NOTICE AND AGENDA

Notice is hereby given that the City Council of the City of Santaquin will hold a City Council Meeting on Wednesday, February 03, 2010, in the Council Chambers, 45 West 100 South, at 7:00 pm.

AGENDA

1. **ROLL CALL**
2. **PLEDGE OF ALLEGIANCE**
3. **INVOCATION/INSPIRATIONAL THOUGHT**
4. **CONSENT AGENDA**
   a. Minutes
      1. January 20, 2010
   b. Bills
      1. $171,570.99
5. **FORUM, BID OPENINGS, AWARDS, AND APPOINTMENTS**
   Public Forum is held to a 30-minute maximum with each speaker given no more than 5 minutes each. If more than 6 Speakers, time will be adjusted accordingly to meet the 30 minute requirement
   a. Awards of Recognition to Planning Commissioner Members
   b. Appointment of Planning Commissioners
6. **FORMAL PUBLIC HEARINGS**
   a. Transportation Capital Facility Plan
7. **UNFINISHED BUSINESS**
8. **BUSINESS LICENSES**
9. **REPORTS OF OFFICERS, STAFF, BOARDS, AND COMMITTEES**
10. **NEW BUSINESS**
    a. Discussion and possible authorization for the Compassionate Friends Support Group to use the old Fire Station for their monthly meetings.
11. **INTRODUCTIONS AND ADOPTION OF ORDINANCES AND RESOLUTIONS (Roll Call Vote)**
    a. Resolution 02-01-2010 "A Resolution of the Santaquin City Council Authorizing the Execution of an Interlocal Cooperation Agreement between Santaquin City and Utah County Regarding Fire Fighting Services"
12. **PETITIONS AND COMMUNICATIONS**
13. **REPORTS BY MAYOR AND COUNCIL MEMBERS**
    a. Mayor DeGraffenried
    b. Council Members
14. **EXECUTIVE SESSION** (May be called to discuss the character, professional competence, or physical or mental health of an individual)
15. **EXECUTIVE SESSION** (May be called to discuss the pending or reasonably imminent litigation, and/or purchase, exchange, or lease of real property)
16. **ADJOURNMENT**

If you are planning to attend this Public Meeting and, due to a disability, need assistance in understanding or participating in the meeting, please notify the City ten or more hours in advance and we will, within reason, provide what assistance may be required.

CERTIFICATE OF MAILING

The undersigned duly appointed City Recorder for the municipality of Santaquin City hereby certifies that a copy of the foregoing Notice and Agenda was faxed to the Payson Chronicle, Payson, UT, 84651.

BY: SBFarnsworth
Susan B. Farnsworth, City Recorder

POSTED:
CITY CENTER
POST OFFICE
ZIONS BANK

® Amendment to the agenda

MINUTES OF A REGULAR COUNCIL MEETING
HELD IN THE COUNCIL CHAMBERS
FEBRUARY 3, 2010

The meeting was called to order at 7:00 pm by Mayor James E. DeGraffenried. Council Members attending: Filip Askerlund, James Linford, Rick Steele, and Brent Vincent. Martin Green was excused.

Others attending: City Manager Ben Reeves, City Planner Dennis Marker, Director of Public Safety Dennis Howard, Kaye Westwood, Steve (Doc) Shaffer, George Mecham, John Chatterley, J-U-B Engineering Representatives Mike Worrall and Lori Labrum, Kurt Stringham, Caleb Peterson and other unidentified individuals.

PLEDGE OF ALLEGIANCE
Council Member Steele Led the Pledge of Allegiance.

INVOCATION/INSPIRATIONAL THOUGHT
Mayor DeGraffenried Offered an Invocation.

CONSENT AGENDA

Minutes

January 20, 2010

Bills

$171,570.99

Council Member Linford moved to approve the Consent Agenda. Council Member Steele seconded the motion. Council Members Askerlund, Linford, Steele and Vincent voted in the affirmative.

FORUM, BID OPENINGS, AWARDS, AND APPOINTMENTS

Awards of Recognition to Planning Commissioner Members

Mayor DeGraffenried presented George Mecham and John Chatterley with a Dedication to Service plaque. He thanked them both for their dedication to the Planning Commission and residents of the community.

Appointment of Planning Commissioners

Mayor DeGraffenried presented the names of Kaye Westwood, Lance Wollebaek, and Steve (Doc) Shaffer as new Planning Commission Members. The new members will be administered the Oath of Office during the next Planning Commission. The new member's will serve on the Planning Commission until December 31, 2013.

Ms. Westwood indicated she appreciated the opportunity to serve on the Planning Commission. She hopes she will be instrumental in uniting the residents of the new annexation and the residents of Santaquin. She was welcomed by the Mayor and Council Members.

Mr. Shaffer reported he hopes he will be an asset on the Planning Commission. He is retired from the building trade and hopes his knowledge will be useful to the Commission.

Council Member Askerlund moved to appoint Kaye Westwood, Lance Wollebaek, and Steve Shaffer to the Planning Commission for a 3 year term. Council Member Linford seconded the motion. Council Members Askerlund, Linford, Steele and Vincent voted in the affirmative.

FORMAL PUBLIC HEARINGS

Transportation Capital Facility Plan

Council Member Askerlund moved to open the public hearing with regard to the Transportation Capital Facility Plan. Council Member Vincent seconded the motion. Council Members Askerlund, Linford, Steele and Vincent voted in the affirmative.

City Planner Marker reviewed the proposed Transportation Capital Facility Plan. A draft copy of the plan has been available at the City Offices for Public review.

Council Member Linford moved to close the public hearing with regard to the Transportation Capital Facility Plan. Council Member Vincent seconded the motion. Council Members Askerlund, Linford, Steele and Vincent voted in the affirmative.

UNFINISHED BUSINESS

Nothing

BUSINESS LICENSES

City Manager Reeves indicated he didn't have any new business licenses to report.

REPORTS OF OFFICERS, STAFF, BOARDS, AND COMMITTEES

Mr. Stringham, Representative of the Planning Commission, reported the Planning Commission granted a Conditional Use Permit for a Dance Studio. The Dance Studio would house a maximum of 12 students at one time. The Mayor and Council Members thanked Mr. Stringham for his time dedicated to the Planning Commission.

NEW BUSINESS

Discussion and possible authorization for the Compassionate Friends Support Group to use the old Fire Station for their monthly meetings.

Mayor DeGraffenried reported he had been approached by Re'nee Butler who was seeking permission to use a room at the old fire station to hold a Compassionate Friend's support group. This support group welcomes those who have experienced the loss of a loved one. Nuskin Company has pledged the fees associated with the current years dues.

Council Member Vincent moved to approve the use of the old fire station for the Compassionate Friends Group. Council Member Askerlund seconded the motion. Council Members seconded the motion. Council Members Askerlund, Linford, Steele and Vincent voted in the affirmative.

INTRODUCTIONS AND ADOPTION OF ORDINANCES AND RESOLUTIONS (Roll Call Vote)

Resolution 02-01-2010 "A Resolution of the Santaquin City Council Authorizing the Execution of an Interlocal Cooperation Agreement between Santaquin City and Utah County Regarding Fire Fighting Services"

Council Member Askerlund moved to approve Resolution 02-01-2010 "A Resolution of the Santaquin City Council Authorizing the Execution of an Interlocal Cooperation Agreement between Santaquin City and Utah County Regarding Fire Fighting Services". Council Member Linford seconded the motion. Council Members Askerlund, Linford, Steele and Vincent voted in the affirmative through a roll call vote.

PETITIONS AND COMMUNICATIONS
Nothing

Moved to item 14
EXECUTIVE SESSION (May be called to discuss the character, professional competence, or physical or mental health of an individual)
At 7:33 p.m. Council Member Linford moved to enter into an Executive Session with regard to the character, professional competence, or physical or mental health of an individual. Council Member Steele seconded the motion. Members Askerlund, Linford, Steele and Vincent voted in the unanimous.

Mayor DeGraffenried, Council Members Askerlund, Linford, Steele, and Vincent, City Manager Ben Reeves and Legal Counsel Brett Rich attended the Executive Session.

At 7:38 pm the Regular Council Meeting resumed.

EXECUTIVE SESSION (May be called to discuss the pending or reasonably imminent litigation, and/or purchase, exchange, or lease of real property)
At 7:39 p.m. Council Member Linford moved to enter into an Executive Session to discuss the pending or reasonably imminent litigation, and/or purchase, exchange, or lease of real property. Council Member Askerlund seconded the motion. Members Askerlund, Linford, Steele and Vincent voted in the unanimous.

Mayor DeGraffenried, Council Members Askerlund, Linford, Steele, and Vincent, City Manager Ben Reeves, Legal Counsel Brett Rich, City Recorder Susan Farnsworth attended the Executive Session.

At 8:05 pm the Regular Council Meeting resumed.

REPORTS BY MAYOR AND COUNCIL MEMBERS

Mayor DeGraffenried

Mayor DeGraffenried indicated the "Finding of No Significant Environmental Impact" is scheduled to be published in the Payson Chronicle. J-U-B Engineering's Representative will be in charge of the publication.

Council Members

Council Member Askerlund requested a review of the Engineering Contract. He requested the issue be an agenda item.

Legal Counsel Rich reported a City Resident is scheduled to appear in Court this next week. He indicated most likely there will be news media attending the hearing.

ADJOURNMENT
At 8:15 pm Council Member Linford moved to adjourn. Council Member Vincent seconded the motion. Council Members Askerlund, Linford, Steele and Vincent voted in the unanimous.

Approved on the 17th day of February, 2010.

James E. DeGraffenried, Mayor

Susan B. Farnsworth, City Recorder

Santaquin City
Est. 1851
freedom · family · friendship

CLOSED EXECUTIVE SESSION AFFIDAVIT

I, James E. DeGraffenried, Mayor of Santaquin City, do hereby certify that the Executive Session held on February 3, 2010 was called to discuss the pending or reasonably imminent litigation, and/or purchase, exchange, or lease of real property.

James DeGraffenried, Mayor

2/3/10
Date

Santaquin City
Est. 1851
freedom · family · friendship

CLOSED EXECUTIVE SESSION AFFIDAVIT

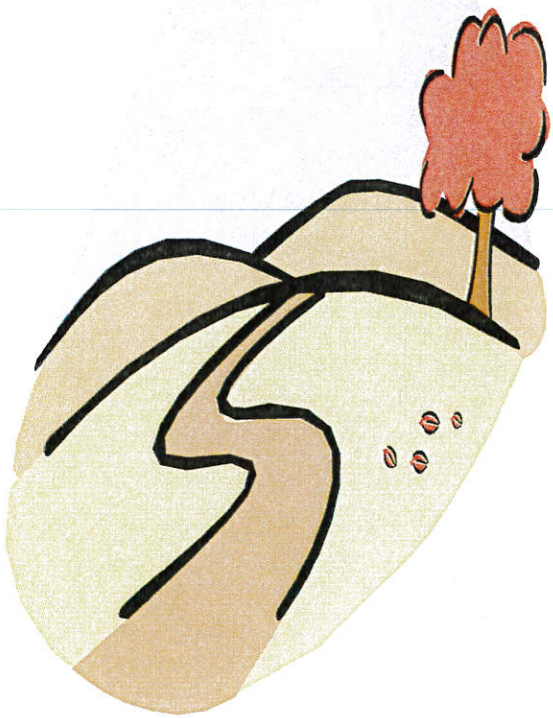
I, James E. DeGraffenried, Mayor of Santaquin City, do hereby certify that the Executive Session held on February 03, 2010 was called to discuss the character, professional competence, or physical or mental health of an individual.

James E. DeGraffenried
James DeGraffenried, Mayor

2/3/10
Date

Down Memory Lane

George, during your time with the Planning Commission, you looked at a lot of agenda items! Here's a brief overview of some of the things that came up for your attention:



Code Amendments

- Architectural standards for Commercial zones
- Multi-family development Standards
- Mobile Home Parks
- Residential Facilities for the Elderly and Disabled
- Hillside Residential Development Zone
- Places of Assembly in Commercial Zones

Conditional Use Permits

- Foli's Fix-it
- Openshaw wholesale fruit distribution
- Wagon Wheel Social Club

Single Lot Splits and Subdivisions

- Wall
- Gifford
- North Vistas
- West
- Butler Twin Home
- Openshaw,
- I Crook
- Dray

Rezones

- A rezone of 1.2 acres at 100 South 100 East from CBD to MSR
- A rezone of 2 acres at 580 North Highway 198

Down Memory Lane

John, during your time with the Planning Commission, you looked at a lot of agenda items! Here's a brief overview of some of the things that came up for your attention:

The General Plan
The City Annexation Policy Plan
Santaquin's First Mixed Use Development
Cherry Orchard Villa Condominiums
Three rezones
Single Lot splits for Knapp, Wall, Gurr, North Vistas, Marc Roberts, West, Openshaw, I Crook, & Dray.

Conditional Use Permits

- Foli's Fix-it
- Kat-Den storage
- Jana Hathaway's Day Care
- Openshaw wholesale fruit distribution
- Wagon Wheel Social Club

Commercial Developments

- KARS at Summit Ridge
- Maverik

Subdivisions

- Orchards
- Oak Summit
- Stone Hollow
- Eastside Estates
- Vistas West
- Santaquin Meadows
- Butler Twin Home
- Canyon
- Countryside Estates
- Sunset Trails

Code Amendments

- Minimum tree sizes for landscaping
- PUD Ordinance
- Billboard location and lighting
- Pole signs in the PC zone and commercial areas
- The development review process
- Defining the 'Core' of the City
- Street signage
- Architectural standards for Commercial zones, including the Main Street Business District.
- Multi-family buffering zone
- Appeals and Land Use Authorities
- Police enforcement of zoning ordinances
- Agricultural Zones and Agricultural Protection areas
- Expansion of legally Non-conforming structures
- Storage Unit Facility Locations
- Temporary Uses
- Animal Rights
- Mobile Home Parks
- Residential Facilities for the Elderly and Disabled
- Hillside Residential Development Zone
- Places of Assembly in Commercial Zones

February 1, 2010
Santaquin, Utah 84655

Dear Mayor Degraffenreid,

This letter is to follow up our talk concerning the opening of a Santquin branch of The Compassionate Friends support group. This group is for families who have experienced the loss of a child, but is open to anyone who would like to attend.

We have put together a group of people who have agreed to serve as the steering commitee for the new Santaquin Chapter. The Compassionate Friends is a national organization with chapters all over the country. At the current time the closest chapter is in Salt Lake City. We feel that it would be very beneficial for the families in this area to have somewhere closer to home to meet.

We would like to find a place to meet here in Santaquin and think that the old public safety building on Main Street would be a good place. We will be meeting once a month, and we were thinking that the last Thursday of each month would work out well for us. We would appreciate hearing from you soon if we will be able to use the building.

We have been given a grant from the Nuskin Company to pay this year's dues and we cannot send the check until we can give them an address for our group. There is no cost for the people who attend this group.

We appreciate your time and help with this. Enclosed you will find some information about The Compassionate Friends. If you have any questions please do not hesitate to call.

Sincerely,

Re'nee Butler
Debbie Evans
Jolynn Crouch
Dawn Christensen
801-754-3746

Santaquin City

Transportation Master Plan
2008-2030

January, 2010

Prepared by:

J-U-B ENGINEERS, Inc.
2875 South Decker Lake Dr., Suite 575
Salt Lake City, Utah 84119

Santaquin City

Transportation Master Plan
2008-2030

January, 2010

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Salt Lake City, Utah 84119

Santaquin City
Transportation Master Plan
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1 - Introduction

The Santaquin City Transportation Master Plan (TMP) was prepared to serve as a guiding document for future roadway improvements and capital facility improvements. This TMP is an important tool to accommodate development in the City and to identify the location and type of transportation facilities needed to meet future travel demands. This Transportation Master Plan:

- Addresses various modes of transportation;
- Is consistent with Santaquin's General Land Use plan;
- Covers a 22-year period with a planning horizon of 2030;
- Includes right-of-way and roadway cross-section recommendations for future capacity;
- Evaluates the existing transportation system, identifies future transportation needs, and recommends mobility improvements.

1.1 Background and Purpose

Santaquin City is situated in central Utah at approximately 39°58'29" north latitude and 111°47'4" west longitude in Utah County (Figure 1.1 - Santaquin City Vicinity Map). Santaquin City was originally called Summit City due to its location on a summit between Juab and Utah counties. US Highway 6 (US-6) passes through the middle of Santaquin City and Interstate 15 (I-15) passes through Santaquin City near the eastern city limits.

In 2007, the General Plan for Santaquin City was created. Based on the general plan's goals, the creation of the TMP was undertaken. As the guide to the City's transportation strategy for the future, the TMP outlines the City's vision for the development of its transportation network and identifies and prioritizes transportation projects. Recommended priority improvements are assigned for short-term (2015) and long-term (2030). This study was developed at Santaquin City's request for the purpose of developing an impact- free structure for new development.

This report summarizes the work undertaken to develop the TMP and the following outlines the content of the TMP:

- Existing traffic and land use conditions
- Future traffic, road network and land use conditions
- Future road networks recommendations
- Cost of implementing the recommendations and priorities for implementation
- Financial capability and implementation plan outlines

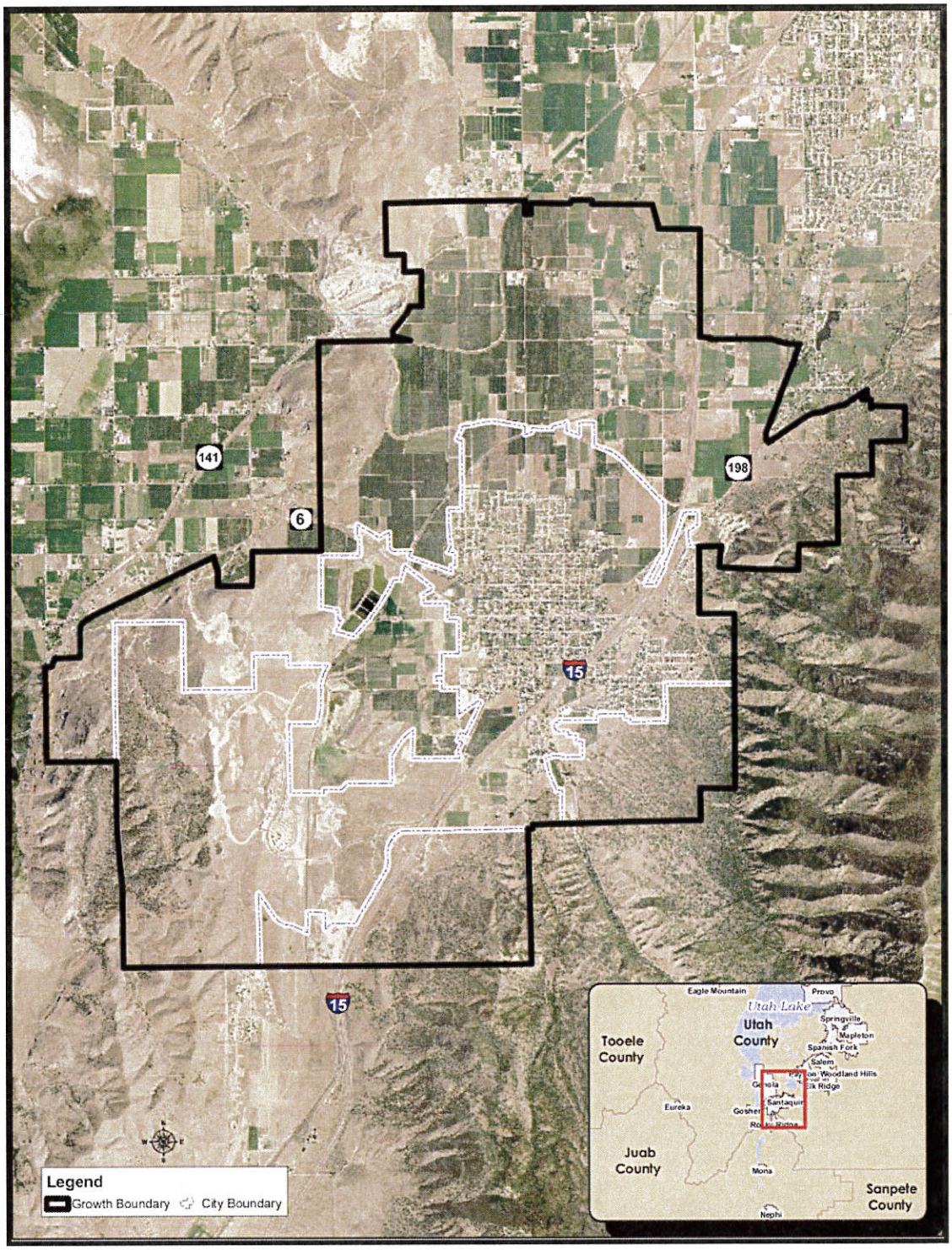


Figure 1.1 Santaquin City Vicinity Map

1.2 Benefits of Transportation Planning

Transportation planning is the process of providing for the development of an efficient and appropriate transportation system to meet existing and future travel needs. The primary purpose is to ensure the orderly and progressive development of the transportation network to serve the mobility and access needs of the public. Transportation planning should also interrelate with land use and trail planning. Good planning identifies the long-term transportation needs for the community, including: roadway requirements, intersection needs, transit facilities, bicycle needs, pedestrian needs, access management, and other associated needs.

