SARATOGA SPRINGS

TRANSPORTATION MASTER PLAN

2022

CITY OF SARATOGA SPRINGS

avenue CONSULTANTS

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1 executive summary

Saratoga Springs was incorporated in December of 1997 and became a city in 2001. Since its inception, Saratoga Springs has experienced continuous rapid growth and is now home to well over 30,000 residents, close to doubling its 2010 US Census population of 17,781 just a decade ago.

In 2020, new developments of residential roads and homes can be seen across the city, and large businesses like Costco are being constructed to meet the demand for this rapidly growing population. The City's location, on the western edge of the Wasatch Front and nestled along Utah Lake, is attractive to its current and future residents and offers a feeling of getting away from the hustle and bustle that exists along the eastern side of the central valley and the I-15 Corridor.

For Saratoga Springs to continue to provide an atmosphere that retains a bucolic feel, its transportation system must be designed to handle the demand for mobility placed upon it. At its core, mobility and transportation is about moving people and goods. But, what makes a truly resilient transportation network, one which can meet the demand of its users, is ***access*** and ***choice***. This Transportation Master Plan (TMP) looks at Saratoga Springs' projected growth combined with the city's unique geography to determine what is needed to ensure residents continue to have both access to their origins and destinations and choice of how to get there.

This TMP provides a recommended project list as guidance for officials and residents as the City plans for growth. Each new development brings more residents and traffic, while available land for the transportation network becomes more finite. Recommendations from this TMP are derived from traffic modeling and analysis out to 2050 that have incorporated specific opportunities and challenges unique to Saratoga Springs to help ensure that the occurring growth is predicated by prudent and throughly-informed decisions.

Figure 1-1 is map of the recommended transportation improvements with details in Table 1-1. Intersection improvements are mapped in Figure 1-2 and listed in Table 1-2.

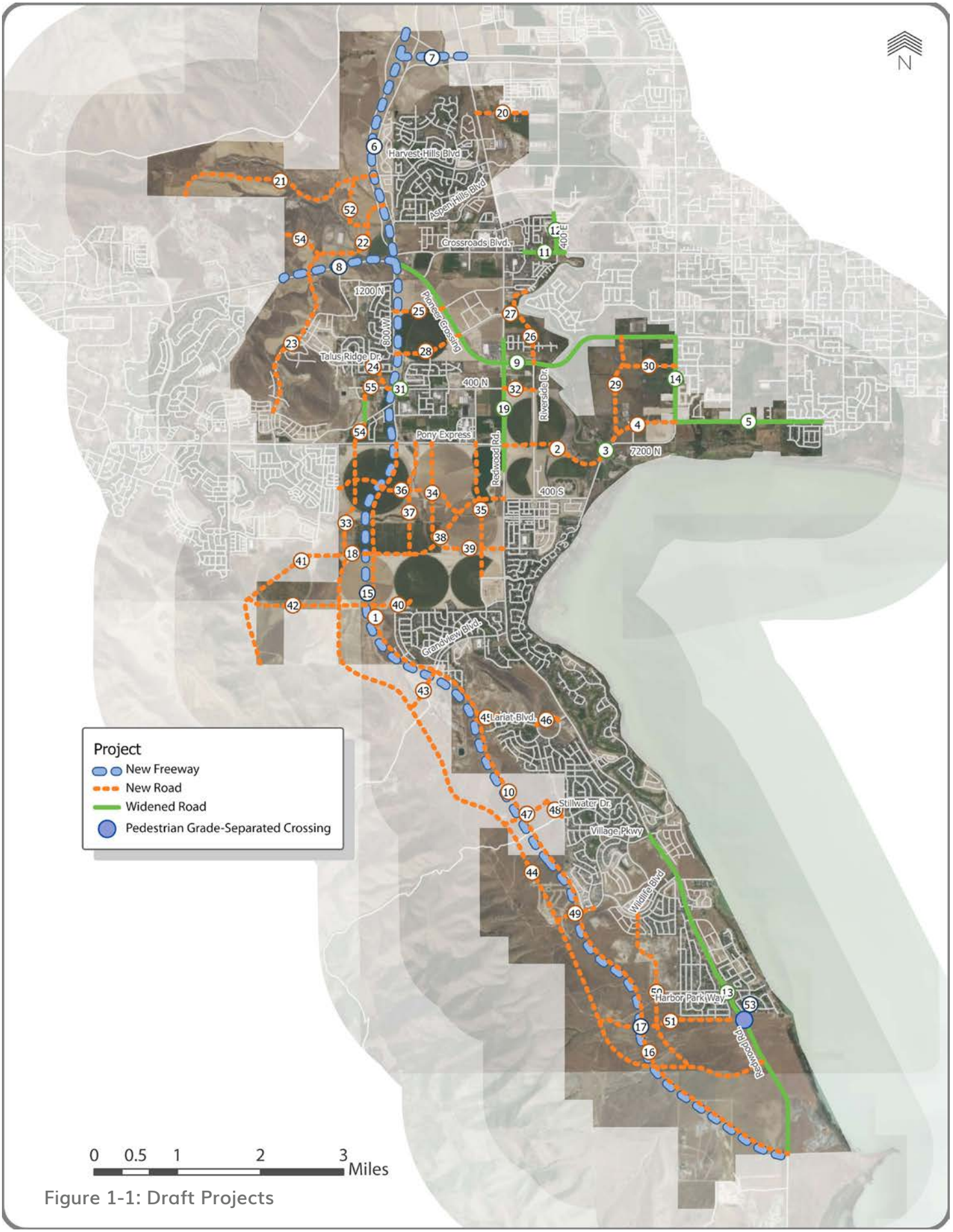


Figure 1-1: Draft Projects

Table 1-1: Roadway Projects

ROADWAY PROJECT				
Project #	Location	Project Type	Functional Class	Jurisdiction
1	Foothill Boulevard: Pony Express to Lariat Boulevard	New Road	Minor Arterial	Saratoga Springs/MAG
2	Pony Express: Redwood Road to Jordan River	New Road	Major Arterial	Saratoga Springs/MAG
3	Pony Express: Jordan River	Widening	Major Arterial	Saratoga Springs/MAG
4	Pony Express: Jordan River to Saratoga Road	New Road	Major Arterial	Saratoga Springs/MAG
5	Pony Express: Saratoga Road to Eastern City Boundary	Widening	Major Arterial	Saratoga Springs/MAG
6	Mountain View Corridor: Northern City Border to Cedar Fort Road (SR-73)	New Road	Freeway	UDOT
7	2100 North Connection: Eastern City Border to Mountain View Corridor	New Road	Freeway	UDOT
8	Cedar Fort Road (SR-73) Freeway: Mountain View Corridor Frontage to Western City Border	Widening	Freeway	UDOT
9	Pioneer Crossing (SR-145): Eastern City Border to Cedar Fort Road (SR-73)	Widening	Principal Arterial	UDOT
10	Foothill Boulevard: Lariat Boulevard to Hunter Boulevard	New Road	Minor Arterial	Saratoga Springs/MAG
11	Crossroads Boulevard: Commerce Drive to Eastern City Border	Widening	Principal Arterial	Saratoga Springs/MAG
12	400 East: Crossroads Boulevard to Northern City Boundary	Widening	Major Arterial	Saratoga Springs/MAG
13	Redwood Road (SR-68): Fairview Boulevard to Southern City Border	Widening	Major Arterial	UDOT
14	Saratoga Road: Pony Express to Pioneer Crossing (SR-175) (Saratoga Springs Portion)	Widening	Minor Arterial	Saratoga Springs
15	Foothill Freeway: Cedar Fort Freeway (SR-73) to Stillwater Drive	New Road	Freeway	UDOT
16	Foothill Boulevard: Hunter Boulevard to Redwood Road	New Road	Freeway	Saratoga Springs/MAG
17	Foothill Freeway: Stillwater Drive to Redwood Road	New Road	Freeway	UDOT
18	Hidden Valley Highway: Foothill Boulevard to Western City Border	New Road	Major Arterial	Saratoga Springs/MAG
19	Redwood Road (SR-68): North Border to Grandview Boulevard	Widening	Principal Arterial	UDOT
20	2400 North: Redwood Road (SR-68) Eastern Border	New Road	Collector	Saratoga Springs
21	Wild Hills Boulevard: Western City Boundary to Mountain View Corridor	New Road	Minor Arterial/Collector	Saratoga Springs
22	Aster Drive: Cedar Fort Road (SR-73) to Mountain View Corridor	New Road	Collector	Saratoga Springs/MAG
23	Mt. Saratoga Boulevard: Cedar Fort Road (SR-73) to Quail Hill Road	New Road	Collector	Saratoga Springs
24	Talus Ridge Drive: Mountain Peak Drive to 400 North	New Road	Collector	Saratoga Springs
25	Medical Drive: Foothill Boulevard to Pioneer Crossing	New Road	Collector	Saratoga Springs
26	Riverside Drive: End of Existing to Pioneer Crossing	New Road	Collector	Saratoga Springs
27	Market Street: Redwood Road (SR-68) to Riverside Drive	New Road	Collector	Saratoga Springs
28	Market Street: Foothill Boulevard to Pioneer Crossing	New Road	Collector	Saratoga Springs
29	500 East: Pony Express to Pioneer Crossing (SR-175)	New Road	Collector	Saratoga Springs
30	550 North: 500 East to Saratoga Road	New Road	Collector	Saratoga Springs
31	400 North: Foothill Boulevard and Grand Sierra Way	New Road	Collector	Saratoga Springs
32	400 North: Redwood Road (SR-68) to Riverside Drive	New Road	Collector	Saratoga Springs
33	Bonneville Drive: Pony Express Pkwy to 1200 South	New Road	Collector	Saratoga Springs
34	500 West: Pony Express to Hidden Valley Drive	New Road	Collector	Saratoga Springs
35	200 West: Pony Express to Founders Boulevard	New Road	Collector	Saratoga Springs
36	Brookwood Drive: Western Boundary to Hidden Valley Driv	New Road	Collector	Saratoga Springs
37	600 West: Brookwood Drive to Hidden Valley Driv	New Road	Collector	Saratoga Springs
38	Hidden Valley Drive: Redwood Road to Foothill Boulevard	New Road	Collector	Saratoga Springs
39	New Road: Redwood Road to Hidden Valley Drive	New Road	Collector	Saratoga Springs
40	1100 South: Ensign Drive to Bonneville Drive	New Road	Collector	Saratoga Springs
41	Hidden Valley Drive: City Boundary to City Boundary	New Road	Minor Arterial	Eagle Mt./MAG
42	1100 South: Hidden Valley Drive to Bonneville Drive	New Road	Collector	Saratoga Springs
43	Grandview Boulevard: Existing to Bonneville Drive	New Road	Collector	Saratoga Springs
44	Bonneville Drive: 1100 South to Redwood Road (SR-68)	New Road	Collector	Saratoga Springs
45	Lariat Blvd: End of Existing to Foothill Boulevard	New Road	Local Collector	Saratoga Springs
46	Ring Road: Finish Loop Roadway	New Road	Local Collector	Saratoga Springs
47	Hunter Drive: Stillwater Drive to Bonneville Drive	New Road	Collector	Saratoga Springs
48	Stillwater Drive: Existing to Hunter Drive	New Road	Collector	Saratoga Springs
49	Village Parkway: Tytus Lane to Bonneville Drive	Widening	Collector	Saratoga Springs
50	Heathercrest Drive: Bonneville Drive to Wildlife Boulevard	New Road	Collector	Saratoga Springs
51	New Road: Redwood Road to Foothill Boulevard	New Road	Collector	Saratoga Springs
52	Chianti Drive: Aster Drive to Wild Blossom Boulevard	New Road	Collector	Saratoga Springs
53	Redwood Road at Approx. 4300 South	Pedestrian Grade-Separated Crossing	NA	TIF Active / Alpine School District
54	1000 West: 400 North to Evans Lane	New Road/Widening	Collector	Saratoga Springs
55	Evans Lane: 1000 West to Talus Ridge Drive	New Road	Collector	Saratoga Springs
56	New Road: Eagle Mountain to Bonneville Drive	New Road	Collector	Saratoga Springs

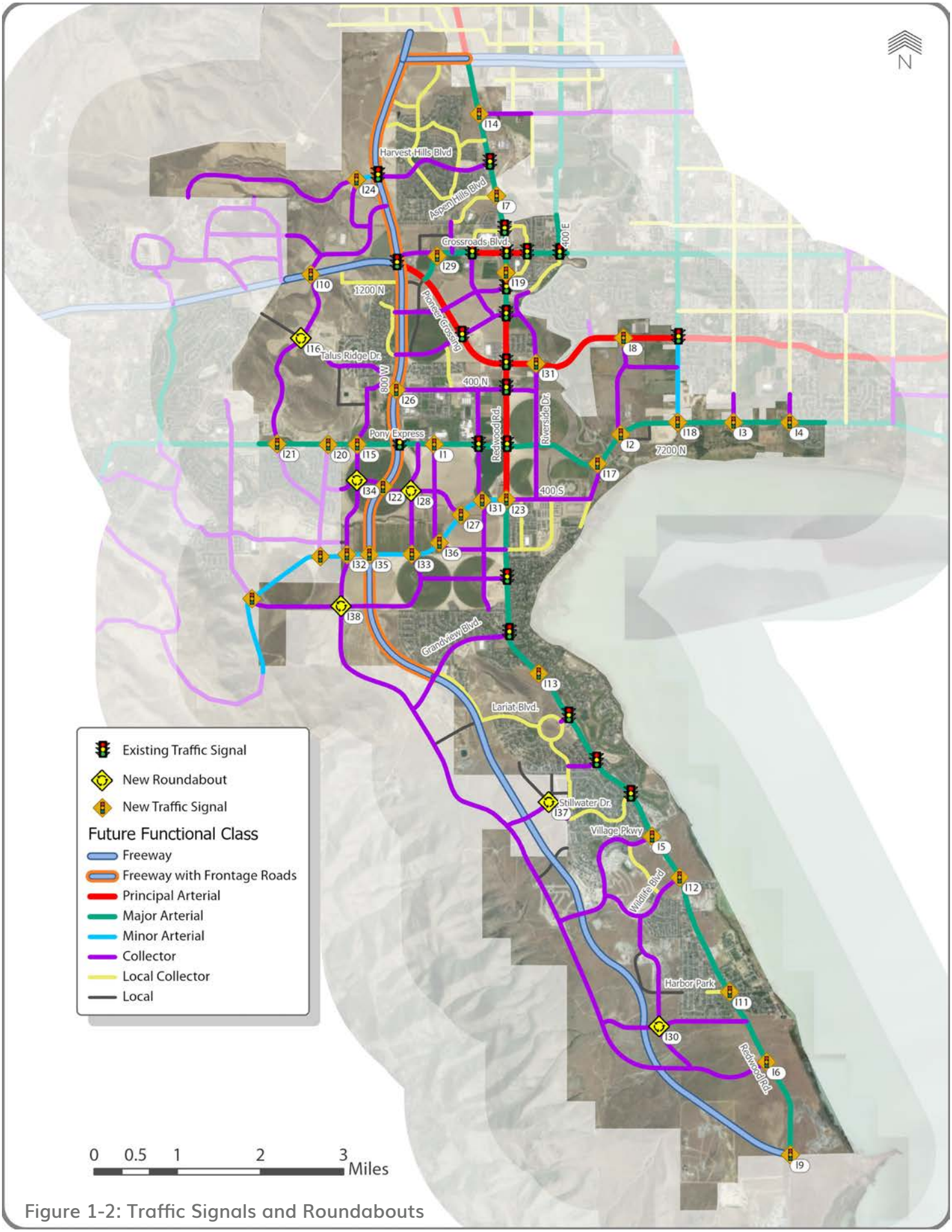


Figure 1-2: Traffic Signals and Roundabouts

Table 1-2: Signals & Roundabout Projects

SIGNALS & ROUNDABOUTS			
Project #	**Type**	**Location**	**Jurisdiction**
I1	New Traffic Signal	Pony Express Parkway and 600 West	UDOT
I2	New Traffic Signal	Pony Express Parkway and Saratoga Road	UDOT
I3	New Traffic Signal	Pony Express Parkway and 1700 West	UDOT
I4	New Traffic Signal	Pony Express Parkway and 1100 West	UDOT
I5	New Traffic Signal	Redwood Road (SR-68) and Village Parkway	UDOT
I6	New Traffic Signal	Redwood Road (SR-68) and Bonneville Drive	UDOT
I7	New Traffic Signal	Aspen Hills Boulevard and Redwood Road (SR-68)	UDOT
I8	New Traffic Signal	Pioneer Crossing (SR-145) and 500 East	UDOT
I9	New Traffic Signal	Redwood Road (SR-68) and Foothill Boulevard	UDOT
I10	New Traffic Signal	SR-73 and Mt. Saratoga Boulevard	UDOT
I11	New Traffic Signal	Redwood Road (SR-68) and Harbor Parkway	UDOT
I12	New Traffic Signal	Redwood Road (SR-68) and Wildlife Boulevard	UDOT
I13	New Traffic Signal	Redwood Road (SR-68) and Centennial Boulevard	UDOT
I14	New Traffic Signal	Redwood Road (SR-68) and 2400 North	UDOT
I15	New Traffic Signal	Pony Express Parkway and Bonneville Drive	UDOT
I16	New Roundabout	Talus Ridge Drive and Mount Saratoga Boulevard	Saratoga Springs
I17	New Traffic Signal	Pony Express Parkway and Saratoga Rd	UDOT
I18	New Traffic Signal	Pony Express and Saratoga Road	Saratoga Springs
I19	New Traffic Signal	Redwood Road (SR-68) and South Commerce Drive*	UDOT
I20	New Traffic Signal	Woodhaven Boulevard and Pony Express	UDOT
I21	New Traffic Signal	Pony Express and Mount Saratoga Bld	UDOT
I22	New Traffic Signal	Foothill Boulevard and Brookwood Drive	Saratoga Springs
I23	New Traffic Signal	Redwood Road (SR-68) and 400 South	UDOT
I24	New Traffic Signal	Wild Blossom Boulevard and Chianti St	Saratoga Springs
I26	New Traffic Signal	Foothill Boulevard and 400 North	Saratoga Springs
I27	New Traffic Signal	400 South and Brookwood Drive	Saratoga Springs
I28	New Roundabout	Brookwood Drive and 600 West	Saratoga Springs
I29	New Traffic Signal	Crossroads Boulevard and 1400 North	Saratoga Springs
I30	New Roundabout	Heathercrest Drive and 4400 South	Saratoga Springs
I31	New Traffic Signal	Riverside Drive and Pioneer Crossing (SR-145)	UDOT
I31	New Traffic Signal	400 South and Thunder Boulevard	Saratoga Springs
I32	New Traffic Signal	800 South and Bonneville Drive	Saratoga Springs
I33	New Traffic Signal	800 South and Ensign Drive	Saratoga Springs
I34	New Traffic Signal	Bonneville Drive and Brookwood Drive	Saratoga Springs
I35	New Traffic Signal	Foothill Boulevard and 800 South	Saratoga Springs
I36	New Traffic Signal	800 South and 600 West	Saratoga Springs
I37	New Roundabout	Hunter Drive and New Road	Saratoga Springs
I38	New Traffic Signal	Bonneville Drive and Ensign Drive	Saratoga Springs

* Until the Foothill Freeway is connected to Grandview Boulevard or points south only one of these intersections will be signalized.

2 where we are

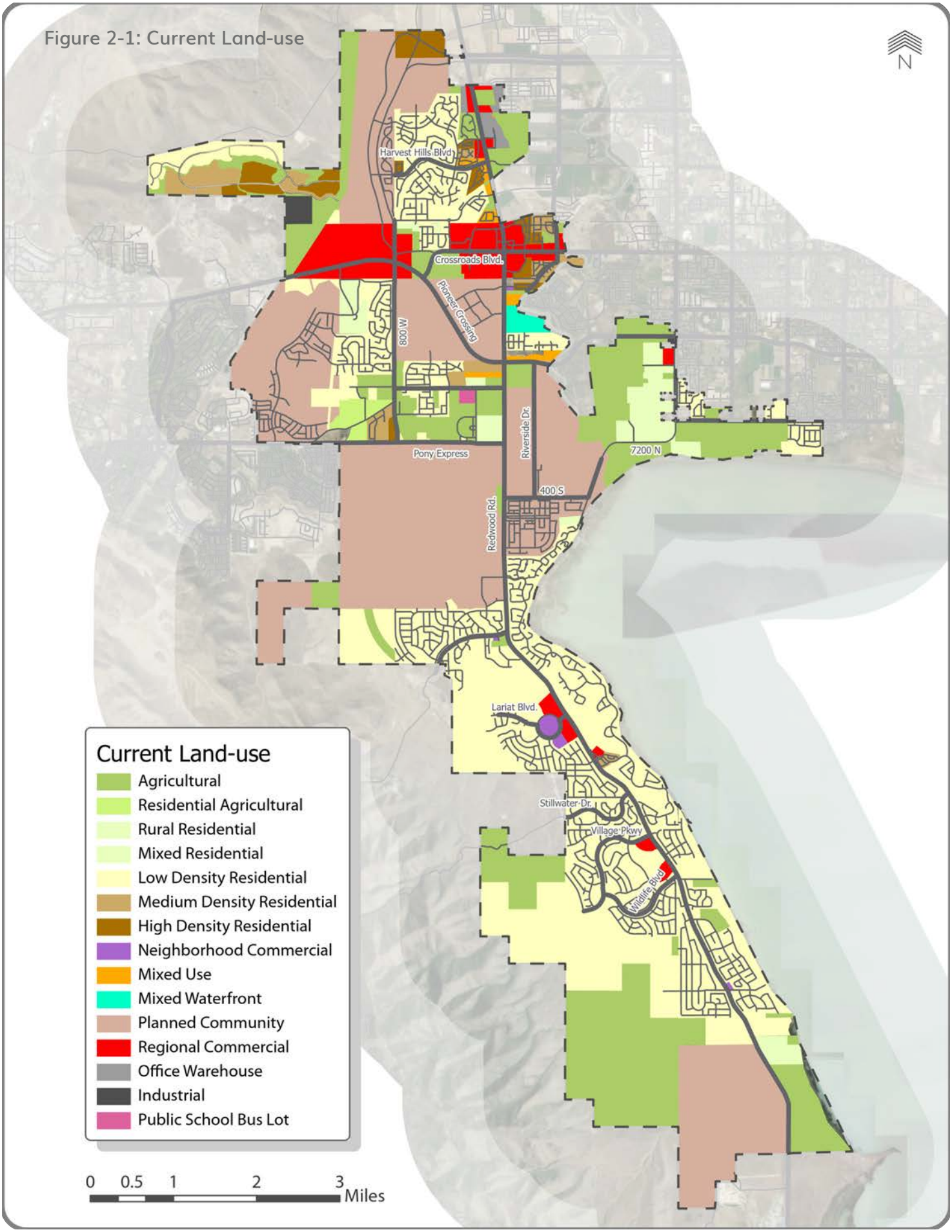
This chapter evaluates the existing transportation system within Saratoga Springs and establishes the framework for the development of the TMP. This analysis includes a description of the land-use as well as the demographics of Saratoga Springs and how these factors affect the transportation system within the city. This chapter details the existing conditions as of 2020.

ZONING AND LAND-USE

In order to analyze the transportation system and plan for future growth, it is essential to understand zoning and land-use patterns within the area. Travel is a daily requirement for most of the public as people travel from their homes to work, shopping, schools, health care facilities, and recreational opportunities. Zoning and land-use patterns must function cohesively with the transportation system to support a high quality of life and promote economic development within Saratoga Springs.

Saratoga Springs zoning is mostly residential, and currently there are many more households than jobs. This is consistent with the General Plan that encourages single-family-residential as the predominant housing type. This zoning and land-use pattern is consistent with other communities in northern Utah County. While Saratoga Springs is largely zoned for single-family residential, there are several areas of regional commercial zoning along Redwood Road, with a major commercial area located near the intersection of Crossroads Boulevard. Large areas are also zoned for planned communities which allow for a mixture of land-uses and housing types on properties of more than 500 acres. The existing land-use within Saratoga Springs is shown in Figure 2-1.

Figure 2-1: Current Land-use

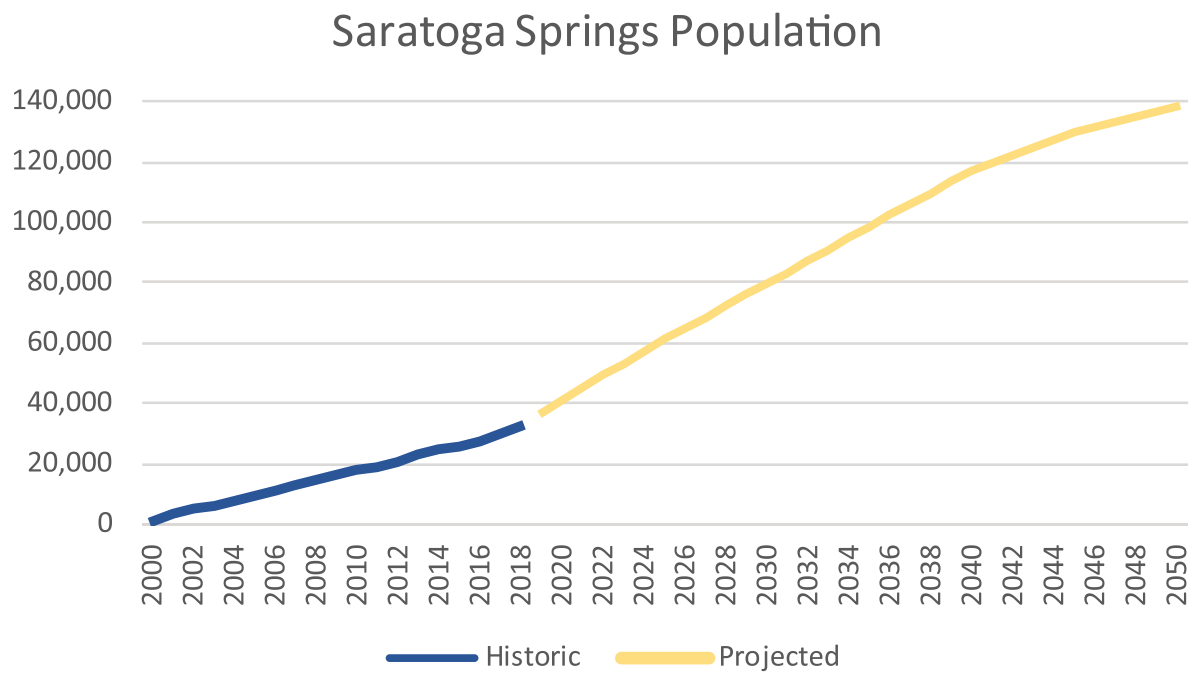


DEMOGRAPHICS

Population

Saratoga Springs experienced significant population growth over the last several decades, with the population increasing from just over 1,000 people in 2000 to an estimated 27,247 residents in 2018. This represents more than a 3100 percent increase in population which has transformed the character of Saratoga Springs from a rural community to a suburban city. This trend is expected to continue encouraged by current zoning and land-use policy as illustrated in Figure 2-2. Steady population growth is anticipated into the future with a projected population of more than 130,000 people by year 2050.

