Rating

LOCATION:	Sheep Rock Trail
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	2
Rutting	0-100	0
Corrugation	0-10	1
Raveling	0-10	0
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	1
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	1
Oxidation (aging)	0-10	0
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**5**

Comments: Recent Seal Coat

Condition Rating: 95

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Asphalt Pavement Condition Rating

LOCATION:	Iron Horse Dr. North
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	1
Rutting	0-100	0
Corrugation	0-10	1
Raveling	0-10	2
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	1
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	1
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**6**

Comments: Recent Seal Coat

Condition Rating: 94

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Asphalt Pavement Condition Rating

LOCATION:	Pheasant Ln
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	0
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	1
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	2
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	2
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**5**

Comments: New Road; seal coat needed.

Condition Rating: 95

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Asphalt Pavement Condition Rating

LOCATION:	Antonio Dr, Burger St, Denton Ave, Dolan Dr, Halloran Ct, Weston Way, Tiffany Ln, Ezra St, Shelby Rd, Colette St
SURVEY DATE:	September 30, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	1
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	0
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	1
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	1
Oxidation (aging)	0-10	1
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**4**

Comments: New Neighborhood

Condition Rating:	**96**

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Asphalt Pavement Condition Rating

LOCATION:	Saddleback Blvd from SR-36 to Second Roundabout
SURVEY DATE:	October 1, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	15
Shrinkage, Transverse and Longitudinal Cracking	0-10	7
Rutting	0-100	3
Corrugation	0-10	3
Raveling	0-10	3
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	5
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	2
Oxidation (aging)	0-10	4
Depressions	0-10	1
Deficient Drainage	(0-5,10,15)	4
	Sum of Defects:	**47**
Comments:		
	Condition Rating:	**53**

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Asphalt Pavement Condition Rating

LOCATION:	Davies Place
SURVEY DATE:	October 1, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	0
Rutting	0-100	0
Corrugation	0-10	1
Raveling	0-10	1
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	4
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	2
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	6
	Sum of Defects:	**14**

Comments: Road in good condition but road has no crown and asphalt end had no forward slope for proper drainage.

Condition Rating: **86**

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Asphalt Pavement Condition Rating

LOCATION:	Sage Ln, Meadow Lark Ln
SURVEY DATE:	October 1, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	3
Shrinkage, Transverse and Longitudinal Cracking	0-10	4
Rutting	0-100	0
Corrugation	0-10	2
Raveling	0-10	8
Shoving	0-100	0
Potholes	0-100	1
Polished Aggregate	0-10	7
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	0
Oxidation (aging)	0-10	8
Depressions	0-10	1
Deficient Drainage	(0-5,10,15)	10
	Sum of Defects:	**44**
Comments:		
	Condition Rating:	**56**

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Asphalt Pavement Condition Rating

LOCATION:	Burten Dr.
SURVEY DATE:	October 1, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	2
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	1
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	4
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	2
Oxidation (aging)	0-10	2
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**11**
Comments:		
	Condition Rating:	**89**

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Asphalt Pavement Condition Rating

LOCATION:	Parker Ln, Parker Ct, Strasser Ct, Coreys Way, Coreys Ct, Spring Valley Ln
SURVEY DATE:	October 1, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	0
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	3
Shoving	0-100	0
Potholes	0-100	5
Polished Aggregate	0-10	0
Bleeding	0-10	0
Swell	0-10	10
Patching	(0-5,10,15)	3
Oxidation (aging)	0-10	0
Depressions	0-10	2
Deficient Drainage	(0-5,10,15)	0
	Sum of Defects:	**23**

Comments: Several MH patched.