The benefits provided by effective transportation planning are realized by achieving the following objectives:

- Maximizing mobility while minimizing the negative impacts from street widening;
- Preservation of adequate right-of-way for future long-range transportation improvements, and recognizing where future improvement may ultimately be needed;
- Making efficient use of available resources by designating and recognizing the major streets that will likely require improvements;
- Determining the amount of land required for street and highway purposes;
- Identifying the functional role that each street should be designed to serve, in order to promote and maintain the stability of traffic and land use patterns;
- Informing citizens of the streets that are intended to be developed as arterial and collector streets so that private land use decisions can be made appropriately;
- Providing information on transportation improvement needs to determine priorities and schedules in the capital facilities funding; and
- Provide an implementation program to prioritize improvements and identify funding sources.

2 - Existing Conditions

This chapter explores the existing physical features and transportation system in Santaquin. Understanding the existing conditions is an important first step in developing a transportation plan specific to Santaquin's future needs. The existing street network and traffic patterns will serve as the basis for the future street network and in identifying future transportation conditions and needs. Additionally, existing topographic and physical features of the community may influence transportation improvements and should be recognized and considered in the development of the plan. The following transportation information has been collected and analyzed in this report:

- Functional classification of the transportation network.
- Average Daily Traffic (ADT) with peak - hour volumes.
- Turning movement traffic counts at selected intersections.
- Average delay and Level of Service at selected intersections.
- Roadway geometrics (lane and shoulder widths, speeds, parking, etc.).
- Recent accident records.
- Rail corridors.
- Land use characteristics (present and future).

2.1 Transportation Network

The transportation network is the circulatory system of the city: providing routes for the movement of goods, services, and people. Historically, the network for Santaquin City was laid out in a grid pattern, following the township and range quarter sections typical for agricultural areas. A grid network allows for the greatest accessibility and spreads local traffic over a number of streets. This street pattern generally minimizes travel lengths to get from one point to another, and most streets serve similar purposes. With the development that has occurred, much of the new transportation network has deviated from a grid network. Within the City, streets now serve different purposes including access, through travel, and distribution of travel. Accordingly, streets are classified by their function.

2.2 Existing Roadway Functional Classification

Roadways are classified by "function" according to guidelines prepared by the Federal Highway Administration (FHWA). Federal funding programs specifically apply to roadways with functional classifications of collector and above. (All existing functionally classified roadways are shown in Figure 2.1.)

Functional classification of roadways describes both the mobility and access characteristics of a roadway. For example, an interstate freeway occupies one end of a spectrum between mobility and access-providing traffic with greater mobility, and little access to adjacent lands. A cul-de-sac, at the opposite end of this spectrum, provides access to land, but offers very little movement of traffic. The Federal functional classifications are defined as follows.

Interstate and Freeway

Interstates or freeways are flowing, high speed facilities that are "access-controlled," where access is only provided through interchanges. The interchanges include grade separations between the freeway and the accessing roadway, and high speed on- and off-ramps. Through traffic is not impeded by cross traffic. In Santaquin City, I-15 to the east is the major North-South corridor through the region. The interstate promotes movement of traffic with limited access, high speeds, separated directional lanes, and grade-separated interchanges. The interstate is under the jurisdiction of the Utah Department of Transportation. There are no

Interstates or freeways under the jurisdiction of Santaquin City; however, I-15 plays a major role in conveying traffic in to and out of Santaquin City.

Principal Arterial

Principal arterials have high traffic volumes. These roadways contain the greatest proportion of through or long-distance travel. Access is limited to promote efficient traffic movement. Speeds are generally at least 35 to 45 mph in urban situations and parking is usually prohibited. Principal arterials are typically about a mile apart, but may be closer in more densely populated areas. Intersections are typically at-grade crossings. Many of the intersections are signalized, and signal placement and coordination of signal timing are critical to the operation of the arterial. There are no existing principal arterials under the jurisdiction of Santaquin City.

Minor Arterial

Roadways that often connect lesser roadways to principal arterials are classified as minor arterials. Minor arterials usually have capacity sufficient to carry 2 or 4 lanes of through traffic and have curb, gutter, and sidewalk along both sides. Minor arterials also typically include left turn lanes at intersections or continuous two-way left turn lanes. The predominant function of minor arterials is to provide movement of through traffic, but they also provide considerable access for local traffic that originates or is travelling to points along the corridors. Often minor arterials become boundaries to neighborhoods, and serve less concentrated developments such as neighborhood shopping centers or schools.

Urban speeds are generally in the range of 35 to 40 mph. Access may be restricted and parking is often prohibited in an urban situation. There are no roads maintained by Santaquin that are classified as minor arterials. US-6 (Main Street) and a portion of State Road 198 (SR-198) are minor arterials on the state highway system, and connect to I-15.

Collector

A collector is intended to concentrate residential and/or rural traffic and direct it to the arterial system. Collectors usually include two lanes of through traffic and have curb, gutter and sidewalk along both sides. Collectors often include left-turn lanes at intersections or continuous two-way left turn lanes. To preserve neighborhood driving conditions, collectors are generally spaced every half mile and do not cross arterials. Direct access to adjoining property is common and often essential. Operating speeds are generally in the 25 to 35 mph range. Parking is acceptable, but may be limited. Collectors are, in some cases, sub-categorized into major and minor collectors. Major collectors tend to connect important regional facilities directly to the arterials, while minor collectors usually connect to the local roads. Currently, there are no facilities that are configured to operate as collectors in Santaquin City. Over time and as traffic increases, certain Santaquin roadways will need to function as collectors.

Local Streets

Local streets constitute all the remaining City-operated roads. Local streets typically consist of 2 lanes and shoulders, with curb, gutter and sidewalks present in some locations. Local roads are the capillaries of the current Santaquin City transportation network, providing direct access to public facilities, businesses, and private property. In the original town core, existing streets typically include 20-24 feet of paved surface, with minimal or unimproved shoulders and no curb and gutter. A number of the City's local streets have irrigation ditches adjacent to the roadway. Subdivisions constructed between 2002 and 2006 were built with asphalt widths of 37-48 feet. These had curbing and connected sidewalk. Since 2006, street widths were reduced to between 29 and 38 feet with curb, gutter, parking strips, and sidewalk.

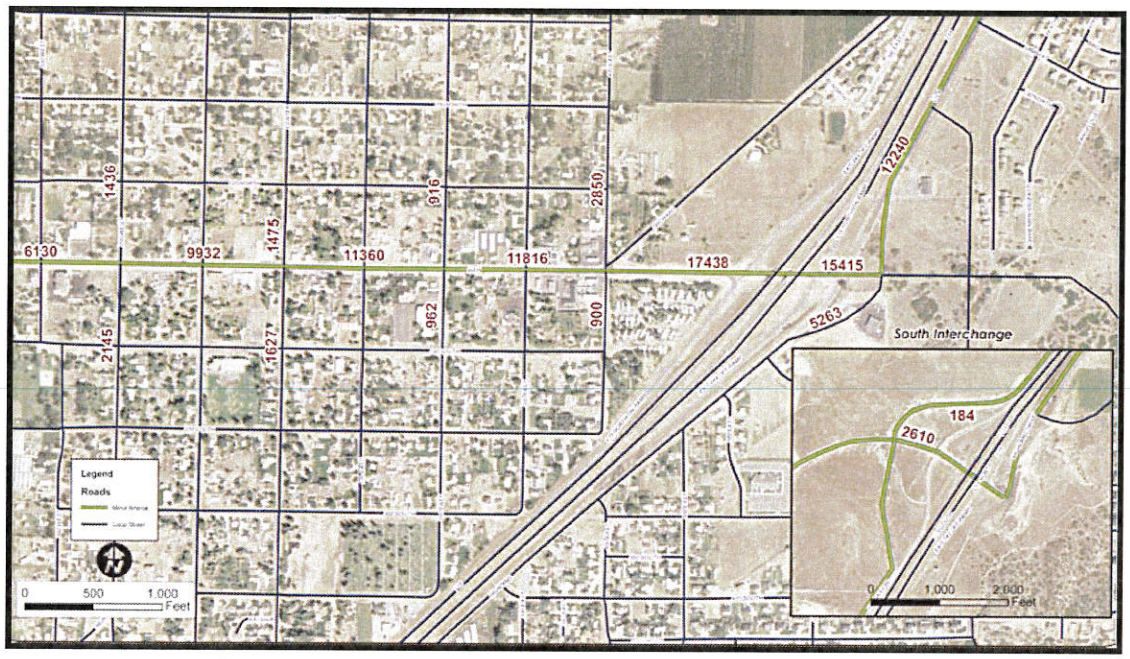


Figure 2.1 Existing Average Daily Traffic and Roadway Classification

2.3 Existing Traffic Volumes

Average Daily Traffic (ADT) counts (shown in Figure 2.1) were collected with automatic counters at a total of 16 locations throughout the study area. Counts were collected in August, 2007. Additionally, counts at 4 locations were conducted in 2006 by UDOT. From these counts, correlations between the afternoon peak hour traffic and the ADT in the study area were determined. The morning peak hour is 7:00 AM to 8:00 AM and the afternoon peak hour is from 4:30 PM to 5:30 PM

The afternoon peak hour traffic volume is approximately 7.2% of the ADT on Main Street and 8% on local streets. On average, urban areas should expect peak hour values in the range of the 9.5% to 10% of the ADT. Afternoon peak data is typically used for analysis, as it represents a worst case scenario.

Figure 2.2 shows the measured hourly traffic on Main Street. Traffic volumes during the day vary; but are heavier during the PM peak hour than during either the AM peak hour or noon time peak.

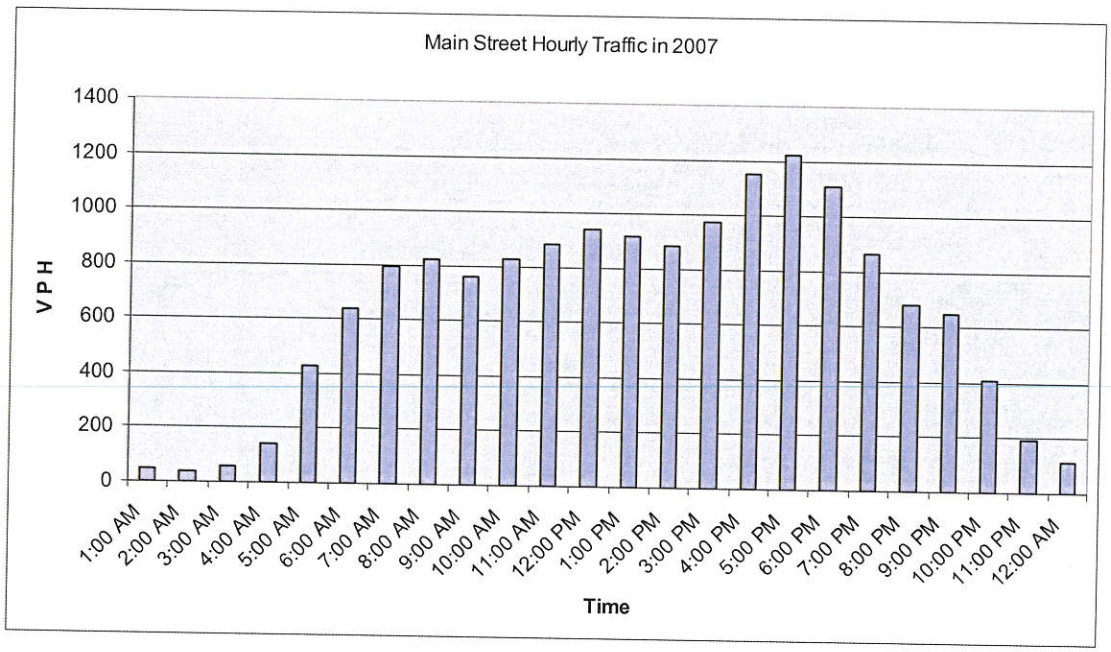


Figure 2.2 2007 Main Street Hourly Traffic

2.4 Existing Traffic Control

Traffic control devices are an essential element to the operation of many intersections. Some lightly used intersections are uncontrolled, while others are signalized or controlled by stop or yield signs. Within Santaquin City, there are no existing signalized intersections. There are four railroad crossings of which, two are signalized. The railroad crossings are at Lark Lane and 600 West, 420 West near 13100 South, Center Street at Highline Canal, and 400 East near 12800 South.

Seven intersections with stop sign controls were evaluated. For each intersection, turning movements were counted, and other intersection features were noted, such as posted speeds, pedestrian presence, adjacent parking, etc.

2.5 Existing Traffic Operations Analysis

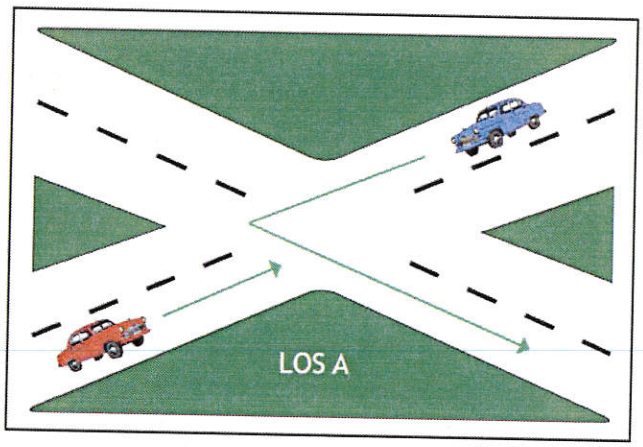
Level of Service (LOS) is a measure of the performance of an element of transportation infrastructure. An intersection, a rural roadway, or an urban road segment can all be graded, A through F, on the adequacy of their performance under given traffic conditions.

LOS is a description of different operating conditions that occur when accommodating various traffic volumes. It is a qualitative measure of the effect of traffic flow factors, such as: speed, travel time, interruptions and delays, freedom to maneuver, and driver comfort and convenience. The LOS for roadways and unsignalized intersections ranges from "free flow" to "highly congested flow."

In rural areas, traffic flow is expected to be uninterrupted; but, in an urban situation the roadways are interrupted by traffic control at intersections, lower speed limits, numerous approaches, and, in some cases, parking. Most of the roadways within the Santaquin City qualify as rural for their LOS evaluation. The LOS for most of the urban roadways will be restricted by the performance of the intersections on the roadway. Flows are divided into six levels of service, which are defined as follows:

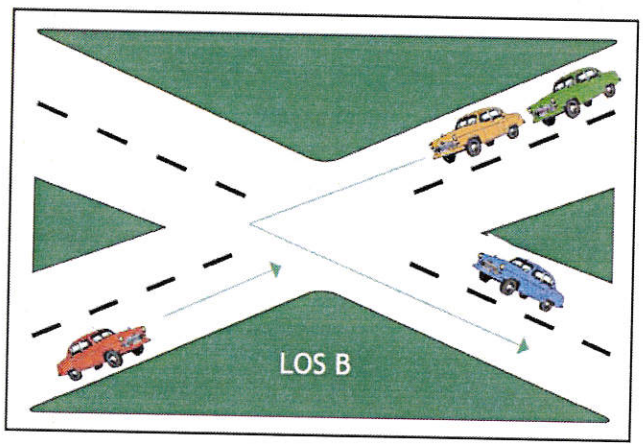
Level A

Free flow, low volumes and densities, high speeds. Drivers can maintain their desired speeds with little or no delay.



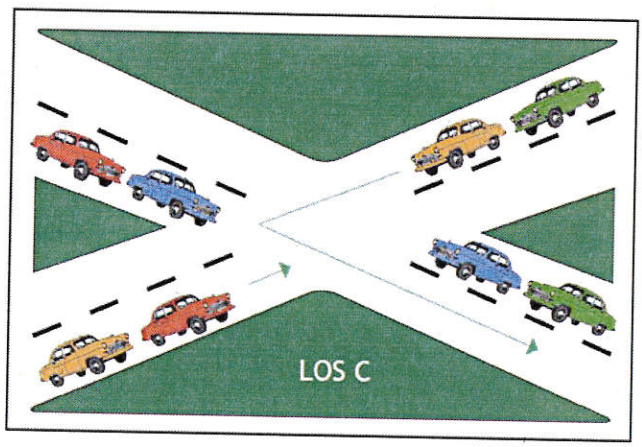
Level B

Stable flow, operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed. Suitable for rural design standards.



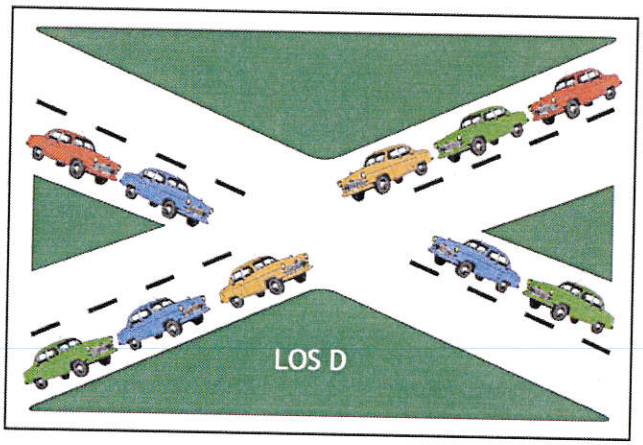
Level C

Stable flow, but speeds and higher volumes more closely control maneuverability. Suitable for urban design standards.



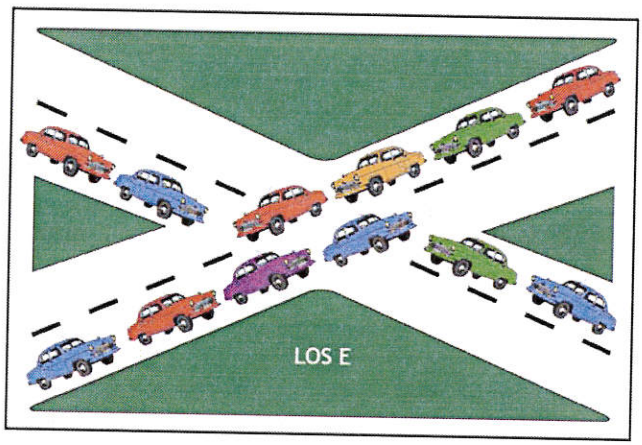
Level D

Approaches unstable flow, tolerable operating speeds that are, however, considerably affected by operating conditions. Drivers have little freedom to maneuver.



