# Payson Transportation Master Plan

2050

**Adopted 2020**

IMAGINE PAYSON

Special thanks and acknowledgments to everyone involved in the completion of this plan:

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# Chapter 1 - Executive Summary

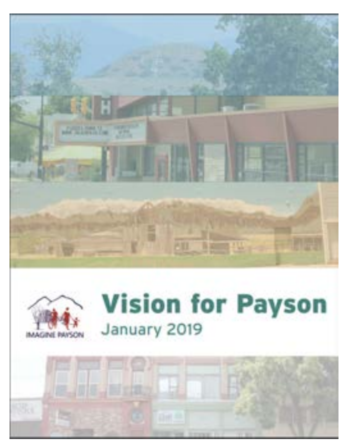
*Figure 1-1: New Construction around LDS Temple.*

Payson is located in southern Utah County and has experienced steady population growth over the last 20 years. This growth is transforming Payson's character from a rural agricultural community to a suburban city with the population increasing from just under 12,000 residents in 1998 to almost 22,000 in 2020. New residences and businesses impact the need for transportation improvements because each new development increases travel demand. Conversely, transportation investments often encourage growth and changes in land use. The primary purpose of a Transportation Master Plan (TMP) is to balance current and future travel demand with roadway, transit, and active transportation improvements by creating a long-term strategy for a circulation system that supports future land development and ultimately Payson City's vision.

As part of the general plan leaders and community members helped define how Payson will look in the future, stating:

Our vision for Payson is a city that has:

- A strong sense of community
- A livable, connected community
- Access to trails and nature
- Infrastructure to support existing and future growth
- Centers, corridors, and connections
- A strong health and educational foundation
- Supporting existing businesses
- Growing new business opportunities
- A community that supports and celebrates agriculture



# ROADS

To develop an efficient and effective transportation system a connected street system is required. Connected street systems reduce traffic congestion, commute times, emergency response times, improve walking and biking options, and permit a variety of land use options for future redevelopment. Streets provide for two distinct and competing functions: mobility and land access. These two functions share an inverse relationship, meaning a roadway with high mobility has a limited number of access points to individual parcels or developments while a roadway with low mobility has frequent access points and driveways.

To plan for a connected street system, streets are classified by the amount of mobility and land access the roadway provides. The classifications for city streets range from the most mobile and fewest access points (arterial) to least mobile with frequent access points (local street) creating a hierarchy for roadways called the functional classification system. Intersections are used in the roadway system to allow for a progression from high mobility to low mobility facilities that provide significant land access and incorporate safe crossings for pedestrians and bicyclists. The following functional classification is used in Payson: Arterial Road, Major Collector: 3 Lane Road, Minor Collector: 2 Lane, and Local Road. The planned functional classification system was developed based upon prior planning efforts, including the Payson Street Master Plan Map and recently completed area specific plans. These prior plans provided the base roadway network that was refined to serve the updated future land use and traffic forecasts that reflects public as well as stakeholder input.

# ACTIVE TRANSPORTATION

Facilities that make communities more walkable or bikeable are a key component of a transportation plan and access to trails is part of Payson's vision. These amenities make cities more desirable places to live, work ,or play, and it is important for Payson to continue to plan for an expanded bicycle and pedestrian network. The existing and planned trail network throughout Payson is extensive with over 10 miles of existing trails and 57 miles proposed trails. The trail system is an important component of both the transportation plan as well as the Park Master Plan. The recommended trail network will connect key origins and destinations throughout the community. Many of these trail corridors are adjacent to existing or planned roads but also follow canals, streams, or utility corridors.

# TRANSIT

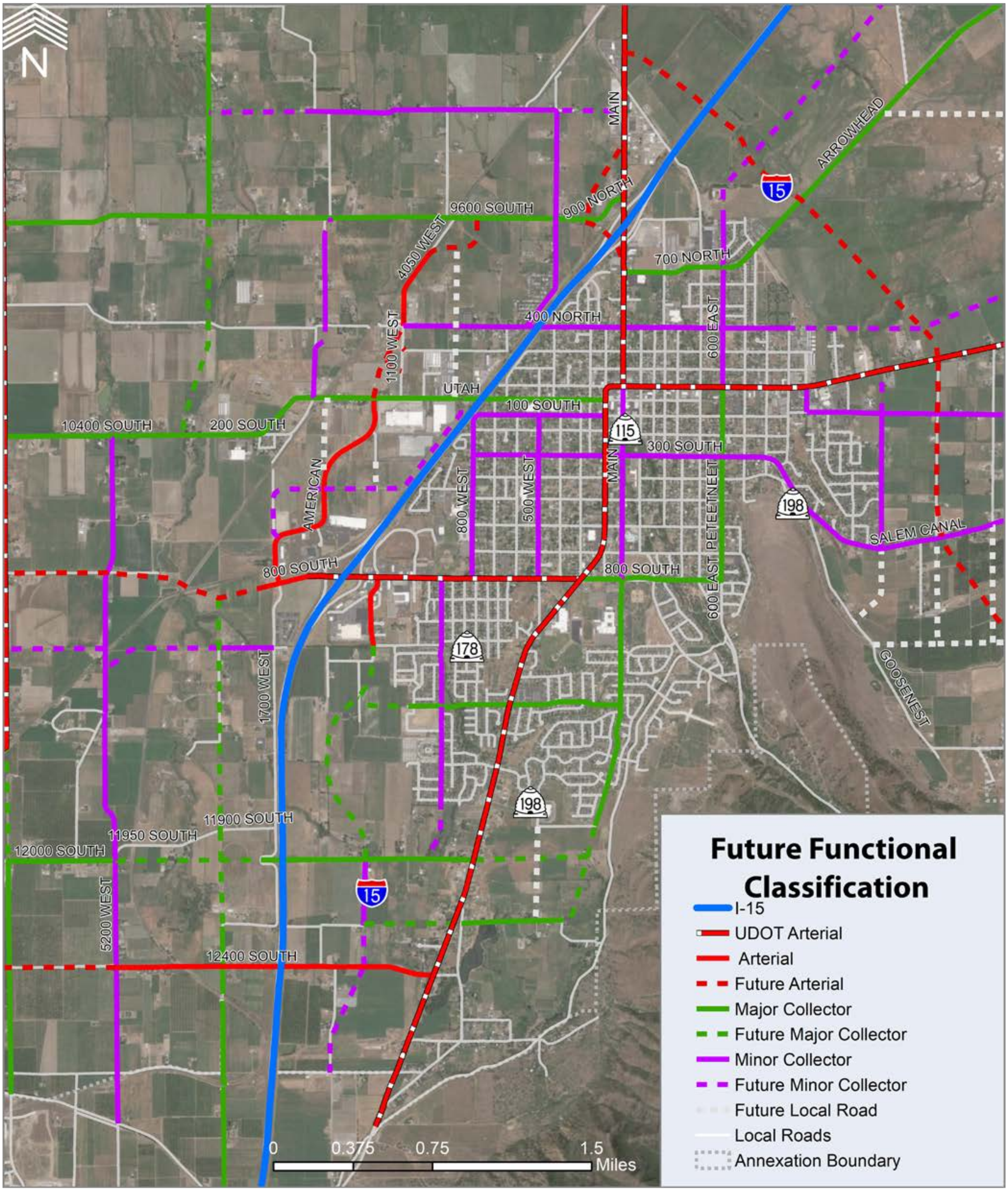
Transit is also an important component of a city's transportation plan. Transit provides additional mobility options for both residents and commuters. Both Mountainland Association of Governments (MAG) and Utah Transit Authority (UTA) are planning for expanded transit service within Payson in the near term with an extension of FrontRunner in phase 1 (2019-2030) of MAG's recently adopted TransPlan50. During the planning process potential options to provide an additional station near Main Street and the planned Nebo Beltway interchange were identified. This second station location is included in the transportation plan along with the previously proposed location at 800 South. Additionally, future routes connecting to the stations are recommended to improve transit access within the city and connections to nearby communities.

# OTHER PLAN ELEMENTS

Additional plan elements are also included in the Transportation Master Plan. These include:

- **Access management to balance mobility and access on the functionally classified roads with the city**
- **Roadway cross-sections that show how to manage the pavement widths and right-of-way**
- **Corridor preservation to help preserve the right-of-way needed for future transportation facilities and prevent development that might be incompatible with these facilities.**
- **Improved street connectivity to expand the existing grid network and improve transportation options and traffic flow throughout the community.**

*Figure 1-2: Future Functional Classification.*



# CAPITAL FACILITIES PLAN

## Project List and Map

A Capital Facilities Plan (CFP) that is based on the forecast traffic volumes, outlines all improvements necessary to provide Payson with an adequate roadway system in the year 2050. This plan should be regularly updated by the City as projects are completed and development occurs. The total costs for the 2030 CFP projects are $209 million dollars with Payson financially responsible for $4.7 million dollars. The total cost estimate for Payson to improve the transportation system by 2050 is $508 million dollars with Payson financially responsible for $86.5 million dollars. The specific roadway improvements required to accommodate future growth throughout Payson are identified in Figure 1-3. Projects costs for the CFP for 2019-2030 are in Table 1-1 and in Table 1-2 for 2031-2050.

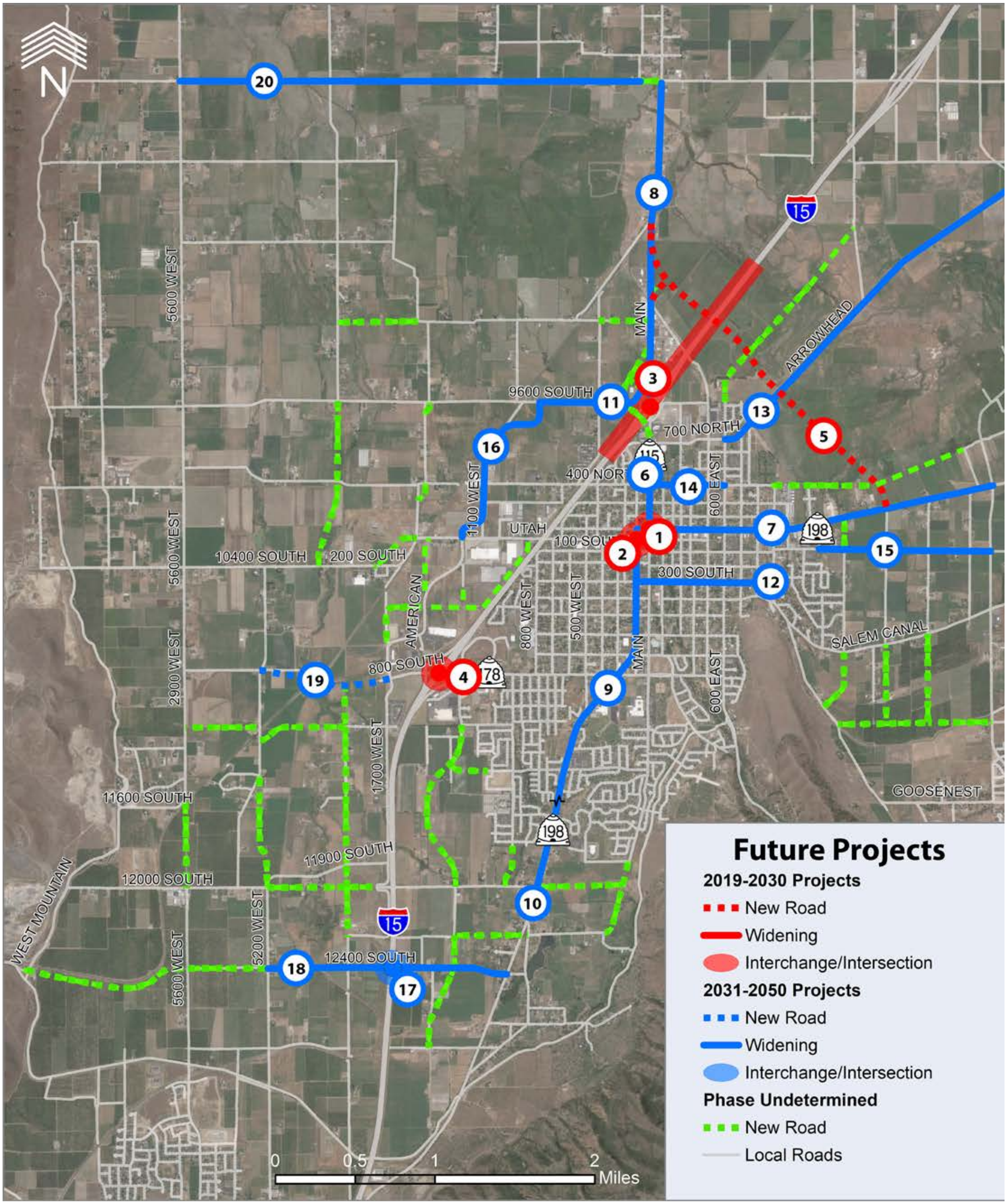
*Table 1-1: Capital Facilities Plan Costs – 2030*

| PROJECT SUMMARY | | | | | |
|---|---|---|---|---|---|
| **PROJECT #** | **LOCATION** | **TOTAL PRICE** | **FUNDING SOURCE** | **RANGE (YR)** | **IMPROVEMENT TYPE** |
| 1 | S.R. 198/Main Street | $1,000,000 | UDOT | 2030 | Intersection Improvement |
| 2 | S.R. 198/Utah Avenue | $1,000,000 | UDOT | 2030 | Intersection Improvement |
| 3 | I-15/Main Street | $96,000,000 | UDOT | 2030 | Interchange |
| 4 | I-15/800 South | $40,000,000 | UDOT | 2030 | Interchange |
| 5 | Nebo Belt Loop | $70,786,000 | MAG/Payson | 2030 | New Road |
| | **SUBTOTAL (UDOT):** | **$138,000,000** | | | |
| | **SUBTOTAL (MAG/PAYSON):** | **$70,786,000** | | | |
| | **TOTAL:** | **$208,786,000** | | | |

*Table 1-2: Capital Facilities Plan Costs – 2050*

| PROJECT SUMMARY | | | | | |
|---|---|---|---|---|---|
| **PROJECT #** | **LOCATION** | **TOTAL PRICE** | **FUNDING SOURCE** | **RANGE (YR)** | **IMPROVEMENT TYPE** |
| 6 | Main Street: S.R. 198 to I-15 | $4,327,000 | UDOT | 2050 | Capacity Improvement |
| 7 | S.R. 198: Main Street to City Boundary | $27,697,000 | UDOT | 2050 | Capacity Improvement |
| 8 | Main Street: I-15 to 8000 South (county) | $25,695,000 | UDOT | 2050 | Capacity Improvement |
| 9 | S.R. 198: 500 West to Main Street | $10,431,000 | UDOT | 2050 | Capacity Improvement |
| 10 | S.R. 198: City Boundary to 500 West | $14,007,000 | UDOT | 2050 | Capacity Improvement |
| 11 | 900 North: 1100 West to Main Street | $11,224,000 | Payson | 2050 | Capacity Improvement |
| 12 | 300 South: S.R. 198 to 600 East | $3,730,000 | Payson | 2050 | Capacity Improvement |
| 13 | Arrowhead Trail: 600 East to Elk Ridge Connector | $25,883,000 | Payson | 2050 | Capacity Improvement |
| 14 | 400 North: Main Street to 600 East | $2,644,000 | Payson | 2050 | Capacity Improvement |
| 15 | 100 South: 1200 East to City Boundary | $15,134,000 | Payson | 2050 | Capacity Improvement |
| 16 | American Way: Utah Avenue to 900 North | $2,479,000 | Payson | 2050 | Capacity Improvement |
| 17 | I-15/12400 South | $40,000,000 | UDOT | 2050 | Interchange |
| 18 | 12400 South: Mountain Road to S.R. 198 | $32,625,000 | MAG/Payson | 2050 | Capacity Improvement |
| 19 | 800 South: 2400 West to 1700 West | $18,427,000 | Payson | 2050 | Capacity Improvement |
| 20 | 8000 South: 5600 West to Main Street | $51,373,000 | MAG/Payson | 2050 | Capacity Improvement |
| | **SUBTOTAL (UDOT):** | **$122,157,000** | | | |
| | **SUBTOTAL (MAG/PAYSON):** | **$163,519,000** | | | |
| | **TOTAL:** | **$285,676,000** | | | |

*Figure 1-3: Future Projects*



# Chapter 2 - Where We Are

This chapter evaluates the existing transportation system within the city and establishes the framework for the development of the transportation plan. This analysis includes a description of the land use as well as the demographic profile of the city and how these factors affect the transportation system. Recent population and employment growth in both Payson and the surrounding area have increased transportation demand and traffic congestion within the city. This chapter details the existing conditions in 2019.

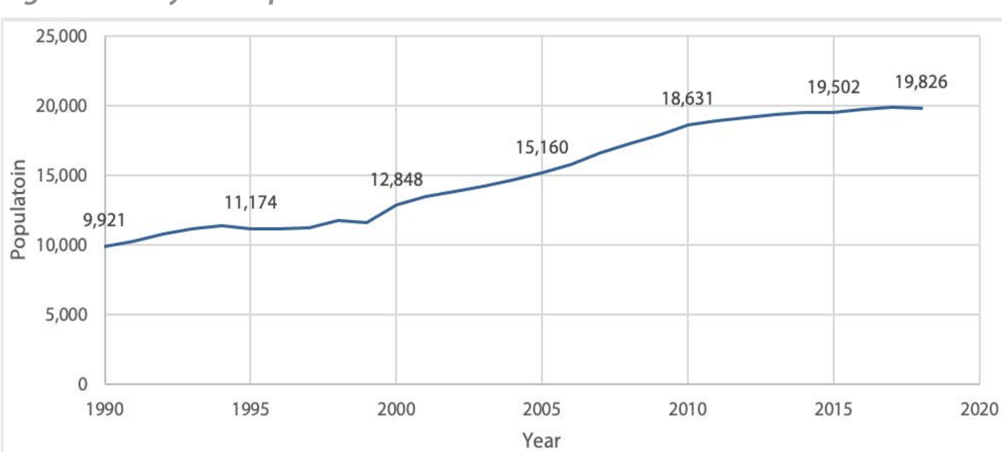
## LAND USE

To analyze the transportation system and plan for future growth, it is essential to understand land use patterns within the city. People need to travel from their homes to work, to shopping, health care, educational, and recreational opportunities. Land use patterns and the transportation systems must work together to support a high quality of life and economic growth in Payson.

Existing land use within Payson is consistent with a transition from a rural agricultural community to a suburban city. Currently, Payson is a balanced community with a good mix of residential, commercial, and industrial land uses with a roadway grid design along its commercial core. This commercial core area is located around Main Street,  the I-15 interchanges, and S.R. 198 (100 North). The existing land use within the city is shown in Figure 2-2.

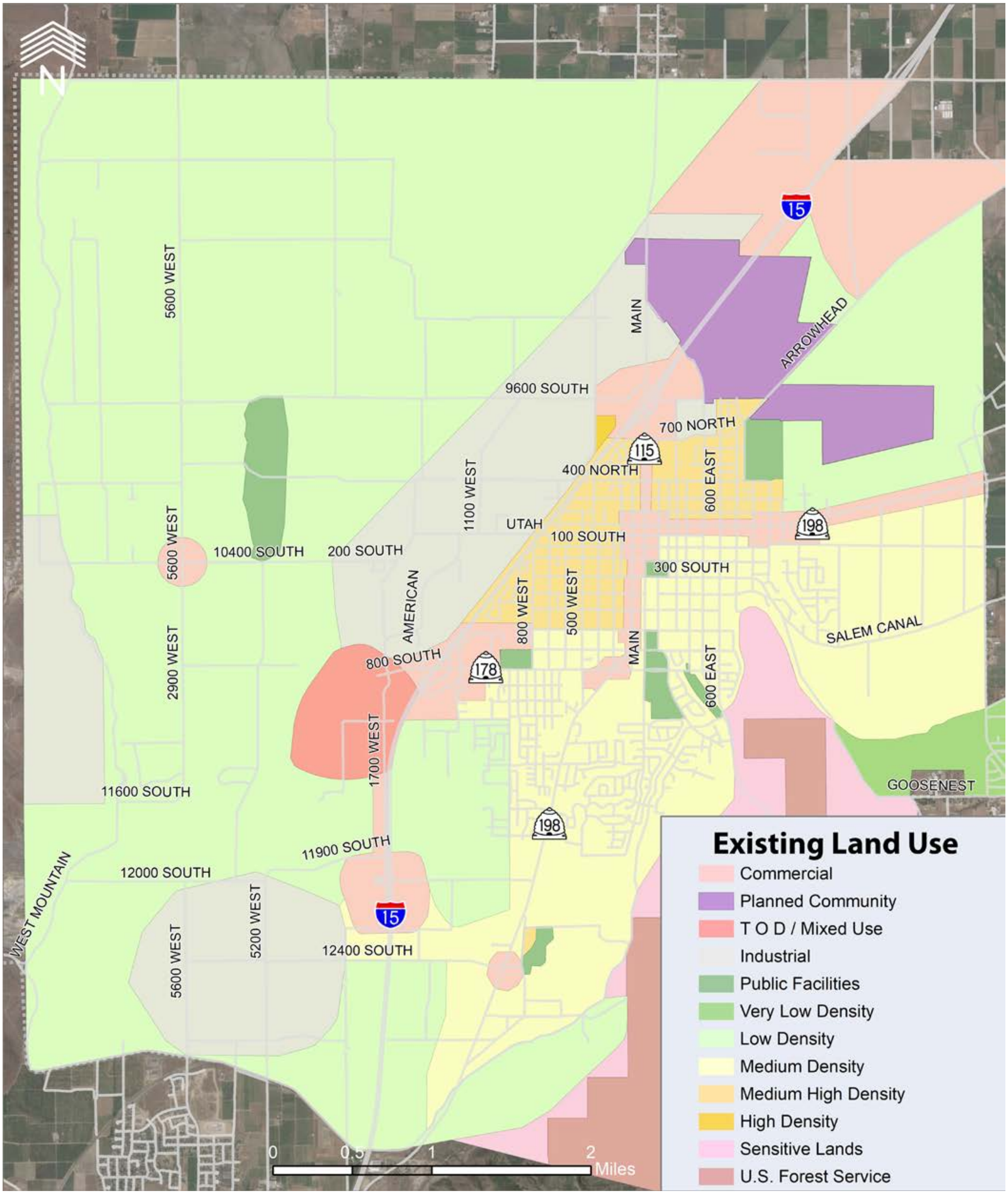
While Figure 2-1 shows that population growth slowed from 2015 to 2018, Payson is once again experiencing the desire for rapid population growth with several building permit applications for large developments.

*Figure 2-1: Payson Population Growth*




*Source: US Census Bureau, Population Estimates Program*

*Figure 2-2: Existing Land Use*



# DEMOGRAPHICS

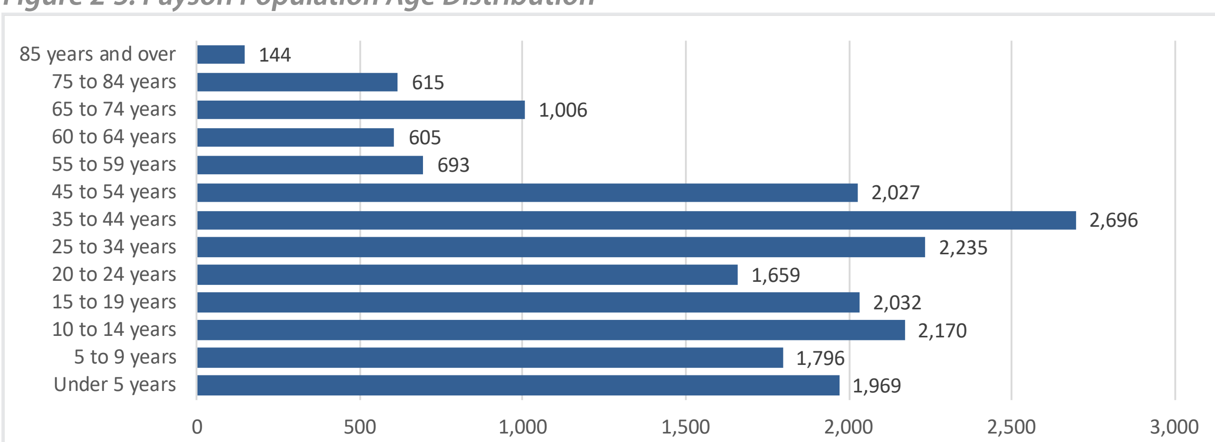
## Population

Payson has experienced steady population growth over the last 20 years. This is transforming Payson's character from a rural agricultural community to a suburban city within a growing region. The city's population has increased from just under 12,000 residents in 1998 to almost 20,000 in 2018. Figure 2 shows this population growth from 1990 through 2018.

The age of residents impacts transportation needs. 30% of Payson's population is less than 15 years old. These younger residents are reliant on others for car related mobility and may require additional bike, pedestrian, and trail amenities to feel comfortable biking or walking.

While there are fewer residents in older population groups, the mobility needs of these residents will continue to expand as the population grows and ages. As with younger population age groups, the transportation plan should create a system that supports other transportation modes for residents that may experience mobility constraints.

*Figure 2-3: Payson Population Age Distribution*

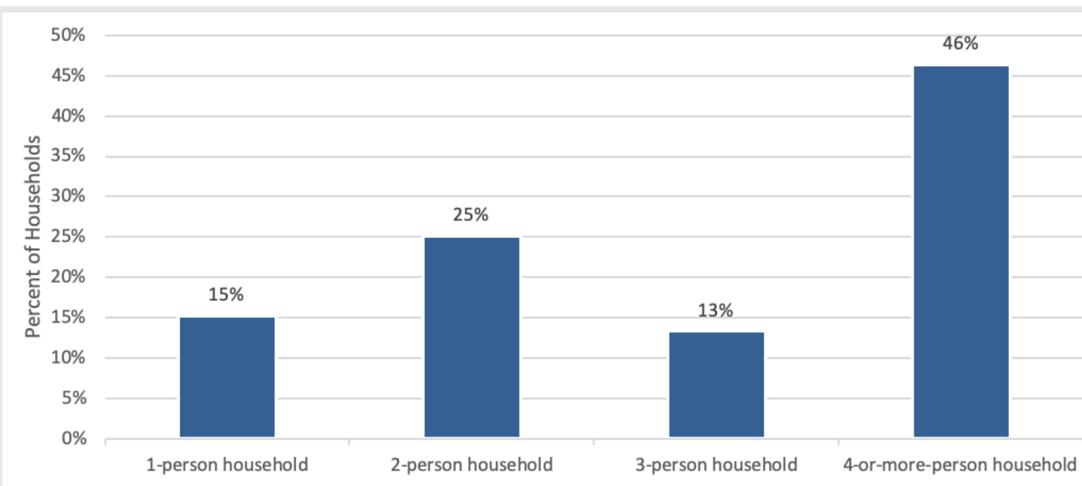



*Source: US Census Bureau, 2013-2017 American Community Survey 5-Year Estimates*

## Housing

Although population is an important indicator in developing a transportation plan, household size and housing type provide a broader picture of how residential growth will affect transportation demand. The number of trips on the transportation network is estimated partly on the number and size of households. Figure 2-4 summarizes the household size in Payson. The average size is 3.69 people per household with 46% of all households having four or more people.

