

AMERICAN FORK CITY

TRANSPORTATION ELEMENT OF THE GENERAL PLAN



MARCH 2020

PREPARED BY

HORROCKS
—|||—
E N G I N E E R S

GLOSSARY OF TERMS

AASHTO	American Association of State Highways and Transportation Officials
ADA	American’s with Disability Act
ADT	Average Annual Daily Traffic
BRT	Bus Rapid Transit
CFP	Capital Facility Plan
FHWA	Federal Highway Administration
GOPB	Governor’s Office of Planning and Budget
HCM	Highway Capacity Manual
HOA	Home Owners Association
IFFP	Impact Fee Facility Plan
ITE	Institute of Transportation Engineers
LOS	Level of Service
L RTP	Long Range Transportation Plan
MAG	Mountainland Association of Governments
BRT	Bus Rapid Transit
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
STIP	Statewide Transportation Improvement Program
STP	Surface Transportation Program
TAZ	Traffic Analysis Zone
TCM	Traffic Calming Measures
TE	Transportation Element of the General Plan
TIP	Transportation Improvement Program
TIS	Traffic Impact Study
TRAX	Transit Express (light rail)
TRB	Transportation Research Board
UDOT	Utah Department of Transportation
UTA	Utah Transit Authority

EXECUTIVE SUMMARY

2020 UPDATE

The American Fork City Transportation Element of the General Plan, adopted in 2018 was updated in 2020 to include the following:

- Travel Demand Modelling (TDM) with the 2050 MAG TDM for existing and 10-Year, and 2040 models
- Roadway Level of Service (LOS)
- Updated 10-Year Capital Facilities Plan based on intersection and roadway analysis (included in appendix)
- Addition of “Legacy” classifications for roadways

INTRODUCTION

American Fork, in northern Utah County, is located 15 miles northwest of Provo and 30 miles south of Salt Lake. According to the US census bureau, American Fork had grown in population from 21,941 in 2000 to 26,263 in 2010. This represents an average annual growth rate of 2.0 percent for the 2000 to 2010 decade. The current population is estimated at 36,300 (2019).

The last version of the American Fork Transportation Element of the General Plan was completed in 2010. An update to the Transportation Master Plan was adopted by ordinance in 2018. This document, titled the American Fork City Transportation Element of the General Plan, is intended to enable development of the roadway portion of the Capital Facilities Plan (CFP) by providing a plan that will accommodate the expected growth in the City’s transportation system and to guide the efforts of the City engineering, public works, and planning departments as they plan for the future.

EXISTING CONDITIONS

A. Socioeconomic Conditions, Land Use, and Roadway Network

The City’s current population is estimated at around 36,300 residents¹. The 2000 to 2010 decade saw moderate growth in American Fork with an increase in population from 21,941 to 26,263 (20 percent). Approximately 50 percent of the land area within the City has been developed or is under development. The roadways in American Fork have been classified as Principal Arterials, Arterials, Major Collectors, Collectors, and Significant Local streets.

B. Traffic Volumes and Level of Service

Sections of 100 East, north of Main Street, currently experience unacceptable levels of service. The intersection of State Street and 500 East is also a trouble spot, particularly during the peak periods of the day. The split phasing is unable to serve the demand placed on the signal from I-15 traffic due to the heavy left turn movements. The roundabout at 900 West in “The Meadows” is also an area where operations are below acceptable standards. The distance between State Street and the roundabout is too short to accommodate the queuing traffic waiting to enter the roundabout.

Within American Fork City there are currently 26 operational traffic signals. The Utah Department of Transportation (UDOT) owns 18 of the 26 signals, American Fork City owns 3 signals, and Utah County

¹ Based on 2010 US census projected to 2015

owns 5 signals. UDOT manages the operations of traffic signals Statewide through their i2 Central System, which allows the signals in the state to be monitored and adjusted in real time from the UDOT Traffic Operations Center. Currently 17 signals within American Fork City have fiber optic cables running to the signal cabinet and are connected to the i2 Central System. UDOT runs signal coordination along State Street (US-89) and American Fork Main Street seven days a week. Within American Fork City, there are several different innovative signals to help reduce delays to the traveling public. The signals include the Diverging Diamond Interchanges (DDI), split-phase intersections, and High-Intensity Activated Crosswalk Beacons (HAWK).

C. Alternative Transportation Modes

Alternative transportation modes to passenger vehicles are an important part of the overall transportation system. A complete transit system may include bus, bus rapid transit (BRT), light rail (TRAX), commuter rail (FrontRunner), and van share facilities. Non-Motorized traffic includes pedestrians, bicyclists, hikers, horseback riders, and joggers/walkers. These modes of transport should be accommodated wherever feasible in a vibrant and sustainable transportation system. The American Fork Bicycle and Pedestrian Master Plan (BPMP) has been adopted in conjunction with this element. The master plan sought to inventory the City's existing facilities as well as provide recommendations for future biking and walking trails systems. American Fork City recently opened a commuter rail station for the FrontRunner line on the west side of I-15 near Pioneer Crossing. With the construction of this new rail line, multiple bus routes between Utah and Salt Lake County were eliminated.

FUTURE CONDITIONS

A. Socioeconomic Conditions and Land Use

Future traffic patterns and the resulting operating conditions of a roadway network are directly related to land use planning and socioeconomic conditions. As traffic is not restricted to the American Fork area, and many of the roadways within the City act as regional roads linking communities north and south the City, the socioeconomic and land use data in the neighboring cities must also be considered when projecting future traffic conditions within the City. Thus, socioeconomic information for all of northern Utah County was obtained for use in the travel demand modeling process.

Based on the current land use, zoning, demographics, and growth patterns, American Fork is expected to grow to approximately 48,000 residents by the year 2040. This forecasted growth will place increased pressure on the City's infrastructure including its street system.

In its Land Use Plan, the City has sites planned for general, design, and neighborhood commercial; high, medium, low, very low density housing; public parks and open space, institutional lands such as schools and public facilities; shoreline protection areas and resorts; and major transportation facilities and transit oriented developments.

B. Travel Model Development

The MAG travel demand model was used to predict future traffic patterns and travel demand. 2040 was selected as the design year in order to be consistent with the Mountainland Association of Governments (MAG) planning process. The 2040 Metropolitan Transportation Plan (available at www.mountainland.org) was adopted by the Mountainland Metropolitan Planning Organization (MPO) Regional Planning Committee in 2015. The transportation plan is a guide to maintain and enhance the regional transportation system for urbanized Utah County.

C. Projected Traffic Volumes and Conditions

A no-build scenario is intended to show what the roadway network would be like in the future if no action were taken to improve the City roadway network. If no improvements are made to American Fork's transportation infrastructure, projected traffic volumes for the planning year 2040 will significantly lower the Level of Service (LOS) of many of the major streets and intersections throughout the City. Some of the major areas of concern include Main Street, Pacific Drive, 100 East, Pioneer Crossing, the 900 West Roundabout in "the Meadows", and parts of 300 North, 300 West, 200 South, and 400 West.

The final recommended roadway network seeks to balance accommodating demand through the year 2040 with being fiscally responsible, while also taking into consideration the planning efforts of MAG and the neighboring cities. It is expected that the roadway network recommended in this document will perform at an acceptable LOS through the planning year 2040. This will help in preserving the quality of life and economic vitality of the City.

D. Roadway Functional Classifications

The following street classifications have been selected by American Fork for inclusion in the Transportation Element (TE):

- Freeway – I-15
- Principal Arterial – 7 Lanes
- Arterial – 5 Lanes
- Major Collector – 3 Lanes
- Collector – 2 Lanes
- Local Road – 2 Lanes

Many of the major streets in American Fork pass through residential areas with homes fronting the roadways. The typical street section has been designed to lessen the impacts of needed roadway widening improvements to these homes.

E. Alternative Transportation Modes

Accommodating alternative modes of transportation to the passenger vehicle is a vital consideration when planning a livable and sustainable community. As a vibrant and growing city it is important for American Fork to continue to plan for improved transit, trails, and pedestrian facilities. These facilities will improve the overall quality of life of the residents while aiding in congestion relief and increasing the lifespan of the City's roadway network.

American Fork does not operate and maintain its own transit system. The combined efforts of The Utah Transit Authority (UTA), UDOT, MAG, and the City will largely dictate the nature of a future expanded transit system. The City should be actively involved in supporting public transit as a viable and attractive alternative transportation mode in the City. These planning and lobbying efforts will assist in procuring the necessary funding and support to develop, implement, and maintain a sustainable transit system.

F. Main Street Vision

In 2010 American Fork City, in conjunction with MAG, published the American Fork Main Street Vision Plan. The Main Street Vision plan includes recommendations on the physical, economic, and mobility characteristics of the downtown area.

G. Access Management

Access management is the process of establishing and enforcing road and driveway accesses within the city. This includes establishing the location, number, spacing, type, and design of city streets and accesses to minimize vehicle conflicts and maximize the traffic capacity and safety of a roadway. American Fork City has adopted an *Access Management Manual* (AM Manual) in April of 2012. The access management concepts and standards presented in the AM Manual are consistent with guidelines established by the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), the Transportation Research Board (TRB), and the Institute of Transportation Engineers (ITE).

H. Safety

One of the main goals of the Transportation Element of the General Plan and long term transportation planning in general is to estimate traffic growth and provide for adequate facilities as the need arises. The safe traffic operations of these future facilities are of equal importance. If residential driveways have to be on a collector or arterial street it is required to have circular driveways or a turn-around where vehicles don't have to back out on to the street, for example. Offset intersections should also be avoided wherever possible and shall follow City Ordinance. To the extent possible, recommendations and requirements in the City's existing access management program and City Ordinance shall be followed.

I. Intersection Improvements

As traffic volumes increase throughout the community, intersection design will become more critical. Proper intersection design will typically facilitate larger traffic flows without widening existing roadway cross-sections. Typical intersection configurations are a helpful planning tool when preserving right-of-way and for project cost estimating. Traffic signals should not be installed unless at least one or more of the eight traffic signal warrants, as outlined in the Manual on Uniform Traffic Control Devices (MUTCD), have been met. The MUTCD should be used as the standard for determining how and when a stop sign is installed. The City of American Fork will consider roundabouts as an intersection alternative at specific locations pending more detailed traffic analysis as needs arise through the development and/or transportation improvement process.

J. Corridor Preservation

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

K. Traffic Impact Studies

As growth occurs throughout the City, the City will evaluate the impacts of proposed developments on the surrounding transportation networks prior to giving approval to build. This will be accomplished by requiring that a Traffic Impact Study (TIS) be performed for new development in the City based on City staff recommendations and the policies adopted by the City herein. As required by City Engineer or at a minimum, a TIS shall be required for the following developments:

- Residential > 100 Units
- Office > 80,000 s.f.
- Retail > 25,000 s.f.
- Industrial > 100,000 s.f.

L. Intelligent Transportation Systems

American Fork is committed to providing Intelligent Transportation Systems (ITS) in the City in the future. Many of the ITS applications are controlled by UDOT. UDOT is renowned nationally for its innovative use of technology and transportation solutions. As there are many UDOT facilities in the City, and due to UDOT’s vast network of ITS components, American Fork has the opportunity to partner with the agency to provide more efficient ITS solutions.

M. Wayfinding

Wayfinding, the method by which the public get directions to important civic sites, is an important element of a transportation system as it allows users to quickly and safely navigate to areas of interest or emergency services with visual clues. Wayfinding, when properly applied, provides a safer environment for travelers as they rely more on the visual cues in their eye line than on maps or GPS instructions.

N. Americans with Disabilities Act (ADA)

The ADA standards should be regularly reviewed to ensure that City standards and specifications are in compliance with Federal ADA regulations. All areas of newly designed and newly constructed buildings and facilities and altered portions of existing buildings and facilities shall comply with the ADA requirements as published.

O. Retroreflectivity

According to the Federal Highways Administration (FHWA), “retroreflectivity” refers to the property of a traffic sign to reflect light back to the driver. Retroreflective traffic signs are used to increase sign visibility at night. Maintaining traffic sign retroreflectivity is important since nighttime fatal crashes occur approximately three times as often as daytime fatal crashes. Retroreflectivity degrades over time. Upgrading poorly maintained traffic signs may reduce traffic injuries and fatalities. New FHWA requirements to maintain traffic signs in the City dictate that certain standards are met by certain compliance dates. The compliance dates are as follows:

- January 2012 – A sign replacement program must be in place
- January 2015 – All regulatory signs must comply with federal retroreflectivity standards
- January 2018 – All signs in the City must comply with federal retroreflectivity standards

CAPITAL FACILITIES PLAN

The City will need to construct new roads, widen existing transportation corridors, and make spot intersection improvements to provide future residents of the City with an adequate transportation system. Individual projects were identified and costs estimates were compiled to produce a Transportation Improvement Program (TIP) for the City. It is expected that the total cost (2020 dollars) of roadway improvements needed before 2050 will be approximately **\$429,738,500**.

A few specific locations on American Fork City’s street network may require some unique improvements to resolve traffic issues at these sites. Some of these are: Main Street and State Street, State Street and 500 East, State Street and Pacific Drive, the 900 West Roundabout in “The Meadows”, Vineyard Connector, Railroad Crossings, 300 North and Pacific Drive, Mill Pond Road, and 300 West and 200 South.



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1.0 INTRODUCTION

1.1 2020 UPDATE

The American Fork City Transportation Element of the General Plan was updated in 2020 to include the following:

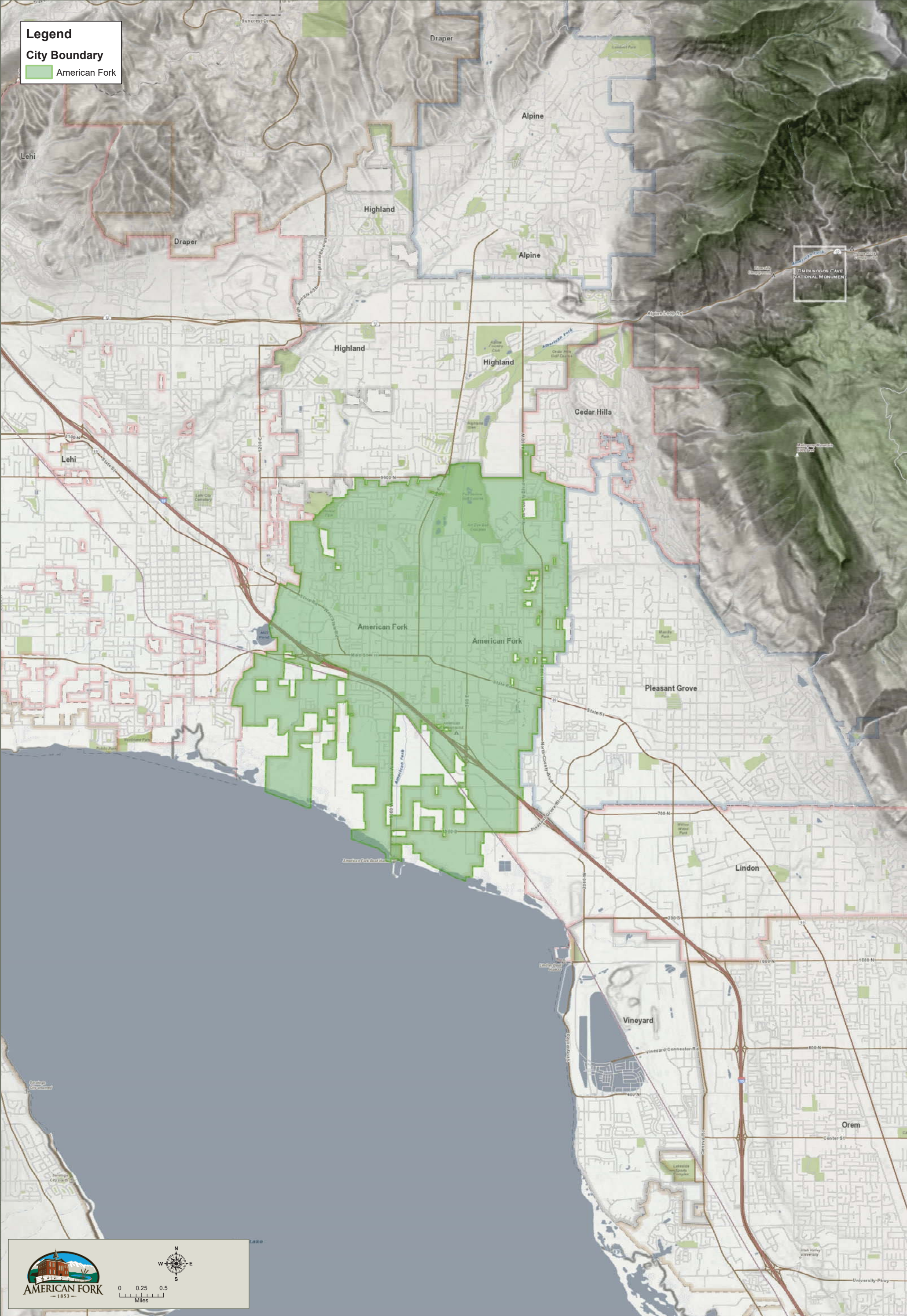
- Travel Demand Modelling (TDM) with the 2050 MAG TDM for existing and 10-Year models
- Roadway Level of Service (LOS)
- Updated 10-Year Capital Facilities Plan based on intersection and roadway analysis (included in appendix)
- Addition of “Legacy” classifications for roadways

The last version of the American Fork Transportation Element of the General Plan was completed in 2010. Updates to the Transportation Master Plan were adopted by ordinance in 2013. More recent updates to certain portions of the General Plan have been adopted in 2018. The City has updated its General Plan Land Use Map and has commenced an update to its Capital Facility Plans as well as an evaluation of its impact fees. This document, titled the *American Fork City, Transportation Element of the General Plan*, is intended to enable development of the roadway portion of the Capital Facilities Plan (CFP) by providing a plan to provide capacity to accommodate the expected growth in the City’s transportation system and to guide the efforts of the City’s engineering, public works, and planning departments as they plan for the future.

1.2 EXISTING DEMOGRAPHICS

American Fork, in northern Utah County, is located 15 miles northwest of Provo and 30 miles south of Salt Lake City (see **Figure 1-1**). It is bordered by Utah Lake on the south and by the Wasatch Mountains to the east. Adjacent to it are the communities of Cedar Hills and Pleasant Grove to the east, Lehi to the west and Highland and Alpine to the north. Discovered by fur trappers and settled by Mormon pioneers, this historic town has become Utah’s fifteenth largest city. Conveniently situated just off Interstate 15 between Provo and Salt Lake City, it has become a favorable location for commuters, families, and businesses. The City was incorporated on June 4, 1853. According to the U.S. Census Bureau, American Fork had grown in population from 21,941 in 2000 to 26,263 in 2010. This represents an average annual growth rate of 2 percent for the 2000 to 2010 decade. The current population is estimated at 36,300 (2019). When compared to the whole of Utah County, which has an average annual growth rate of 4 percent over the same time period, American Fork has had slightly less growth over the last decade than the county as a whole.

Figure 1-1 Area Map



2.0 EXISTING CONDITIONS

A thorough documentation of the City’s existing conditions was performed in order to evaluate the City’s transportation system and update the Transportation Element of the City’s General Plan (TE) to address the City’s current and future needs. The data collected for this TE update includes:

- Key roadway traffic volumes
- Socioeconomic conditions
- Land use and zoning
- Signal locations and timings
- Roadway classifications/widths/cross sections
- Public transit routes
- Bicycle/pedestrian trails

This data forms the basis for analyzing the existing transportation system, as well as providing the foundation to project future traffic conditions.

2.1 EXISTING SOCIOECONOMIC CONDITIONS

The City’s current population is estimated at around 36,300 residents². The 2000 to 2010 decade saw moderate growth in American Fork, with an increase in population from 21,941 to 26,263 (20 percent). The City is issuing an average of 9 permits for residential dwelling units monthly. As a region, the northern Utah County area has experienced rapid development and growth in recent years and this trend is projected to continue into the foreseeable future.

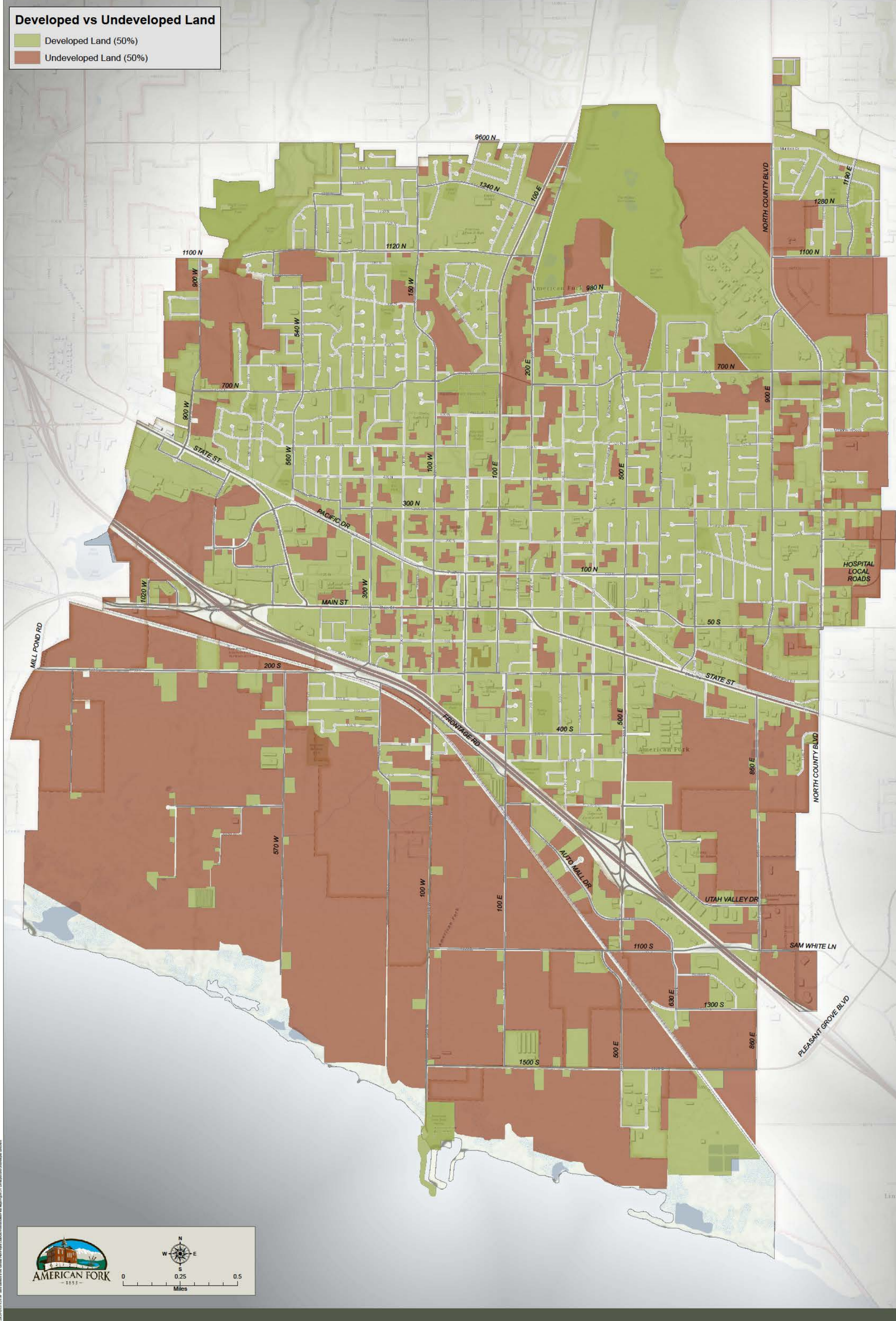
Socioeconomic data used in the transportation analysis was obtained from the City and Mountainland Association of Governments (MAG). The MAG travel demand model was modified to more accurately estimate the travel demand in the City. The MAG travel demand model consists of various Traffic Analysis Zones (TAZ). Each TAZ contains information on the number of households, employment opportunities, and average income levels within the TAZ. This data is used to generate trips originating in each TAZ and assign them to the roadway network where they will be attracted to a destination within another TAZ. The MAG travel demand model predicts regional travel patterns; however, the TAZ structure must be modified to more accurately reflect traffic on the local city level. The TAZ structure within the American Fork area was modified by splitting the existing large TAZ into smaller, more uniform TAZ and verifying the accuracy of the socioeconomic data contained within each TAZ.

2.2 EXISTING LAND USE

Traffic patterns and demand are directly related to land use and development density. Approximately 50 percent of the land area within the City or within the City’s annexation declaration boundary has been developed or is under development (see **Figure 2-1**). There are still several large parcels that remain, as well as numerous smaller tracts of land that will one day be developed.

² Based on 2010 U.S. Census projected to 2019

Figure 2-1 American Fork Developed vs Undeveloped Land within City Annexation Declaration Boundary

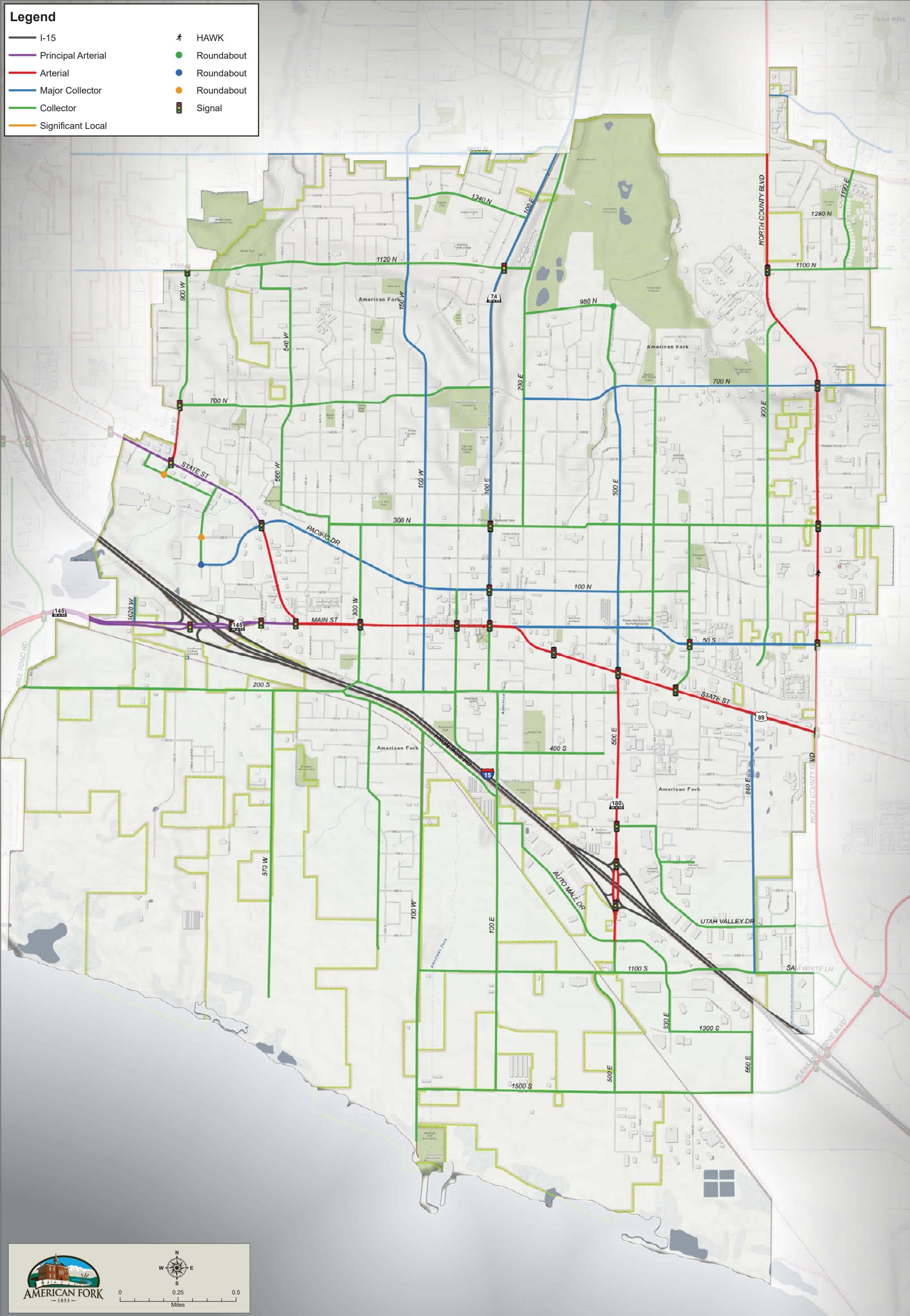


2.3 EXISTING ROADWAY FUNCTIONAL CLASSIFICATION

The roadways in American Fork have been classified as Principal Arterials, Arterials, Major Collectors, and Collectors. One of the reasons American Fork is considered a “gateway” city is because of its excellent access to the state’s major north-south freeway, I-15. American Fork has two major freeway interchanges, located at Pioneer Crossing and 500 East. The recent completion of the I-15 CORE project has brought new and exciting opportunities to the City for both commercial and residential development. The existing roadway network also consists of several other major regional Utah Department of Transportation (UDOT) roadways including US-89 (State Street) that runs east-west through the City connecting Pleasant Grove and Lehi, SR-74 (100 East) that runs north-south connecting the City with Alpine on the north; and SR-145 (Pioneer Crossing) which connects I-15 at American Fork’s Main Street to Redwood Road in Saratoga Springs. In addition to the state roads, the newly completed North County Boulevard (1100 E) runs north-south on the east edge of the City. North County Boulevard is a five-lane facility connecting Pleasant Grove Boulevard I-15 interchange with the communities of American Fork and Cedar Hills. It is anticipated that North County Boulevard will shortly become a state maintained facility. American Fork owns and maintains a number of local and regional collector streets; Pacific Drive/100 North (State Street to 600 East), 600 East (Main Street to 700 North) and 700 North. The existing roadway network, including functional type, is shown in **Figure 2-2**.

Included in **Figure 2-2** are Arterial and Collector roadways classified as “Legacy” roadways. Over time, American Fork has developed typical cross-sections for development which have changed over time to improve travel for vehicle, bicycle and pedestrian traffic. There are sections of American Fork City that were developed before the most recent adopted typical cross-sections. To require future development and redevelopment to force the current functional classification widths into these areas would cause significant impact to the existing developments along these roadways. Although it is recommended to build the roadways to the standards for each classification identified in **Table 3-2**, the development requirements along a “Legacy” classified roadway will be determined on a case-by-case basis by City staff.

Figure 2-2 Existing Roadway Network





2.4 EXISTING TRAFFIC VOLUMES AND LEVEL OF SERVICE

The adequacy of an existing street system can be quantified by assigning Levels of Service (LOS) to major roadways and intersections. As defined in the *Highway Capacity Manual (HCM)*, a document published by the Transportation Research Board (TRB), LOS serves as the traditional form of measurement of a roadway’s functionality. The TRB identifies LOS by reviewing elements, such as the number of lanes assigned to a roadway, the amount of traffic using the roadway and the time of delay per vehicle traveling on the roadway and at the intersections. Levels of service range from A (free flow where users are virtually unimpeded by other traffic on the roadway) to F (traffic exceeds the operating capacity of the roadway).

2.4.1 ROADWAY LEVEL OF SERVICE

Roadway LOS is used as a planning tool to quantitatively represent the ability of a particular roadway to accommodate the travel demand. The following **Table 2-1**, **Table 2-2** and **Table 2-3** were used as guides for quantifying LOS, and, subsequently the conditions of each of the major roadways in the City are based on HCM principles and regional experience. LOS D is approximately 80 percent of a roadway’s capacity and is a common goal for urban streets during peak hours. After discussions with City staff, it was determined that adopting the industry standard of LOS D for system streets (collectors and arterials) was acceptable for future planning. Attaining LOS C on these streets would be potentially cost prohibitive and may present societal impacts, such as the need for additional lanes and wider street cross-sections. LOS D suggests that for most times of the day, the roadways will be operating at well below capacity. The peak times of day will likely experience moderate congestion characterized by a higher vehicle density and slower than free flow speeds.

A four-lane freeway facility can accommodate 70,000 vehicles per day at LOS D; adding two additional lanes will increase this threshold by 40,000 vehicles to 110,000 vehicles per day. Arterial streets can handle significantly less traffic at LOS D; a seven lane arterial (6 travel lanes and one center turn lane) can only accommodate approximately 50 percent of the traffic of a freeway of similar lane configuration (55,000 versus 110,000). Similarly, much capacity is lost when reducing the number of arterial lanes by one in each direction, which results in a 17,700 vehicle per day reduction in LOS D capacity. Collector streets are designed at lower speeds than arterials in order to be less intrusive and are not as strictly access-controlled. Again, this results in a loss of capacity when compared to arterial streets. A three lane collector street will be able to move 1,700 less vehicles per day than a three lane arterial street. Removing the center turn lane on a collector results in a loss of capacity of 1,300 vehicles per day. On local streets LOS C is the minimum expectation for design. This ensures that these streets are more “livable” for homes that may front these streets.

Table 2-1 Suburban Freeway LOS Capacity Criteria in Vehicles per Day

Lanes	LOS C	LOS D	LOS E
4	60,000	70,000	89,000
6	95,000	110,000	140,000



Table 2-2 Suburban Arterial LOS Capacity Criteria in Vehicles per Day

Lanes	LOS C	LOS D	LOS E
3	12,400	15,100	17,700
5	28,500	32,800	40,300
7	43,000	50,500	63,400

Table 2-3 Suburban Collector LOS Capacity Criteria in Vehicles per Day

Lanes	LOS C	LOS D	LOS E
2	9,700	12,100	14,500
3	10,800	13,400	16,100

Source: Utah/Wasatch Front Specific Daily Capacity Estimates; MAG & WFRC

2.4.2 INTERSECTION LEVEL OF SERVICE

Whereas roadway LOS considers an overall picture of a roadway to estimate operating conditions, intersection LOS looks at each individual movement at an intersection and provides a much more precise method for quantifying operations. Since intersections tend to be a source of bottlenecks in the transportation network, a detailed look into the delay at each intersection should be performed on a regular basis. The methodology for calculating delay at an intersection is outlined in the *Highway Capacity Manual* and the resulting criteria for assigning LOS to signalized and un-signalized intersections are outlined in **Table 2-4**. As in the case with roadways, LOS D is considered the industry standard for intersections in an urbanized area. LOS D at an intersection corresponds to an average control delay of 35-55 seconds per vehicle for a signalized intersection and 25-35 seconds per vehicle for an un-signalized intersection.