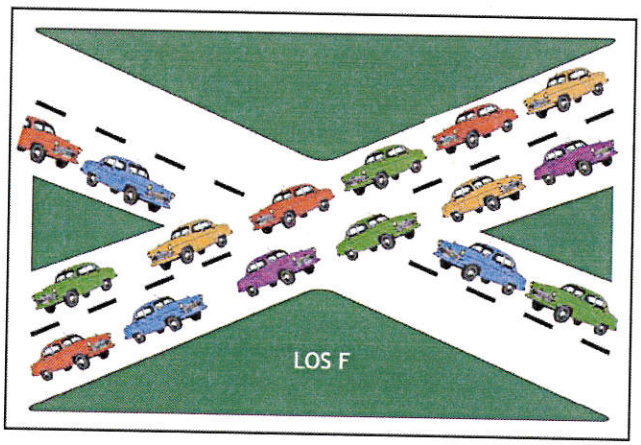
Level E

Unstable flow, with yet lower operating speeds and, perhaps, stoppages of momentary duration. Volumes at or near capacity.



Level F

Forced flow, both speed and volumes can drop to zero. Stoppages may occur for short or long periods. These conditions usually result from queues of vehicles backing up from a restriction downstream.



Traffic Function and Capacity of Urban Roadways

Urban roadways are typically constrained by the operation of intersections, so much of the analysis focuses on intersection operation. At lower speeds (below 50 mph), intersections generally dictate the capacity of an urban roadway section. In this planning project, LOS is determined by the traffic operation performance at major intersections.

Unsignalized Intersections

LOS at unsignalized intersections is determined for traffic movements that must stop or yield to through traffic. LOS is determined by the average delay for each movement, as summarized in Table 2-1.

Table 2-1 Unsignalized Intersections Average Total Delay

Level of Service	Seconds per Vehicle
A	< 10
B	> 10 and < 15
C	> 15 and< 25
D	> 25 and < 35
E	> 35 and < 50
F	> 50

Source: HCM Exhibit 17-2 Level-Of-Service Criteria for All Way Stop Intersections; 2000 Highway Capacity Manual.

When the traffic volume exceeds the capacity of the travel lane, delays will occur and queues will form, causing congestion that affects other traffic movements in the intersection. These conditions typically warrant roadway or traffic control improvements of the intersection.

LOS Analysis

Results of the intersection capacity analysis are summarized in Table 2-2. This analysis was conducted using Synchro traffic modeling software. The table identifies present operating conditions in the study area. The LOS is primarily dependent upon the average delay experienced by individual vehicles. Determining an acceptable LOS is somewhat subjective in nature due to different perceptions of what delay lengths are acceptable in different areas. As a rule of thumb for urban areas, a LOS from A to D is acceptable. Some Santaquin residents may find conditions worse than LOS B or C unacceptable, because traffic congestion is generally infrequent. Based on current traffic conditions in the City, a LOS of C was determined to be the lowest acceptable level of service.

Currently, all of the roadways and intersections analyzed are operating at an acceptable LOS in the AM peak hour. During the PM peak hour there are several intersections that have individual movements operating at unacceptable service levels. Table 2-2 identifies the LOS and delay for the worst

Table 2-2 Unsignalized Intersections, Existing PM Peak- Hour LOS

Primary Roadway	Secondary Roadway	Primary Direction	Stop Control Location	Intersection LOS	Intersection Delay (Seconds)	Movement (Movement / LOS / Delay)
SR-198	Frontage	E/W	N/S	A	4.9	NB / D / 26.9
Main Street (US-6)	NB I-15 On Ramp	E/W	N/S	A	3.7	NB / C / 22.8
Main Street (US-6)	SB I-15 Off Ramp	E/W	N/S	E	45	SB / F / 94.9

Primary Roadway	Secondary Roadway	Primary Direction	Stop Control Location	Intersection LOS	Intersection Delay (Seconds)	Movement (Movement / LOS / Delay)
Main Street (US-6)	400 East	E/W	N/S	A	4.7	SB / E / 44.4
Main Street (US-6)	200 East	E/W	N/S	A	1.2	SB / D / 25.5
Main Street (US-6)	Center Street	E/W	N/S	A	2.8	SB / C / 23.6
Main Street (US-6)	200 West	E/W	N/S	A	5.4	NB / D /32

All of the intersections identified in Table 2-2 have acceptable overall levels of services except Main Street and SB I-15 off-ramp, which operates at a LOS E. The individual legs of SR-198 and US-6 operate at LOS D and E respectively. The increased delays on the individual movements are likely caused by dominating movements that negatively impact the intersection's operations.

2.6 Bicycle and Pedestrian Facilities

A comprehensive transportation master plan involves not only roadway improvements, but also improvements for non-motorized travel where applicable. Bicycle and pedestrian facilities are often overlooked, but provide an alternative to vehicle traffic and important access to public transit. Bicycle and pedestrian facilities should be coordinated with the UTA transit system to provide access to existing and future transit stops.

Currently, Santaquin has identified several trails that are planned to parallel existing roadways in their land use plan. It is a comprehensive trail network to be coordinated with future improvements to roadways.

2.7 Traffic Safety

Crash data is used to identify higher than normal crash rates for specific transportation facilities. Higher than normal crash rates can often be attributed to roadway deficiencies. Crash data for specific locations is analyzed to determine if roadway deficiencies do in fact exist.

Recent crash data was provided by the Utah County Sheriff's Department and UDOT. No fatalities were reported, and only a small number of traffic accidents have been reported over the past three years in Santaquin. There was no data available that categorized accident angles by such descriptions as "rear-end," "left-turn," "T-bone," etc.

A crash rate is the number of crashes per million vehicle miles of travel per year. UDOT classifies US-6 as a rural minor arterial. The UDOT average crash rate for rural minor arterials for 2000-2005 is 2.1. Table 2-3 shows crash rates on US-6 from 2003-2005, which are lower than the UDOT average.

Table 2-3 2003-2005 Crash Rates for US-6

Year	Crash Rate (MVM)	Crashes
2005	1.3	8
2004	1.47	9
2003	2.01	13

It is likely that crash rates will increase as traffic increases, particularly in those locations where roadway deficiencies exist or high congestion occurs.

3 - Future Land Use and Population

The link between land use and transportation is critical. Land use types and their locations influence the travel patterns of an area. While Santaquin has been experiencing a tremendous amount of residential growth, improvements to the transportation network have not kept up with this demand. Residential growth has occurred in areas that were once orchards/agricultural land. The transportation network that was originally designed for the agricultural uses cannot support current or future traffic volumes.

The City's General Plan provides existing and future land use information. This chapter analyzes land uses for the purpose of forecasting the future demand on the transportation network. This data will be the basis for the future "build-out" transportation model.

3.1 Existing Land Use

Currently, there are approximately 5,218 acres of land within City limits. A large portion of the City (42.75%) is undeveloped land that could potentially be available for development. Open space lands or lands unsuitable for development consist of 15.85% of the total. The remaining land within the City is made up of active farming, public roads, residential uses, public/quasi-public buildings, facilities and commercial businesses (Figure 3.1 - Current Land Use). Table 3-1 describes the existing land uses and the percent of the city's acreage they represent.

Table 3-1 Current Land Use Distribution

Land Use	Acres	Percent
Vacant/Undeveloped	2,249	43.1%
Open Space	834	16.0%
Agriculture	686	13.1%
Medium Density Residential	483	9.3%
Roads	483	9.3%
Public/Institutional	242	4.6%
Low Density Residential	123	2.4%
Industrial	47	0.9%
Railroad	37	0.7%
Commercial	17	0.3%
Multi Family Residential	17	0.3%
Total	5,218	100%

Source: Santaquin Land Use Plan, 2007

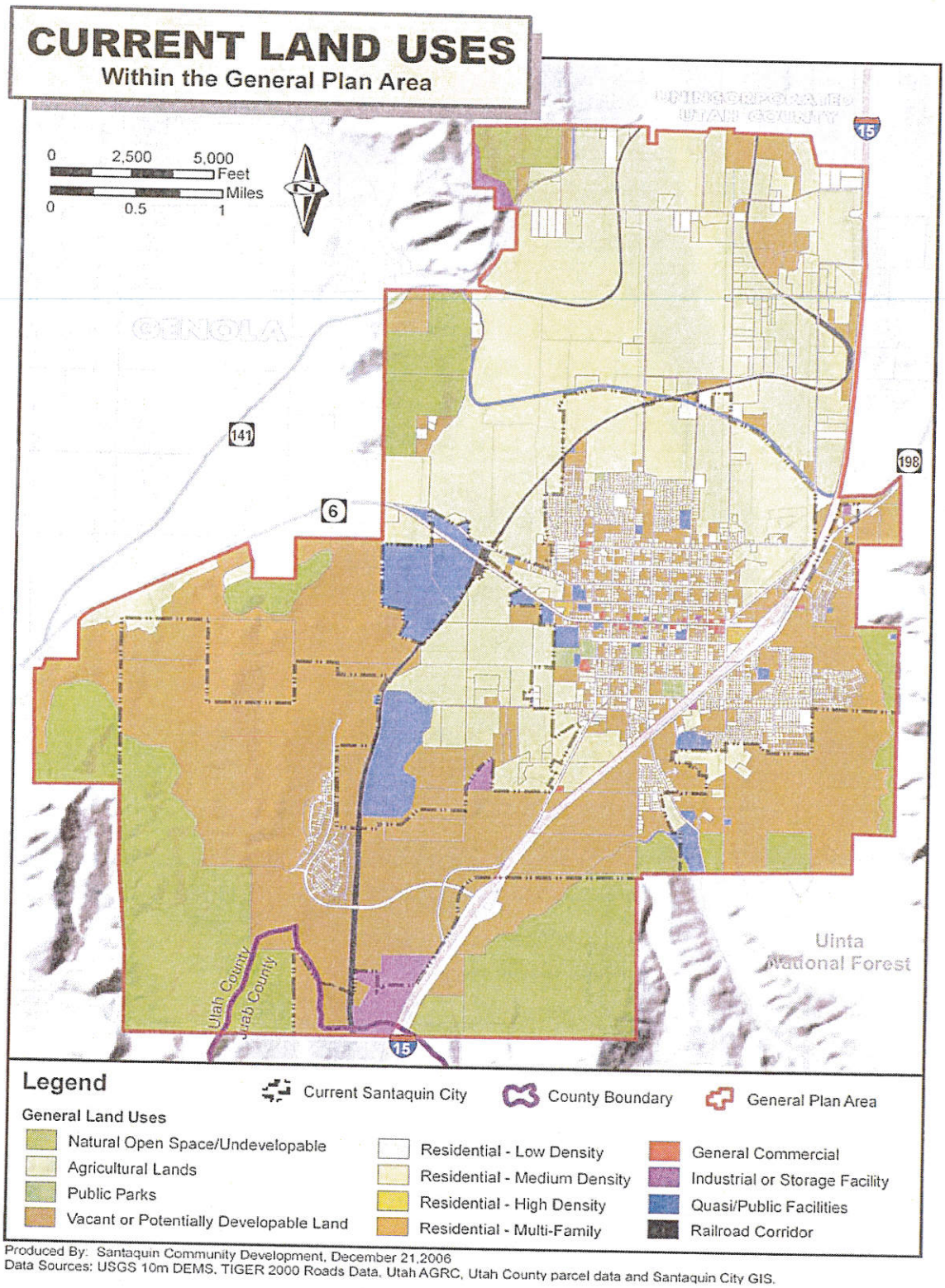


Figure 3.1 Current Land Use

4 - Travel Demand

The purpose of this chapter is to examine conditions used as inputs to the area travel demand model (traffic model). This model is used to estimate future trip generation and traffic volumes for area roadways. Demographic variables discussed in this section include population and employment. Through analysis of these variables and development of forecasts, future transportation needs are identified and evaluated.

4.1 Population Growth and Trends Affecting Transportation

Population projections are a vital tool for anticipating the need for future land uses within a community, and planning accordingly. Santaquin City is confronted with two potential growth scenarios (Figure 4.1).

The U.S. Census Bureau has documented the population in Santaquin City every ten years since 1990. The Utah State Governor's Office of Planning and Budget (GOPB) has projected an annual population in 10-year increments for the years 2000-2050 for planning purposes. Figure 4.1 provides the GOPB population projections for the 2008-2030 planning period.

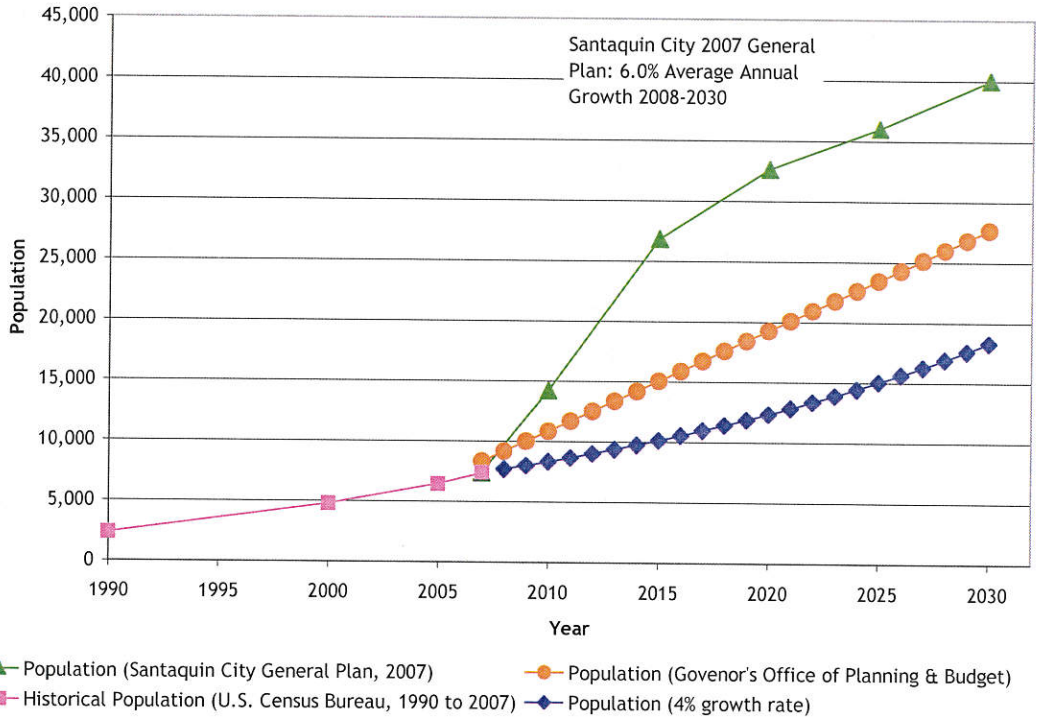


Figure 4.1 Population Projections

Santaquin City has experienced recent strong development and growth, and more is likely to be experienced. Santaquin's General Plan, 2007, projects the population growth to be 8.5% between the years 2007 and 2027. Numerous residential and commercial developments are currently in the planning stages or are moving along through the City's development review process. The rate at which these developments will actually be implemented is a function of:

- Economic and market forces (i.e., home purchase demands, interest rates, land availability, etc.);
- Actual time required to construct infrastructure improvements;

- Availability of City services; and
- Ability of City staff to review development proposals, approve building permits, inspect construction, and issue occupancy permits.

4.2 Future Land Use

This discussion identifies future land use planning for community development. The City's official General Plan outlines the guidelines for regulating the growth and development of the City as established by the Planning Commission and the City Council. It encompasses all geographic areas of the community and all functional elements that will endure the physical development of the City. The plan looks past current conditions and attempts to address the range of future developmental probabilities. The future land use map, a component of the General Plan, identifies areas of general land uses like low density and medium density residential; and general commercial uses like general commercial, mixed-use, etc. Figure 4-2 - Future Land Use Map identifies the location of those land uses.

For transportation planning purposes, the land use map is used to identify how much travel demand a given area will generate. Residential, commercial, and mixed-use areas will experience varying levels of travel demand. The City was divided into the following three general categories for travel demand analysis.

Residential Land Uses

Residential land use, as the name implies, includes housing.

- Residential-Orchard Ranchettes (Density: 0.2 units/acre or less)
- Residential-Low (Density: 0.5 to 1.5 units/acre)
- Residential-Medium (Density: 1.5 to 4 units/acre)
- Residential-Medium/High (Density: 4 to 8 units/acre)
- Residential-Multi-family (Density: 8 to 20 units/acre)

Commercial Land Uses

Commercial land use can vary from industrial parks to shopping centers. Because different types of commercial use have different levels of travel demand, commercial land use is divided into three categories.

- General Commercial - shopping centers, which satisfy the specialty shopping needs of the community and surrounding areas.
- Main Street Overlay Commercial - this category includes the Main Street corridor from I-15 to 500 West. This district will be a mixed-use shopping and financial center for the City and surrounding territory, and characterized as "the center of town." Based on the City's land use plan, the Main street corridor will have about 1,000 residential (units with 15-20 units per acre density) and general commercial and office uses.
- Mixed Use/Transit- Oriented Developments (TOD) - this category is for the land uses where high-density residential is integrated with commercial, civic, and business uses; and is connected or adjacent to major transit stations. Travel patterns and rates are similar to the Main Street Overlay area, but the design of a TOD increases opportunities for walk-ability and public transit between dwellings, recreation, shopping, and work uses. The Utah Transit Authority (UTA) is planning to extend commuter rail to Santaquin. When UTA extends service to Santaquin it is anticipated that TOD will be heavily integrated in the vicinity of the station. Since TOD is heavily integrated with transit, it has different travel demand characteristics than other development.

Business Park Land Uses

- Business Park uses are for employment and manufacturing centers.

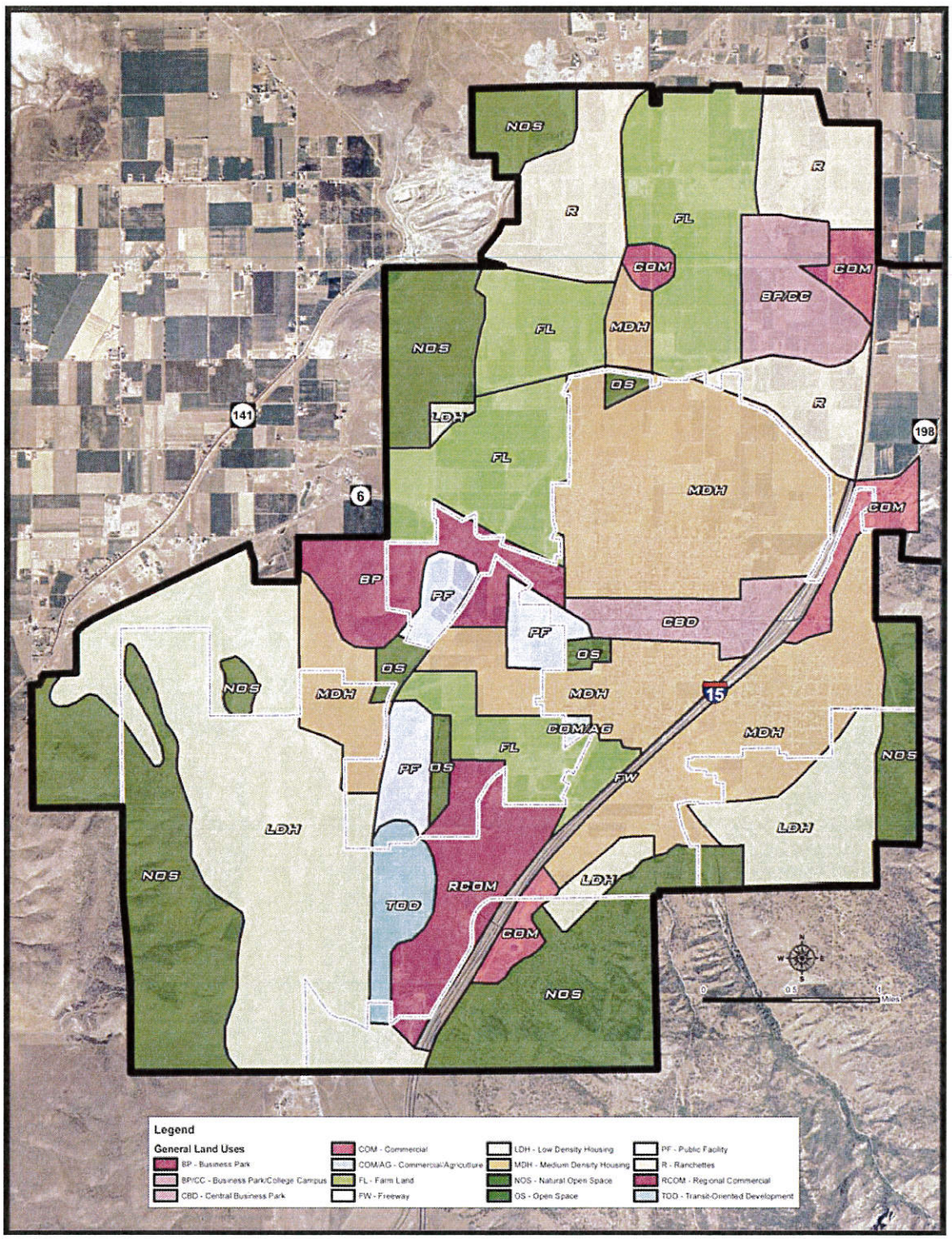


Figure 4.2 Future Land Use Map

4.3 Transportation Analysis Zones

In order to construct a travel demand model for a given area, the overall area must be parsed into smaller units or sub-areas called Traffic Analysis Zones (TAZs). TAZ boundaries typically follow major roadways and are drawn to encompass land areas that are generally homogenous with regard to land use (Figure 4.3 - Traffic Analysis Zones). Ideally, boundaries of TAZs do not overlap with boundaries of sub-areas identified by planning agencies, highway district boundaries or census data boundaries. Each zone has an identifiable or prominent land use or activity characteristic. This characteristic differentiates the area within the zone from the area outside. Prominent internal characteristics might include:

- A residential neighborhood.
- A retail business area.
- A recreational destination.
- A transportation terminal or hub.
- An industrial or agricultural area.