Condition Rating:	**77**

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Asphalt Pavement Condition Rating

LOCATION:	Cluff Ln, Briddle Walk, Owens Cove, Spring Ct, Ila Ct
SURVEY DATE:	October 1, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	2
Shrinkage, Transverse and Longitudinal Cracking	0-10	6
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	2
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	4
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	2
Oxidation (aging)	0-10	4
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	2
	Sum of Defects:	**22**
Comments:		
	Condition Rating:	**78**

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Asphalt Pavement Condition Rating

LOCATION:	Boulder Dr, Peble Cir
SURVEY DATE:	October 1, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	5
Shrinkage, Transverse and Longitudinal Cracking	0-10	4
Rutting	0-100	0
Corrugation	0-10	5
Raveling	0-10	3
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	5
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	5
Oxidation (aging)	0-10	5
Depressions	0-10	2
Deficient Drainage	(0-5,10,15)	2
	Sum of Defects:	**36**
Comments:		
	Condition Rating:	**64**

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Asphalt Pavement Condition Rating

LOCATION:	Stoney Mountain Rd
SURVEY DATE:	October 1, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	0
Shrinkage, Transverse and Longitudinal Cracking	0-10	4
Rutting	0-100	0
Corrugation	0-10	5
Raveling	0-10	3
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	5
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	5
Oxidation (aging)	0-10	5
Depressions	0-10	2
Deficient Drainage	(0-5,10,15)	2
	Sum of Defects:	**31**
Comments:		
	Condition Rating:	**69**

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Asphalt Pavement Condition Rating

LOCATION:	Shepard Ln
SURVEY DATE:	October 1, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	8
Shrinkage, Transverse and Longitudinal Cracking	0-10	6
Rutting	0-100	0
Corrugation	0-10	0
Raveling	0-10	3
Shoving	0-100	0
Potholes	0-100	0
Polished Aggregate	0-10	7
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	2
Oxidation (aging)	0-10	4
Depressions	0-10	0
Deficient Drainage	(0-5,10,15)	5
	Sum of Defects:	**35**
Comments:		
	Condition Rating:	**65**

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Asphalt Pavement Condition Rating

LOCATION:	Center St North of Canyon Rd
SURVEY DATE:	October 1, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	6
Shrinkage, Transverse and Longitudinal Cracking	0-10	5
Rutting	0-100	4
Corrugation	0-10	0
Raveling	0-10	4
Shoving	0-100	0
Potholes	0-100	5
Polished Aggregate	0-10	5
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	5
Oxidation (aging)	0-10	4
Depressions	0-10	2
Deficient Drainage	(0-5,10,15)	2
	Sum of Defects:	**42**
Comments:		
	Condition Rating:	**58**

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Asphalt Pavement Condition Rating

LOCATION:	Center St South of Canyon Rd to City Limit
SURVEY DATE:	October 1, 2024

DEFECTS		**RATING**
Alligator Cracking	0-100	3
Shrinkage, Transverse and Longitudinal Cracking	0-10	5
Rutting	0-100	2
Corrugation	0-10	0
Raveling	0-10	4
Shoving	0-100	0
Potholes	0-100	3
Polished Aggregate	0-10	4
Bleeding	0-10	0
Swell	0-10	0
Patching	(0-5,10,15)	4
Oxidation (aging)	0-10	4
Depressions	0-10	2
Deficient Drainage	(0-5,10,15)	2
	Sum of Defects:	**33**
Comments:		
	Condition Rating:	**67**