*Figure 2-4: Payson Household Size*




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

**Senate Bill 34**

*"Affordable Housing Modifications" requires cities to amend the general plan including the transportation element to comply with the revised requirements by December 1, 2019. These transportation and traffic circulation requirements include:*

- *provide the general location and extent of existing and proposed freeways, arterial and collector streets, public transit, active transportation facilities, and other modes of transportation*
- *plan for residential and commercial development around major transit investment corridors, such as the proposed FrontRunner corridor, to maintain and improve the connections between housing, employment, education, recreation, and commerce*
- *correlate population projections, employment projections, and the proposed land use element of the general plan*
- *consider the regional transportation plan developed by MAG*

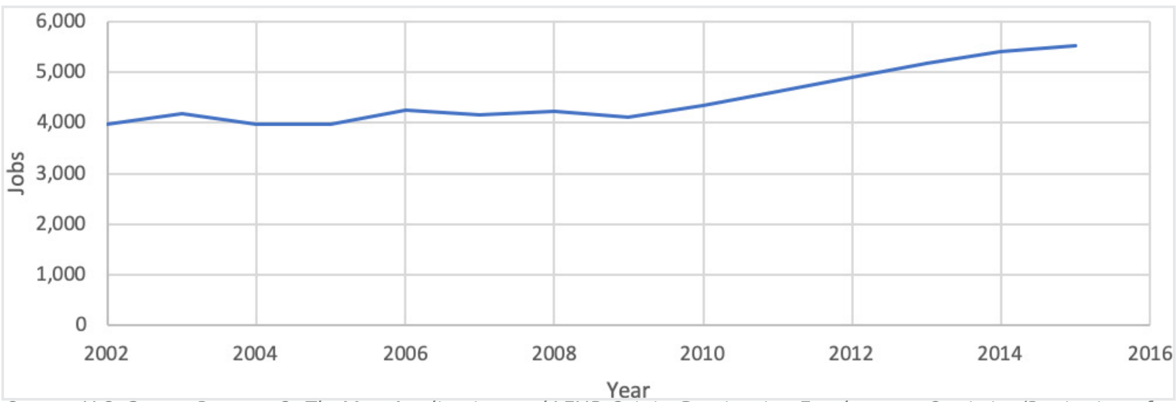
**Housing** *S.B. 34 also requires a moderate-income housing element in the general plan that can include transportation related strategies such as:*

- *encouraging higher density or moderate-income residential development near major transit investment corridors such as those around the proposed FrontRunner stations.*
- *eliminating or reducing parking requirements for residential development where residents are less likely to rely on private vehicles, such as residential developments near the major transit corridors.*

## Employment

There were approximately 5,500 jobs with Payson in 2015 which is the most recent year of data available. The number of jobs within Payson is summarized from 2002 to 2015 in Figure 2-5. Since 2010, about 1,200 jobs have been added within the city representing annualized growth of 4.9% per year. This is a faster rate of growth than the population growth rate for the same period. This change in job housing balance reflects the continued change of the city to a more suburban environment with increased employment opportunities within the community.

*Figure 2-5: Total Jobs within Payson*




*Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2015).*

*Table 2- 1: Largest Employers in Payson*

| NAME | NUMBER OF EMPLOYEES |
|---|---|
| Rocky Mountain Atv, Inc. | 500-999 |
| Liberty Safe & Security Products | 250-499 |
| Mountain View Hospital, Inc. | 250-499 |
| Temkin International, Inc. | 250-499 |
| Walmart | 250-499 |

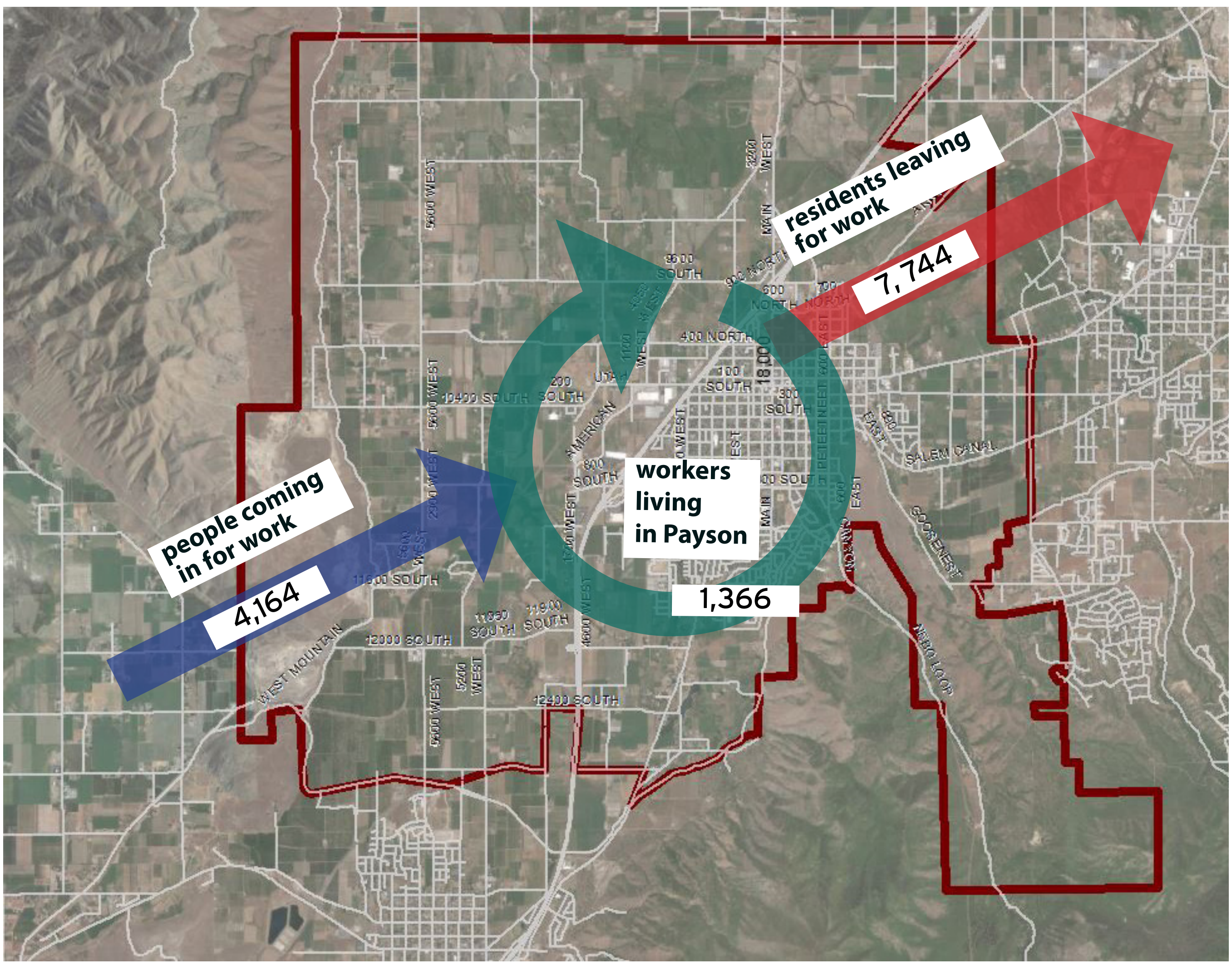
*Source: FirmFind, Department of WorkForce Services, State of Utah.*

*Mountain View Hospital in Payson*

There are five companies with more than 250 employees within Payson. These larger employers within the city are listed in Table 2-1. The location of these companies and other employment areas create local transportation needs, as well as impact commuting patterns of residents.

Although employment within Payson has increased recently, there are still more residents that live within the city but are employed elsewhere. There were approximately 7,700 residents that commuted to a job outside of the city in 2015. However, there were 4,200 people that commuted to Payson from another community for work. There were only about 1,400 residents that both lived and worked within the city. These existing commuting patterns help inform transportation investment decisions because people commuting into and out of the city for work effectively have a greater impact on the overall transportation system demands due to longer trip lengths. This inflow and outflow also impact the I-15 interchanges as more vehicles access these junctions for their trips.

***Figure 2-6: Inflow/Outflow Commuting Patterns***




*Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2015).*

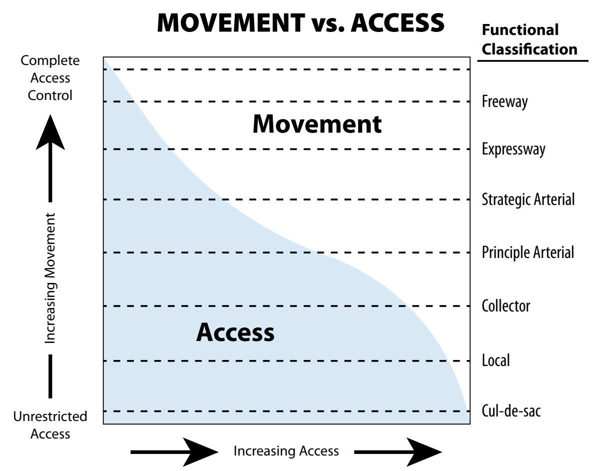
# TRANSPORTATION SYSTEM

The transportation network in Payson has many elements that support the overall community transportation vision. However, there are opportunities to build on the current system to make a more robust network. Below are the findings from a detailed review of the existing transportation conditions within the city.

## Street Network

The existing 2014 Payson Street Master Plan Map identifies the existing and planned locations for functionally classified roads within the city. Roadway functional classification is a means to categorize how a roadway functions and operates based upon a combination of the roadway characteristics.

*Figure 2-7: Mobility vs. Access by Functional Classification*




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 2-7. Both functions are vital, and no trip is made without both. In Payson, street facilities are classified by the relative amount of land-access service they provide. There are four primary classifications, with detailed descriptions in Table 2-2:

- » **Local Roads/Residential Streets** – Residential facilities primarily serve land-access functions. Local Road design and control facilitates the movement of vehicles onto and off the street system from land parcels. Through movement is difficult and is discouraged by both the design and control of this facility.
- » **Collectors** – Collector facilities, the "middle" classification, are intended to serve both through and land-access functions in relatively equal proportions. For long through trips, such facilities are usually inefficient, nevertheless they are frequently used for shorter through movements associated with the distribution and collection portion of trips.
- » **Arterials** – Arterial facilities are designed to primarily serve through-traffic movement. While some land-access service may be accommodated, it is clearly a minor function. All traffic controls and the facility design are intended to provide efficient through movement.
- » **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.

Roadway functional classification does not define the number of lanes required for each roadway. For instance, a collector street may have two or four lanes, whereas an arterial street may have up to seven lanes. The number of lanes is a function of the expected traffic volume on the roadway and serves as the greatest measure of roadway capacity. The existing functional class network in Figure 2-8 is separated into functional classes by access as well as the general right-of-way width.

*Table 2-2: Street Functional Classification*

| CHARACTERISTIC | FUNCTIONAL CLASSIFICATION | | | |
|---|---|---|---|---|
| | FREEWAY & EXPRESSWAY | ARTERIAL | COLLECTOR | RESIDENTIAL STREET |
| **Function** | Traffic movement | Traffic movement, land access | Collect and distribute traffic between streets & arterials, land access | Land access |
| **Typical % of Surface Street System Mileage** | Not applicable | 5-10% | 10-20% | 60-80% |
| **Continuity** | Continuous | Continuous | Continuous | None |
| **Spacing** | 4 miles | 1 mile | ¼ - ½ mile | As needed |
| **Typical % of Surface Street System Vehicle-Miles Carried** | Not applicable | 40-65% | 10-20% | 10-25% |
| **Direct Land Access** | None | Limited: Major Generators Only | Restricted: Some movements prohibited; number & spacing of driveways controlled | Safety controls access |
| **Minimum Roadway Intersection Spacing** | Approximately 1 Mile | Approximately ½ Mile | 300 feet – ¼ Mile | 150 Feet |
| **Speed Limit** | 55-75 mph | 40-50 mph in fully developed areas | 30-40 mph | 20-25 mph |
| **Parking On-Street** | Prohibited | Discouraged | Limited | Allowed |
| **Comments** | Supplements capacity of arterial street system & provides high-speed mobility | Backbone of Street System | | Vehicular through-traffic discouraged by design speed |

The existing 2014 Payson Street Master Plan Map identifies the existing and planned locations for functionally classified roads within the city. Roadway functional classification is a means to categorize how a roadway functions and operates based upon a combination of the roadway characteristics.

*Figure 2-8: Street Functional Class*

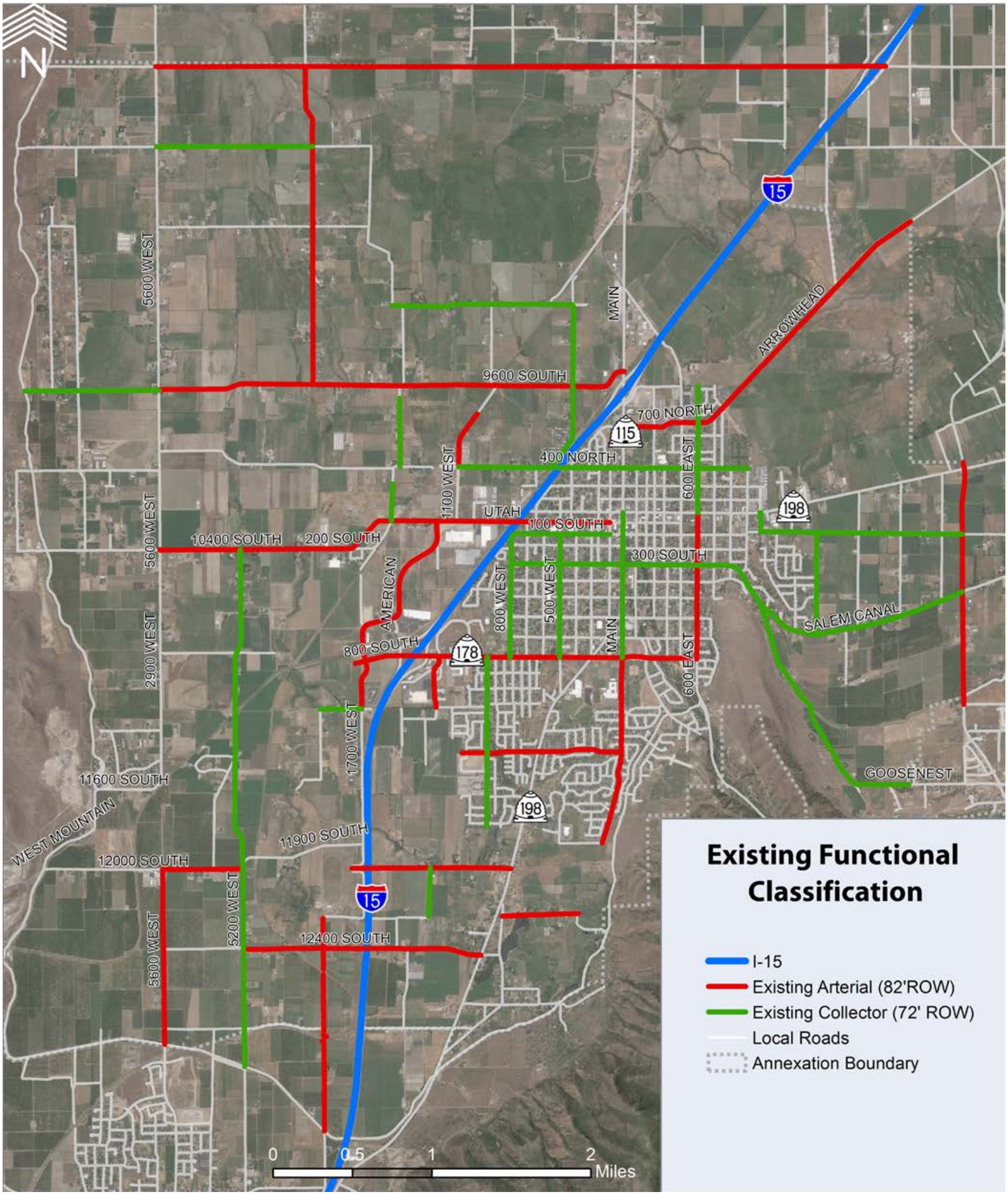


Figure 2-8 summarizes the existing Payson Street Master Plan Map. This street network provides the basis for the development of a trans-transportation plan that builds upon previous planning efforts and reflects changes in planned land use and community vision. While the Street Master Plan Map provides a starting point for existing conditions analysis, updated roadway alignments and functional classifications are included in Chapter 4 to better align the transportation plan to meet the community vision going forward.

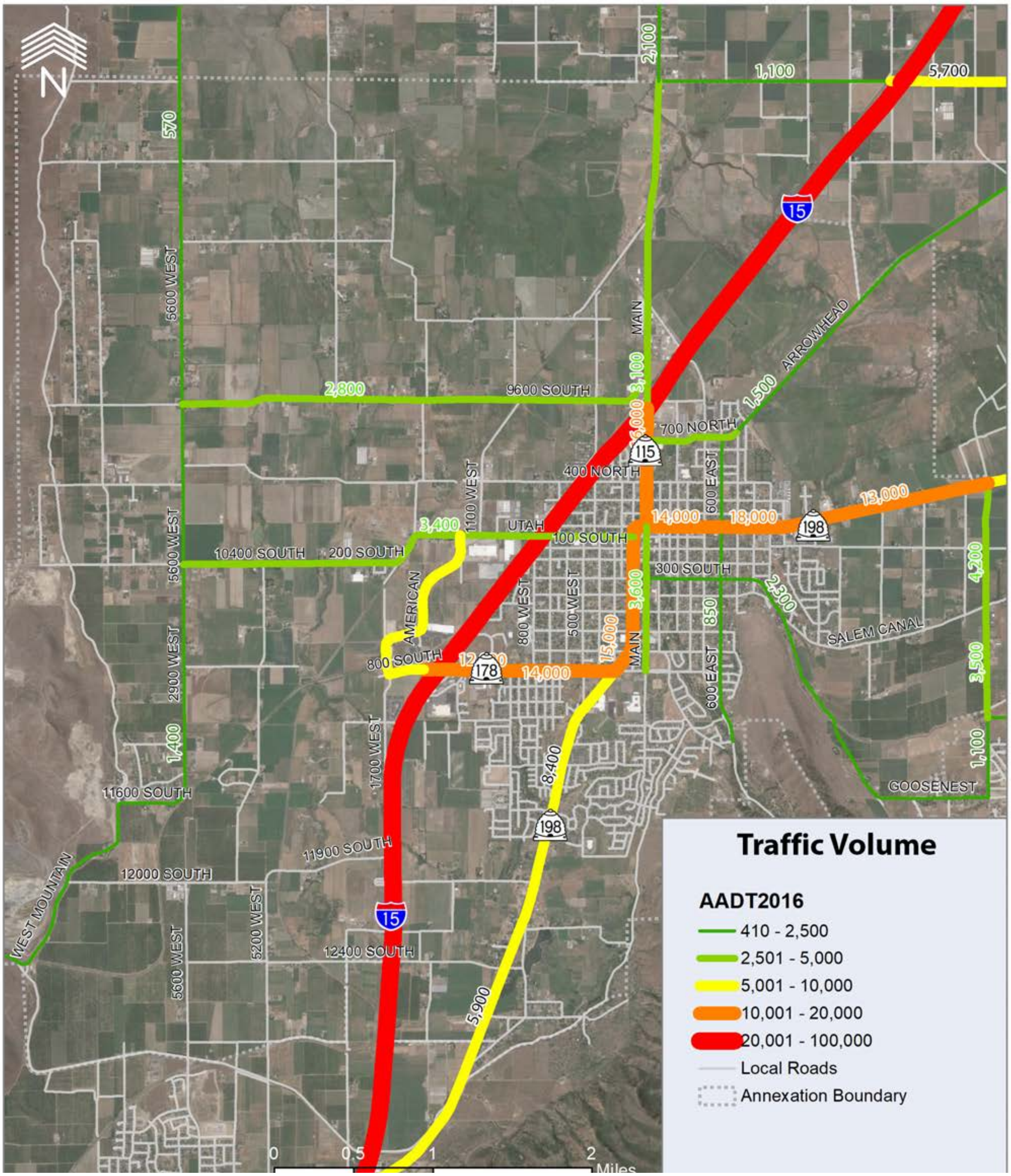
### *Traffic Volume*

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

Payson's highest traffic volumes are on 100 North and 100 West, which comprises S.R. 198 through the city. S.R.198 is a three-lane state highway designed to move regional traffic through the city. The highest daily traffic volumes are east of 600 East, which experienced 18,000 vehicles per day. All along S.R. 198 through Payson the total traffic volume is above 12,000 vehicles. The total traffic volume is also notable at both I-15 interchanges. On Main Street south of I-15 the traffic volume is around 16,000 and this three lane section experiences delay in the PM peak hour. 800 South east of I-15 also carries over 12,000 vehicles a day, but this road has a five lane cross-section, so it doesn't experience the congestion that Main Street does.

***I-15 in Payson carries over 50,000 vehicles a day***

*Figure 2--9: Traffic on Utah Highways*




*Source: Traffic on Utah Highways*

### *Traffic Conditions (LOS)*

Level of Service (LOS) describes the operating performance of an intersection or roadway. LOS is measured quantitatively 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. 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 2-3: 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 |

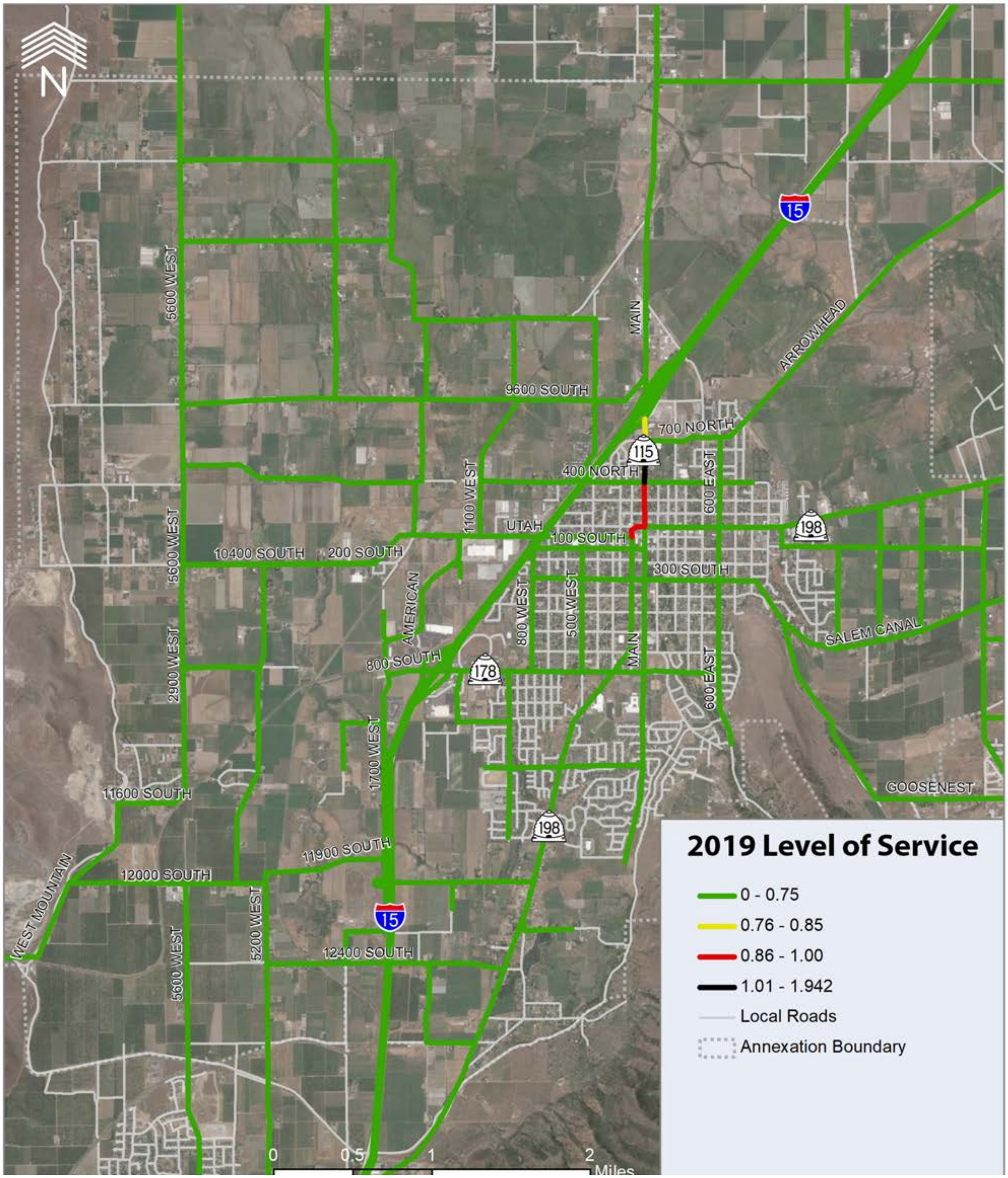
*Source: Highway Capacity Manual 2016, Transportation Research Board National Research Council, Washington D.C.*

Roadway level of service is typically displayed in the relationship between the traffic volume and the roadway capacity (generally the number of lanes), or a V/C ratio. This is the measure displayed in Table 2-3.

Some congestion occurs at a 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 Payson 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. Roadway capacity cannot be scaled to exactly fit demand since demand varies by time of day, day of week, and time of year.

While the travel demand model is used to predict future traffic and level of service, it can also be used to estimate current conditions. Existing conditions were modeled with a 2019 base year for Payson's functional classified roadway network. Figure 2-10 summarize the existing LOS within Payson. 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, Main Street from S.R. 198 to I-15 experience congestion during the peak hours. During these periods there can be delays and queuing at the signalized intersections along the corridor. Although Main Street is congested during peak periods, there are minimal delays on the other roadways within Payson.

*Figure 2-10: 2019 LOS in Payson*



### *Safety*

Crash data for vehicles, bicycles, and pedestrians were analyzed for state and city roads within Payson. This data was utilized to identify potential crash hotspots and high-risk areas to address the overall safety of residents. Figure 2-13 shows jurisdiction of the roads where the crashes occurred and 64% of the crashes were on either I-15 or other state routes. Although the percent of crashes on Payson roadways has remained at about 36% of all crashes, the number of crashes on the local road system has increased every year from 113 crashes in 2013 to 149 crashes in 2017.

Of the 1,306 crashes that were on city or non-interstate state highways, angle crashes (crashes with vehicles turning left) were the most common collision representing 30% of crashes, followed by front-to-rear crashes at 25%. As illustrated in Figure 2-13, these crashes are clustered at the intersections of higher traffic volume roads such as S.R. 198, 800 South and Main Street. Single vehicle crashes were also significant at 22% of all crashes. The most common single vehicle crashes were fence (40 crashes) and wild animal crashes (35 crashes). Although pedestrian crashes were not one of the most common single vehicle crashes, there were 25 pedestrian crashes located throughout the city. Many of the identified projects in Chapter 5 will improve safety within Payson and may lead to a reduction in crashes.