Figure 2-2: Historic and Future Population



Source: US Census Bureau, Population Estimates Program, Kem C. Gardner Policy Institute

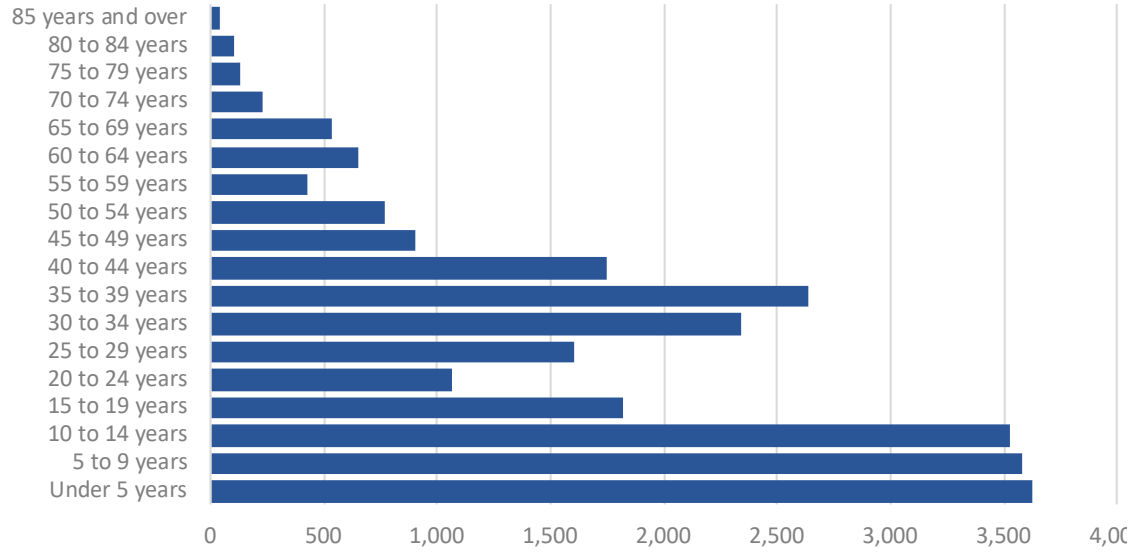
New homes rise up and closer to Redwood Road in Saratoga Springs. Residential-zoned areas are being filled in quickly as the City's population rises.

City Population and Housing Estimates

The age of residents also impacts how they interact with the transportation system. Saratoga Springs has a relatively high population of children with 41 percent of the population under 15. The transportation needs of these younger residents are different than other age-groups, because they are reliant on others for car-related mobility. These young residents may also require additional bike, pedestrian, and trail amenities to feel comfortable biking or walking.

While there are fewer residents in older population groups (4 percent over 65), the mobility needs of these residents will continue to expand as the population grows and ages. As with younger-population-age groups, the transportation system should support mobility options for residents that may chose not to drive or be unable to drive.

Figure 2-3: Population Age Distribution



Source: US Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

Housing

Although population is an important indicator in developing a TMP, housing provides a broader picture of how residential growth will affect transportation demand. The number of trips on the transportation network is estimated largely on the number and size of households. Table 2-1 summarizes the household sizes in Saratoga Springs since 2000. In 2018 the average household size in Saratoga Springs was 4.19 persons per household, which is higher than the statewide average of 3.19 persons per household. In general, larger households make more trips than smaller households, so they have a comparatively-larger impact on the transportation system.

Table 2-1: Population and Households

YEAR	POPULATION	HOUSEHOLDS	AVG. HOUSEHOLD SIZE
2018	27,347	6,516	4.19
2010	14,692	3,624	4.05
2000	1,003	301	3.33

Source: US Census Bureau, American Community Survey 5 year estimates for 2018 & 2010, Kem C. Gardener Policy Institute for 2000

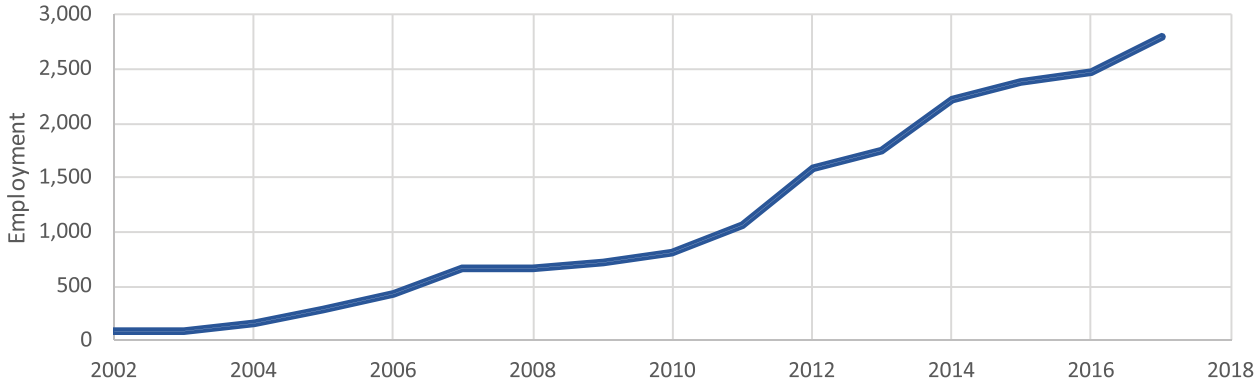
While 2018 is the most up-to-date year that the US Census provides household data, the Saratoga Springs Building Department maintains a more current online "Residential Units Dashboard" for the city. At the time of writing this there are 7,906 occupied housing units in Saratoga Springs. This dashboard is a valuable resource for understanding current conditions in this rapidly growing municipality. This data can be viewed at: https://ssgis.maps.arcgis.com/apps/opsdashboard/index.html#/5bce1949b0c24f64a94d843a8ee05647

Housing in Saratoga Springs comes in all types and accommodates all ages.

Employment

There were approximately 2,800 jobs within Saratoga Springs in 2017, which is the most up-to-date data available from the US Census Bureau Center for Economic Studies. Since 2002, about 2,700 jobs have been added within the city representing an increase of over 3400 percent. This job growths reflects the continued development of the city to a more-suburban environment with increased employment opportunities within the community.

Figure 2-4: Total Jobs within Saratoga Springs



Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2017).

The largest employers within Saratoga Springs are Walmart, Smith Marketplace, and as of the summer of 2020, Costco, all of which are located off Redwood Road. While these retailers are the largest individual employers, education services are the largest industry sector within city. Table 2-2 lists top employers. Schools are three of the six largest employers within the city.

Table 2- 2: Largest Employers in Saratoga Springs

NAME	EMPLOYEES
Smith's Marketplace	250 - 499
Walmart Supercenter	250 - 499
Costco	250 - 499
Lakeview Academy of Science	100 - 249
Saratoga Springs City	100 - 249
Vista Heights Middle School	100 - 249
Westlake High School	100 - 249
Fat Cats	50 - 99

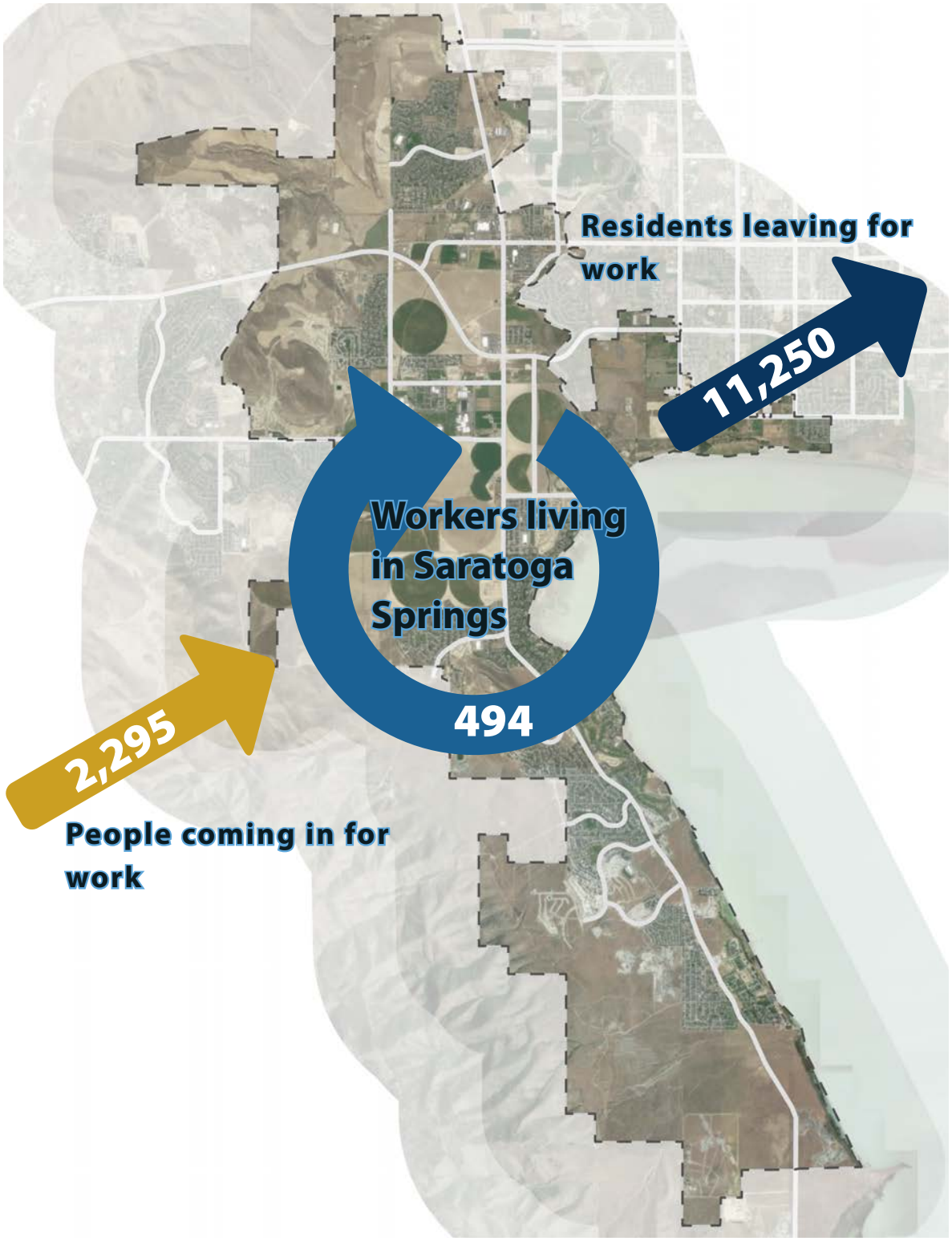
Source: FirmFind,
Department of WorkForce Services, State of Utah.

Smiths Marketplace, at the intersection of Redwood Road and Pioneer Crossing is a major employer in Saratoga Springs.

Costco opened in August of 2020 and was constructed on a vacant field along Redwood Road. In the background is FatCats, an entertainment center in Saratoga Springs that offers bowling and movies.

Although employment within Saratoga Springs has increased recently, there are still more residents who live within the city, but are employed elsewhere. There were approximately 11,250 residents who commuted to a job outside of the city in 2017, while only 2,295 people commuted to Saratoga Springs from another community for work. There were about 494 residents who both lived and worked within the city. These existing commuting patterns help the City make informed decisions about transportation investments because people commuting into and out of Saratoga Springs for work have a greater impact on transportation system demands due to the frequency and length of their trips.

Figure 2-5: Inflow/Outflow Commuting Patterns

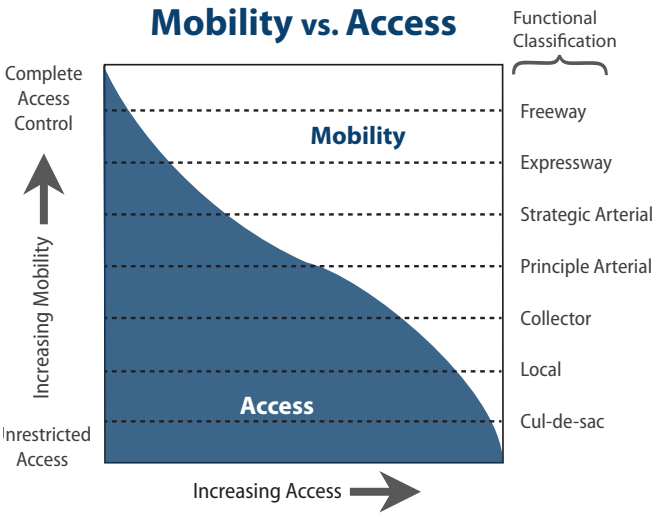


TRANSPORTATION SYSTEM

The transportation network in Saratoga Springs supports the overall community transportation vision. However, there are opportunities to modify and improve the current system to make a transportation network that more efficiently meets the needs of the future. In addition to new capacity, many of the improvements in the transportation network will involve making the system more accessible, safer, and inclusive to an array of age and mode of choice.

Street Network

Figure 2-6: Mobility vs. Access



Roadway functional classification is a means to categorize how a roadway functions and operates based upon a combination of the roadway characteristics. Streets provide for two distinct and competing functions: mobility and land access. As mobility increases, land access decreases, and vice versa, as shown in Figure 2-6. Both functions are vital, and no trip is made without both. In Saratoga Springs, street facilities are classified by the relative amounts of land-access service they provide. There are four primary classifications, with descriptions in Table 2-3 on page 14 and in the following text:

Freeways & Expressways – Freeway and expressway facilities are provided to service long distance trips between cities and states. No land access is provided by these facilities. I-15 is a freeway near Saratoga Springs, but there are currently no freeways or expressways directly located in Saratoga Springs.

Arterials – Arterial facilities are designed to serve a high level of mobility providing fast flowing through-traffic movement, but offer a low-level of land-access service. The traffic controls and facility designs are primarily intended to provide efficient through movement. Redwood Road/S.R. 68 and Pioneer Crossing are arterials in Saratoga Springs. Arterials frequently provide the most direct route from one point to another, not only for vehicles, but for pedestrians and bicyclists as well. These roads may offer wide shoulders that can accommodate buffered or separated bike lanes and also choice locations for bus stops.

Collectors – Collector facilities are intended to serve both short through-trip and land-access functions in relatively equal proportions. For longer trips requiring high mobility, such facilities are inefficient. Instead, they are used more for local trips requiring increased access to destinations. For the bicyclist or pedestrian, collectors can offer a comfortable level of safety and a number of route choices because of the balance between lower vehicle speeds and the variety of available access options to potential destinations.

Local Roads/Residential Streets – Residential facilities primarily serve land-access functions. Local road design and control measures facilitate the movement of vehicles onto and off of the street system from land parcels. Through-movement is difficult and is discouraged by both the design and control of this facility. This level of street network is likely to provide the highest level of comfort to bicyclists and pedestrians. Local roads will have the lowest speeds and be mostly absent of large vehicles. The safety and comfort of local roads is also due to a quieter environment since there are less vehicles and slower speeds, as well as being removed from roadway air pollution that is associated with higher traffic volumes.

It should be noted that roadway functional classification does not necessarily define the number of lanes required for each roadway's capacity. For instance, a collector street may have two, three, or four lanes, whereas an arterial street may have up to nine lanes for motorized traffic. The number of lanes is a function of the expected automobile traffic volume on the roadway and serves as the greatest measure of roadway capacity for vehicles. The existing functional class network in Figure 2-7 is separated into functional classes by access as well as the general right-of-way width.

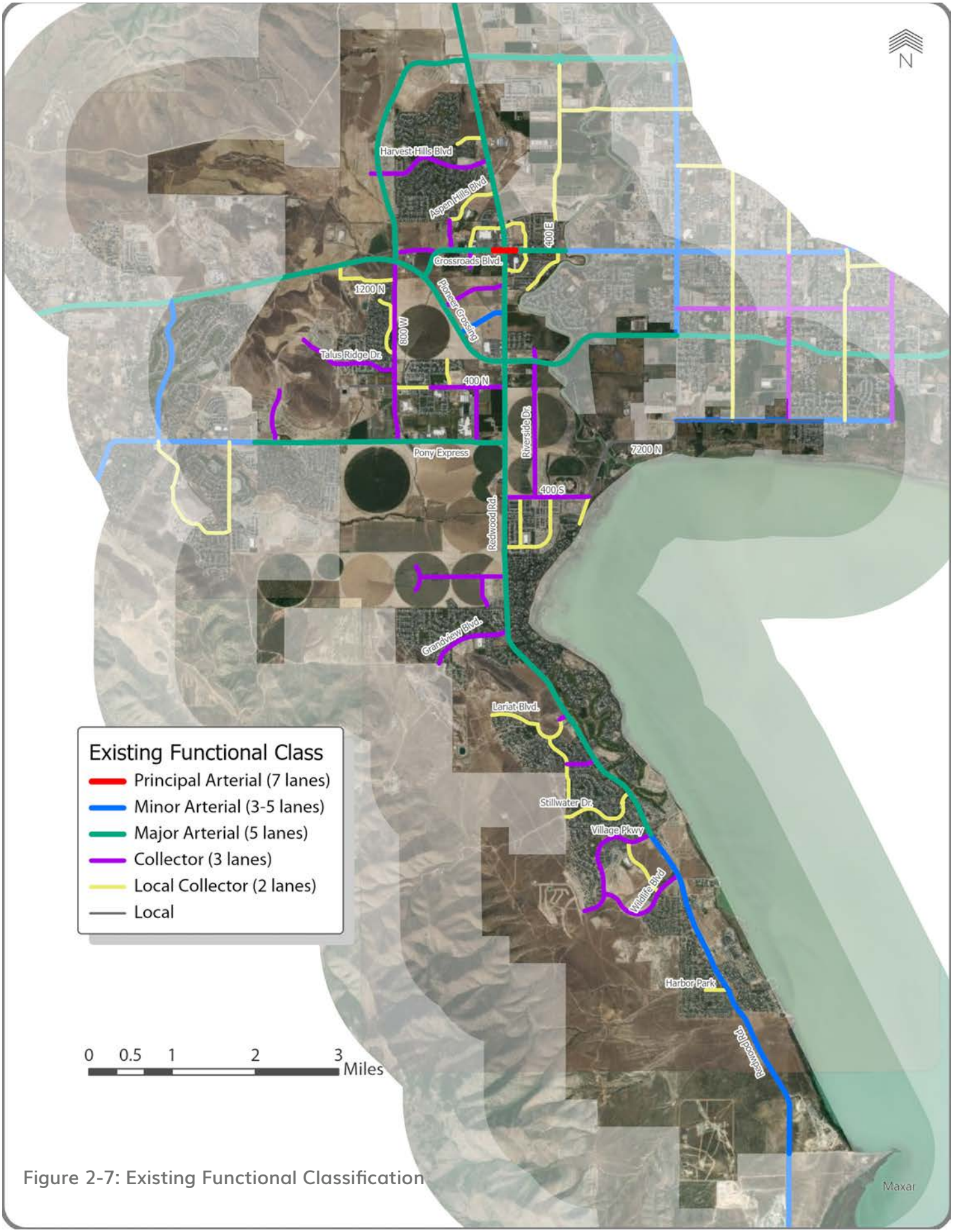


Figure 2-7: Existing Functional Classification

Table 2-3: Roadway Classification

CHARACTERISTIC	FUNCTIONAL CLASSIFICATION			
	FREEWAY & EXPRESSWAY	ARTERIAL	COLLECTOR	RESIDENTIAL STREET
Function	Traffic movement	Traffic movement, land access	Collect & distribute traffic between streets & arterials, land access	Land Access
Typical percent of Surface Street System Mileage	Not applicable	5 - 10 percent	10-20 percent	60-80 percent
Continuity	Continuous	Continuous	Continuous	None
Spacing	See City's Engineering Standards and Specifications			
Typical percent of Surface Street System Vehicle Miles Carried	Not applicable	40 - 65 percent	10-20 percent	10-25 percent
Direct Land Access	None	Limited: Major generators only	Restricted: Some movements prohibited; number & spacing of driveways controlled	Safety controls access
Minimum Roadway Intersection Spacing	See City's Engineering Standards and Specifications			
Speed Limit	See City's Engineering Standards and Specifications			
Parking	Prohibited	Discourages	Limited	Allowed
Comments	Supplements capacity of arterial street system & provides high-speed mobility	Backbone of Street System		Through traffic should be discouraged
Parking	Prohibited	Discouraged	Limited	Allowed
Comments	Supplements capacity of arterial street system & provides high-speed mobility	Backbone of Street System		Through traffic should be discouraged

Traffic Volume

Traffic data is typically shown as the number of vehicles per day or an average daily volume. Data collection was completed as part of the transportation plan. This included traffic data from Saratoga Springs and UDOT, as well as new traffic counts to document traffic volumes and speeds. These volume data provide the basis to calibrate the travel demand model (TDM) and to identify any capacity deficiencies that may exist today.

The highest traffic volumes in Saratoga Springs are on Redwood Road south of Pioneer Crossing. This segment of Redwood Road is a five-lane arterial with a posted speed of 50 miles per hour and is designed to move regional traffic through town. While Redwood Road experiences high traffic volumes through much of the city, this segment has average traffic volumes in excess of 38,000 vehicles/day with some individual days above 40,000 vehicles/day. In addition to Redwood Road, both SR-73 and Pioneer Crossing experience daily traffic volumes above 30,000 vehicles/day.

Level of Service

Level of Service (LOS) describes the operating performance of an intersection or roadway. LOS is measured by delay and is reported on a scale from A to F, with A representing the best performance and F the worst. For unsignalized intersections, LOS is reported based on the average vehicle delay for the worst approach. While for signalized intersections, an overall LOS is reported for the entire intersection based on the average delay of all vehicles. Table 2-3 provides a brief explanation for each LOS and the associated average delay per vehicle for signalized intersections.

Table 2-4: Intersection Level of Service Criteria

LEVEL OF SERVICE	TRAFFIC CONDITIONS	AVERAGE DELAY (SECONDS/VEHICLE)	
		SIGNALIZED INTERSECTION	UNSIGNALIZED INTERSECTION
A	Free Flow Operations / Insignificant Delay	0 ≤ 10	0 ≤ 10
B	Smooth Operations / Short Delays	> 10 and ≤ 20	> 10 and ≤ 15
C	Stable Operations / Acceptable Delays	> 20 and ≤ 35	> 15 and ≤ 25
D	Approaching Unstable Operations / Tolerable Delays	> 35 and ≤ 55	> 25 and ≤ 35
E	Unstable Operations / Significant Delays Begin	> 55 and ≤ 80	> 35 and ≤ 50
F	Very Poor Operations / Excessive Delays Occur	>80	>50

Source: Highway Capacity Manual 2016, Transportation Research Board National Research Council, Washington D.C.

Roadway LOS is typically displayed in the relationship between the traffic volume and the roadway capacity, or a V/C ratio, where V=volume and C= capacity (this is generally presented in a number of vehicles per day as shown in Figure 2-8). Roadway LOS is a planning tool to quantitatively evaluate roadways to accommodate existing and future vehicle demand. Generally, LOS D is the planning goal for urban roadways. Some congestion occurs at LOS D, but the transportation system is assumed to be adequate (not failing) at this level. LOS D was identified as the planning goal for Saratoga Springs in the peak traffic hours, meaning that LOS E and F are unacceptable. Although LOS D is a planning goal, roadway LOS may vary on a street-by-street basis. Table 2-4 summarizes the daily maximum traffic volumes for LOS C through LOS E.