With the TAZ boundaries and respective land uses identified, it is possible to model the density of households and employment centers and their corresponding impact on the existing and future transportation networks. Some reasonable predictions about the distribution of future households and employment centers were assumed: namely, that in a build-out scenario, the City will have approximately 12,617 homes and a population of approximately 45,000 persons.

The City's General Plan does not provide future employment information. Mountainland Association of Governments (MAG) estimated that 6,689 jobs will be available in Santaquin in 2030, based on their future commercial, industrial, and business park land use. This analysis considered population, housing, and employment information for 2030. It is assumed that these 6,689 job positions will be distributed uniformly in the proposed commercial and business park areas. To conservatively estimate traffic volumes for the City's roads, those 6,689 employees are assumed to live in the City.

Two of the TAZ will likely change over time. RAN 4/C6 and RAN 5/C7 currently consist of residential land use, but future improvements to I-15 access would change both zones to commercial land use. The improvement that will precipitate change is the new interchange to be constructed at 12400 South (see the MAG Long Range Transportation Plan for construction details). Alternative scenarios evaluated for this transportation plan investigate the impact of these land use changes in more detail.

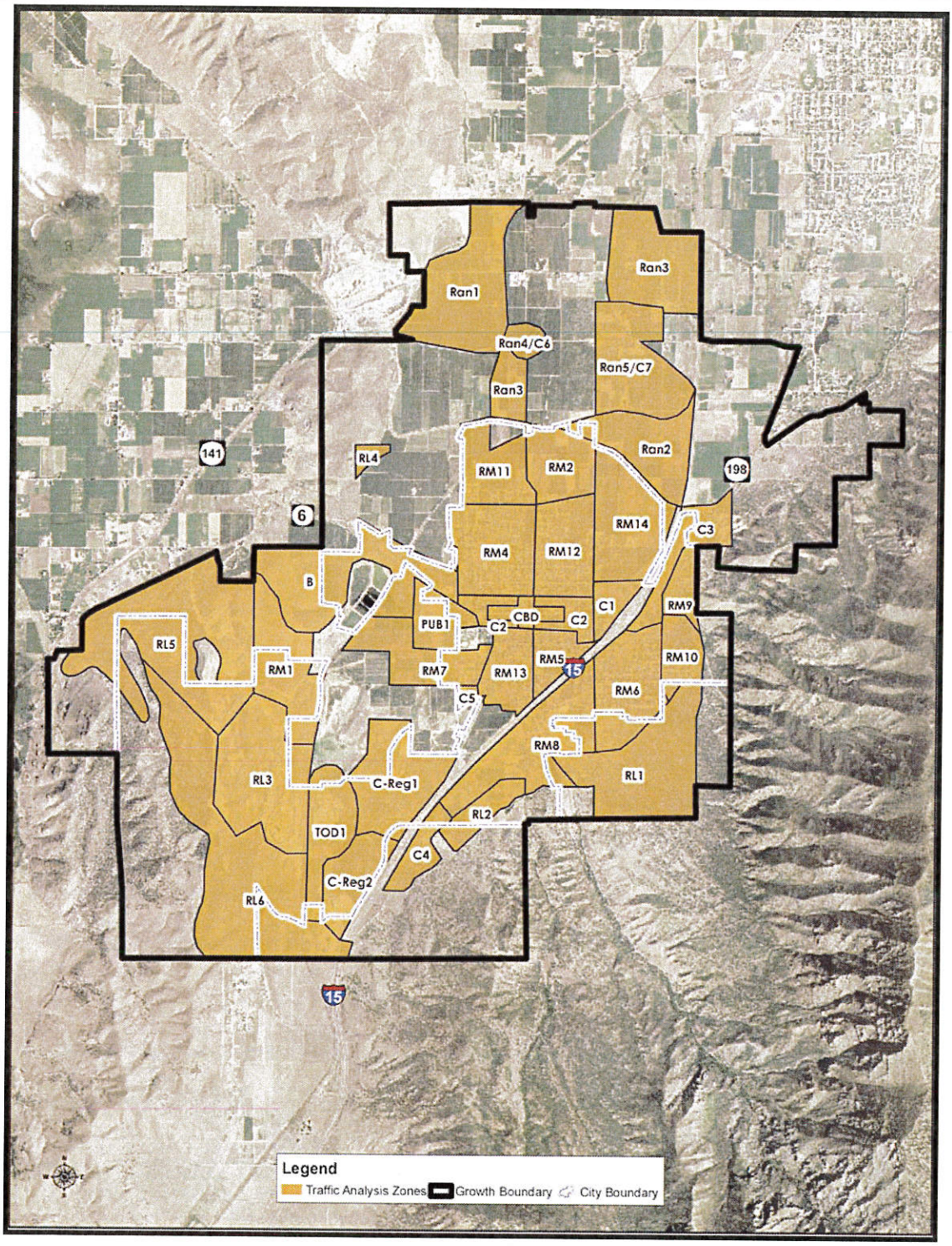


Figure 4.3 **Traffic Analysis Zones (Build-out Land Use TAZ)**

5 - Trip Generation Analysis

To predict how the roadways and intersections will operate in the future, travel demand is projected and traffic conditions analyzed for the proposed build-out year of 2030. 2030 is the planning year used by MAG, the regional planning organization for Utah County and Santaquin City.

The manual, "Trip Generation, 7th Edition", published by the Institute of Transportation Engineers (ITE), is typically used for predicting the future travel generated by proposed land uses. This is the industry standard when estimating the number of vehicle trip ends to be generated by development during the AM and PM peak hours on a typical weekday. Daily traffic on the transportation network includes three different categories:

- Traffic generated by the residents in the study area.
- Pass-by traffic generated by the neighboring cities, such as Payson and Genola. It is assumed that majority of this traffic will use Main Street (US-6).
- Traffic from surrounding communities generated by the regional commercial land uses.

5.1 Traffic Generated by Residents

ITE collects and publishes data from throughout the United States regarding the number of vehicle trips that a particular land use generates. To estimate the travel demand from residential areas, 9.65 daily trips per housing unit (ITE 7th Ed. - Single-Family Detached Housing Land Use Code 220) is applied for each housing unit in each TAZ. These trips were divided into two trip-purpose categories:

1. Home Based Work - Trips with home at one end of the trip and work at the other end. Based on the ITE data, it is assumed that one household in Santaquin City will generate 2.2 daily Home Based Work trips.
2. R-Others - all other trips, presumably with destinations to commercial developments. Note: 10%-15% of trips originate and terminate inside of a TAZ. These trips were not modeled because they do not impact the transportation network.

Business and Commercial land use trips are comprised of two categories:

1. Employee Trips - Based on the MAG data, it is estimated that 6,689 jobs will be distributed uniformly throughout the commercial and business park developments. Each job generates 2.8 daily trips based on NCHRP 365, Travel Estimation Techniques for Urban Areas
2. C-Other/Shopping Trips from Santaquin City - It is assumed that all of trips belonging to "C-Other" categories of land uses will be applied to commercial developments.

5.2 Pass-by Traffic generated by Neighboring Cities

Pass-by traffic data is not projected from the travel demand model, but is determined by traffic counts and data gathered by UDOT. The estimated 2007 pass-by ADT on Main Street (US-6) is 6,400. The 2030 pass-by ADT is estimated to be 8,250, applying an annual growth rate of 1.3%.

5.3 Traffic from Commercial Areas

The commercial land use proposed at Summit Ridge Parkway (south interchange) is identified to be regional commercial. It will accommodate "big -box" development and associated supporting commercial development. The development is likely to attract people from Santaquin City as well as people from surrounding regions. Therefore, it is assumed that a certain percentage of these trips will originate from outside the Santaquin area. As shown in

Table 5-1 Commercial Trip Generation Analysis indicates that TAZs, C-Reg1, C-Reg2, and C4, on the south side of the study area will attract approximately 42,930 trips per day from the surrounding regions. These trips will likely use the southern I-15 interchange at Summit Ridge.

On the north side of town, TAZ C3 will attract 16,521 trips from surrounding regions and this traffic and will likely use US-198 as the accessing roadway. Table 5-1 identifies the results of the Trip Generation Analysis for commercial areas.

Table 5-1 Commercial Trip Generation Analysis

TAZ	Land Use	Area (acres)	Housing Units	ITE Commercial Trips	Employee Trips	Commercial Trips From Santaquin	Commercial Trips From Outside Santaquin
C1	Commercial, Adjacent to Central Business District	60	0	8868*	449	5321	0**
C2	Central Business District	148	1,000	8868*	449	5,321	0**
C3	Commercial	128	0	36,014	2,131	16,521	17,362
C4	Commercial	77	0	21,544	1,266	9,939	10,339
C5	Commercial - Agriculture	12	0	0	182	1,472	0
Mixed Use	Regional Commercial	267	1,200	40,600	2,706	25,695	12,199
C-Reg2	Regional Commercial	149	0	41,770	2,706	25,695	13,369
Total		841	2,200	139,928	10,139	89,964	53,269

* Because C2 is a mixed-use development, some travel demand will be met through public transit and pedestrian and cyclist travel. Travel demand for this zone and the adjacent C1 TAZ will not all require a vehicle, so ITE Commercial Trip rates are higher than actual trips generated.

** Because there is no parking in downtown Santaquin, it was assumed that commercial trips would not be generated from outside Santaquin.

The following two tables show the detailed trip generation results for the TAZs with and without the construction of the interchange at 12400 South and I-15. With construction of the interchange it was assumed that TAZs Ran4 and Ran5 would be developed into commercial areas. These commercial areas will attract trips from the northern part of the study area. Table 5-2 does not include trip generation data for TAZs Ran4 and Ran5 because these zones include very few homes. When the land use is residential the trips are calculated based on the number of homes, the trip data for this case was negligible. Table 5-3 includes traffic data for zones Ran4 and Ran5 because with commercial land uses the travel demand becomes much more significant.

Table 5-2 Build-Out Year Land Use Categories and Values for TAZs without Interchange Construction

				Residential				Commercial		
TAZ	Land Use	Area (acre)	Housing Unit Density (Units/Acre)	Housing Units	ITE ADT	Home Based Work Trips	R-Others	Job Positions	Employee Trips	C-Others
B	Business Park	369	0	0	0	0	0	2,194	6,143	0
C1	Commercial, Adjacent to Central Business District	60	0	0	0	0	0	204	449	5,321
C2	Central Business District	148	0	1,000	6,270	2,200	2,260*	204	449	5,321
C3	Commercial	128	0	0	36,014	0	0	761	2,131	16,521
C4	Commercial	77	0	0	21,544	0	0	452	1,266	9,939
C5	Commercial - Agriculture	12	0	0	0	0	0	65	182	1,549
RL1	Low Density Housing	501	0.5	250	2,392	550	1,842	0	0	0
RL2	Low Density Housing	82	0.5	41	392	90	302	0	0	0
RL3	Low Density Housing	384	0.5	192	1,836	422	1,413	0	0	0
RL4	Low Density Housing	21	0.5	11	106	24	82	0	0	0
RL5	Low Density Housing	635	0.5	317	3,038	698	2,340	0	0	0
RL6	Low Density Housing	702	0.5	351	3,356	772	2,585	0	0	0
RM1	Medium Density Housing	71	4	357	3,416	785	2,631	0	0	0
RM2	Medium Density Housing	157	4	627	5,996	1,379	4,618	0	0	0
RM3	Medium Density Housing	80	5	399	3,818	878	2,940	0	0	0
RM4	Medium Density Housing	252	4	1,007	9,640	2,216	7,423	0	0	0
RM5	Medium Density Housing	83	4	331	3,164	727	2,436	0	0	0
RM6	Medium Density Housing	269	4	1,075	10,290	2,365	7,924	0	0	0

				Residential				Commercial		
TAZ	Land Use	Area (acre)	Housing Unit Density (Units/Acre)	Housing Units	ITE ADT	Home Based Work Trips	R-Others	Job Positions	Employee Trips	C-Others
RM7	Medium Density Housing	188	4	750	7,182	1,651	5,531	0	0	0
RM8	Medium Density Housing	348	4	1,392	13,320	3,062	10,258	0	0	0
RM9	Medium Density Housing	76	4	304	2,908	669	2,240	0	0	0
RM10	Medium Density Housing	105	4	419	4,010	922	3,089	0	0	0
RM11	Medium Density Housing	166	4	664	6,354	1,461	4,893	0	0	0
RM12	Medium Density Housing	203	4	813	7,778	1,788	5,990	0	0	0
RM13	Medium Density Housing	132	4	527	5,044	1,159	3,884	0	0	0
RM14	Medium Density Housing	256	4	1,024	9,800	0	9,800	0	0	0
PUB1	Public Facility	103	0	0	0	0	0	0	0	0
Ran1	Ranchettes	362	0.2~0.3	72	690	158	532	0	0	0
Ran2	Ranchettes	220	0.2~0.3	44	422	97	325	0	0	0
Ran3	Ranchettes	278	0.2~0.3	56	536	123	413	0	0	0
C-Reg1	Regional Commercial	267	N/A	1,200	8,064	2,640	2,712*	1,230	3,444	25,695
C-Reg2	Regional Commercial	149	0	0	0	0	0	1,230	3,444	25,695
TOD1	TOD	175	20	3,500	33,460	7,700	25,760	345	966	7,530
Total		7,078	80	16,723	153,732	34,536	114,223	6,685	18,474	97,571

* 50% of these R-Other trips will use transportation modes other than vehicles.

Table 5-3 Build-Out Year Land Use Categories and Values for TAZs with Interchange Construction

				Residential				Commercial		
TAZ	Land Use	Area (acre)	House Unit Density (Units/Acre)	Housing Units	ITE ADT	Home Based Work Trips	R-Others	Job Positions	Employee Trips	C-Others
B	Business Park	369	0	0	0	0	0	1,845	5,166	0
C1	Commercial, Adjacent to Central Business District	60	0	0	0	0	0	205	451	3,144
C2	CBD	148	0	1,000	6,720	2,200	2,260*	205	451	3,144
C3	Commercial	128	0	0	0	0	0	539	1,509	11,537
C4	Commercial	77	0	0	0	0	0	384	1,075	6,902
C5	Commercial - Agriculture	12	0	0	0	0	0	57	160	1,040
RL1	Low Density Housing	501	1	250	2,392	550	1,842	0	0	0
RL2	Low Density Housing	82	1	41	392	90	302	0	0	0
RL3	Low Density Housing	384	1	192	1,836	422	1,413	0	0	0
RL4	Low Density Housing	21	1	11	106	24	82	0	0	0
RL5	Low Density Housing	635	1	317	3,038	698	2,340	0	0	0
RL6	Low Density Housing	702	1	351	3,356	772	2,585	0	0	0
RM1	Medium Density Housing	71	4	357	3,416	785	2,631	0	0	0
RM2	Medium Density Housing	157	4	627	5,996	1,379	4,618	0	0	0
RM3	Medium Density Housing	80	4	399	3,818	878	2,940	0	0	0
RM4	Medium Density Housing	252	4	1,007	9,640	2,216	7,423	0	0	0
RM5	Medium Density Housing	83	4	331	3,164	727	2,436	0	0	0
RM6	Medium Density Housing	269	4	1,075	10,290	2,365	7,924	0	0	0
RM7	Medium Density Housing	188	4	750	7,182	1,651	5,531	0	0	0
RM8	Medium Density Housing	348	4	1,392	13,320	3,062	10,258	0	0	0
RM9	Medium Density Housing	76	4	304	2,908	669	2,240	0	0	0

				Residential				Commercial		
TAZ	Land Use	Area (acre)	House Unit Density (Units/Acre)	Housing Units	ITE ADT	Home Based Work Trips	R-Others	Job Positions	Employee Trips	C-Others
RM10	Medium Density Housing	105	4	419	4,010	922	3,089	0	0	0
RM11	Medium Density Housing	166	4	664	6,354	1,461	4,893	0	0	0
RM12	Medium Density Housing	203	4	813	7,778	1,788	5,990	0	0	0
RM13	Medium Density Housing	132	4	527	5,044	1,159	3,884	0	0	0
RM14	Medium Density Housing	256	4	1,024	9,800	0	9,800	0	0	0
PUB1	Public Facility	103	0	0	0	0	0	0	0	0
Ran1	Ranchettes	362	0	72	690	158	532	0	0	0
Ran2	Ranchettes	220	0	44	422	97	325	0	0	0
Ran3	Ranchettes	278	0	56	536	123	413	0	0	0
C-Reg1	Regional Commercial	267(145/122)**	N/A	1,200	8,064	2,640	2,712*	1,038	2,907	18,676
C-Reg2	Regional Commercial	149	0	0	0	0	0	1038	2907	18676
TOD1	TOD	175	20	3,500	33,460	7,700	25,760	244	683	5,229
Ran4/C6	Regional Commercial	39	0	0	0	0	0	196	549	3,524
Ran5/C7	Regional Commercial	293	0	0	0	0	0	984	2,755	26,364
Total		7124		16,723	153,732	34,536	114,232	6,689	18,613	98,236

* 50% of these R-Other trips will use transportation modes other than vehicles.

** This value is shows the split between commercial or multi use and others.

5.4 Transit-Oriented Development Zone - Trip Generation

The City of Santaquin does not currently have an existing Transit-Oriented Development (TOD) zone. But Santaquin has identified a TOD zone in their long range plan in anticipation of UTA's commuter rail extension.

UTA recently opened a commuter rail line between Ogden and Salt Lake City. This is the first of many commuter rail lines to be constructed along the Wasatch Front. Commuter rail lines or light rail lines do not exist in Utah County at this time. MAG and the Wasatch Front Regional Council (WFRC) have added commuter rail in their long range transportation plans for 2030 but the current model identifies Payson City as the terminus for the commuter rail line. In discussions with both WFRC and MAG they have indicated that they will revise the model to show Santaquin as the end of the commuter rail line. At the time of this report, the WFRC/MAG regional model had not been updated to reflect this change.

For the TOD Zone, this plan analyzed national transit oriented development data and then interpolated this data to establish ridership projections for the commuter rail at the proposed terminus of Payson . The analysis is intended to provide indicated the changes in trip generation related to TOD and compare that to non-TOD developments. Once MAG and WFRC complete their transit projections for 2040, and Santaquin is identified as the end of the line, the transportation analysis included here should be updated.

Transit ridership for all of the TAZs combined, except for the TOD zone, will generate 1,400 transit trips daily.