*Figure 2-11: Crashes by Manner of Collision*

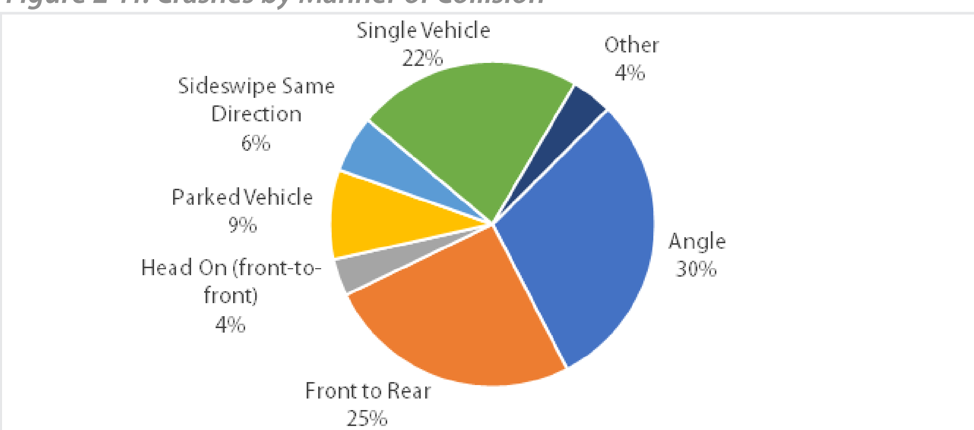



*Figure 2-12: Crashes by Road Jurisdiction*

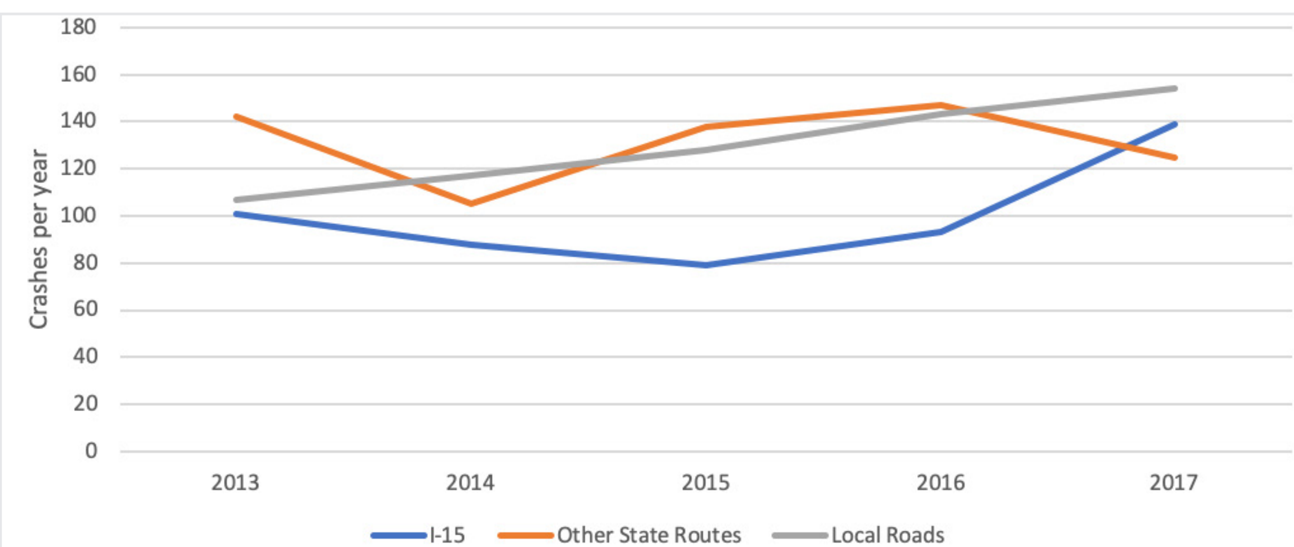
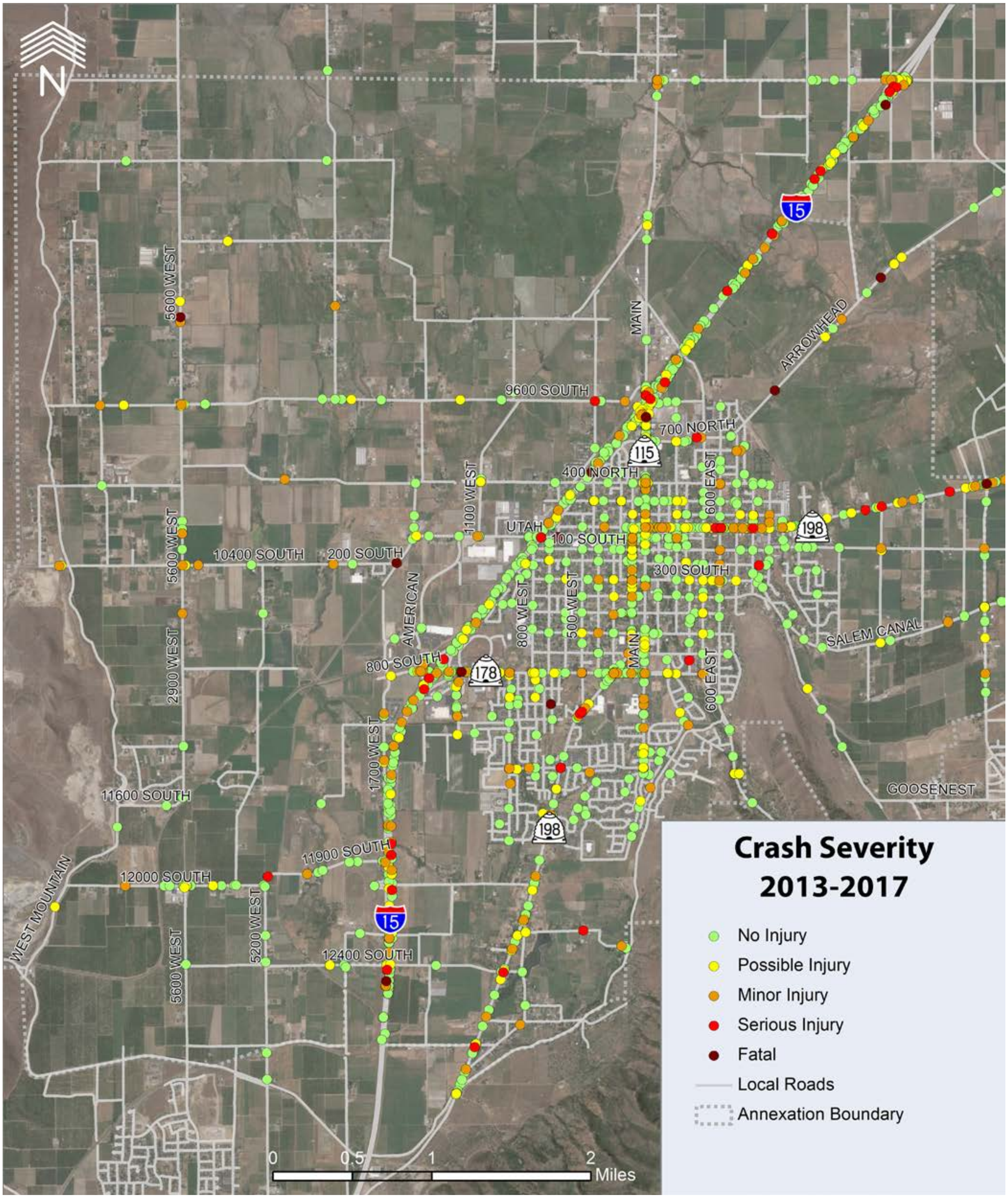


*Figure 2-13: Crash Severity 2013-2017*



## STOP SIGN ORIENTATION APPLICATION

Residents and the city have concerns regarding traffic control or lack of intersection control on some city roads. To address the concerns about these intersections, the existing traffic control was identified on functional classified roads as shown in Figure 2-14.

Installation of traffic control devices, such as stop signs and yield signs, is directed by the Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD contains standards and guidance for both the form and use of various types of traffic control devices including stop signs and yield signs. This guidance summarizes when stop signs should be considered and more quantitative factors to determine if signs should be installed on more than one approach to an intersection.

In general, the street carrying the lowest volume of traffic should be stopped rather than the busier street unless a traffic engineering study recommends stopping the busier street. This means in Payson the stop signs should mostly be on the lower functionally classified roadway so that traffic on the busier roadway is not stopped.

Table 2-4 summarizes the guidance for stop sign applications. Engineering judgment should be used for consideration of two-way stop control and an engineering study completed for multi-way stop sign applications.

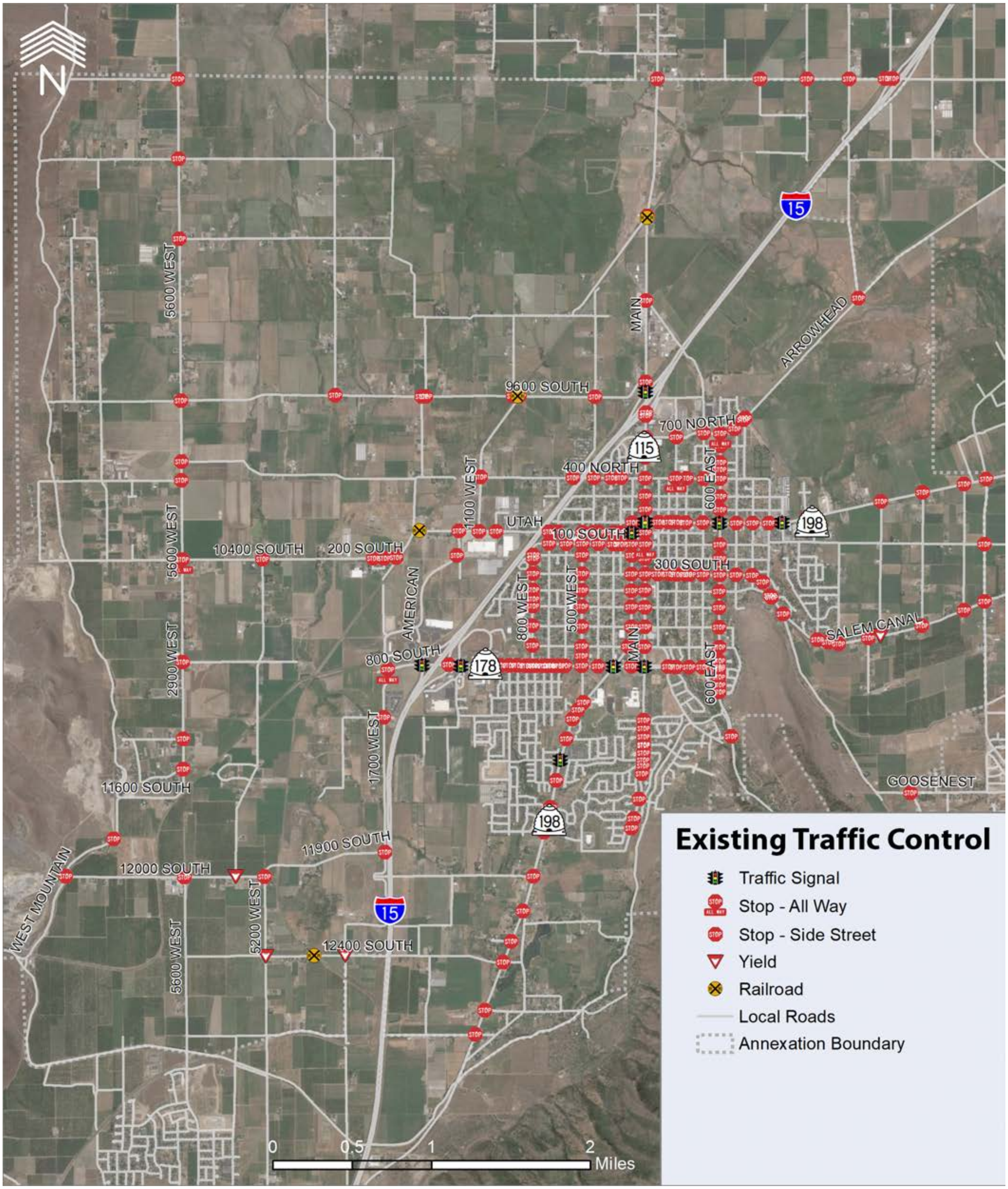
*Payson Intersection with Stop Signs*


*Table 2-4: Stop Sign Application Guidance*

| CONTROL TYPE | GUIDANCE/CRITERIA |
|---|---|
| **Two-way Stop Control** | A restricted view exists that requires road users to stop |
| | >6000 vehicles/day on major street |
| | ≥ 23 crashes susceptible to correction by the installation of a STOP sign in 1 year |
| | or ≥ crashes susceptible to correction by the installation of a STOP sign in 2 years |
| **Mulit-way Stop Control** | ≥300 vehicles/hour entering traffic on major street approaches for any 8 hours of an average day |
| | ≥200 vehicles/hour entering traffic on minor street approaches for any 8 hours of an average day |
| | or ≥ 5 crashes susceptible to correction by the installation of a multi-way STOP sign in 1 year |

*Source: MUTCD 2009 Edition with Revision Numbers 1 and 2 incorporated, dated May 2012, Sections 2B.06, 2B.07*

*Figure 2-14: Existing Traffic Control*



# ACTIVE TRANSPORTATION

The active transportation network is a key component of the transportation system. It provides mobility options for all residents and enhances the overall community. Making walking and biking safe and convenient is a key goal of the transportation plan.

### *Bike Lanes*

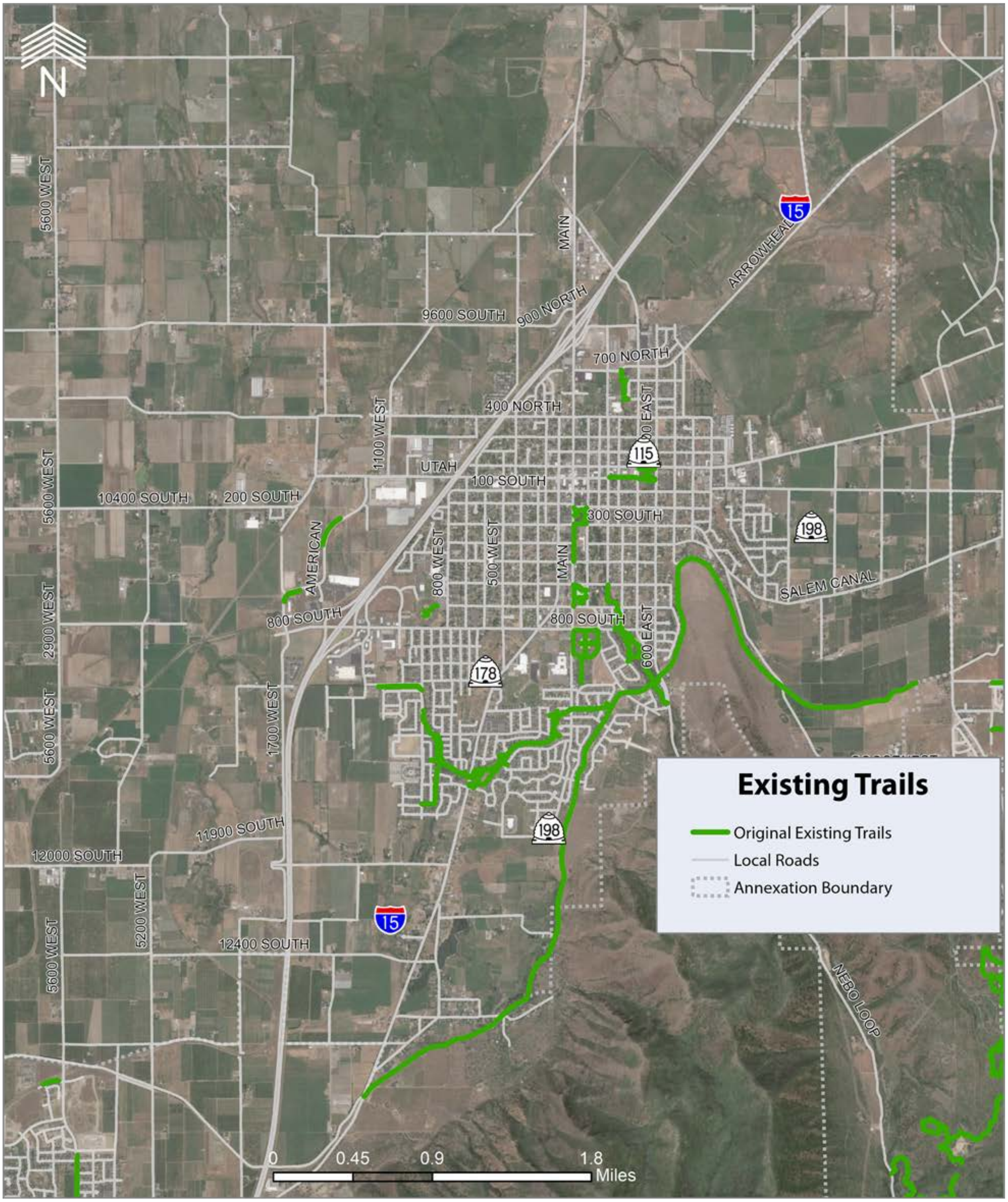
Currently, there are no designated bike lanes within Payson. However, several roadways such as 800 South, Utah Avenue, and S.R. 198 have adequate shoulder and a painted white fog-line that allows for bicycling. Although bicyclists can use these shoulders, these facilities were not designed for cyclists, so there are potential conflicts with parked vehicles and at intersections.

### *Trails*

Within Payson there are many different trail facilities that serve a variety of trail users. Hard surface and soft surface trails all make up the existing trail network within the city. The existing trail system is shown in Figure 2-15. Currently major trails within the city are Dry Creek Trail and High Line Canal Trail. The trail system continues to expand as the city connects existing trail segments creating a more robust trail system.

*Photo of Dry Creek Trail*

*Figure 2-15: Existing Trail System*



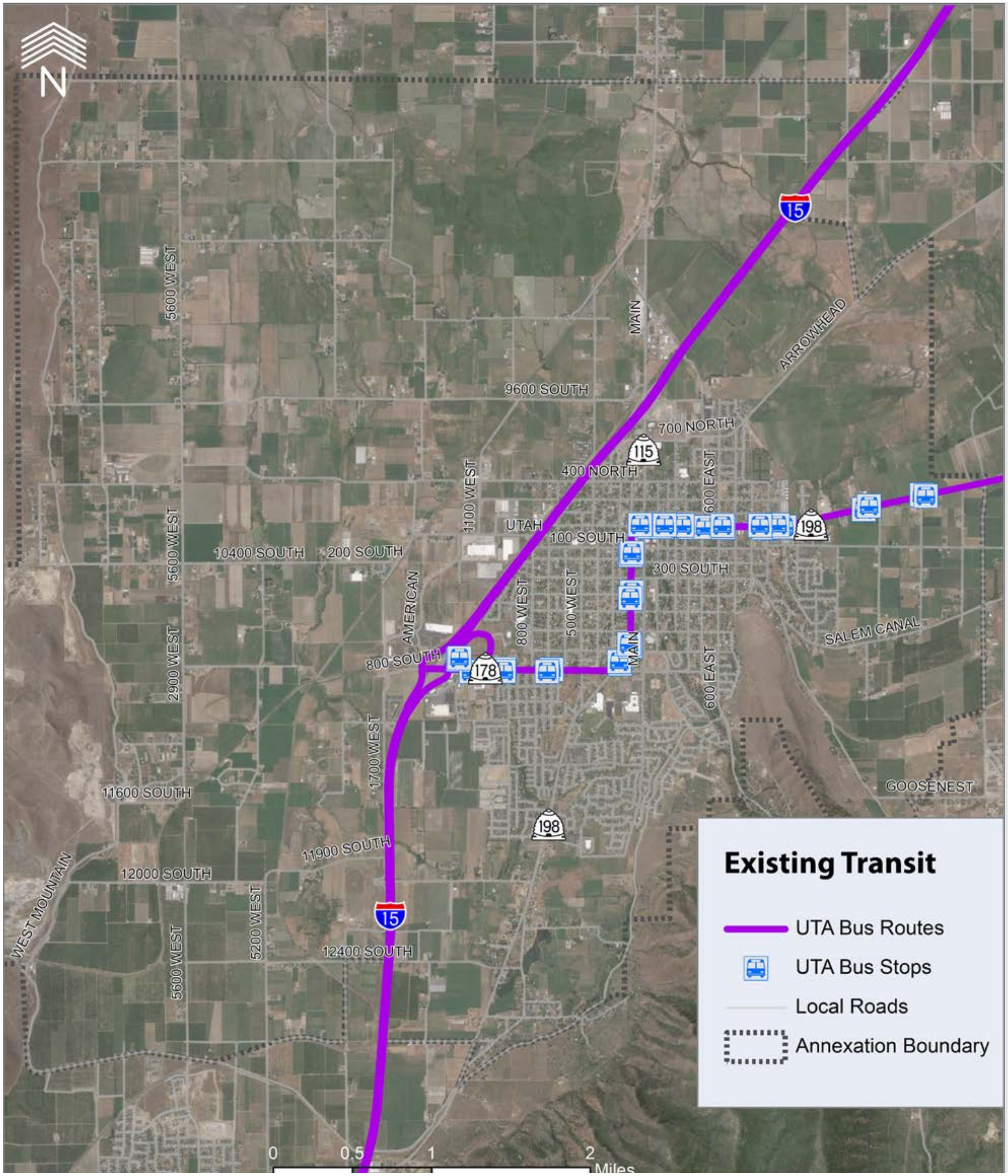
## FREIGHT

Payson does not have any existing formal truck route plan. Trucks and all types of freight are allowed to travel anywhere through the community. However, there may be growing concern from local citizens that truck traffic should not be going through some areas of the city. A truck route map was developed as part of this study and is included in Chapter 4.

## TRANSIT

Figure 2-16 illustrates the existing transit service and stops within Payson. Bus service is provided by the Utah Transit Authority (UTA) with three existing routes offering service within the city. Route 821 is the primary transit route with weekday and Saturday service between Payson and the Provo Central Station, the transfer point to FrontRunner. Routes 805 and 822 provide limited peak direction and period service from Payson to Provo and Brigham Young University, respectively. Currently, transit service is concentrated on to 800 South and S.R. 198 with bus stops limited to these roads. Bus routes are subject to ongoing refinements, and the most current bus routing information is available from UTA.

*Figure 2-16: Existing Transit Service and Planned Station Locations*



## PREVIOUS TRANSPORTATION STUDIES

Payson city has been proactively planning for future growth by completing multiple studies that informed the transportation plan. These studies have previously identified roadways, bike lanes and trails that provide a foundation to build a more robust and community-wide transportation system. The specific planning studies that informed the development of the transportation plan are summarized below.

### *Payson I-15 Interchange EIS (2018)*

This multi-year Environment Impact Statement (EIS) led by UDOT was completed in 2018. It identifies a braided ramps alternative that would provide a free-flow connection between the Main Street interchange and a new interchange connecting to the proposed Nebo Beltway and S.R. 198 in Phase I. Braided ramps (i.e., ramps that cross over each other) would connect the interchanges.

### *S.R. 198 Corridor Study (2018)*

The corridor study led by UDOT considers several options for S.R. 198 through Payson, including five lane options, realigning Main Street, and 100 West among others. This study identified potential impacts but gave no recommendations. It simply identified possible options.

### *South Meadows Area Specific Plan (2016)*

The South Meadows planning area includes 960 acres located near Payson, Utah LDS Temple and south of the I-15 / 800 South interchange. The area specific plan identified land use, roadways, and trails to guide commercial and residential development over the next 20 years. The area specific plan included an extensive trail system through the planning area, as well as roadway network that was integrated into the transportation plan.

### *South Utah County Active Transportation Plan (2016)*

The South Utah County Active Transportation Plan establishes a unified vision for communities in the south county to create a regional active transportation network. The plan addressed key gaps in the regional bicycle and pedestrian system, thereby identifying locations that require infrastructure improvements to create a strong network of active transportation facilities that connects communities in the south county region.

### *Payson City Trails Plan (2014)*

The Payson Trails Plan identifies a comprehensive trails network throughout the city. The plan identified important connections between the existing trail system and new trail corridors within the community. The trails plan would provide most residents access to a trail within at most several blocks from their home.

### *Bamberger Ranch P-C Zone Plan (2011)*

The Bamberger Ranch includes 740 acres of property that is located at the northern entrance of Payson on both the east and west sides of I-15. The P-C Zone Plan applied Payson Planned Community Zone to this property to develop a vision for future development. The land use component of the plan provides design parameters and place types. This land use vision guided a transportation system including transit that would ensure transportation infrastructure is not under-planned in this area.

### *East Side Comprehensive Plan (2009)*

The comprehensive plan provides guidance for the development of the east side planning area from S.R. 198 to Elk Ridge and from 2300 West to Salem. The plan detailed land uses for the area and identified infrastructure to support future growth. This infrastructure plan includes alignments for functionally classified roads and trails through the planning area.

# Chapter 3 -Where are we going?

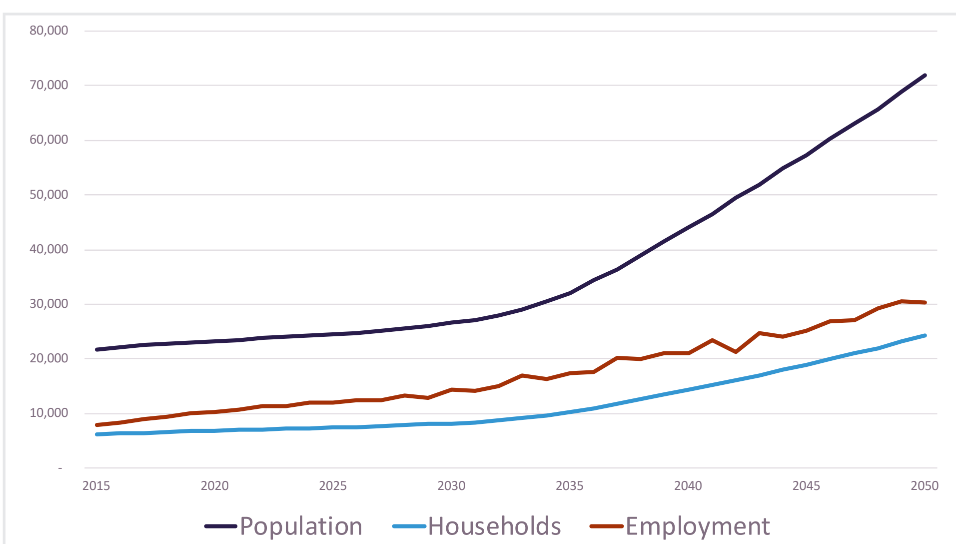
## FUTURE FORECASTS

This chapter discusses the background and assumptions used to forecast transportation related growth in Payson. Using travel demand modeling techniques in conjunction with projected socioeconomic, population, and employment trends, future transportations demands were forecast. Changes that are already committed by agencies such as UDOT and MAG were included in the transportation forecasting prior to recommending any city transportation improvements. Other projects which are planned but not committed are also recommended as part of this process.

### Future Growth

Most of the projected demographic data used in this study comes from the land use element of the general plan update performed in conjunction with this master plan and the future Land Use Plan shown in Figure 3-2. The future we are planning for includes 2050 population of over 70,000 people and over 25,000 jobs. The land use plan reflects this growth and the future land use within Payson includes a variety of uses, including agriculture, residential, industrial and commercial. The information provided is considered the best available for predicting future travel demand. However, land use planning is a dynamic process and the assumptions made in this report should be used as a guide and should not supersede other planning efforts particularly when it comes to localized intersections and roadways.