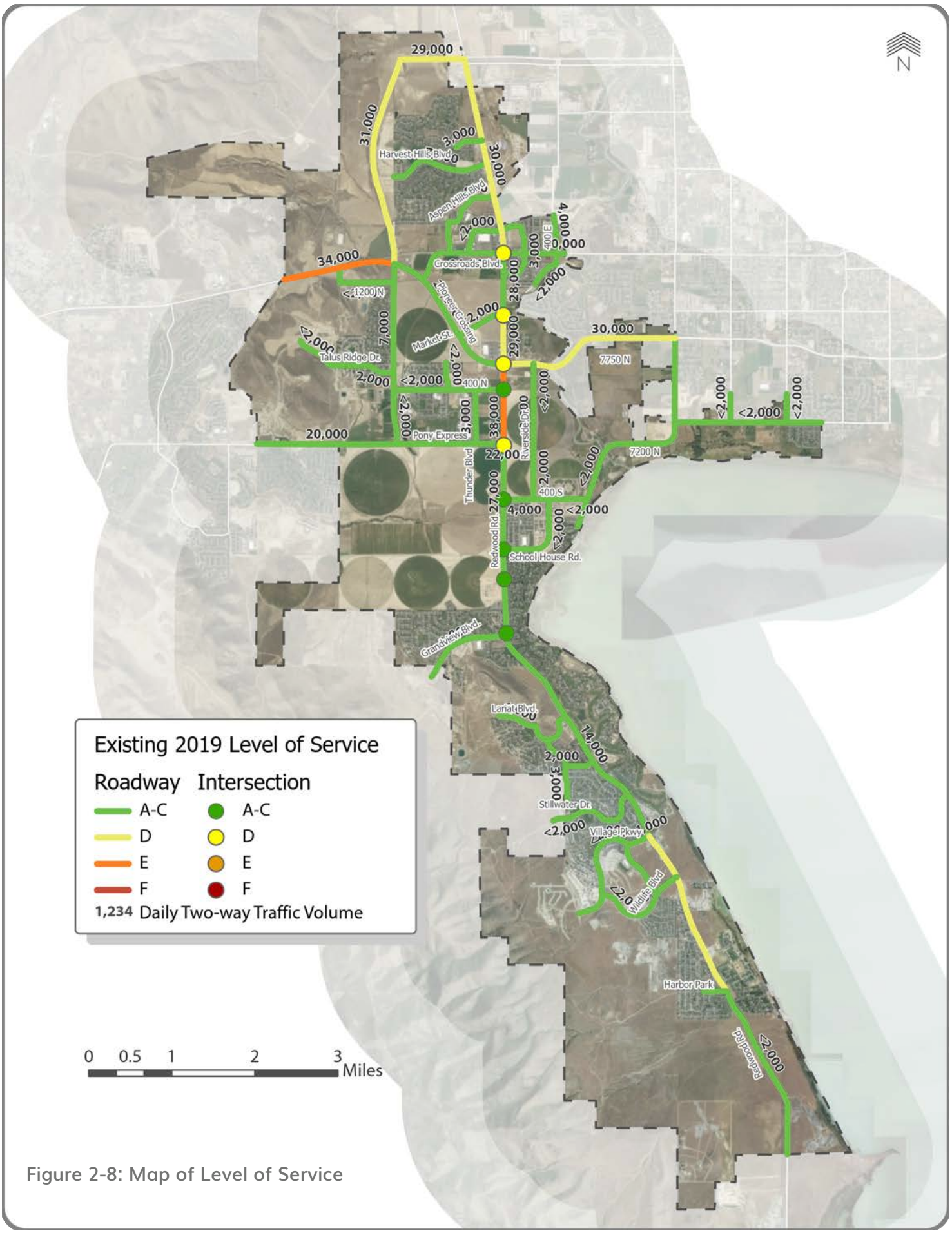


Figure 2-8: Map of Level of Service

Table 2-5: Daily Level of Service Capacity

FUNCTIONAL CLASSIFICATION	LANES	LOS C	LOS D	LOS E
Arterial	3	12,400	15,100	17,700
	5	28,500	32,800	40,300
	7	43,000	50,500	63,400
Collector	2	9,700	12,100	14,500
	3	10,800	13,400	16,100

While the TDM is used to predict future traffic and LOS, it can also be used to estimate current conditions where vehicle counts are not available. The existing functionally-classified roadway network was modeled with a 2019 base year to estimate the current LOS on these roadways. Figure 2-8 is a map that summarizes the existing traffic volumes and LOS within Saratoga Springs. Green roads have little or no traffic congestion, corresponding to LOS A, B or C, while yellow roads have peak-hour traffic congestion, and red roads have significant traffic congestion.

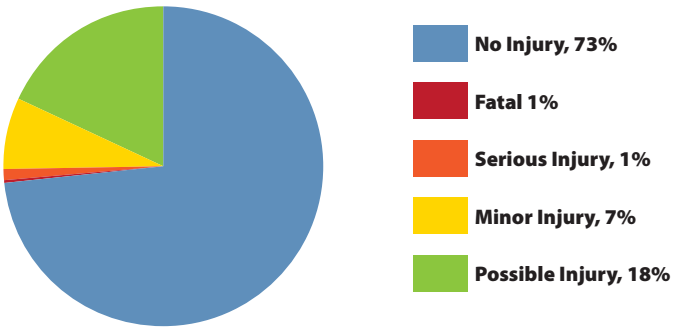
Currently, Redwood and Pioneer Crossing experience congestion during the peak hours. During these periods there can be delays and queuing at the signalized intersections along the corridor. There are minimal delays on the other roadways in Saratoga Springs.

SAFETY

Crash data from 2014 through 2018 for vehicles, bicycles, and pedestrians were analyzed for Saratoga Springs. These data were utilized to identify potential crash hotspots and high-risk areas to address the overall safety of residents.

In the past five years, there have been 1,541 reported crashes in Saratoga Springs, of these, 7 were fatal. These fatal crashes were on the major roadways through the city, including Redwood Road (3), Crossroads Boulevard (2), Pioneer Crossing (1), and Pony Express (1). These roads accounted for 70 percent of all crashes in Saratoga Springs and had the majority of the serious injury (69 percent), and minor injury (70 percent) crashes on them, as well. Figure 2-9 is a graph of crash severity and Figure 2-10 shows the location of these crashes.

Figure 2-9: Severity of Crash Chart



Source: UDOT. These data may be protected under 23 USC 409

A vehicle turns left after traffic passes by. Safety is a key factor when designing points of access to destinations.

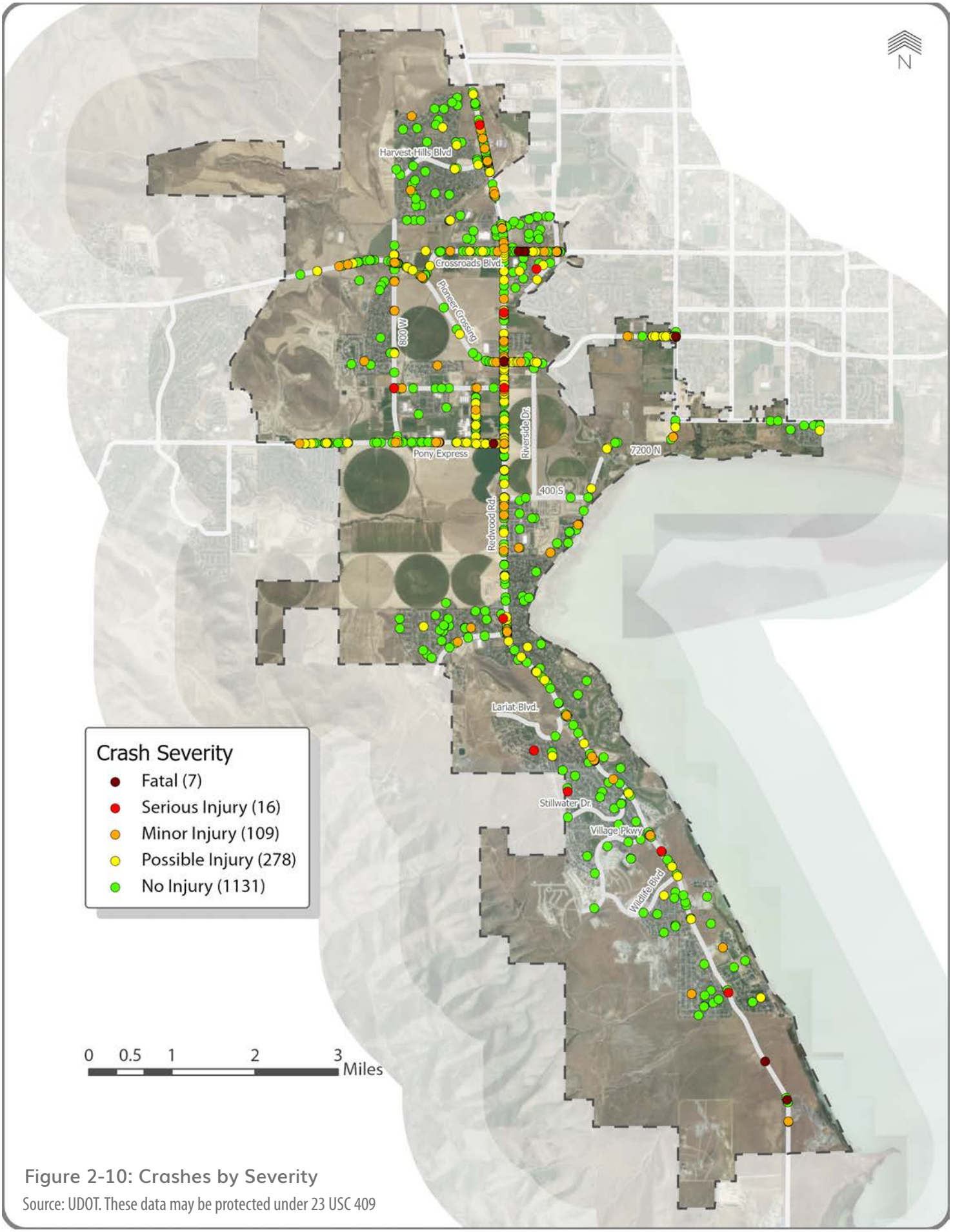
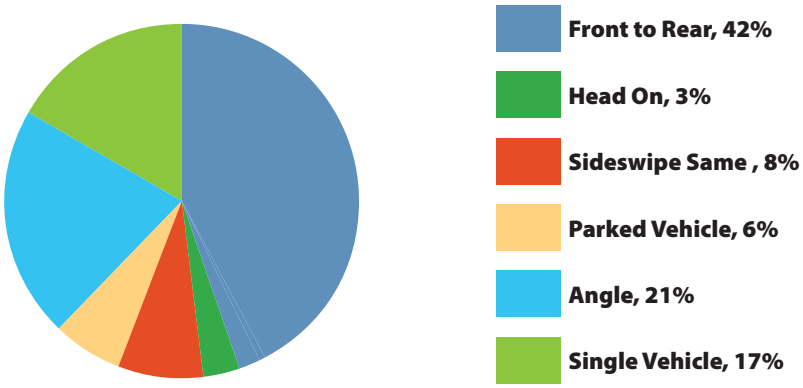


Figure 2-10: Crashes by Severity

Source: UDOT. These data may be protected under 23 USC 409

As shown in Figure 2-11, front-to-rear (or rear-end) crashes were the most common collision representing 42 percent of all crashes, followed by angle crashes (turning vehicles) at 21 percent. These manners of collisions are indicative of congested traffic conditions such as those found on the major roads through the city. The capacity and safety improvements specified in this master plan are designed to reduce these crashes.

Figure 2 11 : Manner of Crashes Chart



Source: UDOT. These data may be protected under 23 USC 409

Front-to-rear crashes are the most common type of accident in Saratoga Springs. These can occur at intersections when drivers are moving at variable speeds and may also be distracted.

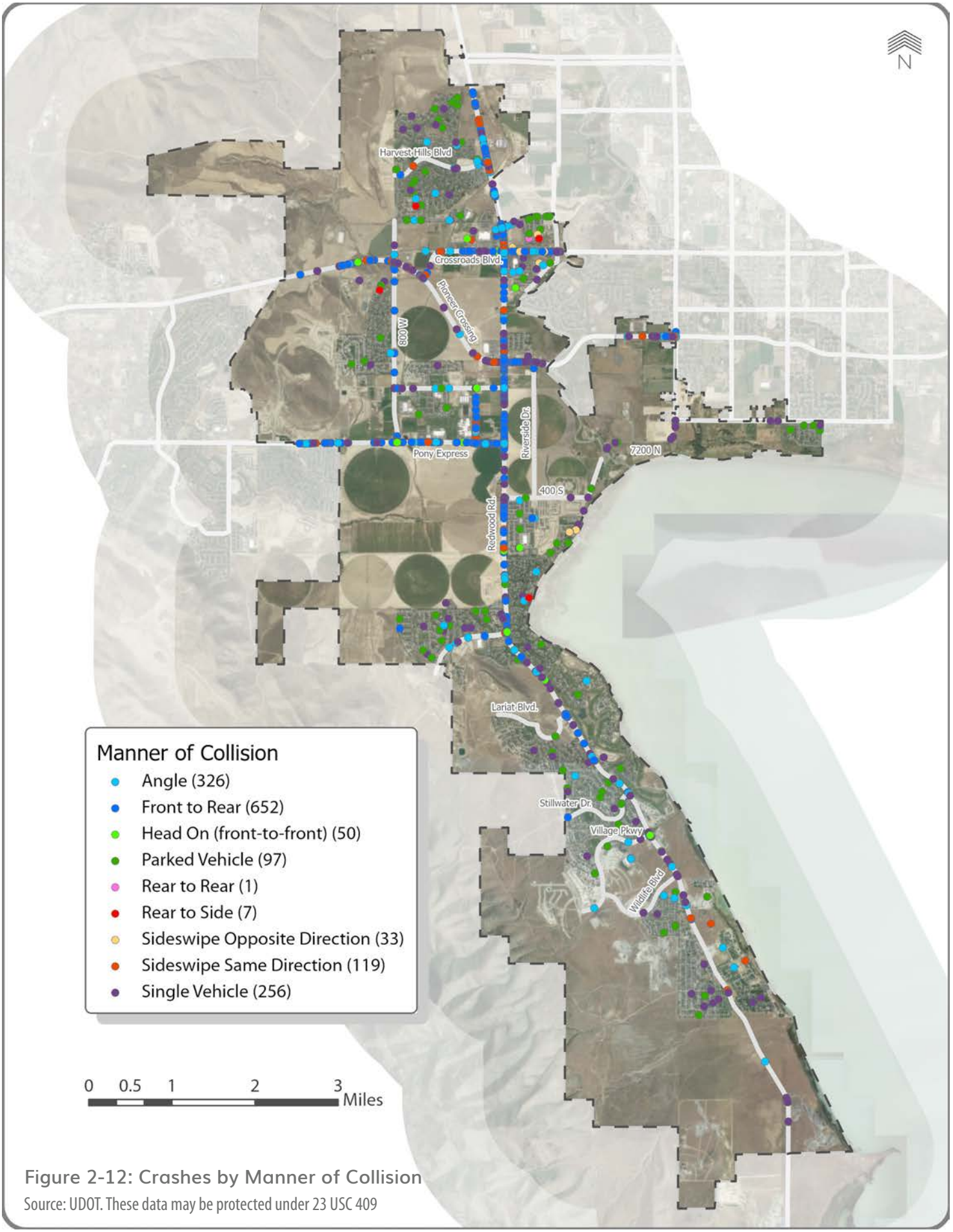


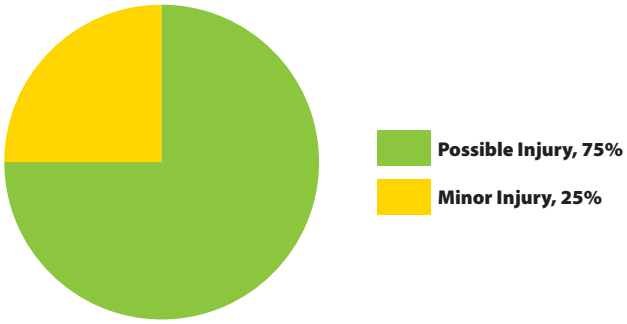
Figure 2-12: Crashes by Manner of Collision

Source: UDOT. These data may be protected under 23 USC 409

Bicycle and Pedestrian Crashes

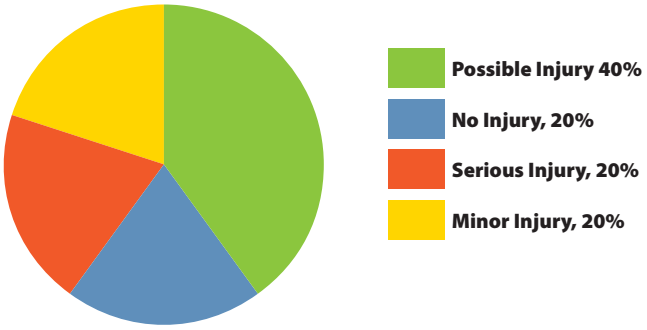
There were 10 recorded crashes between motor vehicles and pedestrians and four crashes between motor vehicles and bicycles from 2014 through 2018. Of these bicycle and pedestrian crashes, there were ***no fatalities*** and only two of the pedestrian crashes had serious injuries as shown in Figures 2-13 and 2-14. The locations of these crashes are dispersed throughout the City, as shown in the map on Figure 2-15. For the most part these were on lower volume roadways with only two pedestrian crashes on Redwood Road and two on Pioneer Crossing.

Figure 2 13: Bicycle Crash Severity Chart



Source: UDOT. These data may be protected under 23 USC 409

Figure 2 14: Pedestrian Crash Severity Chart



Source: UDOT. These data may be protected under 23 USC 409

People jog along a paved street separated trail next to Redwood Road. Using elements such as a park strip to provide separation between vehicles and pedestrians creates a safe environment with a high level of comfort for users.

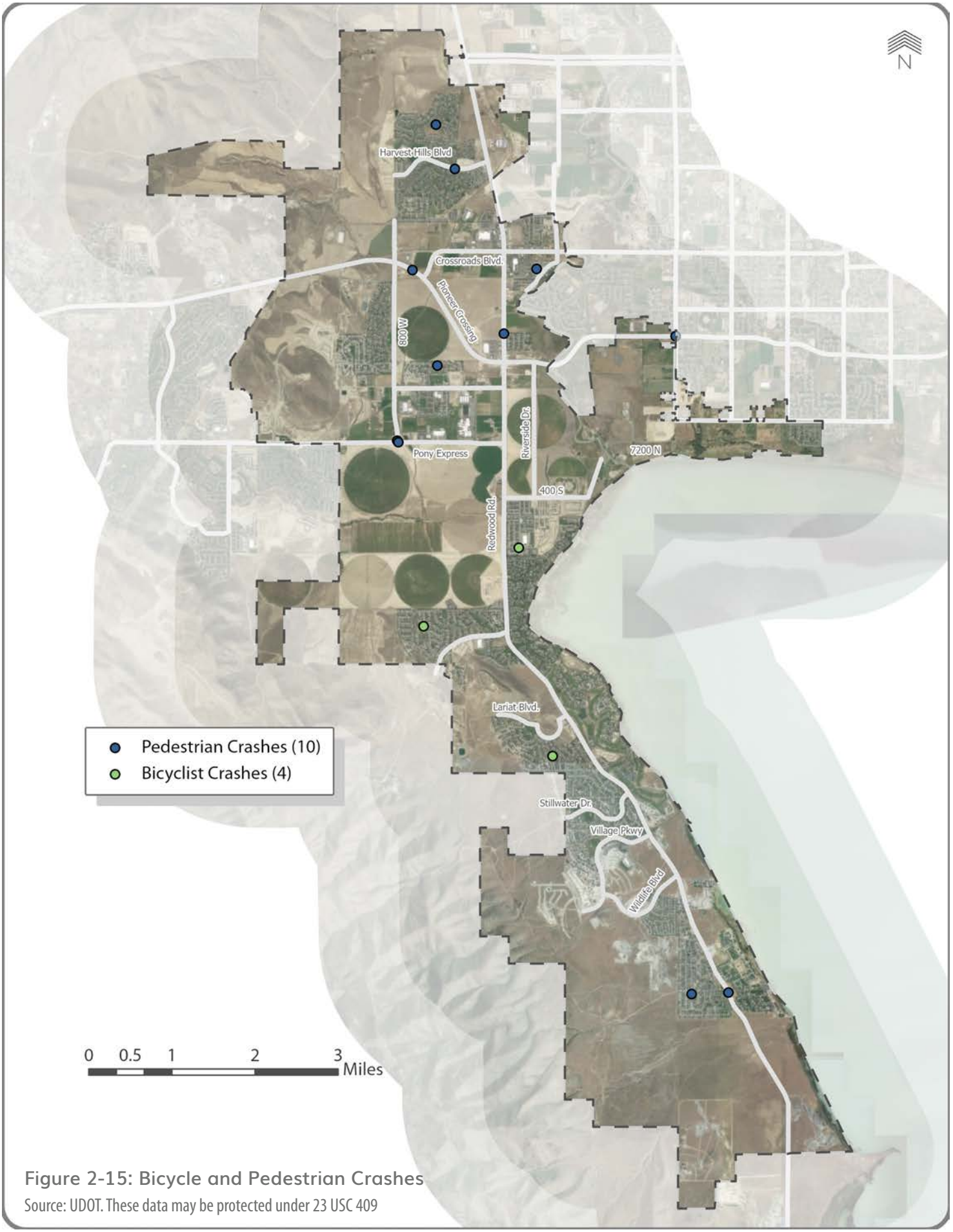


Figure 2-15: Bicycle and Pedestrian Crashes

Source: UDOT. These data may be protected under 23 USC 409

ACTIVE TRANSPORTATION

An active transportation (AT) network is a key component of a transportation system because it provides mobility options for all residents. Making walking and biking safe and convenient is a key goal of any transportation plan. The benefits of a practical and accessible AT network are broad and range from improving physical and mental health, decreasing noise and air pollution, providing a low-cost mode choice, to increasing the property values along the AT network. More transportation choices improve connectivity throughout the community by providing more access to both specific and regional origins and destinations. While freeways and expressways favor mobility, a robust AT network provides its own accessibility options that can connect people to neighborhoods, downtowns, parks, schools, places of work and worship, shopping centers, etc.

Saratoga Springs has a developing trail network with a range of AT options throughout the city, as illustrated in Figure 2-16. On May 5, 2020 Saratoga Springs adopted their **Parks, Recreation, Trails, and Open Space Master Plan.** This document, which provides extensive existing conditions analysis, can be found at: http://www.saratogaspringscity.com/DocumentCenter/View/143/Parks-Recreation-Trails-and-Open-Space.

A bicyclists rides along the east side of Redwood Road using a designated striped bike lane. While this five lane road has a speed limit that varies from 45 to 55 mph, throughout the city, the bike lane creates an environment of comfort by providing distance from vehicles and a defined area marked by engineering designs specific for bicyclists. Appropriate design requires the consideration of variables such as speed, conflicts at intersections, and available Right-of-Way (ROW). Designated bike lanes can be physically buffered, painted green, signed and striped, or potentially remain an unaltered roadway shoulder that already offers enough width to provide a reasonable level of safety and comfort to a certain percentage of bicyclists. Roads that offer bike lanes in Saratoga are Redwood Road, Pioneer Crossing, and Pony Express.

Two people bicycle along a paved street separated trail located along the west side of Redwood Road. This option for AT offers a much higher level of comfort to bicyclists (and pedestrians) than the designated bike lanes along the shoulder of Redwood. These paved paths are found along high speed arterials like Redwood Road and Pony Express, allowing for bicyclists and pedestrians to travel farther distances in safety and comfort. They are also being constructed by contractors in neighborhood developments across the City, like Harvest Hills Boulevard and along and off of Ring Road. These paths can provide seamless AT connections between local roads and arterials when they are designed to link together as they do between Parkway Boulevard and Redwood Road.

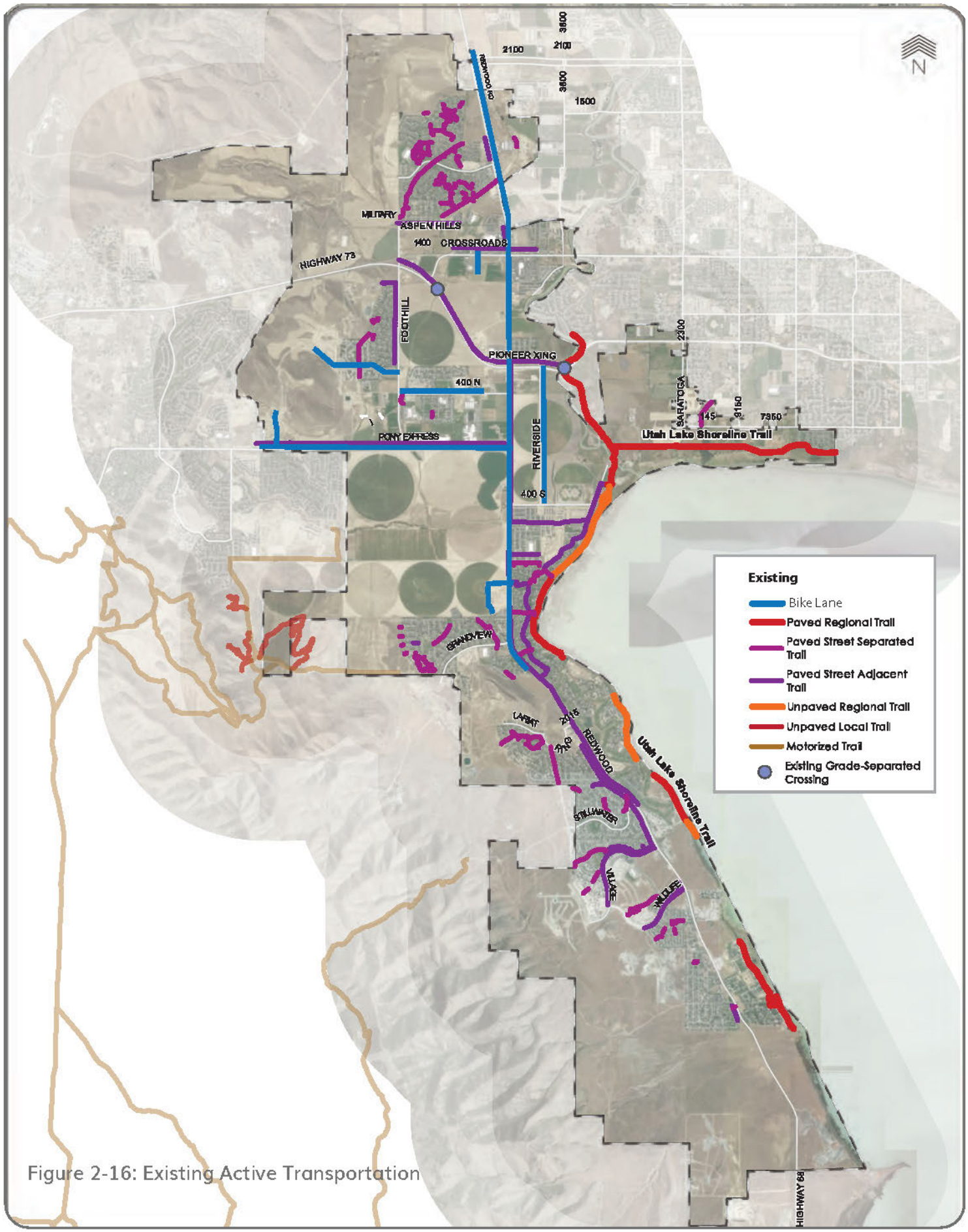


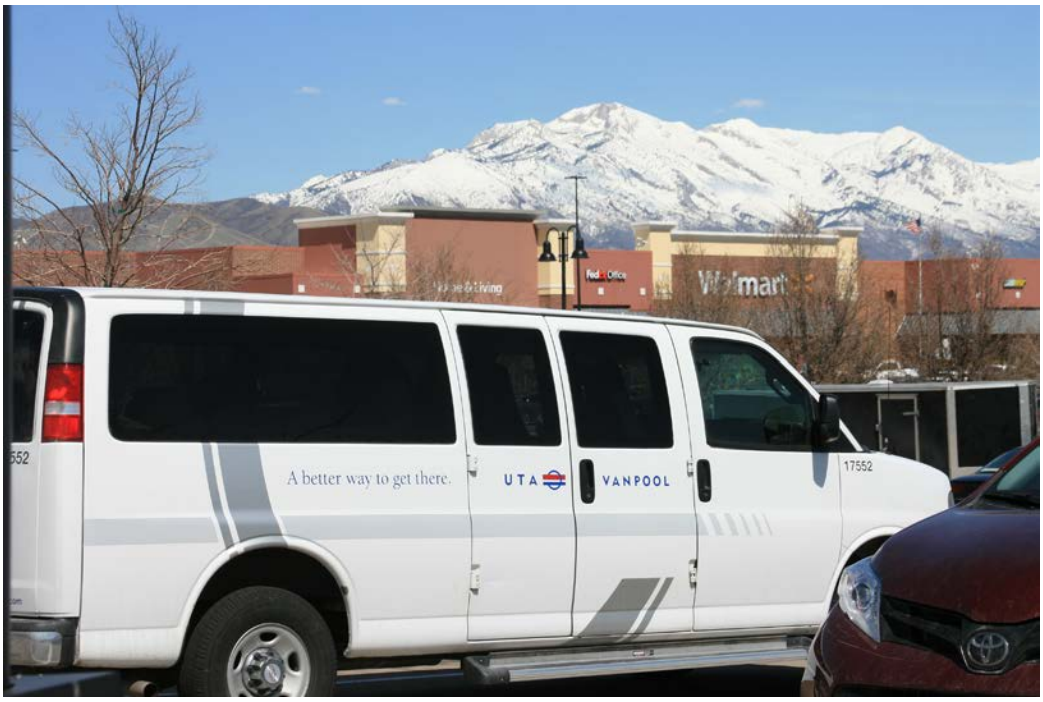
Figure 2-16: Existing Active Transportation

TRANSIT

Saratoga Springs is served by Utah Transit Authority's (UTA) bus route 806, which runs from Eagle Mountain across Saratoga Springs to the Lehi Frontrunner Station and Utah Valley University (UVU). Currently, the bus runs only Monday through Friday, with no transit service offered on the weekends. The UTA 806 makes stops in Saratoga Springs at 478 West Harvest Hills Boulevard, the Harvest Hills Church Park & Ride, and the intersection of Highway 73 and Redwood Rd.