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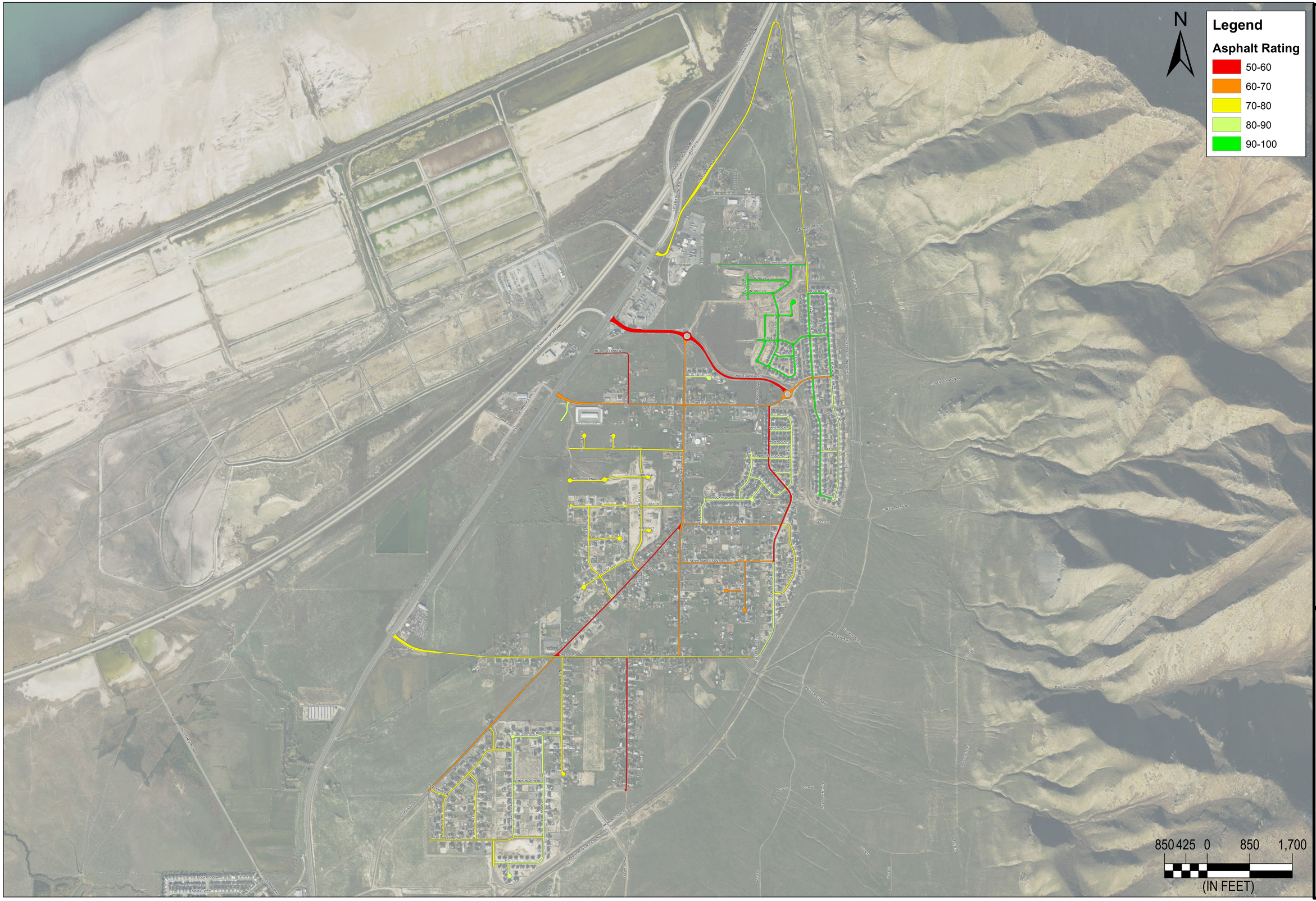

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1528 SUNSET RD
LAKE POINT, UT 84074
CONTACT:
CONTACT CLIENT
PHONE: 801-725-5096
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LAKE POINT TRANSPORTATION MASTER PLAN

LAKE POINT, UTAH

NO.	DATE	REVISION	BY
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OVERALL APHALT RATING

PROJECT NUMBER: XXXX
PRINT DATE: 11/21/2024
DRAWN BY: XXXX
CHECKED BY: XXXX
PROJECT MANAGER: XXXX

EX-100

APPENDIX F

Traffic Impact Study Guidelines

Trip Generation & Traffic Impact Study Guidelines

Lake Point City

Introduction

This document outlines the traffic impact study (TIS) requirements for the City. The purpose of this document is to guide City staff and traffic consultants in knowing how to scope traffic studies for new development within the City. The guidelines in this document were based on Utah Department of Transportation (UDOT) and Institute of Transportation Engineers (ITE) guidelines.

Application Submittal and Review

Prior to submitting a site plan or subdivision application to the City, the applicant should meet with the City's Development Review Committee where they will provide information about the nature and location of the development. Required information will include but may not be limited to:

- Location of development
- Land use type (e.g. single-family or multi-family housing, office, retail, mixed-use, etc.)
- Land use intensity (e.g. unit count, square footage)
- Proposed access points

Based on the information submitted by the applicant, City staff will decide which level of traffic study is required and the boundaries of the study area. Prior to the traffic study beginning, the applicant should contact City Staff to identify the scope of the traffic study. Additional items required for this study will be identified by the City which could include a request for ADT counts, speed data collection / evaluation, intersection sight distance review, traffic control review, etc.