*Figure 3-1: Future Payson City Forecasts*



### Travel Model Development

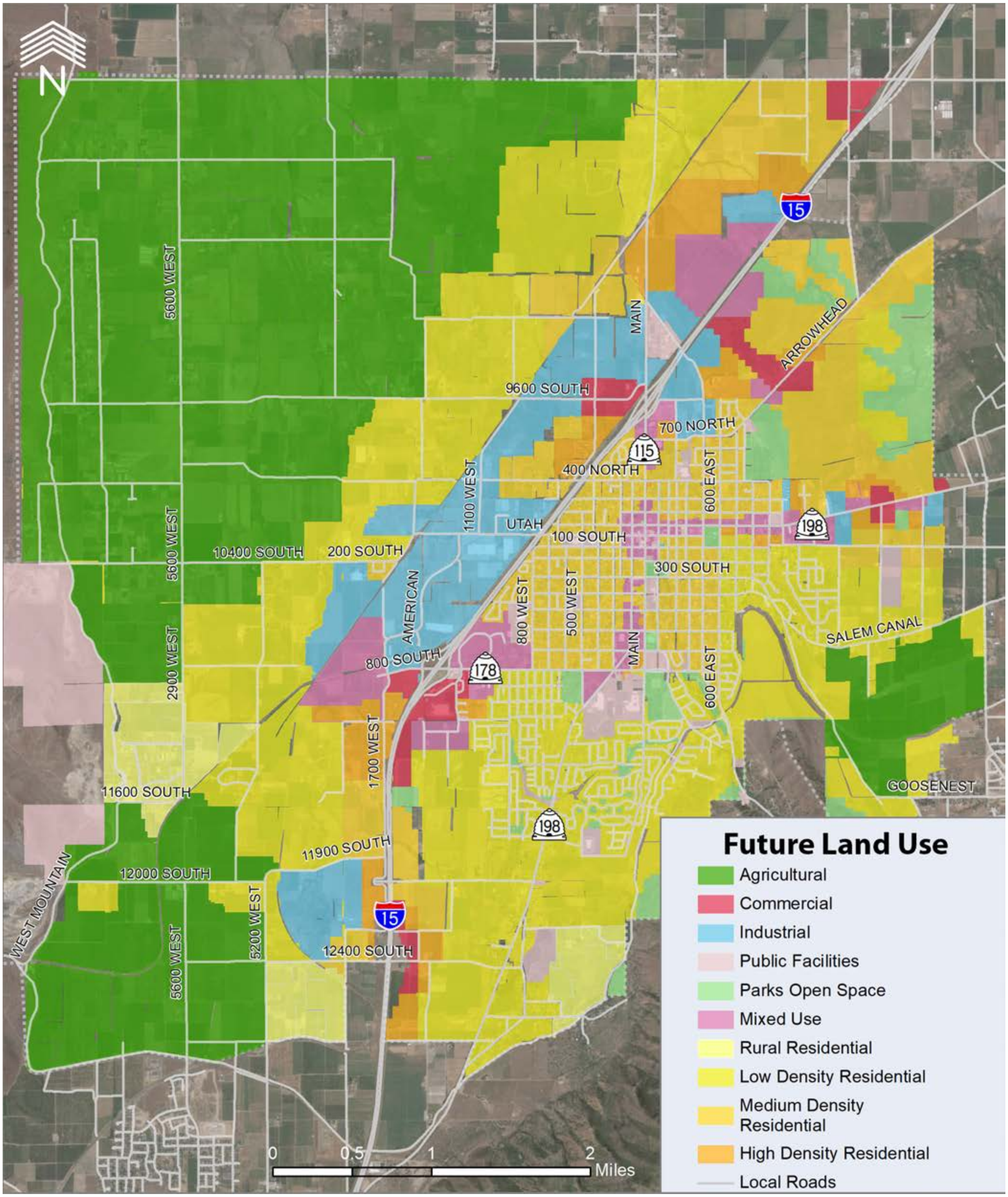
Projecting future travel demand is a function of projected land use and socioeconomic conditions. The MAG Travel Demand Model was used to predict future traffic patterns and travel demand. The travel demand model was modified to reflect better accuracy through the Payson area by creating smaller TAZs and a more accurate and extensive roadway network. Existing conditions were simulated in the travel demand model 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, demographic and socioeconomic data was added into the model to predict the roadway conditions for the design year 2050. The year 2050 was selected as the planning year horizon to be consistent with the MAG planning process. The 2050 Metropolitan Transportation Plan, TransPlan50 (available at www.mountainland.org), was adopted by the Mountainland MPO Regional Planning Committee in 2019. TransPlan50 is a guide to maintain and enhance the regional transportation system for urbanized Utah County.

## LAND USE EFFECT ON TRANSPORTATION

Rapid growth is expected to continue in the coming years. Population is projected to triple over the next thirty years, adding 18,000 housing units. This clearly means that the city will expand geographically, but the growth will also include a large amount of infill development. The density in many developments is also expected to be higher than that of Payson today. Higher density means the new developments like those proposed on Arrowhead Trail Road will have a mix of apartments, duplexes, condos, and single family residential housing options.

As Payson continues to grow, some neighboring agricultural land will be developed and vacant infill land will become scarcer. The projected growth from new development around Payson is depicted in Figure 3-2, the Future Land Use Map.

*Figure 3-2: Payson General Plan Land Use Map*



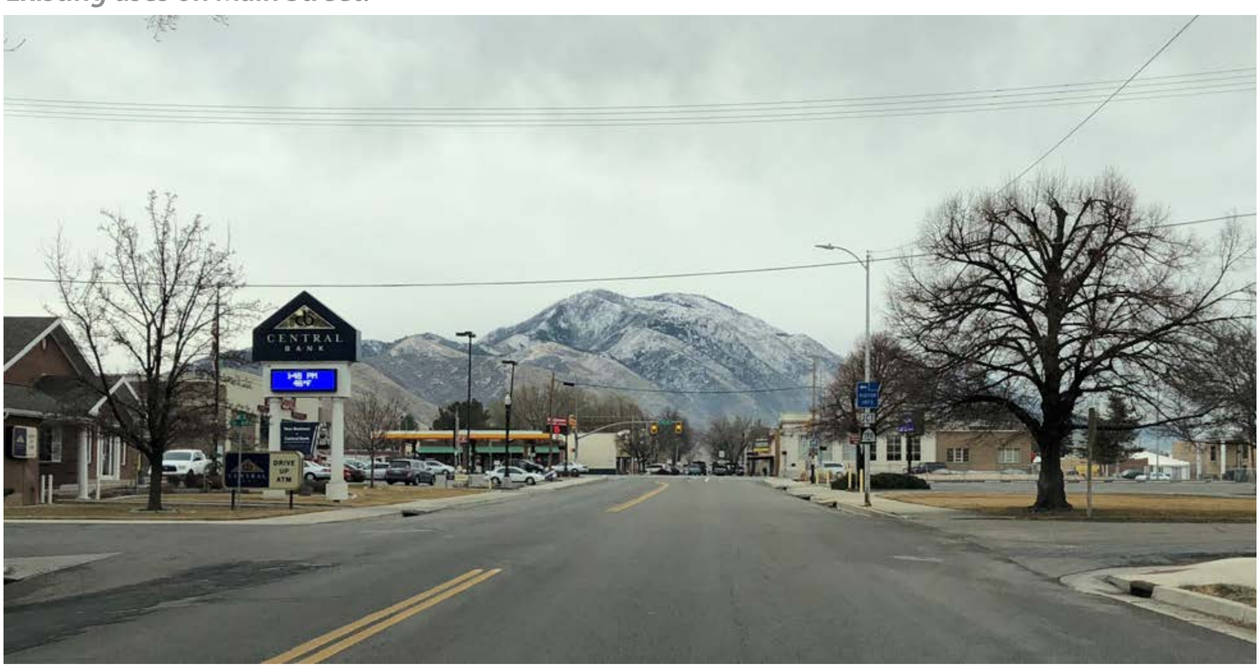
Payson is currently a balanced community with a good mix of residential, commercial, and industrial land uses. As Payson grows and develops, maintaining this balance will be important. The city works with developers to maintain this balance. A large mixed use and commercial development is being planned in the area around the new interchange and arterial in the Bamberger Ranch area.

There are other sites in and around Payson that are planned for mixed use. The city is also planning to expand the industrial areas between I-15 and the railroad tracks with a node by the new southern interchange. These areas are shown in blue on the Future Land Use Map.

Residential areas will still encompass the majority of land use in Payson; however, many of the planned developments may incorporate a mix of housing unit types. Much of the planned residential land will be single family detached housing. There are, however, housing options planned that include townhouses, apartments, senior housing, condos, and duplexes with densities reaching 20 units per acre or higher.

One of Payson's challenges with future land use is and will be developing the infrastructure needed to serve the growth areas. The building of roads, schools, parks, and other necessary community components typically lag several years behind the new developments. This transportation plan identifies the needed roadway improvements that can accommodate the future land uses that are part of the community vision. Future transportation needs are identified using the regional travel demand model. The modeling performed included all the planned land uses and total growth for 2050.

***Existing uses on Main Street.***



# MODEL YEARS & RESULTS

## Projected Traffic Volumes & Conditions

The resulting outputs of the travel demand model were made up of traffic volumes on all of the classified streets in the City and surrounding area. This data was used to identify the need for future roadway improvements to accommodate the projected growth in the City. The following two scenarios were analyzed in detail to assess the travel demand and resulting network performance in the City:

- No-Build
- Recommended Roadway Network
  - MAG Regional Transportation Plan (TransPlan40)
  - Additional Projects to accommodate growth

## 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 it, either by the City or UDOT. The travel demand model was used again to predict this condition by applying future growth and travel demand to the existing roadway network. Interim year growth assumptions were modeled to understand how congestion grows over time. Figures 3-3 and 3-4 show the 2030 and 2040 No Build model Levels of Service respectively. These maps show growing congestion on I-15, S.R. 198, Main Street, and other corridors as the population and employment increases but no improvements are made. This growing congestion is visible in the expansion of yellow, red, and black roadway segments.

Figure 3-5 shows the 2050 No Build LOS. If no improvements are made to Payson's transportation infrastructure, projected traffic volumes for the planning year 2050 will significantly worsen the LOS of many of the major 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)

- Salem Canal Road (2100 West to Elk Ridge Drive)
- 11900 South (5200 West to 4600 West)
- 5600 West (800 South to 9600 South)
- 930 West (1400 South to 1130 South)
- Main Street (800 South to 300 South)
- 600 East (500 South to 300 South)

## LOS E or Worse (Unacceptable)

- 8000 South (Main Street to I-15)
- 900 North (4050 West to Main Street)
- 700 North/Arrowhead Trail Road (Main Street to 2200 West)
- 400 North (3550 West to 600 East)
- Utah Avenue (American Way to 100 West)
- 100 South (1000 East to 2200 West)
- 300 South/Salem Canal Road (100 West to 2100 West)
- 800 South (1700 West to 1270 West)
- 1700 West (11900 South to 4600 West)
- S.R. 198 (12000 South to Elk Ridge Drive)
- Main Street (100 North to 8000 South)
- 600 East (300 South to 700 North)

Based on the number of roadways at LOS D and worse, there are a significant amount of capacity improvements necessary for 2050.

*Figure 3-3: Year 2030 No Build Level of Service*

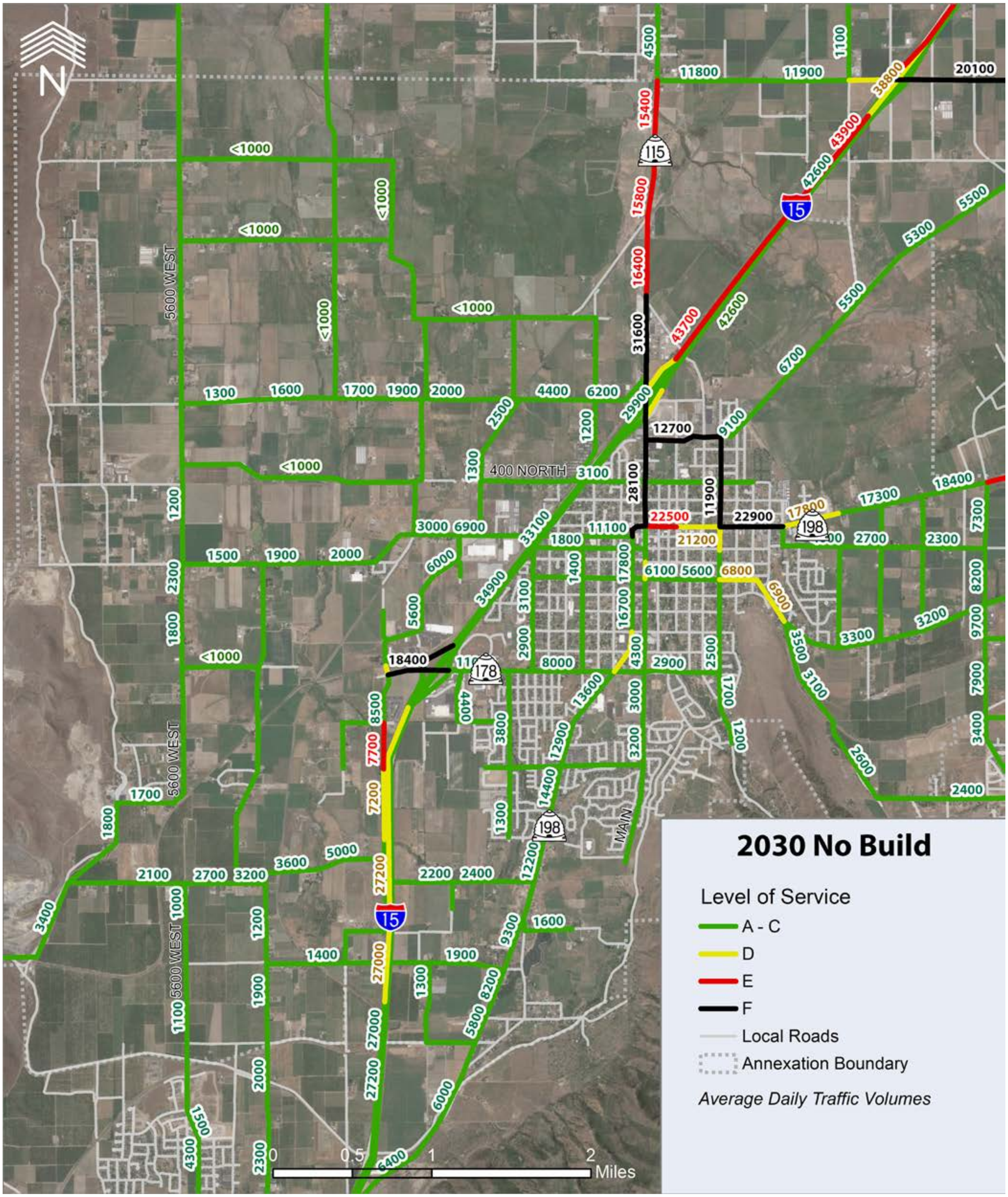


*Figure 3-4: Year 2040 No Build Level of Service*

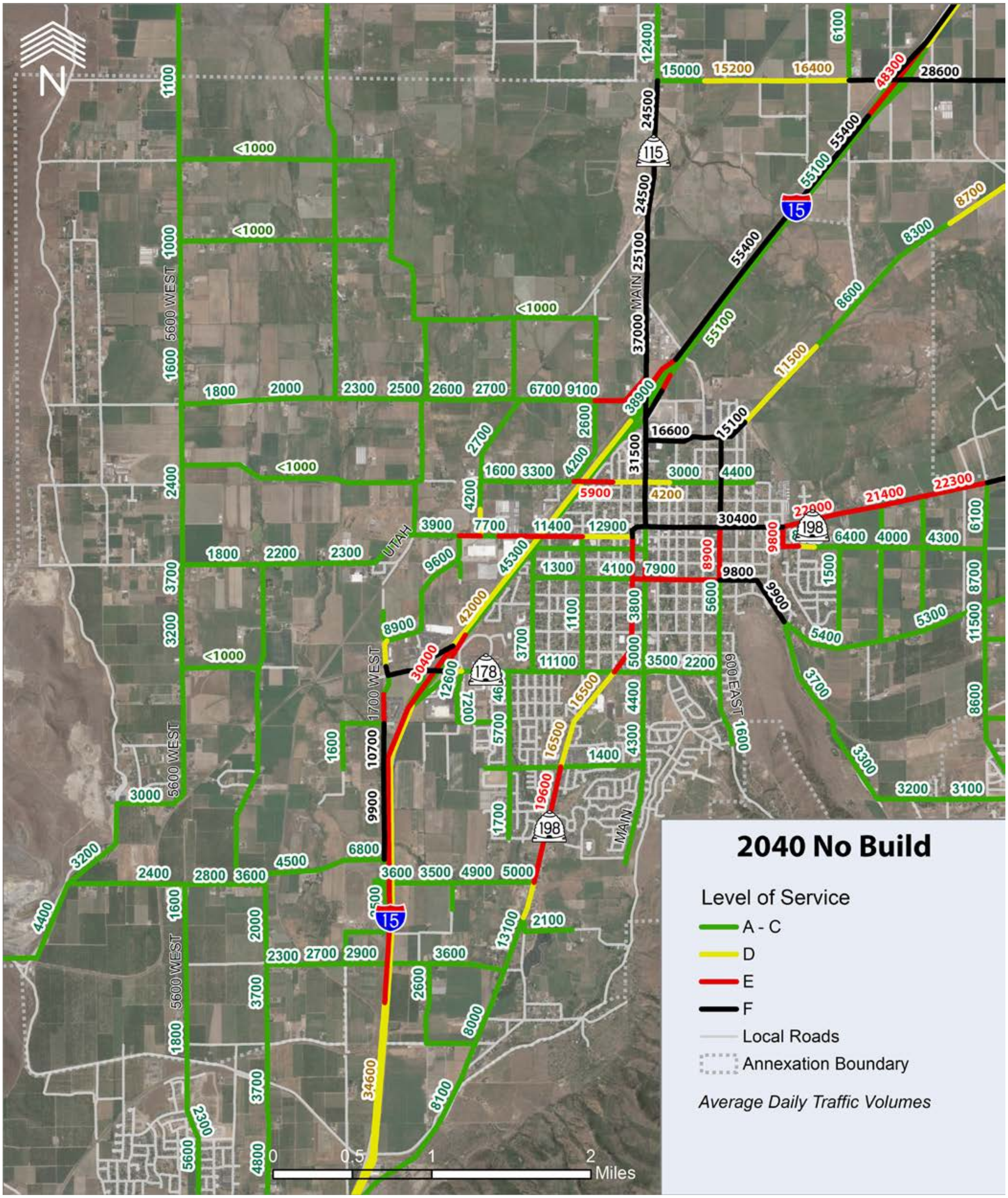
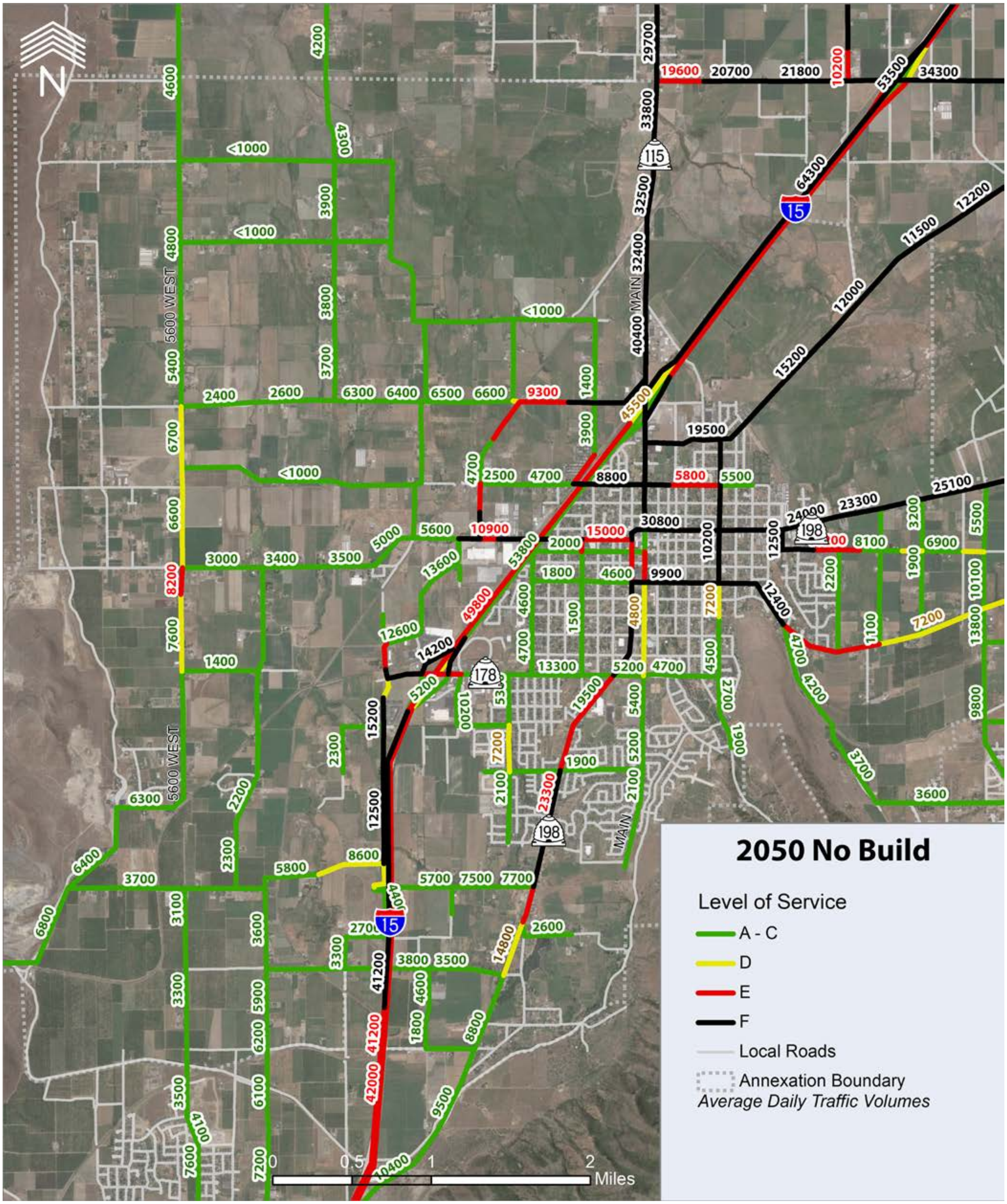


*Figure 3-5: Year 2050 No Build Level of Service*



## Recommended 2050 Roadway Conditions

Improvements will need to be made as growth continues in Payson to preserve the quality of life and to maintain an acceptable LOS on city streets and intersections. These improvements will also provide a street system that will support the city's growing economic base.

Signals will also need to be monitored and updated as conditions change. It is recommended that the signalized intersections in the city be regularly monitored and signal timings adjusted as needed to maintain acceptable operating conditions. Additionally, care should be taken to regularly monitor the non-signalized intersections in the city and, where appropriate, studies should be completed to determine the best mitigation 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 mitigations should be investigated and studied to determine the best alternative. Funding sources for signals and roundabouts should be explored and may include general funds, impact fees where appropriate, and/or a special transportation improvement fund.

The future analysis in Payson can be split into two sections. The first section involves regional projects comprised of included in MAG's TransPlan50. These projects may be funded by UDOT or MAG with a 6.77% match by Payson. After determining where the improvements occur with the addition of the MAG projects, the second section is made up of the rest of the projects necessary to improve the roadway network to LOS D or better, or to build the transportation system necessary to accommodate all the future land use plans.

### *Regional Transportation Plan*

Payson is not alone in improving the roadway network. MAG, in cooperation with UDOT, provides financial assistance for projects included in their Regional Transportation Plan (RTP). If the roadway is included on the RTP and is owned and operated by UDOT, full financial responsibility falls to UDOT. It is important for Payson to include these projects in this Transportation Master Plan as well as coordinate with UDOT to ensure these projects are implemented. If the roadway is on the RTP and not owned by UDOT, Payson must match 6.77% of the project cost. The projects in Payson 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 (2019-2030)**

- I-15/Payson Main ST/Nebo Beltway Interchange
  - New Interchange
- Nebo Beltway
  - Main Street to S.R. 198
  - New 5 lane road

**Phase 2 (2031-2040)**

- 8000 South
  - Main Street to I-15
  - Widen to 5 lanes
- S.R. 198
  - 800 South to 400 North (Salem)
  - Widen to 5 lanes
- I-15/Payson 800 South Interchange
  - Reconstruction

**Phase 3 (2041-2050)**

- 8000 South
  - 5600 West to Main Street
  - New 3 lane road
- 800 South
  - 5200 West to 1700 West
  - New 3 lane road
- I-15/UC 12400 South Interchange
  - New Interchange
- UC 12400 South
  - Mountain Road to S.R. 198
  - New and widen 5 lane road
- Nebo Beltway
  - S.R. 198 to Elk Ridge Drive
  - New 3 lane road (location TBD)

To indicate the impacts of the RTP projects, these projects from Figure 3-6 were added to the future travel demand model to determine how the roadway network improves. This is necessary as major roadway changes will occur in Payson, specifically the new interchanges at Main Street and 800 South.

Only the RTP projects were added to the travel demand model. The LOS is represented in Figure 3-6 and listed below are the roads that perform at LOS D or at LOS E or worse.

### *LOS D (Peak Congestion but Acceptable)*

- Utah Avenue (4050 West to 100 West)
- S.R. 198 (12000 South to 800 South; Utah Avenue to Main Street)
- 600 East (100 North to 700 North)

### *LOS E OR WORSE (Unacceptable)*

- 900 North (500 West to Main Street)
- 800 South (American Way to 1270 West)
- Main Street (100 North to 8000 South)
- Nebo Beltway (Main Street to Arrowhead Trail Road)

This future represents a significant improvement over the 2050 No-build scenario. This means that much of Payson's future traffic can be accommodated on their current roads plus the planned UDOT and MAG improvements. Projects like the new I-15 interchange, S.R. 198 widening, and the new Nebo Beltway arterial go a long way to addressing future demand of the projected growth. There are however, still a few congested areas and some additional projects will be necessary in the long run.