The 806 travels eastbound towards UVU during morning hours and travels westbound towards Eagle Mountain in the afternoon and early evening. The 806 averaged 88 daily riders in 2015 putting the utilized capacity of the bus under 20 percent. The predictability of the bus was at 91 percent. Over the past five plus years, there has been a 16 percent decrease in ridership. Current data from the early (pre-Covid -19) months of 2020 show there are now 74 average daily riders.

UTA offers Vanpool service in Saratoga Springs. The service provides various size vans for rent to groups of individuals and companies. Vanpool functions as an interim transit option for areas like Saratoga Springs that may not yet have the demand for frequent public transit. This service provides residents access to transportation options beyond a single-occupancy vehicle when public transit options like the 806 bus are unavailable. In Saratoga Springs, where bus service is limited, vanpool can allow workers to get to and from their jobs during hours and days bus service is unavailable.



A UTA Vanpool vehicle sits outside of the Walmart in Saratoga Springs.

Figure 2-17: Existing Transit

3 where we're going

This chapter discusses the background and assumptions used to forecast transportation-related growth in Saratoga Springs. Using TDM techniques, in conjunction with projected socioeconomic, population, and employment trends, future transportation demands were forecast. Transportation system improvements that are committed or planned by agencies such as Utah Department of Transportation (UDOT) and Mountainland Associated of Governments (MAG) were included in the transportation forecasting prior to identifying additional transportation projects within Saratoga Springs. MAG is the Metropolitan Planning Organization (MPO) for Utah County and is responsible for coordinating transportation planning in the region.

Future Growth

Most of the projected socioeconomic data used in this study comes from the Land-Use Element of the General Plan. The General Plan was last updated in 2017 and is shown in Figure 3-1. To allow for growth, this Plan reflects significant changes across a variety of land-uses, including agriculture, residential, industrial and commercial. This planned land-use provides the basis for the projected socioeconomic data used in this study and comes from land-use modeling completed by MAG. MAG recently updated their Regional Transportation Plan (RTP), TransPlan 2050, which is the foundational plan for the development of the future regional transportation system. The 2019-2050 RTP, also know as TransPlan50 (available at https://www.mountainland.org) was adopted in 2019. The RTP is a guide to maintain and enhance the regional transportation system for urbanized Utah County. As part of this process, MAG modeled future land-use changes based upon allowed development the transportation system. The output was then used to determine what will be needed for the future functional roadway network. These socioeconomic assumptions were further refined for this TMP update to better reflect existing and planned land-use within Saratoga Springs.

Figure 3-1: General Land-use Plan

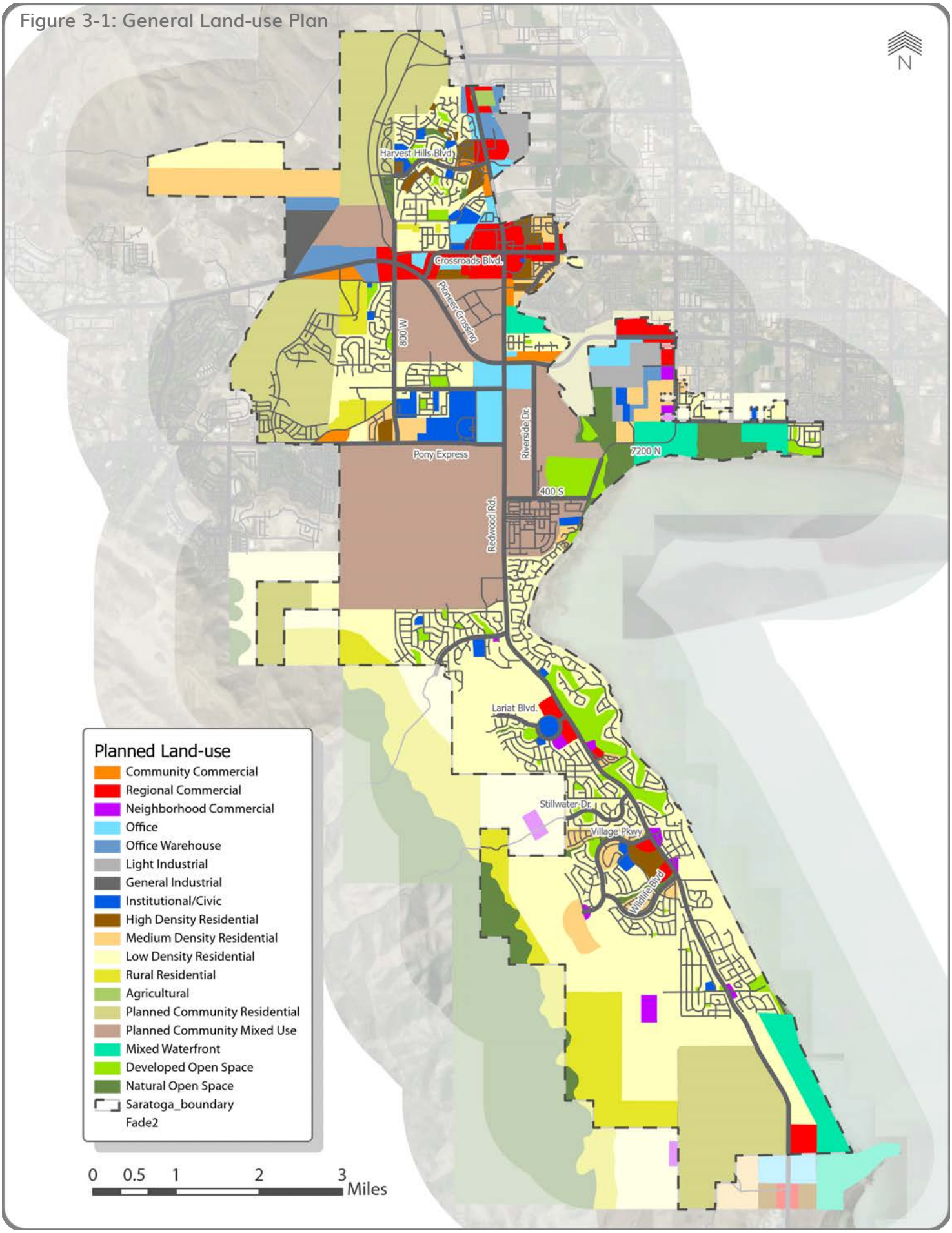
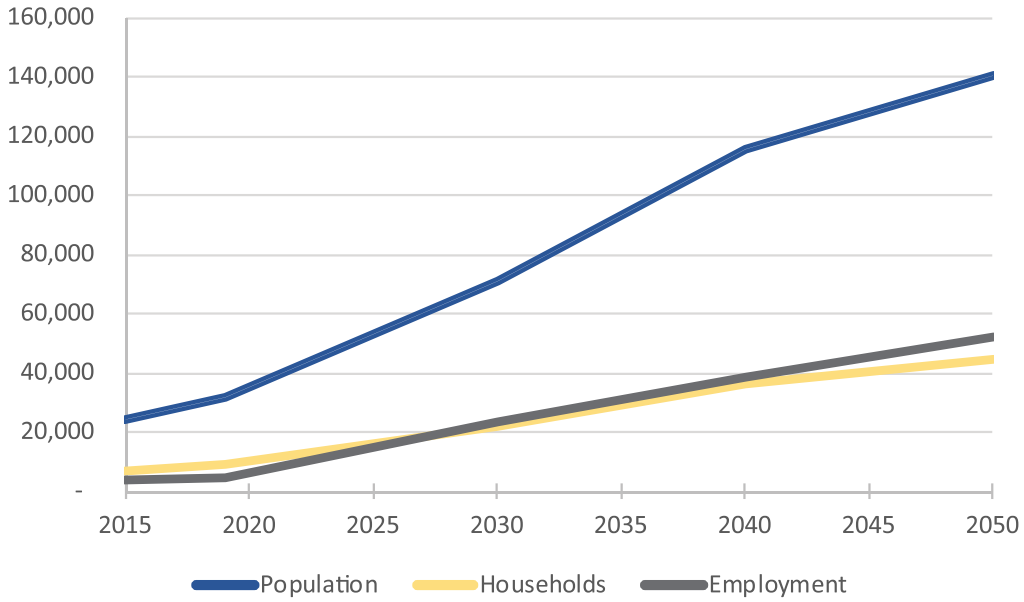


Figure 3-2 summarizes the anticipated growth over the next 30 years. The future we are planning for revolves around significant population and employment growth. The projected 2050 population in Saratoga Springs is over 130,000 people. It is anticipated that there will be an additional 140,000 people in Eagle Mountain that will pass through Saratoga Springs to travel to destinations throughout the Wasatch Front. Job growth is also expected to increase substantially over the next 30 years. While population is anticipated to increase by over 400 percent, employment is forecast to increase by more than 1,100 percent, with more jobs than households being added after 2030.

Figure 3-2: Saratoga Springs Projected Growth



Travel Model Development

Projecting future travel demand is a function of projected land-use and socioeconomic conditions. The MAG TDM was used to predict future traffic patterns and travel demand. The TDM was modified to reflect better accuracy through the Saratoga Springs area by creating smaller Traffic Analysis Zones (TAZ) and a more accurate and extensive roadway network. Existing conditions were simulated in the TDM and compared to the observed traffic count data to get a reasonable base line for future travel demand. Once this effort was completed, future land-uses and socioeconomic data were input into the TDM to predict the roadway conditions for the horizon year 2050. Year 2050 was selected as the planning year horizon to be consistent with the regional planning process.

Land-use's Effect on Transportation

The rapid growth that Saratoga Springs has experienced is expected to continue in the coming years. Population is projected to more than triple over the next thirty years, resulting in increased transportation system demands. These increased demands will require new and improved transportation facilities. Additionally, Saratoga Springs is currently a bedroom community with many more households than jobs after 2030. While the city has a mix of residential, commercial, and industrial land-uses near the intersection of Pioneer Crossing and Redwood Road, these land-uses will increase and develop in additional areas. These new commercial, retail, and office developments are expected to result in more jobs than households. Saratoga Springs will no longer be a bedroom community offering more opportunities for people to shop and work within the community. These changes will require transportation options for people to walk, bike, or take transit for these shorter distance trips, changing how people commute in the future.

MODEL YEARS AND RESULTS

Projected Traffic Volumes & Conditions

The resulting outputs of the TDM consist of traffic volumes on all of the classified streets in the city and surrounding area. These forecasted traffic volumes were used to identify the need for future roadway improvements to accommodate growth. The following two scenarios were analyzed in detail for the years 2030, 2040, 2050 to assess the travel demand and resulting network performance in the city:

- **No-build**
- **Recommended Roadway Network**

No-Build Conditions

A no-build scenario is intended to show what the roadway network would be like in the future if no action were taken to improve the roadway network. The TDM was again used to predict this condition by applying the future growth and travel demand to the existing roadway network. Interim year growth assumptions were also modeled to understand how congestion grows over time. Figure 3-3 and Figure 3-4 show the 2030, 2040, and 2050 no-build model LOS, respectively. These maps show growing congestion on Pioneer Crossing, Pony Express, Redwood Road, and other corridors as the population and employment increases without improvements to the transportation system. This growing congestion is visible in the expansion of orange and red roadway segments.

As shown in, Figure 3-5 if no improvements are made to the transportation system, projected traffic volumes for the planning year 2050 will significantly worsen the LOS of many streets and intersections throughout the city. The following list includes the streets expected to perform at LOS D or worse:

LOS D (Peak Congestion but Acceptable)

Harvest Hills Boulevard (Mountain View Road to Redwood Road)

1200 North (Hillside Drive to Foothill Boulevard)

145 North (Saratoga Road to 1100 West)

Colt Drive (Spring Meadows Drive t Ring Road)

LOS E or Worse (Unacceptable)

2100 North

Crossroads Boulevard

Pioneer Crossing

400 North (200 West to Redwood Road)

Pony Express

400 South

Saratoga Road

Ring Road

Mountain View Road

Foothill Boulevard

Redwood Road

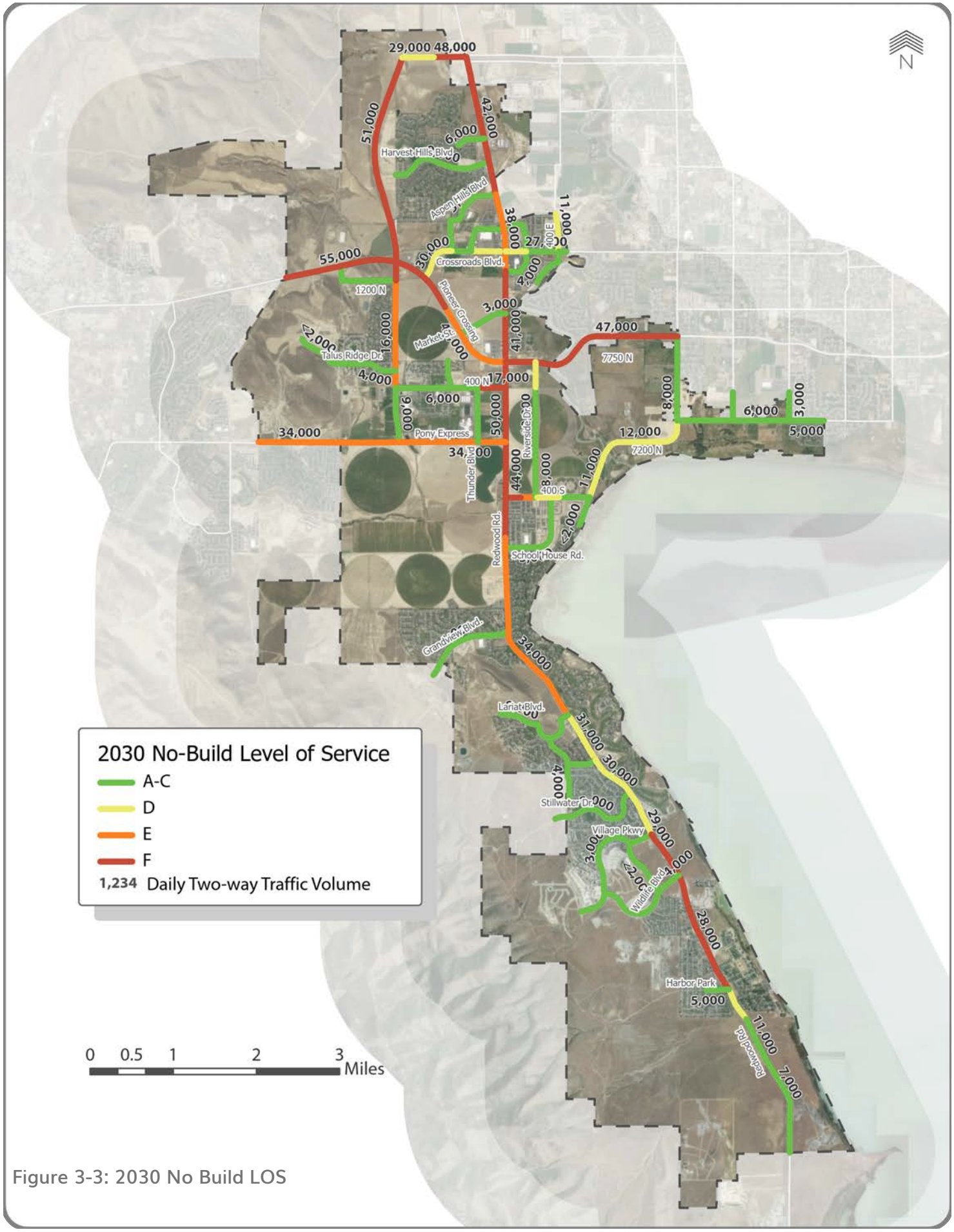


Figure 3-3: 2030 No Build LOS

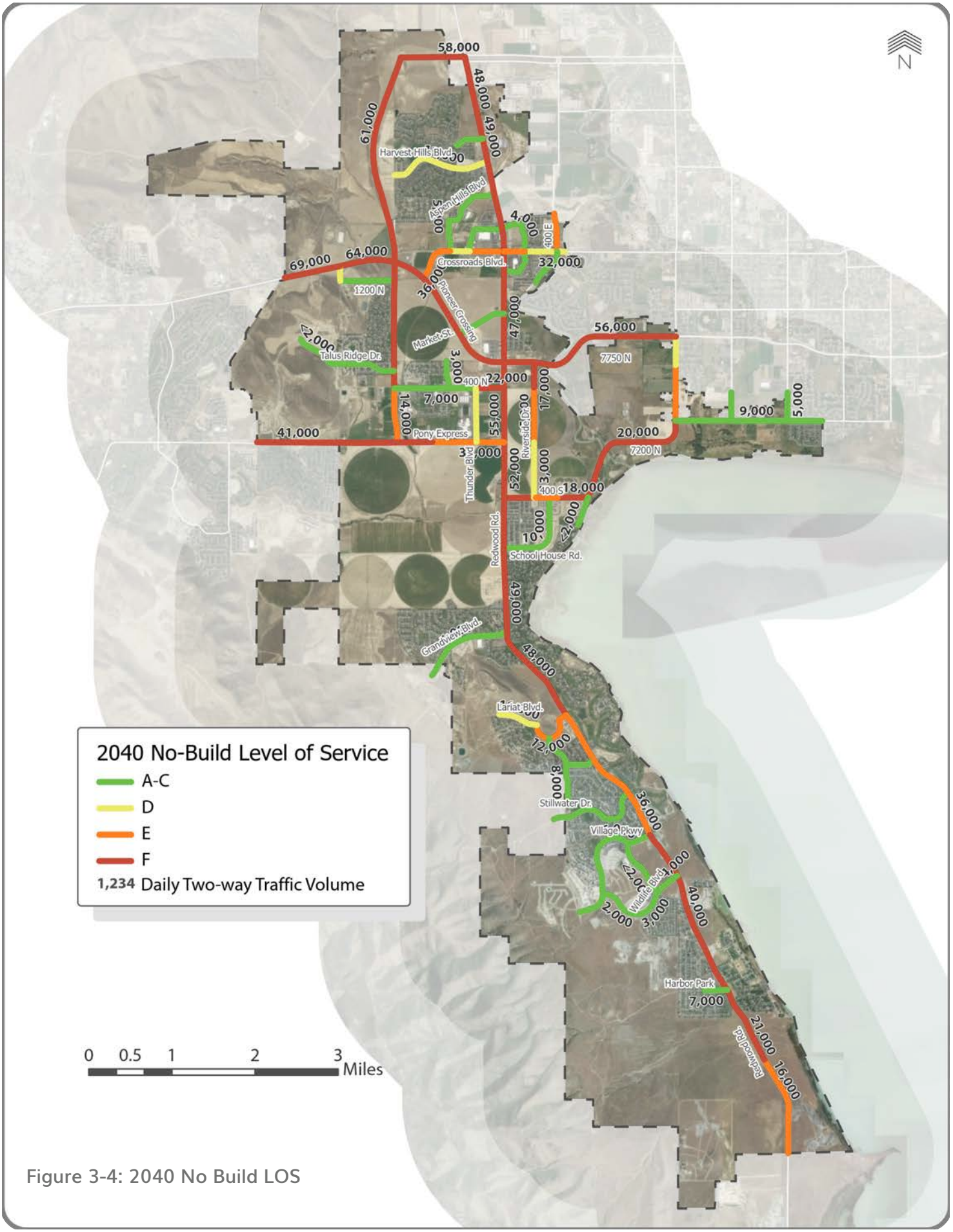


Figure 3-4: 2040 No Build LOS

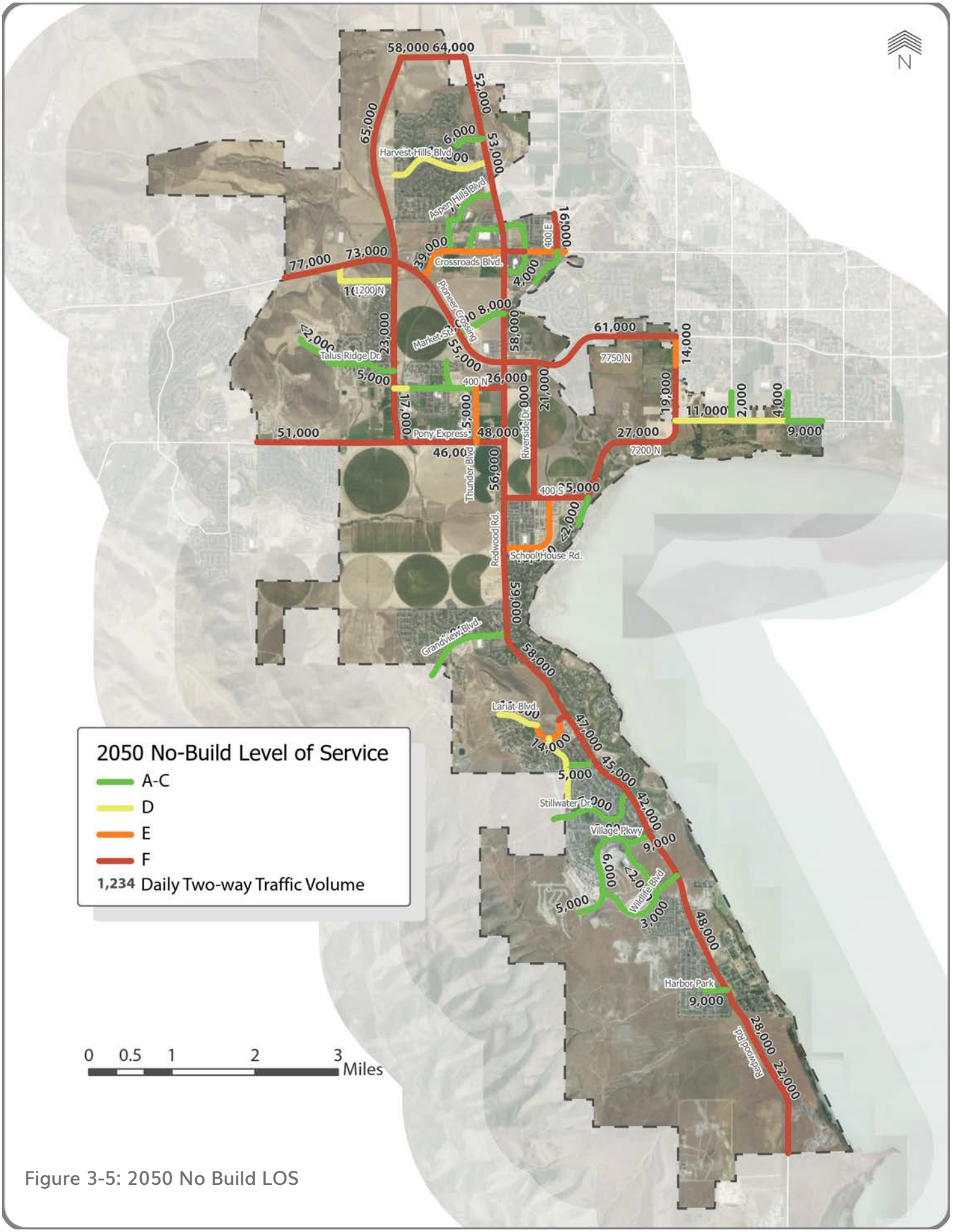


Figure 3-5: 2050 No Build LOS

RECOMMENDED 2050 ROADWAY NETWORK

Transportation system improvements will need to be made to preserve the quality of life and to maintain an acceptable LOS on city streets and at intersections. These improvements will also provide a sound street system that will support the city's economic base.

The future analysis can be split into two sections. The first are regional projects included in MAG's RTP. These projects may be funded in part by MAG. After determining where the improvements occur with the addition of the MAG projects, the second section includes the rest of the projects necessary to improve the roadway network to LOS D, or better, and to build the transportation system necessary to accommodate future land-use plans

New growth requires new roadway capacity improvements to maintain the LOS in Saratoga Springs.

The recommended 2050 roadway network will provide the access and capacity for the growth anticipated in the commercial, retail, and office sectors as well as family housing. The built environment in Saratoga Springs is quickly expanding as seen in the photo above where three houses are in three separate stages of construction on a new development. All three face the new Mountain View Corridor, while their backyards overlook the city and Utah Lake. Without additional improvements to Mountain View Corridor and other high travel speed routes, these arterials will experience more congestion until, ultimately they will perform at an unacceptable LOS and reduce the quality of life for the residents of Saratoga Springs.