Trip Generation

A trip represents a vehicle entering or exiting a project site. Trip generation is determined using the ITE *Trip Generation* manual, which contains trip rates for land uses based on actual counts of trips at various study sites around the United States. The latest *Trip Generation* manual should be used to calculate new trips for a development (currently 11th Edition, 2021). After calculating the trip generation, all trip counts should be rounded up to a whole number.

The ITE *Trip Generation* data provides an average trip rate per an independent variable (e.g. units, square feet) that can be used. If there are several data points for a land use, ITE also provides a fitted curve equation, which is either a linear or logarithmic equation that may provide a more accurate estimate of new trips for a development. The fitted curve equation is reported with a coefficient of determination (R^2) value, which is a value between 0 and 1 that indicates how well the equation fits the data points, with "1" representing a great fit. If the data provided by ITE is not good, the traffic engineer may need to collect local trip data.

The following are various considerations that should be made when determining whether to use the fitted curve equation, the average rate, or local trip data for traffic studies (see ITE *Trip Generation* Handbook, Chapter 4 for more details):

Use the fitted curve equation when:

- A matching ITE land use has at least 20 data points
- OR the R^2 value is at least 0.75

Use the average rate when:

- A matching ITE land use has at least three (and preferably six) data points and the fitted curve equation is not appropriate
- AND the standard deviation is less than 55 percent of the average rate value

Use local trip data when:

- The development land use is unique and does not match any ITE land uses
- OR a matching ITE land use has less than three (and preferably six) data points
- OR if neither the average rate line nor fitted curve fall within the data cluster
- OR the size of development is outside the range of land use sizes in the ITE data

In addition to the above considerations, the engineer should also visually observe where a development fits along the trip generation average rate line or fitted curve to see that the line/curve falls within the cluster of data points of that particular development size. For example, if the fitted curve is deemed appropriate based on data points or the R^2 value but the average rate line fits the data cluster better for that development size, the average rate may be a better option, or vice versa.

Certain developments may experience a reduced new trip generation number due to the nature of the project. The following are the trip reductions that should be considered in trip generation and traffic impact studies based on standard ITE methodologies:

- Pass-by trips: Trips made to a development on the way to an existing destination
- Multi-modal: Trips made via non-vehicle modes such as transit, walking, and biking
- Mixed-use internal capture: Trips made within the development itself due to a mix of uses

For commercial and office space, the City requires that square footage be used as the independent variable to calculate trips, as opposed to using number of employees or other variables. This will help ensure a conservative calculation of trips for a development that will be valid even if the tenant changes in the future.

If an applicant believes they will generate less trips than the average similar land use, a professional traffic operations engineer (PTOE) can complete a local trip generation study based on trip counts and square footages of at least two similar sites along the Wasatch Front.

Traffic Study Levels

Small developments may not need a full TIS but may still be required to submit a trip generation study (TGS) prior to City approval. A TGS includes a description of the project and a calculation of the anticipated trip generation. In addition to the elements of a TGS, a TIS includes level of service (LOS) analyses for study intersections for the current year and potentially future years and recommendations to mitigate poor levels of service. For the City, the acceptable LOS threshold is LOS D.

A development that is anticipated to generate at least 25 new peak hour trips requires a TIS. A development that generates less than 25 new peak hour trips only requires a TGS. General thresholds of 25 peak hour trips for various common land uses are provided in Table 1.

Table 1: General 25 Peak Hour Trip Thresholds

Land Use	ITE Code(s)	≥ 25 Peak Hour Trips
Light Industrial / Manufacturing	110, 140	50,000 sq. ft. GFA
Warehousing	150	150,000 sq. ft. GFA
Mini-Warehouse (Self-Storage)	151	150 storage units
Single-Family Detached Housing	210	25 dwelling units
Single-Family Attached Housing (Townhomes)	215	40 dwelling units
Multifamily: Condo/Apartment	220	50 dwelling units
Mobile Home Park	240	50 dwelling units
Assisted Living	254	100 beds
Hotel	310	*Any Size*
General Office	710	15,000 sq. ft. GFA
Medical / Dentist Office	720	7,000 sq. ft. GFA
Shopping Center	820	5,000 sq. ft. GLA
Bank	911 - 912	*Any Size*
Restaurant	930 - 935	*Any Size*
Gas Station / Convenience Store	944 - 945	*Any Size*

If a TIS is required, City staff will select the level of TIS to be completed based on the anticipated trip generation. At the smallest TIS level (level II), only an analysis of the current or opening year with and without the project is required. At the highest TIS level (level IV), future analyses up to 20 years out with and without the project are also required. A summary of each traffic study level, with its associated peak hour trip thresholds and horizon years, is shown in Table 2. A flowchart to help determine the traffic study level is also shown in Figure 1.