*Figure 3-5: MPO Projects*

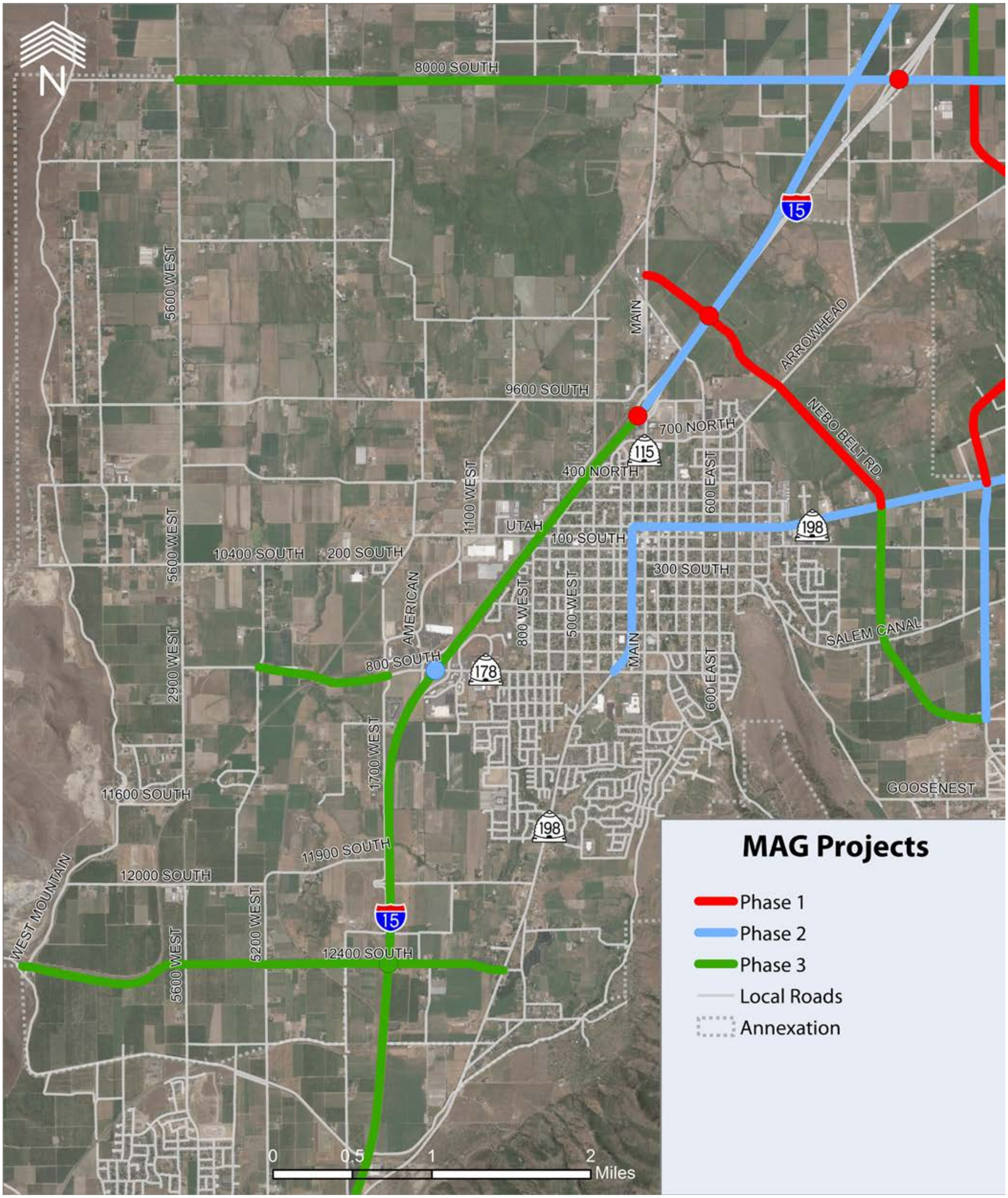
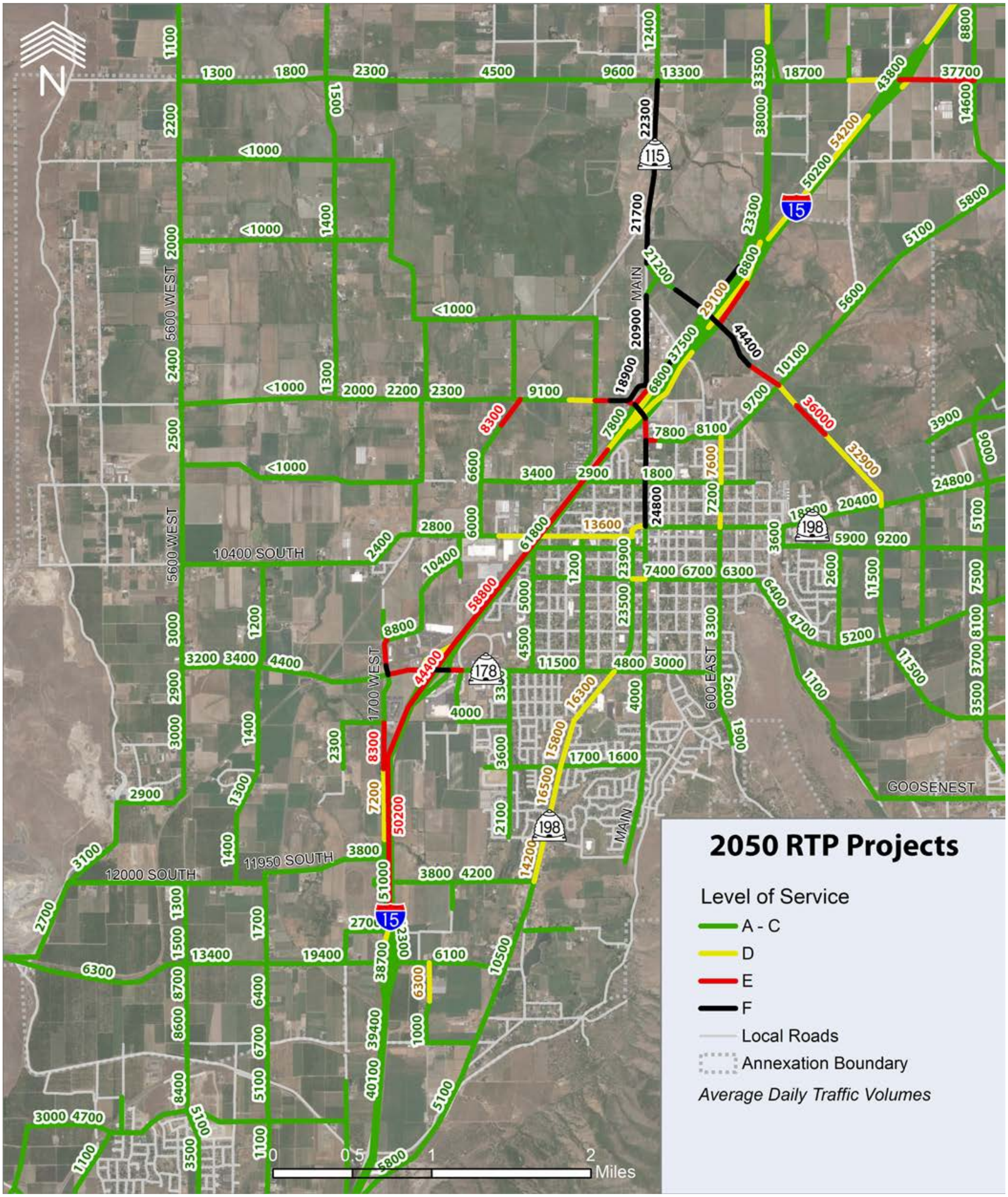


*Figure 3-6: MAG RTP Level of Service*



## 2050 Additional Roadway Improvements

The roadway segments included in MAG's RTP, as well as the additional modeling results developed from community input received in the spring of 2019, form the basis of the improvements included in the 2050 roadway improvements.

In April of 2019 a community workshop was held where the public was presented with the problem of growing traffic and how best to accommodate that future demand with infrastructure projects. We asked the over 100 participants to consider roadway projects all around Payson and to place stickers on maps for the areas they would most like to see roadway improvements. The results were a guide for the development of additional roadway improvements. The public did not identify specific projects but rather their highest priority areas for improvements as shown in Figure 3-7. This input led to the refinement of potential projects; producing a project list based more on what the community values.

Listed below are the refined planned regional projects which better match Payson's individual needs and priorities. These projects include:

### *Phase 1 (2019-2030)*

- S.R. 198/Main Street
  - Intersection Improvement
- S.R. 198/Utah Avenue
  - Intersection Improvement
- I-15/Main Street
  - Upgrade Interchange
- I-15/800 South
  - Upgrade Interchange
- Nebo Beltway
  - Main Street to S.R. 198
  - New Major Arterial

### *Phase 2 (2031-2050)*

- Main Street
  - S.R. 198 to I-15
  - Widen to Minor Arterial
- S.R. 198
  - Main Street to City Boundary
  - Widen to Major Arterial
- Main Street
  - I-15 to 8000 South (County)
  - Widen to Major Arterial
- S.R. 198
  - 500 West to Main Street
  - Widen to Major Arterial
- S.R. 198
  - City Boundary to 500 West
  - Widen to Major Arterial
- 900 North
  - 1100 West to Main Street
  - Minor Arterial
- 600 East
  - 300 South to S.R. 198
  - Restripe to 3 Lane Collector
- 300 South
  - S.R. 198 to 600 East
  - Restripe to 3 Lane Collector
- Utah Avenue
  - American Way to S.R. 198
  - Widen to Minor Arterial
- Arrowhead Trail
  - 750 East to Elk Ridge Connector
  - Widen to Minor Arterial
- 400 North
  - Main Street to 600 East
  - Widen to Minor Arterial
- 100 South
  - 1200 East to City Boundary
  - Widen to Minor Arterial
- 1100 West
  - Utah Avenue to 900 North
  - New/Widen Collector
- I-15/12400 South
  - New Interchange
- 12400 South
  - Mountain Road to S.R. 198
  - New/Widen Major Arterial
- 800 South
  - 2400 West to 1700 West
  - New Minor Arterial
- 8000 South
  - 5600 West to Main Street
  - New/Widen Minor Arterial

With all projects included, Figure 3-5 shows the proposed 2050 roadway network and LOS with all future projects (including MAG RTP projects).

*Figure 3-7: Public Identified Areas of Priority*

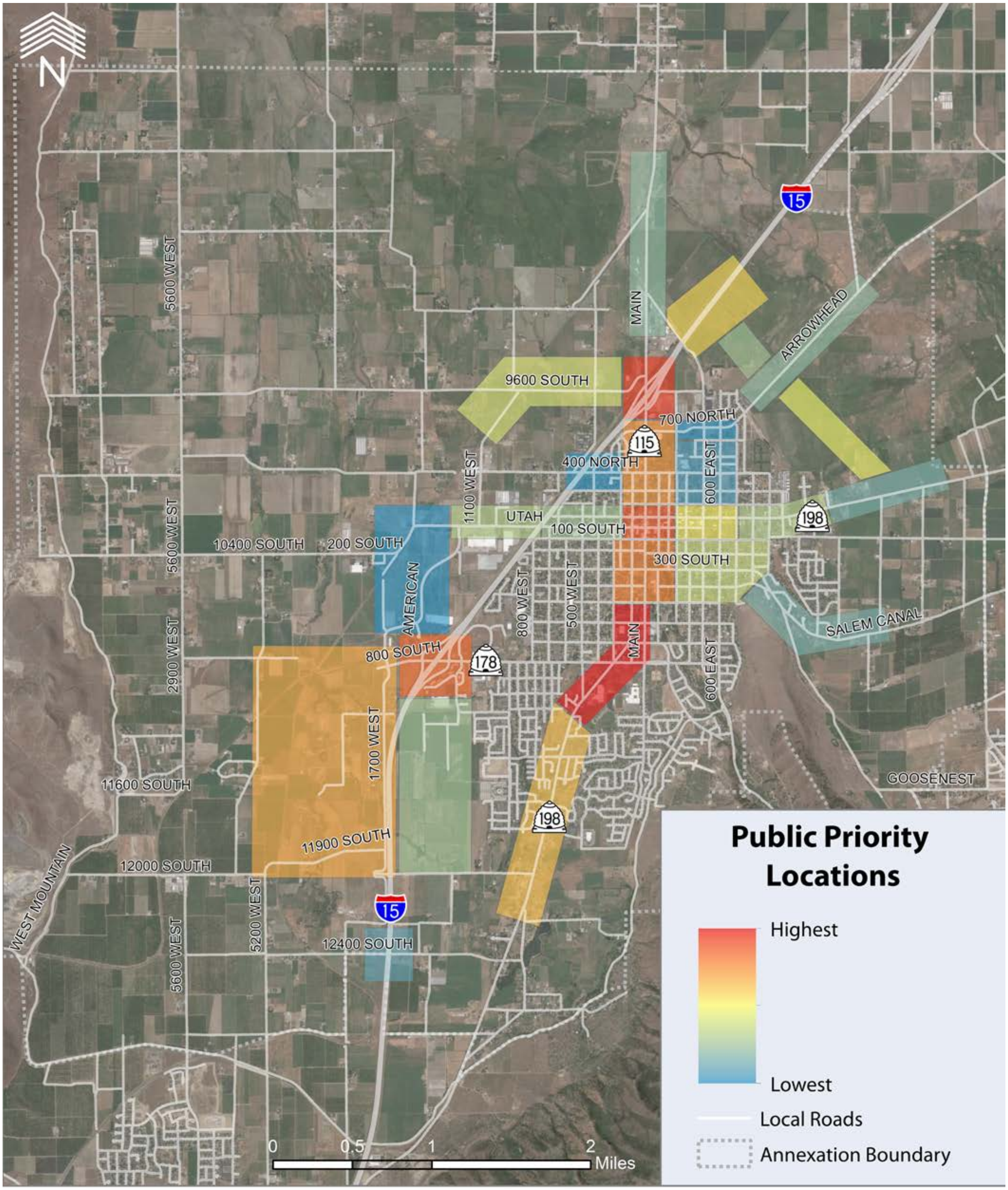
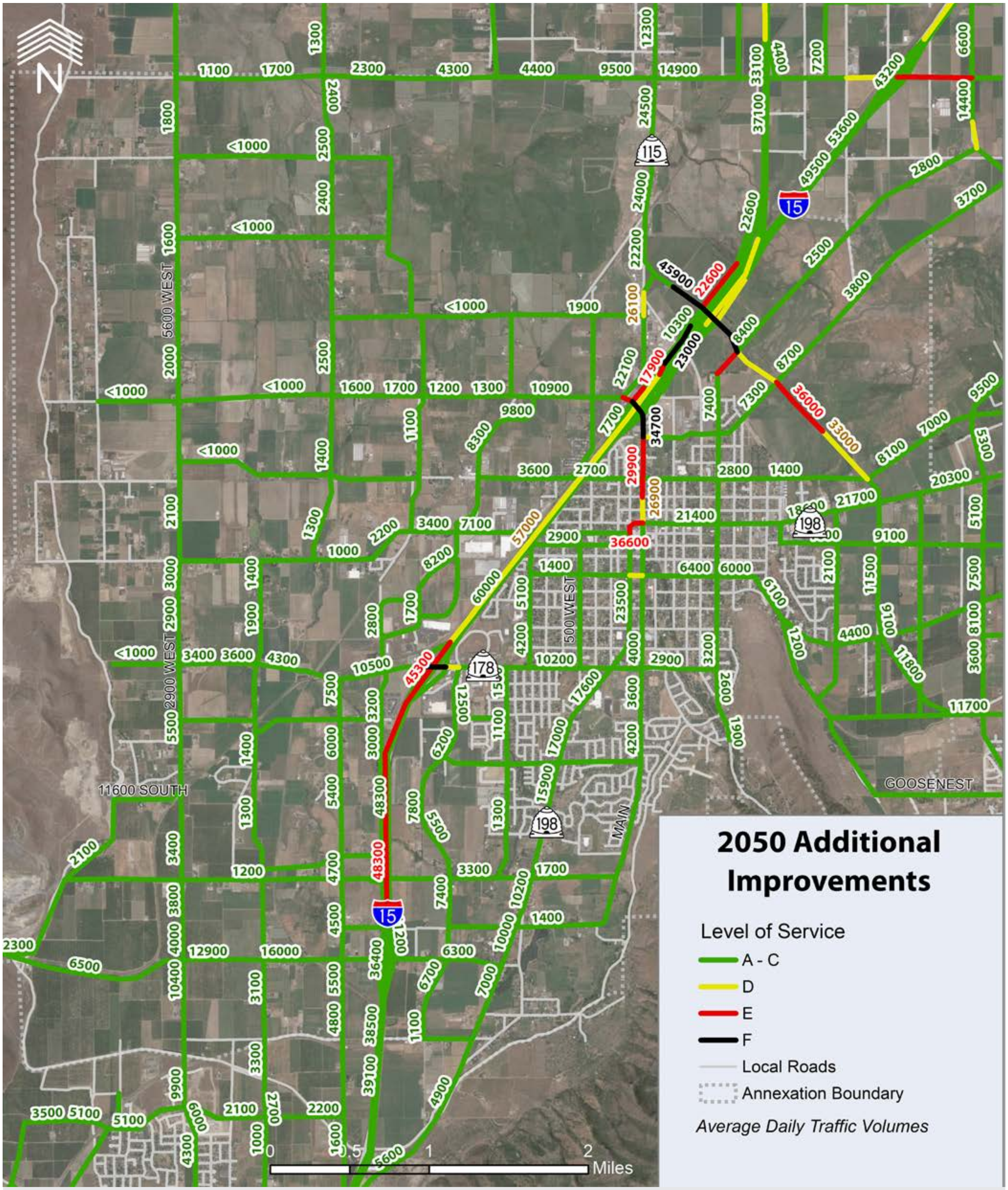


*Figure 3-8: Proposed Roadway Level of Service*



Applying all improvements will improve the roadway network to function at LOS D or better in most locations. These possible improvements are the basis for needed projects and help define which projects are recommended in Chapter 5.

The following roadways perform at LOS D or worse in the 2050 proposed roadway network:

### LOS E or Worse (Unacceptable)

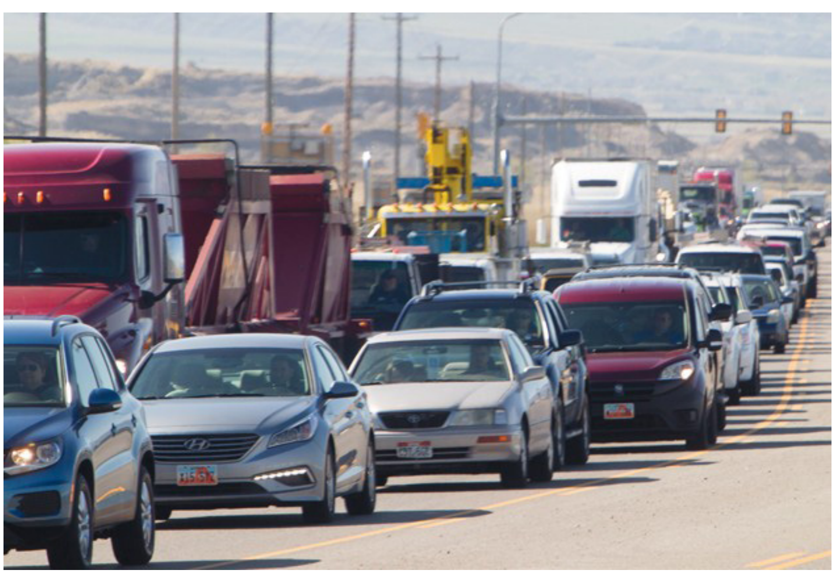
- **Main Street (From 8000 South in Benjamin to 100 North in Payson)**
- **Nebo Beltway (Main Street to Arrowhead Trail Road)**

While the individual interchanges are showing LOS F conditions in the model results, these are often misrepresented because the final interchanges will include single-point junctions or signals that will operate more efficiently then what the travel demand model can predict.

## SUMMARY OF WHAT THE FUTURE HOLDS

With the planned growth of Payson and surrounding communities, the transportation system will experience increasing demand. Without improvements to the transportation network, traffic congestion and resulting delays will increase significantly on most of the functionally classified roadways. However, Payson is not alone in planning for future growth and UDOT and MAG have identified key improvements to the regional roadway network to accommodate future demand. 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 Payson are planned for with the MAG 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 level of service with minimal delays through the planning year 2050.



# Chapter 4 - What is the plan?

Based upon the evaluation of existing and future conditions as well as extensive public input that was received through the planning process, specific recommendations were developed for each element of the plan. These recommendations will be used to complete the transportation network, including functionally classified roads, transit investments, and active transportation projects. Other plan considerations such as access management, corridor preservation and street connectivity to improve the transportation system within the greater Payson area are also summarized in this chapter.

## RECOMMENDED FUNCTIONAL CLASSIFICATION

The recommended functionally classified roadway network is illustrated in Figure 4-1. The functional classification was developed based upon prior planning efforts, including the 2014 Payson Street Master Plan Map and recently completed area specific plans. These prior plans provided the base roadway network that was refined to serve the updated future land use and traffic forecasts.

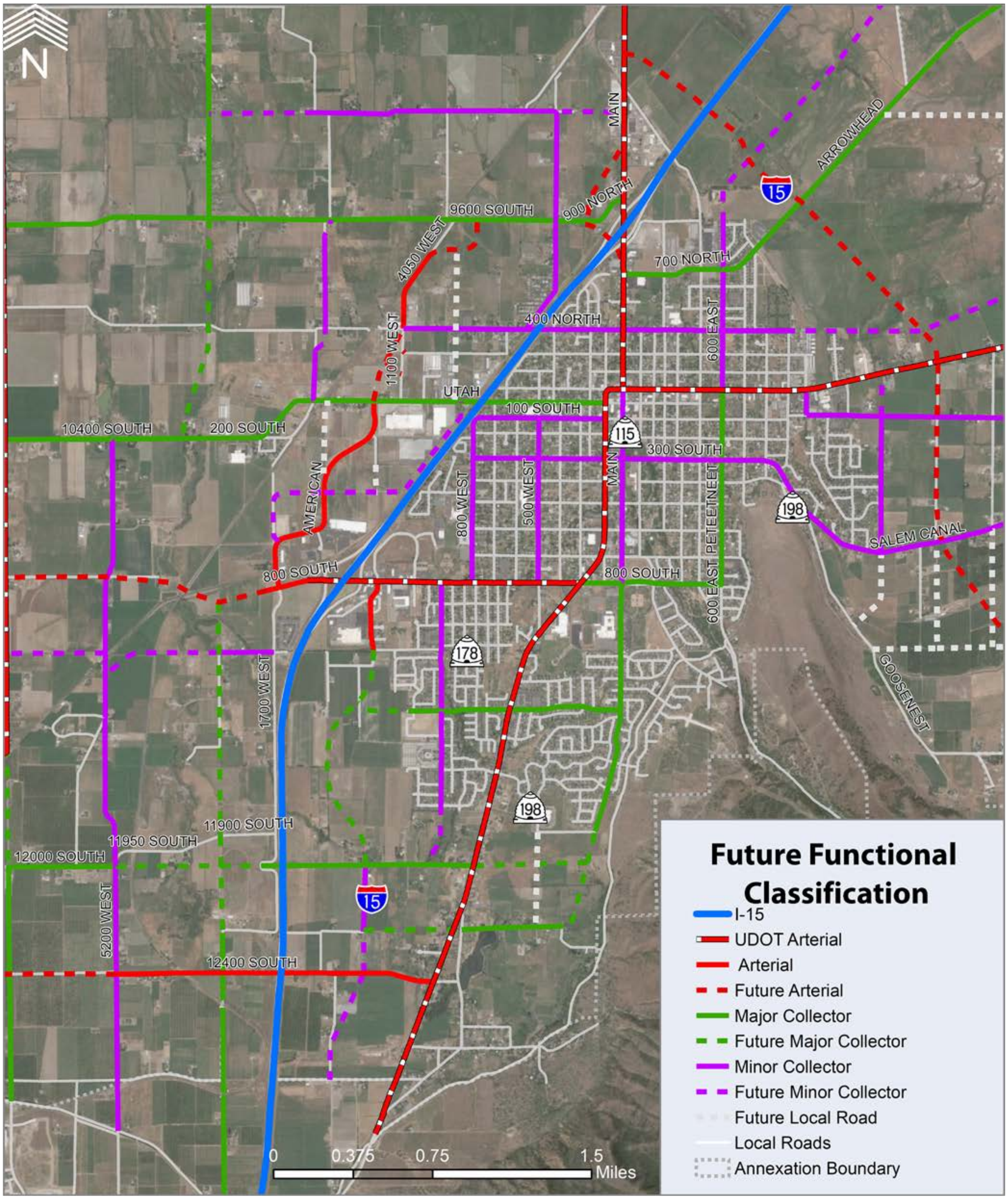
Finally, the recommended functional classification was improved to reflect stakeholder and public comments to create a network that will serve existing and future travel demand. The recommended network includes planned projects in MAG's TransPlan50 as well as those identified in 2050 additional roadway improvements in Chapter 3. These arterial and collector roadways will provide the backbone of the functionally classified transportation network within the city.

The future functional classification map shown in Figure 4-1 is the most comprehensive 1-page image of the Transportation Master Plan. In a single map 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 Payson. It is essentially the future road network.

## STANDARDS & CROSS-SECTIONS

New roadway cross-sections will be adopted with this document. Roadway cross-sections are necessary for understanding the function, capacity, and speed, as well as the look and feel of a road. The roadway cross-section standards for Payson are based on engineering concepts from American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets 2018 (commonly called the "AASHTO Green Book"), and UDOT's Design Manual. Some of the cross-section engineering elements included in the Payson standards from these guide books are 12-foot travel lanes with 14-foot center turn lanes. The cross-sections also include standards from Payson, including two-foot curb and gutter, and five-foot sidewalks.

*Figure 4-1: Future Functional Classification*



The typical cross-sections for each functional classification in Payson were updated. Ranges for Right-of-Way (ROW) width, as well as pavement width for each functional classification are included in Table 4-1. It is important for Payson to use specific values for each cross-section for future development. The cross-sections can be found in Figures 4-2, 4-3, 4-4, and 4-5. These are newly developed cross-sections and part of the new cross-sections are hybrids that offer some flexibility in what is striped. The study team worked with Payson city staff to develop options of striping within the same footprint for some cross-sections. These hybrids allow for the city to accommodate growing traffic without having to expand the ROW.

The cross-sections are designed to give minimum standards for new roads and road improvements. It is expected that all future development will generally use these cross-section standards.

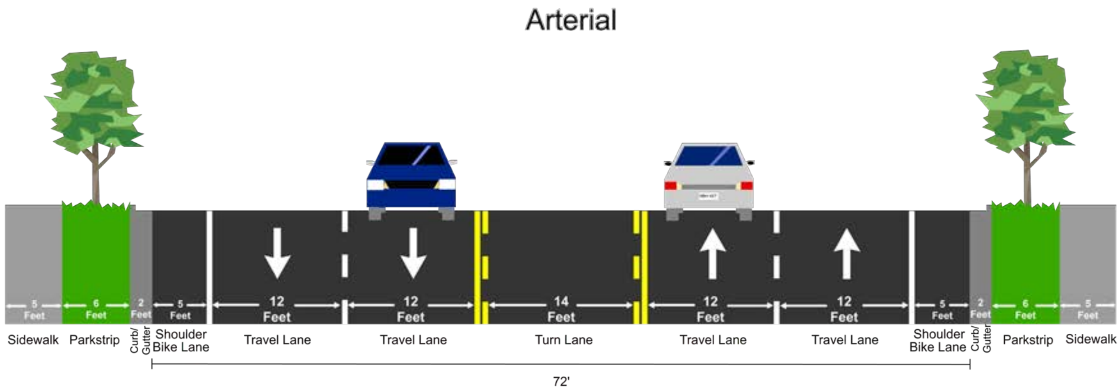
The cross-section standards for Payson are defined in four categories by street functional classification: major arterial, minor arterial, collector, and residential streets.