REGIONAL TRANSPORTATION PLAN

Saratoga Springs is not alone in improving the roadway network. MAG, in cooperation with UDOT, provides financial assistance for projects included in their RTP. If a roadway is included on the RTP and is owned and operated by UDOT, full financial responsibility falls to UDOT. It is important to include these projects in the RTP as well as coordinate with UDOT to ensure these projects are implemented. If the roadway is on the RTP and not owned by UDOT, Saratoga Springs may be able to apply for funding through MAG, in which case, the City will only be responsible to match 6.77 percent of the total cost of the project. The projects within Saratoga Springs included on the RTP are shown in Figure 3-6, and below is a list of the RTP projects to be completed in various phases. An interactive map can be viewed on MAG's website www.mountainland.org:

Phase 1:

Cory Wride Freeway
- » New freeway, frontage roads
- » Mountain View Corridor to Ranches Parkway

Foothill Boulevard
- » New 3 lane road
- » Cory Wride Freeway to Stillwater Drive

Lehi 2100 N Freeway
- » New freeway
- » SR-194 Mountain View Corridor to I-15

400 East / Lehi 3600 West
- » New and widen to 5 lanes
- » Crossroads Boulevard to Clubhouse Drive

Lehi Main ST
- » Widen to 5 lanes
- » Commerce Drive to Lehi 500 W

Pioneer Crossing
- » Widen to 6 lanes
- » Redwood Road to Lehi 2300 W

Pony Express Parkway
- » New and widen to 5 lanes
- » Redwood Road to Vineyard Connector

Triumph Boulevard/Lehi 2300 W
- » New and widen to 5 lanes
- » Timpanogos HWY to Lehi 1900 S

Phase 2:

Foothill Boulevard
- » New 4 lane road
- » Stillwater Drive to Redwood Road

Foothill Freeway
- » New freeway
- » Cory Wride Freeway to Stillwater Drive

Harvest Hills Boulevard
- » New 3 lane road
- » Sunflower Way to Spring Run Drive

Mt. Saratoga Boulevard
- » New 3 lane road
- » Cory Wride Freeway to Harvest Hills Boulevard

North Lakeshore Freeway
- » New freeway (location TBD)
- » Foothill Freeway to I-15

Phase 3

Foothill Freeway
- » Convert to freeway
- » Stillwater Drive to Redwood Road

Hidden Valley Road
- » New 5 lane road
- » East Expressway to Redwood Road

Mountain View Freeway
- » Widen to 8 Lanes
- » Cory Wride Highway to Porter Rockwell Parkway

Utah Lake Bridge
- » New freeway bridge (location TBD)
- » Redwood Road to I-15

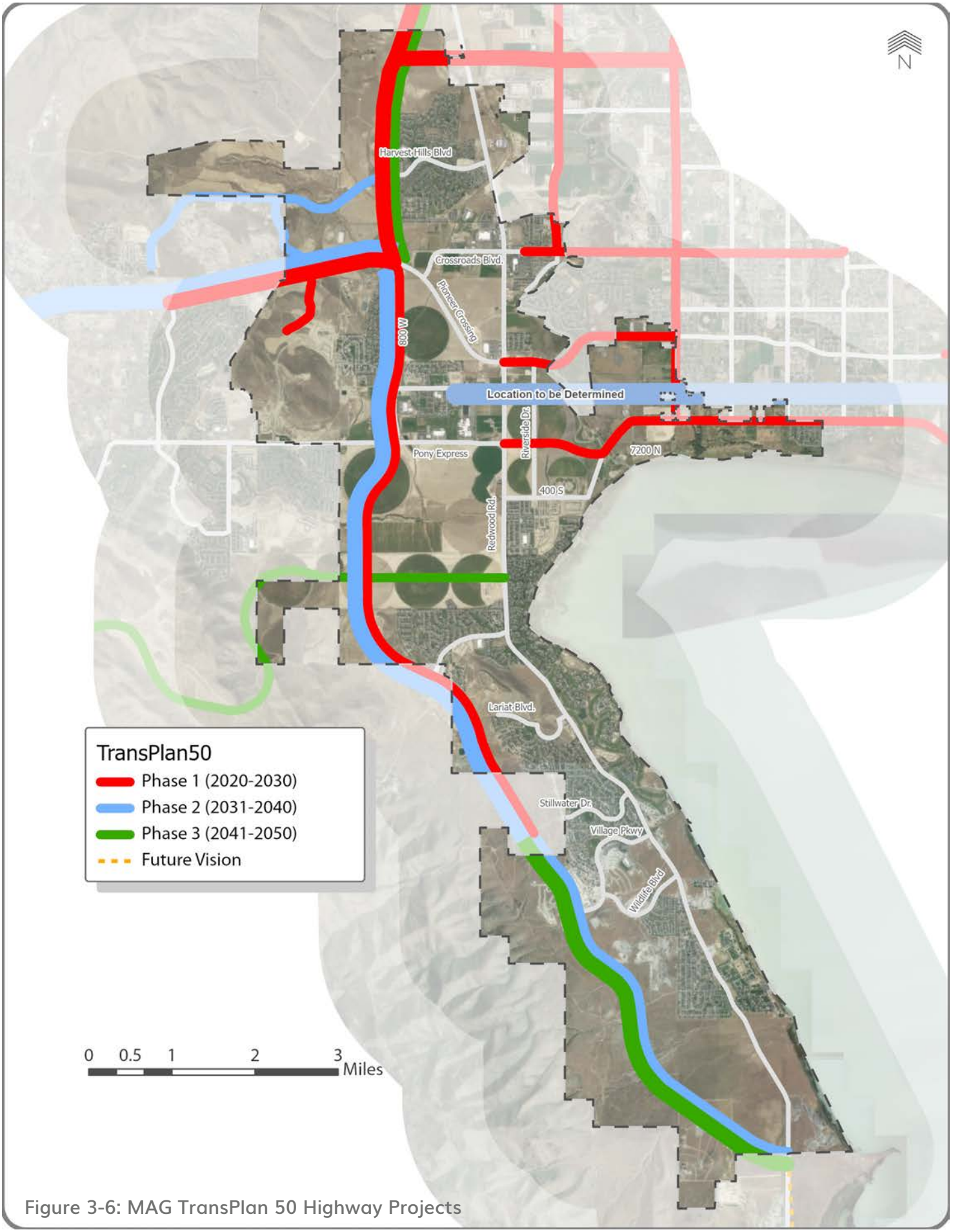


Figure 3-6: MAG TransPlan 50 Highway Projects

2050 Proposed Roadway Network

The indicated roadway segments previously listed, as well as the additional modeling results, form the basis of the improvements included in the 2050 roadway improvements. With all projects included, Figure 3-7 shows the proposed 2050 roadway network and LOS with all future projects (including MAG RTP projects). Applying all improvements will allow the roadway network to function at LOS D or better in all locations.

SUMMARY OF WHAT THE FUTURE HOLDS

With the planned growth of Saratoga Springs and surrounding communities, the transportation system will experience increased demand. Without improvements to the transportation network, traffic congestion and resulting delays will increase significantly on most of the functionally-classified roadways. However, Saratoga Springs is not alone in planning for future growth. UDOT and MAG have identified key improvements to the regional roadway network to accommodate future demand, too. These regional capacity improvements reduce future congestion on the functionally-classified roads within the city. Most of the capacity improvements needed to accommodate the future vision for Saratoga Springs are planned with the MAG's TransPlan 2050. To address remaining capacity needs, additional projects were identified that reflect community input and local priorities. With all the projects identified, the future roadway system is anticipated to function at an acceptable LOS with minimal delays through the planning year 2050.

There is an ongoing North Lakeshore Study involving Saratoga Springs, looking at the option for an east/west freeway connecting to I-15. Although no specific alignment has been decided upon as of yet, one option is for Pioneer Crossing to be converted into a freeway. This roadway expansion would address most of the future east/west capacity issues that modeling shows Saratoga Springs could potentially be faced with. Figure 3-8 shows the 2050 LOS with the option for the Pioneer Crossing Freeway. In this build scenario, the majority of Saratoga Springs will experience LOS A-C, a few areas of LOS D, no areas of LOS F, and one location will have LOS E. In summary, this map shows the most green and the least amount of orange and red of any other map, by far. Compared to the other no-build and build alternatives, this scenario provides residents, visitors, and those whose daily routine carry them through the city the greatest ease of use and the least congestion. The Pioneer Crossing Freeway may have the greatest effect on quality of life to the greatest amount of people of all future scenarios.

Signals will need to be monitored and updated as conditions change. It is recommended that the signalized intersections in the area be regularly monitored, and signal timings adjusted as needed to maintain acceptable operating conditions. Coordination with UDOT will be necessary on all UDOT roads. Additionally, care should be taken to regularly monitor the non-signalized intersections and, where appropriate, studies should be completed to determine the best control for the intersection. The most common mitigations to failing non-signalized intersections are roundabouts and traffic signals. For each intersection, both roundabout and traffic signal solutions should be investigated and studied to determine the best alternative.

Even with high rates of residential and commercial growth, Saratoga Springs can achieve a good LOS if the planned projects are built.

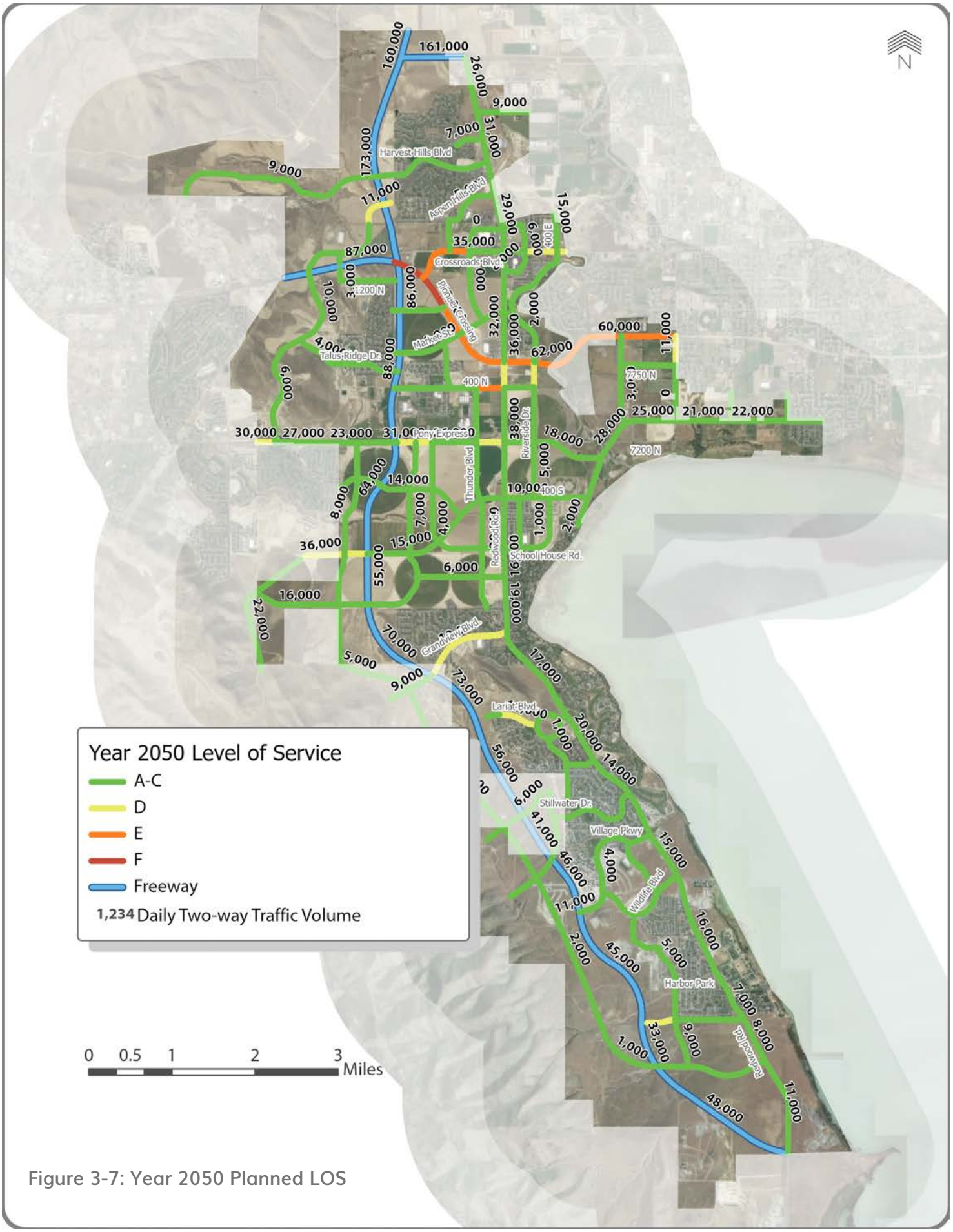


Figure 3-7: Year 2050 Planned LOS

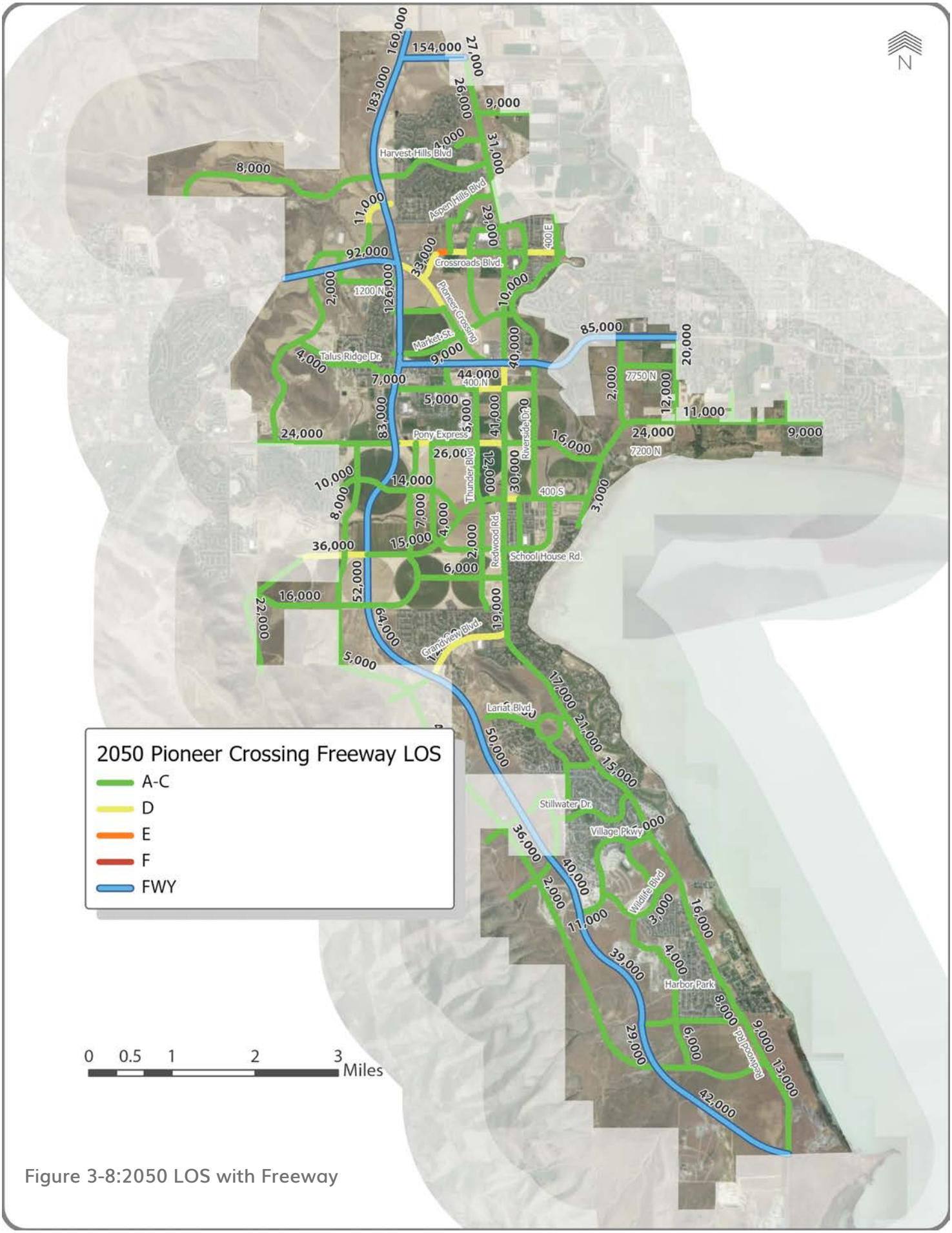


Figure 3-8:2050 LOS with Freeway

4 what we heard

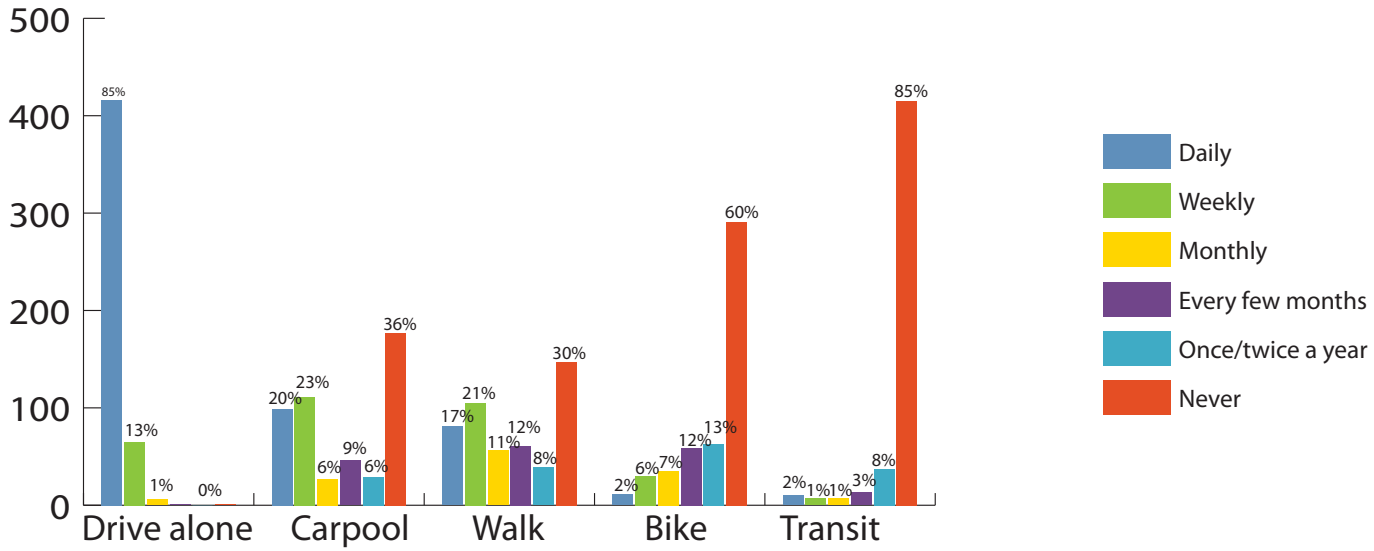
COMMUNITY INPUT

A community survey that focused on issues concerning transportation and planning was available to Saratoga Springs residents and the greater public through the City's Facebook page. The survey was completed by 498 individuals. This information gives insight into the daily routines of the Saratoga Springs residents who participated in the survey. All of the respondents are affected in some way by the transportation network. The feedback received from this survey is a transmittal of the public voice and provides insight into how residents view the current transportation system, what the future could be, and how it affects their quality of life.

Mode of Transportation

Respondents were asked how frequently they used the following transportation modes: driving alone, carpooling, walking, biking, and transit. The levels of use were: daily, weekly, monthly, every few months, once or twice a year, or never.

Figure 4-1: Respondents' mode of transportation usage



When asked how often a specific transportation mode was used, driving alone was by far the most common answer, with 85 percent reporting they drive alone on a daily basis. The second most common mode of travel was carpooling, with 20 percent answering that this was their daily mode of transportation. (It should be noted that the driving alone and the carpooling percentages add up to 105 percent. This indicates that respondents take multiple daily trips, and while the majority of them are in single occupant vehicles, other daily trips are carpool trips.) The number of people who carpool weekly, rather than daily, increased to 23 percent. Less then 10 percent carpool monthly, every few months, or once or twice a year. The largest amount responded, they never carpool (36 percent), while not a single respondent said that they never drive alone.

More people choose to walk frequently than bike;17 percent walk daily and 21 percent weekly, compared to just 2 percent who bike daily and 6 percent weekly. For trips that occur only monthly, every few months, or once or twice a year, both categories waking and biking received responses that hover around 10 percent for each answer, which is an increase for bicycling and a decrease for walking from daily and weekly. Twice as many people responded that they never bicycle (60 percent), compared to those who responded that they never walk for transportation, 30 percent, or 147 people.

Transit as a mode of transportation received the lowest percentages. The highest frequency of transit use was once or twice a year at 8 percent. Ten people, or 2 percent, responded that they used transit daily. 85 percent of people responded they never use transit, which is the same percentage who responded they drive alone everyday.

New roads in Saratoga are designed with striped bike lanes and wide sidewalks. Signage for pedestrians, bicyclists, and motorists help ensure all users are aware of their relationship to other modes of transportation along the ROW.

Transportation Safety and Congestion

Respondents strongly indicated that congestion is an issue. Overall, 92 percent of people responded that there was congestion, with 57 percent agreeing the city is very congested and 35 percent agreeing there is some congestion. One percent responded Saratoga Springs is not congested and the remaining 7 percent felt there is little congestion.

Over half of the responses (56 percent) stated that Saratoga Springs is safe, out of that number, 4 percent agree that it is very safe and 52 percent agree it is mostly safe. Those who felt it was unsafe, 44 percent, either stated that the City is somewhat unsafe (36 percent) or very unsafe (8 percent). Some of the issues identified as contributing to lack of safety were; road conditions that are hazardous to pedestrians and bicyclists, a lack of roads to exit the city in case of an evacuation or emergency, and left turns onto busy roads that are dangerous

Figure 4-2: Respondents' perception of overall transportation safety in the city

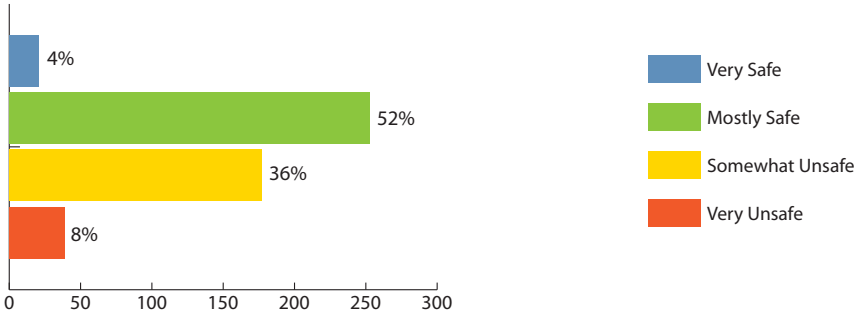
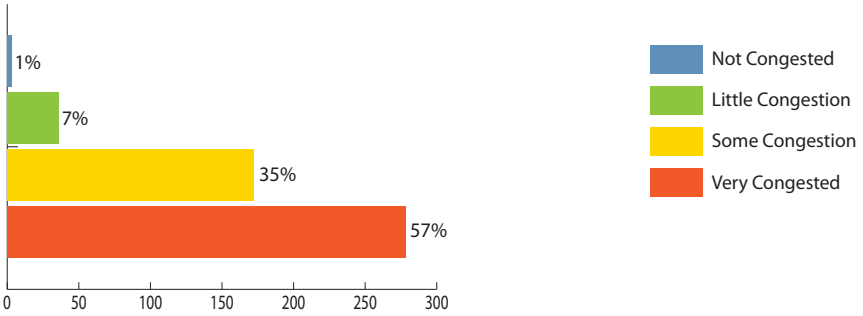
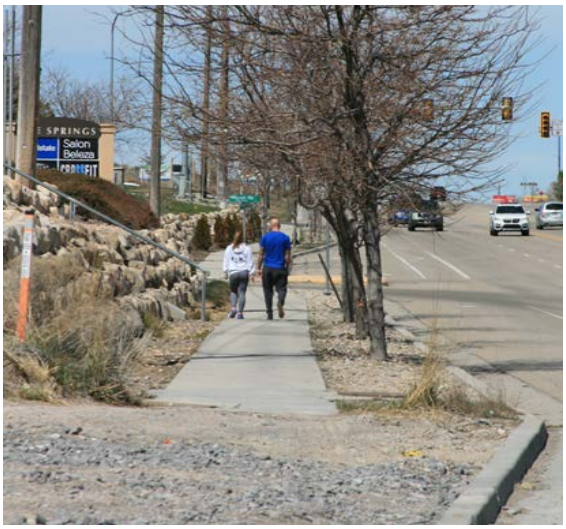


Figure 4-3: Respondents' perception of overall congestion in the city





People walk along a portion of constructed sidewalk on Redwood Road. This image shows current and future sidewalk, a striped bike lane, and traffic lanes. Designing roads to properly accommodate multiple modes of transportation will help decrease congestion by providing alternative transportation options and improve safety by through installing appropriate infrastructure for pedestrians and bicyclists.

Below are excerpts (some paraphrased) of written responses with themed headings about ***community member's transportation safety concerns*** from those who completed the survey.

Transit
»"We have to drive to get to a bus station safely."

Signal
»"More protected left turns would be helpful. Because of the increase in traffic, it is often unsafe or a very long wait with angry people behind you. "

Alternatives
»"Another larger road in and out of Saratoga Springs for safety issues in the event of an emergency or fire, where residents would need to exit the city quickly."

Visibility
»"a better paint used on the lines painted on the road. It is almost impossible to see the guiding lines at night and makes for difficult and dangerous driving."

Bike
»"More and safer bike lanes and paths and safer intersections."

Bike
»"We would love to walk or bike along redwood and by the shopping areas but do not feel safe."

Intersection
»"400 south is an intersection of concern, with the city buildings, Patriot park, and incoming residential development. I would love to see a light there to help citizens safely enter and exit that area of the city."

Redwood
»"There needs to be some lights to make turning left onto redwood safer"

Intersection
»"Pioneer-Crossing is a safety hazard, it's my top spot that needs better flow. Not sure why there are so many lights that stop traffic along the way."