At a signalized intersection under LOS D conditions, the average vehicle will be stopped for less than 55 seconds. This is considered an acceptable amount of delay to experience during the times of the day when roadways are most congested. As a general rule, traffic signal cycle lengths (the length of time it takes for a traffic signal to cycle through each movement in turn) are kept below 90 seconds. An average delay of less than 55 seconds suggests that in most cases, no vehicles will have to wait more than one cycle before proceeding through an intersection.

Un-signalized intersections are generally stop-controlled. Areas where there is a predominate major street may be two-way stop-controlled, meaning only the minor street traffic must stop. In cases where traffic volumes are more evenly distributed or where sight distances may be limited, four-way stop-controlled intersections are common. LOS for an un-signalized intersection is assigned based on the average control at the worst approach (always a stopped approach) of the intersection. An un-signalized intersection operating at LOS D means that the average vehicle waiting at one of the stop-controlled approaches will wait no longer than 35 seconds before proceeding through the intersection. This delay may be caused by large volumes of traffic on the major street resulting in fewer gaps in traffic for a vehicle to turn into, or from queued vehicles waiting at the stop sign.



Table 2-4 Signalized and Unsignalized Intersection LOS Criteria

Level of Service	Signalized Intersections Average Control Delay (sec/veh)	Unsignalized Intersections Average Control Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

Note: LOS for unsignalized intersections is measured for the worst approach only

2.4.3 EXISTING OPERATING CONDITIONS

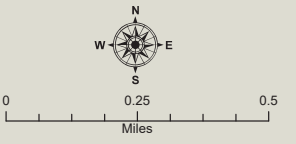
In 2010, traffic counts were collected from UDOT, which included average annual daily traffic (AADT) volumes as defined in *Traffic on Utah Highways*, and manual traffic counts were also performed on many of the City-owned roadways within American Fork in 2012. As part of the TE update (2020), additional daily traffic counts were acquired to update existing LOS. **Figure 2-3** illustrates American Fork 2015-2017 average daily traffic volumes on selected major streets and their corresponding LOS as well as the operating conditions of the signals and roundabouts. Based on the analysis of these traffic count data, there are a few areas of concern within American Fork City. Sections of 100 East north of Main Street currently experience unacceptable levels of service. The intersection at State Street and 500 East is also a trouble spot, particularly during the peak periods of the day. The split phasing is unable to serve the demand placed on the signal from I-15 traffic due to the heavy left turn movements. The roundabout at 900 West in “The Meadows” is also an area where operations are below acceptable standards. The distance between State Street and the roundabout is approximately 200 feet and is too short to accommodate the queuing traffic waiting to enter the roundabout. As part of the TE update (2020) a project is recommended to relocate the roundabout 100 feet south of its current location to accommodate queuing.

Several intersections throughout the City could also benefit from a signal timing analysis. As traffic patterns and volumes change, signal timing plans can become outdated. The timing of the traffic signals in the City should be periodically checked for efficiency and adjusted as needed to accommodate these fluctuations in traffic patterns and volumes. The City should coordinate with UDOT to develop a plan to re-time the signals within the City at regular intervals. Some areas where concerns were identified under the existing conditions are as follows:

- 900 West and State Street
- State Street and 100 East

Figure 2-3 Existing Daily Traffic and LOS

- Acceptable (LOS C or Better)
- Acceptable (LOS D)
- Unacceptable (LOS E or worse)
- I-15
- City Boundary
- Future Annexation Boundary



2.4.4 TRAFFIC SIGNALS AND INTELLIGENT TRANSPORTATION SYSTEMS

Within American Fork City there are currently 25 operational traffic signals. **Table 2-5** provides a summary of the ITS elements associated with each signal. UDOT owns 18 of the 25 signals, American Fork City owns 2 signals, and Utah County owns five signals. The five Utah County signals are located along North County Boulevard and will be turned over to UDOT upon final completion of the project.

UDOT manages the operations of traffic signals statewide through their i2 Central System. Currently, 17 signals within American Fork City have fiber optic cables running to the signal cabinet and are connected to the i2 Central System. It is planned that the five signals along North County Boulevard will be connected into the i2 Central System upon final completion of the project. The two American Fork City signals and the signal at SR-74 and 1120 North are the only signals within American Fork City that are not connected to the i2 Central System. Additionally, 700 North and 900 West has conduit installed for a future fiber optic connection.

UDOT runs signal coordination along State Street (US-89) and American Fork Main Street seven days a week. The current coordination plans begin at the US-89 and SR-73 signal and continue south to the US-89 and 1100 East signal. The signal at American Fork Main and Kawakami Drive ties into the coordination plans running at the US-89 and American Fork Main signal. Currently, the US-89 and 300 West signal only runs coordination plans during the pm peak period Monday to Friday and runs in FREE operations all other times. Running a signal FREE allows the travel demand to dictate the length of green time for each movement. This is standard practice for off-peak times where travel patterns are not necessarily predictable or directional. The signals at 100 East and 100 North and at 100 East and 300 North run coordination and tie into the coordination plans at the US-89 and 100 East signal. The American Fork Main Street and I-15 DDI currently runs in FREE operations at all times of the day. Additionally, the signals at 500 East and 620 South, 500 East and NB I-15 DDI, and 500 East and SB I-15 DDI run in FREE operation.

Within American Fork City, there are several different innovative signals to help reduce delays to the traveling public. The signals include the Diverging Diamond Interchanges (DDI), split-phase intersections, and High-Intensity Activated Crosswalk Beacons (HAWK). The DDIs are located at the Pioneer Crossing/American Fork Main Street interchange and the 500 East interchange. The Pioneer Crossing DDI signal runs from one controller while the 500 East DDI signal runs from two controllers. Each of the controllers at the 500 East DDI controls one of the two I-15 ramps. Another innovative signal used in American Fork City is the split-phase intersection. Split phasing is a signal timing concept used when it is impractical to run two opposite directions concurrently. This is most common where there exists a double left turn lane where one of those lanes also accommodates through traffic. In this case, the opposite left turn movement would not be able to go as it would conflict with the through vehicles. Essentially a split phased signal will allow each direction its own separate phase. Currently, there are two split-phase intersections in American Fork located at US-89 and 500 East and at US-89 and American Fork Main Street. These two signals have heavy northbound and southbound left turn volumes but there is limited right-of-way to provide for traditional dual left turn lanes. The split-phase intersections have a dedicated left turn lane and a shared through-left turn lane. Because of the shared through-left turn lanes, the northbound and southbound through movements cannot be served at the same time so the split phasing allows both movements to be service separately while still maintaining the necessary lane capacity to service the heavy left turn volumes. The final innovative intersection found in American Fork City is the HAWK pedestrian signal. The HAWK signal allows for a protected signalized pedestrian mid-block crossing. Currently, the only HAWK signal in American Fork is on North County Boulevard in front of the American Fork Hospital.



Outside of the traffic signals, American Fork City has some additional ITS elements such as CCTV cameras and ramp meters. Currently, there are CCTV cameras at the following locations in American Fork City:

- NB I-15 @ 500 East
- NB I-15 @ Pioneer Crossing
- SB I-15 @ Pioneer Crossing
- Main Street @ Kawakami Drive
- Main Street @ US-89
- Main Street (US-89) @ 100 East (SR-74)
- US-89 @ 500 East (SR-180)
- US-89 @ 1100 East
- NB I-15 @ 200 West
- Pioneer Crossing @ 1020 West

There are also four ramp meters in American Fork City at the following locations:

- NB I-15 @ 500 East
- SB I-15 @ 500 East
- NB I-15 @ Pioneer Crossing
- SB I-15 @ Pioneer Crossing

Table 2-5 Existing Signal Inventory

Primary Street	Secondary Street	Owner of Signal	Integrated into the UDOT i2 Central System	Existing/Planned CCTV at signal	Existing/Planned Fiber connection	Running Coordination	Planned Future Signal Location	Intersection Configuration
US-89	900 West	UDOT	X		X	X		Standard 8-phase
900 West	700 North	AF City						Standard 4-phase
US-89	Pacific Drive	UDOT	X		X	X		Standard 8-phase
US-89	AF Main	UDOT	X	X	X	X		Split Phase
AF Main	I-15 DDI (2 Signals)	UDOT	X	X	X			DDI
AF Main	Kawakami Drive	UDOT	X	X	X	X		Standard 8-phase
US-89/AF Main	300 West	UDOT	X		X	X		Standard 4-phase
US-89/AF Main	Center Street	UDOT	X		X	X		Standard 4-phase
US-89/AF Main	100 East (SR-74)	UDOT	X	X	X	X		Standard 8-phase
100 East (SR-74)	100 North	UDOT	X		X	X		Standard 4-phase



Primary Street	Secondary Street	Owner of Signal	Integrated into the UDOT i2 Central System	Existing/Planned CCTV at signal	Existing/Planned Fiber connection	Running Coordination	Planned Future Signal Location	Intersection Configuration
100 East (SR-74)	300 North	UDOT	X		X	X		Standard 4-phase
100 East (SR-74)	1120 North	UDOT						Standard 4-phase
US-89	500 East	UDOT	X	X	X	X		Split Phase
500 East (SR-180)	620 South	UDOT	X		X			Standard 4-phase
500 East (SR-180)	NB I-15 DDI	UDOT	X	X	X			DDI
500 East (SR-180)	SB I-15 DDI	UDOT	X		X			DDI
US-89	700 East	UDOT	X		X	X		Standard 4-phase
700 East	50 South	AF City						Standard 4-phase
US-89	No. County Blvd	UDOT	X	X	X	X		Standard 8-phase
900 West	1120 North	AF City			X			Standard 4-phase
No. County Blvd	50 South	Utah County		X	X			Standard 4-phase
No. County Blvd	Hospital HAWK	Utah County			X			HAWK Signal
No. County Blvd	300 North	Utah County		X	X			Standard 4-phase
No. County Blvd	700 North	Utah County		X	X			Standard 4-phase
No. County Blvd	1100 North	Utah County			X			Standard 3-phase
No. County Blvd	1750 North	Utah County					X	

2.5 EXISTING ALTERNATIVE TRANSPORTATION MODES

Alternative transportation modes are an important part of the overall transportation system. A complete transit system may include bus, bus rapid transit (BRT), light rail, commuter rail, and van share facilities. Non-motorized traffic includes pedestrians, bicyclists, hikers, horseback riders, and joggers/walkers. These modes of transport are very important and should be accommodated wherever feasible in a vibrant and sustainable transportation system.

2.5.1 EXISTING NON-MOTORIZED TRAFFIC

American Fork is committed to providing a trails network for bicycle and pedestrian traffic for both recreational and commuter trips. American Fork is an excellent location for recreation due to its proximity to both Utah Lake and the Wasatch Mountains. Trails connectivity is essential to provide access to these assets, as well as to neighboring community’s trails and bikeways.

Trails serve many purposes from recreational uses to commuting to work and home. They also serve a diverse group of users; including children, bicyclists, walkers/joggers, and equestrian users. The American Fork Bicycle and Pedestrian Master Plan (BPMP) has been adopted in conjunction with this element. The master plan sought to inventory the City's existing facilities, as well as provide recommendations for future biking and walking trails. American Fork recognizes that trails and bikeways are a vital portion of any good transportation network; therefore, this transportation element of the General Plan should act as a companion volume to the BPMP.

The BPMP seeks to address the need for future trails connectivity to meet the growing need for both recreation and non-motorized commuters. The existing trails are listed in Table 2-6 and are also shown in **Figure 2-4**. The bikeways in the City are classified as shared-use paths, sidepaths, bike lanes, marked shared roadways and signed shared roadways. Sidewalks are generally present along the major roadways in the central part of the City. Some sidewalks are placed next to the curb, while others are buffered from the street by a park strip. The longest stand-alone trail in the City is the Art Dye shared-use path. The Art Dye trail travels from Art Dye Park north to American Fork's border with Highland. A connection to the Murdock Canal Trail can be made in Highland via the paved Art Dye Trail. The BPMP makes the following recommendations for trails classifications:

- Shared-Use Path
 - Paved facilities built in or adjacent to non-roadway rights-of-way, such as streams, canals, railroads, and utility corridors.
- Sidepath
 - Sidepaths are built adjacent to roadways with frequent driveway and intersection crossings. The distinction between sidepaths and shared-use paths is important because they have very different operational characteristics. Sidepaths typically have more frequent at-grade crossings of driveways and intersections than shared-use paths. They also encourage bicyclists to travel against traffic, which often places them in locations where motor vehicle drivers may not see them.
- Bike Lanes
 - A bike lane is a portion of the roadway designated by striping, signage, and pavement markings for the preferential use of bicyclists. Bike lanes create a visual separation between bicycle and automobile facilities, thereby increasing bicyclists' comfort and confidence. Bike lanes are typically used on major streets with average daily traffic of 3,000 or higher and carry bicycle traffic in the same direction as motor vehicle traffic.
- Marked Shared Roadway
 - Marked shared roadways are used where traffic volumes and speeds are relatively low or where it is not possible to install higher-level bikeways like bike lanes. As the name suggests, "sharrow" pavement markings are used to indicate that a given lane is to be shared between drivers and bicyclists. Marked shared roadways may have any combination of parking, shoulder space, and number of lanes. Typically, this alternative should not be chosen if the speed limit is greater than 35 mph. Speed limits of 20-30 mph are preferable. A common use of marked shared roadways is bridging a gap between other road segments that have bike lanes or another higher-level bikeway type.
- Signed Shared Roadway
 - This bikeway type is very similar to marked shared roadways. The only significant difference is that green "BIKE ROUTE" signs rather than pavement markings are used to designate these routes. A common use of signed shared roadways is along roads with shoulder space where parking is allowed but infrequently used.








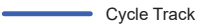


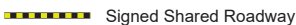
- Cycle Track
 - A cycle track is an exclusive bike facility that has elements of a separated path and on-road bike lane. A cycle track, while still within the roadway, is physically separated from motor traffic and is distinct from the sidewalk. Cycle tracks may be one-way or two-way, and may be at road level, at sidewalk level, or at an intermediate level. They all share in common some separation from motor traffic with bollards, parking or barriers.

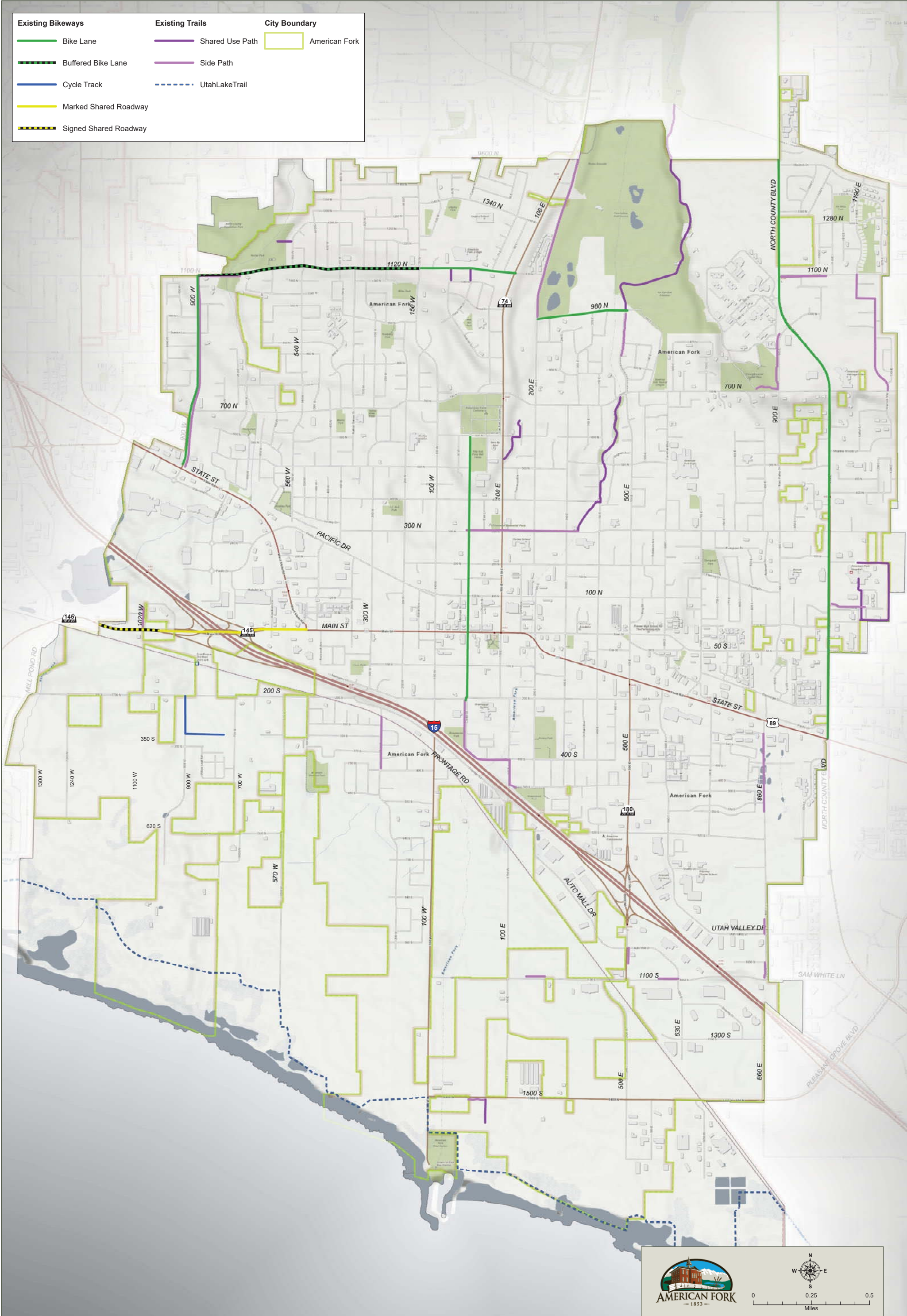


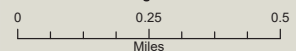
Table 2-6 Existing Trails

Trail Identification	Existing Miles	Trail Type
American Fork River	0.68	Shared-Use Path
Art Dye	1.09	Shared-Use Path
Fox Hollow Loop Trail/Reservoir Trail	0.41	Shared-Use Path
Murdock Canal Trail	0.51	Shared-Use Path
Center St / 400 S / 100 E	0.55	Sidepath
Center Street Sidepath	0.46	Sidepath
Center Street	1.12	Bike Lane
Alpine Highway	0.58	Bike Lane
Pioneer Crossing	0.57	Marked Shared Bikeway
Pioneer Crossing	0.35	Signed Shared Roadway
Total	6.32	

Source: American Fork Bicycle & Pedestrian Master Plan 2013

Figure 2-4 Existing Trails Network

Existing Bikeways		Existing Trails		City Boundary
	Bike Lane		Shared Use Path	 American Fork
	Buffered Bike Lane		Side Path	
	Cycle Track		UtahLakeTrail	
	Marked Shared Roadway			
	Signed Shared Roadway			

2.5.2 EXISTING TRANSIT SERVICE

The Utah Transit Authority (UTA) is the provider of public transportation throughout the Wasatch Front. It operates fixed route buses, express buses, Bus Rapid Transit (BRT) lines, ski buses, light rail, and commuter rail. In this capacity, UTA is responsible for the operation of the transit network in American Fork City. It is the responsibility of the City and UTA to work cooperatively to provide transit planning to accommodate alternative transportation options to its residents as demand increases.

American Fork City recently opened a commuter rail station for the FrontRunner line on the west side of I-15 near Pioneer Crossing. With the construction of this new rail line, multiple bus routes between Utah and Salt Lake County were eliminated. The following transit routes and stations are currently in operation in American Fork:

- Bus Route 806: Eagle Mtn./Saratoga Springs/Lehi Station/UUV
 - Originating at Utah Valley University, route 806 runs North to the Lehi Station via I-15, then runs West via Hwy 73, Redwood Rd, and Pony Express where it terminates at the Eagle Mountain. Church Park & Ride. The service runs on weekdays and is predominantly for commuter traffic running towards UVU in the morning between 6:03 am and 7:33 am and towards Eagle Mountain in the afternoon between 2:28 pm and 5:28 pm.
- Bus Route 809: American Fork/Pleasant Grove
 - Originating at the American Fork FrontRunner station, route 809 runs along State Street through American Fork, South at County Blvd, and North on Pleasant Grove Blvd terminating at 150 S & Main in Pleasant Grove.
- Bus Route 850: North/South State Street
 - Route 850 originates at the Provo Central Station. The service runs on State Street with a detour to the American Fork FrontRunner station and terminates at the Lehi FrontRunner station. Service runs every 15 minutes all day long on weekdays with the first northbound trip at 5:09 am to and final southbound trip at 9:51 pm. Service is also regular on Saturdays with the first northbound trip at 6:45 am and final northbound trip at 9:14 pm. Sunday routes are limited to every hour from 8:27 am to 6:54 pm.
- FrontRunner: American Fork Station at 782 W. 200 S.
 - In April 2008, UTA introduced the state's first commuter rail line, FrontRunner. The line originally connected Salt Lake, Davis, and Weber Counties. In 2012, UTA completed construction of a southern portion of the FrontRunner line, which now connects Salt Lake County to Utah County as far south as Provo. Plans are in place to continue this southern portion to Payson. The American Fork station provides commuter rail service every 30 minutes during the commute times in the morning and evening and every hour during the off-peak times. Saturday service runs every 60 minutes all day. There is currently no Sunday service.

Figure 2-5 displays the existing transit routes and stations at the time of this report. However, UTA maintains up-to-date route information at www.rideuta.com.

Figure 2-5 Transit Network



AMERICAN FORK CITY ENGINEER: 2015.10.15 10:00 AM



3.0 FUTURE CONDITIONS

Future traffic patterns and the resulting operating conditions of a roadway network are directly related to land use planning and socioeconomic conditions. As traffic is not restricted to the American Fork area and many of the roadways within the City act as regional roads linking communities north and south of the City, the socioeconomic and land use data in the neighboring cities must also be considered when projecting future traffic conditions within the City. Thus, socioeconomic information for all of northern Utah County was obtained for use in the travel demand modeling process.

3.1 FUTURE SOCIOECONOMIC CONDITIONS

The projected socioeconomic data used in this study comes mostly from the MAG travel demand model, which is based upon the best available statewide data provided by the Governor’s Office of Planning and Budget (GOPB). This data was supplemented and verified using the data provided by the City planning department in the form of the adopted Land Use Plan and Zone Map (see **Figure 3-1** and **Figure 3-2**). This information is considered the best available for predicting future travel demand; however, land use planning is a dynamic process and the assumptions made in this report should be used as a guide and should not supersede other planning efforts.

Based on the current land use, zoning, demographics, and growth patterns, American Fork is expected to grow to approximately 48,000 residents by the year 2040 (**Table 3-1**). This forecasted growth will place increased pressure on the City’s infrastructure, including its street system. American Fork is also committed to increasing its commercial, office, and retail base, providing greater opportunity for its residents to live, work and play in the City. This growth will have considerable impact on traffic volumes. The projected traffic volumes for the planning year 2040 show a corresponding increase in average traffic of 40 percent on the City’s roadways.

Table 3-1 American Fork City Projected Population Growth

Year	Population	Population Change	Population Change %
2000	21,941	-	-
2010	26,263	4,493	20.5%
2020	32,566	6,132	23.2%
2030	39,635	7,069	21.7%
2040	47,678	8,043	20.3%
2050	54,000	6,322	13.3%
Buildout	~82,000	~6,000	51.9%

Source: Governor’s Office of Planning and Budget & Mountainland Association of Governments

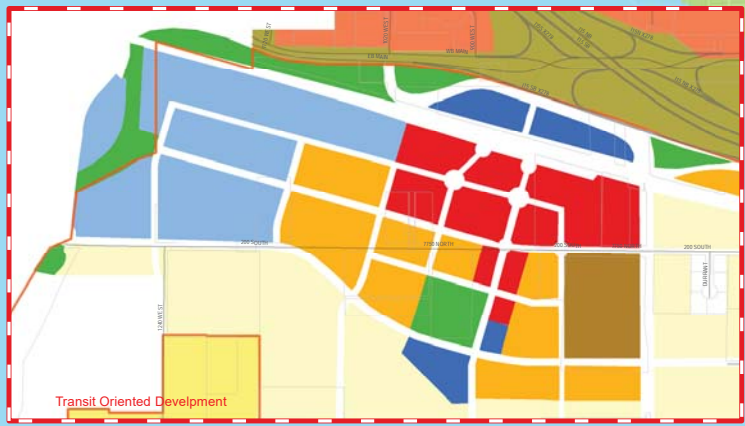
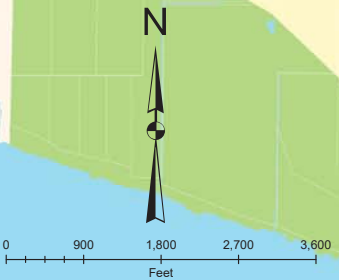
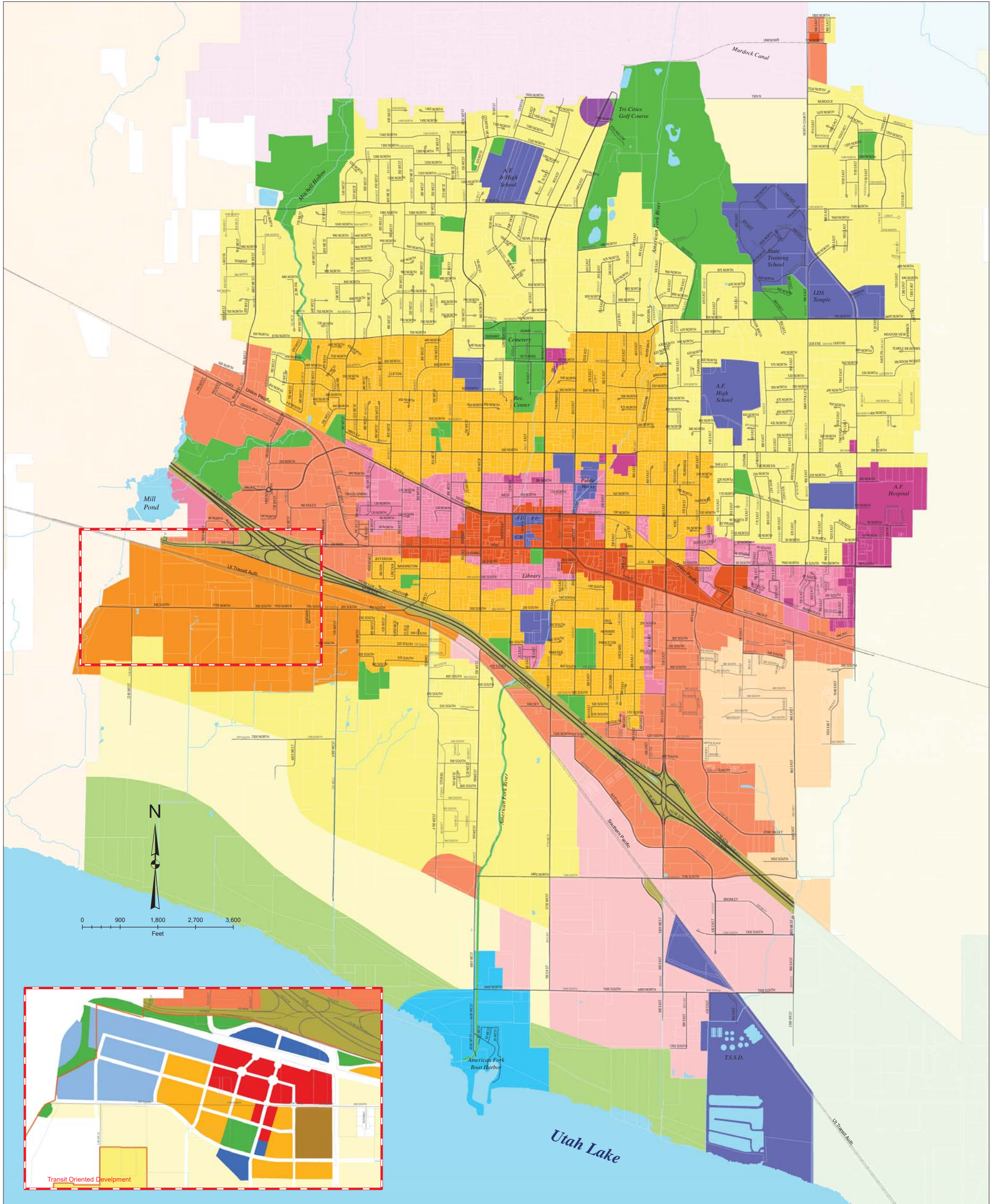
American Fork aims to plan for and encourage responsible and sustainable growth in the City. Part of the commitment to provide a sustainable system includes encouraging a reduction in vehicle trips by providing a balance of roads, trails and bikeways, and public transit facilities. Today’s transportation system should not only accommodate existing travel demands, but should also have built-in capacity to

account for the demand that will be placed on the system in the future. While considering the socioeconomic data used in this report and the anticipated growth in the City, some precautions should be considered. First, the TAZ specific socioeconomic data only approximates the boundary conditions of the City and is based on data provided by MAG and the City's planning documents. Second, actual values may vary somewhat as a result of the large study area of the regional travel demand model, which includes the unincorporated areas around American Fork. Therefore, the recommendations in this report represent a planning level analysis and should not be used for construction of any project without review and further analysis.

As the designated Metropolitan Planning Organization (MPO) for the Utah Valley area, MAG, organized in 1972, is largely responsible for regional transportation planning in the three-county region of Summit, Wasatch and Utah Counties. In this capacity, MAG produces a 30 Year Long Range Transportation Plan (LRTP) and a 5 Year Transportation Improvement Program (TIP). Both of these products are constrained by reasonably available revenue. As a result, the LRTP does not always include the regional facility improvements, which are planned by local communities. This TE makes great efforts to supplement the regional plans produced by MAG and to provide direction for future regional planning efforts that will include American Fork City.

3.2 FUTURE LAND USE

In its Land Use Plan, the City has sites planned for general, design, and neighborhood commercial; high, medium, low, very low density housing; public parks and open space, institutional lands such as schools and public facilities; shoreline protection areas and resorts; and major transportation facilities and transit oriented developments. There is also a planned community in the Land Use Plan and a transit oriented development. These areas were identified and reviewed individually in addition to the MAG land use assumptions. **Figure 3-1** and **Figure 3-2** show the latest Land Use Plan and Zone Map respectively.



American Fork City -- Land Use Map
 Last Updated: March 1, 2018

American Fork City Public Works Department
 GIS/CAD Division -- (801) 763-3060
 275 E. 200 N., American Fork, Utah 84003

This Map is the "Official American Fork City Land Use Map" as adopted by the American Fork City Council. Questions regarding American Fork City planning should be directed to the American Fork City Planning Department: 275 East 200 North, American Fork, Utah 84003, (801) 763-3000.