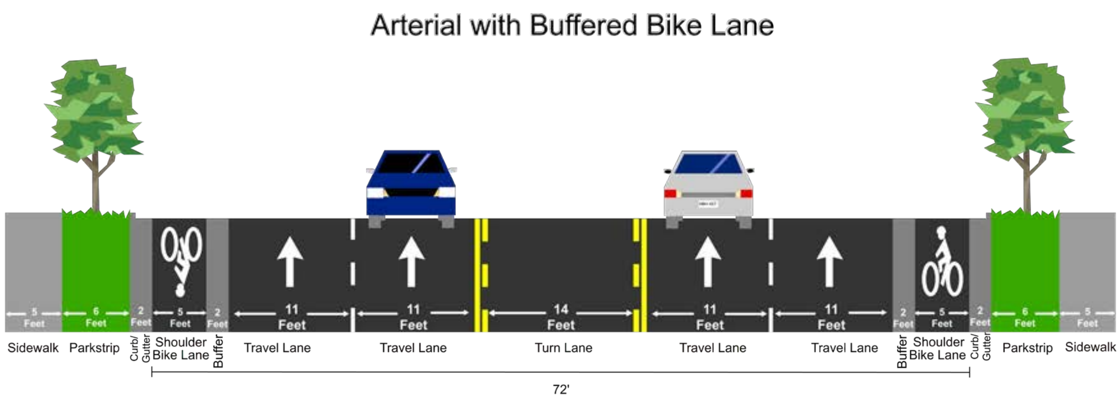
*Table 4-1: Cross-Sections in Payson*

| FUNCTIONAL CLASSIFICATION | NUMBER OF LANES | RIGHT-OF-WAY (ROW) | PAVEMENT | TARGET VOLUME (VEH/DAY) |
|---|---|---|---|---|
| Arterial | 5 | 98' | 72' | 17,000-32,500 |
| Major Collector | 3 | 76' | 50' | 9,000-17,000 |
| Minor Collector | 2 | 76' | 50' | 5,000-9,000 |
| Local Residential | 2 | 60' | 34' | 2,000-5,000 |

*Roadway Elements*

*Figure 4-2: Arterial*

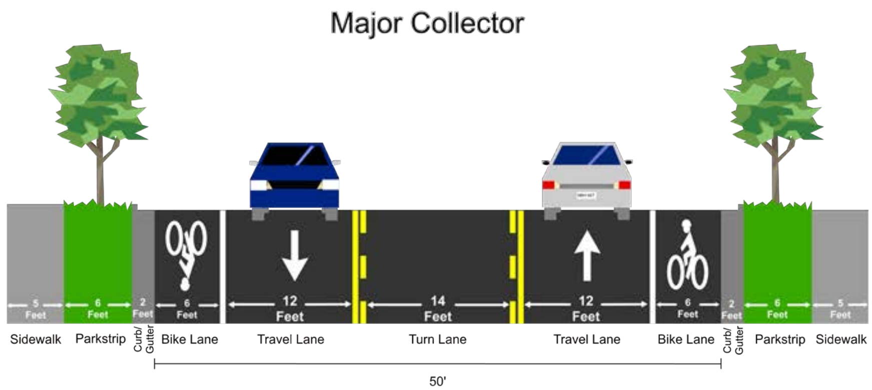


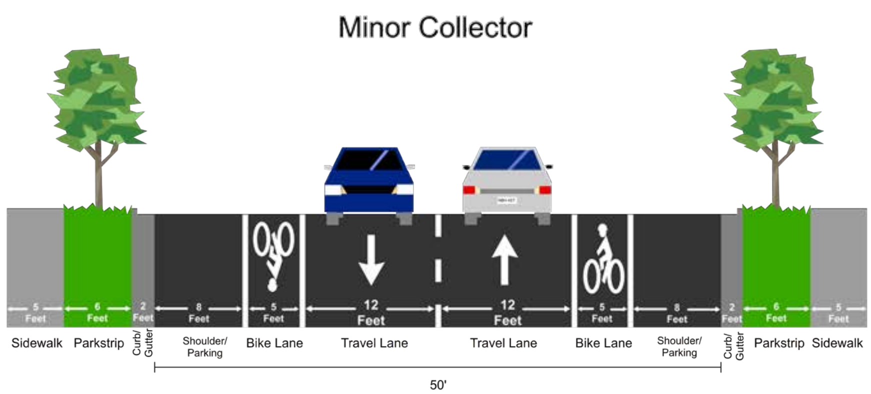




## Arterials

Arterial streets are designed to move vehicles through an area by limiting access, allowing for higher speeds, and installing traffic signals at major cross streets. Arterials are generally spaced about one or two miles apart. The arterial street cross-sections in Figure 4-2 have a 98-foot right-of-way and 72-feet of pavement with four travel lanes, a center turn lane, and bike lanes along the shoulders. A moderate reduction in the width of the travel lanes allows for the accommodation of buffered bike lanes, as seen above. Arterials in Payson include S.R. 198, 800 South (which may already meet this standard) and the Nebo Beltway. As further development occurs, the city must oversee the changes in roads designated as arterials to ensure their functionality comes to fruition.

*Figure 4-3: Major & Minor Collectors*

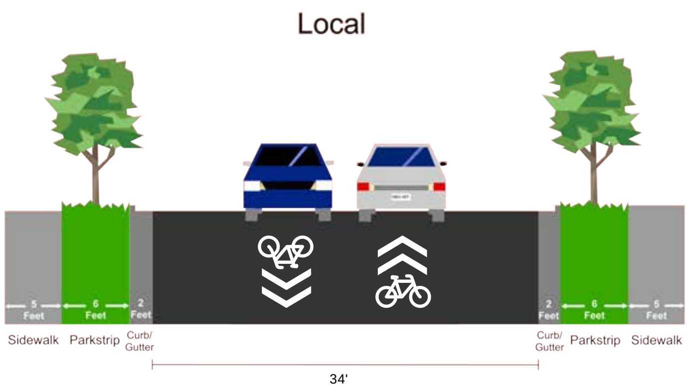



## Collectors

Collector streets are designed to offer local traffic access to arterial streets but they are not for accommodating long distance travel. They have less vehicle capacity than arterials but more capacity than local streets. These roads typically have no limitations to street or driveway access and facilitate slower speeds, generally 35 miles per hour or below. Planned collectors in Payson include 400 North, 300 South, 100 South, 500 West, 800 West, and others. Figure 4-3 includes cross-sections for major and minor collectors. The major collector has a 66-foot right-of-way with one 12-foot travel lane in each direction, a 14-foot two way center turn lane, and 6-foot bike lanes in each direction. The minor collector has a 12-foot travel lane in each direction, 5-foot bike lanes in each direction, and 8-feet of parking on both sides of the street.

*Figure 4-4: Local*




## Local Streets

Local streets are designed to offer access from residences to the roadway network. Local streets connect driveways to collectors or arterials. They 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 throughout Payson and are in all of the residential developments. Figure 4-4 is a local street cross-section that includes one ten-foot travel lane in each direction with shoulders, curb and gutter, parkstrip, and sidewalk. Bike lanes may still be striped along these local streets, however, with slower speeds and less traffic volume than collectors and arterials, bicyclists may feel a lower level of stress accompanied with a higher level of biking comfort along residential local roads. Because of this the use of "sharrow" markings (road markings indicating the roadway lanes are shared between bicycles and motor vehicles) may provide a design solution for the right context along local streets.

# ACTIVE TRANSPORTATION

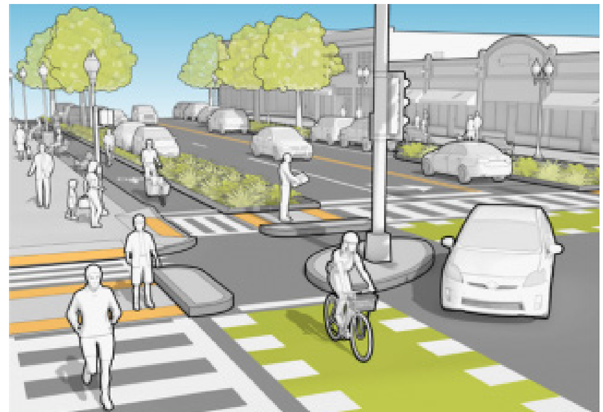
Designing roadways to accommodate all types of users is commonly termed "complete streets." This type of roadway design approach offers the following benefits:

- » Safety: A Federal Highways Administration safety review found that streets designed with sidewalks, raised medians, traffic-calming measures and treatments for disabled travelers improves pedestrian safety.
- » Health: Multiple studies have found a direct correlation between walking and biking availability options and obesity rates. In fact, the Centers for Disease Control and Prevention recently named adoption of Complete Streets policies as a recommended strategy to prevent obesity.
- » Reduced User Costs: Complete Streets offer inexpensive transportation alternatives to roadway users. A recent study found that most families spend far more on transportation than on food.
- » Foster Strong Communities: A recent study found that people who live in walkable communities are more likely to be socially engaged and trusting than residents living in less walkable communities.

## Complete Streets on Existing Roadways

There are several areas in Payson where sidewalk deficiencies exist. To improve overall pedestrian connectivity, mobility and accessibility while limiting the number of pedestrians crossing at uncontrolled locations due to the abrupt termination of a sidewalk, it is recommended that Payson develop a rotating sidewalk construction and rehabilitation program.

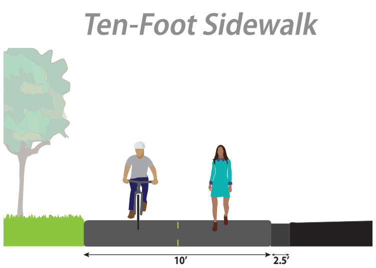
This rotating program would be designed to construct sidewalks throughout the existing paved roadway network. Each of the sidewalks could also be assessed to the abutting home owners. The percentage of the sidewalk assessed does not have to be 100 percent but could be any range of values depending upon the City's available budget. To start the program, the City would need a "seed" fund to initiate the first round of sidewalk construction. The length of sidewalk constructed each year could also vary depending upon the available funds. If the fund is not 100 percent assessed, public-private partnerships could be promoted by allowing sidewalk improvement areas to be prioritized if abutting property owners are willing to go above the required assessment percentage.

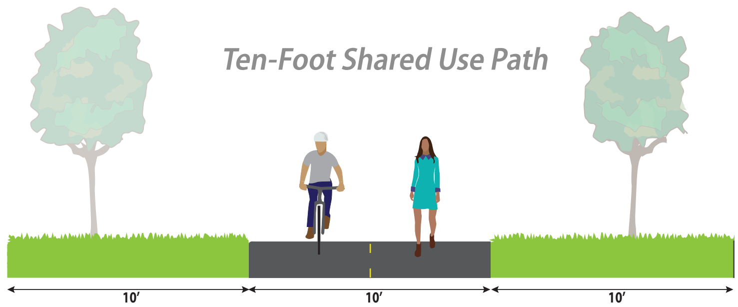


COMPLETE STREETS

Streets are a valuable public asset to be shared by everyone regardless of age, ability, or mode of travel. Streets can bring people together but can also create barriers for communities. "Complete Streets" mitigate such problems via policies, plans, and procedures that ensure the same rights and safe access for all users of streets, including pedestrians, bicyclists, motorists, and transit riders. Because each street is tailored to its circumstances, Complete Streets take a variety of forms unique to each road. Typical elements include wide sidewalks, bike lanes, dedicated bus lanes, comfortable and accessible transit stops, ample crossing opportunities, curb extensions, and medians. Implementing elements of Complete Streets infrastructure in this area will improve safety, increase transportation options, decrease transportation costs for the city as well as residents, improve health through walking and biking, stimulate the local economy, and create a sense of place. MAG, along with WFRC and the Federal Highway Administration, have all adopted complete street policies and provide further information regarding Complete Streets on their respective websites.

*Figure 4-6: Active Transportation Cross-sections*




This fund could be continued as a rehabilitation fund, cycling through sidewalks in need of repair and sidewalks in need of ADA improvements to accommodate disabled pedestrians. It is important to note that as these local roadways are rehabilitated, ADA improvements should be included within the project scope to hasten the efforts to upgrade existing sidewalks to meet these design requirements.

Facilities that make communities more walkable or bikeable are a key component of a transportation plan and access to trails is part of Payson's Vision. These amenities make cities more desirable places to live, work or play and it is important for Payson to continue to plan for an expanded bicycle and pedestrian network. A robust active transportation system will improve overall quality of life for residents while providing mobility options that can help reduce congestion throughout the community.

## Trails

The existing and planned trail network throughout Payson is extensive with over 10 miles of existing trails and 57 miles proposed trails. The recommended trail network will connect key origins and destinations throughout the community. Many of these trail corridors are adjacent to existing or planned roads but also follow canals, streams, or utility corridors. The recommended trail system is illustrated in Figure 4-8. The trail system is an important component of both the transportation plan as well as the Parks and Recreation Master Plan. As these facilities are planned and constructed, the recommended trail network should be included in the design and construction.

The planned trail system was developed with community input. At more than one event the study team received input on where residents would like to see trails and which areas in Payson need connections. The future trails plan is ambitious; some of the trails identified in the map will more likely become ten-foot sidewalks along existing roadways than separated paved shared use paths. For example, the map in Figure 4-8 shows a proposed trail on Utah Avenue that crosses I-15 to connect the community on both sides. This "trail" would be more like an eight to ten-foot sidewalk that can be accommodated under this existing bridge by extending the curb and gutter into the shoulder closer to the travel lanes.

Figure 4-7 shows the roadways that have planned improvements where proposed trails are also located as well. This map highlights opportunities to add ten-foot sidewalk/trails with the roadway improvements. S.R. 198 is a good example of this, where if the roadway is expanded to 5 lanes, UDOT can construct a complete street with a ten-foot sidewalk on one or both sides to serve as the proposed trail connection.

## Bike Lanes

The Mountainland Association of Governments, (MAG) which is the Metropolitan Planning Organization for Utah County produced the **South Utah County Active Transportation Plan** in 2016. This plan provides specific recommendations for Payson including buffered bike lanes, trails and traffic calming measures. This plan can be viewed on MAG's website at *https://mountainland.org/img/transportation/Trails/South%20Utah%20County%20Trail%20Plan.pdf*

When determining what bikeway infrastructure is best for a street it is important to take into consideration all elements of the street, such as motor vehicle speed, traffic volume, and ROW. When considering bikeway design it is beneficial to examine it from a context similar to the traditional roadway classification network, where different infrastructure should be installed based off of the assessment of needs for specific roadways. For example, a bike lane along a high speed arterial may utilize a design treatment such as buffered or separated bike lanes while a bike lane along an adjacent collector road may be a striped shoulder with bike lane markings. While these two separate bike lanes may cater to different riders with different origins and destinations, they may also be part of a broad bikeway network with a variety of access and mobility choices for cyclists.

Safety, comfort and connectivity are three key indicators that will determine who and how many people will ride along a bicycle facility. The public can be divided into general categories of bicycle ridership, with the majority of people being "interested but concerned" when it comes to riding bikes on the road. These categories of riders are often used to determine why a certain facility type is recommended when designing bike lanes. Figure 4-7 shows the four general types of bike riders.

*Figure 4-7: Types of Bicycle Riders*

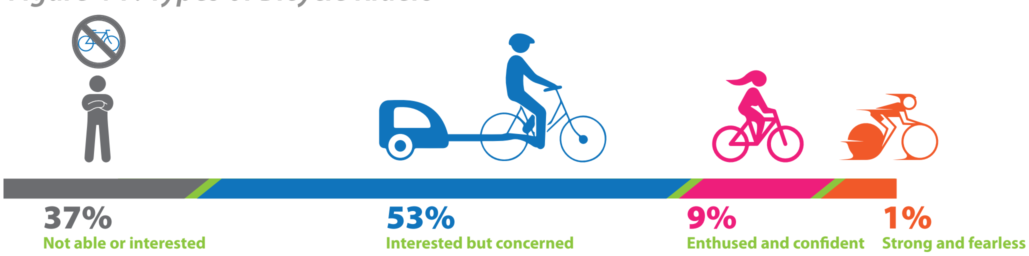
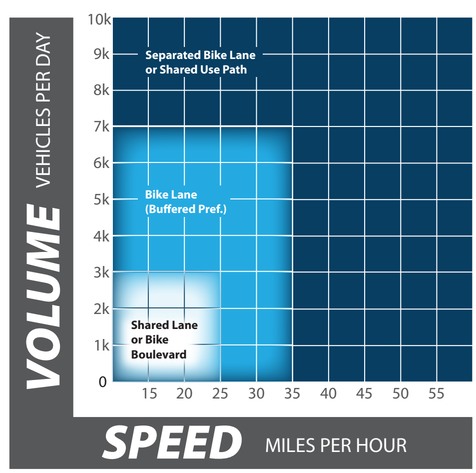



*Figure 4-8: Recommended Bikeway Facility Type*




When designing bikeway networks or specific bikeway projects the level of traffic stress (LTS) is used to evaluate what type of rider will feel comfortable and safe along a given facility. LTS is a rating system based off of the numbers 1-4, where 1 is most comfortable and 4 is the least comfortable. When each bikeway's LTS is determined bikeway network connectivity can be evaluated by comfortability.

For guidance along specific roads, the 2019 Bikeway Selection Guide published by the US Department of Transportation Federal Highway Administration (FHWA) is a valuable resource filled with up-to-date recommendations and information for planning and designing bikeways. The PDF can be found here: *https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf*. Figure 4-8 is a graphic detailing FHWA's recommendations for specific facility type when considering motor vehicle speed and traffic volume. This table uses the components of LTS as inputs to create these recommendations.

## Wayfinding

Wayfinding refers to information systems that guide people through a physical environment and enhance their understanding and experience of the space. It helps them "find their way".

Wayfinding is particularly important in urban/suburban environments and in larger community settings. As Payson looks to add trails, sidewalks, and bike lanes, people will need visual cues such as signs, maps, directions, arrows, and symbols to help guide them to their destinations and around the community. An effective wayfinding system can contribute to a sense of wellbeing, safety, and security for cyclists and pedestrians in these often high-stress, car-centric environments.

In Payson a simple signage and information system for both pedestrians and cyclists (and even motorists), who have unique challenges navigating streets and roadways can be an effective way to help people develop "mental maps" of the terrain and simplify their routes to the extent possible.

Wayfinding signs should be used along trails and bike lanes in conjunction with existing signs, including road signs to orient trail users and riders and to assist in route planning. These signs inform users that they are on a network trail, how far they are from the next junction or destination, and illustrate the route of the trail or road from their point forward. Signage at trail intersections should be limited to signage regarding the direction to the closest "exit" with distance noted, numbered markers to assist with map reading (i.e., 'You Are Here') and directions for emergency services.

Signs for bicycle routes can be mounted at a height that is in the eye line of the cyclist, which may be around 4 feet, when a person is seated on a bicycle and include the text "bike route", the trail name, directional arrow, etc. Taller wayfinding signs that can direct cars, bicycles, and pedestrians would be appropriate in heavier used areas in downtown Payson. These signs could identify specific locations like the library, Memorial Park, etc. Example of these two types of signs are shown here.


*Figure 4-9: Planned Trails along Roadway Improvements*

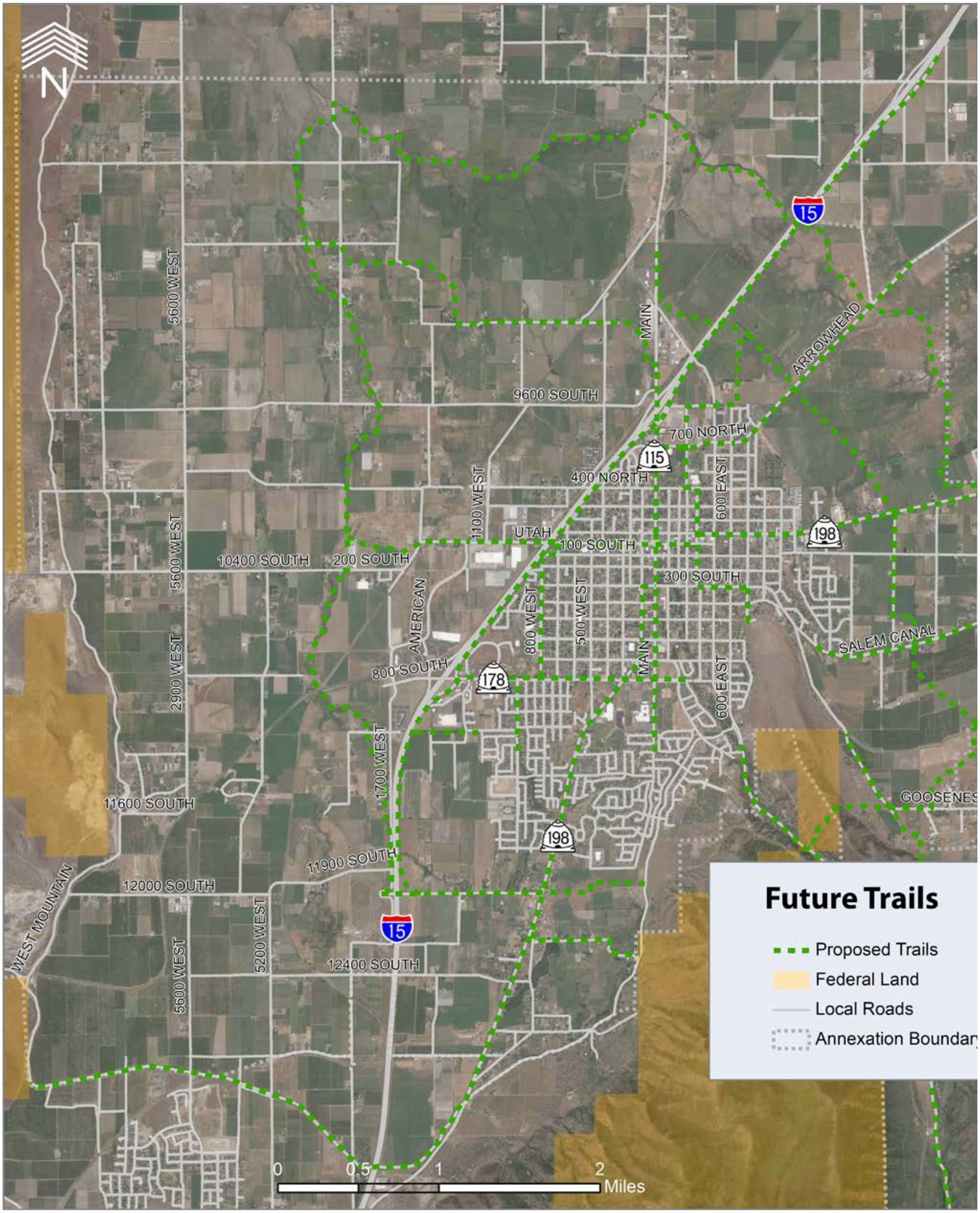
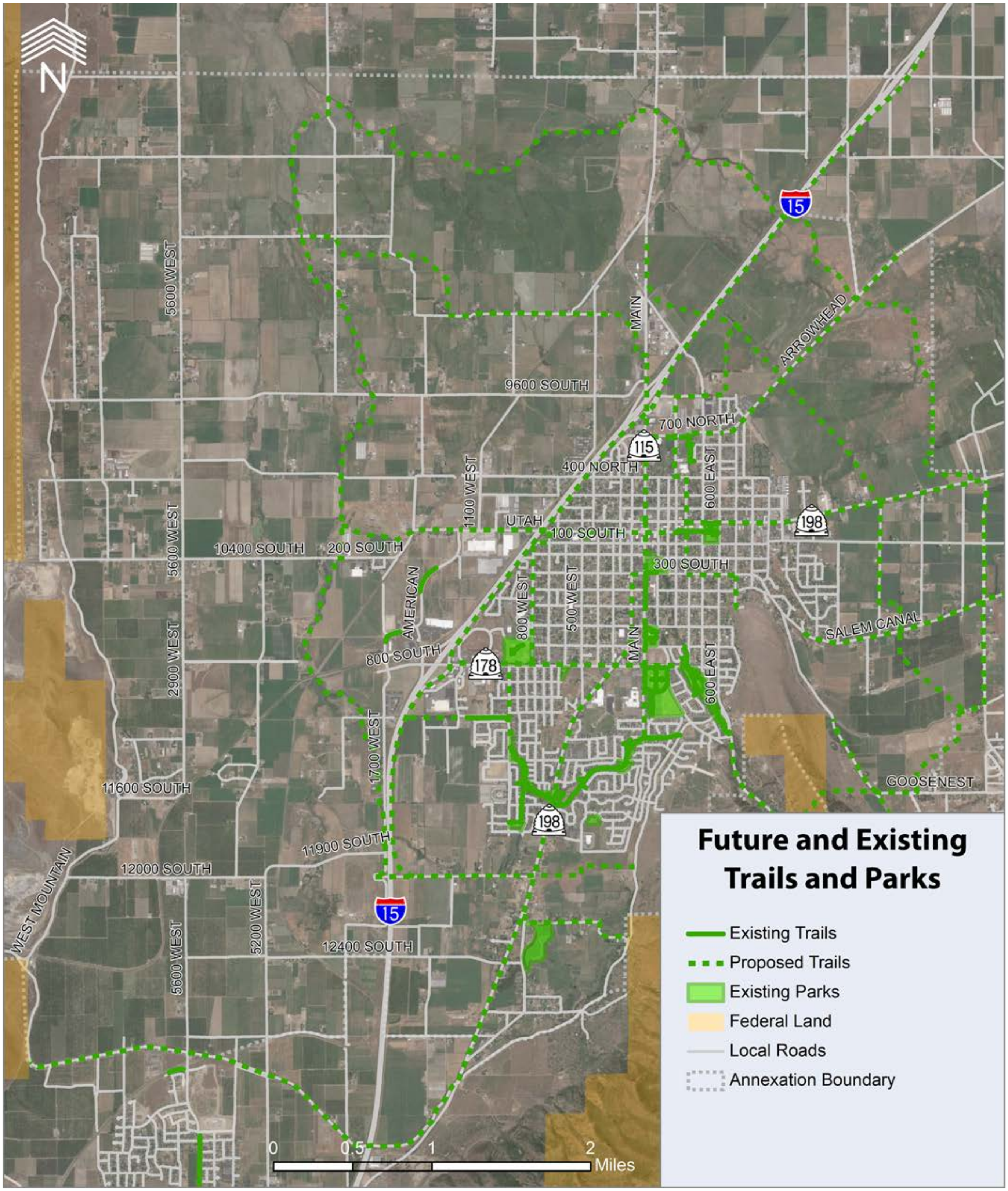


*Figure 4-10: Future and Existing Trails and Parks*



## FUTURE TRANSIT

As with the active transportation network, transit is an important component of a city's transportation plan. Transit provides additional mobility options for both residents and commuters. Both MAG and UTA are planning for expanded transit service within Payson in the near term.

The most substantial transit investment will be an extension of FrontRunner to Payson. FrontRunner is UTA's commuter rail system that connects Utah, Salt Lake, Davis, and Weber counties with 16 existing stations located through-out the Wasatch Front.  MAG's recently adopted TransPlan50 has FrontRunner being extended to Payson during phase 1 of the plan which is from 2019 to 2030.