Redwood
»"It would be nice if there was a right green arrow and a merging lane on Redwood Road from Parkway Boulevard"

Intersection
»"Extend the new roundabout that lets people travel to eagle mountain on the north west side of town all the way down through the southern end so that those way down at the end are not boxed in. Major fire safety hazard if we had to evacuate for example."

Walking
»"Kids walking to school on 800 W to Thunder Ridge are SO unsafe!!! Sidewalks need to be wider!!!"

Redwood
»"Remove the ability to turn left onto Redwood from Tanner Lane by the new middle school. It is unsafe."

Redwood
»"Redwood-Road and commerce drive is always unsafe. No sidewalks going north."

Redwood
»"Getting out of the Smiths parking lot onto redwood is dangerous. "

Walking & Biking
»"I would like to see roads built to handle safe pedestrian and bicycle traffic. "

Bus Stop
»"10420 W needs to be widened and speeding enforced. Many commuters cut through here instead of taking Redwood which is a safety concern being so close to homes and school bus stops.'"

Alternatives
»"We need a road parallel to Redwood Road running up along Lake Mountain extending at least from Pony Express to the south of Saratoga Springs. We only have one way out south of Pony Express. Not safe in an emergency."

Needs and Improvements

The community outreach allowed respondents to state, through open ended questions, what their vision was and what their wishes were for Saratoga Springs. Each response was categorized by topic so the amount of responses for each category could be illustrated through graphs and charts. Some topics that received the most comments were: improvements to traffic congestion, better connectivity, measures to improve safety, a lake crossing, traffic calming strategies, and wider roads.

Figure 4-4: Respondents' desire for transportation improvements in the city

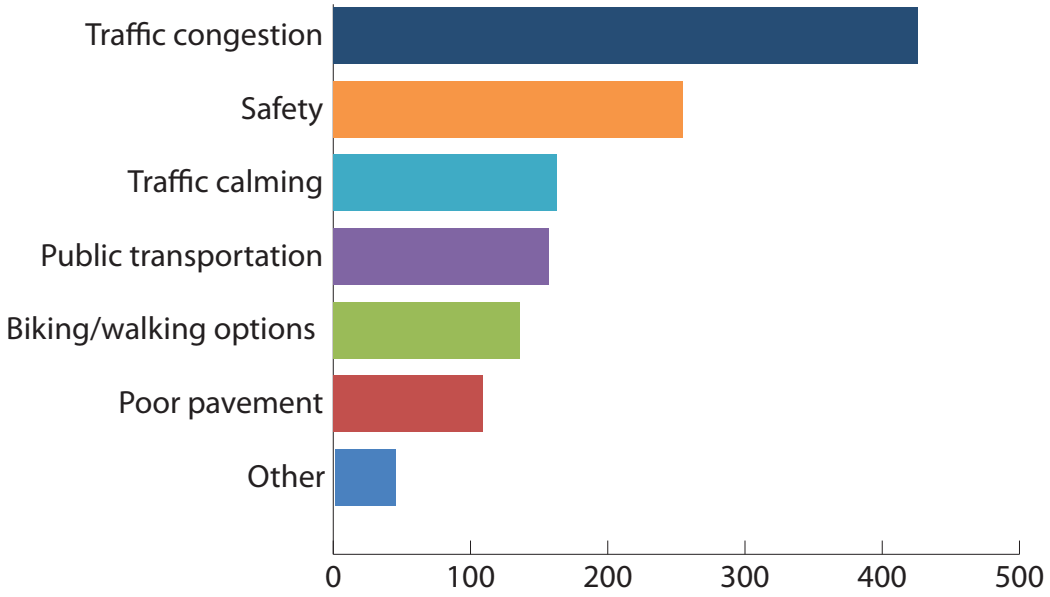
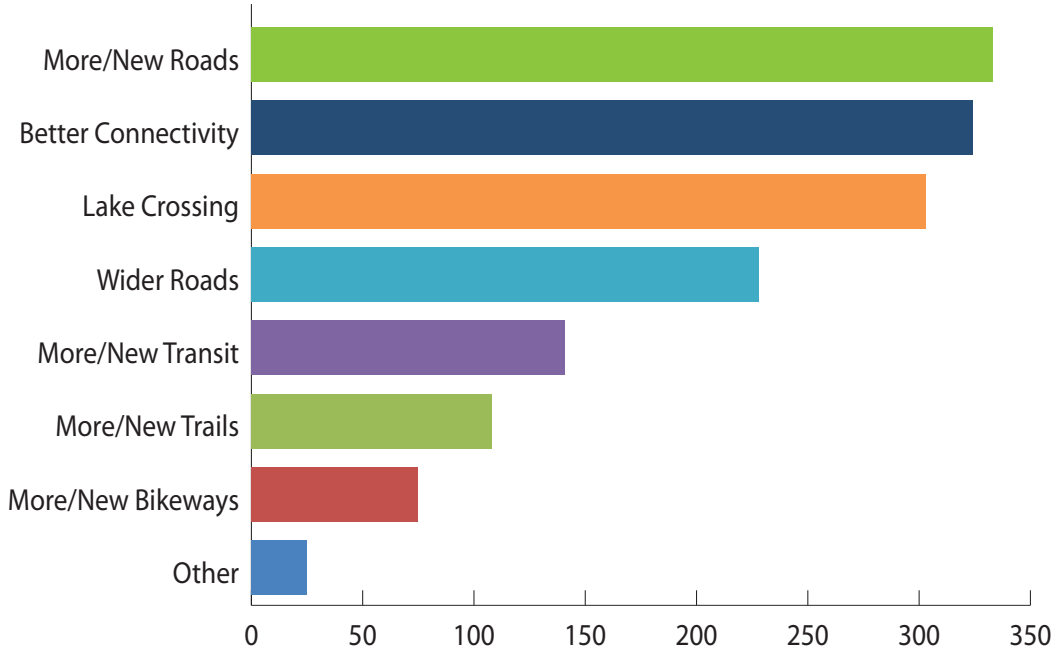


Figure 4-5: Respondents' desire for transportation projects in the city



Transportation Issues

An interactive map embedded in the community survey allowed respondents to place pins at specific locations where they identified concerning transportation issues. The survey encouraged respondents to include a description of the issue. The majority of the pins were accompanied with an explanation. The most commonly-identified issues were: congestion, safety, signal timing, and the need for new roads. Below is a bar chart breaking down the transportation issues identified by Saratoga residents.

Figure 4-6: Respondents' opinions of the most significant transportation issues

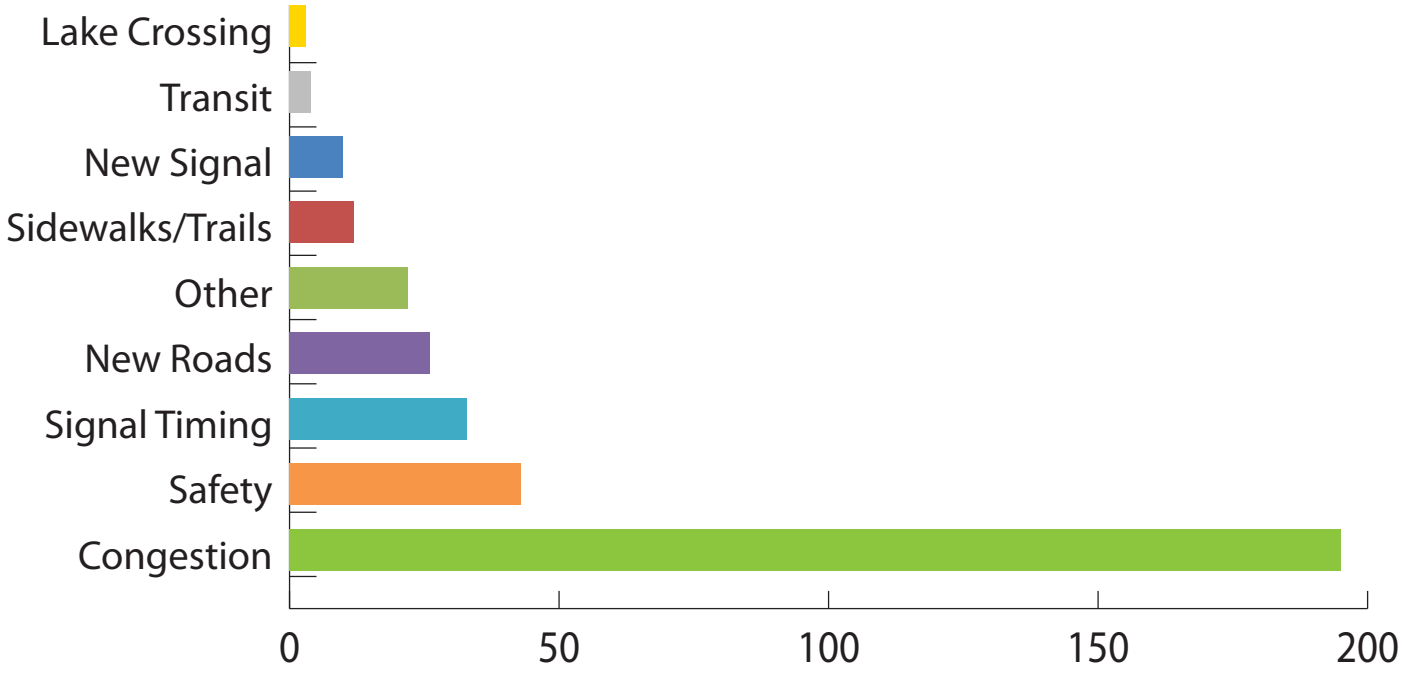


Figure 4-7 on the following page shows the pin locations placed by survey respondents to identify specific transportation issues in and around Saratoga Springs. The map and its legend are comprised of the same unique categories as the bar chart above.

Many community members may have been drawn to Saratoga Springs because of its location. But, when it comes to transportation issues, the location creates a demand for new roads to ensure that residents can have the choice of multiple access points to enter and exit the city.

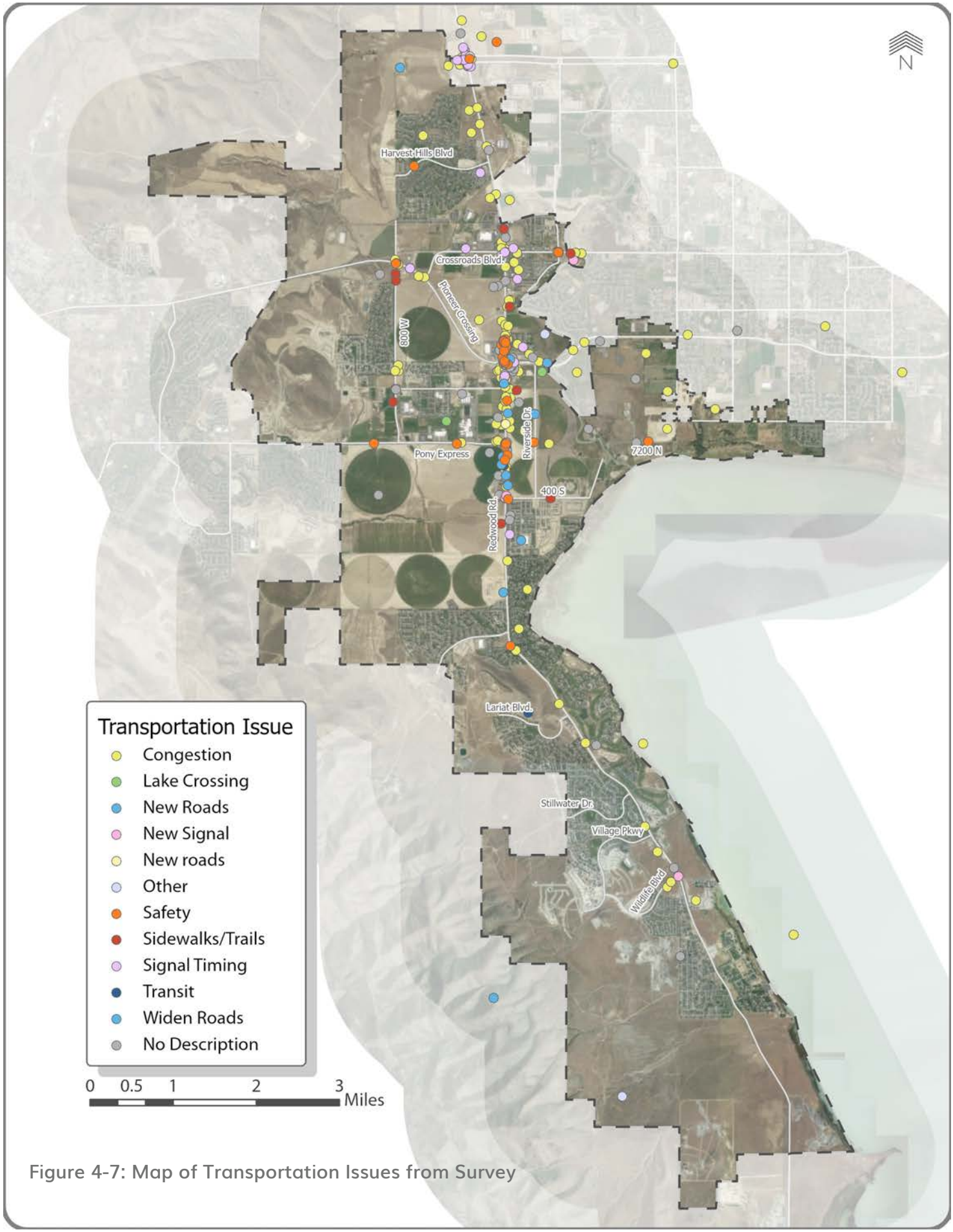


Figure 4-7: Map of Transportation Issues from Survey

5 Recommendations

This chapter focuses on specific transportation recommendations. It includes the Future Functional Classifications Map with roadway cross-sections and descriptions. It also contains discussions of access management and other transportation recommendations, including future transit and AT recommendations.

FUTURE FUNCTIONAL CLASSIFICATIONS

The recommended functionally-classified roadway network is illustrated in Figure 5-1. The functional classification was developed based upon prior planning efforts, including the existing functional classifications shown in Figure 2-7. This existing map provided the base roadway network that was refined to serve the updated future land-uses and traffic forecasts from the TDM. Finally, the recommended functional classifications reflect stakeholder and public comments to create a network that will serve existing and future travel demand. The recommended network includes planned projects from MAG's RTP. These arterial and collector roadways will provide the backbone of the functionally-classified transportation network within Saratoga Springs.

The Future Functional Classifications Map shown in figure 5-1 on the next page is a comprehensive one-page image of the City's Transportation Master Plan. It shows the existing and future roads with their connectivity and general sizing so the community will know what the plan is for future roads in Saratoga Springs. It is essentially the future road network.

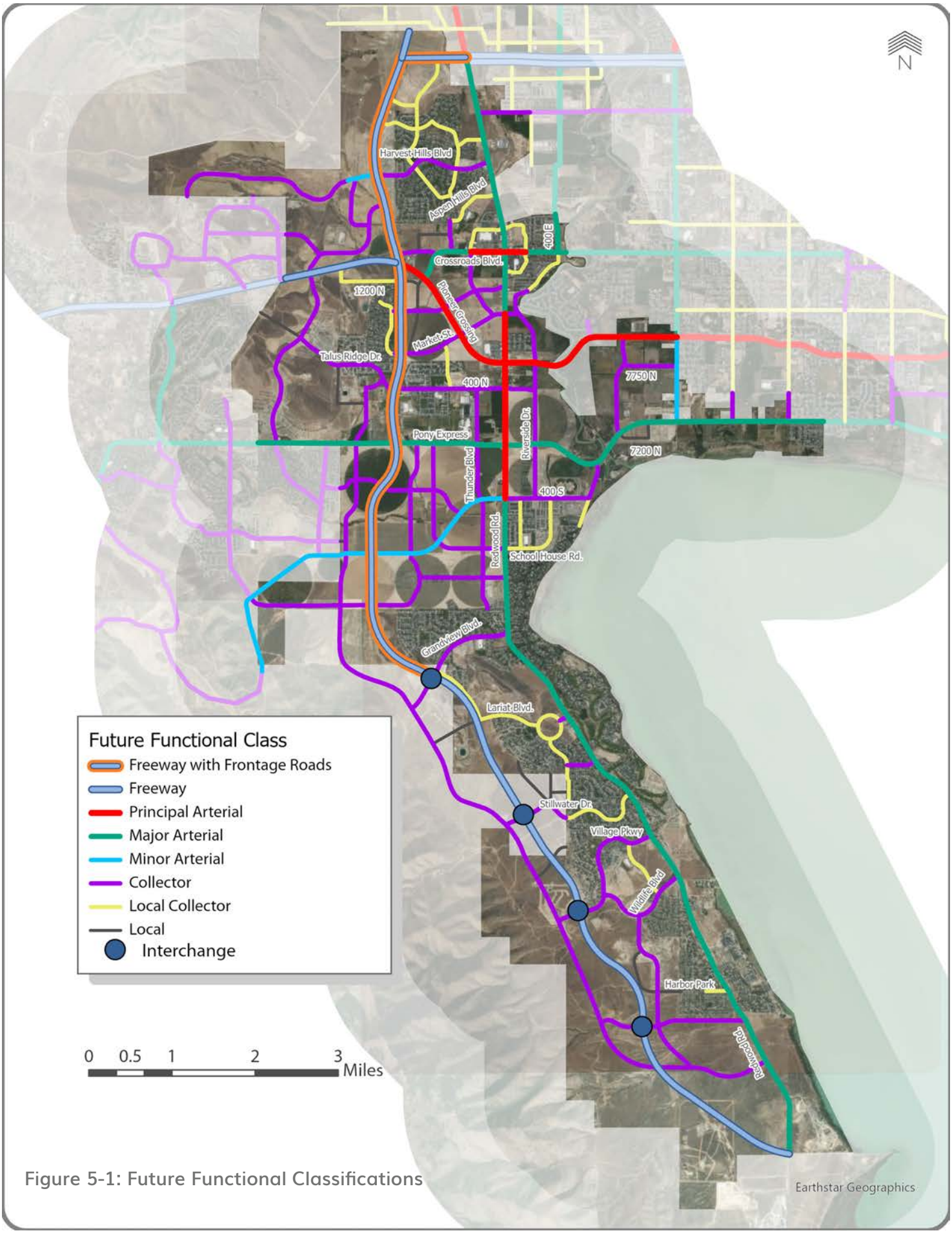


Figure 5-1: Future Functional Classifications

STANDARDS AND CROSS-SECTIONS

Accompanying the Future Functional Classifications Map to better complete the road network are standard roadway cross-sections. Roadway cross-sections are essential for understanding the function, capacity, and speed, as well as the look and feel of a road. The roadway cross-section standards for this TMP are based on Saratoga Springs City Standards and engineering concepts from the American Association of State Highway and Transportation Officials'(AASHTO) design manual "A Policy on Geometric Design of Highways and Streets 2018," commonly called the "AASHTO Green Book".

The typical cross-sections for each functional classification in Saratoga Springs are drawn in this section. These cross-section standards take into account certain necessary elements of a functional road system like: access, capacity, safety, vehicle emissions, and mobility. Smaller, lower-speed designs allow for more driveway and neighborhood access, while roadways like principle arterials, which are designed for easier long-distance travel at higher speeds, serve the function of moving a greater capacity of cars to areas with limited access. Cross-section drawings are located on the following pages. These are only examples of possible lane configurations within the pavement widths because there is variability in the application of standards.

All roadway design should be checked and compared to the City's Engineering Standards and Specifications.

Arterials

Principal arterial streets are mostly UDOT roads and are designed to move vehicles through an area. These roads have limited access, higher speeds, and traffic signals at major cross-streets. Principal arterials are generally spaced about one or two miles apart and usually have four to six travel lanes with a center-turn lane. Principal arterials in Saratoga Springs include Redwood Road, Pioneer Crossing, and S.R. 73. As shown below, the design widths for the principal arterials are variable and can be used for 3 to 7 lane roadway sections. ROW often varies and can be flexible to specific locations. Saratoga roads also include major and minor arterials which are designed for less volume than principal arterials but more volume than other existing road classifications in the city.

Figure 5-2: 7-Lane Major Arterial Cross-section

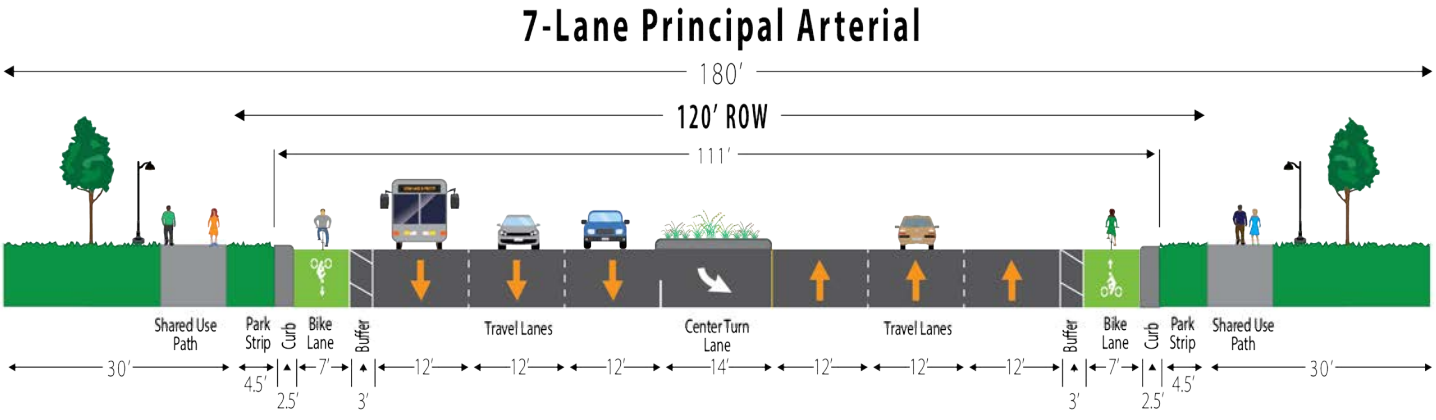


Figure 5-3: 5-Lane Major Arterial Cross-section

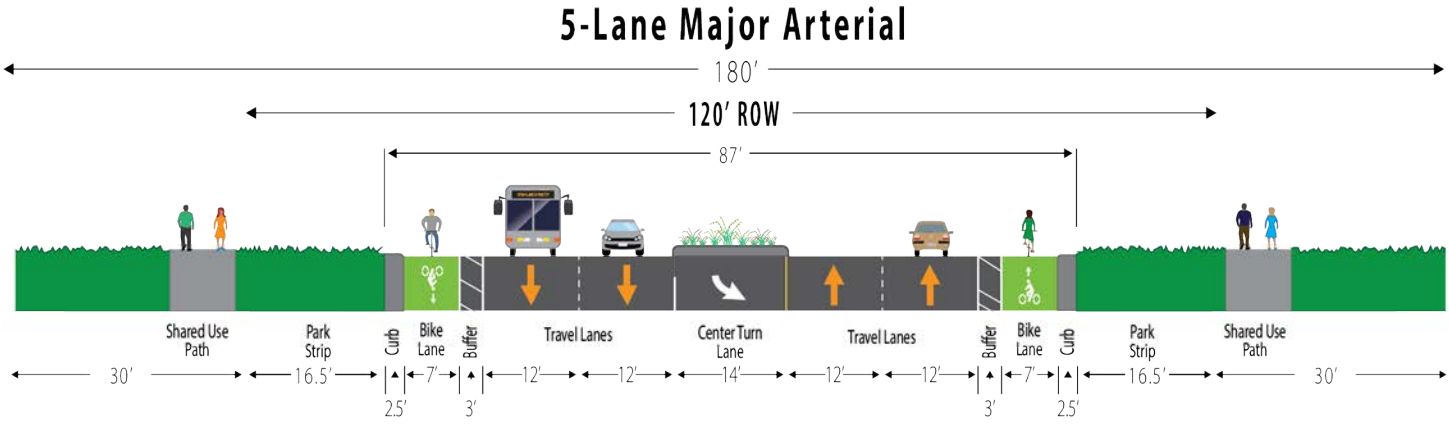


Figure 5-4: Alternative 5-Lane Major Arterial Cross-section

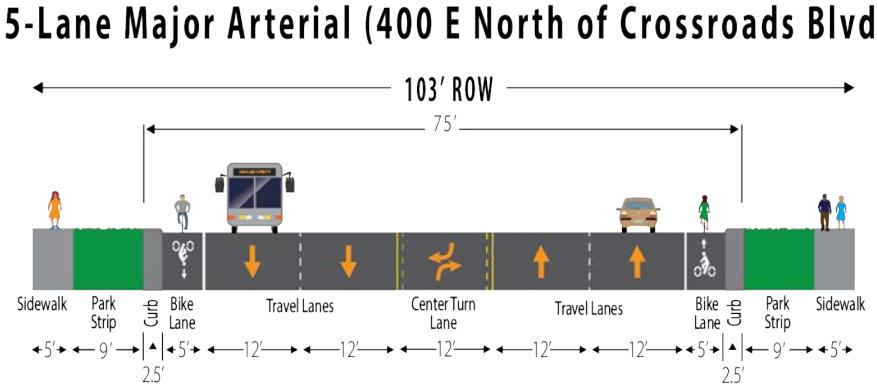
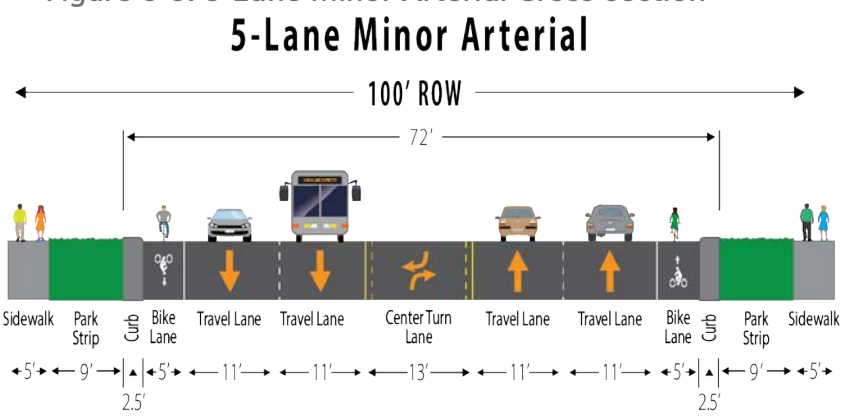