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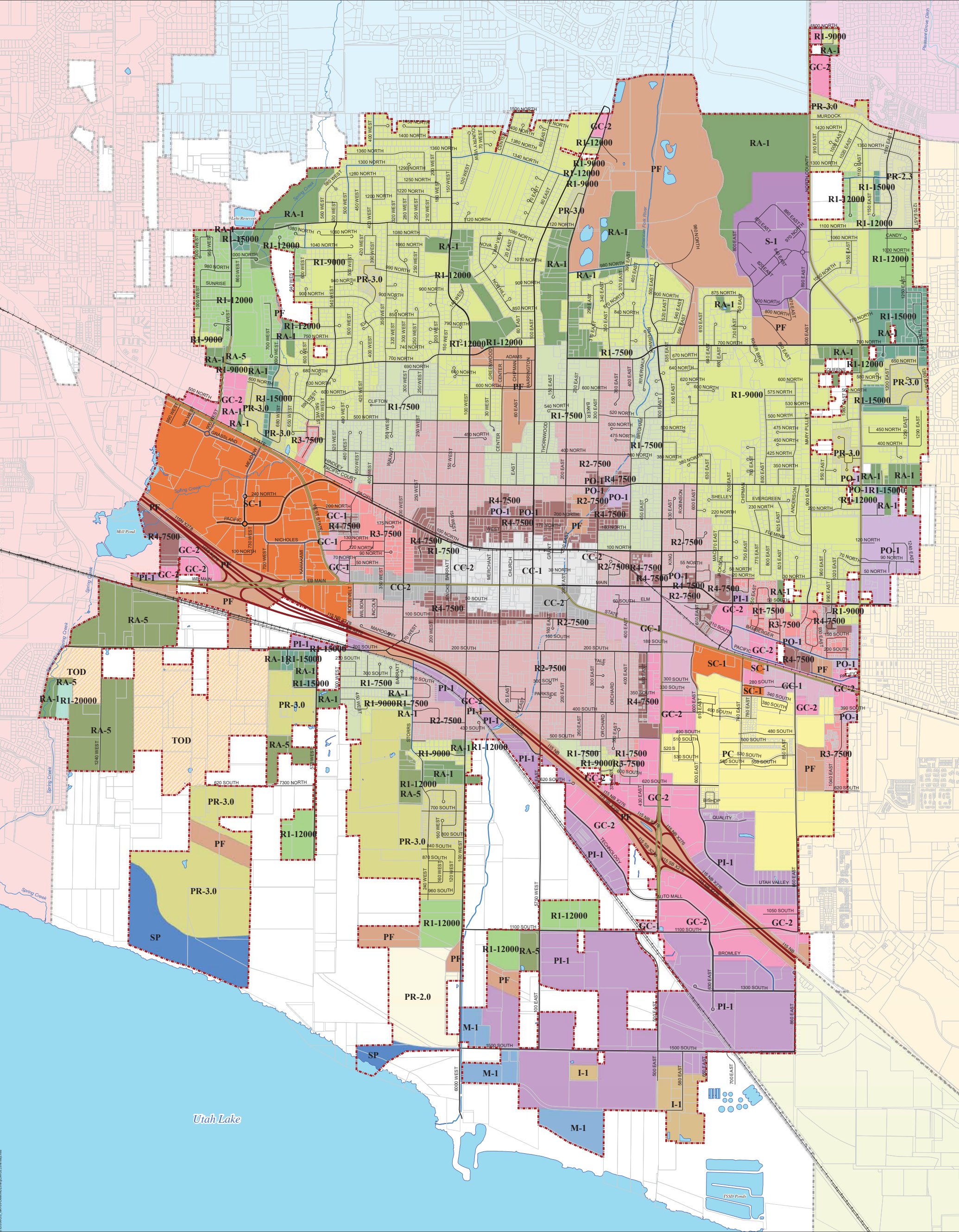


Transit Oriented Development

Business and Office Campus Commerce Center	Medium Density Multi Family Attached Housing 10-30 du/ac
Civic and Community Support Facilities	Parks, Plazas and Open Space Corridor
High Density Multi Family Residential 25-40 du/ac	Development core Mixed Use of High Density Residential, Offices and Neighborhood Commercial 35-65 du/ac
Medium Density Detached Single Family Residential Lots 4-6 du/ac	

MAP LEGEND

Local and/or Paved Roads	Cedar Hills	Residential High Density
Federal & State Roads	Highland	Residential Medium Density
Arterial Collectors	Lehi	Residential Low Density
Major Collectors	Lindon	Residential Very- Low Density
Minor Collectors	Pleasant Grove	Planned Community
Parcels	Vineyard	Shoreline Protection
Railroads	Professional Office	Public Parks & Open Space
Streams & Canals	Design Industrial	Resort
Lakes & Ponds	General Commercial	Institutional Lands, Schools and Public Facilities
<all other values>	Design Commercial	Major Transportation Facilities
Alpine	Neighborhood Commercial	Transit Oriented Development



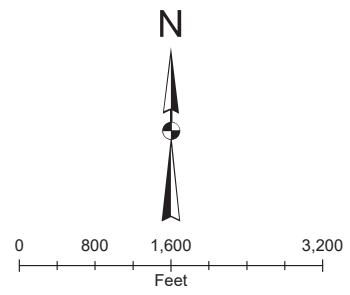
American Fork City - Zone Map
 Last Updated: February 15, 2018

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 atf@afcity.net

This map is the "Official American Fork City Zone Map" as adopted by the American Fork City Council. Questions regarding American Fork City Zones should be directed to the City Planning Department:
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MAP LEGEND

Federal	American Fork River	CC-1	PO-1	R2-7500
Arterial	Creeks	CC-2	PR-2.0	R3-7500
Major Collector	Canals and Ditches	GC-1	PR-2.3	R4-7500
Minor Collector	Lakes&Ponds	GC-2	PR-3.0	RA-1
Significant Local		I-1	R1-12000	RA-5
Local		M-1	R1-15000	S-1
Alley		PC	R1-20000	SC-1
Private		PF	R1-7500	SP
Future		PI-1	R1-9000	TOD

3.3 TRAVEL MODEL DEVELOPMENT

Projecting future travel demand is a function of projected land use and socioeconomic conditions. The MAG travel demand model was used to predict future traffic patterns and travel demand. The travel demand model was modified to reflect better accuracy through the American Fork area by creating smaller TAZ and a more accurate and extensive roadway network. Existing conditions were simulated in the travel demand model and compared to the observed traffic count data to get a reasonable base line for future travel demand. Once this effort was completed, future land uses and socioeconomic data was input into the model to predict the roadway conditions for the design year 2050, as well as intermediate years 2030 (ten year condition) and 2040 (mid-range planning). 2040 was selected as the design year. The 2050 Metropolitan Transportation Plan (available at www.mountainland.org) was adopted by the Mountainland MPO Regional Planning Committee in 2019. The transportation plan is a guide to maintain and enhance the regional transportation system for urbanized Utah County.

3.4 PROJECTED TRAFFIC VOLUMES AND CONDITIONS

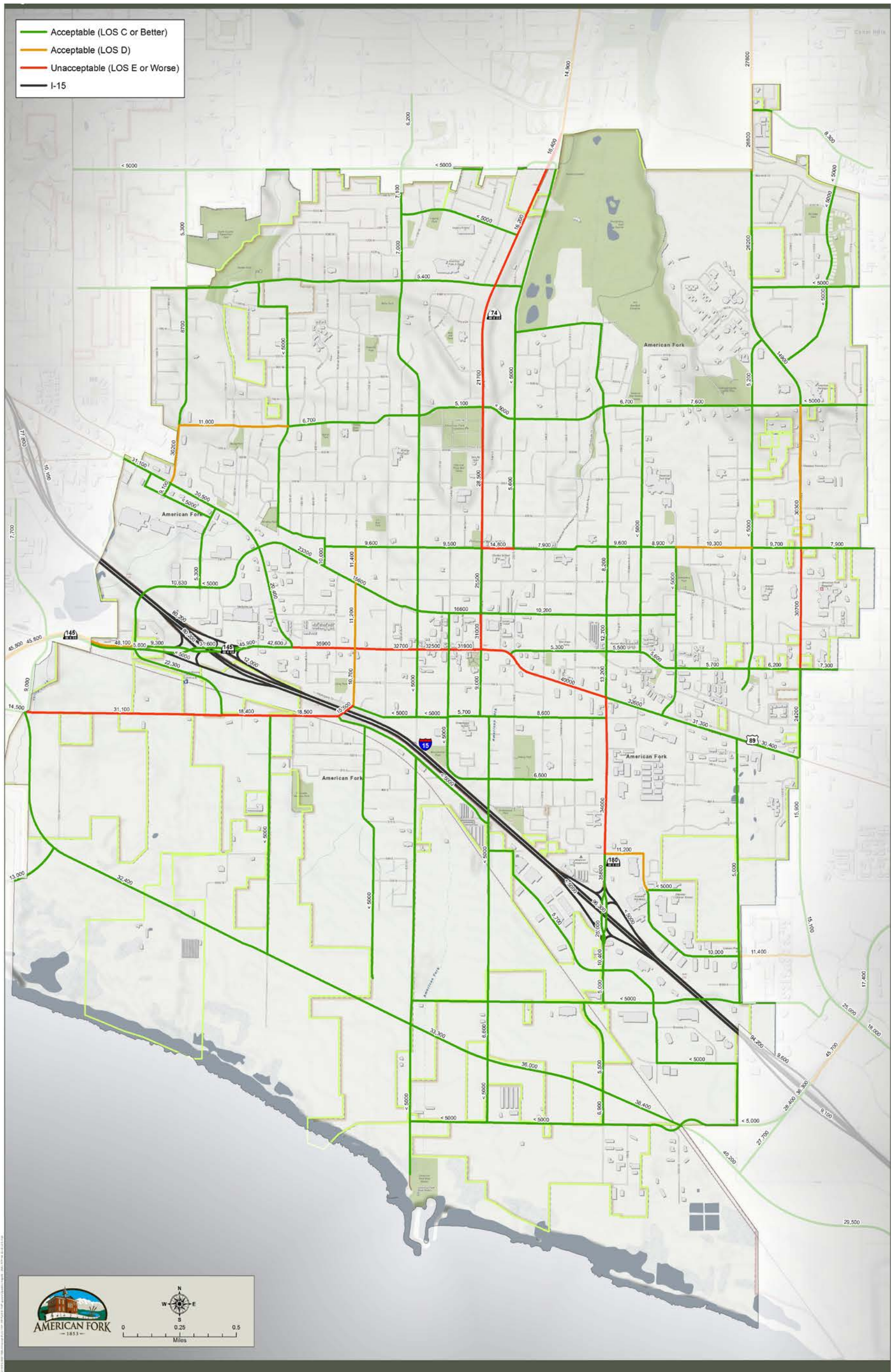
The resulting outputs of the travel demand model were made up of traffic volumes on all of the classified streets in the City and surrounding area. This data was used to identify the need for future roadway improvements to accommodate the projected growth in the City. A number of modeled alternatives were reviewed by the Planning Commission and City Council to establish the recommended roadway network for 2040. The following two scenarios were analyzed in detail to assess the travel demand and resulting network performance in the City:

- No-Build
- Recommended Roadway Network

3.4.1 NO-BUILD CONDITIONS

A no-build scenario is intended to show what the roadway network would be like in the future if no action were taken to improve the City roadway network. The travel demand model was again used to predict this condition by applying the future growth and travel demand to the existing roadway network. As shown in **Figure 3-3**, if no improvements are made to American Fork's transportation infrastructure, projected traffic volumes for the planning year 2040 will significantly lower the LOS of many of the major streets and intersections throughout the City. Some of the major areas of concern include Main Street, Pacific Drive, 100 East, Pioneer Crossing, the 900 West roundabout in "The Meadows", and parts of 300 North, 300 West, 200 South, and 400 West.

Figure 3-3 2040 No-Build Traffic Volumes and LOS



3.4.2 RECOMMENDED 2040 ROADWAY CONDITIONS











Improvements will need to be made as growth occurs in order to preserve the quality of life for American Fork residents and to maintain an acceptable LOS on City streets and intersections. These improvements will also provide a sound street system that will support the City's growing economic base.

LOS for signals is very difficult to predict so far out into the future. It is expected that at least some of the signals will fail to operate at LOS D or better as growth occurs and traffic patterns change and new roadways are added to the network. It is recommended that the signalized intersections in the City be regularly monitored and signal timings adjusted as needed to maintain acceptable operating conditions. Additionally, care should be taken to regularly monitor the non-signalized intersections in the City and, where appropriate, signal warrant studies should be performed to assess whether a traffic signal is warranted. Funding sources for signals should be explored and may include general funds, impact fees where appropriate and/or a special transportation improvement fund.







Areas of future concern in the American Fork street system were identified using traffic models of existing and projected traffic volumes to evaluate existing and projected level of service conditions. A recommended roadway network was created for the planning year 2040. This network was developed through a series of iterations with input from City staff, planning commission and city council. The final recommended roadway network seeks to balance accommodating demand through the year 2040 with fiscal responsibility, while also considering the planning efforts of MAG and the neighboring cities. Many of the neighboring cities and other jurisdictional stake holders including Lehi City, Lindon City, Pleasant Grove City, Highland, Cedar Hills and UDOT were consulted and their input welcomed and considered during this planning process. Transportation plans from each of the participating stakeholders are included in the appendix of this report. The culmination of this analysis, as well as the efforts of the Planning Commission and City Council, is shown as a recommended 2040 roadway network in **Figure 3-4**. It is expected that the roadway network recommended in this document will perform at an acceptable LOS through the planning year 2040. This will help in preserving the quality of life and economic vitality of the City. The specific details of the recommended roadway network are discussed more extensively in subsequent sections.

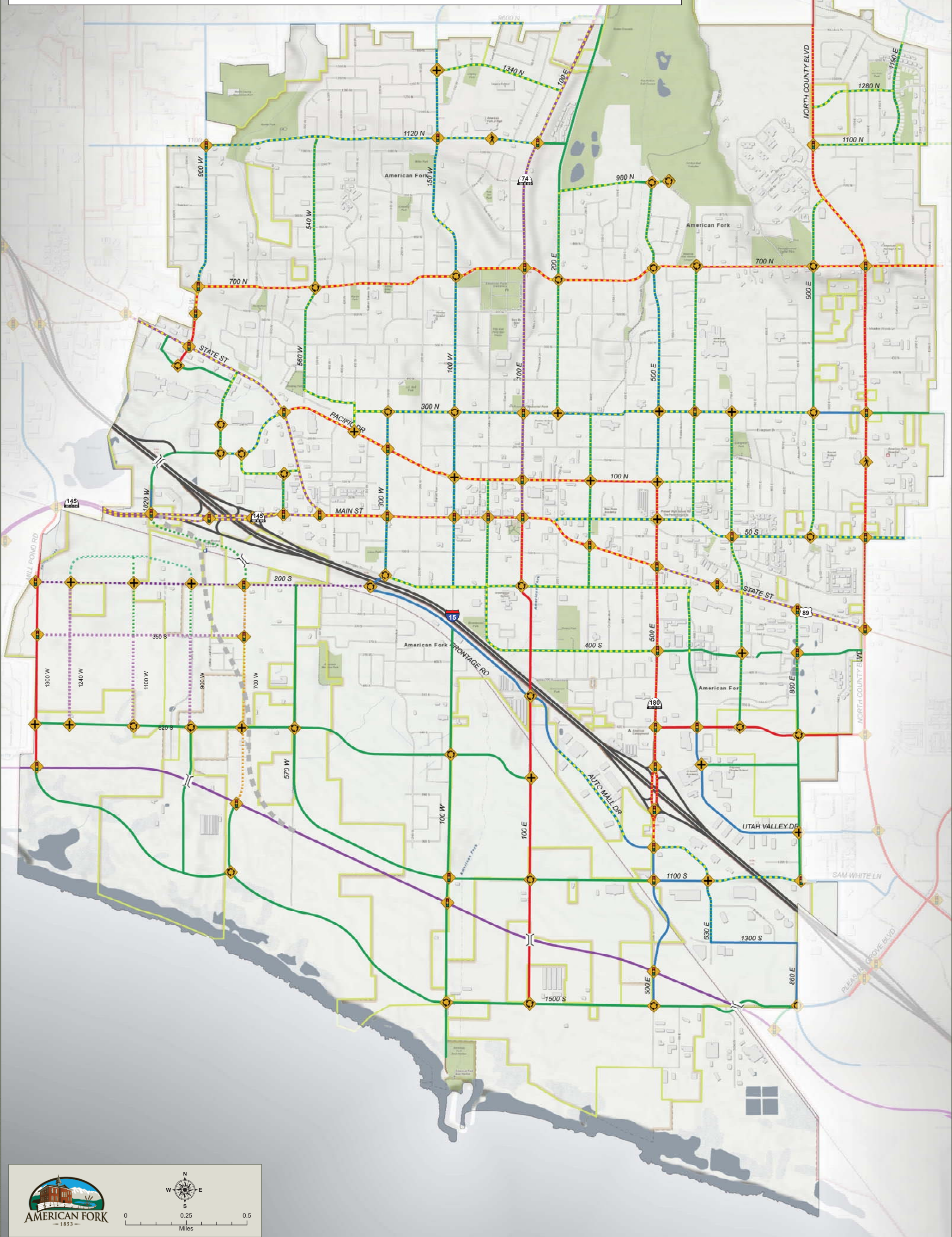
Figure 3-4 Probable "Vision" Network

Vision Roadway Network

-  I-15
-  Legacy Principal Arterial
-  Legacy Major Arterial
-  Legacy Minor Arterial
-  Legacy Collector
-  Principal Arterial
-  Arterial
-  Major Collector
-  Collector
-  Vineyard Connector (UDOT Cleared Alignment)

Transit Oriented Development Intersections

-  Business-Core Loop
-  Business Arterial
-  Major Arterial
-  Core Collector
-  Neighborhood Collector
-  Roundabout
-  Signal
-  HAWK
-  Intersection Improvement
-  Overpass



3.5 ROADWAY FUNCTIONAL CLASSIFICATION

A major reason for transportation planning is to provide adequate transportation solutions for connectivity with the surrounding region, while at the same time preserving the quality of life of the residents in the City. The key to maintaining this balance exists in the ability to adequately plan for major corridors that minimize cut-through traffic in neighborhoods and coordinating land use and transportation plans that capitalize on the efficient movements of people and goods. To accomplish this objective, this plan defines a hierarchy of streets known as a Functional Classification of Streets. The following street classifications have been selected by American Fork for inclusion in the TE:

- Freeway – I-15
- Principal Arterial – 7 Lanes
- Arterial – 5 Lanes
- Major Collector – 3 Lanes
- Collector – 2 Lanes
- Local Road – 2 Lanes

Each of these roadway classifications has a specific purpose and function. Access and mobility are competing functions. This recognition is fundamental to the design of roadway systems that preserve public investments, contribute to traffic safety, reduce fuel consumption and vehicle emissions, and do not become functionally obsolete. Suitable functional design of the roadway system also preserves the private investment in residential and commercial development. The Federal Highway Administration (FHWA) defines the roadway classifications as follows:

- Arterial
 - Provides the highest level of service at the greatest speed for the longest uninterrupted distance, with some degree of access control.
- Collector
 - Provides a less highly developed level of service at a lower speed for shorter distances by collecting traffic from local roads and connecting with arterials.
- Local
 - Consists of all local roads not defined as arterials or collectors; primarily provides access to land with little or no through movement.

A typical trip on an urban street system can be described as occurring in identifiable steps. These steps can be sorted into a definite hierarchy with respect to how the competing functions of mobility and access are satisfied. For example, the primary purpose of an arterial street is to move large volumes of traffic at higher speeds and provide access to collector roads and higher density retail and commercial land uses. Some key arterial streets that currently traverse the City of American Fork include State Street, Pioneer Crossing, 100 East and North County Boulevard. At the low end of the hierarchy are local roads that provide good access to abutting properties, but provide limited opportunity for through movement. Collector roads provide a transition between arterials and local roadways by providing both access and traffic moving capacity. Examples of existing collector roads within the City include 300 North and 900 West. Collector type facilities serve moderate traffic volumes at moderate speeds. At the highest end of the hierarchy are freeway facilities that provide good mobility by limiting and controlling access to the roadway, thereby reducing conflicts that slow the flow of through traffic. Interstate 15 is the only freeway facility serving American Fork.

Roadway specialization simply means using each individual street facility to perform the desired mix of functions of access or movement. This is accomplished by classifying corridors with respect to the amount of access or mobility they are to provide and then identifying and using the most effective facility to perform that function.



Typical roadway cross-section dimensions are included in the American Fork City Standards and Specifications which can be accessed through the American Fork City website: <https://afcity.org/DocumentCenter/View/73/Standards-and-Specifications-Drawings-Only-PDF>. Included in the TE is a summary table for all typical cross-sections included in the standards and specifications as shown in **Table 3-2**. Roadways which will include proposed bike lanes require an additional 20' of right-of-way.

Table 3-2 Roadway Cross Sections

Roadway Classification	ROW Width (ft.)	Roadway Width (ft.)	# of Lanes
<i>City Cross-Sections</i>			
Local Street (all variations)	62	32	2
Minor Collector	72	42	2
Minor Collector w/ 14' Sidepath	72	38	2
Minor Collector w/ 10' Sidepath	72	42	2
Major Collector	84	54	3
Major Collector w/ 14' Sidepath	84	50	3
Major Collector w/ 10' Sidepath	84	54	3
Arterial	100	70	5
Arterial w/ 14' Sidepath	100	66	5
Arterial w/ 10' Sidepath	100	70	5
<i>¹Private Roadway Cross-Sections</i>			
Private Street (trees)	62	32	2
Private Street (no trees)	52	32	2
<i>Transit Oriented Development Cross-Sections</i>			
Major Arterial	84	62	4
² Business Arterial	112.5	74.5	4
Core Collector	84	35	2
Neighborhood Collector	79	35	2
Business - Core Loop	82	38	2
Rear Lane (residential)	24	20	2
Rear Alley (non-residential)	30	26	2

1. Private roads are to meet public road standards. Unless in TOD area.
2. Cross-Section Varies

Impacts to adjacent properties can be limited by applying minimal typical sections to stretches of roadway between intersections. Typically, intersections are choke points in a traffic system. Providing sufficient left and right turn pockets to accommodate at least the average expected peak hour at intersections could maximize capacity. Treatments at intersections are discussed further in the section below entitled *Intersection Improvements*. Pedestrian and bicycle traffic should also be considered in the design of major roadways as discussed in the next sections.

Accommodating alternative modes of transportation is a vital consideration when planning a livable and sustainable community. As a vibrant and growing city, it is important for American Fork to continue to plan for improved transit, trails, and pedestrian facilities. These facilities will improve the overall quality

of life of the residents while aiding in congestion relief and increasing the lifespan of the City’s roadway network.

It is also important that the correct speed limits be posted on the streets in the roadway network. Arterials will typically have higher speeds than collector streets. The City’s access management standards recommend that the City use the following guidelines when posting speed limits:

- Collector 25 mph
- Major Collector 30 mph
- Arterial 35 mph
- Principal Arterial 45 mph

TOD Roadways

- Business – Core Loop 25 mph
- Neighborhood Collector 25 mph
- Core Collector 25 mph
- Business Arterial 25 mph
- Major Arterial 30 mph

3.6 FUTURE ALTERNATIVE TRANSPORTATION MODES

3.6.1 NON-MOTORIZED TRAFFIC

Pedestrian and bicycle safety is an important feature of any transportation master plan. People will be more inclined to walk or ride their bicycle when the experience is pleasant, they feel safe, and distances are reasonable. High-density housing near high-traffic generators or main street type areas encourages people to use alternative travel options to the automobile. Provision has been made in the design of the typical cross-sections for use in American Fork City to accommodate pedestrian and bicycle facilities. Each of the standard cross-sections shown in **Table 3-2** includes a five-foot sidewalk coupled with an eight-foot parkstrip to provide a buffer between pedestrians and vehicular traffic. The Bicycle and Pedestrian Master Plan also provides guidelines on the location and nature of future trails and bikeways to accommodate the future needs of the City. This document seeks to integrate the recommendations provided in the BPMP with the recommended roadway cross sections shown above. **Table 3-2** shows roadway cross-sections for roadways that are on both the TE and BPMP.

The BPMP should be used to guide the transportation planning efforts in terms of trails and pedestrian facilities in the future. Specifically, the trails portion of the plan includes several recommendations, which are reiterated in the TE as priorities for the future planning in the City. The recommendations in the plan can be categorized into the following ideas:

- Connect all areas of the City
- Fill critical gaps in the walking and bicycling networks
- Identify existing and planned facilities on the City’s perimeter so that recommended facilities provide seamless connections to surrounding communities
- Where possible, recommend facility types that serve the widest range of users, particularly those who are less comfortable riding bicycles in close proximity to traffic
- Recommend facilities than can feasibly be constructed and maintained by the City
- Use a phased implementation approach that provides logical short- and medium-term recommendations, while retaining long-term visionary recommendations
- Avoid impacting on-street parking or traffic lanes along the critical roadways where those impacts would be highly undesirable

In order to create a more connected and complete trails system, each of the roads that appear on both the Transportation Master Plan and the Recommended Bikeways Map (shown in **Figure 3-5**) will include bicycle facilities. The design guidelines set forth in the Trails Master Plan should be followed when planning and constructing the additional trails. For more info on where the standards and guidelines are see <https://afcity.org/DocumentCenter/View/73/Standards-and-Specifications-Drawings-Only-PDF>

The BPMP identifies the following bikeway classifications for future construction:

- **Shared-Use Paths**
 - Shared-use paths are generally located within rights-of-way separated from roadways (such as streams, utility corridors, and railroads) and serve all types of non-motorized users. They are the facility of choice for many people who wish to avoid bicycling near traffic. However, they are also the most expensive bikeway type, may not serve transportation purposes as well as on-street facilities, and have limited opportunities for development due to the scarcity of non-roadway rights-of-way. Shared-use paths are typically 10' wide or greater and can be constructed of asphalt or concrete.
- **Sidepaths**
 - Sidepaths are similar to shared-use paths in terms of pavement, desired width, and user mix, although they are sometimes narrower than shared-use paths where right-of-way is tight. They are called “sidepaths” because they run parallel to roads with frequent driveways or intersections. This creates an operational difference that distinguishes sidepaths from shared-use paths. Shared-use paths travel for long distances without encountering vehicle crossings and generally cross roads at right angles. Sidepaths, on the other hand, encounter more complex driveway and intersection conflicts with cars, particularly when bicyclists ride in the direction opposite the traffic flow on the road adjacent to the sidepath.
 - Sidepaths can be useful for pedestrians as well as children and adults who bicycle slowly and exhibit behavior similar to pedestrians. However, they are not a good alternative for faster or more experienced bicyclists because they place bicyclists in places where drivers may not expect them. In situations where a shared-use path is preferred but not feasible, short stretches of sidepath can be used as a substitute to connect shared-use paths on both ends of the sidepath.
- **Bike Boulevards**
 - Bike boulevards are a relatively new bikeway type. They take advantage of low-speed, low-traffic streets where many people prefer to bicycle. Typically these types of streets work well for bicyclists for a few blocks at a time but pose a challenge as soon as the street intersects a larger or higher speed road. Key components of bike boulevards are intersection improvements such as median islands and signage that allow bicyclists to safely cross busy streets.
 - Bike boulevards are not typically installed on collector or arterial roads because dedicated space (such as a bike lane) is not provided on bike boulevards to separate bicycles from cars. Neighborhood traffic circles, curb extensions, and other traffic calming measures often accompany bike boulevards in order to keep traffic volumes and speeds low. Maintenance requirements for bike boulevards are generally limited to necessary upkeep of neighborhood traffic circles or intersection treatments.
- **Buffered Bike Lanes**
 - Buffered bike lanes use a painted buffer space to provide a measure of separation from car traffic. People who are uncomfortable bicycling near traffic usually prefer buffered bike lanes to “regular” bike lanes.
 - Buffered bike lanes may require more frequent sweeping than car lanes because cars tend to push rocks into the buffered bike lanes. As a result, they accumulate debris without regular sweeping.

- Bike Lanes
 - Bike lanes use a single white stripe to separate bicycle traffic from car traffic. Bike lanes will normally accommodate confident and experienced bicycle riders, but they may not provide enough separation from high-speed cars to attract less-experienced riders. As with buffered bike lanes, regular sweeping may be needed to keep the lanes free from debris pushed into them by car tires.
 - Care must be taken to transition bike lanes (and buffered bike lanes) through intersections in a safe manner and also protect the lanes from car doors in instances where the bike lanes are next to car parking
- Marked Shared Roadways
 - Marked shared roadways are typically implemented in corridors where dedicated space for higher-level treatments cannot be allocated or where traffic speeds and volumes dictate that a higher-level facility is not warranted. This treatment should not be used on any roadways with a speed limit in excess of 35 mph, although it is preferable to limit them to roads with speed limits of 30 mph or less.
 - Unless speeds and volumes are low, many people will not feel comfortable riding on a road with this treatment. However, in instances where a higher-level facility is not technically or politically feasible they can serve as valuable treatments to legitimize experienced riders who choose to bicycle there. The markings can be accompanied by optional signage that further notifies automobile drivers that bicyclists should be expected to ride in the lane where the markings are placed. Proposed marked shared roadways are listed in **Figure 3-5**
- Signed Shared Roadways
 - Signed shared roadways do not have any dedicated roadway space for bicycles. They simply provide signage designating the road as a bike route. Signed shared roadways can be created on roads with or without shoulders as well as with or without parking. It is a particularly effective treatment on roads with wide shoulders where parking is permitted but is infrequently used. In these instances the shoulders behave like de-facto bike lanes for long stretches.
 - Care should be taken when considering implementing this type of bikeway on roads with little or no shoulder or on roads with heavy parking volumes. In those cases a marked shared roadway may be a better option as long as the speed limit does not exceed 35 mph.
- Walkways
 - The walkways recommended in this master plan consist of prioritized sidewalk installations, sidepaths, shared-use paths, and unpaved trails. Sidewalks were chosen for prioritized status based on proximity to schools, location on collector and arterials streets where lots of traffic is present, and whether at least one side of the road already has a sidewalk.
- Cycle Track
 - Cycle tracks combine the off-street separation of shared-use paths with on-street elements of bike lanes. Between intersections, they provide the greatest amount of separation between cars and bicyclists of any on-street bikeway type. However, intersections must be treated at a very high level in order to safely transition cycle tracks through. The distinguishing characteristic of a cycle track is some form of physical separation between moving cars and bicycles. Less-experienced bicyclists often prefer cycle tracks over other bikeway types because of the separation from car traffic.

- In snowy climates care must be taken to design cycle tracks to facilitate snow removal. Smaller plows or the use of removable bollard posts are ways to construct cycle tracks which can be cleared of snow and winter debris. Cycle tracks may also require frequent sweeping to keep the pavement clear and safe for bicycle travel.

Approximately 127 miles of bikeway and walkway are planned in the City for the future. 37.26 of these miles are walkways and 89.72 miles are bikeways. It is recommended that the Bicycle and Pedestrian Master Plan be the determining document for when pedestrian and bicycle facilities are constructed on a given roadway. The number of bikeway and walkway miles needed in the future is summarized by facility type in

















Table 3-3.

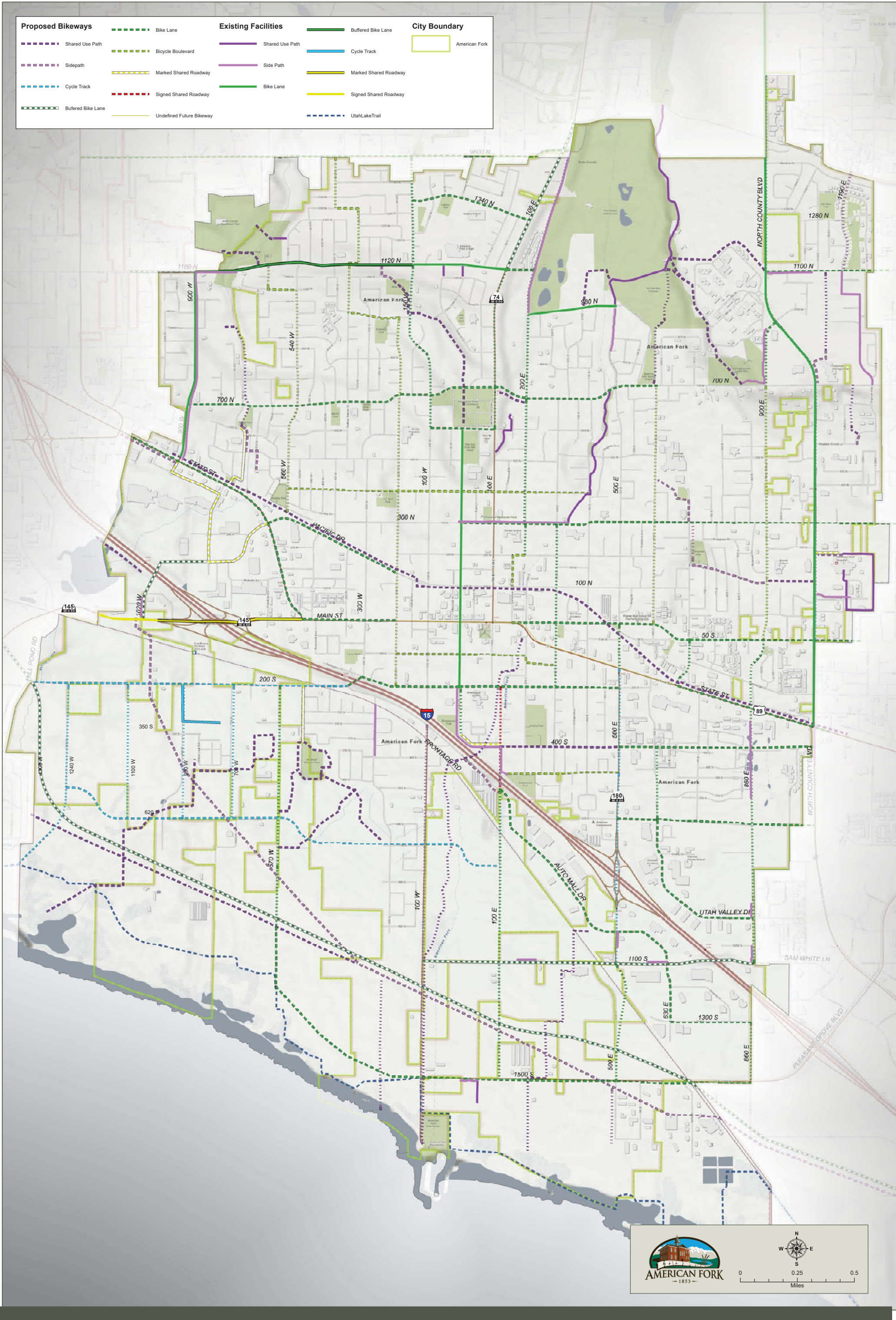


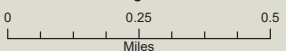
Figure 3-6 shows the recommended future walkways.

Table 3-3 Recommended Bikeways and Walkways

Facility Type	Length (miles)
Shared-Use Path	27.85
Bikeway Sidepath	9.52
Bike Boulevard	8.75
Buffered Bike Lane	8.79
Bike Lane	31.29
Marked Shared Roadway	1.78
Signed Shared Roadway	0.45
Undefined Bikeway	1.29
5' Sidewalk Walkway	10.44
Walkway Sidepaths	24.79
Unpaved Trails	2.03
Total	126.98

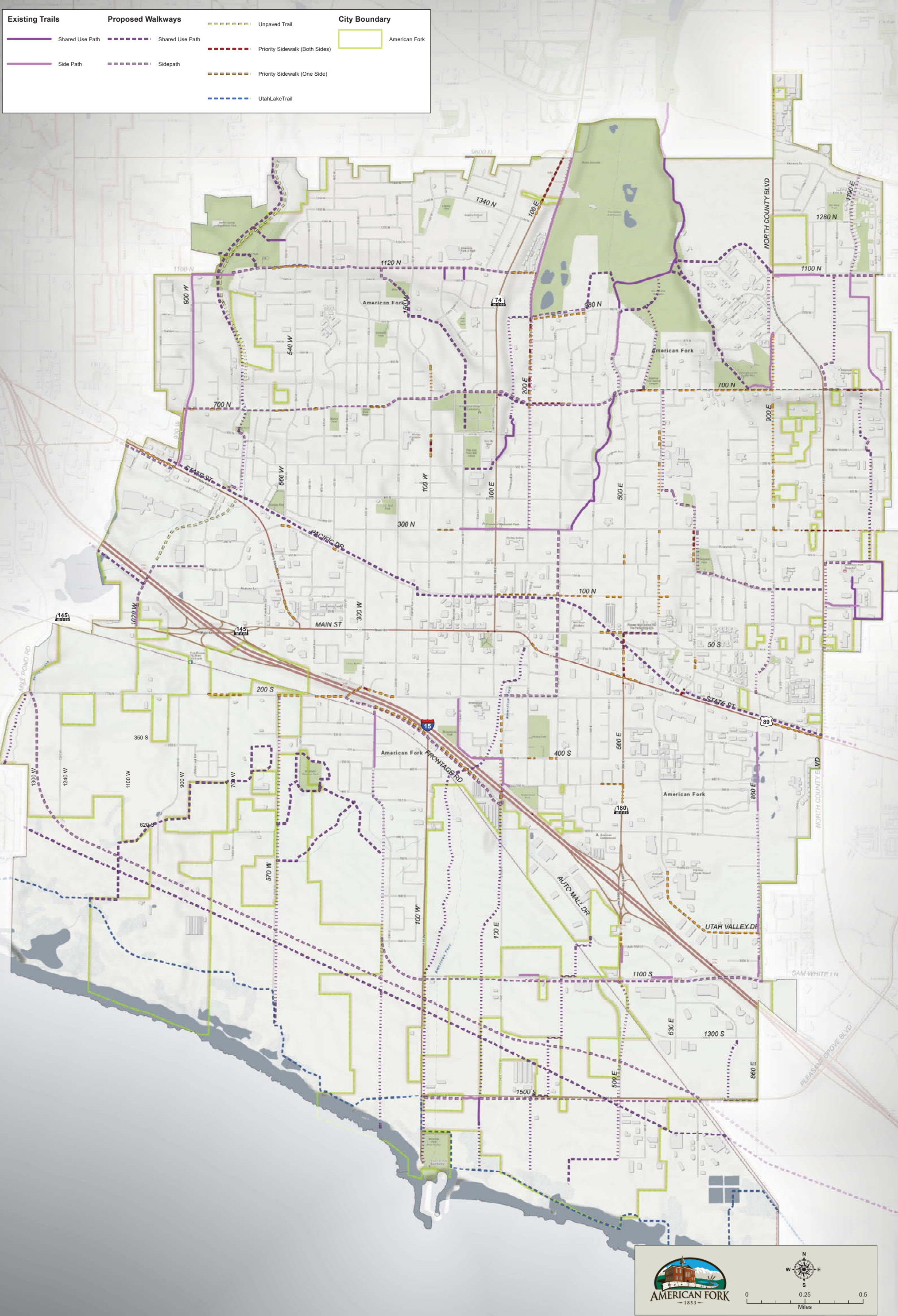
Figure 3-5 Recommended Bikeways

Proposed Bikeways		Existing Facilities		City Boundary	
	Bike Lane		Shared Use Path		American Fork
	Shared Use Path		Bicycle Boulevard		
	Sidepath		Marked Shared Roadway		
	Cycle Track		Signed Shared Roadway		
	Buffered Bike Lane		Undefined Future Bikeway		
			Buffered Bike Lane		
			Cycle Track		
			Marked Shared Roadway		
			Signed Shared Roadway		
			UtahLakeTrail		

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Figure 3-6 Recommended Walkways



AMERICAN FORK
— 1853 —

0 0.25 0.5
Miles

A compass rose and a scale bar are located in the bottom right corner. The scale bar indicates distances of 0, 0.25, and 0.5 miles. The compass rose shows North, South, East, and West directions.