Transit ridership for the TOD zone was calculated as follows:

The report, "Case Study TCRP Report 102: Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects" identified that in California, TODs can "lower annual rates of driving by 20 to 40 percent for those living, working, and/or shopping near major transit stations." The dwelling densities in TOD zones ranged from 20 to 50 units per acre. The report also identified that transit ridership increased 6% when the dwelling densities increased at least 10%.

These findings were applied to the Santaquin TOD zone, where 30 units/acre are assumed in a portion of the TOD, and 50 units/acre in the more densely developed portion of the TOD.

Development of transit oriented development land uses could potentially reduce the total trips on the surrounding transportation network by approximately 50%. Work trips could be reduced by approximately 40% and non-work trips by approximately 60%. The projected daily transit ridership generated by the proposed TOD zone is approximately 6,090 riders per day. To estimate the highest total travel demand, 6.72 daily trips per housing unit is applied for each unit in the TOD zone (ITE 7th Ed. - Apartment Land Use Code 220). These trips are divided into two trip-purpose categories:

1. Home Based Work (HBW) with 2.2 daily trips per household.
2. Others - all other trips (the assumed destination being the proposed commercial developments).

Table 5-4 TOD Trip Generation Results

	Area (Acres)	Density (units/acre)	House Units	Total Trips	Vehicle Trips on Surrounding Roads	Transit Ridership	Trips By Other Modes
Part 1	64	30	1,920	12,902	6,451	1,690	4,762
Part 2	100	50	5,000	33,600	16,800	4,400	12,400
Total	164	-	6,920	46,502	23,251	6,090	17,162

The nature of the proposed mixed-use land uses within the TOD zone will result in approximately 50% of those trips choosing transit or non-vehicular travel modes instead of choosing a vehicle trip. Figure 5.1 shows that within the TOD the non-vehicular travel modes will include 13% that use transit, and 37% that use other modes such as walking or bicycling (assuming those trips are for commercial and other recreation purposes).

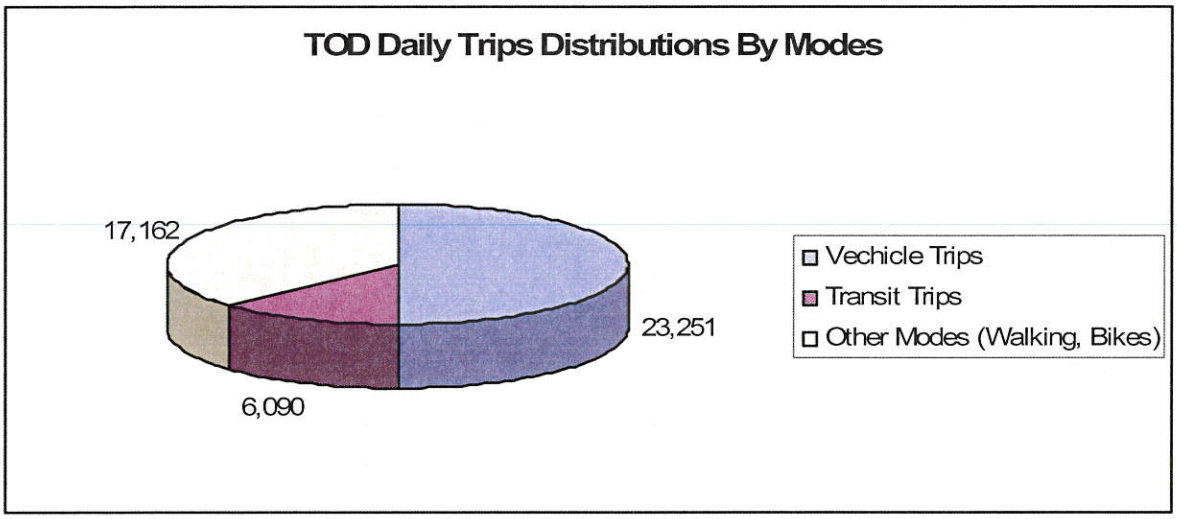


Figure 5.1 TOD Daily Trips Distributions by Travel Modes

5.5 Unincorporated Utah County Development

There is planned to be a large master plan development to the west of Santaquin along US 6. The traffic impacts of this development that could affect to this TMP have not been included, but a high level review of the traffic numbers generated by this proposed development has been completed. As the development progresses it will be necessary to monitor and assess the future traffic impacts along US 6, specifically at the I-15 interchange. This location will experience the greatest amount of impact from the planned development and should be monitored closely. Additionally, the Mountainland Association of Governments has considered the addition of a new interchange on I-15 at 12400 South. Scenarios both "with" and "without" the construction of this interchange are considered in Section 6 of this report, but do not consider the travel demand that could be generated from this development.

6 -Transportation Network Impact Scenarios

Santaquin City had identified a future transportation network which was used in developing the trip generation analysis (Figure 6.1 - Proposed 2030 Roadway Network). This future network was based on the network hierarchy identified in the MAG long range transportation plan. At the completion of the trip generation analysis, the next step was to evaluate five scenarios to determine the overall effect on the future transportation network, with and without significant roadway improvements. The analysis included evaluation of the following scenarios:

1. No-Build.
2. Upgraded Network without the 12400 South Interchange and without the TOD.
3. Upgraded Network with the 12400 South Interchange and without TOD.
4. Upgraded Network without the 12400 South Interchange and with TOD.
5. Upgraded Network with the 12400 South Interchange and with TOD.

The Upgraded Network scenarios propose certain upgrades to alleviate traffic congestion and improve safety and mobility at intersections throughout the transportation network. These improvements include signalizing the intersections listed in Table 6-1.

Table 6-1 Traffic Signal Improvements for Intersections in the Upgraded Network

Intersections	
Santaquin Canyon	Highland
Center Street	200 South
Center Street	200 North
Center Street	13000 South
200 West	200 North
400 East	200 North
Summit Ridge	Highway 89
5920 West	Highway 89
5920 West	500 South
Highway 89	500 South
3-lane Exploratory Collector	500 South
Highway 89	3-lane Exploratory Collector
US-6	Highland
US-6	I-15
US-6	400 East
US-6	Center Street
US-6	200 West
US-6	500 West
US-6	Business Park
US-6	3-lane Exploratory Collector
I-15	Summit Ridge

The TOD and 12400 South interchange were also evaluated because of the uncertainty as to when (and if) their implementation would occur. For scenarios involving upgrades to the 12400 South interchange, the intersections listed in Table 6-2 would require signal upgrades.

Table 6-2 Traffic Signal Improvements for Intersections Near the 12400 South Interchange

Intersections	
400 East	12400 South
I-15	12400 South
Center Street	12400 South

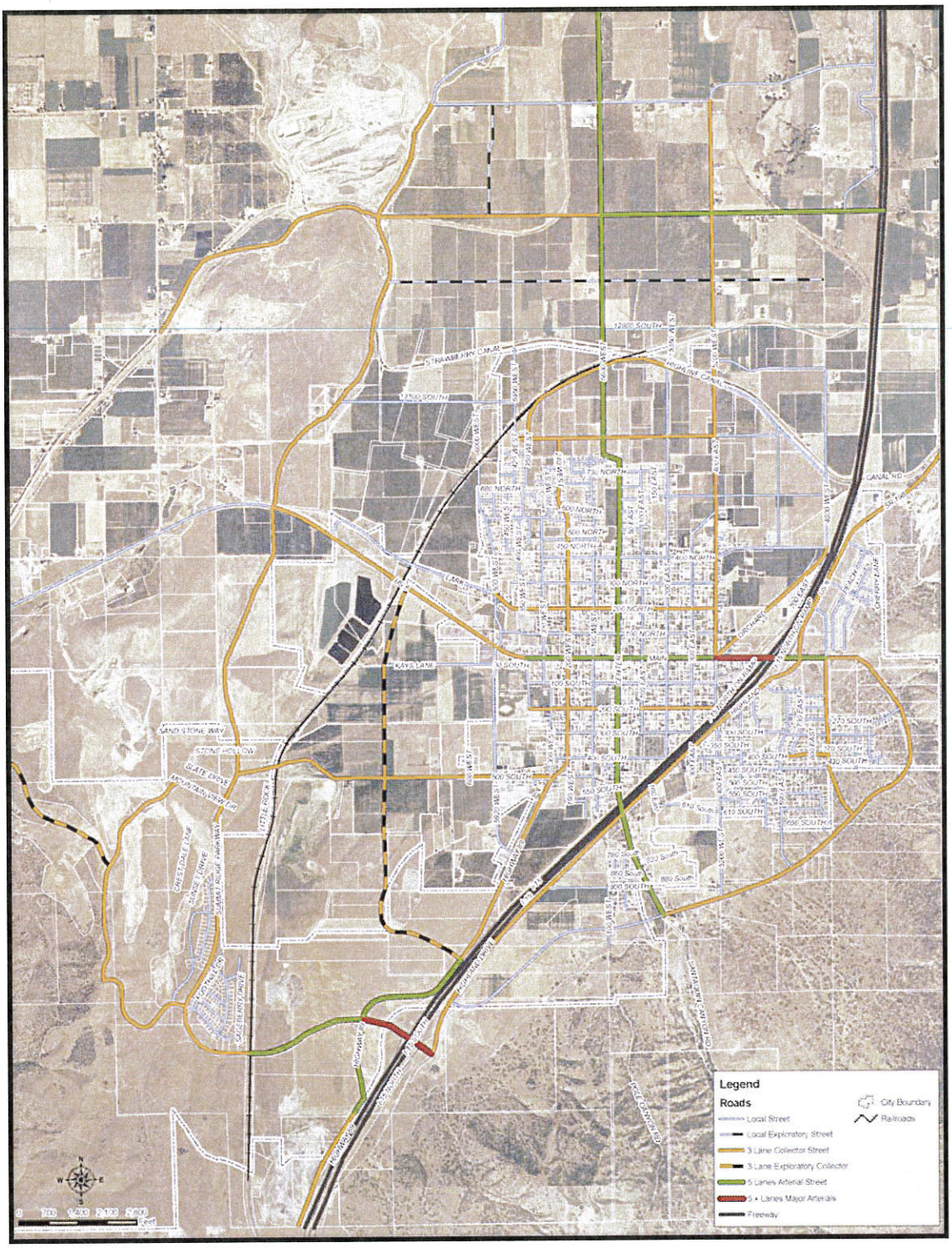


Figure 6.1 **Proposed 2030 Roadway Network**

6.1 No-Build

The No-Build scenario assumes that the existing road network and traffic control devices would remain as they are, with only maintenance and minor modifications occurring. This condition was analyzed using traffic projections from the land use build-out numbers. Under this scenario, all study area intersections and roadway are projected to operate below acceptable levels of service. The US-6 corridor and the Summit Ridge interchange were included in the no-build scenario to demonstrate the performance of the "no-build" network. Results of the capacity analysis are identified in Figure 6.2

Table 6-3 Study Area Intersection Capacity Analysis - No-Build Scenario

Intersections		Projected 2030 LOS
US-6	Highland	F
US-6	I-15	F
US-6	400 East	F
US-6	Center Street	F
US-6	200 West	F
US-6	500 West	F
I-15	Main Street	F
I-15	Summit Ridge	F

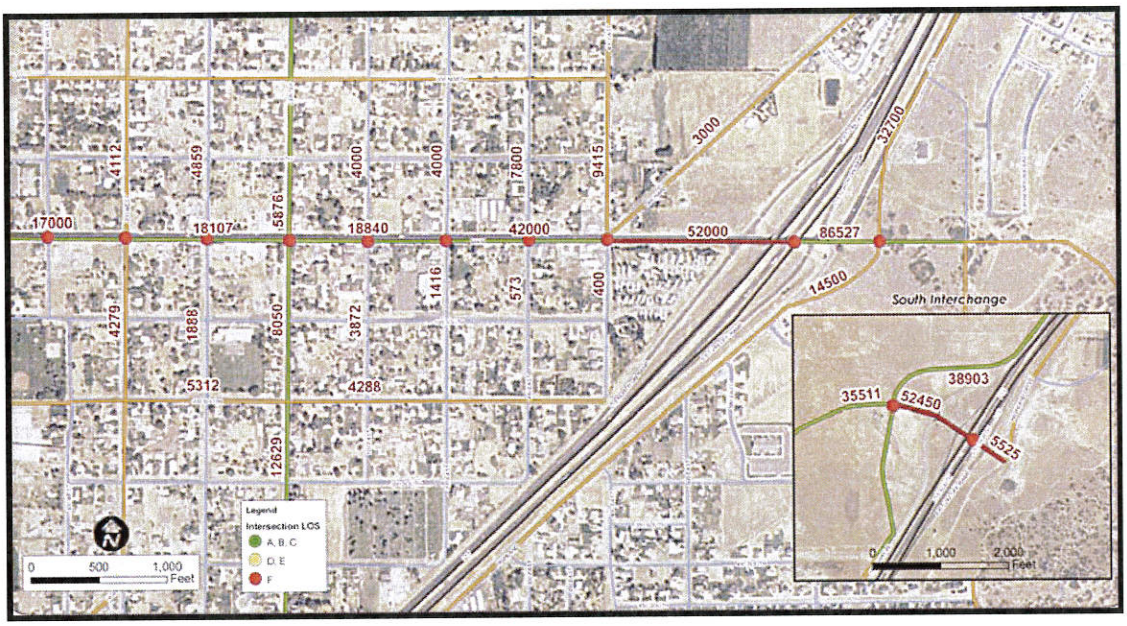


Figure 6.2 No-Build Scenario Capacity

6.2 Upgraded Network without 12400 South Interchange and without TOD

Transportation network upgrades were identified by taking the currently proposed 2030 road network and then including upgraded traffic control devices at the necessary intersections and adjusting functional classifications as necessary for applicable roads. The roadway improvements applied were based on the traffic volume data from the build-out travel demand model but did not include the 12400

South interchange or any improvements related to the TOD zone. The average daily traffic volumes and the required improvements for the 2030 upgrade scenario are illustrated in Figure 6.3.

It is important to note that the proposed intersection signalization at Main Street and the I-15 interchange would occur on Utah Department of Transportation (UDOT) roadways. Participation by and approval from UDOT would be required to construct these upgrades.

The traffic volumes described earlier and illustrated in Figure 6.3 were analyzed to determine the operating conditions of the 2030 roadway network for this scenario. This analysis was conducted using the Synchro modeling software. Results of the intersection capacity analysis are summarized in Table 6-4. Under this scenario, most of the study area intersections are projected to operate at acceptable levels of service. The only intersection projected to operate at unacceptable levels of service is the Summit Ridge and I-15 interchange, which will operate at a LOS E in 2030. The only other intersection projected to operate at unacceptable levels of service is US-6 and 400 East, which is projected to operate and LOS D. While these may represent conditions worse than residents are accustomed to, a level of service D is an acceptable level of service in built-out urban environments.

Figure 6.3 Proposed 2030 Roadway Network without 12400 South Interchange, without TOD

6.3 Upgraded Network with 12400 South Interchange and without TOD

This scenario involved taking the proposed 2030 roadway network, upgrading traffic control devices at necessary intersections, and adjusting functional classifications as necessary to accommodate the projections of the scenario. The improvements were determined based on the traffic volume data from the build-out travel demand model with the assumption that the 12400 South interchange will be built but did not include development of the proposed TOD. The average daily traffic volumes and the projected improvements for this scenario are illustrated in Figure 6.4.

This scenario includes traffic projections for the year 2030 network with upgrades to operating conditions at intersections throughout the study area. Results of the intersection capacity analysis are summarized in Table 6-4. Under this scenario, most of the study area intersections are projected to operate at acceptable levels of service. The intersection of Summit Ridge and the I-15 interchange is projected to operate at a LOS E in 2030. The only other intersection that is projected to operate at an unacceptable level is US-6 and 400 East, which is projected to operate at LOS D. While these may represent conditions worse than residents are accustomed to, a level of service D is an acceptable level of service in built-out urban environments.

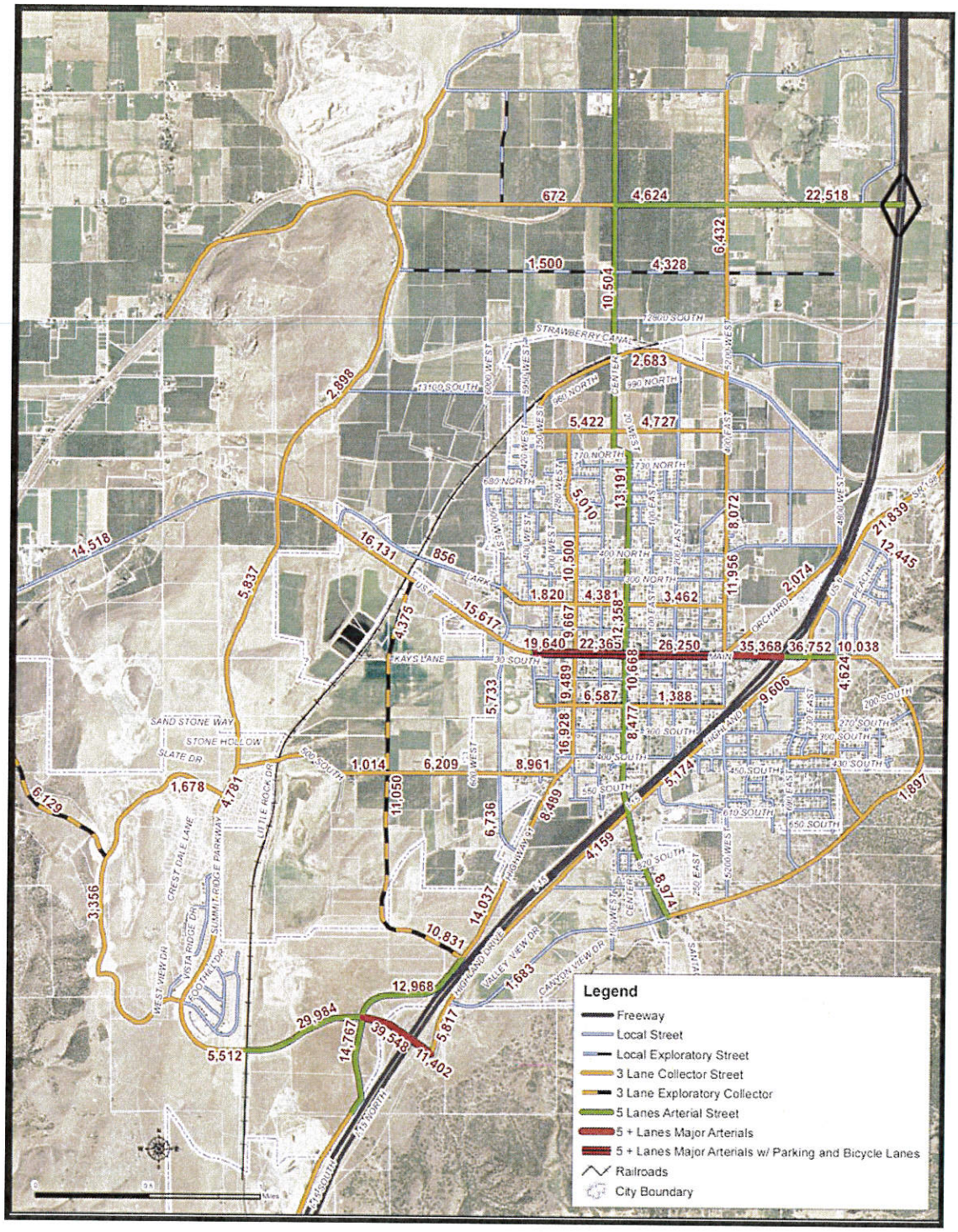


Figure 6.4 **Proposed 2030 Roadway Network with 12400 South Interchange, without TOD**

6.4 Upgraded Network with 12400 South Interchange and with TOD

This scenario involved taking the proposed 2030 road network, upgrading traffic control devices at necessary intersections, and adjusting functional classifications as necessary to accommodate the projections of the scenario. The improvements were determined based on the traffic volume data from the build-out travel demand model with the assumption that the 12400 South and I-15 interchange is constructed and the TOD zone is built-out. The average daily traffic volumes and the projected roadway improvements for the 2030 upgrade scenario are illustrated in Figure 6.5.