Figure 5-5: 5-Lane Minor Arterial Cross-section



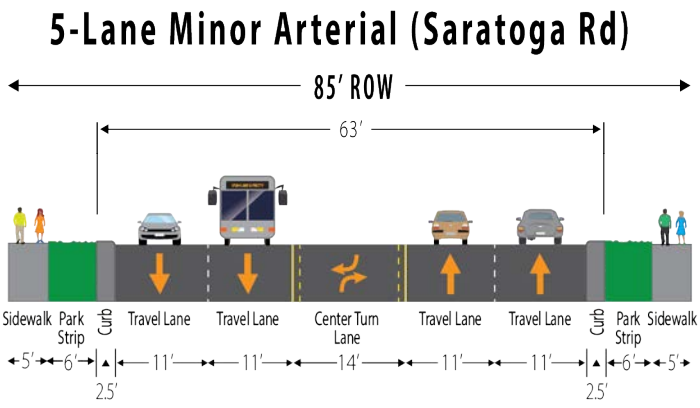
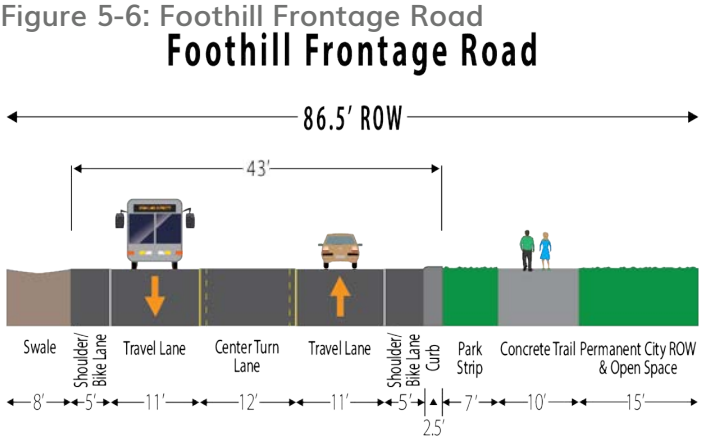


Figure 5-6: Foothill Frontage Road

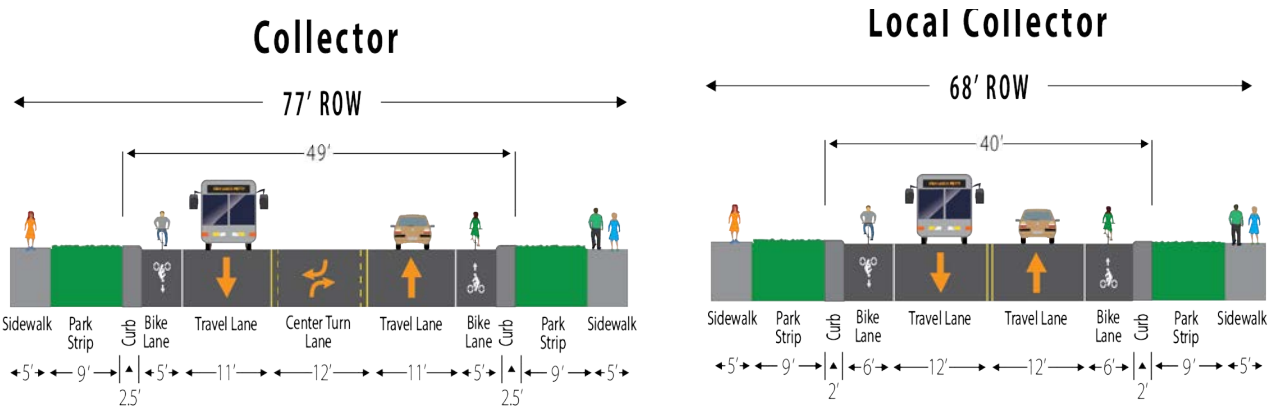


Collectors

Collector streets are designed to offer local traffic access to arterial streets, but they are not designed for long-distance travel. These roads have limitations to street and driveway access. Planned collectors in Saratoga Springs include Harvest Hills Boulevard and Parkway Boulevard. A collector has less vehicle capacity, and is not as wide as, an arterial, but it provides more capacity than local streets. Because of a collector's lower speeds and lower capacity, or flow rate, the geometric roadway design may have more curves, moving more with the contours of the land than an arterial.

Planned collectors in Saratoga Springs will connect to roads like Talus Ridge Drive, Pony Express Parkway, and Wildlife Boulevard. Currently, the City is not planning new local collector corridors.

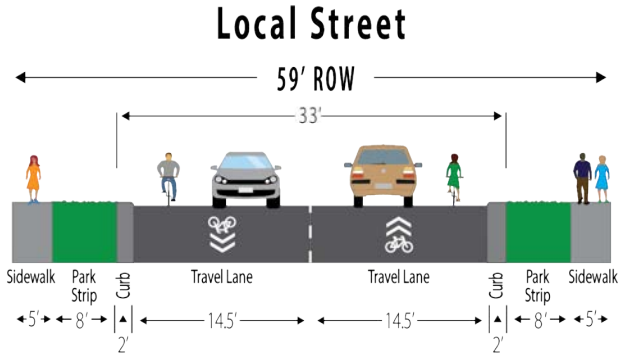
Figure 5-7: 3-Lane & 2-Lane Collector Cross-section



Local Streets

Local streets are designed to offer homes access to the greater roadway network by connecting to collectors or arterials. Local streets are typically laced with driveways on both sides and have posted speed limits of 25 miles per hour. These streets are part of developers' plans for neighborhoods, and are built within sub-divisions. Local streets exist across Saratoga Springs are found in residential developments. The local street cross-section has a 59-foot right-of-way, which could include one 14.5-foot travel lane in each direction, 2-feet of curb and gutter, 8-feet of park strip, and sidewalks at minimum width of 5-feet.

Figure 5-8: Local Street Cross-section



ACCESS MANAGEMENT

Access management is the practice of coordinating the location, number, spacing, and design of access points to minimize site access conflicts and maximize the traffic capacity and safety of a roadway. Uncoordinated growth along major travel corridors often results in strip development and a proliferation of access points. In many of these instances, each individual development along the corridor has its own access driveway. Numerous access points along major travel corridors create unnecessary conflicts between turning and through traffic, which causes delays and accidents. Numerous benefits are derived from controlling the location and number of access points to a roadway. Those benefits include:

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

For further information about access management, see the City's Engineering Standards and Specifications.

Principles of Access Management

Growing traffic congestion, concerns over traffic safety, and the ever-increasing cost of upgrading roads have generated interest in managing the access to not only the highway system, but to surface streets as well. Access management is the process that provides access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety, capacity, and speed. Access management attempts to balance the need to provide good mobility for through traffic with the requirements for reasonable access to adjacent land-uses.

Arguably, the most important concept in understanding the need for access management is to ensure that the movement of traffic and access to property is not mutually exclusive. No facility can both move traffic efficiently and provide unlimited access at the same time. Figure 5-2 shows the relationship between mobility, access, and the functional classification of streets. The extreme examples of this concept are freeways and cul-de-sacs. Freeways move traffic very well with few opportunities for access, while the cul-de-sacs have unlimited opportunities for access, but don't move traffic very well. In many cases, accidents and congestion are the result of streets trying to serve both mobility and access at the same time.

A good access management program will accomplish the following:

- Limit the number of conflict points at driveway locations
- Separate conflict areas
- Reduce the interference of through traffic

» Provide sufficient spacing for at-grade, signalized intersections

» Provide adequate on-site circulation and storage

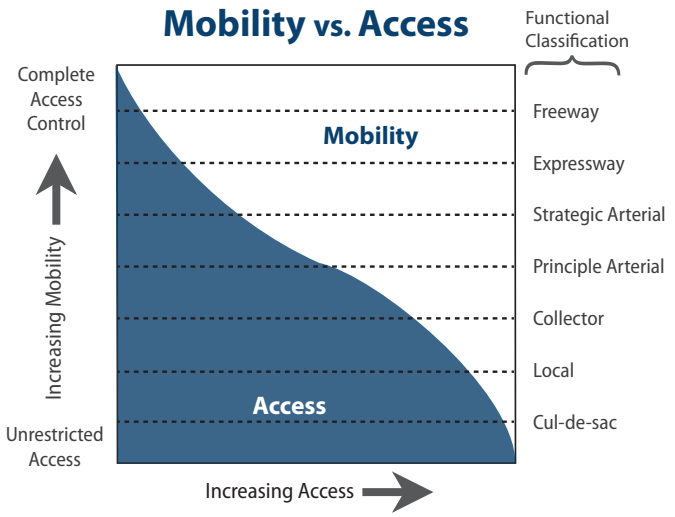
Access management attempts to put an end to the seemingly-endless cycle of road improvements followed by increased access, increased congestion, and the need for more road improvements.

Poor planning and inadequate control of access can quickly lead to an unnecessarily-high number of direct accesses along roadways. The movements that occur on and off roadways at driveway locations, when those driveways are too closely spaced, can make it very difficult for through traffic to flow smoothly at desired speeds and levels of safety. The AASHTO state that "the number of accidents is disproportionately higher at driveways than at other intersections… thus their design and location merits special consideration." Studies have shown that anywhere between 50 and 70 percent of all crashes that occur on the urban street system are access related.

Fewer direct accesses, greater separation of driveways, and better driveway design and location are the basic elements of access management. There is less occasion for through traffic to brake and change lanes in order to avoid turning traffic when these techniques are implemented uniformly and comprehensively.

Consequently, with good access management, the flow of traffic will be smoother and average travel speeds higher, with less potential for crashes. Before-and-after analyses by the Federal Highway Administration (FHWA), show that routes with well-managed access can experience 50 percent fewer accidents than comparable facilities with no access controls.

Figure 5-9: Mobility vs. Access



Through the development review and approval process, the City will evaluate proposed access points using the principles described above.

Roadway Network and Access Management Standards

As guidelines and standards are updated frequently, the access management guidelines and standards used for development and construction are included in the Saratoga Springs Engineering Standards. Please contact the City for more information on how to access the Engineering Standards.

The access management concepts and standards presented below are consistent with guidelines established by the FHWA, AASHTO, the Transportation Research Board (TRB), and the Institute of Transportation Engineers (ITE).

There are a number of access management techniques that can be used to preserve or enhance the capacity of a roadway. Specific techniques for managing access are discussed in this section and illustrated with examples. Not all techniques will apply to every situation. Some of them are more appropriate to less-developed rural areas of the city, whereas others are more appropriate in the urban areas. In the urban areas, the techniques can be applied when

existing sites are redeveloped or when negotiations with landowners are successful. Therefore, it is up to the City to determine what will work best based in each situation.

Number of Access Points

Controlling the number of access points or driveways from a site to a roadway reduces potential conflicts between cars, pedestrians, and bicycles. Normally, each parcel should be allowed one access point, and commercial properties should be required to share access where possible. Provisions can be made in the local land-use regulations to allow for more than one access point where special circumstances would require additional accesses.

Spacing of Access Points

Establishing a minimum distance between access points reduces the number of points a driver has to observe, and reduces the opportunity for conflicts. Spacing requirements should be based on the classification and design speed of the road, the existing and projected volume of traffic as a result of the proposed development, and the physical conditions of the site. Minimum spacing standards should be applied to both residential and commercial/industrial developments.

To ensure efficient traffic flow, new signals should be limited to locations where the progressive movement of traffic will not be impeded significantly. Uniform, or near uniform, spacing of signals is essential for the progression of traffic.

Un-signalized accesses are far more common than signalized accesses. They affect all kinds of activity, not merely large activity centers. Traffic operational factors lead to wider spacing of driveways (especially medium- and higher-volume driveways) include weaving and merging distances, stopping-sight distance, acceleration rates, and storage distance for back-to-back left turns. From a spacing perspective, these driveways should be treated the same as public streets.

Restricted access movement (i.e., right-in/right-out access) can provide for additional access to promote economic development with minimum impact to the roadway facility. This type of access should be spaced to allow for a minimum of traffic conflicts and provide distance for deceleration and acceleration of traffic in and out of the access. Restricting access on roads may create double-frontage lots. This can be mitigated through landscape buffering. See the City's Standard Technical Specifications for specific access management standards.

TRAFFIC CALMING

Street patterns are typically developed in response to the desires of the community at the time of construction. In Utah, the history of using a grid system for planning and development purposes started long ago and has proven efficient for moving people and goods throughout a network of surface streets. However, the nature of a grid system with wide and often long, straight roads can result in excessive speeds. For that reason, traffic calming measures (TCMs) can be implemented to reduce speeds on residential roadways. Saratoga Springs is an exception to the Utah grid system, and as, such has fewer problems with long, wide, straight street sections that can contribute to high speeds and unsafe conditions. Traffic calming is, however, still applicable to many neighborhood or local streets and should be at least given consideration on the City's local and residential streets on a case by case basis where

Managing access like on Pioneer Crossing is an important tool for transportation planning within Saratoga Springs.

applicable. See the City's Traffic Calming Policy for guidance.

TRAFFIC IMPACT STUDIES

As growth occurs throughout the city, the City will evaluate the impacts of proposed developments on the surrounding transportation networks prior to giving approval to build. This will be accomplished by requiring that a Traffic Impact Study (TIS) be performed for any development in the City. UDOT's traffic levels will be referenced as guidance for the TIS. The study will allow the City to determine the site-specific impacts of a development, including internal site circulation, access issues, and adjacent roadway and intersection impacts. In addition, a TIS will assist in defining possible impacts to the overall transportation system in the vicinity of the development. The area and items to be evaluated in a TIS include key intersections and roads as acknowledged by the City Engineer on a case-by-case basis. Other items that should be included in a TIS include:

- A description of the project site and study area boundaries including a site plan and study area map showing the proposed project access locations and connections to the adjacent road network.
- A description of existing and proposed land-uses within the study area including a discussion of the project land-use.
- A description of existing and proposed key roadways and intersections in the study area including lane configurations and traffic controls.
- A discussion of trip generation, distribution, and assignment methodologies and assumptions.
- A LOS and capacity analysis of existing traffic levels and conditions for key roadway segments and intersections.
- A LOS and capacity analysis of background traffic levels and conditions (existing traffic plus additional traffic projected from normal growth rates and from other known developments in the study area at the time of completion) for key roadway segments and intersections.
- A LOS and capacity analysis of background plus project traffic levels and conditions (background traffic plus projected traffic associated with the proposed project) for key roadway segments and intersections.
- A safety analysis for key roadways and intersections including applicable accident histories.
- Any applicable yield sign, stop sign, multi-way stop signs, and traffic signal warrant analyses.
- A determination of the street system's ability to accommodate projected traffic levels.
- An identification of impacts to the existing street system as a result of the project.
- A discussion of improvements to be implemented as part of the project to accommodate project traffic such as roadway and intersection widening to provide exclusive turn lanes or modifications to traffic controls.
- A discussion of mitigation measures to be implemented to restore or improve traffic operations to an acceptable LOS on any key roadway segments or at key intersections within the study area.

Each TIS will be conducted by a professional engineer at the developer's cost.

SPECIAL CONSIDERATIONS

A few specific locations on Saratoga Springs City's street network may require some unique improvements to resolve traffic issues at these sites. These areas are identified below along with the unique characteristics of each location.

Mountain View Corridor and Foothill Boulevard (2100 North to Grandview Boulevard)

Mountain View Corridor and Foothill Boulevard, from 2100 North to Grandview Boulevard, runs through a substantial portion of property managed by Suburban Land Reserve, Inc. (SLR). SLR has in place a development agreement for their property in the City and has been involved in the transportation planning process as it pertains to their property. The Mountain View Corridor and Foothill Boulevard extensions are proposed on the MAG 2020-2040 metropolitan transportation plan as part of phase 3 (2031-2040). The facility is expected to be a 6-Lane freeway facility with one-way frontage roads. This project will need extensive environmental clearance and the City will need to coordinate with UDOT when it comes time to begin that process. This roadway has been studied multiple times over the past few years by MAG. Three of these studies are listed below and can be accessed online at the following locations:

MAG West Lake Vision Study

http://mountainland.org/img/transportation/Studies/West_Lake_Final.pdf

Lake Mountain Transportation Study

http://mountainland.org/img/transportation/Studies/Lake%20Mountain%20All.pdf

Utah County East-West Study

http://mountainland.org/img/transportation/Studies/East-West%20Final%20Report.pdf

There is an ongoing North Lakeshore Study, led by MAG, involving Saratoga Springs that looks at the option for an east/west freeway connecting to I-15. Although no specific alignment has been decided upon as of yet, one option is for Pioneer Crossing to be converted into a freeway.

There is a current planning effort going on in the North Lakeshore region of Utah County. This involves MAG and UDOT partnering with eight local communities to develop a collaborative regional transportation strategy that is consistent with the vision and needs for the region. This regional effort includes the communities of Eagle Mountain, Saratoga Springs, Lehi, Lindon, American Fork, Pleasant Grove, Vineyard, Orem, Utah County, and UTA. As this regional growth continues, consistency in local land-use plans and the transportation networks in each city may need to be adjusted to ensure continuity for one coordinated effort to meet transportation demand. The study will follow the new Solutions Development Process developed by UDOT and will plan for the next 50 years from a regional perspective.

ACTIVE TRANSPORTATION

Future bicycle and pedestrian facilities also play an important part of a complete TMP. Figure 5-8 is a map that shows the planned AT network and facilities. Currently, Saratoga Springs is incorporating AT facilities into much of its ROW and roadway design and has plans to continue this effort into the future, creating more access, more connections, and more variety of facility type for all users. The combination of completed and planned mileage of AT facilities is shown in Table 5-1. This information is from the **Parks, Recreation, Trails, and Open Space Master Plan** for Saratoga Springs, which was adopted May 5, 2020. This document can be viewed at: http://www.saratogaspringscity.com/DocumentCenter/View/143/Parks-Recreation-Trails-and-Open-Space.

Table 5-1: Existing and Proposed Active Transportation Facilities in Miles

	EXISTING	PROPOSED
Bike Lane	11.6	56.2
Paved Trail	37.1	126.9

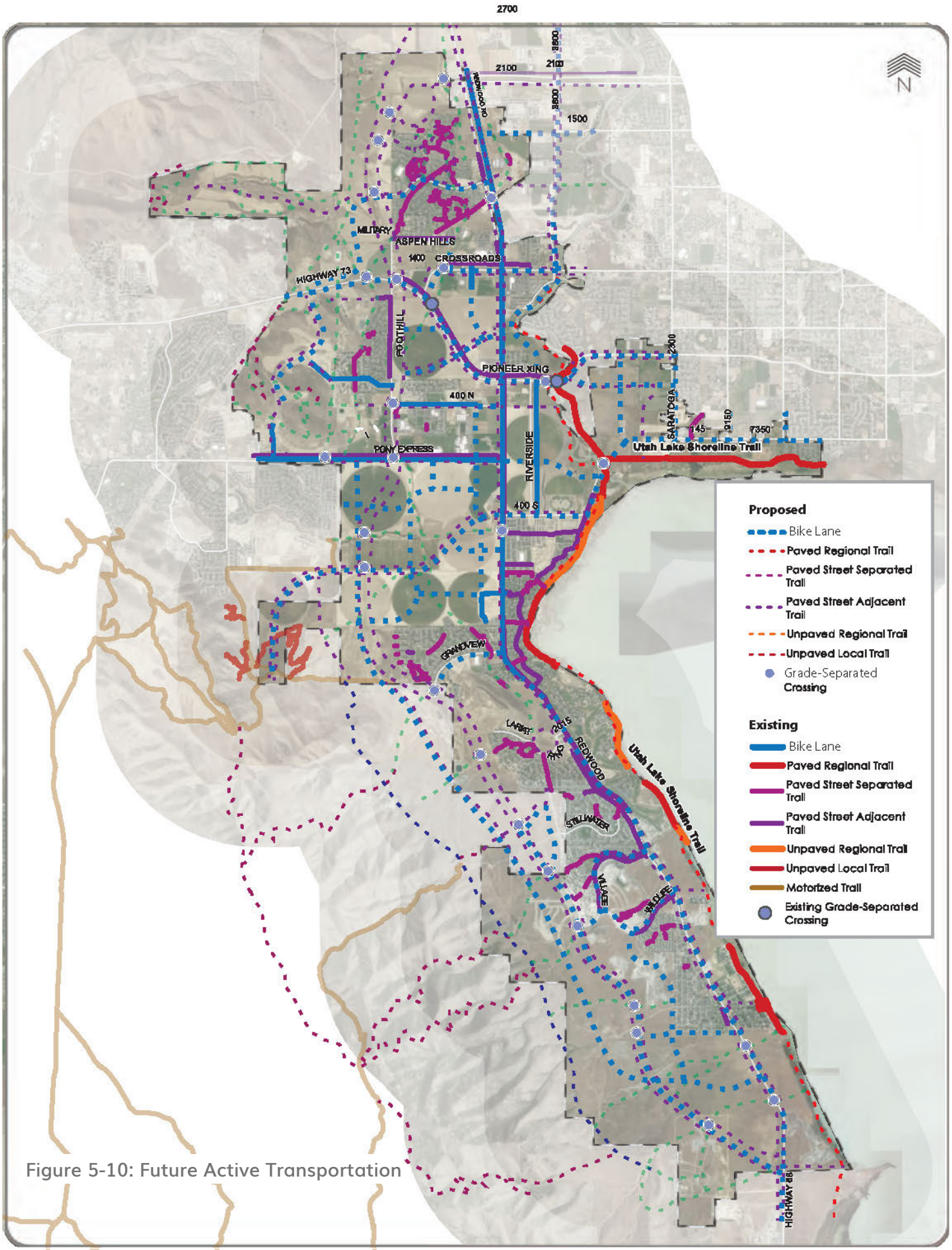


Figure 5-10: Future Active Transportation

TRANSIT

Transit can provide a viable mobility option across economic strata for City residents and commuters. As Saratoga Springs grows in population and density, it can expand the geographic coverage and frequency of its transportation network. While UTA currently only offers a weekday core bus route, future transit plans include local bus routes, bus rapid transit (BRT), and a BRT/ light-rail route. Coordination of this expansion involves both MAG and UTA.

Public transit service best utilizes its capacity and provides the greatest benefit to the most people in areas that have a high population density. When there is a demand for transit in areas that have the population numbers to support the service, more frequent and faster transit lines can be implemented to expand the service and meet the public's needs. As areas become more densely populated transit operates as a more efficient tool to reduce congestion. The existence of transit can help reduce the frequency and intensity of winter inversion days by improved air quality, guide growth by incentivizing mixed use development, promote AT, and many other urban planning and design strategies that can improve a community's overall quality of life. However, a certain population level has to be reached to maximize the benefits of transit. If transit is set up in advance, it can help the impacts of growth in a proactive way, or it can be reactive, and assist the City after a higher level of population has been reached, reacting to the needs of the public and satisfying a latent demand.

Figure 5-10 is a map displaying the future of transit service with the new express route highlighted.

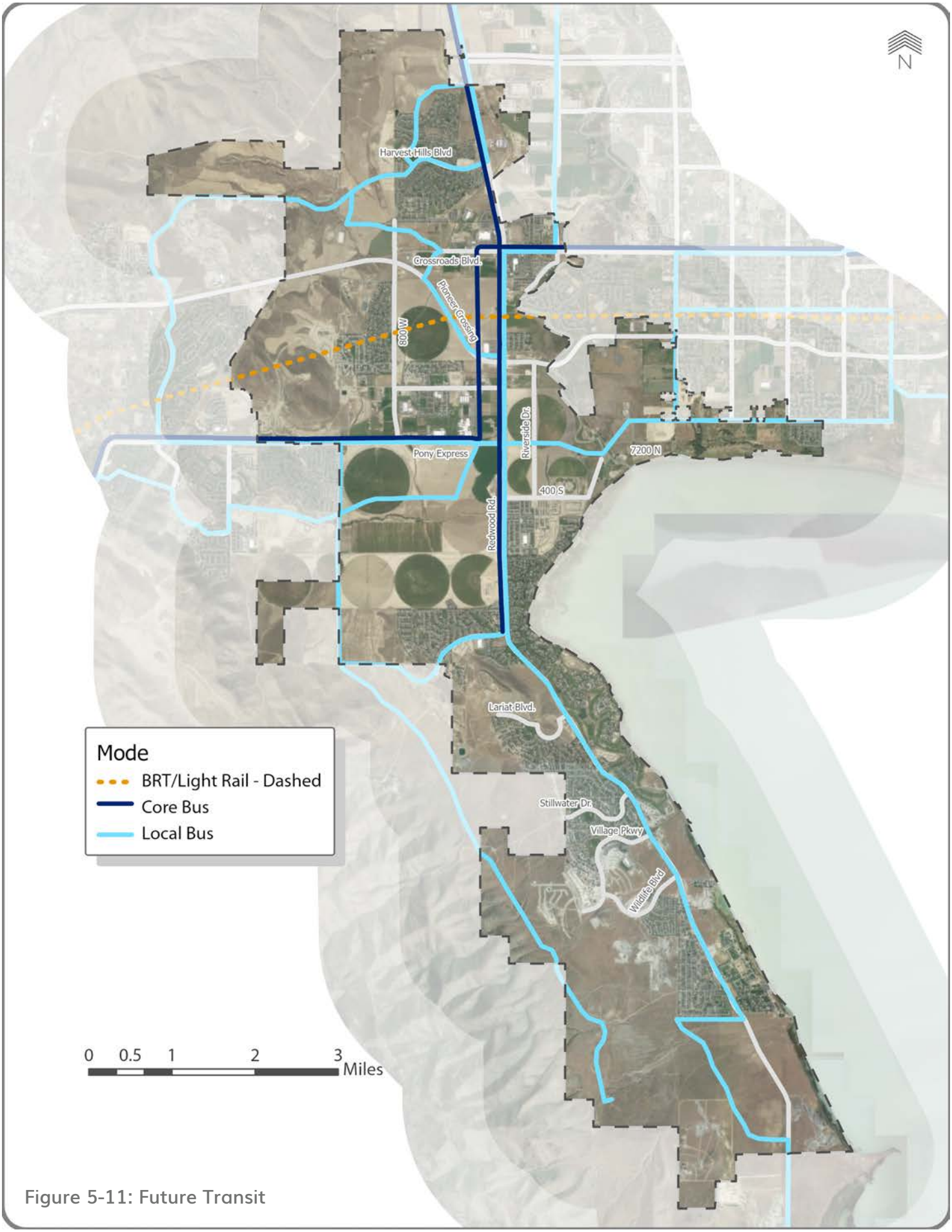


Figure 5-11: Future Transit

6 what's the plan

This chapter includes a capital facilities plan with recommended projects and costs estimates. Based upon the evaluation of existing and future conditions, as well as public input that was received through the planning process, specific recommendations were developed for each plan element. These recommendations will be used to complete the transportation network, including functionally-classified roads, transportation investments, and AT projects.