The current MAG plan shows FrontRunner terminating at a proposed station at approximately 800 South. However, during the planning process, potential options to provide an additional station near Main Street and the planned Nebo Beltway interchange were discussed with both MAG and UTA. This station location shown in Figure 4-9 would provide improved transit access to the planned Utah Valley University – Payson campus and more intense land uses near the interchange. The 800 South station location is also located within a planned transit-oriented development (TOD) and would provide access to the new high density development.

As a result, both stations are shown in the plan, and future refinement of the station locations will be determined when an environmental document is completed for the FrontRunner extension.

In order to take full advantage of the planned FrontRunner extension, new core bus service connecting to the commuter rail station is also included in MAG's TransPlan50. This core bus service is planned to run on S.R. 198 and 800 South. Future upgrades of these corridors to bus rapid transit (BRT) are included in an unfunded phase of the MAG plan. Additional circulator routes are also recommended that would provide service to Elk Ridge, Santaquin and West Payson. While these circulator routes are currently not planned by MAG or UTA, the addition of bus routes to improve transit access within the City should be coordinated with UTA as plans for the extension of FrontRunner further advance.

## FUTURE FREIGHT

As Payson grows, the City will experience an increase in truck traffic. Trucks, like any vehicle can drive on any public roads, but they are often better served on arterials that are wider and faster. Figure 4-11 is a possible truck route map that indicates which routes might best serve trucks in the community. While they would still be allowed on all roads, identifying truck routes may help the city work with suppliers or employers that have regular trucking and manage future roadway maintenance by checking truck counts and pavement conditions on these routes.

*Figure 4-10: Future Transit Network*

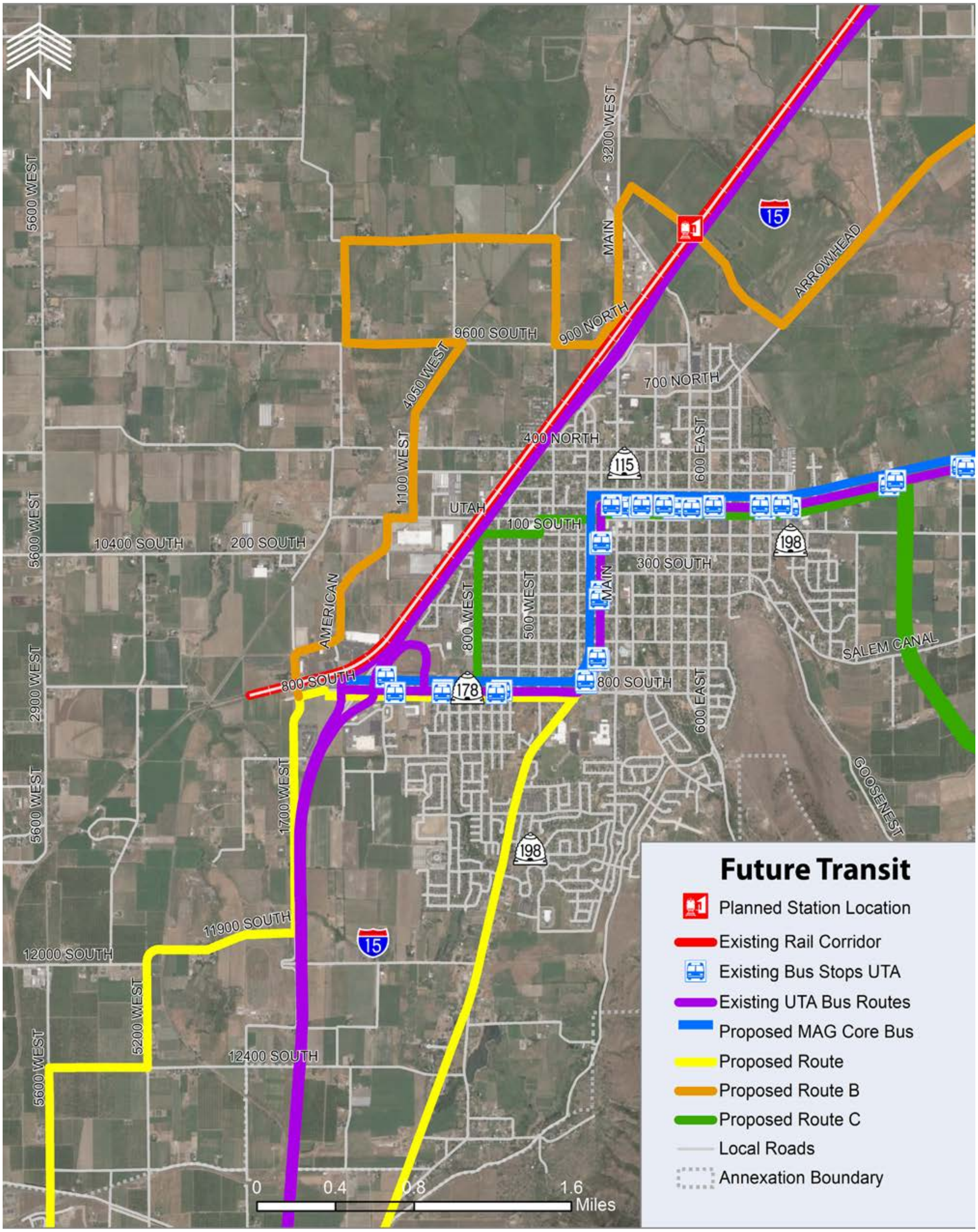
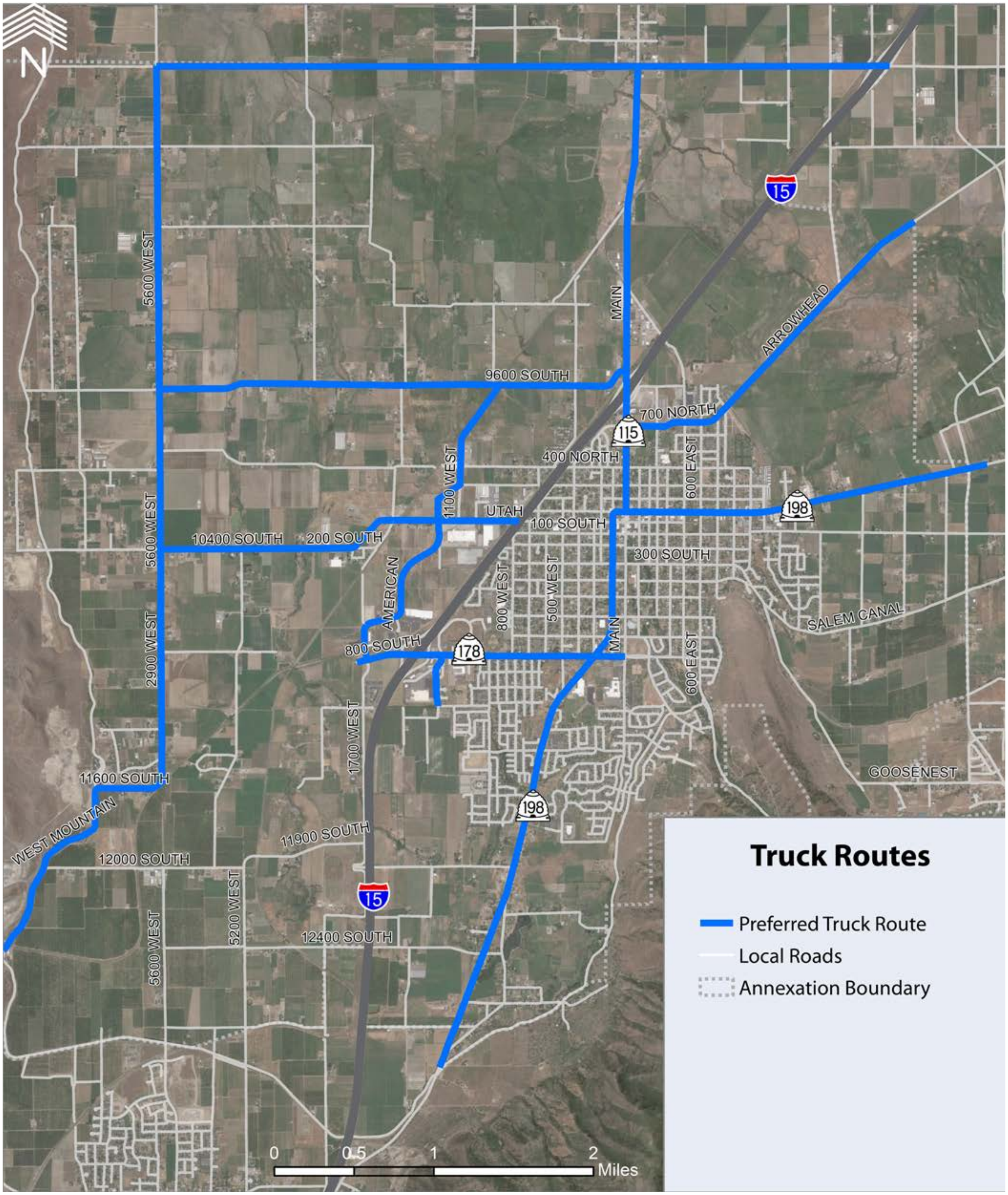


*Figure 4-10: Preferred Truck Routes*



# ACCESS MANAGEMENT

Access management is a term that refers to providing and managing access to land development while maintaining traffic flow and being attentive to safety issues. It includes elements such as driveway spacing, signal spacing, and corner clearance. Access management is a key element in transportation planning, helping to make transportation corridors operate more efficiently and carry more traffic without costly road widening projects. Access management offers local governments a systematic approach to decision-making, applying principles in a uniform, equitable, and consistent way throughout the jurisdiction. It is recommended that the City adopt an Access Management Program.

### *Principles of Access Management*

Constantly growing congestion, concerns with 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 understand that movement of traffic and access to property are competing priorities. No facility can move traffic very well and provide unlimited access at the same time. Extreme examples of this concept are the freeways and the cul-de-sac. The freeway moves traffic very well with few opportunities for access, while the cul-de-sac has unlimited opportunities for access, but doesn'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 enough 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. Take for example the movements that occur on and off roadways at driveway locations, when those driveways are too closely spaced, it becomes difficult for through-traffic to flow smoothly at desired speeds and acceptable levels of safety. The American Association of State Highway and Transportation Officials (AASHTO) states, "the number of accidents is disproportionately higher at driveways than at other intersections…thus their design and location merits special consideration." Studies have shown that anywhere between 50 and 70 percent of all crashes that occur on the urban street system are access related.

Fewer points of direct access, greater separation of driveways, and better driveway design and location are the basic elements of access management. There is less need for through-traffic to brake and change lanes 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. There will be less potential for accidents. According to the Federal Highway Administration (FHWA), before and after analyses show that routes with well managed access can experience 50 percent fewer accidents than comparable facilities with no access controls.

## CORRIDOR PRESERVATION

Corridor preservation is an important transportation planning tool that agencies should use and apply to all future transportation corridors. There are several new transportation facilities that have been identified in the Transportation Master Plan. In planning for these future facilities, corridor preservation techniques should be employed. The main purposes of corridor preservation are to:

- » Preserve the viability of future options
- » Reduce the cost of these options
- » Minimize environmental and socio-economic impacts of future implementation

Corridor preservation seeks to preserve the right-of-way needed for future transportation facilities and prevent development that might be incompatible with these facilities. This is primarily accomplished by the community's ability to apply land use controls, such as zoning and approval of developments.

Perhaps the most important elements of corridor preservation are ensuring that the corridors are preserved in the correct location and that they meet the applicable design and right-of-way standards for the type of facility being preserved. Since the master plan does not define the exact alignment of each future corridor, it becomes the responsibility of the City to make sure that the corridors are correctly preserved. This will have to be accomplished through the engineering and planning reviews done within the City as development and annexation requests are approved that involve properties within or adjacent to the future corridors.

### *Corridor Preservation Techniques*

Some examples of specific corridor preservation techniques that may be most beneficial and easily implemented include the following:

- » Developer Incentives & Agreements: Public agencies can offer incentives in the form of tax abatements, density credits, or timely site plan approvals to developers who maintain property within proposed transportation corridors in an undeveloped state.
- » Exactions: As development proposals are submitted to the City for review, efforts should be made to exact land identified within the future corridors. Exactions are similar to impact fees, except they are paid with land rather than cash.
- » Fee Simple Acquisitions: This will most likely consist of hardship purchases or possible City acquisition of property identified within the corridors. Parcels obtained in fee title can later be sold at market value to the owner of the transportation facility when construction begins.
- » Transfer of Development Rights & Density Transfers: Government entities can provide incentives for developers and landowners to participate in corridor preservation programs using the transfer of development rights and density transfers. This is a powerful tool in that there seldom is any capital cost to local governments.

» Land Use Controls: This method allows government entities to use its policing power to regulate intensity and types of land use. Zoning ordinances are the primary controls over land use and the most important land use tools available for use in corridor preservation programs.

» Purchase of Options & Easements: Options and easements allow government agencies to purchase interests in property that lies within highway corridors without obtaining full title of the land. Usually, easements are far less expensive than fee title acquisitions.

## STREET CONNECTIVITY

The functionally classified arterial and collector roadways provide the backbone of the roadway network within the city. However, local street connectivity is an important consideration as new local streets are constructed and existing roads improved. Street networks with high connectivity reduce travel time and congestion by allowing people to make shorter and more direct trips. Additionally, connectivity allows traffic to disperse onto several streets rather than concentrate on any single road further reducing congestion on all roads. Connected street networks also improve options to walk or bike by reducing the distance to schools, parks and businesses by creating more direct routes. It is proven to reduce emergency response times for vehicles like police, fire and ambulances and provides options for alternate routes if the most direct route is blocked.

Payson requires a connected street system for all new developments that minimizes the use of cul-de-sacs and builds upon the existing grid network. Future local streets should have average intersection spacing of 300-400 feet between local street intersections with a maximum of 600 feet. Infill parcels will provide future street stubs to adjacent parcels with the potential for development. These stubs will build upon the existing grid or create a grid network. Retail and office developments shall allow for cross access easements to adjacent properties for developments on functionally classified roads to eliminate multiple access points to the major street system.

*Figure 4-12: Examples of Street Connectivity*

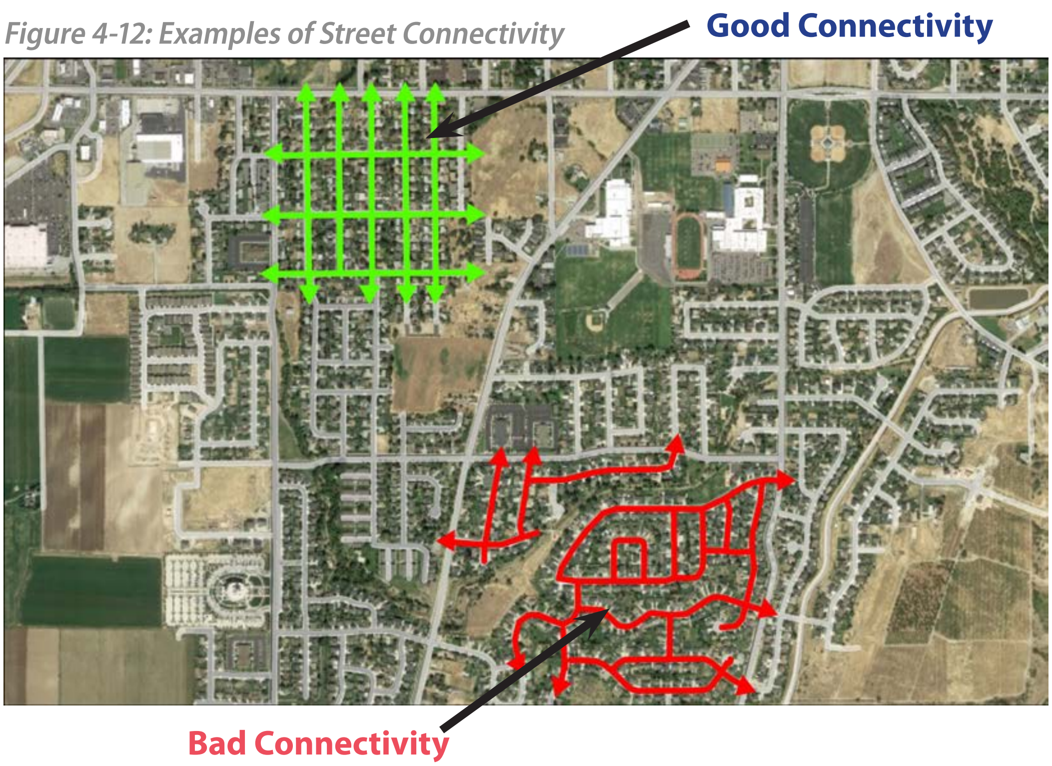
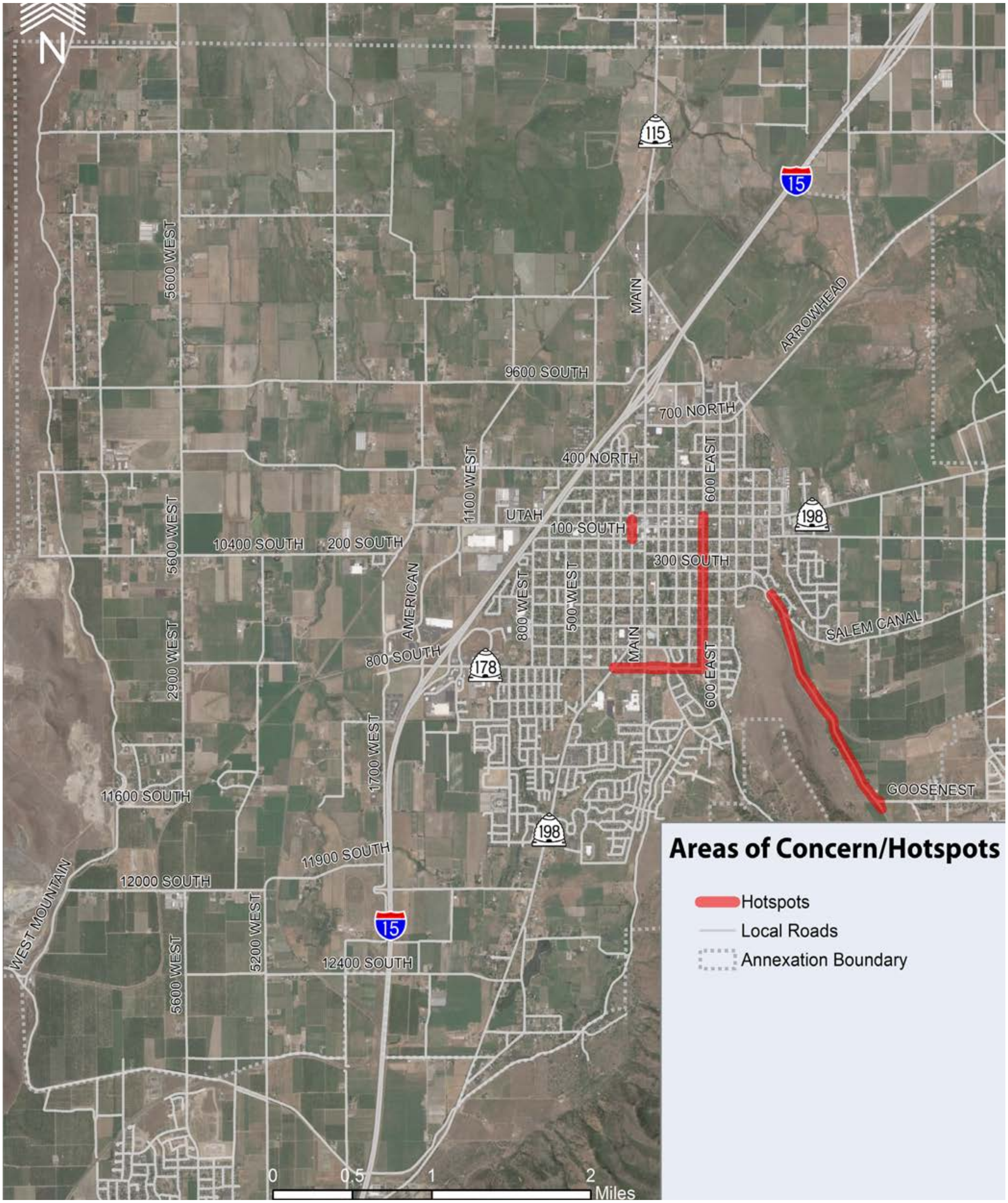


*Figure 4-12: Hotspot Locations*



# AREAS OF CONCERN

Several “hotspot” areas were identified within Payson where transportation issues are of concern. These hotspots have context specific transportation needs that range from one-way circulation on Main Street to travel speeds on 600 South and 800 South. The specific areas and issues are summarized below.

## Downtown Main Street

Main Street from 100 North to 100 South has one southbound travel lane with on-street parking. North and south of historic downtown, Main Street allows for two-way traffic flow. To improve business visibility on Main Street, two-way circulation on this segment of Main Street was identified as option to improve transportation circulation in downtown and improve the business environment.

## Goosenest Drive

Goosenest Drive is a narrow two-lane road that connects the city core to southeast Payson, Gladstan Golf Course and Elk Ridge. Currently, most of the roadway has been constructed with a section that includes 20’ of pavement, no curb/gutter, and no sidewalk. Goosenest Drive has been identified in the prior Payson Street Master Plan Map and in the County Master Plan as a collector roadway. In order to meet the adopted standards for collector roads, Goosenest Drive would require widening. This would be difficult due to limited right-of-way and topography.

## 600 East

600 East is north/south route that connects east-side neighborhoods to Downtown Payson. Additionally, 600 is the northern access to the Mount Nebo Scenic Byway that draws a substantial amount of tourist traffic. The road is a two-lane collector with on-street parking. Local residents have expressed concerns regarding vehicle speeds due to the relatively straight and wide road that makes drivers feel comfortable traveling at higher speeds.

## 800 South

As with 600 East, 800 South is an arterial road that provides access to east Payson and the Mount Nebo Scenic Byway from I-15. Residents near the road have expressed concerns about traffic volumes and speeds. Continued development and tourist traffic have endangered the quiet character of these residential areas and has created transportation concerns for area residents.

## Downtown Main Street

*Figure 1: Historic Downtown Main Street looking south*

Historic Downtown Payson is centered on Main Street from 100 North to 100 South and is home to a variety of local retailers and restaurants. Currently, Main Street has one-way southbound traffic through this two-block segment. Both north and south of the downtown core Main Street allows for two-way traffic flow. One transportation option identified to improve the downtown business environment is to convert this segment of Main Street from one-way traffic to two-way traffic to increase business exposure and opportunities.

To evaluate the potential impact on traffic volumes from two-way traffic circulation on Main Street through the downtown core, traffic counts were conducted in the fall of 2018. Currently, there are approximately 1,800 vehicles per day (vpd) that drive south on historic Main Street. South of downtown in front of Parkview Elementary School the southbound traffic is slightly higher at 2,140 vpd and there are 1,280 northbound vehicles. By converting downtown Main Street to two-way traffic, the northbound traffic would not have to divert and it would increase traffic on historic Main Street by 1,300-1,600 vpd based upon the existing traffic.

Although these circulation changes would increase traffic volume, there would be a trade-off with a reduction in the number of parking stalls. Within downtown there is one southbound travel lane with angled parking on Main Street that maximizes the available parking for local businesses. Two-way traffic would require that angle parking be converted to parallel parking to accommodate a northbound travel lane. The change from angle to parallel parking would reduce the number of parking stalls on Main Street by approximately half.

**Conclusion:**

If Main Street were to be converted to two-way traffic from 100 North to 100 South, we would likely see an increase in 800 to 1,200 vehicles a day, but that project would remove parking, impact the signal timing on 100 West and be costly.

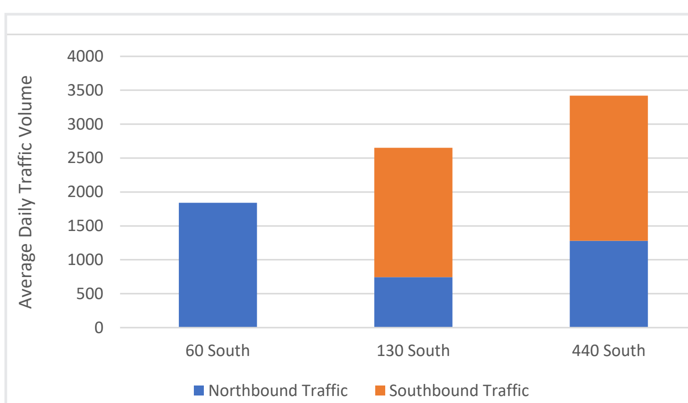



*Figure 13: Main Street Average Traffic Volume (October 2018)*

## Goosenest Drive

Goosenest Drive is a collector roadway that connects the city core to southeast Payson City and the Gladstan Golf Course. The road currently has one northbound and one southbound travel lane with no shoulders. Residents have voiced concerns regarding traffic on the narrow roadway as southeast Payson and areas near the golf course continue to develop.

*Figure 1: Goosenest Drive*

Goosenest Drive is bounded by the High Line Canal and steep terrain to the west. Additionally, the orchards near the roadway are within agricultural protection areas. These constraints will make improvements to Goosenest Drive difficult and costly to implement.

To understand travel demand on Goosenest Drive, traffic forecasts were developed for existing and future conditions that are shown below. Without improvements to Goosenest Drive or other roadways within southeast Payson, the traffic volumes on Goosenest Drive are anticipated to double by 2050 from 2,100 vehicle per day (vpd) to 4,200 vpd in the year 2050.

Generally, roadways are planned to operate at LOS D with some congestions during the peak hours, but the transportation system is assumed to be adequate (not failing) at this level. Despite the significant growth in traffic on the roadway, the forecast traffic volume on Goosenest Drive is still well below the estimated capacity of a two-lane rural road. These existing and forecast volumes indicate that Goosenest Drive is expected to function at an acceptable LOS without major widening and only intersection improvements at junctions with other functionally classified roadways.

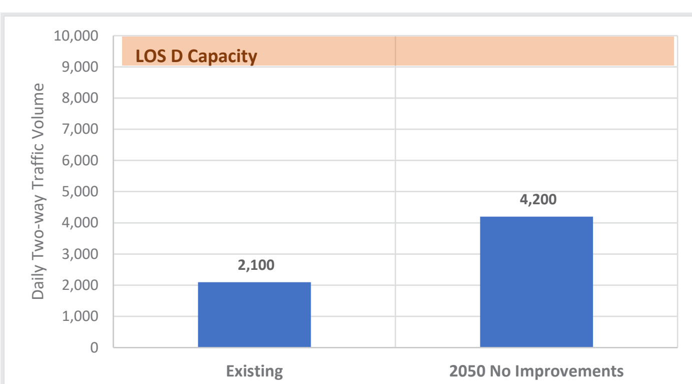


*Figure 14: Existing Forecast Traffic Volumes – Goosenest Drive*

**Conclusion:**

Goosenest Drive is shown as a collector in the future and the projected traffic volume will not require it to be anything more than a two-lane road.

## 600 East

600 East is a two-lane collector roadway that connects eastside neighborhoods to the city core. Additionally, 600 East is also the northern access point to Payson Canyon and the Mount Nebo Scenic Byway. The road currently has one lane in each direction with on-street parking permitted in the shoulders. The primary concerns on 600 East are existing traffic speeds, and traffic volumes.