Traffic volumes for this scenario were evaluated to determine the 2030 network operating conditions. Table 6-4 identifies the level of service for the year 2030 network operating conditions including roadway and intersection upgrades to the intersections throughout the study area. Under this scenario, most of the study area intersections are projected to operate at acceptable levels of service. The intersection of Summit Ridge and the I-15 interchange is projected to operate at a LOS E in 2030. The only other intersection that is projected to operate at an unacceptable level is US-6 and 400 East, which is projected to operate at LOS D. While these may represent conditions worse than residents are accustomed to, a level of service D is an acceptable level of service in built-out urban environments.

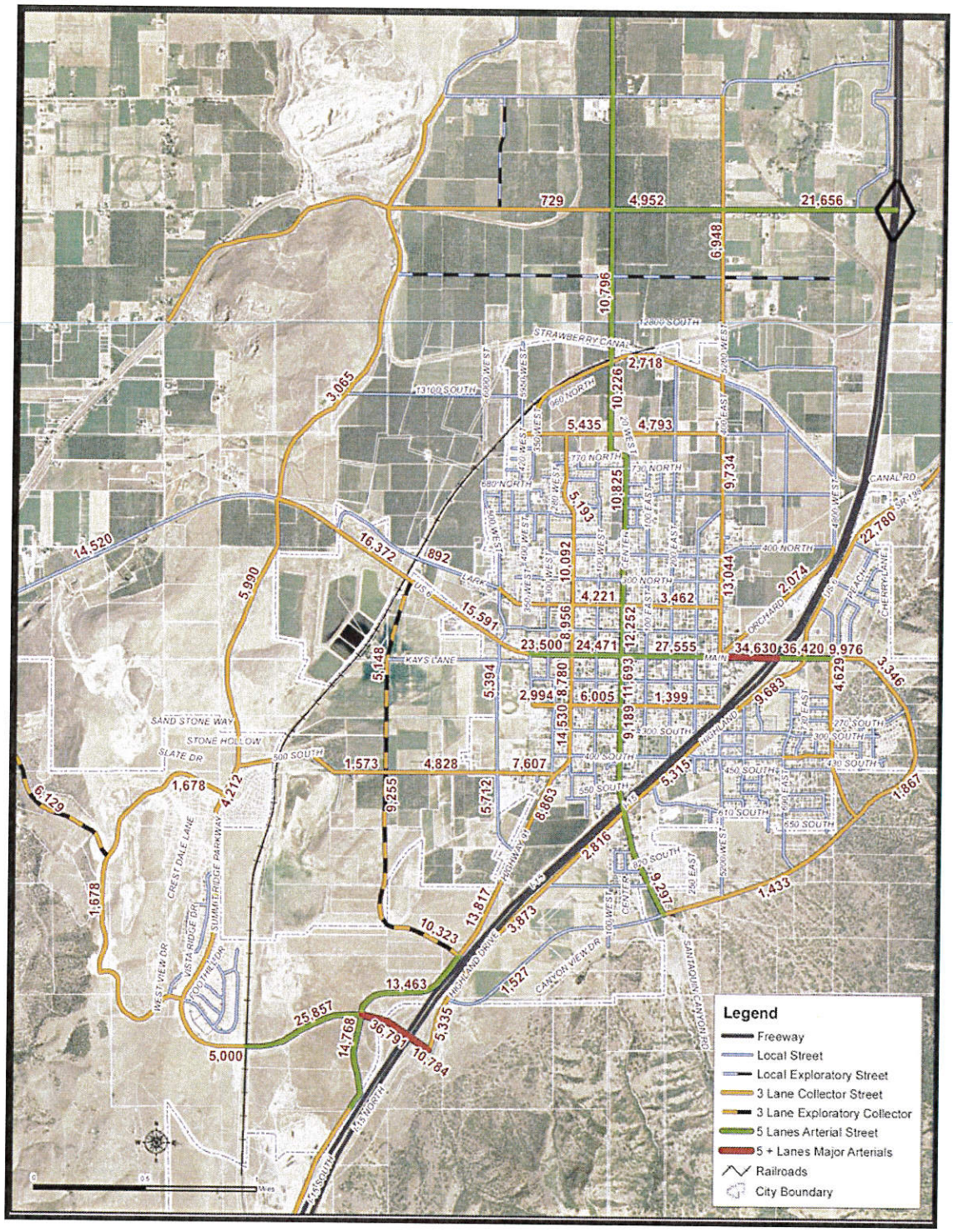


Figure 6.5 Proposed 2030 Roadway Network with 12400 South Interchange and TOD

6.5 Upgraded Network without 12400 South Interchange and with TOD

This scenario involved taking the proposed 2030 road network, upgrading traffic control devices at necessary intersections, and adjusting the functional classifications as necessary to accommodate the projections of the scenario. The improvements were determined based on the traffic volume data from the build-out travel demand model with the assumption that the 12400 South and I-15 interchange was not constructed, but that the TOD zone did develop to full build-out. The average daily traffic volumes and the projected improvements for the 2030 upgrade scenario are illustrated in Figure 6.6.

Traffic volumes for this scenario were evaluated to determine the 2030 network operating conditions with upgrades. Table 6-4 identifies the level of service for the year 2030 network operating conditions including roadway and intersection upgrades throughout the study area. Under this scenario, most of the study area intersections are projected to operate at acceptable levels of service. The intersection of Summit Ridge and the I-15 interchange is projected to operate at a LOS E in 2030 and the intersection of US-6 and 400 East is projected to operate at a LOS D. While these may represent conditions worse than residents are accustomed to, a level of service D is an acceptable level of service in built-out urban environments.

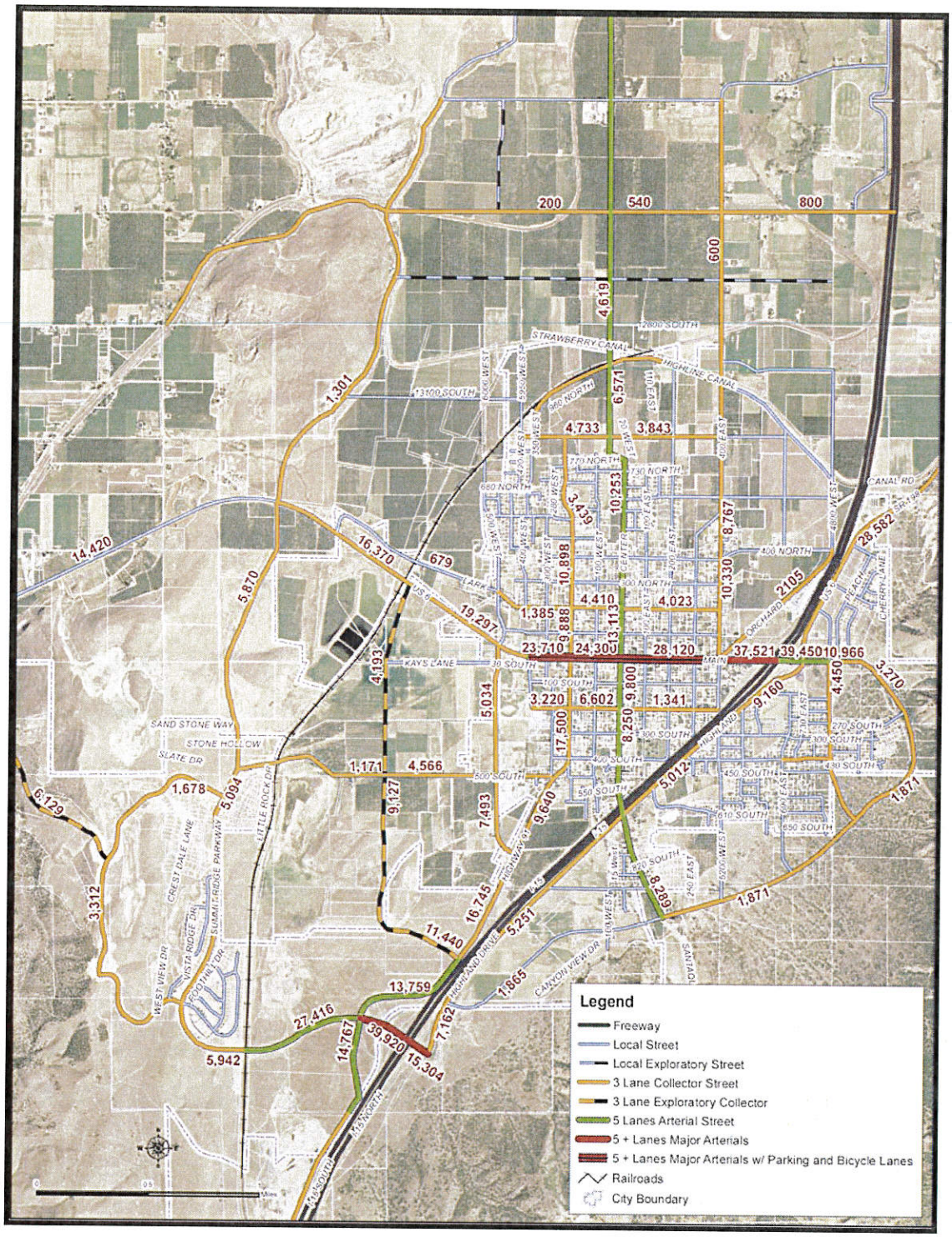


Figure 6.6 Proposed 2030 Roadway Network without 12400 South Interchange and with TOD

6.6 Summary

The following five scenarios were analyzed for the year 2030:

1. No-Build.
2. Upgraded Network without the 12400 South Interchange and without TOD.
3. Upgraded Network with the 12400 South Interchange and without TOD.
4. Upgraded Network without the 12400 South Interchange and with TOD.
5. Upgraded Network with the 12400 South Interchange and with TOD.

Under the No-Build scenario, all intersections and roads are projected to operate at unacceptable levels of service in 2030. In all other scenarios, the proposed 2030 roadway network will operate at acceptable levels of service with the exception of the intersections of Summit Ridge and the I-15 interchange, and US-6 and 400 East. The intersection of US-6 and Highland is projected to fail in all scenarios if no improvements are made to the intersection geometry. The recommendations section of this plan addresses the high volume of traffic traveling from eastbound US-6 to northbound Highland or using SR-198. That section also addresses the close proximity of the intersections to the I-15 interchange. The level of service results for each scenario are shown in Table 6-4.

Table 6-4 LOS Performance for Build Scenarios

Intersections		Signalized Intersection Capacity			
		Without 12400 So. Without TOD	With 12400 So. Without TOD	With 12400 So. With TOD	Without 12400 So. With TOD
Santaquin Canyon	Highland	A	A	A	A
Center Street	200 South	B	B	B	B
Center Street	200 North	B	B	B	B
Center Street	13000 South	B	B	B	B
Center Street	12400 South	N/A	B	B	N/A
200 West	200 North	B	B	B	B
400 East	200 North	B	B	B	B
Summit Ridge	Highway 89	B	B	B	B
5920 West	Highway 89	B	B	B	B
5920 West	500 South	B	B	B	B
Highway 89	500 South	B	B	B	B
3-lane Exploratory Collector	500 South	B	B	B	B
Highway 89	3-lane Exploratory Collector	B	B	B	B
US-6	Highland	F	F	F	F
US-6	I-15	B	B	B	B
US-6	400 East	D	D	D	D

Intersections		Signalized Intersection Capacity			
		Without 12400 So. Without TOD	With 12400 So. Without TOD	With 12400 So. With TOD	Without 12400 So. With TOD
US-6	Center Street	B	B	B	B
US-6	200 West	B	B	B	B
US-6	500 West	B	B	B	B
US-6	Business Park	B	B	B	B
US-6	3-lane Exploratory Collector	B	B	B	B
I-15	Main Street	C	C	C	C
I-15	12400 South	N/A	C	C	N/A
I-15	Summit Ridge	E	E	E	E
400 East	12400 South	N/A	B	B	N/A

The future development of the 12400 South Interchange and the TOD Zone will have a future impact on the transportation network. The traffic analysis identifies that the proposed 12400 South Interchange will increase the city's traffic by approximately 10%, but it will provide for a reduction in traffic volume on Main Street by 5-10%, compared to the scenarios where the interchange was not built. The proposed TOD Zone will provide for a reduction of approximately 10,209 daily vehicle trips on the City's road networks compared to that same zone if transit oriented design elements were not developed, but will the TOD zone adds approximately 3,420 homes, due to the increases in density, within acceptable walking distances of planned transit and commercial developments.

The scenario "Upgraded Network with the 12400 South Interchange and with TOD" has the highest future travel demand, but also has the lowest daily traffic volumes on the proposed 2030 roadway network.

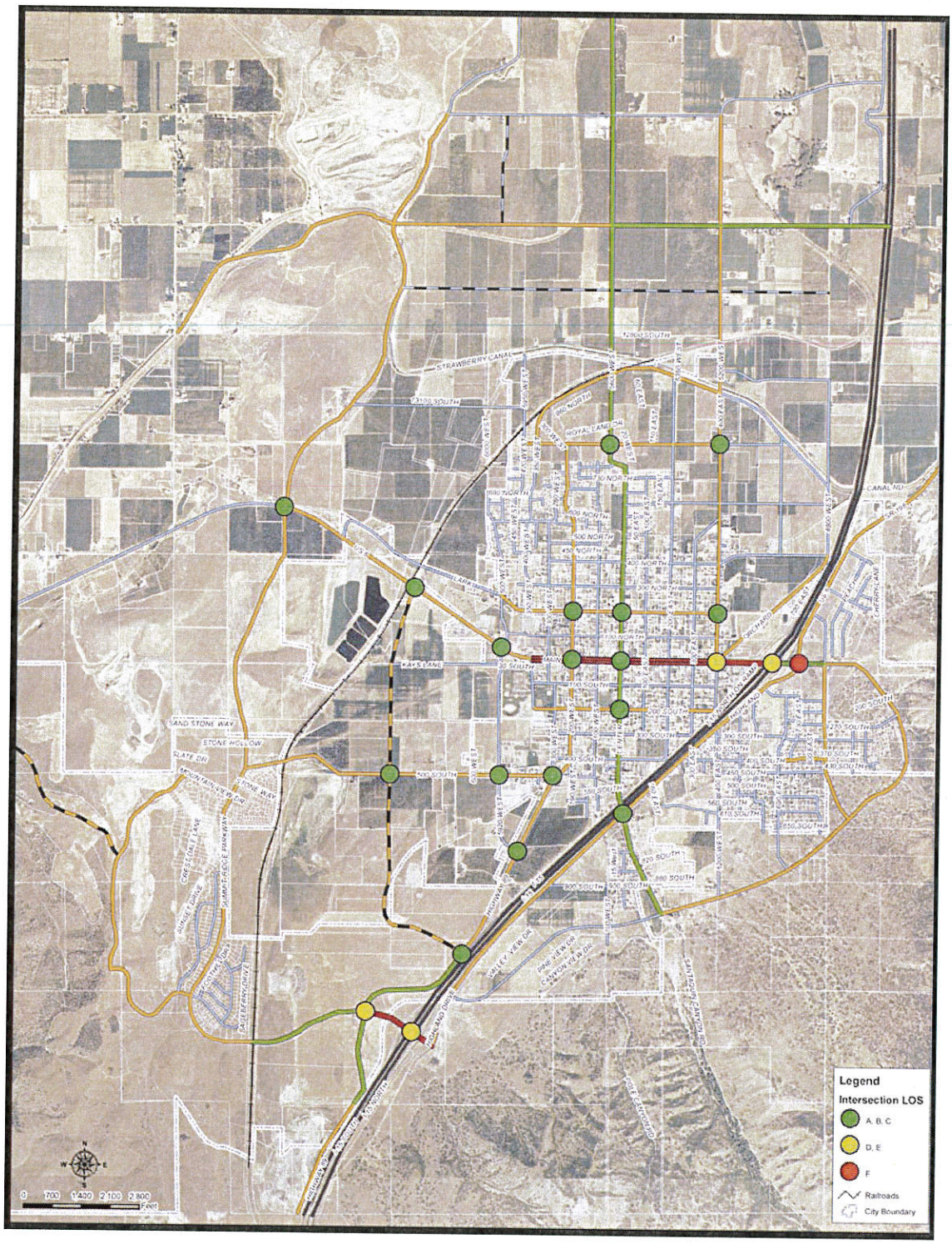


Figure 6.7 **Projected LOS in 2030**

7 - Capital Improvement Plan

Based on the results of the level of service analysis, a list of future roadway and intersection projects was prepared. These projects are separated into four categories: projects on City roads; projects on roads managed by UDOT (on US-6 and SR-198); railroad crossing projects; and projects to be completed by developers. The projects include all required improvements necessary to achieve a functional transportation system.

Tables 7-1, 7-2, and 7-4 through 7-8 exhibit a list of road segment upgrades and projected costs through the year 2030 for existing and collectors and arterials.

The 2009 price for ROW in Santaquin is estimated to be $8 per square foot. Cost estimates were developed for collector and arterial roadway construction, consistent with the City's typical street section standards, including curb, gutter and 6' sidewalks on each side. The road segments are listed in the order they are projected to be implemented. Costs are based on 2009 prices, and will invariably increase over time.

Table 7-3 identifies four additional traffic signals that may be needed on access roads in future commercial areas. These costs are not included in this capital plan because it is assumed that future developers would pay the construction costs.

It is recommended that each major development continue to be subject to safe engineering principles and that the most significant developments should be required to perform a site-specific traffic impact analysis. For the purposes of this study, it is assumed that each development will be required to provide sufficient connections the existing roadway network, subject to the review and approval by the City Planning Commission and/or City Council approval.