CAPITAL FACILITIES

A capital facilities plan is designed to show the future transportation investment needed in a community. It enhances existing transportation corridors and plans spot intersection improvements to provide future residents of the community with a high quality transportation system. The capital facilities plan for future growth between the planning years of 2020-2050 is provided below. Figure 6-1 is a map of all the needed transportation project over the next 30 years.

Tables 6-1 and 6-2 detail the projects in Figures 6-1 and 6-2.

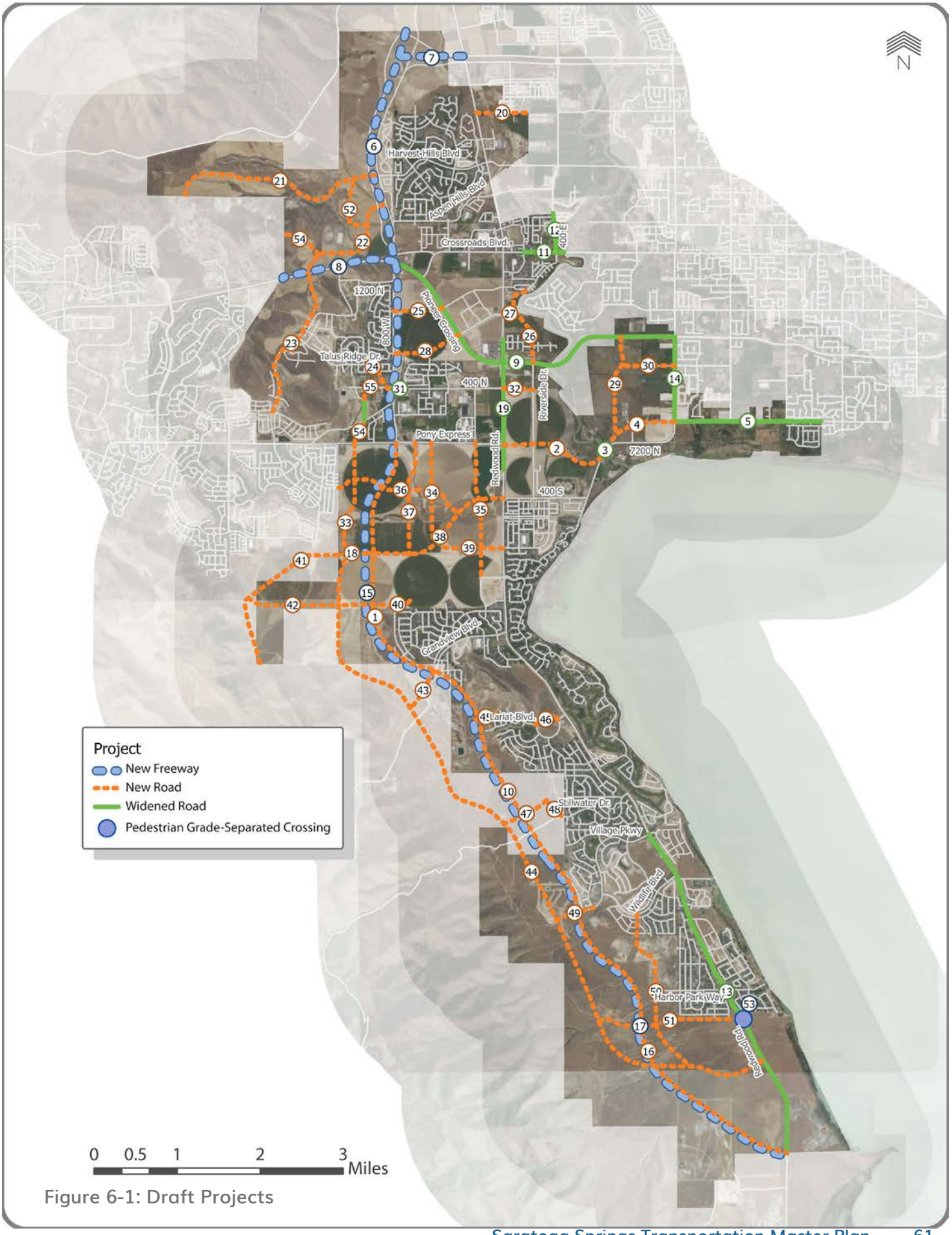


Figure 6-1: Draft Projects

Table 6-1: Roadway Projects

ROADWAY PROJECT				
Project #	Location	Project Type	Functional Class	Jurisdiction
1	Foothill Boulevard: Pony Express to Lariat Boulevard	New Road	Minor Arterial	Saratoga Springs/MAG
2	Pony Express: Redwood Road to Jordan River	New Road	Major Arterial	Saratoga Springs/MAG
3	Pony Express: Jordan River	Widening	Major Arterial	Saratoga Springs/MAG
4	Pony Express: Jordan River to Saratoga Road	New Road	Major Arterial	Saratoga Springs/MAG
5	Pony Express: Saratoga Road to Eastern City Boundary	Widening	Major Arterial	Saratoga Springs/MAG
6	Mountain View Corridor: Northern City Border to Cedar Fort Road (SR-73)	New Road	Freeway	UDOT
7	2100 North Connection: Eastern City Border to Mountain View Corridor	New Road	Freeway	UDOT
8	Cedar Fort Road (SR-73) Freeway: Mountain View Corridor Frontage to Western City Border	Widening	Freeway	UDOT
9	Pioneer Crossing (SR-145): Eastern City Border to Cedar Fort Road (SR-73)	Widening	Principal Arterial	UDOT
10	Foothill Boulevard: Lariat Boulevard to Hunter Boulevard	New Road	Minor Arterial	Saratoga Springs/MAG
11	Crossroads Boulevard: Commerce Drive to Eastern City Border	Widening	Principal Arterial	Saratoga Springs/MAG
12	400 East: Crossroads Boulevard to Northern City Boundary	Widening	Major Arterial	Saratoga Springs/MAG
13	Redwood Road (SR-68): Fairview Boulevard to Southern City Border	Widening	Major Arterial	UDOT
14	Saratoga Road: Pony Express to Pioneer Crossing (SR-175) (Saratoga Springs Portion)	Widening	Minor Arterial	Saratoga Springs
15	Foothill Freeway: Cedar Fort Freeway (SR-73) to Stillwater Drive	New Road	Freeway	UDOT
16	Foothill Boulevard: Hunter Boulevard to Redwood Road	New Road	Freeway	Saratoga Springs/MAG
17	Foothill Freeway: Stillwater Drive to Redwood Road	New Road	Freeway	UDOT
18	Hidden Valley Highway: Foothill Boulevard to Western City Border	New Road	Major Arterial	Saratoga Springs/MAG
19	Redwood Road (SR-68): North Border to Grandview Boulevard	Widening	Principal Arterial	UDOT
20	2400 North: Redwood Road (SR-68) Eastern Border	New Road	Collector	Saratoga Springs
21	Wild Hills Boulevard: Western City Boundary to Mountain View Corridor	New Road	Minor Arterial/Collector	Saratoga Springs
22	Aster Drive: Cedar Fort Road (SR-73) to Mountain View Corridor	New Road	Collector	Saratoga Springs/MAG
23	Mt. Saratoga Boulevard: Cedar Fort Road (SR-73) to Quail Hill Road	New Road	Collector	Saratoga Springs
24	Talus Ridge Drive: Mountain Peak Drive to 400 North	New Road	Collector	Saratoga Springs
25	Medical Drive: Foothill Boulevard to Pioneer Crossing	New Road	Collector	Saratoga Springs
26	Riverside Drive: End of Existing to Pioneer Crossing	New Road	Collector	Saratoga Springs
27	Market Street: Redwood Road (SR-68) to Riverside Drive	New Road	Collector	Saratoga Springs
28	Market Street: Foothill Boulevard to Pioneer Crossing	New Road	Collector	Saratoga Springs
29	500 East: Pony Express to Pioneer Crossing (SR-175)	New Road	Collector	Saratoga Springs
30	550 North: 500 East to Saratoga Road	New Road	Collector	Saratoga Springs
31	400 North: Foothill Boulevard and Grand Sierra Way	New Road	Collector	Saratoga Springs
32	400 North: Redwood Road (SR-68) to Riverside Drive	New Road	Collector	Saratoga Springs
33	Bonneville Drive: Pony Express Pkwy to 1200 South	New Road	Collector	Saratoga Springs
34	500 West: Pony Express to Hidden Valley Drive	New Road	Collector	Saratoga Springs
35	200 West: Pony Express to Founders Boulevard	New Road	Collector	Saratoga Springs
36	Brookwood Drive: Western Boundary to Hidden Valley Driv	New Road	Collector	Saratoga Springs
37	600 West: Brookwood Drive to Hidden Valley Driv	New Road	Collector	Saratoga Springs
38	Hidden Valley Drive: Redwood Road to Foothill Boulevard	New Road	Collector	Saratoga Springs
39	New Road: Redwood Road to Hidden Valley Drive	New Road	Collector	Saratoga Springs
40	1100 South: Ensign Drive to Bonneville Drive	New Road	Collector	Saratoga Springs
41	Hidden Valley Drive: City Boundary to City Boundary	New Road	Minor Arterial	Eagle Mt./MAG
42	1100 South: Hidden Valley Drive to Bonneville Drive	New Road	Collector	Saratoga Springs
43	Grandview Boulevard: Existing to Bonneville Drive	New Road	Collector	Saratoga Springs
44	Bonneville Drive: 1100 South to Redwood Road (SR-68)	New Road	Collector	Saratoga Springs
45	Lariat Blvd: End of Existing to Foothill Boulevard	New Road	Local Collector	Saratoga Springs
46	Ring Road: Finish Loop Roadway	New Road	Local Collector	Saratoga Springs
47	Hunter Drive: Stillwater Drive to Bonneville Drive	New Road	Collector	Saratoga Springs
48	Stillwater Drive: Existing to Hunter Drive	New Road	Collector	Saratoga Springs
49	Village Parkway: Tytus Lane to Bonneville Drive	Widening	Collector	Saratoga Springs
50	Heathercrest Drive: Bonneville Drive to Wildlife Boulevard	New Road	Collector	Saratoga Springs
51	New Road: Redwood Road to Foothill Boulevard	New Road	Collector	Saratoga Springs
52	Chianti Drive: Aster Drive to Wild Blossom Boulevard	New Road	Collector	Saratoga Springs
53	Redwood Road at Approx. 4300 South	Pedestrian Grade- Separated Crossing	NA	TIF Active / Alpine School District
54	1000 West: 400 North to Evans Lane	New Road/Widening	Collector	Saratoga Springs
55	Evans Lane: 1000 West to Talus Ridge Drive	New Road	Collector	Saratoga Springs
56	New Road: Eagle Mountain to Bonneville Drive	New Road	Collector	Saratoga Springs

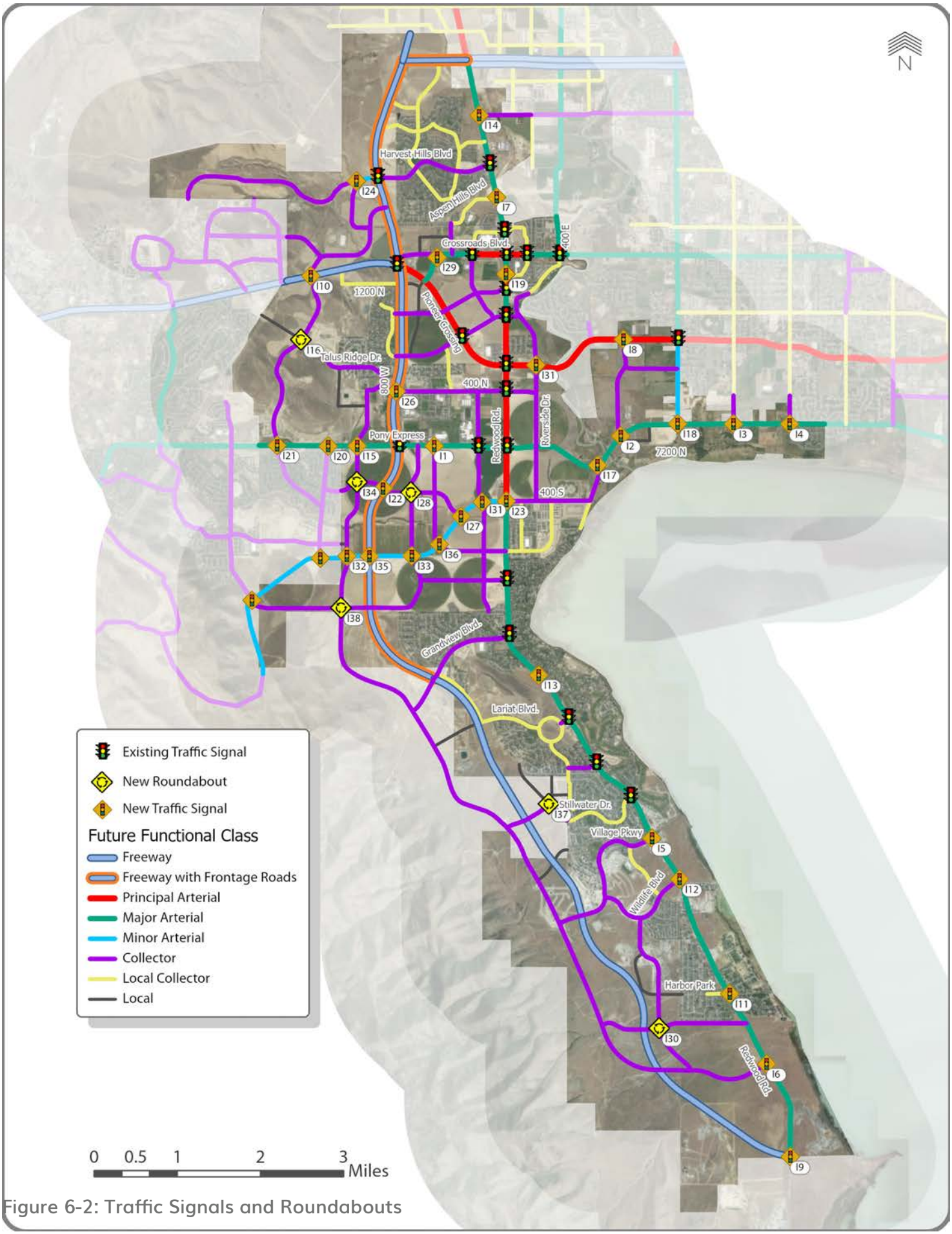


Figure 6-2: Traffic Signals and Roundabouts

Table 6-2: Signals & Roundabout Projects

SIGNALS & ROUNDABOUTS			
Project #	Type	Location	Jurisdiction
I1	New Traffic Signal	Pony Express Parkway and 600 West	UDOT
I2	New Traffic Signal	Pony Express Parkway and Saratoga Road	UDOT
I3	New Traffic Signal	Pony Express Parkway and 1700 West	UDOT
I4	New Traffic Signal	Pony Express Parkway and 1100 West	UDOT
I5	New Traffic Signal	Redwood Road (SR-68) and Village Parkway	UDOT
I6	New Traffic Signal	Redwood Road (SR-68) and Bonneville Drive	UDOT
I7	New Traffic Signal	Aspen Hills Boulevard and Redwood Road (SR-68)	UDOT
I8	New Traffic Signal	Pioneer Crossing (SR-145) and 500 East	UDOT
I9	New Traffic Signal	Redwood Road (SR-68) and Foothill Boulevard	UDOT
I10	New Traffic Signal	SR-73 and Mt. Saratoga Boulevard	UDOT
I11	New Traffic Signal	Redwood Road (SR-68) and Harbor Parkway	UDOT
I12	New Traffic Signal	Redwood Road (SR-68) and Wildlife Boulevard	UDOT
I13	New Traffic Signal	Redwood Road (SR-68) and Centennial Boulevard	UDOT
I14	New Traffic Signal	Redwood Road (SR-68) and 2400 North	UDOT
I15	New Traffic Signal	Pony Express Parkway and Bonneville Drive	UDOT
I16	New Roundabout	Talus Ridge Drive and Mount Saratoga Boulevard	Saratoga Springs
I17	New Traffic Signal	Pony Express Parkway and Saratoga Rd	UDOT
I18	New Traffic Signal	Pony Express and Saratoga Road	Saratoga Springs
I19	New Traffic Signal	Redwood Road (SR-68) and South Commerce Drive*	UDOT
I20	New Traffic Signal	Woodhaven Boulevard and Pony Express	UDOT
I21	New Traffic Signal	Pony Express and Mount Saratoga Bld	UDOT
I22	New Traffic Signal	Foothill Boulevard and Brookwood Drive	Saratoga Springs
I23	New Traffic Signal	Redwood Road (SR-68) and 400 South	UDOT
I24	New Traffic Signal	Wild Blossom Boulevard and Chianti St	Saratoga Springs
I26	New Traffic Signal	Foothill Boulevard and 400 North	Saratoga Springs
I27	New Traffic Signal	400 South and Brookwood Drive	Saratoga Springs
I28	New Roundabout	Brookwood Drive and 600 West	Saratoga Springs
I29	New Traffic Signal	Crossroads Boulevard and 1400 North	Saratoga Springs
I30	New Roundabout	Heathercrest Drive and 4400 South	Saratoga Springs
I31	New Traffic Signal	Riverside Drive and Pioneer Crossing (SR-145)	UDOT
I31	New Traffic Signal	400 South and Thunder Boulevard	Saratoga Springs
I32	New Traffic Signal	800 South and Bonneville Drive	Saratoga Springs
I33	New Traffic Signal	800 South and Ensign Drive	Saratoga Springs
I34	New Traffic Signal	Bonneville Drive and Brookwood Drive	Saratoga Springs
I35	New Traffic Signal	Foothill Boulevard and 800 South	Saratoga Springs
I36	New Traffic Signal	800 South and 600 West	Saratoga Springs
I37	New Roundabout	Hunter Drive and New Road	Saratoga Springs
I38	New Traffic Signal	Bonneville Drive and Ensign Drive	Saratoga Springs

* Until the Foothill Freeway is connected to Grandview Boulevard or points south only one of these intersections will be signalized.

FUNDING

All possible revenue sources have been considered as a means of financing transportation capital improvements needed as a result of new growth. This section discusses the potential revenue sources that could be used to fund transportation needs as a result of new development.

Transportation routes often span multiple jurisdictions and provide regional significance to the transportation network. As a result, other government jurisdictions or agencies often help pay for such regional benefits. Those jurisdictions and agencies could include the Federal Government, the State (UDOT), the County, and MAG. The City will need to continue to partner and work with these other jurisdictions to ensure adequate funds are available for the specific improvements necessary to maintain an acceptable LOS. Saratoga Springs will also need to partner with adjacent communities to ensure corridor continuity across jurisdictional boundaries (i.e., arterials connect with arterials; collectors connect with collectors, etc.).

Funding sources for transportation are essential if Saratoga Springs recommends improvements to be built. The following paragraphs further describe the various transportation funding sources available to the City.

Federal Funding

Federal monies are available to cities and counties through the federal-aid program. UDOT administers the funds. In order to be eligible, a project must be listed on the five-year Statewide Transportation Improvement Program (STIP).

The Surface Transportation Program (STP) funds projects for any roadway with a functional classification of a collector street or higher, as established on the Statewide Functional Classification Map. STP funds can be used for both rehabilitation and new construction. The Joint Highway Committee programs a portion of the STP funds for projects around the state in urban areas. Another portion of the STP funds can be used for projects in any area of the state at the discretion of the State Transportation Commission. Transportation Enhancement funds are allocated based on a competitive application process. The Transportation Enhancement Committee reviews the applications and then a portion of the application is passed to the State Transportation Commission. Transportation enhancements include twelve categories ranging from historic preservation, bicycle and pedestrian facilities, and water runoff mitigation.

MAG accepts applications for federal funds from local and regional government jurisdictions. The MAG Technical Advisory and Regional Planning Committees select projects for funding every two years. The selected projects form the Transportation Improvement Program (TIP). In order to receive funding, projects should include one or more of the following aspects:

- Congestion Relief – spot improvement projects intended to improve Levels of Service and/ or reduce average delay along those corridors identified in the Regional Transportation Plan as high congestion areas
- Mode Choice – projects improving the diversity and/or usefulness of travel modes other than single occupant vehicles
- Air Quality Improvements – projects showing demonstrable air quality benefits
- Safety – improvements to vehicular, pedestrian, and bicyclist safety

The Better Utilizing Investments to Leverage Development (BUILD) grant program, provides opportunities for investment in road, rail, transit, and port projects. The BUILD grant program replaced the TIGER program as of 2018 and can provide capital funding directly to any public entity, including municipalities, counties, MPOs, and others in contrast to traditional Federal funding that goes to mostly State DOTs and transit agencies. BUILD grants are intended to fund multi-modal, multi-jurisdictional projects that are more difficult to support through traditional DOT programs. Potential projects within Saratoga Springs include Foothill Boulevard and the eventual Foothill Freeway that provide regional mobility, freight, and multi-modal improvements for the greater Wasatch Front. BUILD grants are competitively awarded, with only 91 awarded projects out of 851 applications in 2018. The U.S. DOT has allocated $1 billion in fiscal year 2020 for these grants. Source: https://www.transportation.gov/policy-initiatives/build/tigerbuild-application-list

State/County Funding

The distribution of State Class B and C Program funds is established by State Legislation and is administered by the State Department of Transportation. Revenues for the program are derived from State fuel taxes, registration fees, driver license fees, inspection fees, and transportation permits. 75 percent of these funds are kept by UDOT for their construction and maintenance programs. The rest is made available to counties and cities. As many of the roads in the city fall under UDOT jurisdiction, it is in the interests of the City that staff are aware of the procedures used by UDOT to allocate those funds and to be active in requesting that the funds be made available for UDOT-owned roadways in the City.

Class B and C funds are allocated to each city and county by a formula based on population, centerline miles, and land area. Class B funds are given to counties, and Class C funds are given to cities and towns. Class B and C funds can be used for maintenance and construction projects; however, 30 percent of those funds must be used for construction or maintenance projects that exceed $40,000. The remainder of these funds can be used for matching federal funds or to pay the principal, interest, premiums, and reserves for issued bonds.

In 2005, the State Senate passed a bill providing for the advance acquisition of right-of-way for highways of regional significance. This bill enabled cities and counties to better plan for future transportation needs by acquiring property to be used as future right-of-way before it is fully developed and becomes extremely difficult to acquire. UDOT holds on account the revenue generated by the local corridor preservation fund, but the county is responsible to program and control monies. In order to qualify for preservation funds, the City must comply with the Corridor Preservation Process, found at the following link www.udot.utah.gov/public/ucon and also provided in the appendix of this report.

City Funding

Some cities utilize general fund revenues for their transportation programs. Another option for transportation funding is the creation of special improvement districts. These districts are organized for the purpose of funding a single specific project that benefits an identifiable group of properties. Another source of funding used by cities is revenue bonding for projects intended to benefit the entire community.

Private interests often provide resources for transportation improvements. Developers construct the local streets within subdivisions and often dedicate rights-of-way and participate in the construction of collector/arterial streets adjacent to their developments. Developers can also be considered a possible source of funds for projects through the use of impact fees. These fees are assessed as a result of the impacts a particular development will have on the surrounding roadway system, such as the need for traffic signals or street widening.

General fund revenues are typically reserved for operation and maintenance purposes as they relate to transportation. However, general funds could be used, if available, to fund the expansion or introduction of specific services. Providing a line item in the City-budgeted general funds to address roadway improvements, which are not impact fee eligible, is a recommended practice to fund transportation projects, should other funding options fall short of the needed amount.

General obligation bonds are debt paid for or backed by the City's taxing power. In general, facilities paid for through this revenue stream are in high demand amongst the community. Typically, general obligation bonds are not used to fund facilities that are needed as a result of new growth because existing residents would be paying for the impacts of new growth. As a result, general obligation bonds are not considered a fair means of financing future facilities needed as a result of new growth.

Certain areas might have different needs or require different methods of funding than traditional revenue sources. A Special Assessment Area (SAA) can be created for infrastructure needs that benefit or encompass specific areas of the

City. Creation of the SAA may be initiated by the municipality by a resolution declaring public health, convenience, and necessity to require the creation of a SAA. The boundaries and services provided by the district must be specified and a public hearing must be held prior to creation of the SAA. Once the SAA is created, funding can be obtained from tax levies, bonds, and fees when approved by the majority of the qualified electors of the SAA. These funding mechanisms allow the costs to be spread out over time. Through the SAA, tax levies and bonding can apply to specific areas in the City needing to benefit from the improvements.

Interfund Loans

Since infrastructure must generally be built ahead of growth, it must sometimes be funded before expected impact fees are collected. Bonds are the solution to this problem in some cases. In other cases, funds from existing user rate revenue will be loaned to the impact fee fund to complete initial construction of the project. As impact fees are received, they will be reimbursed. Consideration of these loans will be included in the impact fee analysis and should be considered in subsequent accounting of impact fee expenditures.

Developer Dedications & Exactions

Developer dedications and exactions can both be credited against the developer's impact fee analysis. If the value of the developer dedications and/or extractions are less than the developer's impact fee liability, the developer will owe the balance of the liability to the City. If the dedications and/or extractions of the developer are greater than the impact fee liability, the City must reimburse the developer the difference.

Developer Impact Fees

Impact fees are a way for a community to obtain funds to assist in the construction of infrastructure improvements resulting from and needed to serve new growth. The premise behind impact fees is that if no new development occurred, the existing infrastructure would be adequate. Therefore, new developments should pay for the portion of required improvements that result from new growth. Impact fees are assessed for many types of infrastructures and facilities that are provided by a community, such as roadway facilities. According to state law, impact fees can only be used to fund growth related system improvements.