AMERICAN FORK CITY ENGINEER: JEFFREY L. HARRIS, CIVIL ENGINEER, LICENSE NO. 25010. AMERICAN FORK CITY ENGINEER: JEFFREY L. HARRIS, CIVIL ENGINEER, LICENSE NO. 25010.



Table 3-4 below gives a summary of bikeway and walkway projects that are located adjacent to Phase 1 roadway projects. For efficiency it is recommended that the adjacent bike/ped. facilities be constructed at the same time as their adjacent roadway. Costs were gathered from the BPMP and proportioned out according to the length of facility adjacent to the Phase 1 roadway projects.

Table 3-4 Proposed Bike/Ped. Facilities Adjacent to Phase 1 Roadway

American Fork City Phase 1 Bike/Ped. Projects							
Adjacent Roadway Project Number	Type	Trail Name/ Location	From	To	Jurisdiction(s)	Length (miles)	Total Project Costs
1.6	Shared Use Path	700 E Connection Trail	100 E	200 E	City	0.13	\$ 159,693.00
1.8	Shared Use Path	Historic Utah Southern Rail Trail	900 W	680 W	UDOT/UTA	0.35	\$ 352,651.52
1.18	Shared Use Path	Historic Utah Southern Rail Trail	700 E	East City Limits	UDOT/UTA	0.63	\$ 627,651.52
1.21	Shared Use Path	American Fork 200 S Trail	Center St	Spring Creek Ranch Rd	UDOT	1.87	\$ 4,500,000
1.78	Shared Use Path	Power Line Trail	West City-Limit	East City-Limit	City	1.54	\$ 1,929,877.57
1.68	Shared Use Path	American Fork River Trail	1500 S	American Fork Marina	UDOT	0.82	\$ 1,033,487.85
1.6	Walkway Side Path	700 N	900 W	680 W	City	0.30	\$ 168,067.00
1.7	Walkway Side Path	1100 N	1100 E	East City Limit	City	0.27	\$ 149,590.71
1.17	Walkway Side Path	300 E	300 N	200 S	City	0.72	\$ 398,672.31
1.74	Walkway Side Path	860 E	State St	1050 S	City	0.62	\$ 342,927.75
1.48	Walkway Side Path	570 W	200 S	Vineyard Connector	City	1.01	\$ 557,508.89
1.72	Walkway Side Path	1100 S	100 W	500 E	City	0.84	\$ 465,743.16
1.8	Bikeway Side Path	Historic Utah Southern Rail Trail	West City Limit	900 W	UDOT/UTA	0.24	\$ 132,746.00
1.15	Bikeway Side Path	Spring Creek Crossing	Meadow Ln	Main St	City	0.59	\$ 326,335.00
1.78	Bikeway Side Path	Vineyard Connector	East City Limit	West City Limit	UDOT	3.60	\$ 1,991,194.00
1.21	Cycle Track	200 S	1300 West	Frontage Rd	City	1.37	\$ 500,000.00



American Fork City Phase 1 Bike/Ped. Projects

Adjacent Roadway Project Number	Type	Trail Name/ Location	From	To	Jurisdiction(s)	Length (miles)	Total Project Costs
1.46	Cycle Track	1240 West	200 S	700 S	City	0.57	\$ 209,646.65
1.51	Cycle Track	900 W	200 S	700 S	City	0.59	\$ 216,351.47
1.60	Cycle Track	700 S	1240 W	570 W	City	1.97	\$ 719,074.87
1.50	Cycle Track	1100 W	200 S	700 S	City	0.59	\$ 214,969.03
1.52	Cycle Track	700 W	200 S	700 S	City	0.59	\$ 215,038.16
1.16	Buffered Bike Lane	100 E (Alpine Hwy)	North City Limit	1120 N	UDOT	0.74	\$ 17,194.00
1.15	Buffered Bike Lane	1020 W (I-15 Crossing)	Pacific Dr	Pioneer Crossing	City	0.47	\$ 326,335.00
1.78	Buffered Bike Lane	Vineyard Connector	Pioneer Crossing	West City Limits	UDOT	3.51	\$ 81,401.00
1.72	Buffered Bike Lane	1100 S	100 W	500 E	City	0.89	\$ 20,088.15
1.16	Bike Lane	100 E (Alpine Hwy)	600 N	1120 N	UDOT	0.70	\$ 12,848.00
1.7	Bike Lane	1100 N	900 E	East City Limits	City	0.44	\$ 8,103.00
1.8	Bike Lane	State St	West City Limits	Main St	UDOT	1.14	\$ 20,961.00
1.17	Bike Lane	300 E	300 N	200 S	City	0.71	\$ 88,673.55
1.48	Bike Lane	570 W	200 S	Vineyard Connector	City	1.01	\$ 558,871.84
1.53	Bike Lane	100 West	Frontage Rd	Vineyard Connector	City	1.17	\$ 21,592.00
1.68	Bike Lane	100 West	Vineyard Connector	American Fork Marina	City	0.42	\$ 12,319.00
1.69	Bike Lane	Automall Dr	100 E		City	0.27	\$ 4,971.01
1.35	Bike Lane	Automall Dr	500 E		City	0.13	\$ 2,342.18
1.18	Bike Lane	State St	700 E	East City Limits	UDOT	0.64	\$ 11,787.00
1.12	Bike Lane	620 S	500 E	600 E	City	0.17	\$ 3,203.00
1.11	Bike Lane	620 S	600 E	East City Limits	City	0.64	\$ 11,787.00
1.74	Bike Lane	900 E/860 E	State St	1100 S	City	1.11	\$ 611,985.46
1.2	Marked Shared Roadway	Grassland Dr	Meadow Ln	State St	City	0.24	\$ 1,856.35
Cost of Bike/Ped. Projects Adjacent to Phase 1 Roadway Projects							\$17,027,600

American Fork does not operate and maintain its own transit system. The combined efforts of UTA, UDOT, MAG, and the City will largely dictate the nature of a future expanded transit system. The City should be actively involved in supporting transit as a viable and attractive alternative transportation mode in the City. These planning and lobbying efforts will assist in procuring the necessary funding and support to develop, implement, and maintain a sustainable transit system.

The UTA bussing system is versatile as routes and stops can be adjusted as the demand and other factors require it. With the recent addition of the FrontRunner commuter line into Utah County, many bus lines were adjusted or eliminated. The MAG transit plan can be seen in **Figure 3-7**.

3.6.2.1 BUS RAPID TRANSIT (BRT)

BRT is a relatively new public transportation alternative in Utah. In July 2008, UTA opened its first MAX BRT line. The line currently operates along 3500 South between the 3300 South Light Rail station and Magna. BRT is often referred to as light rail with rubber tires as it can and often does operate in a dedicated guide way, separate from traffic. BRT offers limited stops and traffic signal priority, significantly decreasing route travel times. UTA has plans to begin operating additional BRT routes along 5600 West in Salt Lake County and along University Parkway on Orem. Several other BRT routes are identified in the MAG regional transit plan including two in American Fork.

The MAG regional transit plan for 2040 shows a planned Bus Rapid Transit (BRT) line running through American Fork in two places.

North County Boulevard BRT

North County Boulevard connects State Street in Lindon, north through American Fork to SR-92 at Alpine. The MAG transit plan shows a BRT line following this roadway corridor.

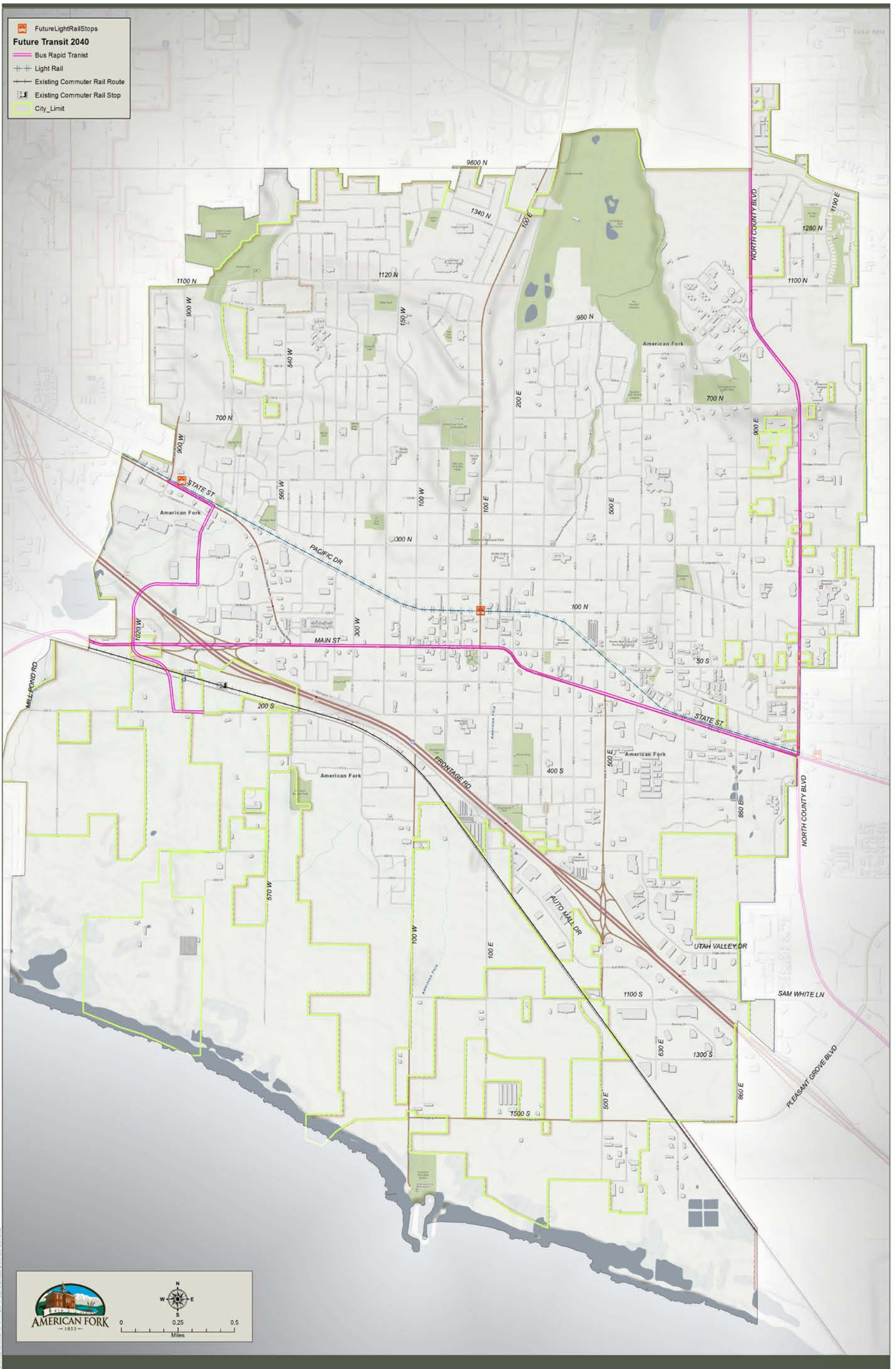
State Street

State Street runs from Springville Main Street to Lehi near Thanksgiving Point. A BRT line is shown on the MAG transit plan along State Street through American Fork that continues west along Pioneer Crossing towards Saratoga Springs and Eagle Mountain.

3.6.2.2 LIGHT RAIL: TRAX

Light Rail, called “TRAX” in Utah, has been operating in Salt Lake County for more than a decade. There are currently three lines in operation with two more under construction that are expected to open before 2015. There are no existing TRAX lines in Utah County or any under construction. According to the MAG regional plan, the first TRAX line in Utah County will be an extension of the existing TRAX line in Draper. However, it is not anticipated to come online in Utah County until 2031-2040. The new TRAX line will have stops in American Fork near 900 West/State Street, 100 East/Main Street, and North County Boulevard/State Street. As a rule of thumb, at least one mile spacing between Light Rail stations is typical, compared to commuter rail stations that are approximately 5+ miles apart.

Figure 3-7 Future Transit Plan



3.6.2.3 COMMUTER RAIL: FRONTRUNNER

The most recent addition to the Utah statewide transportation system is UTA's FrontRunner commuter rail line. The line connects Davis, Weber, Salt Lake, and Utah counties with stations along the Wasatch Front. Many stations have a connection to the TRAX and bus networks. FrontRunner is a push/pull locomotive system, which can travel up to 79 mile per hour. Future planned expansions will add service to Brigham City in the north and Payson in the South. Part of the MAG *Vision* plan, which extends beyond 2040, includes a FrontRunner line connecting American Fork to Santaquin via Lehi, Saratoga Springs, Eagle Mountain, Cedar Fort, Fairfield and Goshen west of Utah Lake.

An essential consideration of a good transportation system is the ability to seamlessly transfer from one transportation mode to the next. This could be from car to commuter rail, bike to bus, or foot to light rail. Each of these transfers must be accomplished efficiently in order for a transit system to be attractive to users. One way to accomplish exceptional connectivity is with an intermodal center. Intermodal centers are transit hubs where multiple modes of transportation converge and passengers enter using one form of transportation and leave by another. Transfers can occur between as many modes as the physical space can permit. The FrontRunner station in American Fork provides this connectivity as it serves as a park and ride lot, FrontRunner station and bus hub. In the future, TRAX will be integrated into the area and bus, BRT, and trails routes will be added.

3.7 MAIN STREET VISION

In 2010, American Fork City, in conjunction with the MAG, published the *American Fork Main Street Vision Plan*. The American Fork Main Street Vision Plan is an initiative of the City of American Fork, and is funded and managed by the MAG. This visioning and planning process was intended to help define a desired future vision for Main Street, and identify potential opportunities and strategies for strengthening Main Street's role in the community. Implementing the Main Street Vision will be a long process. Achieving the complete Vision may require 30-40 years of individual public works projects and numerous public/private partnerships. The Main Street Vision plan has been fully incorporated into the planning of the Transportation Element of the General Plan and is included in the appendix of this report. Main Street through the vision study area will remain a 5-lane roadway and Pacific Drive will be upgraded to a 5-lane facility. These parallel facilities will serve both purposes of maintaining traffic flow and providing a sustainable and vibrant downtown area.

The Main Street Vision plan includes recommendations on the physical, economic, and mobility characteristics of the downtown area. These recommendations include beautification and urban design strategies, identifying and creating a community development area, prioritizing projects and identifying potential funding sources, clarifying policies regarding City offered incentives, issuing requests for qualifications to developers clearly outlining the goals and incentives for the downtown development, adopting the Main Street Vision into both the City and regional transportation master plans, preserving funds for roadway enhancements, exploring the option for increased parking availability, and updating zoning and development regulations to include bicycle and pedestrian infrastructure.

The Main Street Vision study area is split into 6 distinct districts shown below in **Figure 3-8**. Each district has distinct objectives and characteristics. For a complete narrative please see the published American Fork Main Street Vision document. The major objectives and how they relate to the Transportation Element of the General Plan are considered in the following paragraphs.

Figure 3-8 Main Street Vision Districts



3.7.1 DOWNTOWN HISTORIC CORE DISTRICT

The downtown historic district is the heart of the City. It is comprised of several historic structures that have long served as attractions to the downtown area.

The Main Street Vision Plan focuses on strengthening the Historic Core District as the Heart of the City by encouraging preservation and reuse of historic buildings; adopting strategies for infill development of multi-story uses to strengthen the street wall; improving the pedestrian infrastructure; encouraging the restaurants, professional offices and specialty retail stores to locate downtown; and locating cultural facilities and community events in the downtown area. Focused attention also needs to be placed on ensuring that the Historic Core remains a destination with good access to I-15 and neighboring communities by restricting speed through the Historic Core, reducing pedestrian and vehicular conflicts, encouraging on-street parking, introducing multi-modal transportation infrastructure, and utilizing bulb-outs as possibilities for on-street sales and dining.

Building heights should be limited to three stories. Street furniture, such as signs, lamps, and benches, should be used to enhance the pedestrian experience. Building materials and styles should be consistent with the historic feel of the downtown area. High speeds should be discouraged through the downtown area. Historic buildings and fabric should not be destroyed wherever possible.

3.7.2 TOD DISTRICT

The Transit Oriented Development (TOD) district will take advantage of its close proximity to the future TRAX/BRT station on Pacific Drive. The district should have higher density mixed use developments and infrastructure to support multimodal travel, particularly bicycle and pedestrian activity.

The TOD district should be developed and designed to serve the needs of daily residents and employees, as well as acting as a destination for visitors, by providing mixed uses within the district, expanding the amount of housing in the downtown area to accommodate varying levels of life cycle stages and age groups, and promoting higher density development to support transit and non-motorized travelers. The transportation hub must be an effective point for transit related activity with safe and efficient transfer between transportation modes, the ability to complete multiple daily activities within the district without automobile use, providing adequate parking for areas where automobile use is desired, and construction of safe and attractive pedestrian facilities.

Building heights of three to five stories should be encouraged. Multi-level mixed-use buildings should have a first floor retail element. Varying and interesting building designs should be encouraged to complement the Historic Core District. Community gathering places for events should be provided. Surface parking should be consolidated and multilevel parking structures considered. Parking should not be placed between buildings and the adjacent street. “Big box” retail should not be permitted.

3.7.3 EASTERN GATEWAY DISTRICT

The area between 500 East and 1100 East should serve as the eastern gateway to American Fork’s Downtown and should focus on office parks, medical/employment support, and infill development. The street will be developed into an attractive entrance to the downtown area.

The goals of the Main Street Vision are to create a distinguished entry and eastern gateway into American Fork’s downtown and attract a business and retail environment providing local employment opportunities. This can be accomplished by developing State Street into a pleasant seven-lane boulevard with attractive landscaping, balancing the need for mobility with pedestrian access by providing adequate and functional pedestrian facilities and signal progression; utilizing the existing right-of-way for frontage roads; bike paths, and pedestrian facilities; exploring the opportunity for a TRAX station close to 1100 East; encouraging infill development; developing master plans for large undeveloped areas; capitalizing on the proximity of the Hospital by creating a medical office park; increasing the number of retail facilities that support business parks; and considering housing opportunities close to the business centers.

Low maintenance trees and landscaping should be used to minimize future costs. Development should be limited in height to three stories and include street infrastructure to ensure State Street is pedestrian friendly by tying open space and trails facilities into similar facilities on State Street. Large parking lots between developments and the roadway should be discouraged.

3.7.4 MAIN STREET BUSINESS DISTRICT

The Main Street business district between Pacific Drive and I-15 serves as a transition zone between the “big box” Meadows district and the Historic Core district. This district consists mostly of small-scale businesses and professional offices and should continue to provide these land uses in the future.

Focus should be placed on reinforcing Main Street as a retail and business destination and making Main Street a “complete street”. This can be achieved by encouraging infill development to create a continuous street wall; ensuring pedestrian activity is encouraged with businesses facing Main Street; developing a Main Street improvement program to include landscaping, street furniture, and pedestrian facilities; ensuring that automobile traffic moves efficiently through the area at pedestrian friendly speeds; making Main Street multimodal; and encouraging on-street parking.

New development should be scaled and designed to complement the existing architecture and character of Main Street. Buildings should be limited to three stories. High speeds on Main Street should be discouraged.

3.7.5 “MEADOWS” WESTERN GATEWAY DISTRICT

The “Meadows” is a predominantly regional commercial district and is dominated by “big box” retail. It is one of Utah County’s largest retail centers and serves the entirety of northern Utah County. Mobility and visibility in this area are crucial to its viability and sustainability as a regional commercial center.

The focus points for the Meadows region are to redefine the area as an entry to American Fork and to make the district accessible by multiple modes of transportation. This would include beautification, wayfinding, landscaping, parks and trails, water features, mixed development areas, improved roadway facilities, an I-15 flyover, and TRAX line.

Surface parking lots should have trees and plantings at regular intervals. Building setbacks should be encouraged at less than 30 feet on new developments. Structures should not be oriented away from the street. Entryways to buildings should not be restricted to parked areas only. Although additional “big box” development may be desirable, it should not allow one-story strip style developments.

3.7.6 STATE STREET BUSINESS DISTRICT

The State Street Business District forms a transition between the Eastern Gateway and TOD districts. Businesses supportive to the TOD are required to provide necessary support to surrounding developments. The District should also include attractive and iconic landmarks in the City.

Focus should be placed on creating and enhancing this district as a connection and focal point for all other districts. This can be achieved by capitalizing on the Main Street and State Street jog to create an iconic landmark feature, providing improved street and intersection treatments, installing enhanced pedestrian facilities, encouraging infill development on vacant and underutilized lots, and providing a mix of uses, including housing in this district.

Iconic architecture and design should be encouraged. Pedestrian connections should be made between this district and the Western Gateway and TOD districts. Parking lots should not be located between buildings and street sidewalks.

3.8 ACCESS MANAGEMENT

Access management is the process of establishing and enforcing road and driveway accesses within the City. This includes establishing the location, number, spacing, type, and design of city streets and accesses to minimize vehicle conflicts and maximize the traffic capacity and safety of a roadway. Unmanaged or unorganized development along travel corridors can result in poor and unsafe roadways. In some cases, each individual landowner along a corridor has their own access driveway; partly due to the order development occurs. One owner is ready to develop while the adjacent landowner may not be. Numerous access points along travel corridors create unnecessary conflicts between turning and through traffic, which causes delays and reduces safety. Numerous benefits are derived from controlling the location and number of access points to a roadway. Those benefits include:

- Improving overall roadway safety
- Reducing the total number of vehicle trips on the roadway
- Decreasing interruptions in traffic flow

- Minimizing traffic delays and congestion
- Maintaining roadway capacity
- Extending the useful life of roads
- Avoiding costly highway projects
- Improving air quality
- Encouraging compact development patterns
- Improving access to adjacent land uses
- Enhancing pedestrian and bicycle facilities

3.8.1 PRINCIPLES OF ACCESS MANAGEMENT

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

A very important concept when administering access management standards is to understand that the movement of traffic and access to property are not mutually exclusive. No facility can simultaneously move traffic efficiently and provide unlimited access. **Figure 3-9** shows the relationship between mobility, access, and the functional classification of streets. The extreme examples of this concept are freeways and cul-de-sacs. Freeways move traffic very well with few opportunities for access, while the cul-de-sac has many opportunities for access, but doesn't move traffic very well. In many cases, accidents and congestion are the result of an imbalance in serving both mobility and access at the same time. A good access management program will accomplish the following:

- Limit the number of conflict points at driveway locations
- Separate conflict areas
- Reduce the interference of through traffic
- Provide sufficient spacing for at-grade, signalized intersections
- Provide adequate on-site circulation and storage

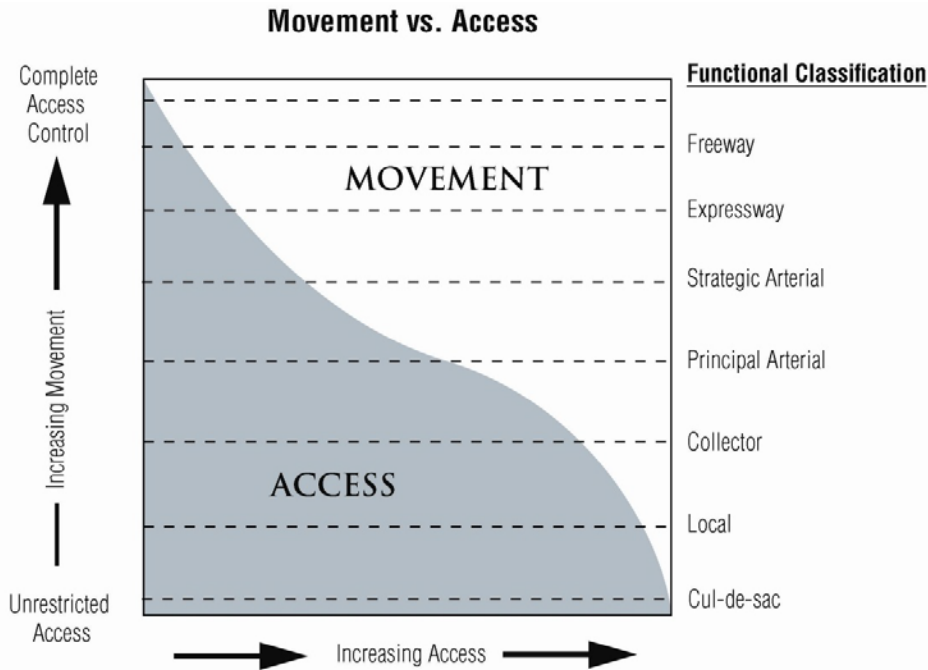
Access management strategies attempt to end the cycle of road improvements followed by increased access, increased congestion, and the need for more road improvements.

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

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

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

Figure 3-9 Mobility vs. Access by Functional Classification



3.8.2 ROADWAY NETWORK AND ACCESS MANAGEMENT STANDARDS

American Fork City has adopted an *Access Management Manual* (AM Manual) in April of 2012. The access management concepts and standards presented in the AM Manual are consistent with guidelines established by the FHWA, AASHTO, TRB, and ITE. It is recommended that the detailed access management strategies not be duplicated in the General Plan in order to reduce the potential for conflicts between this document and the AM Manual. The City and the public should refer to the AM Manual when planning or designing new roadways or driveways. For roadways that are in the city limits but are owned by UDOT, UDOT’s access management guidelines apply and should be followed.

There are a number of access management techniques that can be used to preserve or enhance the capacity of a roadway. Specific techniques for managing access are discussed in the AM Manual with tables, charts and illustrated examples. Not all techniques will apply to every situation. Some of them are more appropriate to less developed rural areas of the City, whereas others are more appropriate in the urban areas. In areas where redevelopment occurs, the access management standards in the AM Manual may not always be attainable. In these situations City staff should consult and follow the guidelines for access management contained in the AM Manual as closely as possible.

3.8.2.1 NUMBER OF ACCESS POINTS

It is important to balance good commercial/retail access while maintaining traffic flow. More access points or driveways on a roadway increase potential vehicle, pedestrian, and bicycle conflicts. Commercial

developments should be encouraged to share accesses where possible to reduce the number of accesses along a roadway.

3.8.2.2 SPACING OF ACCESS POINTS

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

To ensure efficient traffic flow, new signals should be limited to locations where the progressive movement of traffic will not be impeded significantly. Uniform, or near uniform, spacing of signals will benefit the progression of traffic and allow for better signal coordination. Typically, signals are spaced no less than one-quarter mile (1,320 feet) apart on any street. On principal arterial streets, signals should be placed no closer than one-half mile (2,640 feet).

Un-signalized accesses are far more common than signalized accesses. Traffic operational factors suggest that longer distances between driveways improve roadway traffic operations, especially at medium/high-volume driveways. Properly spaced accesses help with traffic weaving, merging, stopping sight distance, acceleration rates, and storage distance for back-to-back left turns. From a spacing perspective, high-volume driveways can operate the same as some public streets.

Restricted access movement (i.e. right-in/right-out access) can provide for additional access to promote economic development with minimum impact to the roadway facility. This type of access should be spaced to allow for a minimum of traffic conflicts and provide distance for deceleration and acceleration of traffic in and out of the access. For detailed access management requirements, consult the most current American Fork City Access Management Manual.

3.9 SAFETY

One of the main goals of the Transportation Element of the General Plan and long term transportation planning in general is to estimate traffic growth and provide for adequate facilities as the need arises. The safe traffic operations of these future facilities are of equal importance. As a result, all of these facilities should be constructed and maintained to applicable design and engineering standards such as those set forth in American Fork City ordinances, AASHTO “Policy on Geometric Design of Highways and Streets,” and the Manual on Uniform Traffic Control Devices (MUTCD). This includes implementing applicable Americans with Disabilities Act (ADA) standards and school zone treatments.

3.9.1 RESIDENTIAL DRIVEWAYS ON MAJOR STREETS

Due to population growth, geometric limitations, right-of-way, or funding, residential driveways are sometimes found on collector or arterial streets. If residential driveways have to be on a collector or arterial street, it is recommended to require circular driveway or a turn-around where vehicles don’t have to back out on to the street. Backing maneuvers into busy streets can be very dangerous, as this is not a typical action drivers expect. Any new development should restrict any residential access on collector or arterial roadways.

3.9.2 OFFSET INTERSECTIONS

Offset intersections often have negative impacts on traffic flow and can potentially create capacity problems at intersections where the left turn storage areas overlap, forcing queued vehicles into through traffic lanes. Aligning access on both sides of the street will minimize conflict points in the roadway and provide safer and more efficient traffic flow. Offset intersections should be avoided wherever possible and should never be approved with new development.

3.10 INTERSECTION IMPROVEMENTS

As traffic volumes increase throughout the community, intersection design will become more critical. Proper intersection design will typically facilitate larger traffic flows without widening existing roadway cross-sections. This can minimize impacts to adjacent properties. Therefore, emphasis was placed on identifying critical intersections during the traffic modeling process.

Intersections are a critical element to future roadway functionality and should provide sufficient turn lanes and adequate turn pockets to accommodate vehicle queues. In the future, many intersections throughout the City may require signalization in order to maintain a desirable LOS (**Figure 3-4**). Stop signs and traffic signals should not be used when not warranted per the MUTCD. Studies have shown that in areas where intersection control has been installed and not warranted, a higher percentage of the motoring public will disregard the control measure and create a more unsafe condition.

As in the case with the typical roadway cross sections found in **Table 3-2**, typical intersection configurations are a helpful planning tool when preserving right-of-way and for project cost estimating. Keep in mind, intersections as well as the full right-of-way width, if a bike lane is proposed then an additional 20' of right-of-way is required. This document includes some typical intersection treatments, including expanded right-of-way requirements, turn pocket configurations, and taper lengths. **Figure 3-4** shows intersections where future traffic signals are likely to be needed as well as areas where other intersection treatments may be more desirable than a signal. These areas may include two-way or all-way stop-controlled intersections, yield-controlled intersections, or roundabouts. Each intersection must be considered separately but the guidelines in the following sections should be followed.