Table 2: Study Horizon Years by Level

Study Level		New Peak Hour Trips	TIS Horizon Year(s)
TGS	I	< 25	N/A
TIS	II	≥ 25 - 100	Current / Opening Year
	III	≥ 100 - 500	Current / Opening Year, + 5 years
	IV	≥ 500	Current / Opening Year, + 5 years, + 20 years

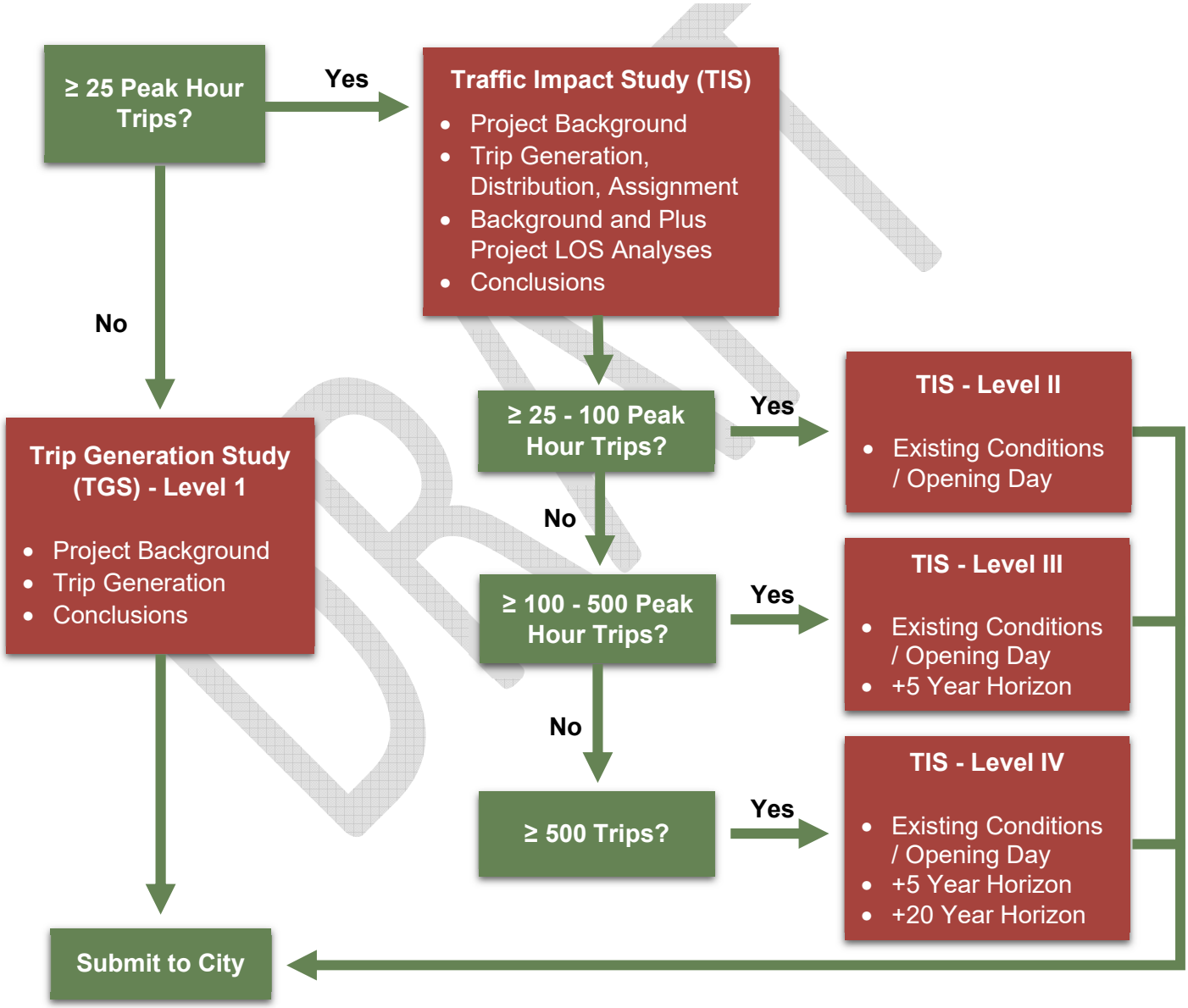

Figure 1: Traffic study flowchart

Study Area

The study area to be analyzed in a TIS also depends on the size of the development. Large developments may impact intersections miles away while small developments may have minimal impacts on adjacent roadways. The **minimum** required study areas for each TIS level are provided in Table 3. City staff may request additional intersections as needed.

In general, each TIS will include an analysis of the project accesses and nearby major intersections. Major intersections are defined as signalized or unsignalized intersections of two public roadways that are anticipated to be used by project traffic. This does not include minor intersections or other accesses or private roadways near the project, unless requested by the City. However, if a minor intersection is an existing access to the site or located across from an existing or proposed project access, it should be included in the analysis.

Table 3: TIS Study Areas by Level

Study Level	Study Area
II	Project Accesses & Closest Major Intersections
III	Project Accesses & Major Intersections within ¼ Mile
IV	Project Accesses & Major Intersections within ½ Mile

Report Elements

The following sections outline the elements that should be included in the TGS and TIS reports:

TGS Elements

Each TGS report will be required to contain at minimum the following elements:

- Project Background:
  - Identify the project site location, development type, and site access drives
- Trip Generation:
  - Calculate trip generation for the development according to ITE standards
- Conclusions:
  - State the key findings and recommendations of the TGS in a concise manner

TIS Elements

Each TIS report will be required to contain at minimum the following elements:

- Traffic studies should be completed by a licensed professional engineer (PE) with a Professional Traffic Operation Engineer (PTOE) certificate
- The study should be stamp and signed by the PE / PTOE engineer
- Executive Summary:
  - Include a concise summary at the beginning of the report with the key assumptions, findings, and recommendations of the TIS

- Study Area:
  - Identify the existing nearby roadways and intersections including roadway classifications, intersection control, and speed limits
- Data Collection:
  - Collect at minimum peak hour turning movement counts at the study intersections and potentially daily volumes if requested by staff
  - Normally collect morning (7-9 AM) and evening (4-6 PM) peak hour counts unless the study area and/or development will have different peak hours (e.g. schools)
- Analysis Period:
  - Identify the study peak hour based on existing counts and the proposed trip generation; at minimum, the highest peak hour should be analyzed
  - City staff may request that multiple peak hours be analyzed
- Project Background:
  - Identify project site location, development type, project phasing, site access drives and nearby intersections to be affected by the development
- Access and Auxiliary Lanes:
  - Identify the location and configuration of each access drive to the site and the need to add auxiliary lanes (deceleration and acceleration turn lanes)
- Trip Generation:
  - Calculate trip generation according to ITE standards and apply reductions when applicable
- Trip Distribution and Assignment:
  - Document the distribution and assignment of project trips for each horizon year
- Capacity Analysis:
  - Calculate delay, LOS, and queuing results for all study intersections in the study area for existing background (without project) conditions, existing plus project conditions, future background conditions, and future plus project conditions (if required by the study level)
  - Complete this analysis using Synchro/SimTraffic, Vistro, or VISSIM software
  - Report LOS of whole intersection for signalized, roundabout, and all-way stop intersections, and report LOS of worst movement for other intersections
- Proposed Mitigations:
  - Identify proposed mitigations to roadway and intersection characteristics in the study area based on the LOS and queueing results
  - Clearly show whether these mitigations are caused by background or site-generated traffic
- Exhibits:
  - Include figures showing peak hour turning movement volumes used in the analysis for each scenario, including trip assignment volumes
  - Include figures or reports that show the assumed lane configurations
  - Include tables or figures that show the LOS at each intersection for each scenario
- Appendices:
  - Include raw traffic count data
  - Include capacity analysis and queueing reports for each scenario
  - Include a site or concept plan of the development if available