To better understand how traffic currently operates on the corridor, traffic counts were collected at approximately 750 South and 600 East. These traffic counts collected traffic speeds as wells as volumes. Based upon the count data:

- **The average speeds were 29 mph northbound and 30 mph southbound.**
- **Average daily traffic volume was 3,450 vehicles per day.**

In addition, to the average speed and traffic volume, the counts identified the 85th percentile speed. The 85th percentile speed is typically used to as a standard to set the speed limit at a safe speed, minimizing crashes and promoting uniform traffic flow. The average speeds and the 85th percentile speeds are shown below along with the posted speed limit on 600 East which is 25 mph. Both the average speeds and 85th percentile speeds are above the posted speed limit likely due to wider roadway and shoulder that make it more comfortable for drivers to travel at higher speeds.

It is recommended that when a speed limit is established it should be within 5 mph of the 85th-percentile speed. The 85th percentile speed reflects the collective judgment of most drivers and setting speed limits lower than 85th percentile speed does not encourage compliance with the posted speed limit.

One option to address the difference between the posted and actual speeds is to increase the speed limit to 30 mph. This would bring the speed limit in line with how drivers perceive the roadway. A second option would be to consider additional traffic calming measures on 600 East that physically alter the vertical or horizontal alignment of the roadway. These could include vertical changes such as speed tables / raised intersections or horizontal changes like medians / edge treatments that narrow the roadway and slow drivers.

**Conclusion:**

600 East is projected to be a minor arterial in the and it provide connectivity that is important to the residents in Payson. The current speeds indicate that it would be appropriate to raise the speed limit to 30 or 35 MPH and the future need supports that conclusion.

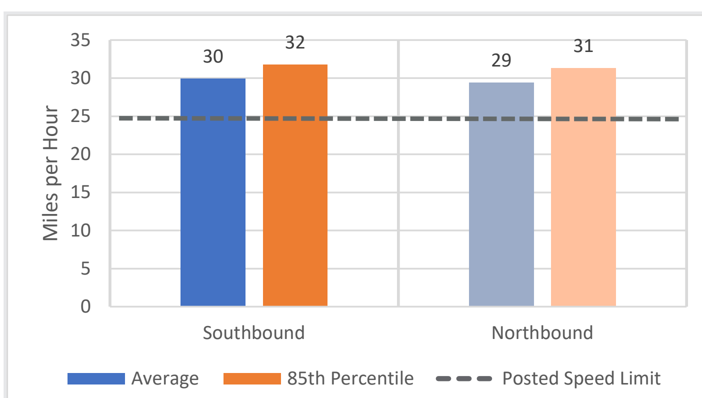



*Figure 15: Weekday Traffic Speeds between 700 S and 800 S*

## 800 South

800 South is a three-lane collector roadway east of S.R. 198 and it provides access to east Payson. The 800 South corridor also provides access to I-15 and connects to 600 East and is the northern access point to Payson Canyon as well as the Mount Nebo Scenic Byway. The road currently has one travel lane in each direction with a two-way left-turn lane (TWLTL) and shoulders. The major issues on 800 South are existing traffic speeds, and traffic volumes.

To identify potential issues and existing traffic operations, traffic counts were collected at approximately 450 East and 800 South. The traffic counts included traffic volumes and traffic speeds. Based upon the count data:

- **Average daily traffic volume was 3,450 vehicles per day.**
- **Average speeds were 31 mph northbound and southbound.**

In addition to the average speed and traffic volume, the counts identified the 85th percentile speed. The 85th percentile speed is used as a standard to set the speed limit at an appropriately safe level, minimizing crashes and promoting uniform traffic flow. The average speeds and the 85th percentile speeds are shown below along with the posted speed limit on 800 South. Both the average speeds and 85th percentile speeds are well above the posted speed limit of 25 mph likely due to the wider roadway, two way left turn lanes (TWLTL), and shoulders that make it more comfortable for drivers to travel above the posted limit.

It is recommended that when a speed limit is established it should be within 5 mph of the 85th-percentile speed. The 85th percentile speed reflects the collective judgment of most drivers and setting speed limits lower than 85th percentile speed does not encourage compliance with the posted speed limit.

One option to address the difference between the posted and actual speeds is to increase the speed limit to 30 mph. This would bring the speed limit in line with how drivers perceive the roadway and guidance for establishing speed limits. A second option would be to consider additional traffic calming measures on 800 South that physically alter the vertical or horizontal alignment of the roadway. These traffic calming measures could include vertical changes such as speed tables or raised intersections. Horizontal changes like the existing median on 800 South between Main Street and 200 East could be extend, or edge treatments that narrow the roadway and slow drivers could be implemented.

**Conclusion:**

800 South is projected to be a minor arterial in the future and it provide east/west connectivity that is needed Payson. The current speeds indicate that it would be appropriate to raise the speed limit to 30 or 35 MPH and the future need supports that conclusion.

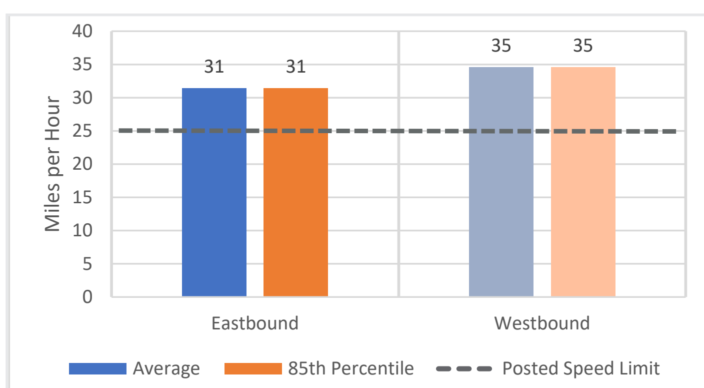



*Figure 16: Weekday Traffic Speeds between 400 East and 500 East*

# Chapter 5 - How do we get there?

## CAPITAL FACILITIES

As shown in the Roadway Network section in Chapter 3, Payson will need to construct new roads, widen existing transportation corridors, and make spot intersection improvements to provide future residents of the City with an adequate transportation system.

### *Transportation Needs as a Result of New Development*

The specific transportation needs resulting from future growth throughout the City are identified in Table 5-1, and Figure 5-1. This future projects list and map will need to be regularly updated by the City as project scopes change and development occurs. Individual projects were identified, and cost estimates were compiled to produce a Transportation Improvement Plan (TIP) for the City. Table 5-1 identifies the specific projects that will be necessary, however, only arterial and collector improvements were identified because any local roads would be required to be built as part of future development. Costs have not been adjusted for inflation and therefore represent 2019 dollars. The cost estimates shown represent the costs of construction, right-of-way, and engineering. Impact fee eligible costs, as well as other potential funding sources, were identified for each project in Tables 5-1 and 5-2. Roadways of regional significance were assumed to be built through help from other jurisdictions, such as UDOT and MAG. Details for each project cost can be found in Appendix.

Table 5-2 includes all projects in the City through the year 2050. Actual development and transportation needs should provide the final decision on project timing. Although many of these projects are included on MAG's RTP, MAG funding is not guaranteed. The City will assume these projects will only be completed with financial assistance from MAG. Therefore, the City will only collect impact fees for the required 6.77 percent match. It is expected that the total cost of roadway improvements needed before 2050 will be over $500 Million, of which less than $200 Million will be the responsibility of the City and may be eligible for impact fee expenditure.

*Figure 5-1: Future Project Map*

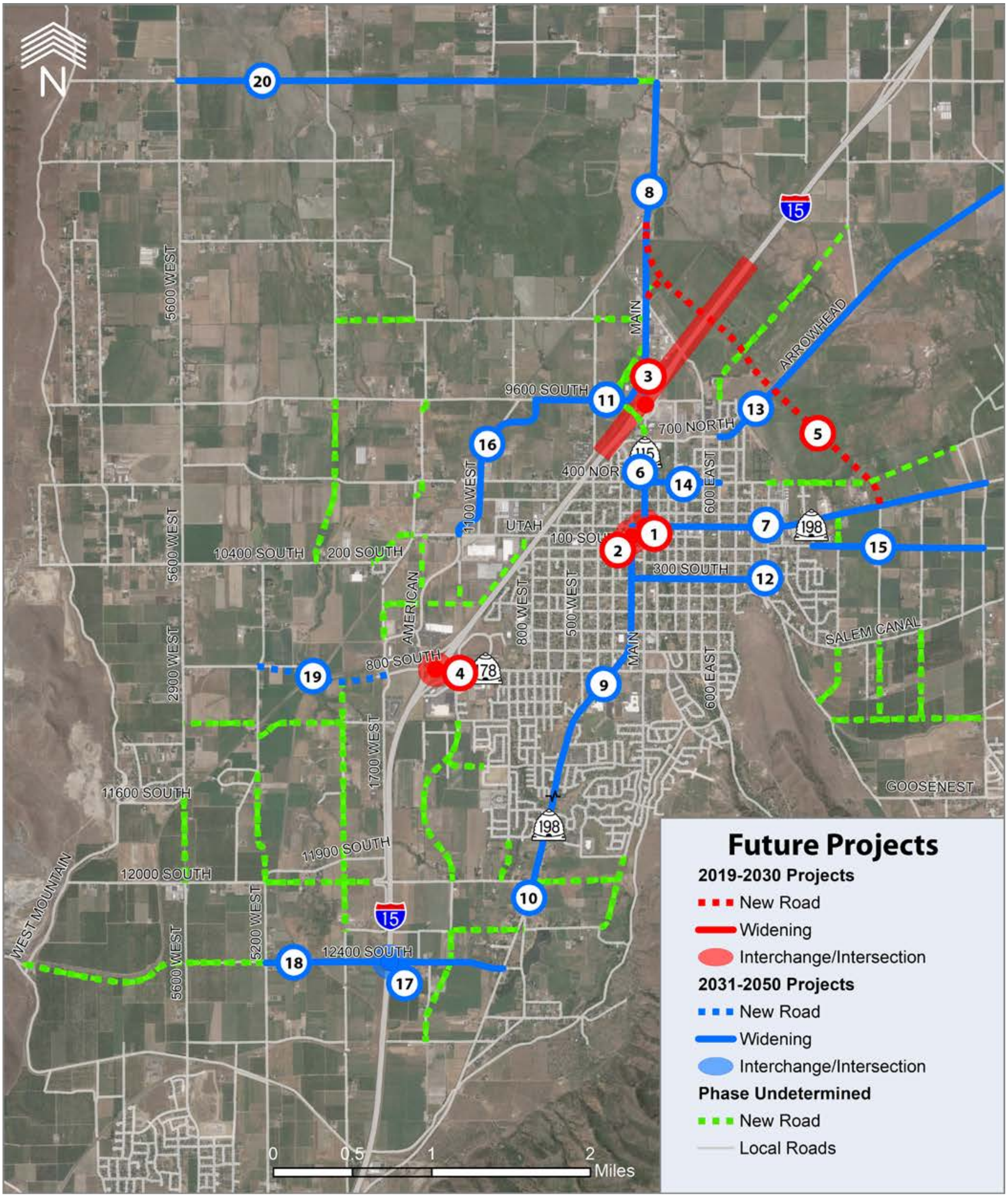


*Table 5-1: Capital Facilities Plan Costs – 2030*

| PROJECT SUMMARY | | | | | |
|---|---|---|---|---|---|
| PROJECT # | LOCATION | TOTAL PRICE | FUNDING SOURCE | RANGE (YR) | IMPROVEMENT TYPE |
| 1 | S.R. 198/Main Street | $1,000,000 | UDOT | 2030 | Intersection Improvement |
| 2 | S.R. 198/Utah Avenue | $1,000,000 | UDOT | 2030 | Intersection Improvement |
| 3 | I-15/Main Street | $96,000,000 | UDOT | 2030 | Interchange |
| 4 | I-15/800 South | $40,000,000 | UDOT | 2030 | Interchange |
| 5 | Nebo Beltway: Main Street to S.R. 198 | $70,786,000 | MAG/ Payson | 2030 | New Road |
| | SUBTOTAL (UDOT): | $138,000,000 | | | |
| | SUBTOTAL (MAG/PAYSON): | $70,786,000 | | | |
| | TOTAL: | $208,786,000 | | | |

*Table 5-2 Capital Facilities Plan Costs – 2050*

| PROJECT SUMMARY | | | | | |
|---|---|---|---|---|---|
| PROJECT # | LOCATION | TOTAL PRICE | FUNDING SOURCE | RANGE (YR) | IMPROVEMENT TYPE |
| 6 | Main Street: S.R. 198 to I-15 | $4,327,000 | UDOT | 2050 | Capacity Improvement |
| 7 | S.R. 198: Main Street to City Boundary | $27,697,000 | UDOT | 2050 | Capacity Improvement |
| 8 | Main Street: I-15 to 8000 South (county) | $25,695,000 | UDOT | 2050 | Capacity Improvement |
| 9 | S.R. 198: 500 West to Main Street | $10,431,000 | UDOT | 2050 | Capacity Improvement |
| 10 | S.R. 198: City Boundary to 500 West | $14,007,000 | UDOT | 2050 | Capacity Improvement |
| 11 | 900 North: 1100 West to Main Street | $11,224,000 | Payson | 2050 | Capacity Improvement |
| 12 | 300 South: S.R. 198 to 600 East | $3,730,000 | Payson | 2050 | Capacity Improvement |
| 13 | Arrowhead Trail: 600 East to Elk Ridge Connector | $25,883,000 | Payson | 2050 | Capacity Improvement |
| 14 | 400 North: Main Street to 600 East | $2,644,000 | Payson | 2050 | Capacity Improvement |
| 15 | 100 South: 1200 East to City Boundary | $15,134,000 | Payson | 2050 | Capacity Improvement |
| 16 | American Way: Utah Avenue to 900 North | $2,479,000 | Payson | 2050 | Capacity Improvement |
| 17 | I-15/12400 South | $40,000,000 | UDOT | 2050 | Interchange |
| 18 | 12400 South: Mountain Road to S.R. 198 | $32,625,000 | MAG/Payson | 2050 | Capacity Improvement |
| 19 | 800 South: 2400 West to 1700 West | $18,427,000 | Payson | 2050 | Capacity Improvement |
| 20 | 8000 South: 5600 West to Main Street | $51,373,000 | MAG/Payson | 2050 | Capacity Improvement |
| | **SUBTOTAL (UDOT):** | **$122,157,000** | | | |
| | **SUBTOTAL (MAG/PAYSON):** | **$163,519,000** | | | |
| | **TOTAL:** | **$285,676,000** | | | |

# 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 the local metropolitan planning organization (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. The City 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 the City of Payson recommends improvements are 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

### *State/County Funding*

The distribution of State Class B and C Program monies is established by State Legislation and is administered by the State Department of Transportation. Revenues for the program are derived from State fuel taxes, registration fees, driver license fees, inspection fees, and transportation permits. 75% 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 Payson 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 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, thirty 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 would enable 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. Currently, Payson uses Class C funding for their transportation projects.

### *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 right-of-ways 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.

## IMPLEMENTATION

The specific roadway improvements required to accommodate future growth throughout Payson were identified in Figure 5-1. Projects costs for the CFP for 2019-2030 are in Table 5-1, and in Table 5-2 for 2031-2050. All projects for the CFP are compiled into a project cost summary that are included in the Appendix.

The total costs for the 2030 CFP projects is $209 million dollars with Payson financially responsible for $4.7 million dollars. Many of the identified projects are for UDOT roads or roads which would be eligible for MAG funding assistance. Where a planned project occurs on a UDOT road, it is assumed that the City would not participate in funding that project. In the case of MAG, eligible roadways such as the Nebo Beltway that is not an existing UDOT road, the City would be responsible for a 6.77% match of the total project cost. This 6.77% would need to be funded by the City with the funding mechanisms described earlier.

Also included in Table 5-2 are the other projects necessary for the year 2050 functionally classified roadway network. Although this transportation plan should be regularly updated, all roadway improvements were identified to accommodate forecast traffic volumes. The total cost estimate for Payson to improve the transportation system by 2050 is $508 million dollars with Payson financially responsible for $86.5 million dollars.

avenue CONSULTANTS

# Amendments

# Amendment #1

Approved By City Council on January 6, 2021

**OVERVIEW:**

The Transportation Master Plan (TMP) is an appendix to the General Plan and provides guidance on future transportation needs within the City of Payson.

The Development Services Department previously contracted with Avenue Transportation Engineers to prepare the latest update to the TMP to reflect existing, and future conditions based on current land uses and zoning.

**FINDINGS OF FACTS:**

1. The TMP is an appendix of the General Plan and is mandated to be included in the General Plan by state law.
2. The TMP provides information on current and future transportation conditions to be taken into consideration when reviewing future development projects and capital improvements.
3. The City Council adopted the existing TMP in September 2020.
4. The TMP's proposed amendment to the 2020 TMP has been reviewed and endorsed by the Payson City Engineer, Police Chief, and Street Superintendent.

The roadway components include the following:

1. Five feet wide concrete sidewalk
2. Six feet wide landscaped park strip
3. Two feet wide concrete curb and gutter
4. Off-street parking – shoulder
5. Five feet wide bike lanes
6. Twelve feet wide traveling lanes
7. Twelve or fourteen feet wide share left-turn lanes – Center Turn Lane (CTL)

The following figure illustrates the roadway elements:

Roadway Elements

Table 4-1 of the TMP shows the right of way width and asphalt pavement width for arterials, collectors, and local roads.

*Table 4-1: Cross-Sections in Payson*

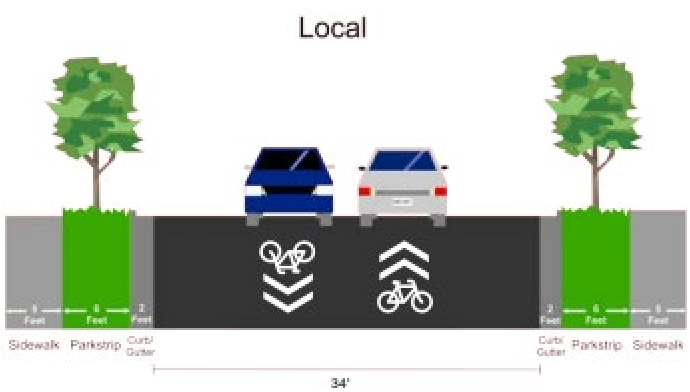
| FUNCTIONAL CLASSIFICATION | NUMBER OF LANES | RIGHT-OF-WAY (ROW) | PAVEMENT | TARGET VOLUME (VEH/DAY) |
|---|---|---|---|---|
| Arterial | 5 | 98' | 72' | 17,000-32,500 |
| Major Collector | 3 | 76' | 50' | 9,000-17,000 |
| Minor Collector | 2 | 76' | 50' | 5,000-9,000 |
| Local Residential | 2 | 60' | 34' | 2,000-5,000 |

The following table shows the roads' classification according to the adopted 2020 Transportation Master Plan (TMP).

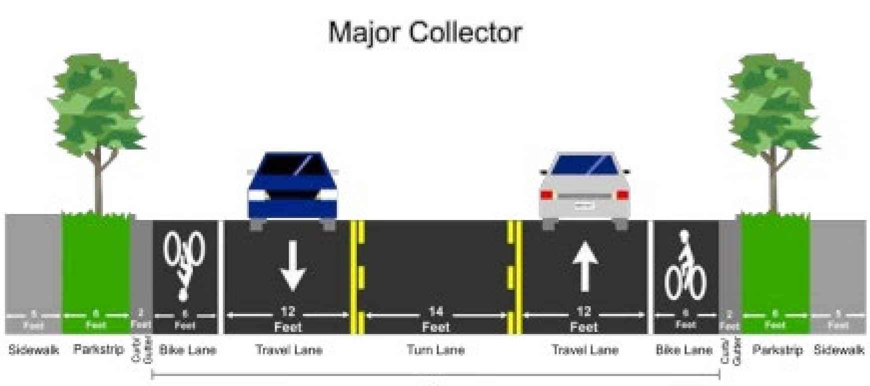
| Street Name | From | To | Current Classification |
|---|---|---|---|
| 920 North | 300 East (*) | 500 East | Local |
| 300 East | 920 North | 600 North | Local |
| 500 East | 920 North | 600 North | Local |

(*) from where 300 East turns into 980 North

The following figure shows the cross-section for a Local Street:

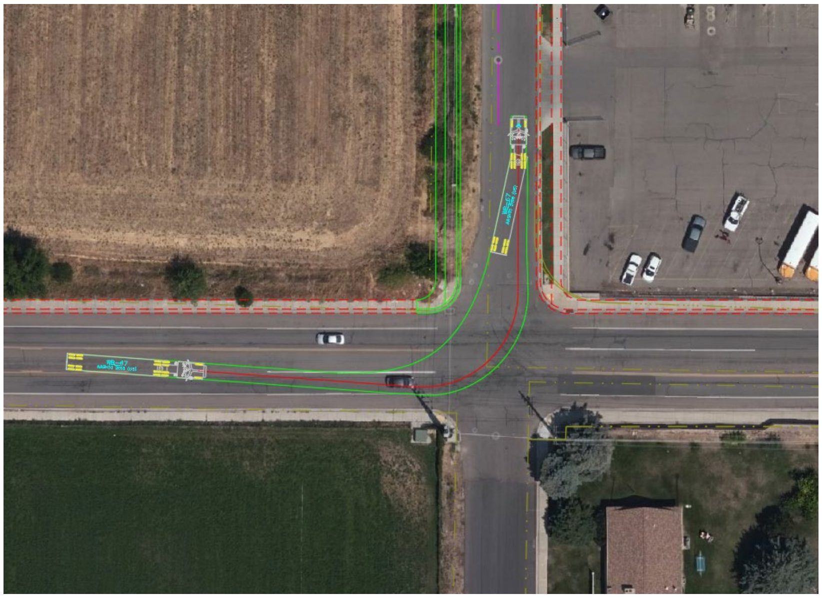



The following figure shows the cross-section for a Major Collector Street:



Due to the number of large-size trucks using the roads listed above, the recommended road cross-section, local street, does not provide enough space for a safe left turn movement for a WB-67 truck. A Local Road has only 34 feet wide asphalt pavement.

The classification of the roads from local to Major Collector will increase the pavement width to 50 feet. Wider asphalt pavement will provide sufficient room for large size vehicles turning movements.



A wider asphalt pavement width will improve the traffic and pedestrian safety of the vehicles using these roads.

**Analysis:**

1. **Public purpose for the amendment in question:**
   The amendment is an update to the TMP to help guide future transportation needs for the City.

2. **Compatibility of the proposed amendment with General Plan policies, goals, and objectives:**
   The proposed change is compatible with the General Plan policies, goals, and objectives.

3. **Adverse impacts on adjacent landowners:**
   No adverse impacts are anticipated.

**<u>Recommendation</u>**

The Public Works and Development Services Departments are requesting the Planning Commission forward a positive recommendation of the requested 2020 Transportation Master Plan Amendment #1 to the City Council.

**<u>ATTACHMENTS:</u>**

EXHIBIT 1: 2020 Adopted Transportation Master Plan

EXHIBIT 2: 2020 Adopted Transportation Master Plan Amendment #1

**EXHIBIT 1: Adopted 2020 Transportation Master Plan**

*Figure 1-2: Future Functional Classification.*

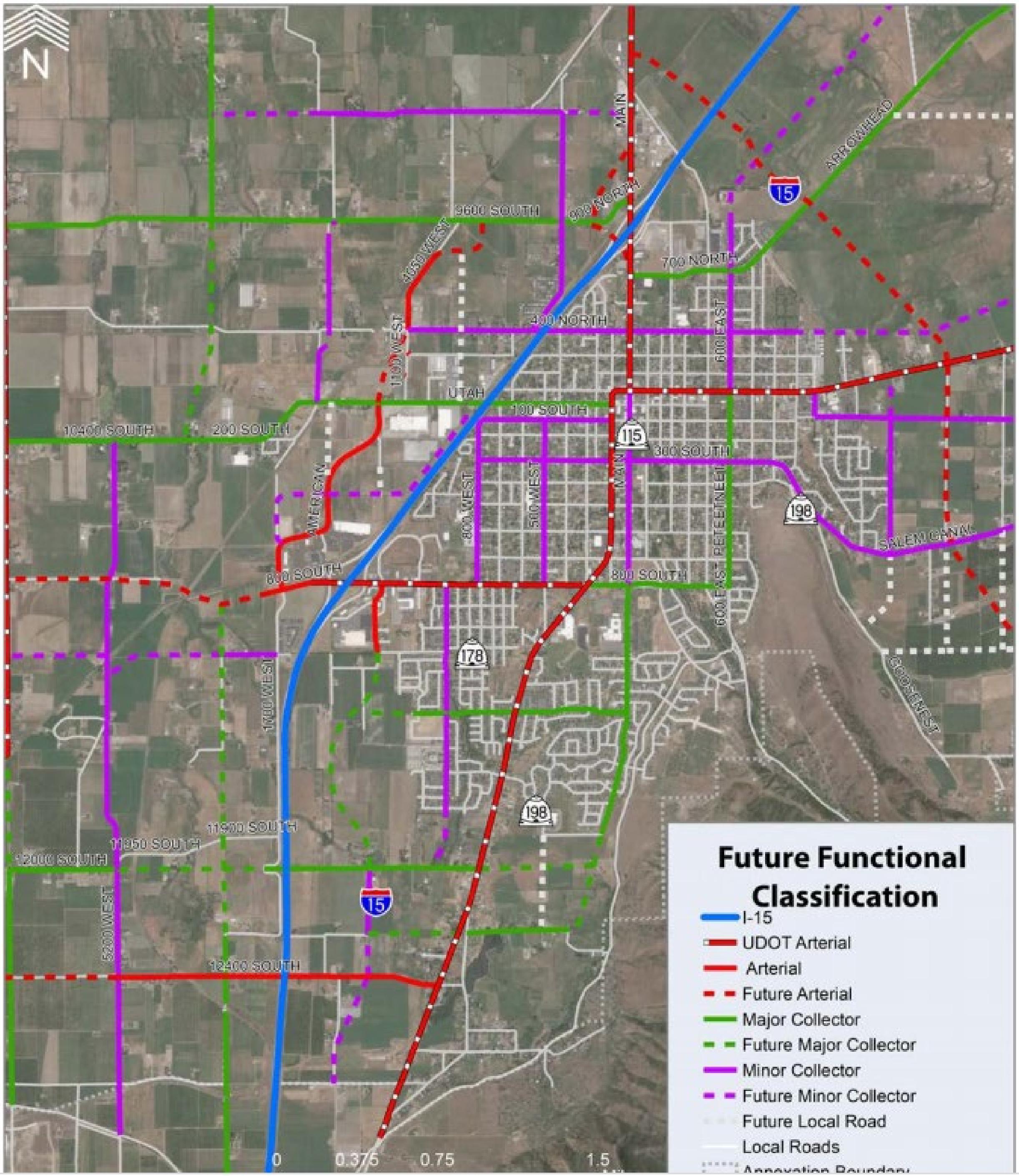


**EXHIBIT 2: Proposed 2020 Transportation Master Plan Amendment #1**

*Figure 1-2: Future Functional Classification.*