3.10.1 TRAFFIC SIGNALS

Traffic signals should not be installed unless at least one or more of the nine traffic signal warrants (as outlined in the MUTCD) have been met. Even if warrants are met for a particular intersection, justification for installation should still be based on information obtained through engineering studies and comparisons with the requirements set forth in the MUTCD. As stated in the MUTCD, *"the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal."* The nine warrants outlined in the MUTCD include the following:

- Warrant 1: Eight-Hour Vehicular Volume
- Warrant 2: Four-Hour Vehicular Volume
- Warrant 3: Peak Hour
- Warrant 4: Pedestrian Volume
- Warrant 5: School Crossing
- Warrant 6: Coordinated Signal System
- Warrant 7: Crash Experience
- Warrant 8: Roadway Network
- Warrant 9: Intersection Near a Grade Crossing (Railroad)

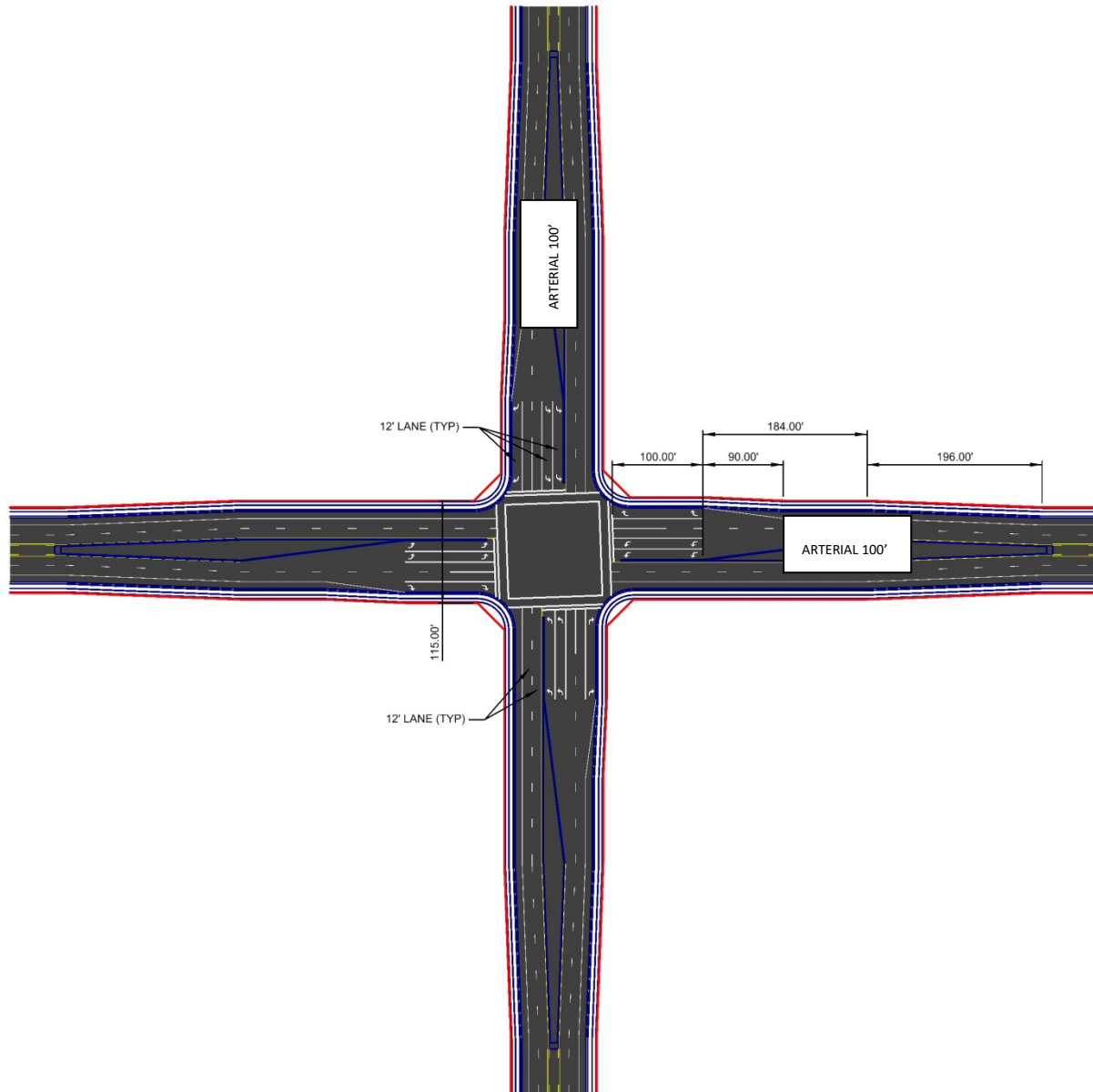
Traffic signals may be warranted at the intersection of any two roadways depending upon the parameters outlined above. The design of the signal and intersection will depend primarily on the amount of traffic passing through the intersection during the peak times of day. Design parameters that are essential to a well-designed signalized intersection include lane configuration, turn radii, and turn pocket lengths and taper lengths. Each of these parameters is a function of the road classification, peak hour volumes, and design speeds. Typical signalized intersection designs for different functional classifications are given in the following paragraphs and should be treated as guidelines for planning purposes only. The typical intersection layouts shown in the following sections are for planning purposes only, it is imperative that each intersection be studied and designed individually prior to construction. In the case of the left and right turn pockets, each design shows a 100' turn pocket; this length will be adjusted based on anticipated turning volumes for each individual intersection.

3.10.1.1 INTERSECTION OF TWO ARTERIAL STREETS

As previously discussed, Arterial streets are typically high volume, high speed, and low access roadways. They provide the backbone of the roadway network and, as such, carry the greatest burden of traffic movement in the City. Due to the high volume of traffic on Arterial streets, signals will be almost certainly warranted and necessary where two Arterials intersect. It is also highly probable that the volume of traffic will warrant dedicated right turn lanes and double left turn lanes. Signals should be timed to provide protected left turns wherever double left turn lanes are needed. Progression and platooning are essential elements of an effective Arterial street and care should be taken to ensure that Arterial corridor signals are coordinated to allow safe and efficient progression of vehicles, especially at peak times of the day. **Figure 3-10** shows a typical intersection design where two Arterials meet.

As shown below, where two Arterials meet, additional right-of-way should be preserved to accommodate the expanded lane configuration. The typical cross section for an Arterial street consists of a 100 foot right-of-way. In order to ensure sufficient room at the intersections for turn pockets, 115 foot of right-of-way should be preserved. 100 foot long turn pockets were assumed for conceptual design which will require a total length of tapers of 480 feet from the intersection stop bar before returning to the typical Arterial cross-section. This length will increase if an individual intersection study finds that the turn pocket lengths should be increased.

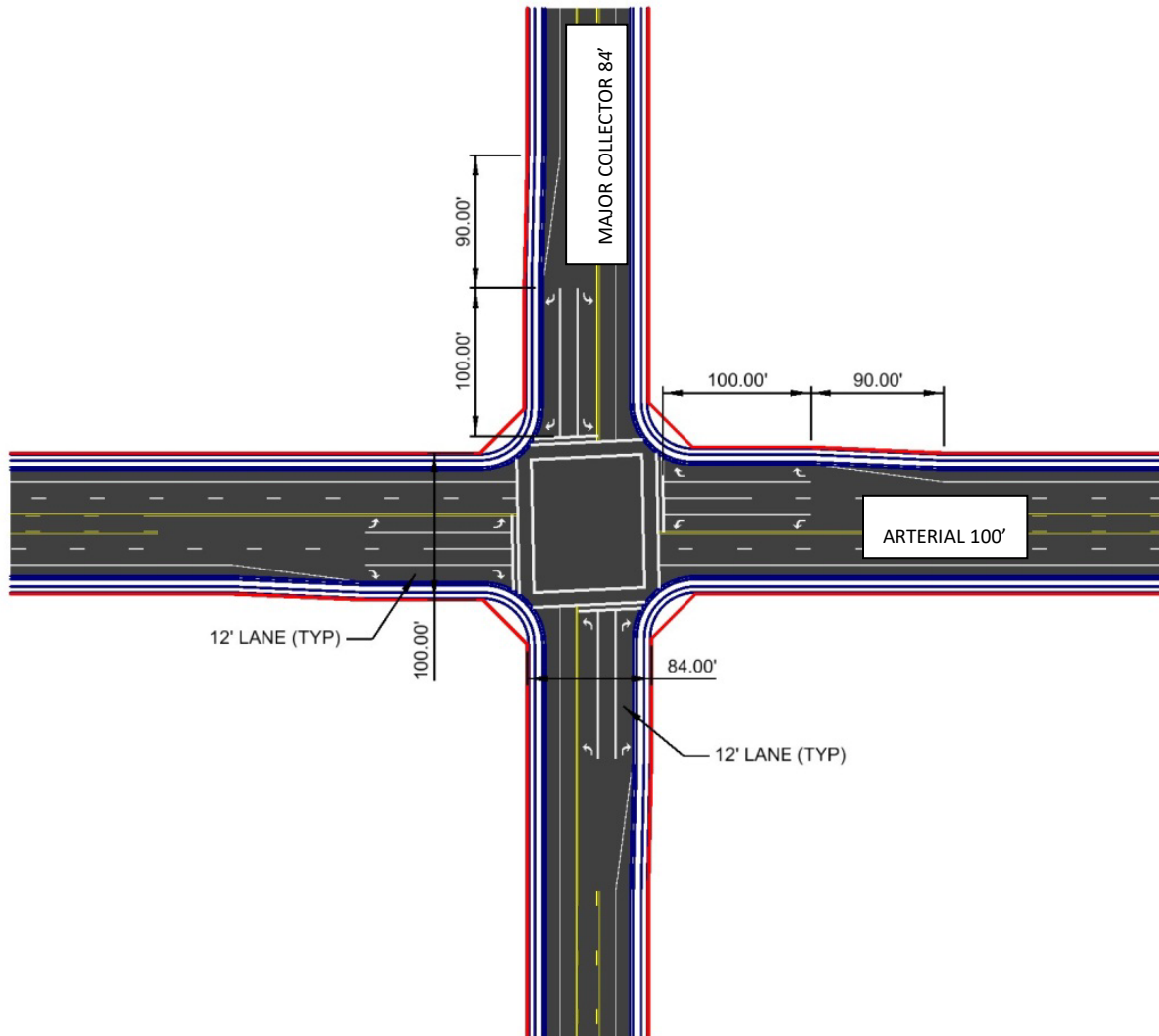
Figure 3-10 Intersection of Two Arterial Streets



3.10.1.2 INTERSECTION OF ARTERIAL AND MAJOR COLLECTOR

Major Collectors also have relatively high volumes, sometimes in excess of 1,000 vehicles during the peak times of day. When these roads intersect with Arterials, signals are often necessary. Right turn pockets are generally desirable, as are dedicated left turn lanes. Dual left turn lanes are however less likely to be needed. Protected left turn movements may be desired where the amount of conflicting through traffic causes there to be few gaps. Coordination of the signals along a corridor can help to provide gaps through platooning, the idea that groups of vehicles arrive and leave a signal together. Where there are sufficient gaps in opposing traffic, a protected/permitted or permitted only left turn phase may be more efficient. **Figure 3-11** shows a typical intersection design where an Arterial meets a Major Collector.

Figure 3-11 Intersection of Arterial and Major Collector



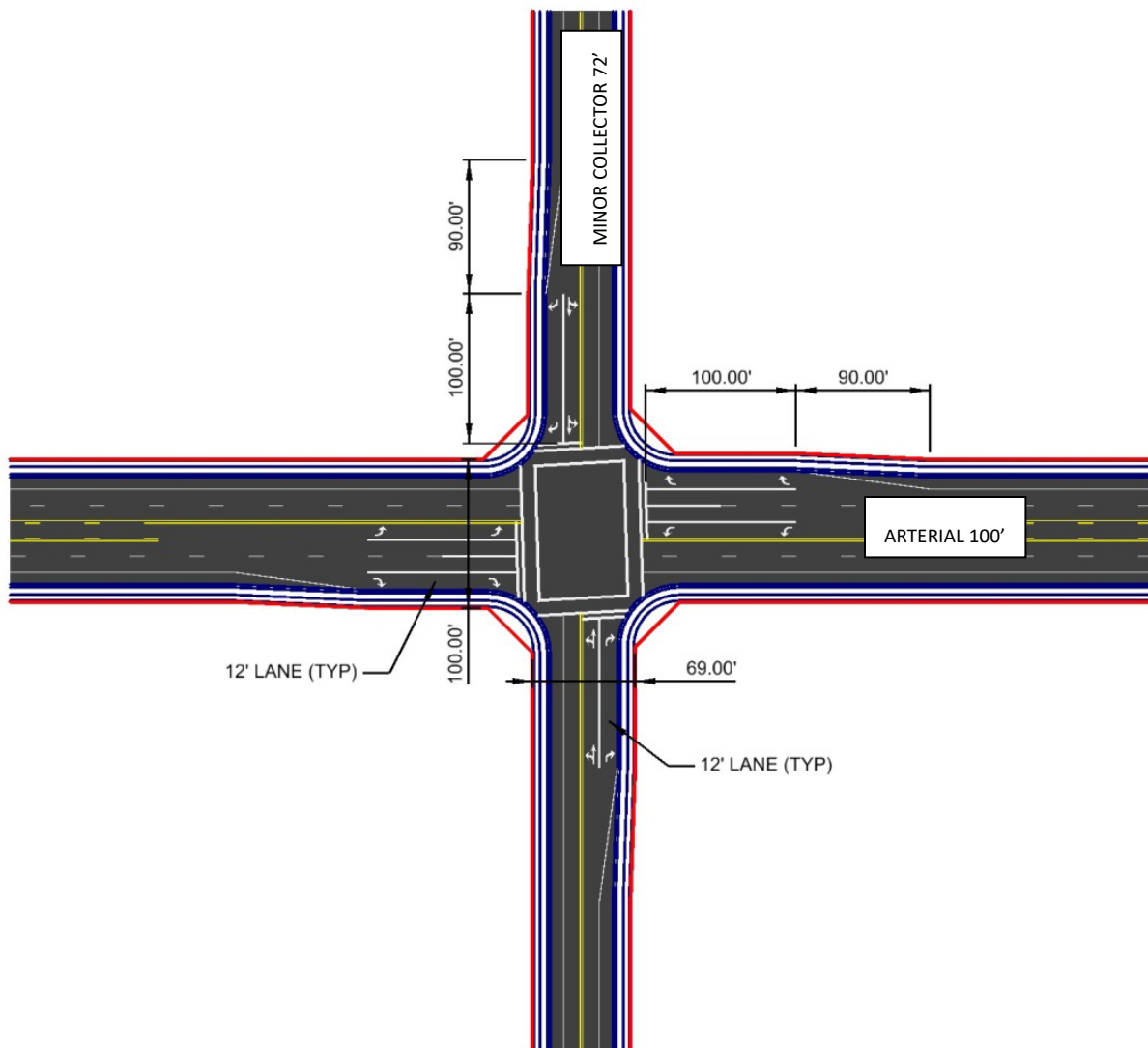
As both the Arterial and Major Collector typical sections provide a two-way left turn lane, a dedicated left turn pocket will require little or no widening at the intersection. The addition of a right-turn pocket however will require additional right-of-way. The length of the expanded cross-section requirement assuming 100 foot turn pocket lengths will be 190 feet for both the Arterial and the Major Collector. Where longer turn pockets are required, the taper lengths should be modified accordingly.

3.10.1.3 INTERSECTION OF ARTERIAL AND MINOR COLLECTOR

Minor Collectors have lower volumes and so may not require signalization. As with all intersections where signalization is considered, the guidelines in the MUTCD should be strictly followed. In the case that the intersection of an Arterial and Minor Collector does warrant signalization, the volume on the Minor Collector is typically small enough to not require expansive intersection treatments. It is generally accepted that turning movements from Arterials should have dedicated lanes so that slowing vehicles making the turn do not cause a safety hazard to the fast moving through travelling vehicles. As such, right and left turn lanes should be provided wherever possible on the Arterial leg of the intersection. In the

case of the Minor Collector, dedicated right and left turn pockets are often not required. As the Minor Collector does not have a two-way left turn lane, some provision must be made to create a turn pocket for either left turning or right turning vehicles at the intersection. Each individual intersection should be studied to determine whether a dedicated left or dedicated right turn is preferable. Typically, a dedicated right turn is preferred to a dedicated left turn unless the proportion of left turns to right turns is high. A dedicated right turn allows the vehicles turning right to turn on a red light where there is no opposing traffic. Where a shared right/through lane is used, right-turning vehicles can be blocked behind a through vehicle stopped on red. Generally, a protected/permitted phase is desired for the Arterial left turn movement but a permitted only phase is sufficient for the Minor Collector left turn movement. **Figure 3-12** shows a typical intersection design where an Arterial meets a Minor Collector.

Figure 3-12 Intersection of Arterial and Minor Collector

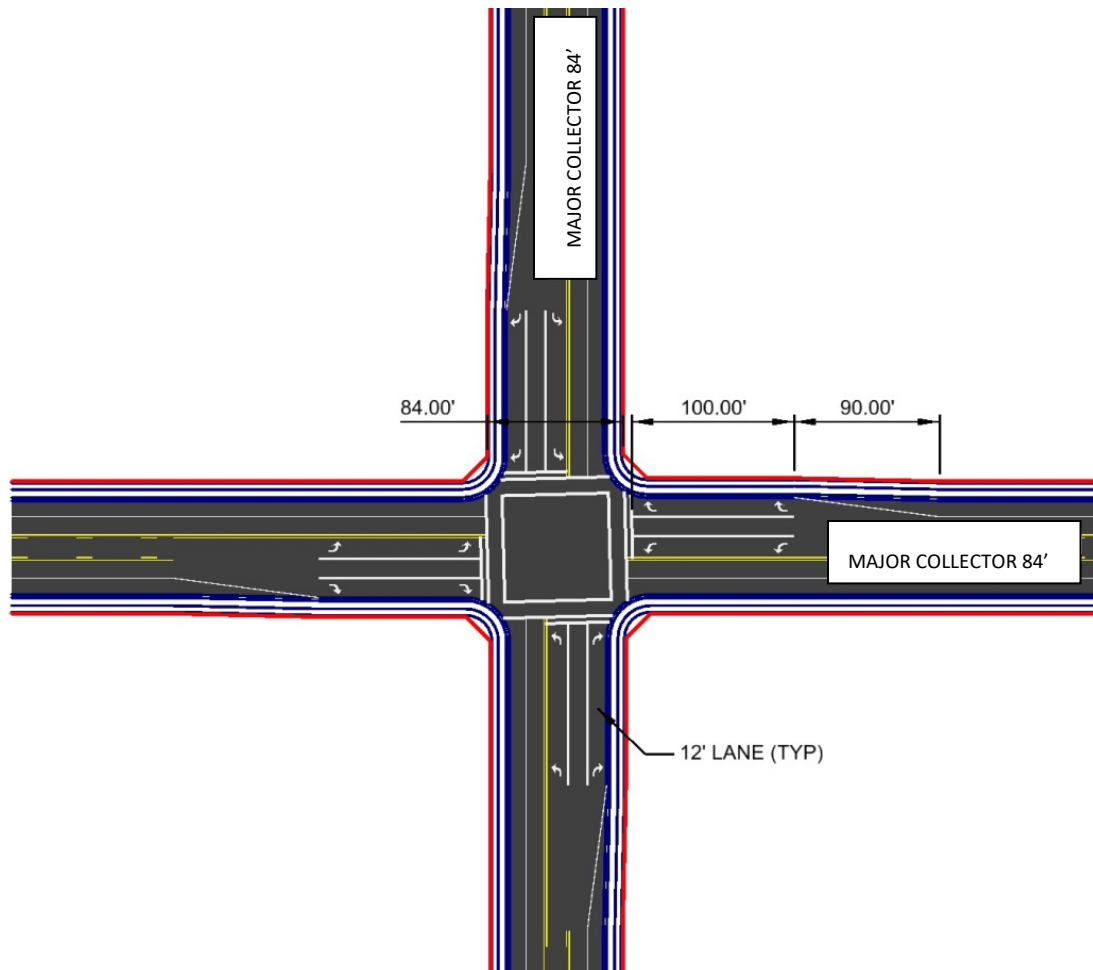


In many cases a two-way stop controlled intersection may be the preferred intersection control where an Arterial meets a Minor Collector. The STOP sign should be placed on the Minor Collector approach and care should be taken to ensure that adequate sight distances are maintained.

3.10.1.4 INTERSECTION OF TWO MAJOR COLLECTORS

Where two Major Collectors meet, a signal may be warranted. In this case, dedicated left and right turn lanes are desirable to remove slow turning vehicles from the traffic stream and provide a more efficient signal. The expanded right-of-way requirements for an intersection where two Major Collectors meet will be similar to the requirements on a Major Collector, which intersects an Arterial. This is illustrated in **Figure 3-13**. The intersection of two Major Collectors may also be treated with two-way or four-way stop control. In the case of two-way stop control, the STOP sign should be placed on the approach with the least volume. Stop control should never be used as a traffic calming method. Roundabouts are also a very efficient method of controlling traffic at Major Collector intersections. Roundabouts are discussed in more detail in subsequent sections.

Figure 3-13 Intersection of Two Major Collectors

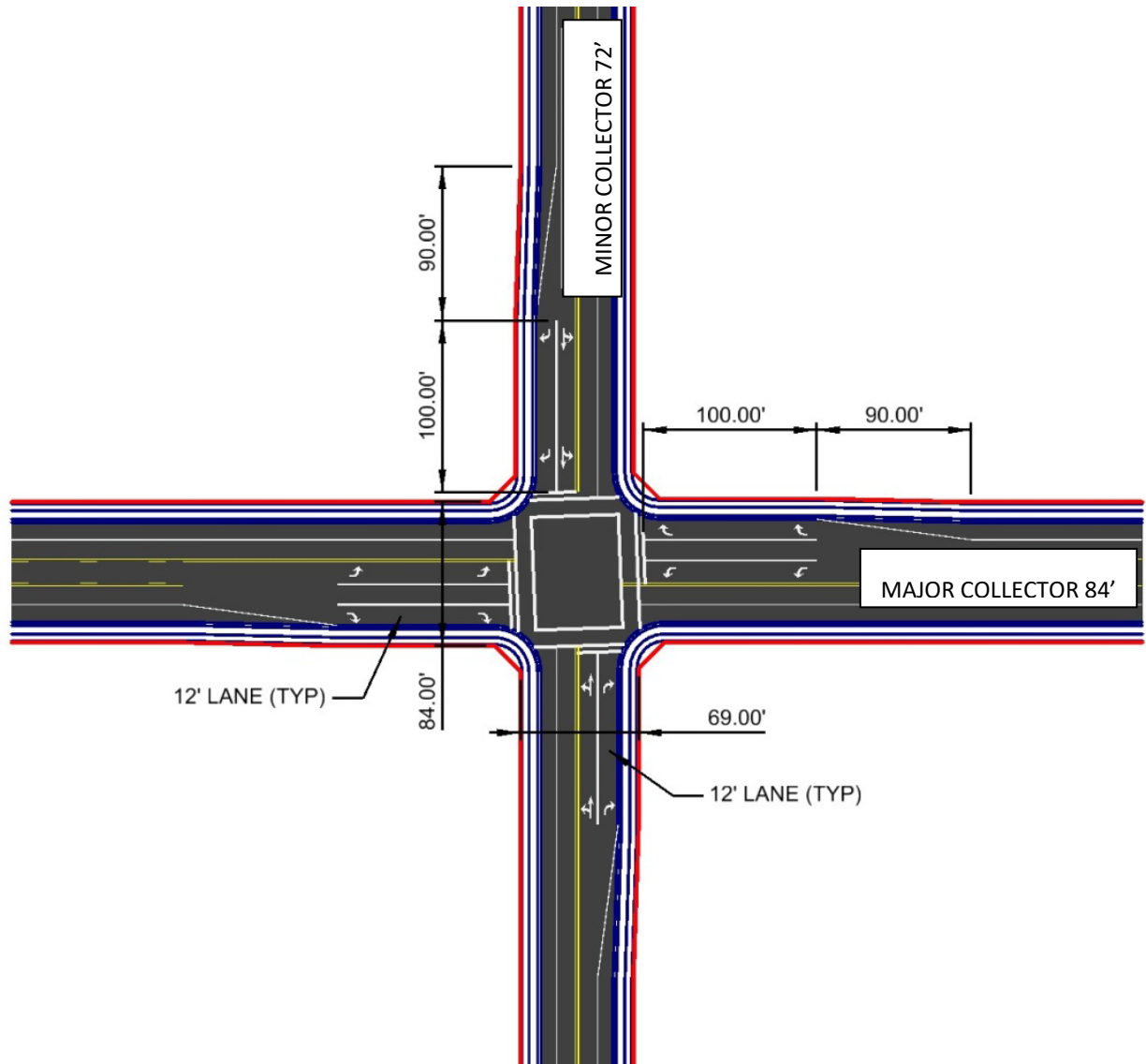


3.10.1.5 INTERSECTION OF A MAJOR COLLECTOR AND MINOR COLLECTOR

Intersections of Major Collectors and Minor Collectors may, in rare cases, warrant signalization. Where this is the case, the design parameters in **Figure 3-14** should be applied. Protected left turn movements will likely not be required in this situation and in some cases, the need for dedicated left and/or right turn lanes may not be present. Stop control is also a viable intersections treatment where warranted at the intersection of a Major and Minor Collector. Two-way stop control is generally preferred and the STOP

sign should be placed on the Minor Collector approach. As with all STOP sign applications, appropriate sight distances should be maintained. Roundabouts should also be considered in this situation.

Figure 3-14 Intersection of Major Collector and Minor Collector



3.10.1.6 MINOR COLLECTORS AND LOCAL STREETS

Intersections of two Minor Collectors, two Local Streets, or a Minor Collector and a Local Street will rarely warrant expanded intersection areas. Nevertheless, intersection studies should be performed in these locations to ensure that safe traffic operations can be maintained. Small roundabouts and stop or yield control may be the most appropriate intersection control in these situations.

3.10.2 STOP SIGNS

The MUTCD should be used as the standard for determining how and when a stop sign is installed. As stated in the MUTCD, *“Stop signs should be used if engineering judgment indicates that one or more of the following conditions exist:*

- *Intersection of a less important road with a main road where application of the normal right-of-way rule would not be expected to provide reasonable compliance with the law;*
- *Street entering a through highway or street;*
- *Un-signalized intersection in a signalized area; and*
- *High speeds, restricted view, or crash records indicate a need for control by the stop sign.”*

The number of vehicles that are required to stop should be minimized, if at all possible, to preserve capacity and functionality of the roadway network; therefore, when deciding which road to stop, the street carrying the lowest volume of traffic should be chosen. Less restrictive traffic control such as a yield sign can be used as an alternative to stop signs, if at all possible, to minimize delays. Yield signs should also be installed per the MUTCD guidelines. Stop signs should not be used to control speed, but to designate right-of-way at intersecting roadways.

4-way stop control may be used as a safety measure at intersections where the volume of traffic is approximately equal for all approaches and where safety is of concern, or as an interim measure where a traffic signal is justified and has yet to be installed. Engineering judgment and the guidelines outlined in the MUTCD should be used to determine the appropriate application of stop and yield signs.

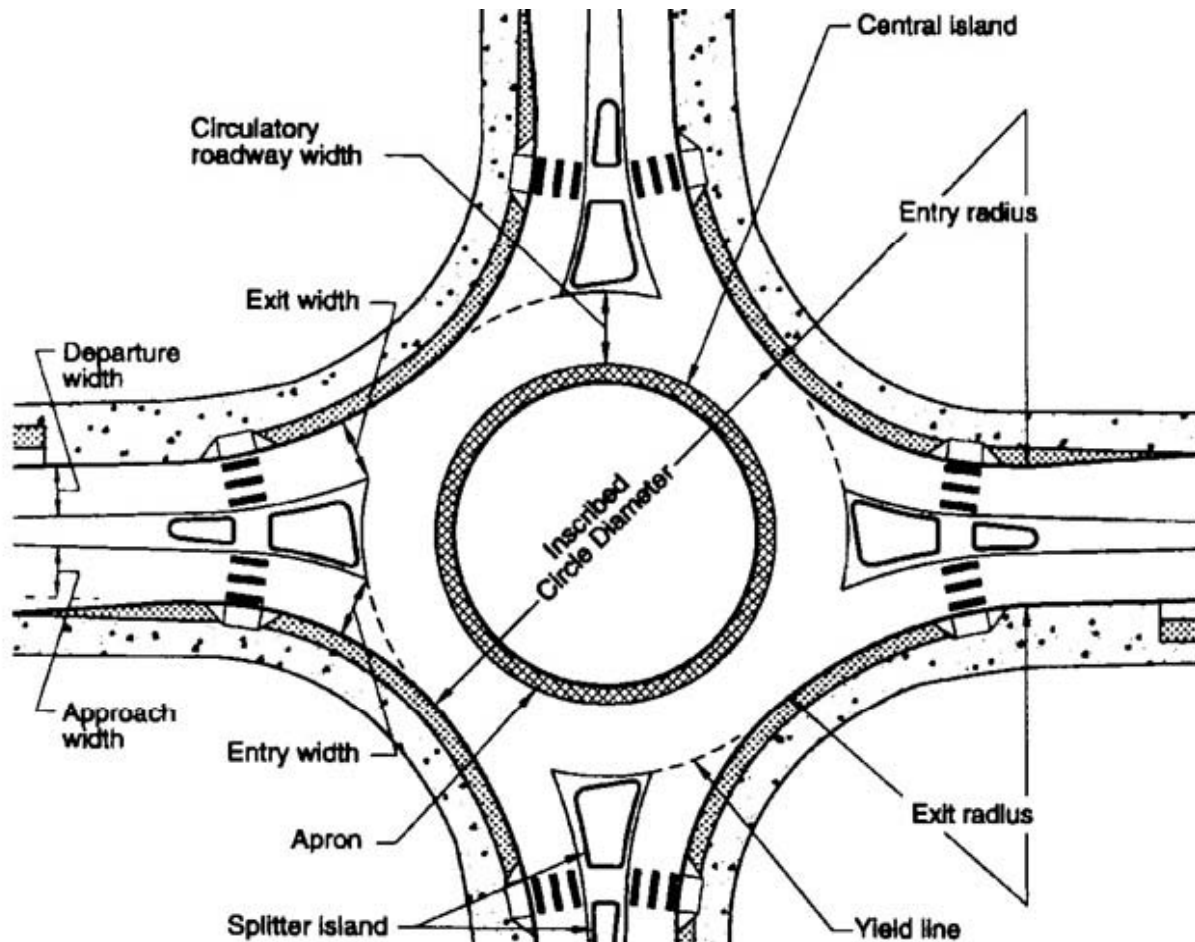
3.10.3 ROUNDABOUTS

Many communities in the United States are beginning to embrace the concept of roundabouts. A roundabout is an intersection control measure used successfully in Europe and Australia for many years. A roundabout is composed of a circular, raised, center island with deflecting islands on the intersecting streets to direct traffic movement around the circle. Traffic circulates in a counter-clockwise direction making right turns onto the intersecting streets. There are no traffic signals; rather, entering traffic yields to vehicles already in the roundabout.

Advantages of roundabouts include reduced traffic delays, increased safety, and reduced right-of-way requirements. They can reduce delays compared to a signalized intersection due to the all red phase being eliminated. At the same time, roundabouts can improve safety because the number of potential impact points and conflict points the driver must monitor are substantially reduced over a conventional four-way intersection. Properly designed roundabouts can also accommodate emergency vehicles, trucks, and snow plowing equipment. The roundabout nearly eliminates the “T-bone” accidents that happen at intersections.

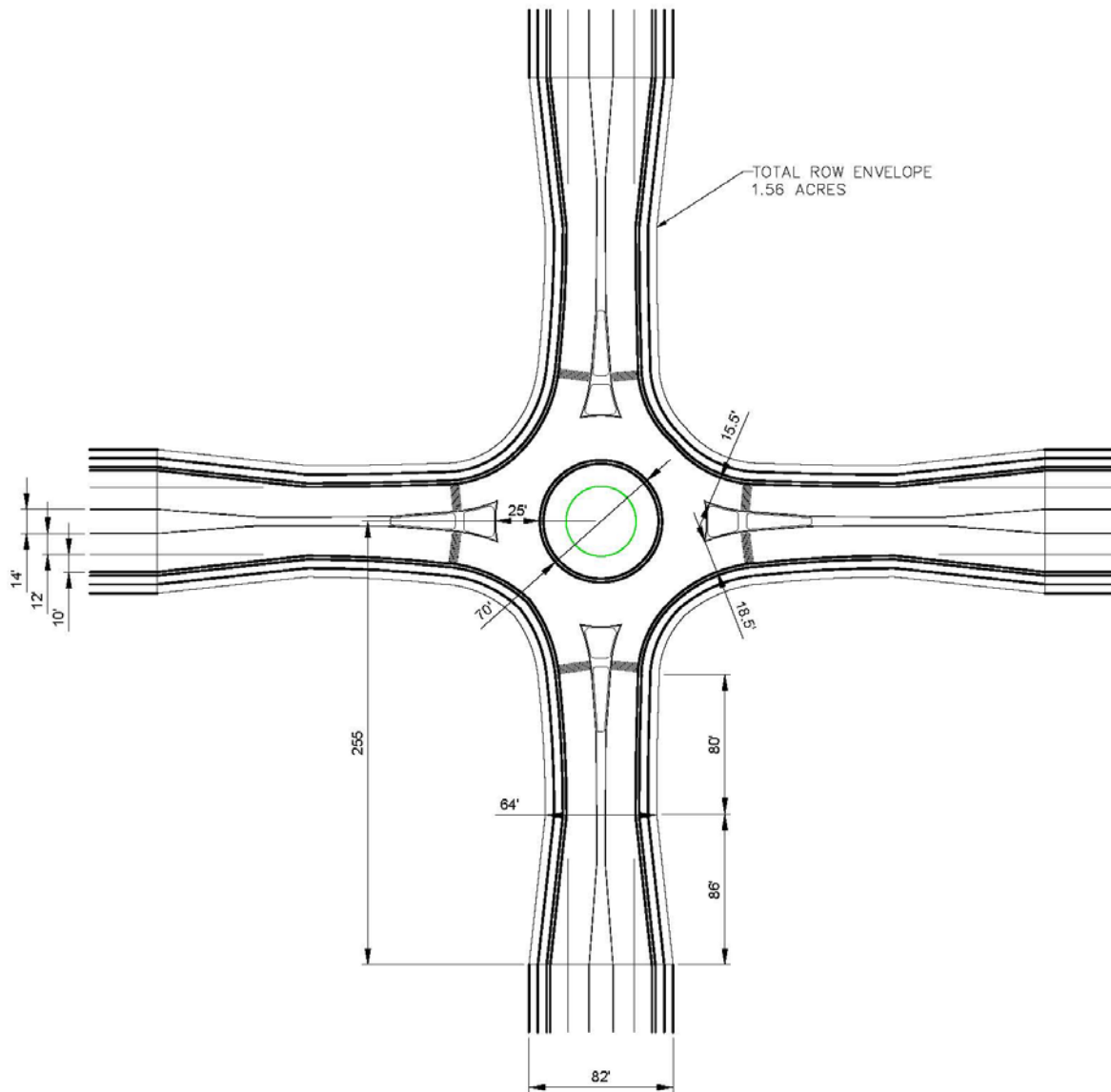
Unlike the typical New England “traffic circle” or “rotary,” design standards for roundabouts are very specific and FHWA has prepared a design guide for modern roundabouts in the United States (<http://www.fhwa.dot.gov/publications/research/safety/00067/00067.pdf>). Development of a roundabout will only occur as a result of an intersection study performed by a qualified Traffic Engineer and when the minimum capacity and design criteria are met. The FHWA has determined that the maximum flow rate that a roundabout can accommodate depends on the geometric elements (circle diameter, number of lanes, etc.), the circulating flow (vehicles going around the circle), and entry flow (vehicles entering the circle). A single lane roundabout can accommodate up to 1,800 vehicles per hour and a double lane roundabout can accommodate up to 3,400 vehicles per hour. **Figure 3-15** shows an example of a typical single lane roundabout design.