Figure 7.1 Illustrated Capital Improvement Plan - New Road/Facility Projects

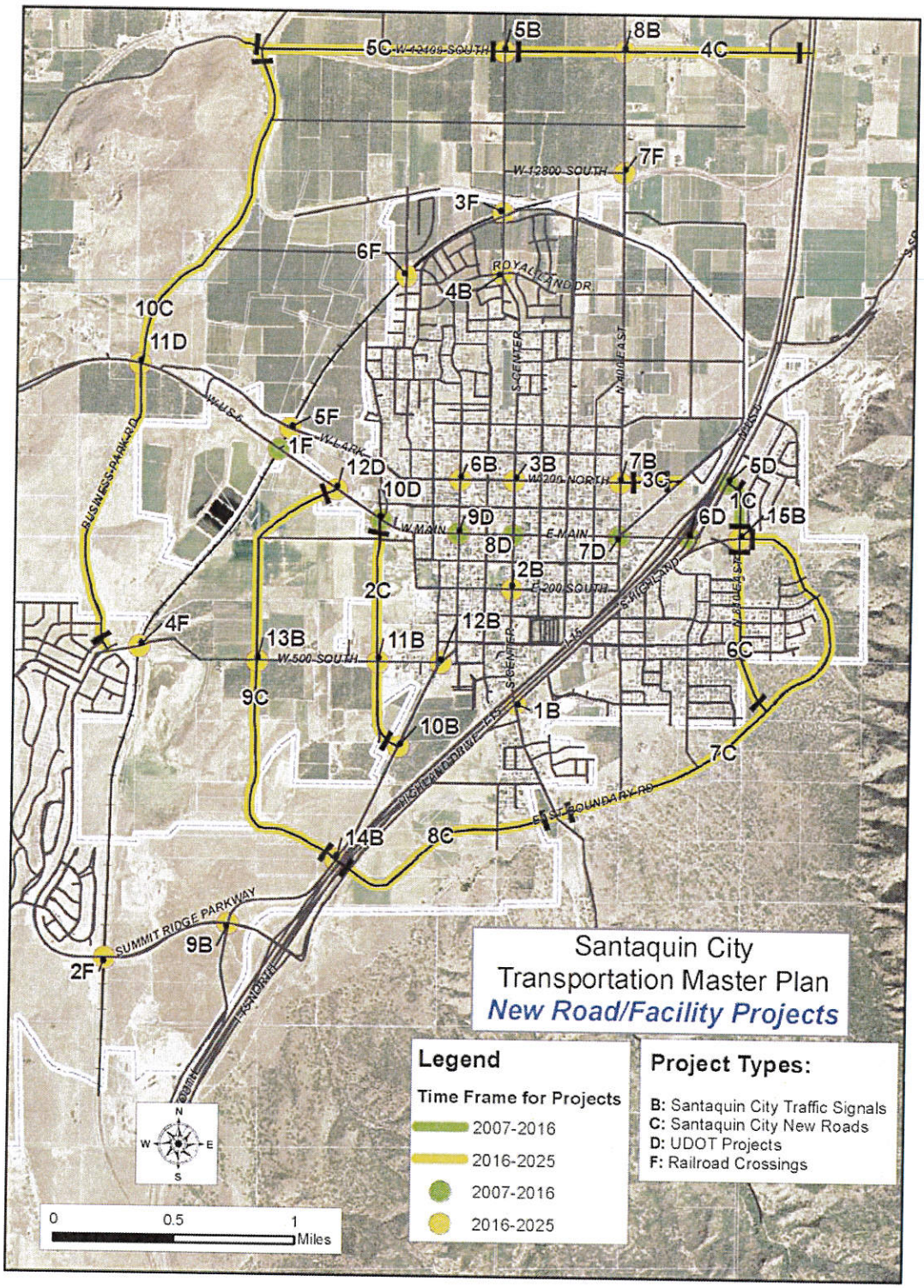


Figure 7.2 Illustrated Capital Improvement Plan - Widening Projects

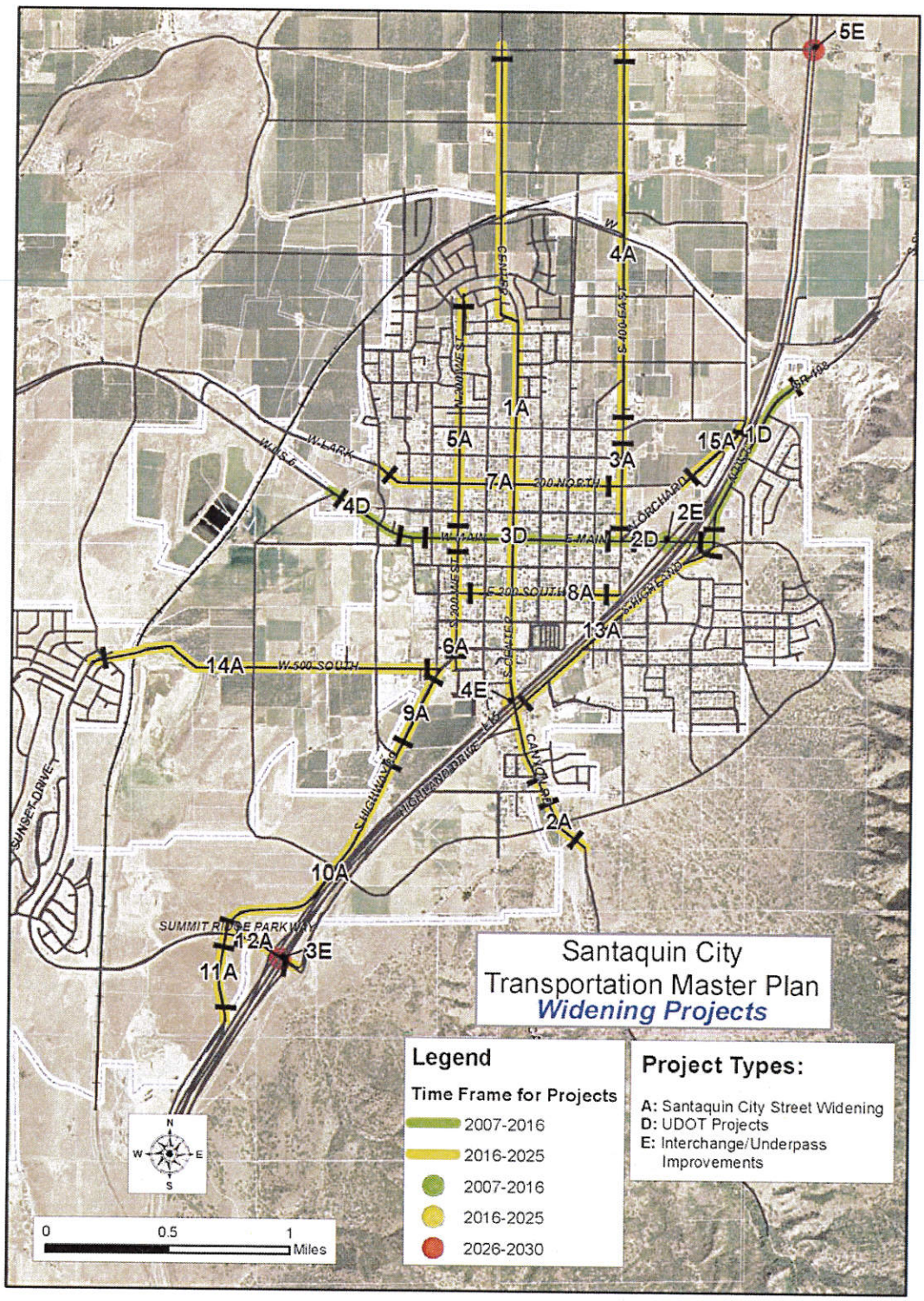


Table 7-1 Road Improvement Project List and Costs: Santaquin City Widening

Period	#	Road	From	To	Length (ft.)	Functional Classification	Total Reconstruction Average Cost/Feet	ROW Cost $8 per sq. ft.	Total Construction Cost	Total
2016-2025	1A	Center Street	900 South	12400 South	16,233	5-lane Arterial	$1,632	$5,342,432.00	$26,489,292.12	$31,831,724.12
	2A	Santaquin Canyon	East City Boundary	900 South	1,536	3-lane Collector with ROW for Parking & Bike Lane	$1,632	$516,096.00	$2,506,471.55	$3,022,567.55
	3A	400 East	Main Street	400 North	3,876	5-lane Arterial	$1,632	$1,575,536.00	$6,324,924.31	$7,900,460.31
	4A	400 East	400 North	12400 South	8,163	3-lane Collector	$1,175	$23,072.00	$9,591,486.23	$9,614,558.23
	5A	200 West	Main Street	900 North	6,120	3-lane Collector	$1,175	$297,600.00	$7,190,970.93	$7,488,570.93
	6A	200 West	500 South	Main Street	3,000	5-lane Arterial	$1,632	$499,520.00	$4,895,452.25	$5,394,972.25
	7A	200 North	400 East	500 West	5,390	3-lane Collector	$1,175	$33,408.00	$6,333,224.40	$6,366,632.40
	8A	200 South	200 West	400 East	3,540	3-lane Collector	$1,175	$0.00	$4,159,483.19	$4,159,483.19
	9A	Highway 89	5920 West	500 South	2,585	5-lane Arterial	$1,632	$165,440.00	$4,218,248.02	$4,383,688.02
	10A	Highway 89	Summit Ridge	5920 West	2,651	5- lane Arterial	$1,632	$1,110,480.00	$4,325,947.97	$5,436,427.97
	11A	Highway 89	South City Boundary	Summit Ridge	3,520	5- lane Arterial	$1,632	$844,800.00	$5,743,997.31	$6,588,797.31
	12A	Summit Ridge	Highland	Highway 89	1,820	7- lane Arterial	$2,098	$980,800.00	$3,818,737.80	$4,799,537.80
	13A	Highland	Santaquin Canyon	Main Street	5,570	3-lane Collector	$1,175	$142,560.00	$6,544,723.54	$6,687,283.54
	14A	500 South	Highway 89	Summit Ridge Parkway	6,800	3-lane Collector	$1,175	$1,704,640.00	$7,989,967.70	$9,694,607.70
	15A	Orchard	400 North	200 North	2,000	3-lane Collector	$1,175	$0.00	$2,349,990.50	$2,349,990.50
SUBTOTAL								**$13,236,384**	**$102,482,918**	**$115,719,302**

Table 7-2 Road Improvement Project List and Costs: Santaquin City Traffic Signals

Period	#	Intersection		Total Reconstruction Average Cost/Feet	Total Construction Cost	Total
2016-2025	1B	Santaquin Canyon	Highland	$300,000	$300,000	$300,000
	2B	Center Street	200 South	$300,000	$300,000	$300,000
	3B	Center Street	200 North	$300,000	$300,000	$300,000
	4B	Center Street	Royal Land Drive	$300,000	$300,000	$300,000
	5B	Center Street	12400 South	$300,000	$300,000	$300,000
	6B	200West	200 North	$300,000	$300,000	$300,000
	7B	400 East	200 North	$300,000	$300,000	$300,000
	8B	400 East	12400 South	$300,000	$300,000	$300,000
	9B	Summit Ridge	Highway 89	$300,000	$300,000	$300,000
	10B	5920 West	Highway 89	$300,000	$300,000	$300,000
	11B	5920 West	500 South	$300,000	$300,000	$300,000
	12B	Highway 89	500 South	$300,000	$300,000	$300,000
	13B	3-lane Exploratory Collector	500 South	$300,000	$300,000	$300,000
	14B	Highway 89	3-lane Exploratory Collector	$300,000	$300,000	$300,000
	15B	840 East	Highland	$300,000	$300,000	$300,000
SUBTOTAL					**$4,500,000**	**$4,500,000**

Table 7-3 Traffic Signals Paid for by Others

#	Major Road	Crossing Road
CM1	Summit Ridge	Commercial Access Rd.
CM2	Planned 3-lane Exploratory Collector	Commercial Access Rd.
CM3	Summit Ridge	Highland Rd.
CM4	US 6	Commercial Access Rd. or Cherry Lane

Table 7-4 Road Improvement Project List and Costs: Santaquin City New Roads

#	Period	Road	From	To	Length (ft.)	Functional Classification	2008 Total Reconstruction Average Cost/Feet	ROW Cost $8 per sq. ft.	Total Construction Costs	Total
1C	2007-2016	840 East	US 6	Highland	1,230	5-lane Arterial	$1,632	$621,600.00	$2,007,135.42	$2,628,735.42
2C	2016~2025	5290 West	Main Street	Highway 89	6,000	3-lane Collector	$1,175	$0.00	$7,049,971.50	$7,049,971.50
3C	2016~2025	200 North	400East	Orchard	1,200	3-lane Collector	$1,632	$633,600.00	$1,958,180.90	$2,591,780.90
4C	2016~2025	12400 South	I-15	Center Street	6,600	5-lane Arterial	$1,632	$4,329,600.00	$10,769,994.95	$15,099,594.95
5C	2016~2025	12400 South	Center Street	Highway 141	5,860	3-lane Collector	$21,285	$3,094,080.00	$124,727,609.50	$127,821,689.50
6C	2016~2025	840 East	Main Street	East South Boundary	3,860	3-lane Collector	$1,175	$0.00	$4,535,481.67	$4,535,481.67
7C	2016~2025	East Boundary Road	Highland	Santaquin Canyon	10,560	3-lane Collector	$1,175	$0.00	$12,407,949.84	$12,407,949.84
8C	2016~2025	Parkside Drive	Santaquin Canyon	Highland	5,702	Local	$1,175	$0.00	$6,699,822.92	$6,699,822.92
9C	2016~2026	3-lane Exploratory Collector	Main Street	Highway 89	16,000	3-lane Collector	$1,175	$8,448,000.00	$18,799,924.00	$27,247,924.00

#	Period	Road	From	To	Length (ft.)	Functional Classification	2008 Total Reconstruction Average Cost/Feet	ROW Cost $8 per sq. ft.	Total Construction Costs	Total
10C	2016~2026	Business Park Rd.	500 South	12400 South	13,728	3-lane Collector	$1,175	$7,248,384.00	$16,130,334.79	$23,378,718.79
SUB TOTAL								**$38,979744**	**$246,147,789**	**$285,127,533**

Table 7-5 Road Improvement Project List and Costs: UDOT

#	Period	Road	From	To	Length (ft.)	Functional Classification	2008 Total Reconstruction Average Cost/Feet	ROW Cost $8 per sq. ft.	Total Construction Costs	Total
1D	2007-2016	SR198	East City Boundary	Highland	10,900	5-lane Arterial	$1,632	$1,395,200	$17,786,809.84	$19,182,009.84
2D	2007-2016	US 6	Highland	400East	1,940	7-lane Arterial	$2,098	$190,080	$4,070,522.71	$4,260,602.71
3D	2007-2016	US 6	400 East	400 West	4.752	5-lane Arterial with ROW for Parking and Bike Lane	$2,098	$722,304	$9,970,682.44	$10,692,986.44
4D	2007-2016	US 6	400 West	West City Boundary	15,840	Collector	$1,175	$509,280	$18,611,924.76	$19,121,204.76
5D	2007-2017	US 6	840 East		Traffic Signal		$300,000		$300,000	$300,000
6D	2007-2016	US 6	I-15		Traffic Signal		$300,000		$300,000	$300,000
7D	2007-2016	US 6	400 East		Traffic Signal		$300,000		$300,000	$300,000
8D	2007-2016	US 6	Center Street		Traffic Signal		$300,000		$300,000	$300,000
9D	2007-2016	US 6	200 West		Traffic Signal		$300,000		$300,000	$300,000

#	Period	Road	From	To	Length (ft.)	Functional Classification	2008 Total Reconstruction Average Cost/Feet	ROW Cost $8 per sq. ft.	Total Construction Costs	Total
10D	2007-2016	US 6	500 West			Traffic Signal	$300,000		$300,000	$300,000
11D	2016 - 2025	US 6	Business Park			Traffic Signal	$300,000		$300,000	$300,000
12D	2016 - 2025	US 6	3-lane Exploratory Collector			Traffic Signal	$300,000		$300,000	$300,000
SUBTOTAL								**$2,816,864**	**$52,839,940**	**$55,656,804**

Table 7-6 Interchange and Underpass Improvements: UDOT

#	Period	Road	From	To	Functional Classification	Total Construction Cost	Total
2E	2007-2016	I 15	Main Street	Main Street	Upgrade to SPUI Interchange with Traffic Signal	$50,000,000	$50,000,000
3E	2026-2030	I 15	Summit Ridge	Summit Ridge	Upgrade to SPUI Interchange with Traffic Signal	$50,000,000	$50,000,000
4E	2016~2025	I 15	Santaquin Canyon	Santaquin Canyon	Widening I -15 Underpass for Center Street	$20,000,000	$20,000,000
5E	2026-2030	I 15	12400 South	12400 South	New Interchange with Traffic Signal	$83,000,000	$83,000,000
1F	2007-2016	US_6			Widening to 4-Lane Overpass, Railroad Crossing	$25,000,000	$25,000,000
SUBTOTAL						**$228,000,000**	**$228,000,000**

Table 7-7 Road Improvement Project List and Costs: Railroad Crossings

#	Period	Road	Description	2008 Total Reconstruction Average Cost/Feet	2008 Total Construction Costs	Total
2F	2016-2025	Summit Ridge	Use Existing Overpass	$0.00	$0.00	$0.00
3F	2016-2025	Center Street	New Railroad Crossing	$100,000	$100,000.00	$100,000.00
4F	2016-2025	500 South	Widening to 4-Lane Overpass	$25,000,000	$25,000,000.00	$25,000,000.00
5F	2016-2025	Lark	New Railroad Crossing	$100,000	$100,000.00	$100,000.00
6F	2016-2025	420 West	New Railroad Crossing	$100,000	$100,000.00	$100,000.00
7F	2016-2025	400 East/ 12800 South	New Railroad Crossing	$100,000	$100,000.00	$100,000.00
SUBTOTAL					**$25,400,000**	**$25,400,000**

Table 7-8 Road Improvement Project List and Costs: Summary

Totals			
Table	ROW Cost	Construction Cost	TOTAL
7-1 Santaquin City Widening	$13,236,384	$102,482,918	$115,719,302
7-2 Santaquin City Traffic Signals	$0	$4,500,000	$4,500,000
7-4 Santaquin City New Roads	$38,979,744	$246,147,789	$285,127,533
7-5 UDOT	$2,816,864	$52,839,940	$55,656,804
7-6 Interchange and Underpass Improvements (UDOT)	$0	$228,000,000	$228,000,000
7-7 Railroad Crossings	$0	$25,400,000	$25,400,000
TOTAL COST	$55,032,992	$659,370,647	$714,403,639

Table 7-9 Road Improvement Project List and Costs: Totals

Totals			
	UDOT/Other	Santaquin City	TOTAL
ROW Cost	$2,816,864	$52,216,128	$55,032,992
Construction	$280,839,940	$378,530,707	$659,370,647
TOTAL COST	$283,656,804	$430,746,835	$714,403,639

Table 7-10 Planned Road Improvements to be Paid for by Others

#	Road	From	To	Length (ft.)	Functional Classification	New Rd.
L1	12000 South	HWY 141	4800 West	10,560	Major Local	Yes
L2	13100 South	HWY 141	5950 West	3,854	Major Local	Yes
L3	W Lark Rd	US 6	500 West	4,330	Major Local	No
L4	Kays Lane	Planned 3-lane Exploratory Collector	350 West	4,120	Local	Yes
L5	S Highline Canal Rd	400 East	4800 West	3,420	Major Local	Yes
L6	400 North	400 East	4800 West	2,700	Major Local	No
L7	960 North	900 N	400 East	5,397	Major Local	No
L8	900 South	Santaquin Canyon Rd	Highland Dr	2,700	Local	Yes
L9	Cherry Ln	E Lambert Ave	East Boundary Rd	1,500	Major Local	Yes
L10	4800 West	680 North	400 North	1,531	Major Local	No
L11	610 North	200 East	4800 West	3,732	Major Local	Yes
L12	900 North	200 East	5200 West	1,550	Major Local	Yes

#	Road	From	To	Length (ft.)	Functional Classification	New Rd.
L13	Highland	Santaquin Canyon	Summit Ridge	7,286	3-lane Collector	Yes
L14	13000 South	400 East	420 West	5,000	3-lane Collector	Yes
L15	Foothill Dr. and West View Dr.	500 South	Summit Ridge	22,660	3-lane Collector	Yes

Table 7-11 Roadway Unit Construction Cost Estimation

SANTAQUIN TRANSPORTATION MASTER PLAN				
Arterial Street per 100' of Roadway - 5,7 Lanes				
ITEM	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
Clearing and Grubbing	ACRE	0.30	$1,500.00	$450
Roadway Excavation	CY	1050	$15.00	$15,750
Granular Borrow (10" thick)	TON	525	$25.00	$13,125
Untreated Road Base (10" thick)	TON	567	$30.00	$17,000
Hot Mix Asphalt (4" thick)	SF	10000	$3.00	$30,000
30" Concrete Curb & Gutter	LF	200	$25.00	$5,000
6' Concrete Sidewalk	SF	1200	$10.00	$12,000
Topsoil (6" thick)	TON	29	$40.00	$1,160
Turf Sod	SF	1000	$3.00	$3,000
Misc. Utilities	LS	1	$1,666.67	$1,667
Drainage	LF	100	$100.00	$10,000
		SUBTOTAL		$109,152
Contingency, Unlisted Items and Preconstruction (30%)				$32,746
		SUBTOTAL		$141,897
Mobilization (10%) & Traffic Control (5%)				$21,285
		TOTAL		$163,182
				cost/foot
				$1,632
Arterial Street per 100' of Roadway - 7 Lanes				
Collector Street per 100' of Roadway - 3 Lanes				
Clearing and Grubbing	ACRE	0.42	$1,500.00	$630
Roadway Excavation	CY	1470	$15.00	$22,050
Granular Borrow (10" thick)	TON	735	$25.00	$18,375
Untreated Road Base (10" thick)	TON	793	$30.00	$23,800
Hot Mix Asphalt (4" thick)	SF	14000	$3.00	$42,000
30" Concrete Curb & Gutter	LF	200	$25.00	$5,000
6' Concrete Sidewalk	SF	1200	$10.00	$12,000
Topsoil (6" thick)	TON	29	$40.00	$1,160
Turf Sod	SF	1000	$3.00	$3,000
Misc. Utilities	LS	1	$2,333.33	$2,333
Drainage	LF	100	$100.00	$10,000
		SUBTOTAL		$140,348
Contingency, Unlisted Items and Preconstruction (30%)				$42,105
		SUBTOTAL		$182,453
Mobilization (8%)				$27,368
		TOTAL		$209,821
				cost/foot
				$2,098

Collector Street per 100' of Roadway - 3 Lanes				
ITEM	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
Clearing and Grubbing	ACRE	0.18	$1,500.00	$270
Roadway Excavation	CY	630	$15.00	$9,450
Granular Borrow (10" thick)	TON	315	$25.00	$7,875
Untreated Road Base (10" thick)	TON	340	$30.00	$10,200
Hot Mix Asphalt (4" thick)	SF	6000	$3.00	$18,000
30" Concrete Curb & Gutter	LF	200	$25.00	$5,000
6' Concrete Sidewalk	SF	1200	$10.00	$12,000
Topsoil (6" thick)	TON	30	$40.00	$1,200
Turf Sod	SF	1200	$3.00	$3,600
Misc. Utilities	LS	1	$1,000.00	$1,000
Drainage	LF	100	$100.00	$10,000
		SUBTOTAL		$78,595
Contingency, Unlisted Items and Preconstruction (30%)				$23,579
		SUBTOTAL		$102,174
Mobilization (8%)				$15,326
		TOTAL		$117,500
				cost/foot
				$1,175

8 - Conclusions and Recommendations

The population of Santaquin City is projected to exceed 40,000 people within the next 20 years. It is also anticipated that automobiles will remain the main mode of travel. It is expected that traffic volumes will correspondingly increase. In order to project where the increased traffic will originate, and which roads will be most impacted and the extent of the impact, an analysis of several different factors is required. These contributing factors are as follows:

- Future Land Development: It must be determined, based on the City's General Plan, where and when each type of development will occur in the City.
- Transportation Corridors and Transit Oriented Development: It needs to be determined where the traffic is going to be carried on the transportation network, so that future improvements can be planned.
- Physical Infrastructure: The condition and maintenance of the roadway network needs to be monitored for sufficiency.