Figure 3-15 Typical Roundabout Design



TRB examined traffic delays before and after a roundabout was installed at eight intersections in the United States. The study determined that delays (the time spent stopped and moving up to the intersection) decreased on average by 78 percent and 76 percent during the AM and PM peak hour, respectively. The results indicate that roundabouts can reduce congestion in certain circumstances. In addition, the FHWA studied safety characteristics of a sample of eleven roundabouts in the United States. The agency determined that the number of personal injury accidents and property damage-only accidents decreased 51 percent and 29 percent, respectively, after roundabouts replaced conventional intersections. Roundabouts are an appropriate solution for certain problem intersections in the region. **Figure 3-16** shows a typical roundabout design with right-of-way envelope area and dimensions. Caution must be taken to design each roundabout in the City on a case by case basis, the information provided here is for illustrative and planning purposes only.

Figure 3-16 Roundabout Design with Right-of-Way



There are numerous reasons for selecting a roundabout as a preferred alternative, with each reason carrying its own considerations and trade-offs. Below are some potential applications for roundabouts³:

³ Source: NCHRP Report 672, Roundabouts: An Informational Guide Second Edition

- **New Residential Subdivisions**
Developers have begun to use roundabouts in residential subdivisions with increasing frequency. Roundabouts provide a variety of operational and aesthetic benefits and create a sense of place that is attractive to developers and homeowners.
- **Urban Centers**
Roundabouts may be considered an optimal choice in situations where existing or planned access-management strategies along a corridor facilitate U-turn movements at nearby intersections.
- **Suburban Municipalities and Small Towns**
Smaller municipalities are often ideal locations to consider roundabouts. Right-of-way is often less constrained, traffic volumes are lower, and the aesthetic opportunities for landscaping and gateway treatments are enticing. Existing operational and/or safety deficiencies can also often be addressed. Roundabouts can also be less costly to maintain than typical intersections.
- **Rural Settings and Small Communities**
Safety may often be the driving factor over capacity in making a roundabout an appealing choice. Within small communities along an extended highway, a roundabout is ideal for supporting speed reductions.
- **Interchanges**
Situations where an intersection ramp terminal has the potential for a high proportion of left-turn flows from the off-ramps and to the on-ramps may be ideal candidate for a roundabout.
- **Commercial Developments**
Roundabouts in commercial developments provide for a central focus point for a development and enhance aesthetic qualities. They are also capable of processing high volumes of traffic.
- **Unusual Geometry**
Intersections with unusual geometric configurations, intersection angles, or more than four legs are often difficult to manage operationally. Roundabouts are a proven traffic control device in such situations, effectively managing traffic flows without the need for costly expenditures on unique signal controller equipment or unusual signal timing.
- **Closely Spaced Intersections**
Roundabouts balance traffic flows and manage queue lengths between closely spaced intersections.

The City of American Fork will consider roundabouts as an intersection alternative at specific locations pending more detailed traffic analysis as needs arise through the development process. There is one roundabout relocation/modification project in this Master Plan that is planned to be addressed due to the close proximity to a major highway. It is highly recommended that all roundabouts be designed or reviewed by qualified engineers.

3.11 CORRIDOR PRESERVATION

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

- Preserve the viability of future options,

- Reduce the cost of these options, and
- Minimize environmental and socio-economic impacts of future implementation.

Corridor preservation seeks to preserve the right-of-way needed for future transportation facilities and prevent development that might be incompatible with these facilities. This is primarily accomplished by the community’s ability to apply land use controls, such as zoning and approval of developments. Adoption of the TE by American Fork City is a commitment to citizens and future leaders in the community that the identified future corridors will be the ultimate location for transportation facilities.

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

The City’s Access Management Manual should be the guide when laying out and planning future roadways.

3.11.1 CORRIDOR PRESERVATION TECHNIQUES

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

- Developer Incentives and Agreements: Public agencies can offer incentives in the form of tax abatements, density credits, or timely site plan approvals to developers who maintain property within proposed transportation corridors in an undeveloped state.
- Exactions: As development proposals are submitted to the City for review, efforts should be made to exact land identified within the future corridors. Exactions are similar to impact fees, except they are paid with land rather than cash.
- Fee Simple Acquisitions: This will most likely consist of hardship purchases or possible city acquisition of property identified within the corridors. Parcels obtained in fee title can later be sold at market value to the owner of the transportation facility when construction begins.
- Transfer of Development Rights and Density Transfers: Government entities can provide incentives for developers and landowners to participate in corridor preservation programs using the transfer of development rights and density transfers. This is a powerful tool in that there seldom is any capital cost to local governments.
- Land Use Controls: This method allows government entities to use its policing power to regulate intensity and types of land use. Zoning ordinances are the primary controls over land use and the most important land use tools available for use in corridor preservation programs.
- Purchase of Options and Easements: Options and easements allow government agencies to purchase interests in property that lies within highway corridors without obtaining full title of the land. Usually, easements are far less expensive than fee title acquisitions.
- Annexation: American Fork City has adopted the policy of requiring right-of-way for roadways be dedicated to the City during the annexation process. This becomes part of the annexation

agreement and is an effective and efficient way to procure needed right-of-way for future expansion.

3.12 TRAFFIC IMPACT STUDIES

As growth occurs throughout the City, the City will evaluate the impacts of proposed developments on the surrounding transportation networks prior to giving approval to build. This will be accomplished by requiring that a Traffic Impact Study (TIS) be performed for any development in the City based on City staff recommendations. A TIS will allow the City to determine the site specific impacts of a development including internal site circulation, access issues, and adjacent roadway and intersection impacts. In addition, a TIS will assist in defining possible impacts to the overall transportation system in the vicinity of the development. The area and items to be evaluated in a TIS include key intersections and roads as determined by the City Engineer on a case by case basis.

Each TIS will be conducted by a qualified Traffic Engineer chosen by the developer at their cost and approved by the City. A scoping meeting will be required by the developer/Traffic Engineer with the City Engineer to determine the scope of each TIS. American Fork Traffic Impact Study Requirements are included in the appendix of this report. The City Engineer will review the TIS or assign someone to do so and will respond in writing to the TIS report within 30 days.

Included in the appendix of this report are guidelines for developers to completing a TIS and submitting it to the City. The requirements include when a TIS will be required and what level of effort must be established in the study, who may or may not perform a TIS, and when certain elements must be included. The TIS guidelines presented in the appendix follow closely the guidelines outlined by UDOT. It is important that these guidelines be fluid and that each development be treated individually, as special cases may require more or less information than the standard requires. The City reserves the right to waive any and all TIS requirements as well as requiring extra information at the discretion of the City Engineer.

3.13 INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent Transportation Systems (ITS) are becoming an increasingly important part of the transportation system. ITS seek to provide innovative services to different modes of transportation and traffic management and allow users to receive information. A more informed travelling public is generally a safer and more efficient travelling public. American Fork is committed to providing ITS in the City in the future. Many of the ITS applications are controlled by UDOT. UDOT is renowned nationally for its innovative use of technology and transportation solutions. As there are many UDOT facilities in the City, and due to UDOT's cast network of ITS components, American Fork has the opportunity to partner with the agency to provide more efficient ITS solutions.

3.13.1 UDOT MAXVIEW CENTRAL SYSTEM

As mentioned in the existing conditions section of this report, UDOT manages the operations of traffic signals statewide through their MaxView Central System. Many of the American Fork signals are currently on the MaxView Central System. It is recommended that the signals at SR-74 and 1120 North and the two American Fork owned signals at 700 East and 50 South and at 900 West and 700 North be connected to the MaxView Central System. The City is willing to coordinate with UDOT to assist with this process through an agreement. This will allow for these signals to be remotely controlled via the UDOT Traffic Operations Center (TOC) in the case of emergency or a special event. There are currently no plans for UDOT to connect the signal at SR-74 and 1120 North to the MaxView system; however, the City should

actively lobby UDOT to make this connection. In order to connect the two American Fork City signals into the UDOT MaxView Central System, there needs to be a connection to the UDOT ATMS fiber network either through installation of fiber to the signals or installation of wireless radios at the two signals that would connect to nearby signals along State Street (US-89). All future signals in the City should be connected via fiber to the UDOT MaxView Central System.

3.13.2 OTHER ITS ELEMENTS

Many other ITS elements exist that may or may not be important to the City in the future. These elements are discussed further here and a recommendation made as to their importance in future transportation solutions.

3.13.2.1 TRAFFIC CONTROL CENTER

The American Fork City public works building is already fiber optic connected. With this connection, a simple traffic control center would be available to the City. As a signal partner, UDOT generally will accommodate and fund a traffic control center consisting of a fiber connection and console in the City public works building. This connection to the i2 system will allow the City access to all of the state CCTV cameras as well as the ability to monitor and adjust the City owned signals on the system. This will become more of a priority as the City adds more signals to its network.

3.13.2.2 VARIABLE MESSAGE SIGNS (VMS)

VMS are extremely effective in informing travelers of expected delays, travel times, and alternate routes in the case of accidents. UDOT maintains multiple VMS on their freeway and highway networks. The closest VMS to American Fork is on Pioneer Crossing and gives travelers information regarding travel times on I-15. Similar VMS should be installed on State Street, east of Kawakami Drive to provide the same information for westbound travelers. In the future, VMS should also be considered on other major routes in the City, including North County Boulevard.

3.13.2.3 CLOSED CIRCUIT TELEVISION (CCTV)

CCTV cameras are located around the City on state routes and I-15. Most of the UDOT intersections that are on the i2 Central System are installed with CCTV. This allows the intersection to be monitored from the TOC and aids in safe and efficient traffic operations. All of the future signals in the City should be installed with CCTV cameras. Other possible locations for CCTV cameras include Main Street, Pacific Drive, 500 East, and 100 East.

3.13.2.4 TRANSIT APPLICATIONS

As American Fork becomes more and more transit friendly, ITS become more and more important. The new FrontRunner station and future TRAX line provide excellent opportunities for the City to pave the way for integrated multimodal ITS solutions. This can include route timing on VMS throughout the City, delay information for trains as well as roadways, and automated advanced warning signs at railroad crossings.

3.14 WAYFINDING

Wayfinding is essentially directions for the travelling public. This could include motorists, bicyclists, pedestrians, and transit riders. Wayfinding is an important element of a transportation system as it allows

users to quickly and safely navigate to areas of interest or emergency services with visual clues. Wayfinding, when properly applied, provides a safer environment for travelers as they rely more on the visual cues in their eye line than on maps or GPS instructions. In each case the MUTCD chapter 2 governs the application of wayfinding signs and should be used as the design guide for sign shape, size, and color.

There are three main types of wayfinding signs available to the City and identified in the following MUTCD chapters: General Service Signs (Chapter 2I), Recreational and Cultural Interest Area Signs (chapter 2M), and Community Wayfinding Signs (Chapter 2D).

3.14.1 GENERAL SERVICE SIGNS

The MUTCD states that general service signs are generally used for commercial services such as gas, food, and lodging on major routes. These types of signs are typically found on Freeways and major Highways. General Service signage is usually not required in urban areas except for hospitals, law enforcement assistance, tourist information centers, and camping.

The MUTCD standard for General Service Signs is as follows:

Standard:

All General Service signs and supplemental sign panels shall have white letters, symbols, arrows, and borders on a blue background.

Guidance:

General Service signs should be installed at a suitable distance in advance of the turn-off point or intersecting highway.

States that elect to provide General Service signing should establish a statewide policy or warrant for its use, and criteria for the availability of services. Local jurisdictions electing to use such signing should follow State policy for the sake of uniformity.

Standard:

General Service signs, if used at intersections, shall be accompanied by a directional message.

Option:

The Advance Turn (M5 series) or Directional Arrow (M6 series) auxiliary signs with white arrows on blue backgrounds as shown in Figure 2I-1 may be used with General Service symbol signs to create a General Service

Directional Assembly.

The General Service sign legends may be either symbols or word messages.

In American Fork, only the Hospital and Police Station qualify for General Service signs. The hospital is well signed from I-15, State Street, North County Boulevard, Pioneer Crossing and Timpanogos Highway. No further signs are needed. The police station, located at 75 East 80 North, is set back from the main roads in the City and is therefore not easy to find from the main roads. Signs indicating where to turn from State Street to get to the Police Station should be erected. **Figure 3-17** shows the MUTCD recommended signs for a police station. **Figure 3-18** shows an example directional arrow.

Figure 3-17 D9-14 Police



Figure 3-18 Directional Arrow M6-1



3.14.2 RECREATIONAL AND CULTURAL INTEREST AREA SIGNS

Recreational and cultural interest area signs can be used for attractions or traffic generators that are open to the general public for the purpose of play, amusement, or relaxation. Recreational attractions include such facilities as parks, campgrounds, gaming facilities, and ski areas, while examples of cultural attractions include museums, art galleries, and historical building sites.

The purpose of recreation and cultural interest area signs is to guide road users to a general area and then to specific facilities or activities within the area.

As an important public facility, adding a sign on State Street indicating the correct place to turn for the library will make this facility more appealing to residents and improve quality of life in the City. Other facilities such as public parks, the recreation center, and historic landmarks may also be considered for recreational and cultural interest area signs. **Figure 3-19** shows an example directional assembly sign for recreational and cultural interest areas.

Other facilities of interest to the residents of American Fork include the Fitness Center, Amphitheater, Boat Harbor, Art Dye Park and the Cemetery. Each of these facilities should at a minimum have wayfinding signs on State Street at the most convenient place to turn to access the facility. Additional signs closer to the actual facility would also be desirable.

Figure 3-19 Swimming Sign (RS-061) with Directional Assembly



3.14.3 COMMUNITY WAYFINDING SIGNS

According to the MUTCD, community wayfinding signs form part of a coordinated and continuous system of signs that direct tourists and other road users to key civic, cultural, visitor and recreational attractions and other destinations within a city.

Community wayfinding guide signs are a type of destination guide sign for conventional roads with a common color and/or identification enhancement marker for destinations within an overall wayfinding guide signs plan for an area.

The MUTCD Standard for community wayfinding signs is as follows:

The use of community wayfinding guide signs shall be limited to conventional roads. Community wayfinding guide signs shall not be installed on freeway or expressway mainlines or ramps. Direction to community wayfinding destinations from a freeway or expressway shall be limited to the use of a Supplemental Guide sign (see Section 2E.35) on the mainline and a Destination sign (see Section 2D.37) on the ramp to direct road users to the area or areas within which community wayfinding guide signs are used. The individual wayfinding destinations shall not be displayed on the Supplemental Guide and Destination signs except where the destinations are in accordance with the State or agency policy on Supplemental Guide signs.

Community wayfinding guide signs shall not be used to provide direction to primary destinations or highway routes or streets. Destination or other guide signs shall be used for this purpose as described elsewhere in this Chapter and shall have priority over any community wayfinding sign in placement, prominence, and conspicuity.

Because regulatory, warning, and other guide signs have a higher priority, community wayfinding guide signs shall not be installed where adequate spacing cannot be provided between the community wayfinding guide sign and other higher priority signs. Community wayfinding guide signs shall not be installed in a position where they would obscure the road users' view of other traffic control devices.

Community wayfinding guide signs shall not be mounted overhead.

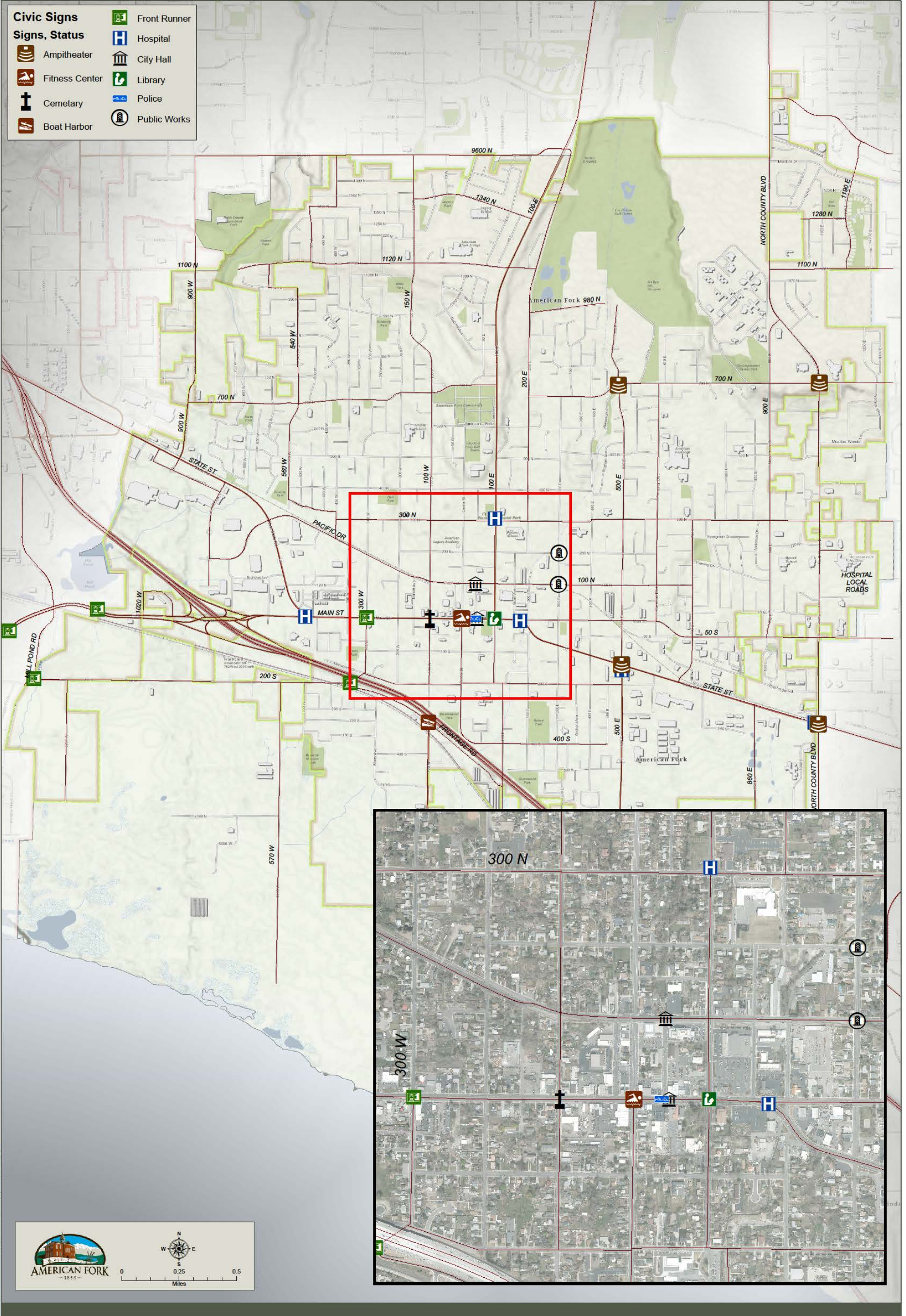
Community wayfinding signs should be considered in planning the Main Street Vision to identify and sign the specific Main Street Vision districts and attractions.

City Hall has the same problem as the Police Station; it is set back from the Main Street and is not easily visible. Adding a turning sign on State Street would help people navigate to City Hall. The Public Works building is located in a residential area and is not signed from any major street. Signs should be added on State Street and 200 West indicating where people should turn. It may also be helpful to sign the public works building from City Hall in the case that a resident visits City Hall and is directed that the service they require is located at the public works building. Adding turning signs on 100 North is recommended. **Figure 3-20** shows the MUTCD recommended sign for a directional community wayfinding sign. **Figure 3-21** gives some recommendations on wayfinding sign placement for each sign type.

Figure 3-20 Directional Community Wayfinding Sign



Figure 3-21 Wayfinding Map



3.15 AMERICANS WITH DISABILITIES ACT (ADA)

The Americans with Disabilities Act of 1990 prohibits discrimination and ensures equal opportunity and access for persons with disabilities.

ADA standards govern the construction and alteration of places of public accommodation, commercial facilities, and state and local government facilities. The Department of Justice (DOJ) maintains ADA standards that apply to all ADA facilities except transit facilities, which are subject to similar standards issued by the Department of Transportation (DOT). The DOJ published revised regulations for Titles II and III of the American with Disabilities Act of 1990 in the Federal Register on September 15, 2010, which are available online at http://www.ada.gov/2010ADASTandards_index.htm. Chapter 4: Accessible Routes of the 2010 ADA Standards for Titles II and III Facilities governs the design of Accessible Routes.

The ADA standards should be regularly reviewed to ensure that City standards and specifications are in compliance with Federal ADA regulations. All areas of newly designed and newly constructed buildings and facilities and altered portions of existing buildings and facilities shall comply with the ADA requirements as published. Although only new and altered facilities must be in compliance with ADA standards, in order to improve the quality of life of American Fork residents with disabilities, a thorough review of all public rights-of-way and facilities should be conducted over the next few years, as far as is economically viable.

The City Public Works Department will budget funds for survey, inventory and reconstruction of existing facilities to identify areas of non-compliance. American Fork City intends to inventory the City facilities that are eligible for ADA compliance over the next two years. These facilities will be stored within a Geographic Information Systems (GIS) database and areas of ADA deficiency will be cataloged. Once a database has been established, a plan will be set in motion to budget for improving those facilities that can be readily approved in compliance with the 2010 ADA standards. Priority will be given to sensitive facilities such as the senior center, schools, senior care centers and medical centers. In addition, the City will prioritize public facilities over private or residential areas. Some areas where compliance issues will be addressed as priorities include ramps at pedestrian crossings, missing sidewalks and deficient sidewalk widths.

3.16 RETROREFLECTIVITY

According to FHWA, “retroreflectivity” refers to the property of a traffic sign to reflect light back to the driver. Retroreflective traffic signs are used to increase sign visibility at night. Maintaining traffic sign retroreflectivity is important since nighttime fatal crashes occur approximately three times as often as daytime fatal crashes.

Retroreflectivity degrades over time. Upgrading poorly maintained traffic signs may reduce traffic injuries and fatalities. New FHWA requirements to maintain traffic signs in the City dictate that certain standards are met by certain compliance dates. The MUTCD outlines new retroreflectivity requirements in sections 2A.07 and 2A.08. **Table 3-5** shows the minimum required retro-reflectivity levels per the MUTCD.

Table 3-5 Minimum Maintained Retroreflectivity Levels

Sign Color	Sheeting Type (ASTM D4956-04)				Additional Criteria
	Beaded Sheeting		Prismatic Sheeting		
	I	II	III	III, IV, VI, VII, VIII, IX, X	
White on Green	W*; G ≥ 7	W*; G ≥ 15	W*; G ≥ 25	W ≥ 250; G ≥ 25	Overhead
	W*; G ≥ 7	W ≥ 120; G ≥ 15			Post-mounted
Black on Yellow or Black on Orange	Y*; O*	Y ≥ 50; O ≥ 50			2
	Y*; O*	Y ≥ 75; O ≥ 75			3
White on Red	W ≥ 35; R ≥ 7			4	
Black on White	W ≥ 50			–	
¹ The minimum maintained retroreflectivity levels shown in this table are in units of cd/lx/m ² measured at an observation angle of 0.2° and an entrance angle of -4.0°.					
² For text and fine symbol signs measuring at least 48 inches and for all sizes of bold symbol signs					
³ For text and fine symbol signs measuring less than 48 inches					
⁴ Minimum sign contrast ratio ≥ 3:1 (white retroreflectivity ÷ red retroreflectivity)					
[*] This sheeting type shall not be used for this color for this application.					
Bold Symbol Signs					
<ul style="list-style-type: none"> • W1-1,2 – Turn and Curve • W1-3,4 – Reverse Turn and Curve • W1-5 – Winding Road • W1-6,7 – Large Arrow • W1-8 – Chevron • W1-10 – Intersection in Curve • W1-11 – Hairpin Curve • W1-15 – 270 Degree Loop • W2-1 – Cross Road • W2-2,3 – Side Road • W2-4,5 – T and Y Intersection • W2-6 – Circular Intersection • W2-7,8 – Double Side Roads 		<ul style="list-style-type: none"> • W3-1 – Stop Ahead • W3-2 – Yield Ahead • W3-3 – Signal Ahead • W4-1 – Merge • W4-2 – Lane Ends • W4-3 – Added Lane • W4-5 – Entering Roadway Merge • W4-6 – Entering Roadway Added Lane • W6-1,2 – Divided Highway Begins and Ends • W6-3 – Two-Way Traffic • W10-1,2,3,4,11,12 – Grade Crossing Advance Warning 		<ul style="list-style-type: none"> • W11-2 – Pedestrian Crossing • W11-3,4,16-22 – Large Animals • W11-5 – Farm Equipment • W11-6 – Snowmobile Crossing • W11-7 – Equestrian Crossing • W11-8 – Fire Station • W11-10 – Truck Crossing • W12-1 – Double Arrow • W16-5P,6P,7P – Pointing Arrow Plaques • W20-7 – Flagger • W21-1 – Worker 	
Fine Symbol Signs (symbol signs not listed as bold symbol signs)					
Special Cases					
<ul style="list-style-type: none"> • W3-1 – Stop Ahead: Red retroreflectivity ≥ 7 • W3-2 – Yield Ahead: Red retroreflectivity ≥ 7; White retroreflectivity ≥ 35 • W3-3 – Signal Ahead: Red retroreflectivity ≥ 7; Green retroreflectivity ≥ 7 • W3-5 – Speed Reduction: White retroreflectivity ≥ 50 • For non-diamond shaped signs, such as W14-3 (No Passing Zone), W4-4P (Cross Traffic Does Not Stop), or W13-1P,2,3,6,7 (Speed Advisory Plaques), use the largest sign dimension to determine the proper minimum retroreflectivity level. 					

The following sections summarize the new FHWA requirements and outlines a plan for the City to comply with the new guidelines.

3.16.1 SIGN MAINTENANCE PROGRAM

FHWA has declared that local government agencies should have had a sign maintenance program that can regularly address the new minimum sign retroreflectivity requirements in place by January 2012. The program does not need to be implemented by this time, but must be in place.

The most efficient way to track retroreflectivity is in a GIS database. American Fork is currently in the process of upgrading their GIS and now is a perfect time to integrate retroreflectivity standards into the GIS platform. The existing sign inventory in the City should be collected via GPS data collection. The type and location of each of the City owned signs should be inventoried. The advantages of a GIS database are that vast amounts of the information required by the new FHWA guidelines can be stored and spatially related to individual signs. Once the database is established, it will be easy for the City to identify signs that do not meet the applicable standards and plan and budget for their replacement. Also, as new signs are added to the City inventory, they can be added to the database with relative ease.

A sign maintenance program can be constructed using any of the following methods as prescribed in the MUTCD:

A. Visual Nighttime Inspection—The retroreflectivity of an existing sign is assessed by a trained sign inspector conducting a visual inspection from a moving vehicle during nighttime conditions. Signs that are visually identified by the inspector to have retroreflectivity below the minimum levels should be replaced.

B. Measured Sign Retroreflectivity—Sign retroreflectivity is measured using a retroreflectometer. Signs with retroreflectivity below the minimum levels should be replaced.

C. Expected Sign Life—When signs are installed, the installation date is labeled or recorded so that the age of a sign is known. The age of the sign is compared to the expected sign life. The expected sign life is based on the experience of sign retroreflectivity degradation in a geographic area compared to the minimum levels. Signs older than the expected life should be replaced.

D. Blanket Replacement—All signs in an area/corridor, or of a given type, should be replaced at specified intervals. This eliminates the need to assess retroreflectivity or track the life of individual signs. The replacement interval is based on the expected sign life, compared to the minimum levels, for the shortest-life material used on the affected signs.

The method of maintenance chosen will depend on the information available to the City. If information on historical sign degradation is known as well as information on the date of sign installation, the expected sign life method may be favorable. Where this information is not readily available, either the visual nighttime inspection or measured sign retroreflectivity methods should be employed. Blanket replacement is also a viable option where financial constraints are less of a problem. Currently, the City is replacing its regulatory and address signs based on the date of installation and the orientation of the sign. South and West facing signs show signs of degradation quicker than East and North facing signs due to the orientation of the sun. The City is replacing its South and West facing signs every four years and its North and East facing signs every six years.

One of the simplest methods of establishing the existing retroreflectivity of the signs in the City is to test retroreflectivity during the inventory process. This would require the City to hire or purchase a retroreflectometer and test each sign as it is inventoried. Where a spatial sign inventory exists, using the visual nighttime inspection method may be more efficient.

3.16.2 PARTIAL COMPLIANCE

By January 2015, the City must comply with the new retroreflectivity requirements for most of their traffic signs they have installed, including all “regulatory” signs (such as STOP signs and Speed Limit signs), yellow “warning” signs, and green/white “guide” signs.

As such, the City should prioritize these types of signs during the next two years when the City signs are added to the GIS database. Any signs that are found to be noncompliant with the regulations must be replaced by January 2015. As City budgets are set well in advance of January, collecting the data on these signs must become a priority so that adequate funds can be allocated to replace noncompliant signs prior to January 2015.

3.16.3 FULL COMPLIANCE

By January 2018, the City must comply with the new retroreflectivity requirements for all signs including overhead guide signs and all street name signs. This will require much more effort than the guide signs required before 2015. The same process will need to be followed to ensure that all guide signs and street signs are in compliance. It may be cost efficient for the City to blanket replace all street signs installed before a certain date but a thorough cost analysis of the alternative compliance methods should be performed. In any case, a GIS database of existing sign inventory is advantageous and the guide and street signs should be added to this database.



4.0 CAPITAL FACILITIES PLAN

As shown and discussed in Section 4, the City will need to construct new roads, widen existing transportation corridors, and make spot intersection improvements to provide future residents of the City with an adequate transportation system. A concept plan for future growth between the planning years of 2019-2050 is provided below. The Impact Fee Facilities Plan (IFFP) includes detailed analysis on projects from 2020-2030. This document is separate from the TMP. Contact the City to obtain a copy of the document.

4.1 TRANSPORTATION NEEDS AS A RESULT OF NEW DEVELOPMENT

The specific transportation needs resulting from future growth throughout the City are identified in **Table 4-1** below. This table will need to be regularly updated by the City as project scopes change and development occurs in the City. Individual projects were identified and costs estimates were compiled to produce a Transportation Improvement Plan (TIP) for the City. The table identifies the specific projects that will be necessary between now and the year 2040; however, only arterial and collector improvements were identified since any local roads would be required to be built as part of future development. All costs have not been adjusted for inflation and therefore represent 2020 costs. The cost estimates shown represent the costs of construction, right-of-way, and engineering. Impact fee eligible costs, as well as other potential funding sources, were identified for each project in the table below. Roadways of regional significance were assumed to be built through help from other jurisdictions, such as UDOT and MAG.

The table is split into three phases. The Phase 1 projects are expected in the ten-year planning timeframe; this is consistent with the impact fee facilities plan requirements. The Phase 2 timeframe represents a mid-range planning estimate and Phase 3 is consistent with the regional planning efforts of MAG and UDOT. The recommended timing is intended as a planning tool only based on projected growth and land use. Actual development and transportation needs should provide the final decision on project timing. It is expected that the total cost of roadway improvements needed will be **\$429,738,500**.

This 2020 master plan update focused on Phase 1 projects to determine an updated TIP list and associated project costs. The analysis included specific intersection analysis to determine requirements at the intersection and to update the project costs based on the results. See the Appendix for a memorandum regarding the intersection analysis. The project lists and costs for Phase 2 and Phase 3 remain unchanged unless the project was moved to/from Phase 1.

It is recommended to fully update this master plan to incorporate all planning efforts through the year 2050 within the next couple of years.