8.1 Access Management

The three main tenets of maintaining an efficient and effective transportation system are safety, mobility, and access. Of these three, access, or the management of access, has the greatest effect on the other two. The more accesses there are along a roadway, the more conflict points there are for vehicles in opposing movements. This results in a decrease in capacity and an increase in accident rates. Furthermore, as the number of accesses increases, the number of vehicles slowing to use the accesses and weaving to reach the accesses increases. These movements cause the through traffic to slow, increase congestion and decrease mobility. It is therefore critical to employ, at a minimum, an access management plan for the collectors and arterials in the City.

UDOT details five criteria that need to be considered when creating an access management plan:

1. **Limit the Number of Conflict Points at Driveway Locations** - Conflict points are good indicators of the potential for accidents. The more conflict points there are at an intersection, the higher the potential for vehicular crashes. When left-turn and cross-street through movements are restricted, the number of conflict points is significantly reduced.
2. **Separate and Define Conflict Areas** - Intersections created by public streets and driveways represent basic conflict areas. Adequate spacing between intersections allows drivers to react to one intersection at a time, and reduce the potential for conflicts. Driveways that are directly opposed lessen the size of the conflict area and define turning movements.
3. **Reduce the Interference to Through Traffic** - Through traffic often needs to slow down for vehicles exiting, entering, or turning across the roadway. Providing turning lanes, designing driveways with large turning radii, and restricting turning movements in and out of driveways allows turning traffic to clear from through traffic.
4. **Providing Sufficient Spacing for Medium Openings Intersections** - Good spacing of intersections and median openings reduces multiple conflict areas and increases the potential for smooth traffic progression. Driver expectation and judgment is eased with uniform roadway and access design.
5. **Provide Adequate Driveway Design and On-Site Circulation and Storage** - Good design of on-site circulation for internal vehicle and pedestrian movements in parking areas and on local streets provides faster and more efficient ingress and egress to the

major road. Proper access and driveway throat design aids in system efficiency. Development can benefit by shared access points.

From these items, some key parameters that should be considered in an access management plan are as follows:

- All new requests for access onto collectors or arterials should consider sharing existing accesses where feasible.
- No new individual residence accesses should be allowed onto collectors or arterials.

For "arterials" the following minimum spacing is recommended:

- Minimum signal spacing—2,640 feet
- Minimum street spacing—660 feet
- Minimum access spacing—350 feet

The UDOT categorization that best resembles a "collector" is Category 8, Community Urban, with the following minimum recommended spacing:

- Minimum signal spacing—1,320 feet
- Minimum street spacing—300 feet
- Minimum access spacing—150 feet

Looking to the future, as traffic volumes on these roads increase, having a workable and adequate access management plan will make all the difference in providing a transportation system that meets mobility needs and safety goals as well as provides for the access needs of individual property owners.

8.2 Intersection Traffic Control Devices

There are two general types of traffic control devices at intersections: signalized and unsignalized. Signalized intersections employ traffic signal systems in order to address the safety and mobility of traffic traversing the intersection. Unsignalized devices include stop signs, yield signs, and modern roundabouts.

Stop signs can be used either in a directional manner (for example a two-way stop) or in an overall application (as in an all way stop). A roundabout is an alternative form of traffic control that maintains continuous flow by using "yield" control at the entrances and not mandating "stop" conditions. Some appropriate conditions for roundabout installation include:

- Four-way stop intersections.
- Intersections with high delays.
- Intersections with more than four legs.
- Intersections with high left-turn flows.
- Intersections where traffic signals are not warranted.
- Intersections with unusual geometry.
- Intersections with changing traffic patterns.
- Intersections where storage capacities for signalized intersections are restricted.
- Intersections that are important from an urban design or visual point of view.

The size of a roundabout is usually referenced by the diameter of its inscribed circle. The diameter of the inscribed circle is generally defined as the distance across a roundabout

(through its center) from face of curb to face of curb. For a residential application, an urban compact roundabout can be used.

8.3 Capital Improvements & Recommended Transportation Road Network Plan

Since the main routes through the City are the two state roads: SR-198 and US-6, the City's future transportation needs are twofold. First, the City needs to plan for improvements and widening of the State routes by using its means to get those roads in the Utah County Long Range Plan and future State Transportation Improvement Programs so that they will have funding for future improvements by UDOT. Second, for City roads, additional budgetary monies will be required for right-of-way purchase and construction of the City's roadway connections.

It is assumed that all roadway upgrades will be to the City Development Standards discussed earlier and shown in Figure 8.1. Figures 8.2 and 8.3 show recommended road cross-sections. Adhering to the City standards, the total projected City costs to upgrade existing roads to the proposed road network over the next 20 years is **$790,711,253** including **$52,216,128** full width right-of-way purchases.

8.4 Intersection Improvements Recommendations

Based on the filed survey and year 2030 LOS analysis, improvements for several intersections are recommended as the following:

- Upgrade from current diamond interchange to single point urban interchange (SPUI) for the two I-15 interchanges at Main Street and Summit Ridge.
- As shown in the Figure 8.2, close Orchard road at the intersection of 400 East and Main Street to make a regular 4-leg intersection; and close 300 West at 500 South; or make it a right in/out only and make a T-intersection of 500 South and 200 West.
- As shown in Figure 8.2, close the connection of 300 West to 500 South and terminate in a cul-de-sac. Then a T-intersection should be constructed with 500 South and 200 West (US-89).
- As shown in the Figure 8.3, extend 840 East to US-6 to make a T-intersection of 840 E and US-6; and close Highland Drive at Main Street and extend it to 840 East to make a 4-leg intersection. The purposes of this reconfiguration are to: move the intersection away from the I-15 interchange; and address the high traffic volume of westbound US-6 to northbound SR-198. If these improvements are made, the LOS for the intersection changes from F to B.

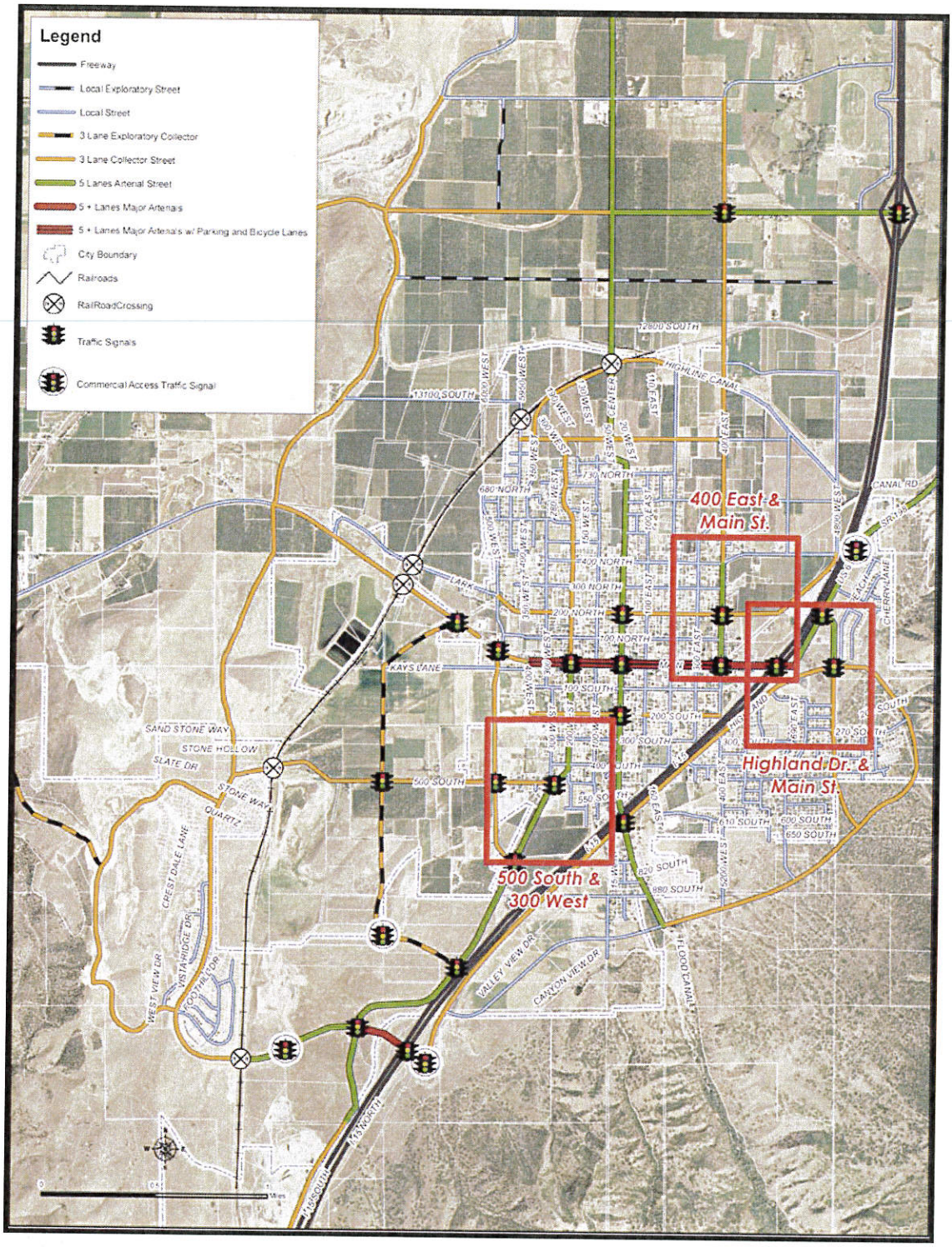


Figure 8.1 Transportation Road Network Plan

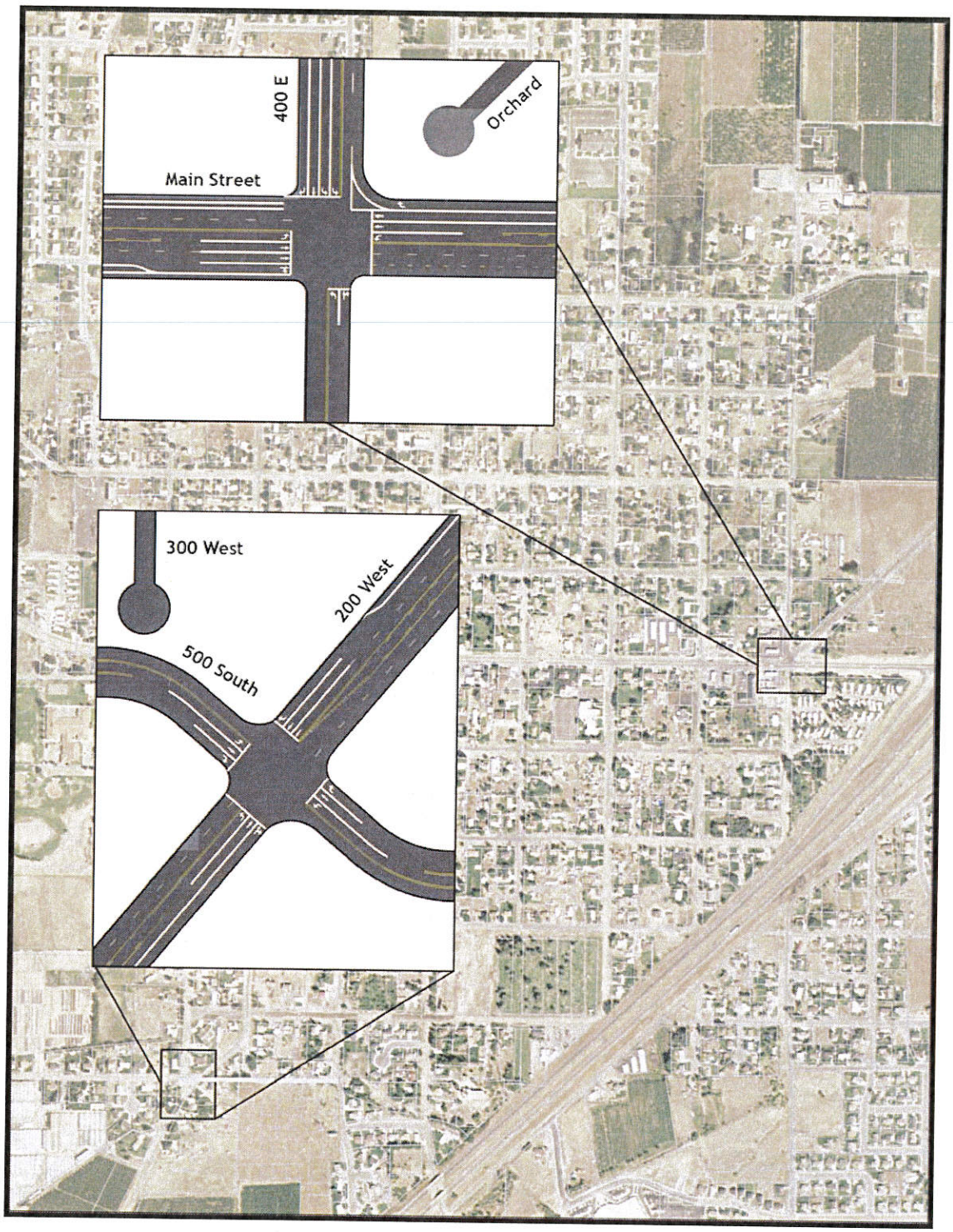


Figure 8.2 Conceptual Intersection Details for 200 West / 500 South and 400 East / Main Street

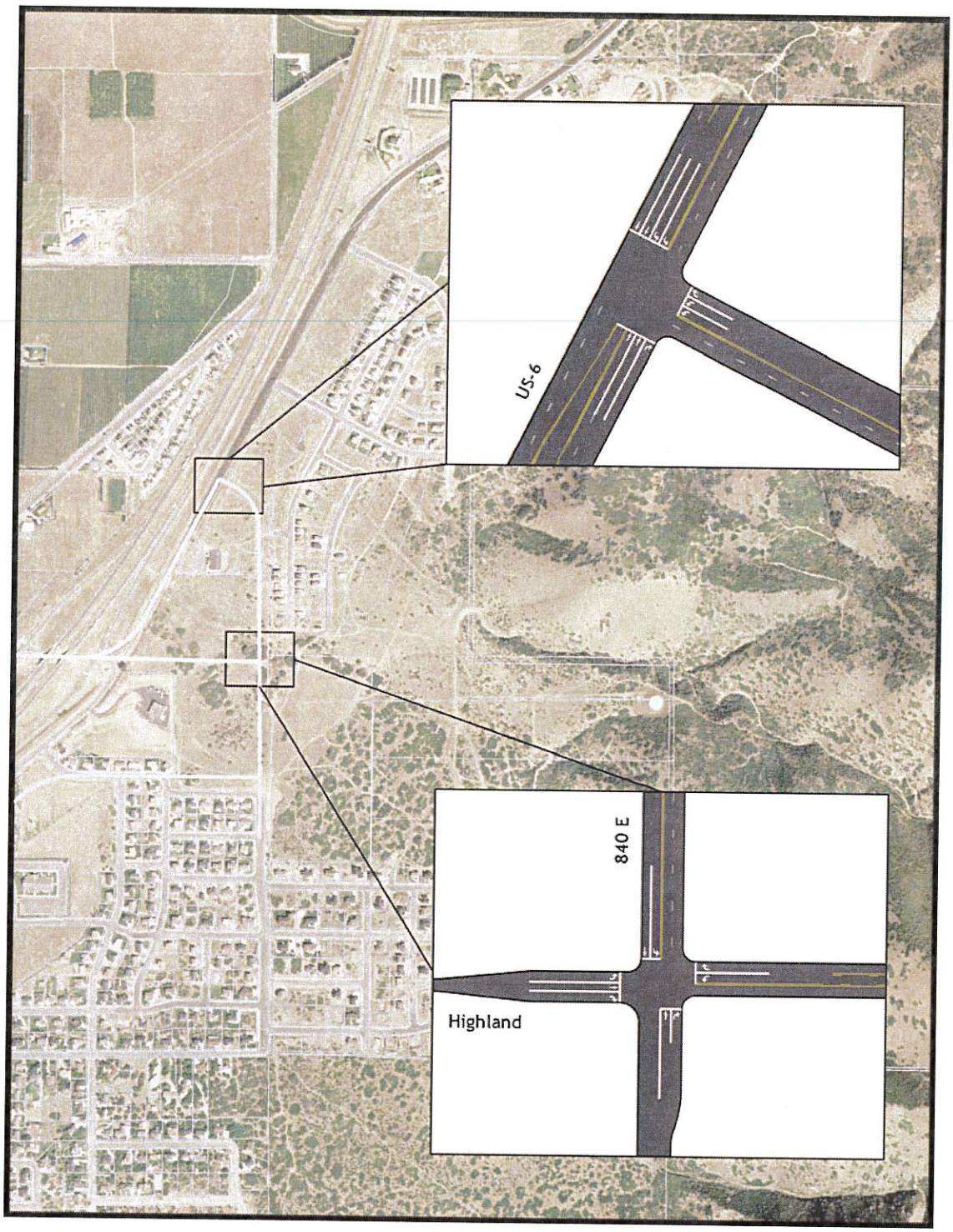


Figure 8.3 Conceptual Intersection Details for 840 East / Highland and 840 East / US-6

Dennis,

I tried to get this earlier, but I can't seem to do simple math when I am under pressure. I am forwarding the revised TMP. It incorporates the changes you suggested including:

1. A paragraph is added Section 5 on page 30 regarding the potential development (Cannonball) west of Santaquin. It describes that the analysis did not account for it and that impacts to Santaquin would need to be accounted for including US 6 and 12400 South Interchange.

2. We added two summary tables in the cost tables. One breaks things down by type of project the other breaks things down by responsible agency.

3. We looked at the signal warrant study from UDOT at 4th and US 6. Traffic volumes haven't really changed since we counted them, so overall I think volumes are probably good.

Dave and I saw an interesting presentation on impact fee development last week. We may want to have a conversation after the public hearing to discuss how best to incorporate this analysis into the impact fee development. I think we would probably want some transitional dialogue with the financial folks as they get started.

Mike

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