Table 4-1 American Fork City Recommended Transportation Improvements

American Fork City Transportation Improvement Program (TIP)							
Project Number	Type of Improvement	Roadway or Location	From	To	Jurisdiction(s)	Total Project Costs ¹	Potential Funding Source ²
1.2	Roundabout	900 West & Grasslands Dr	-	-	City	\$1,781,000	M, C, O
1.3	New Major Collector (3-Lanes)	700 North	100 East	200 East	City	\$1,401,000	C, O



American Fork City Transportation Improvement Program (TIP)							
Project Number	Type of Improvement	Roadway or Location	From	To	Jurisdiction(s)	Total Project Costs ¹	Potential Funding Source ²
1.4	New Roundabout	980 North & 550 East	-	-	City	\$716,000	C, O
1.5	Widen to Collector (2 to 3)	400 West	300 North	Pacific Drive	City	\$917,000	C, O
	New Traffic Signal	Pacific Drive & 400 West	-	-			
1.6	Upgrades to Major Collector (2 to 3-Lanes)	700 North	100 East	900 West	City	\$51,000	M, C, O
1.7	Widen to Collector (2 to 3 lanes)	1100 North	North County Blvd	East City-Limits	City	\$612,000	
1.8	Upgrade to Principal Arterial	State Street	Main St	900 West	City/UDOT	\$3,500,000	M, S, C, O
1.9	New Traffic Signal	500 East & 400 South	-	-	City	\$423,000	C, O
1.10	New Collector (2 to 3-Lanes)	1280 North	North County Blvd	1030 East	City	\$1,015,000	M, C, O
1.11	New Arterial (5-Lanes)	620 South	600 East	East City-Limits	City	\$4,633,000	M, C, O
1.12	Widen to Arterial (5-Lanes)	620 South	500 East	600 East	City	\$131,000	C, O
1.14	Widen to Arterial (5-Lanes)	300 West	300 North	Pacific Drive	City	852,000	M, S, C, O
	New Traffic Signal	Pacific Drive & 300 West	-	-			
1.15	New Collector (2-3-Lanes)	Pacific Dr Extension	Pioneer Crossing	Meadow Lane	City/UDOT	\$50,000,000	M, C, O
1.16	Widen to Arterial (5-Lanes)	100 East	Main St	9800 North	City/UDOT	\$15,200,000	M, S, C, O
1.17	Widen to Major Collector (2 to 3 lanes)	300 East	300 North	200 South	City	\$541,000	M, S, C, O
1.18	Upgrade to Principal Arterial	State Street	500 East	East City-Limits	City/UDOT	\$19,800,000	M, S, C, O
1.20	New Collector (2 to 3-Lanes)	1020 West	Pioneer Crossing	200 South	City	\$20,000,000	C, O
1.21	Widen to Arterial (5-Lanes)	200 South	West City-Limits	300 West / Frontage Rd	City	\$11,169,000	C, O
1.23	New Traffic Signal	1120 North & 150 West	-	-	City	\$423,000	M, C, O



American Fork City Transportation Improvement Program (TIP)							
Project Number	Type of Improvement	Roadway or Location	From	To	Jurisdiction(s)	Total Project Costs ¹	Potential Funding Source ²
1.24	New Roundabout	700 North & 540 West	-	-	City	\$716,000	M, S, C, O
1.25	New Roundabout	700 North & 100 West	-	-	City	\$716,000	M, S, C, O
1.26	New Traffic Signal	700 North & 100 East	-	-	City/UDOT	\$524,000	C, O
1.27	New Traffic Signal	700 North & 200 East	-	-	City	\$679,000	M, S, C, O
1.28	New Traffic Signal	Pioneer Crossing & 1020 West	-	-	City/UDOT	\$423,000	O
1.29	New Traffic Signal	900 West & 550 North	-	-	City	\$423,000	M, S, C, O
1.30	New Traffic Signal	600 East & 620 South	-	-	City	\$423,000	M, C, O
1.32	New Traffic Signal	200 South & 1020 West	-	-	City	\$423,000	C,O
1.33	New Traffic Signal	500 East & 1100 South	-	-	City	\$458,000	M, C, O
1.34	New Roundabout	100 East & 200 South	-	-	City	\$2,818,500	M, S, C, O
1.35	New Traffic Signal	Auto Mall Dr & 500 East	-	-	City	\$429,000	M, C, O
1.36	New Roundabout	200 South & Frontage Rd	-	-	City	\$716,000	M, C, O
1.37	New Roundabout	300 West & Mahogany Dr	-	-	City	\$1,139,000	M, S, C, O
1.38	New Traffic Signal	860 East & 620 South	-	-	City	\$423,000	M, C, O
1.39	Intersection Improvement	Sam White Ln & 860 East	-	-	City	\$705,000	M, S, C, O
1.41	Intersection Improvement	300 North & 600 East	-	-	City	\$705,000	M, S, C, O
1.42	New Traffic Signal	200 South & Vineyard Connector	-	-	City	\$423,000	M, C, O
1.43	Intersection Improvement	200 South & 1300 West	-	-	City	\$705,000	C, O
1.44	Intersection Improvement	1100 West & 200 South	-	-	City	\$705,000	M, S, C, O
1.45	Intersection Improvement	900 West & 200 South	-	-	City	\$705,000	C, O
1.46	New Arterial (5-Lanes)	1300 West	Vineyard Connector	200 South	City	\$4,969,000	M, C, O
1.47	New Arterial (5-Lanes)	350 South	700 West	Vineyard Connector	City	\$6,486,000	M, C, O



American Fork City Transportation Improvement Program (TIP)							
Project Number	Type of Improvement	Roadway or Location	From	To	Jurisdiction(s)	Total Project Costs ¹	Potential Funding Source ²
1.48	Widen to Collector (2 to 3 lanes)	570 West	700 South	200 South	City	\$3,895,000	M, C, O
1.49	New Collector (3-Lanes)	1100 West	200 South	Vineyard Connector	City	\$2,900,000	M, C, O
1.50	New Collector (2 to 3-Lanes)	1100 West	700 South	200 South	City	\$3,248,000	M, C, O
1.51	New Collector (3-Lanes)	900 West	Vineyard Connector	200 South	City	\$4,314,000	M, C, O
1.52	Widen to Collector (2 to 3 lanes)	700 West	200 South	Vineyard Connector	City	\$2,690,000	M, C, O
1.53	Widen to Major Collector (2 to 3-Lanes)	100 West	1500 South	Frontage Road	City	\$4,658,000	M, C, O
1.54	Intersection Improvement	700 South	-	-	City	\$705,000	M, C, O
1.55	Intersection Improvement	1300 West & 700 South	-	-	City	\$705,000	M, C, O
1.56	New Roundabout	1100 West & 700 South	-	-	City	\$716,000	M, C, O
1.57	New Roundabout	900 West & 700 South	-	-	City	\$716,000	M, C, O
1.58	New Roundabout	700 West & 700 South	-	-	City	\$716,000	M, C, O
1.59	New Roundabout	700 south & 570 West	-	-	City	\$716,000	M, C, O
1.60	New Collector (3-Lanes)	700 South	1730 West	100 East	City	\$11,368,000	M, C, O
1.61	New Roundabout	100 West & 700 South	-	-	City	\$716,000	M, C, O
1.62	New Traffic Signal	Vineyard Connector & 1300 West	-	-	City	\$423,000	M, C, O
1.63	New Collector (3-Lanes)	900 West	700 South	700 West	City	\$7,767,000	M, C, O
1.64	New Traffic Signal	Vineyard Connector & 700 West	-	-	City	\$423,000	M, C, O
1.65	New Collector (2 to 3-Lanes)	1100 South	100 East	700 South	City	\$4,038,000	M, C, O
1.66	New Roundabout	100 West & 1100 South Extension	-	-	City	\$716,000	M, C, O



American Fork City Transportation Improvement Program (TIP)							
Project Number	Type of Improvement	Roadway or Location	From	To	Jurisdiction(s)	Total Project Costs ¹	Potential Funding Source ²
1.67	New Traffic Signal	Vineyard Connector & 100 West	-	-	City	\$423,000	M, C, O
1.68	Widen to Collector (2 to 3-Lanes)	100 West	1500 South	American Fork Marina	City	\$983,000	M, C, O
1.69	New Collector	Auto Mall Drive	Auto Mall Drive	100 East	City	\$2,251,000	M, C, O
	New Roundabout	Frontage Rd & 100 East	-	-	City		C, O
1.70	New Roundabout	700 South Extension & 100 East	-	-	City	\$716,000	M, C, O
1.71	New Roundabout	100 East & 1100 South	-	-	City	\$716,000	M, C, O
1.72	Widen to Collector (2 to 3 lanes)	1100 South	100 East	500 East	City	\$2,840,000	M, C, O
1.73	Intersection Improvement	State St & 860 East	-	-	City	\$705,000	M, C, O
1.74	Widen to Major Collector (2 to 3-Lanes)	860 East	State Street	1100 South	City	\$4,305,000	M, C, O
1.75	New Collector (2 to 3-Lanes)	740 East	550 South	620 South	City	\$505,000	M, C, O
1.76	New Collector (3-Lanes)	Quality Drive	600 East	860 East	City	\$2,171,000	M, C, O
1.77	Intersection Improvement	Utah Valley Drive & 860 East	-	-	City	\$705,000	M, C, O
1.78	New Arterial (5-Lanes)	Vineyard Connector	West City-Limits	East City Limits	City	\$30,663,000	M, C, O
1.79	New Arterial (5-Lanes)	Pony Express Extension	Vineyard Collector	West City-Limits	City	\$13,637,000	M, C, O
1.80	New Roundabout	Pacific Drive & 700 West	-	-	City	\$716,000	M, C, O
1.81	New Roundabout	130 North & 600 West	-	-	City	\$716,000	M, C, O
Total for Improvements needed for Phase 1						\$272,360,500	
2.1	Intersection Improvement	1340 North & 150 West	-	-	City	\$705,000	C, O
2.3	New Roundabout	700 North & 500 East	-	-	City	\$716,000	C, O



American Fork City Transportation Improvement Program (TIP)							
Project Number	Type of Improvement	Roadway or Location	From	To	Jurisdiction(s)	Total Project Costs ¹	Potential Funding Source ²
2.4	New Roundabout	700 North & Caveman Blvd	-	-	City	\$716,000	C, O
2.5	New Roundabout	700 North & 900 East	-	-	City	\$716,000	C, O
2.6	I-15 NB On Ramp	Pacific Drive & NB I-15	-	-	City/UDOT	\$20,000,000	S, C, O
2.7	Widen to Arterial (5-Lanes)	Pacific Dr.	State St	500 East	City/UDOT	\$9,945,000	M, S, C, O
2.8	Upgrades to Major Collector (2 to 3-Lanes)	300 West	200 South	Pacific Drive	City	\$1,399,000	C, O
2.9	Intersection Improvement	Pacific Drive & 100 West	-	-	City	\$705,000	C, O
2.10	Intersection Improvement	100 North & 300 East	-	-	City	\$705,000	C, O
2.11	Intersection Improvement	100 North & 500 East	-	-	City	\$705,000	C, O
2.12	Intersection Improvement	300 East & Main Street	-	-	City	\$705,000	C, O
2.13	Widen to Arterial (5-Lanes)	500 East	State Street	Pacific Drive (100 North)	City	\$3,092,000	C, O
2.14	New Roundabout	50 South & 900 East	-	-	City	\$716,000	C, O
2.15	Upgrades to Major Collector (2 to 3-Lanes)	Frontage Road	200 South	100 East	City	\$4,923,000	C, O
2.16	New Signal	400 South & 660 East	-	-	City	\$423,000	C, O
2.17	Upgrades to Major Collector (2 to 3-Lanes)	Auto Mall Dr.	Project 1.69	630 East	City	\$11,286,000	C, O



American Fork City Transportation Improvement Program (TIP)							
Project Number	Type of Improvement	Roadway or Location	From	To	Jurisdiction(s)	Total Project Costs ¹	Potential Funding Source ²
2.18	Intersection Improvement	Utah Valley Dr & Quality Dr	-	-	City	\$705,000	C, O
2.19	Upgrades to Major Collector (2 to 3-Lanes)	Utah Valley Dr.	620 South	860 East	City	\$4,664,000	C, O
2.20	New Roundabout	1500 South & 700 West	-	-	City	\$716,000	C, O
2.21	Widen to Arterial (5-Lanes)	500 East	Sam White Ln (1100 S)	1000 South (Auto Mall Dr.)	City	\$1,459,000	C, O
2.22	Intersection Improvement	1100 South & 630 East	-	-	City	\$705,000	C, O
2.23	New Arterial (5-Lanes)	500 East	Vineyard Connector	Sam White Ln (1100 S)	City	\$19,297,000	C, O
2.24	Widen to Major Collector	1300 South	630 East	860 East	City	\$1,034,000	C, O
2.25	Widen to Major Collector	860 East	1300 South	Pleasant Grove Blvd	City	\$813,000	C, O
2.26	New Roundabout	1500 S & 660 East	-	-	City	\$716,000	C, O
Total for Improvements needed for Phase 2						\$87,566,000	
3.1	New Traffic Signal	N County Blvd & Harvey Blvd	-	-	City	\$423,000	C, O
3.2	New Roundabout	300 North & 300 West	-	-	City	\$716,000	C, O
3.3	New Roundabout	300 North & 100 West	-	-	City	\$716,000	C, O
3.4	Intersection Improvement	300 North & 200 East	-	-	City	\$705,000	C, O



American Fork City Transportation Improvement Program (TIP)							
Project Number	Type of Improvement	Roadway or Location	From	To	Jurisdiction(s)	Total Project Costs ¹	Potential Funding Source ²
3.5	Upgrades to Minor Arterial (2 to 3-Lanes)	300 North	300 West	East City-Limits	City	\$11,155,000	C, O
3.6	New Roundabout	300 North & 500 East	-	-	City	\$716,000	C, O
3.7	New Roundabout	300 North & 700 East	-	-	City	\$716,000	C, O
3.8	New Roundabout	300 North & 900 East	-	-	City	\$716,000	C, O
3.9	New Business Core Loop	150 South	900 West	1300 West	City	\$2,925,000	C, O
3.10	New Core Collector	1100 West	200 South	150 South	City	\$1,010,000	C, O
3.12	Intersection Improvement	400 South & 740 East	-	-	City	\$705,000	C, O
3.13	New Roundabout	620 South & 740 East	-	-	City	\$716,000	C, O
3.14	New Collector (3-Lanes)	1500 South	Vineyard Connector (at 700 West)	100 West	City	\$13,017,000	C, O
3.15	Widen remaining sections to Major Collector (3-Lanes)	Sam White Lane (1100 South)	500 East	East City-Limits	City	\$9,611,000	C, O
3.16	New Roundabout	1500 South & 100 West	-	-	City	\$716,000	C, O
3.17	Widen to Collector (3-Lanes)	1500 South	100 West	600 East	City	\$9,867,000	C, O
3.18	Widen to Collector (3-Lanes)	100 East	1500 South	I-15	City	\$13,001,000	C, O
3.19	New Roundabout	1500 South & 100 East	-	-	City	\$716,000	C, O
3.20	New Traffic Signal	Vineyard Connector & 500 East	-	-	City	\$423,000	C, O
3.21	New Roundabout	500 East & 1500 South	-	-	City	\$716,000	C, O
3.22	New Collector (2-Lanes) Connection to Vineyard Connector	1500 South	600 East	750 East	UDOT	\$1,231,000	S,C,O



American Fork City Transportation Improvement Program (TIP)							
Project Number	Type of Improvement	Roadway or Location	From	To	Jurisdiction(s)	Total Project Costs ¹	Potential Funding Source ²
Total for Improvements needed for Phase 3						\$69,812,000	
Total for All Improvements						\$429,738,500	

¹Cost represents existing (2019) construction, right of way, and engineering costs.

²Potential Funding Source: M-MAG, S-State, C-City, and O-Other



4.2 PLANNING FOR THE FUTURE (VISION)

In addition to identifying the projects needed to accommodate growth through the year 2040, an ultimate “vision” for the City was developed. This vision scenario includes probable projects that will be needed to accommodate growth throughout the City through build-out. It also includes projects that are included in the vision planning efforts of MAG, UDOT, and other agencies.

These vision projects do not have a timeframe other than it is not anticipated that they will be needed before 2050. The vision projects consist mainly of widening roads that either currently exist or are expected to be needed at a lower classification by 2050. The long-term transportation vision for American Fork is shown in **Figure 3-4**. Cost estimates were also created for these vision projects (see **Table 4-2**) however, it must be noted that these projects are considered very long-term and must be re-evaluated on a regular basis to ensure the assumptions made are still valid. **Figure 4-1** illustrates the anticipated timing of the recommended roadway improvements. Timing is split into short-term (2030), mid-term (2040), long-term (2050) and very long-term (vision).

Table 4-2 Vision Project Cost Estimates

American Fork City Transportation Improvement Program (TIP)							
Project Number	Type of Improvement	Roadway or Location	From	To	Jurisdiction(s)	Total Project Costs ¹	Potential Funding Source ²
V.1	Widen to Arterial (5-Lanes)	100 East	State Street	Vineyard Connector	City	\$7,979,000	C, O
V.2	Widen to Arterial (5-Lanes)	700 North	900 West	City Limits	City	\$13,364,000	C, O
Total for "Vision" Improvements						\$21,343,000	

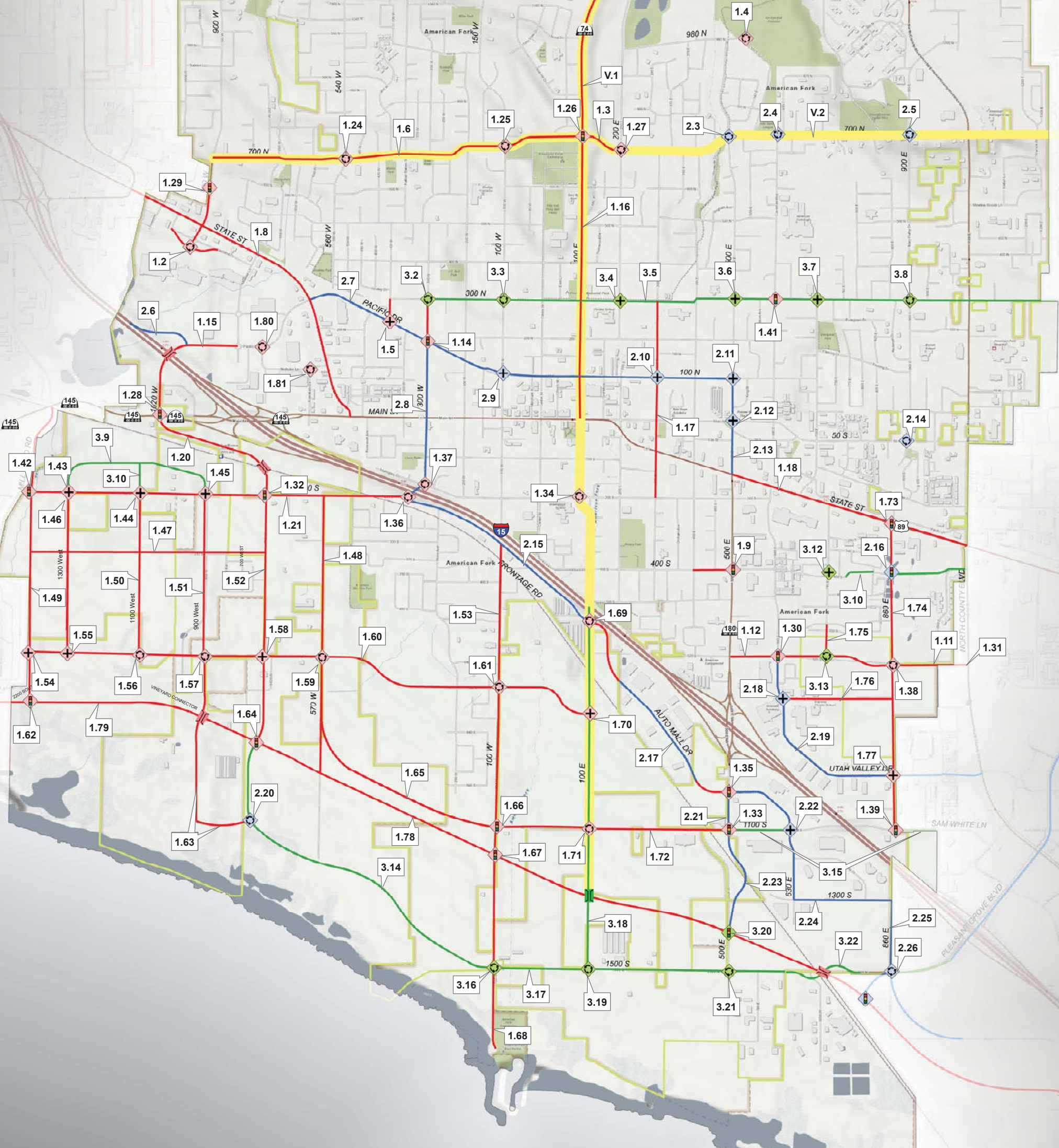
¹Cost represents existing (2017) construction, right of way, and engineering costs.

²Potential Funding Source: F-Federal, S-State, C-City, and O-Other

Figure 4-1 Project Timing

Legend

Intersections	Roadway Network
Phase 1-Signal	Phase 1
Phase 1-Intersection Improvement	Phase 2
Phase 1-Roundabout	Phase 3
Phase 1-Overpass	Vision
Phase 2-Signal	
Phase 2-Intersection Improvement	
Phase 2-Roundabout	
Phase 2-Overpass	
Phase 3-Signal	
Phase 3-Intersection Improvement	
Phase 3-Roundabout	
Phase 3-Overpass	



0 0.25 0.5
Miles

4.3 SPECIAL CONSIDERATIONS

A few specific locations on American Fork City’s street network may require some unique improvements to resolve traffic issues at these sites. These areas are identified below along with the unique characteristics of each location. Refer to the intersection analysis study located in the **Appendix** for greater details regarding these special considerations.

4.3.1 MAIN STREET AND STATE STREET

The Main Street and State Street intersection in American Fork has been a trouble spot for some time. American Fork Main Street, 200 East, and State Street intersect in this location. Main Street runs parallel into State Street, and WB traffic from Main Street is stop controlled. 200 East intersects with Main Street and continues south to intersect with State Street leaving a raised island between the three streets. There are a high number of crashes at this location. This location is also part of the Bicycle and Pedestrian Master Plan and provides a potential connection point between the areas north and south of State Street. The intersection skew angle and s-curve through this area pose a significant problem to safety as well as mobility. To mitigate the safety concerns at this intersection, Main Street will be re-aligned to connect perpendicular to State Street. 200 East will be realigned so it only connects to Main Street. The intersection at 300 East and State Street will be signalized, increasing the amount of gaps for vehicles to turn onto State Street from Main Street.

4.3.2 STATE STREET AND 500 EAST

The eastbound and westbound leg of the existing intersection consist of two through lanes, a right turn lane, and a protected/permissive left turn lane. The northbound leg consists of one shared through/left turn lane, one left turn only lane, and a right turn lane. The southbound leg consists of a shared through/left turn lane and a shared through/right turn lane. The northbound and southbound legs operate on a split phase signal. The crossing streets at this intersection are skewed. Between 2009 and 2011, 46 vehicles were involved in crashes at this intersection. In order to accommodate the high volumes of traffic turning onto State Street from 500 East, and because of restricted right-of-way, the signal at State Street and 500 East is split phased. This is the only option at a signal where a protected left turn phase includes a shared through/left lane.

At some point in the future, this intersection will need to be improved. The considered safety and capacity improvements should include widening of the north leg of the intersection to provide a left turn only lane, and converting the through/left lane to a through only lane. A through only lane will also be added on the south leg of the intersection, and the existing shared through/left will be converted to a through only lane. The existing pavement width on the south is sufficient to provide the additional lane without any widening. The intent of the additional lanes is to eliminate the split phase signal and allow the left turns to operate as protected/permissive. It is expected that these improvements will lower congestion on the eastbound and westbound legs.

4.3.3 STATE STREET AND PACIFIC DRIVE

The northbound leg of the existing intersection consists of two through lanes with a protected/permissive left turn lane. The southbound leg consists of two through lanes with dual left turn lanes, as well as a third through “trap” lane that terminates at a right turn lane. The eastbound and westbound legs consist of a through lane, a right turn lane, and a permissive left turn lane. Between 2009 and 2011, 76 vehicles were involved in crashes at this intersection. The American Fork police department indicated that delays

on the eastbound and westbound legs are excessive, which contributes to poor driver decisions. The intersection is located on a curve which impedes sight distance for left turning vehicles.

The proposed safety improvements include the addition of dual left turns with a protected only phase in the northbound direction. The improvements can likely be completed within the existing pavement if the southbound trap lane is terminated prior to Pacific Drive and the shoulders are eliminated at the intersection.

4.3.4 900 WEST ROUNDABOUT IN “THE MEADOWS”

The 900 West Roundabout is not operating efficiently. Frequently, and especially during peak shopping times, the southbound leg of the roundabout backs up and interferes with traffic on State Street. This presents a significant safety hazard on State Street. Also, the excessive delays at the roundabout can cause drivers to become impatient and violate the yield rules, thus presenting a further unsafe condition. The problem is not particularly the roundabout itself, rather the lack of available storage on the north leg of the roundabout. This could be mitigated by moving the roundabout south closer to the retail stores and increasing the vehicle storage on the north leg. Doing so would require a new roundabout design and allow for some minor improvements to the roundabout itself to increase capacity.

4.3.5 VINEYARD CONNECTOR

The Vineyard Connector is a proposed UDOT highway which runs from Lindon all the way to Saratoga Springs. A large portion of the roadway runs along the south edge of American Fork adjacent to Utah Lake. The highway will eventually break off and travel north to connect to Pioneer Crossing, bisecting the undeveloped land south of I-15 in American Fork.

Timing on the Vineyard Connector has been somewhat of a contentious issue in the past. Early on in the planning process, it was expected that the entire highway would be built in the near future (10 years), but more recently, the MAG transportation plans shows the highway to be constructed between 2030 and 2040. This poses a problem to the City, as the area south of I-15 is in the future annexation boundary but is not all incorporated into the City. Planning efforts in this area must account for traffic growth and assume that the Vineyard Connector will not be built before 2040. This may result in larger than expected cross-sections on some of the roads in the south area of the City. These roads will likely experience a significant drop in traffic volumes after the construction of the Vineyard Connector, but will continue to experience traffic growth beyond 2040. It is expected that the cross-sections used to accommodate growth without Vineyard Connector will be appropriate for a very long term “vision” traffic scenario when the City is built to capacity.

4.3.6 RAILROAD CROSSINGS

There are a number of railroad crossings in the City on both the north and south side of I-15. The Union Pacific Railroad line, which is also the probable future TRAX rail line, runs parallel to State Street and Pacific Drive for much of the City. The new FrontRunner high speed rail line runs close to I-15 on the south side.

Each of these rail lines must be treated with extreme caution when planning the roadway network. The potential for catastrophic vehicle/train or pedestrian/train accidents are very high at at-grade rail crossings. Wherever feasible, grade separated rail crossings should be provided. Where there are areas of high pedestrian activity, such as in mixed-use zoning and transit oriented development, or around transit stops, provision must be made to include a physical barrier between the pedestrian facilities and the rail tracks. Grade separated pedestrian walkways are more feasible than grade separated vehicular

facilities and should be used where possible. When grade separation is not feasible, strict adherence to design and safety standards must be maintained and all plans should be prepared by a qualified engineer.

4.3.7 300 NORTH TO PACIFIC DRIVE

Getting vehicles from 300 North to Pacific Drive is challenging. The favored route is currently to use 400 West. 400 West is a short road with an at-grade railroad crossing close to Pacific Drive. Vehicles frequently back up to 300 North during the peak times of day. There is a very heavy left turn movement from 300 North onto 400 West. Once vehicles are on 400 West, it is near impossible to make a left turn onto Pacific Drive due to the high volume of cross traffic.

The Transportation Master Plan proposes that the main north-south route from 300 North to Pacific Drive be moved from 400 West to 300 West. 300 West provides much more storage for southbound vehicles queuing at Pacific Drive. 300 West is also classified as a Major Collector and runs south until it crosses under I-15. This is the natural north-south street for vehicles wishing to move between the north and south sides of I-15. There is also a much better situation for signalization on Pacific Drive at 300 West, as it is approximately ½ mile from the signal at US-89 and Pacific Drive, whereas 400 West is just over ¼ mile from US-89.

4.3.8 300 WEST AND 200 SOUTH

300 West passes under I-15 and connects to the Frontage Road and 200 South. This is the only Freeway crossing between 500 East and the Pioneer Crossing interchanges. Due to the recent completion of the I-15 CORE project, it is unlikely that any other crossings will be permitted along this stretch of I-15 in the foreseeable future. As such, this connection is vital to maintaining good connectivity between the north and south side of the Freeway and avoiding a “divided” community. There are two intersections very close to each other on either side of I-15, one at Mahogany Drive and one at Frontage Road. The closeness of these intersections poses an interesting traffic dilemma as any excessive delay between the two may result in unsafe operating conditions.

Two possible scenarios have been identified to ensure that the two intersections work in harmony and can meet the traffic demand. The first consisted of a coordinated two signal solution where both intersections would become traffic signals. The second solution would involve constructing a roundabout at each intersection. Although both scenarios would function adequately, the risk of a signal back up is greater than with a free-flowing roundabout. In this case, the two roundabout solution is recommended, but a two signal solution will also function adequately.

4.3.9 560 WEST AND PACIFIC DRIVE

The intersection of 560 West and Pacific Drive is an important north-south connection in the future. This connection will help to alleviate traffic congestion on the local street network, particularly on 300 North and 400 W. It will also help to ease delay at the newly proposed 300 West and Pacific Drive signal. Due to the close proximity of 560 West to the existing signal at State Street and Pacific Drive, it is unlikely that a full movement intersection will provide acceptable operations at 560 West. As such it is important that this intersection be studied in detail before any decision is made as to the nature of the intersection treatment. At a minimum, left turns onto 560 West from eastbound Pacific Drive should be restricted. This could come in the form of a three quarter intersection where only right turns are permitted from Pacific Drive. A High-T intersection is also a possibility, this would result in free-flowing eastbound

movements on Pacific Drive and would possibly eliminate any queue blocking the State Street intersection and causing an unsafe situation.



5.0 APPENDIX

To:

From: Kevin Croshaw

Date: January 28, 2020

Memorandum

Subject: American Fork Intersection Analysis

Introduction and Summary

This report presents the findings of the traffic Impact Study (TIS) performed for American Fork City. This study is intended to address the following intersections:

- 700 W & 200 S
- 1020 W & Pioneer Crossing
- 1100 S & 500 E
- 620 S & 600 E
- 7280 N & 1040 E
- 300 E & 100 N
- 400 W & Pacific Dr
- 300 W & Pacific Dr
- 900 W & Grassland Dr
- 500 E & 700 N
- 540 W & 700 N
- 150 W & 700 N
- Alpine Hwy & 700 N
- 200 E & 700 N
- 150 W & 1120 N

This report addresses the impacts based on Level of Service (LOS) values calculated by delay per vehicle. Both AM and PM peak hour turning movement counts were performed at the above intersections

All counts were used to establish a base condition for the analysis, which assists in estimating traffic flow for new traffic around the proposed development. The count data and existing turning movement counts are included in the appendix.

Analysis of Existing Conditions

In order to quantify the traffic conditions currently exhibited in the study area, the roadway geometries, traffic data, and signal timings were entered in the Synchro 10 software package. Using the Highway Capacity Manual (HCM) (6th Edition) method of calculating intersection delay, a Level of Service (LOS) grade was assigned to the intersections for both the existing AM and PM peak hours.

Level of Service (LOS) is a term used by the HCM to describe the traffic operations of an intersection, based on congestion and delay. LOS ranges from A (almost no congestion or delay) to F (traffic demand exceeds capacity and intersection experiences long queues and delay). LOS E is the threshold when the intersection exceeds an acceptable standard and intersection improvements are required. The delay criteria used to assign a letter grade to an intersection for signalized and unsignalized intersections are shown in **Table 1**.

Table 1: LOS Delay Criteria

Level of Service	Average Control Delay (sec/veh)	
	Signalized	Unsignalized
A	≤ 10	≤ 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

Existing Conditions

Turning movement counts were obtained by Horrocks Engineers at the intersections listed in **Table 2**. These counts were used to establish a base condition and estimate the direction of travel that vehicles will take to access and leave the site. Under existing conditions, all intersections operate at an acceptable LOS. The intersection with the longest delay is 1020 W & Pioneer Crossing, the delay for this intersection is 15.6 and 19.0 seconds per vehicle in the AM and PM hour, respectively.

Table 2: Existing Peak Hour Intersection Operations

Intersection ID	Intersection	AM Peak Hour		PM Peak Hour	
		Average Control Delay (sec/veh)	Level of Service	Average Control Delay (sec/veh)	Level of Service
Existing Conditions					
1	200 S & 700 W	0.2	A	0.2	A
2	1020 W & Pioneer Crossing	15.6	A	19.0	A
3	1100 S & 500 E	10.6	A	9.2	A
4	620 S & 600 E	4.7	A	8.4	A
5	7280 N & 1040 E	0.2	A	0.2	A
6	300 E & 100 N	4.9	A	7.0	A
7	400 W & Pacific Dr	5.3	A	6.4	A
8	300 W & Pacific Dr	3.7	A	4.3	A
9	900 W & Grassland Dr	3.0	A	5.4	A
10	500 E & 700 N	1.9	A	2.7	A
11	540 W & 700 N	4.0	A	22.1	C
12	100 W & 700 N	8.0	A	9.0	A
13	Alpine Hwy & 700 N	4.5	A	8.7	A
14	200 E & 700 N	12.5	B	9.9	A
15	150 W & 1120 N	12.7	B	12.2	B

For each analysis scenario, the changes in LOS will be monitored to determine if any mitigations are recommended due to general growth projected by the 2030 Traffic Demand Model (TDM).

Projected Traffic

Future Traffic

In order to successfully analyze traffic conditions for future conditions at each intersection, existing traffic counts along with the 2030 TDM and the NCHRP Synthesis 225 were used as inputs to project the growth in American Fork.

Traffic Analysis

This report analyzed the 2030 projected traffic scenario.

2030 Projected Traffic

The existing background traffic is projected to represent the 2030 background traffic scenario and is shown in Error! Reference source not found. All study intersections were analyzed and all intersections except 300 E & 100 N and 500 E & 700 perform at a failing LOS F as shown in **Table 3**.

Table 3: 2030 Projected Analysis

Intersection ID	Intersection	AM Peak Hour		PM Peak Hour	
		Average Control Delay (sec/veh)	Level of Service	Average Control Delay (sec/veh)	Level of Service
2030 Projected Conditions					
1	200 S & 700 W	14.1	B	77.4	F
2	1020 W & Pioneer Crossing	40.5	F	56.2	F
3	1100 S & 500 E	111.1	F	180.9	F
4	620 S & 600 E	159.6	F	4888.9	F
5	7280 N & 1040 E	47.0	F	46.1	F
6	300 E & 100 N	5.2	A	7.8	A
7	400 W & Pacific Dr	16.3	C	36.2	E
8	300 W & Pacific Dr	5.2	A	66.2	F
9	900 W & Grassland Dr	3.3	A	4.7	A
10	500 E & 700 N	3.5	A	5.8	A
11	540 W & 700 N	16.9	C	70.0	F
12	100 W & 700 N	65.8	F	42.3	E
13	Alpine Hwy & 700 N	781.4	F	837.2	F
14	200 E 700 N	371.3	F	26.6	D
15	150 W 1120 N	67.6	F	54.4	F

Mitigations

Recommended mitigations and results are shown in **Table 4**.

Table 4: Intersection Mitigations & LOS

American Fork Intersection Improvement									
Location		Peak Hour	Existing LOS	Delay (sec/veh)	2030 LOS	Delay (sec/veh)	Mitigation LOS	Delay (sec/veh)	Improvement Type
1	200 S & 700 W	AM	A	0.2	B	14.0	B	13.9	New Signal
		PM	A	0.2	F	75.4	B	15.3	
2	1020 W & Pioneer Crossing	AM	A	15.6	E	40.5	C	24.5	New Signal
		PM	A	19.0	F	56.2	D	49.3	
3	1100 S & 500 E	AM	A	10.5	F	107.4	B	15.1	Signal, WB right-turn pocket
		PM	A	9.3	F	183.8	B	18.7	
		AM	A	10.5	F	107.4	A	6.8	Roundabout & WB right-turn pocket
		PM	A	9.3	F	183.8	B	14.0	
4	620 S & 600 E	AM	A	4.7	F	168.4	D	35.5	Signal, EB right-turn pocket and NB left-turn pocket
		PM	A	8.4	F	479.0	C	21.6	
5	North County Blvd & 620 S	AM	A	0.2	F	47.0	B	11.3	New Signal
		PM	A	0.2	F	46.1	B	12.9	
6	300 E & 100 N	AM	A	4.8	A	5.1	-	5.1	N/A
		PM	A	6.8	A	7.6	-	7.6	
7	400 W & Pacific Dr	AM	A	5.8	F	57.2	B	10.7	Signal
		PM	B	12.0	F	163.1	D	45.6	
8	300 W & Pacific Dr	AM	A	4.1	A	10.0	B	13.1	Signal, EB/WB left-turn pockets
		PM	B	14.9	F	575.4	B	18.2	
10	500 E & 700 N	AM	A	1.8	A	3.3	A	3.3	N/A
		PM	A	2.5	A	5.7	A	5.7	
11	540 W & 700 N	AM	A	4.0	C	17.1	B	13.0	Signal, EB/WB left-turn pockets
		PM	C	22.7	F	287.2	C	21.4	
		AM	A	4.0	C	17.1	A	7.0	Roundabout with EB/WB right-turn pockets
		PM	C	22.7	F	287.2	B	11.6	
12	100 W & 700 N	AM	A	8.0	F	168.2	B	15.9	Signal, EB/WB left-turn pockets
		PM	A	9.0	F	143.0	B	15.0	
		AM	A	8.0	F	168.2	B	13.0	Roundabout
		PM	A	9.0	F	143.0	B	11.9	
13	Alpine Hwy & 700 N	AM	A	4.0	F	805.6	C	34.5	Signal, EB, WB, NB, SB left-turn & right-turn pockets
		PM	B	10.1	F	866.8	C	28.6	
14	200 E & 700 N	AM	B	12.5	F	374.1	C	21.7	Signal, left-turn pockets All Approaches
		PM	A	9.9	D	26.2	B	11.0	
		AM	B	12.5	F	374.1	C	23.8	Roundabout with right-turn pockets All Approaches
		PM	A	9.9	D	26.2	A	5.6	
15	150 W & 1120 N	AM	B	14.5	F	81.9	C	25.3	Signal
		PM	B	13.6	F	67.7	C	27.2	
Location		Peak Hour	Link (ft)	Existing Queue	Mitigation link (ft)	2030 Queue		Improvement Type	
9	900 W & Grassland Dr	PM	181	263	293	265		Move Roundabout 100'	

After mitigations all intersections perform at an acceptable LOS.

Conclusions

American Fork Intersection Improvement									
Location		Peak Hour	Existing LOS	Delay (sec/veh)	2030 LOS	Delay (sec/veh)	Mitigation LOS	Delay (sec/veh)	Improvement Type
1	200 S & 700 W	AM	A	0.2	B	14.0	B	13.9	New Signal
		PM	A	0.2	F	75.4	B	15.3	
2	1020 W & Pioneer Crossing	AM	A	15.6	E	40.5	C	24.5	New Signal
		PM	A	19.0	F	56.2	D	49.3	
3	1100 S & 500 E	AM	A	10.5	F	107.4	B	15.1	Signal, WB right-turn pocket
		PM	A	9.3	F	183.8	B	18.7	
4	620 S & 600 E	AM	A	4.7	F	168.4	D	35.5	Signal, EB right-turn pocket and NB left-turn pocket
		PM	A	8.4	F	479.0	C	21.6	
5	N. County Blvd & 620 S	AM	A	0.2	F	47.0	B	11.3	New Signal
		PM	A	0.2	F	46.1	B	12.9	
6	300 E & 100 N	AM	A	4.8	A	5.1	-	5.1	N/A
		PM	A	6.8	A	7.6	-	7.6	
7	400 W & Pacific Dr	AM	A	5.8	F	57.2	B	10.7	Signal
		PM	B	12.0	F	163.1	D	45.6	
8	300 W & Pacific Dr	AM	A	4.1	A	10.0	B	13.1	Signal, EB/WB left-turn pockets
		PM	B	14.9	F	575.4	B	18.2	
10	500 E & 700 N	AM	A	1.8	A	3.3	A	3.3	N/A
		PM	A	2.5	A	5.7	A	5.7	
11	540 W & 700 N	AM	A	4.0	C	17.1	A	7.0	Roundabout with EB/WB right-turn pockets
		PM	C	22.7	F	287.2	B	11.6	
12	100 W & 700 N	AM	A	8.0	F	168.2	B	13.0	Roundabout
		PM	A	9.0	F	143.0	B	11.9	
13	Alpine Hwy & 700 N	AM	A	4.5	F	781.4	C	34.5	Signal, EB, WB, NB, SB left-turn & right-turn pockets
		PM	A	8.7	F	837.2	C	28.6	
14	200 E & 700 N	AM	B	12.5	F	371.3	B	11.0	Signal, left-turn pockets All Approaches
		PM	A	9.9	D	26.6	A	9.9	
15	150 W & 1120 N	AM	B	12.7	F	67.6	C	23.5	Signal
		PM	B	12.2	F	54.4	C	26.1	
Location		Peak Hour	Link (ft)	Existing Queue	Mitigation link (ft)	2030 Queue		Improvement Type	
9	900 W & Grassland Dr	PM	181	263	293	265		Move Roundabout 100'	



Appendix



Traffic Counts

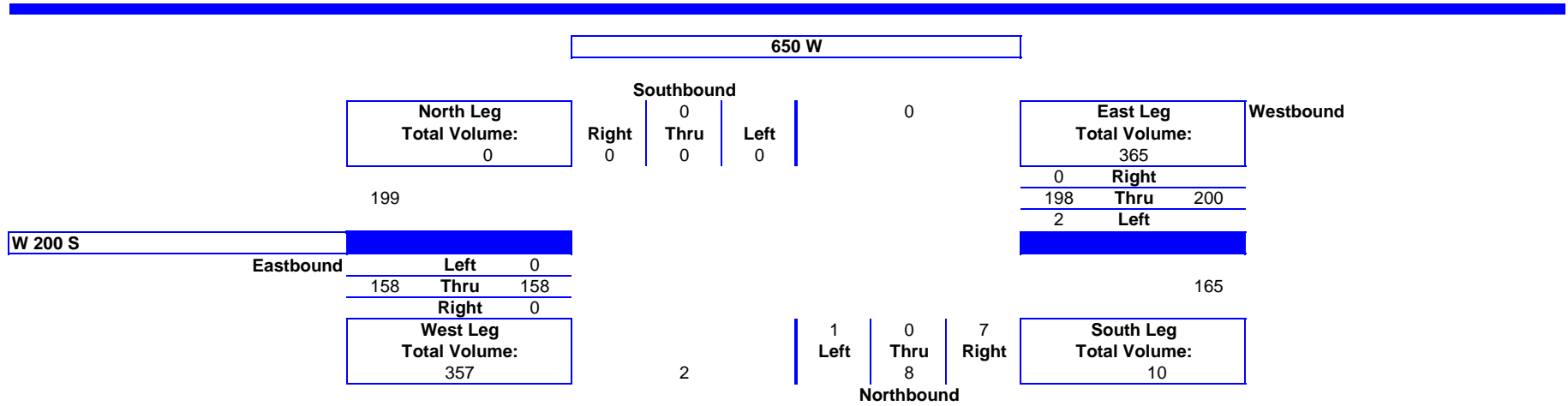
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **650 W**
 Date: **Thursday, September 19, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **W 200 S**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	0	0	0	0	0	60	0	0	0	0	1	0	0	33	0	0	94	
07:15 AM	07:30 AM	0	0	0	0	0	50	0	0	1	0	1	0	0	34	0	0	86	
07:30 AM	07:45 AM	0	0	0	0	2	44	0	0	0	0	4	1	0	38	0	0	88	
07:45 AM	08:00 AM	0	0	0	0	0	44	0	0	0	0	1	0	0	53	0	0	98	366
08:00 AM	08:15 AM	0	0	0	0	1	34	0	0	0	0	2	0	0	41	0	0	78	350
08:15 AM	08:30 AM	0	0	0	0	1	34	0	0	0	0	1	0	0	44	0	0	80	344
08:30 AM	08:45 AM	0	0	0	0	2	29	0	0	0	0	0	0	0	31	0	0	62	318
08:45 AM	09:00 AM	0	0	0	0	0	29	0	0	0	0	0	0	0	31	0	0	60	280



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	0	0	2	198	0	1	0	7	0	158	0	
0			200			8			158			
Trucks:			Trucks:			Trucks:			Trucks:			
0%			0%			13%			0%			
Peak Hour: 07:00 AM to 8:00 AM						Peak Vol: 366			PHF: 0.93			

TRAFFIC COUNT SUMMARY



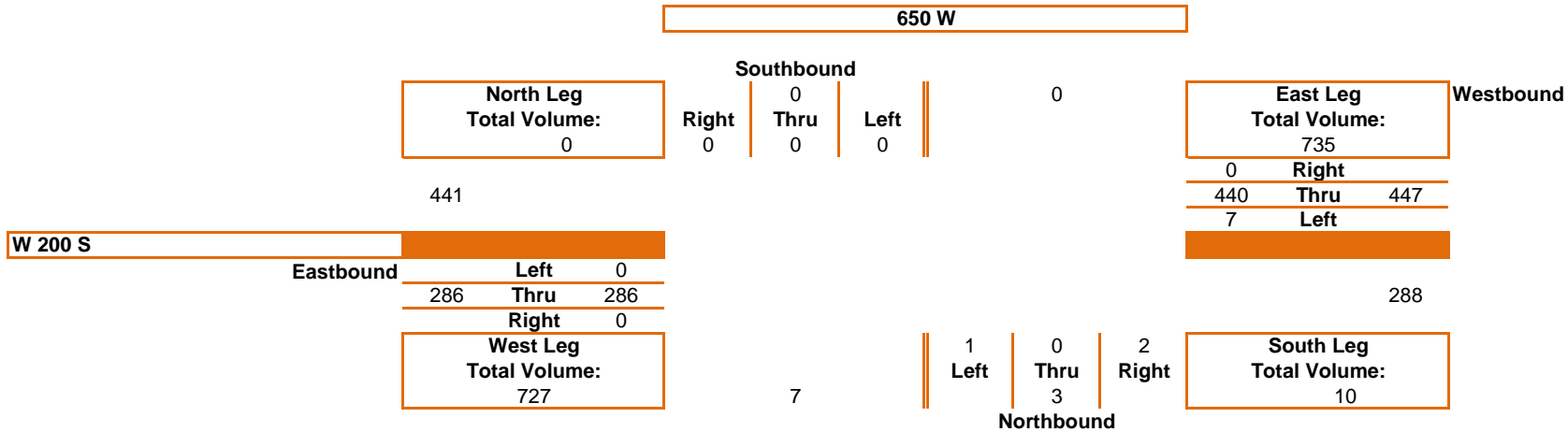
Updated September 13, 2019

City: **American Fork**
 N-S Street: **650 W**
 Date: **Wednesday, September 18, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **W 200 S**

For Use with Jamar PetraPro Software

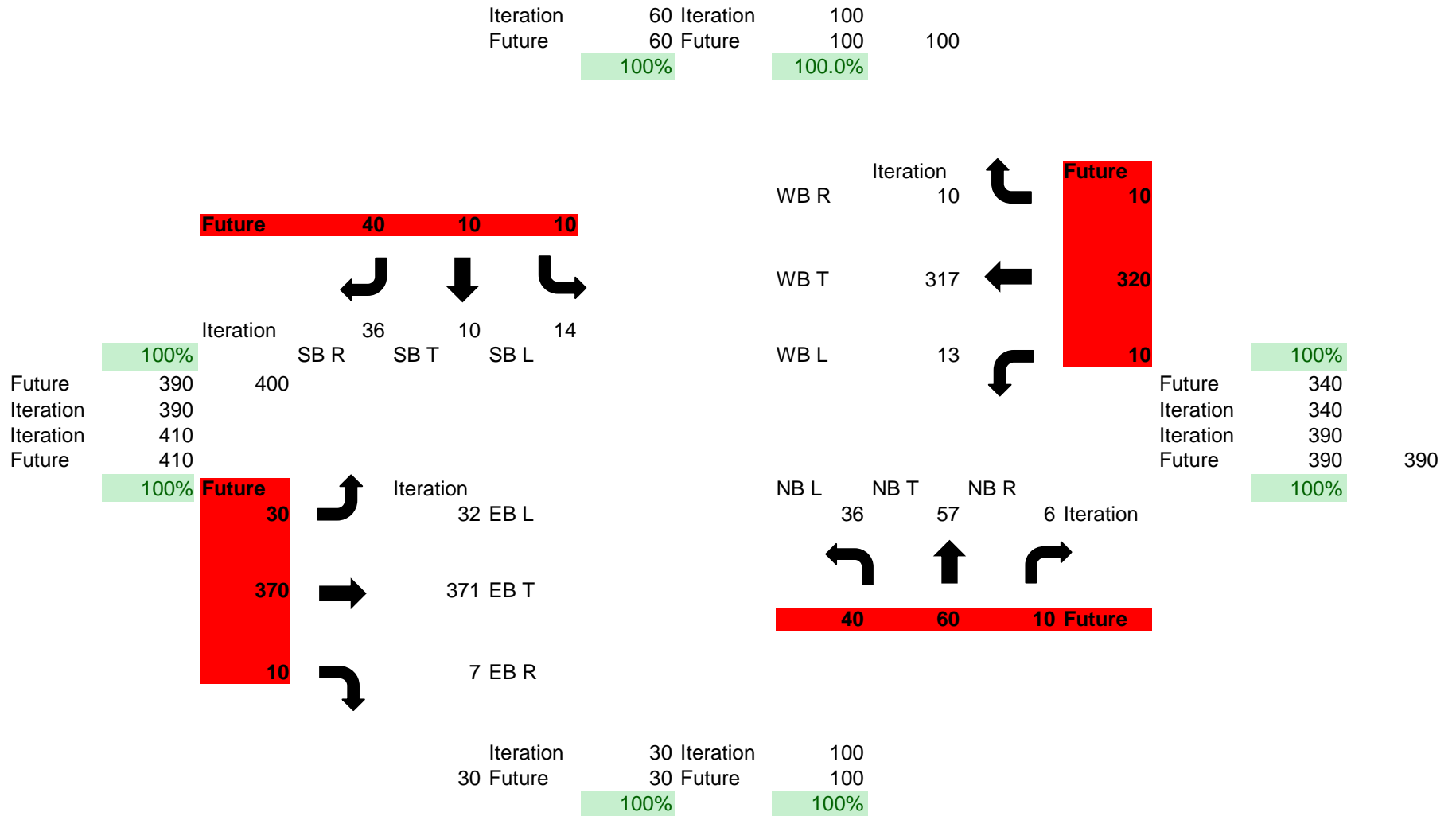
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		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	0	0	0	0	0	50	0	0	0	0	1	1	0	39	0	0	90	
04:15 PM	04:30 PM	0	0	0	0	0	69	0	0	0	0	1	0	0	36	0	0	106	
04:30 PM	04:45 PM	0	0	0	0	0	100	0	0	0	0	0	1	0	52	0	0	152	
04:45 PM	05:00 PM	0	0	0	0	3	110	0	0	1	0	0	1	0	56	0	0	170	518
05:00 PM	05:15 PM	0	0	0	1	1	112	0	0	0	0	2	0	0	87	0	0	202	630
05:15 PM	05:30 PM	0	0	0	0	2	125	0	0	0	0	0	1	0	46	0	1	173	697
05:30 PM	05:45 PM	0	0	0	0	1	93	0	0	0	0	0	0	0	97	0	0	191	736
05:45 PM	06:00 PM	0	0	0	0	0	74	0	0	0	0	0	0	0	48	0	0	122	688



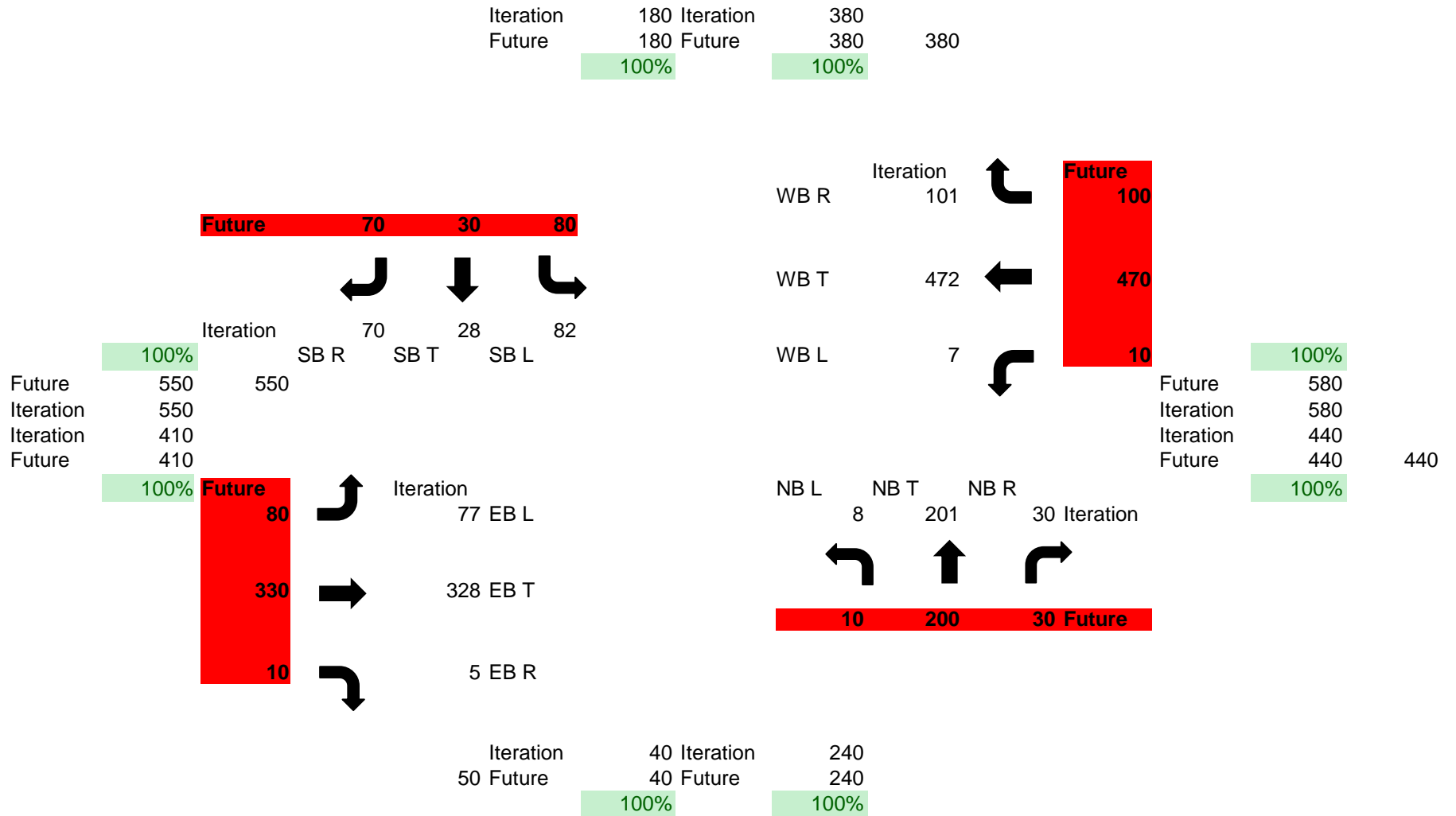
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Daily:	1.00
Interval:	1.00
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ADJUSTED PEAK HOUR TRAFFIC VOLUMES											
Southbound			Westbound			Northbound			Eastbound		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
0	0	0	7	440	0	1	0	2	0	286	0
0			447			3			286		
Trucks:			0%			Trucks:			0%		
Peak Hour:			04:45 PM to 5:45 PM			Peak Vol:			736 PPH: 0.91		

2030 AM: 700 W and 200 S



2030 AM: 700 W and 200 S



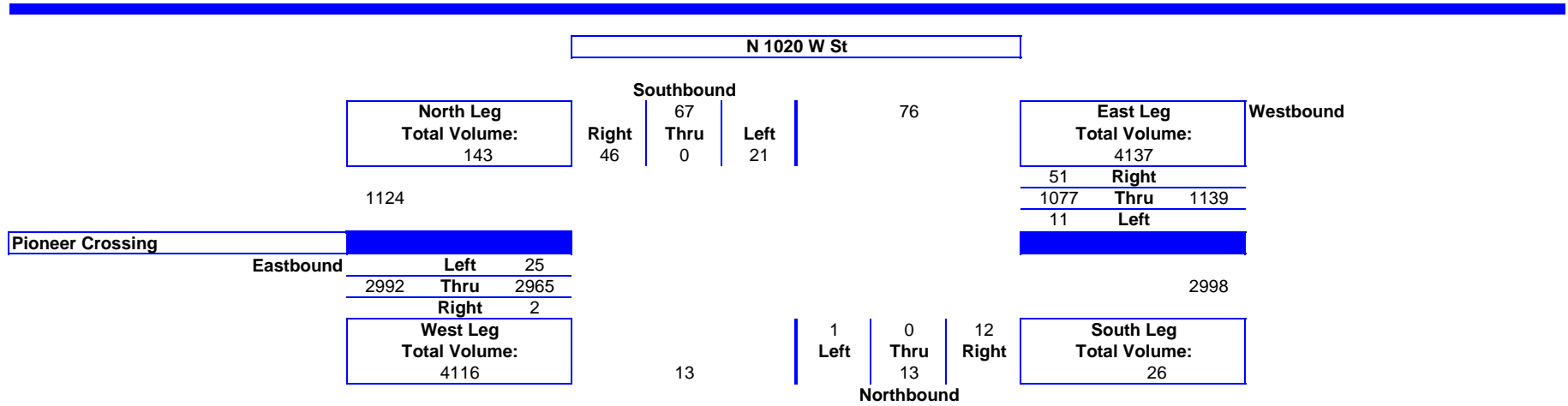
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **N 1020 W St**
 Date: **Thursday, September 19, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **Pioneer Crossing**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
12:00 AM	12:15 AM	8	0	8	0	2	271	7	0	0	0	1	0	6	591	0	0	894	
12:15 AM	12:30 AM	5	0	10	0	1	289	18	0	0	0	0	0	5	650	1	0	979	
12:30 AM	12:45 AM	3	0	12	0	0	232	16	0	0	0	6	0	7	806	0	0	1082	
12:45 AM	01:00 AM	8	0	12	0	2	280	15	0	1	0	2	0	5	764	0	0	1089	4044
01:00 AM	01:15 AM	5	0	14	0	1	293	7	0	0	0	3	0	9	727	1	0	1060	4210
01:15 AM	01:30 AM	5	0	8	0	8	272	13	0	0	0	1	0	4	668	1	0	980	4211
01:30 AM	01:45 AM	3	0	7	0	1	243	10	0	0	0	10	0	4	673	0	0	951	4080
01:45 AM	02:00 AM	5	0	6	0	2	220	10	0	0	0	1	0	2	624	0	0	870	3861



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21	0	46	11	1077	51	1	0	12	25	2965	2	
67			1139			13			2992			
Trucks: 0%			Trucks: 0%			Trucks: 0%			Trucks: 0%			
Peak Hour: 12:30 AM to 1:30 AM			Peak Vol: 4211			PHF: 0.97						

TRAFFIC COUNT SUMMARY



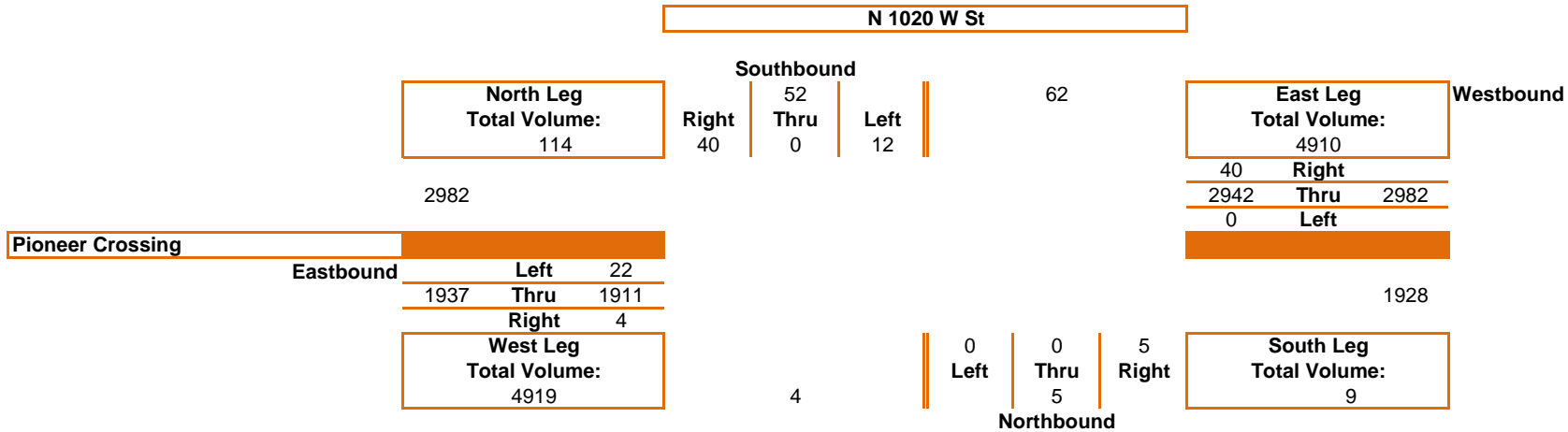
City: **American Fork**
 N-S Street: **N 1020 W St**
 Date: **Thursday, September 19, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **Pioneer Crossing**

For Use with Jamar PetraPro Software

Updated September 13, 2019

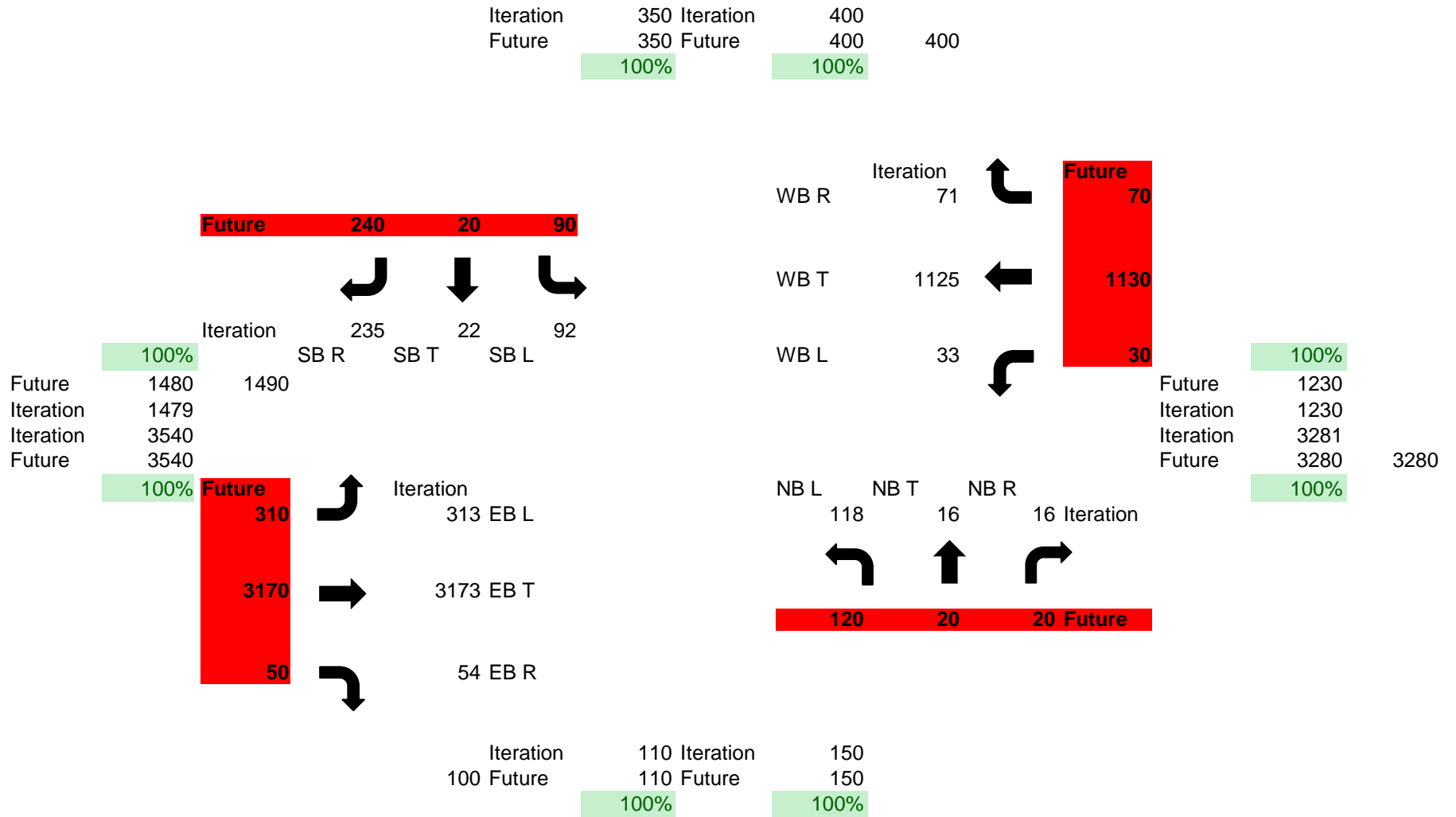
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		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	3	0	12	0	4	676	12	0	0	0	2	0	3	461	1	0	1174	
04:15 PM	04:30 PM	5	0	13	0	2	651	18	0	0	0	4	0	3	499	0	0	1195	
04:30 PM	04:45 PM	4	0	12	0	0	608	19	0	0	0	1	0	3	468	3	0	1118	
04:45 PM	05:00 PM	1	0	13	0	0	735	8	0	0	0	3	0	3	470	1	0	1234	4721
05:00 PM	05:15 PM	0	0	11	0	0	732	7	0	0	0	0	0	2	477	1	0	1230	4777
05:15 PM	05:30 PM	4	0	6	0	0	793	11	0	0	0	1	0	9	496	1	0	1321	4903
05:30 PM	05:45 PM	7	0	10	0	0	682	14	0	0	0	1	0	8	468	1	0	1191	4976
05:45 PM	06:00 PM	8	0	27	0	1	706	15	0	0	0	0	0	13	457	0	0	1227	4969



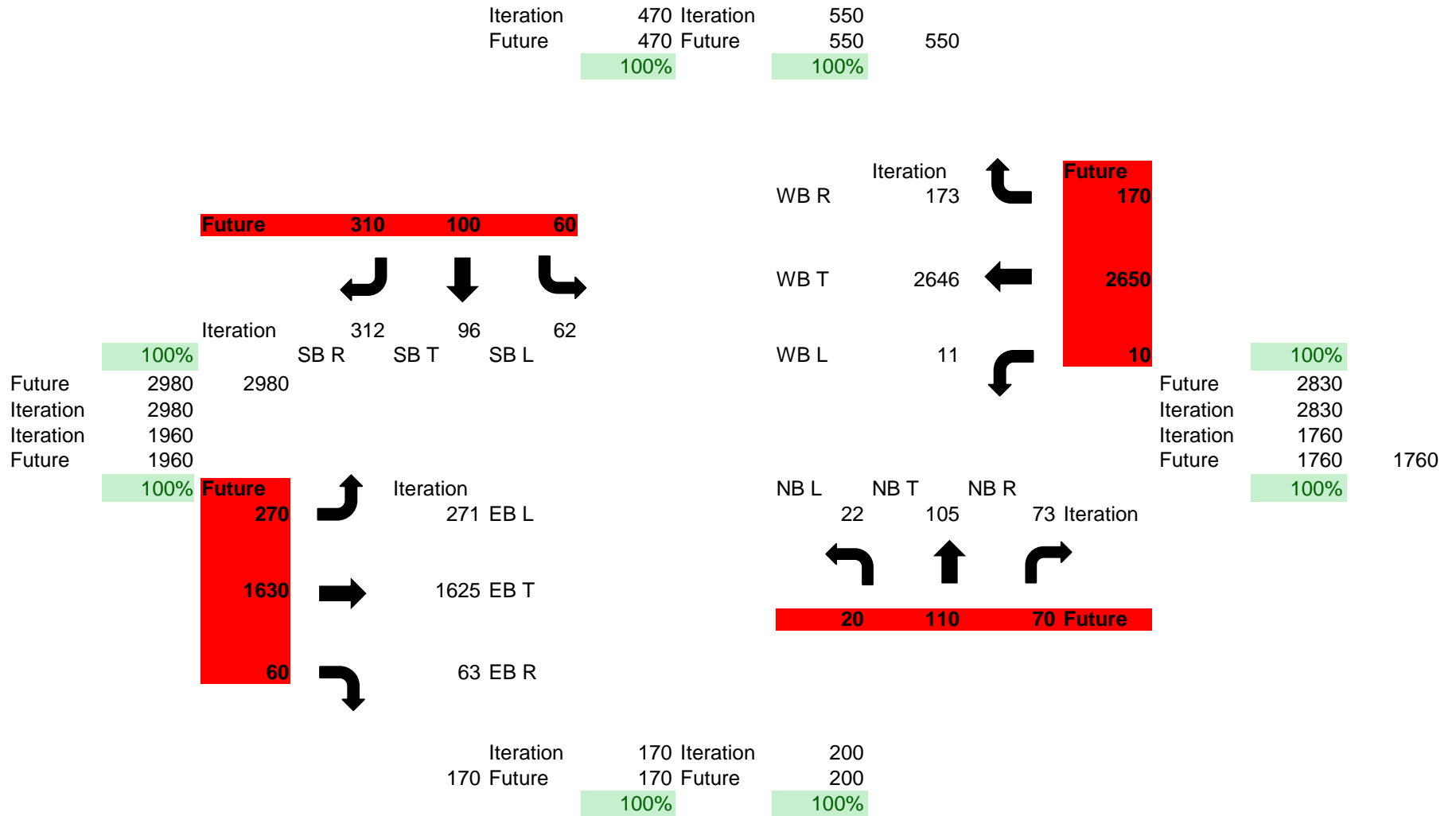
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Daily:	1.00
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ADJUSTED PEAK HOUR TRAFFIC VOLUMES											
Southbound			Westbound			Northbound			Eastbound		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
12	0	40	0	2942	40	0	0	5	22	1911	4
52			2982			5			1937		
Trucks:			Trucks:			Trucks:			Trucks:		
0%			0%			0%			0%		
Peak Hour:						Peak Vol:					
04:45 PM to 5:45 PM						4976 PHF: 0.94					

2030 AM: 1020 W & Pioneer Crossing



2030 PM: 1020 W & Pioneer Crossing



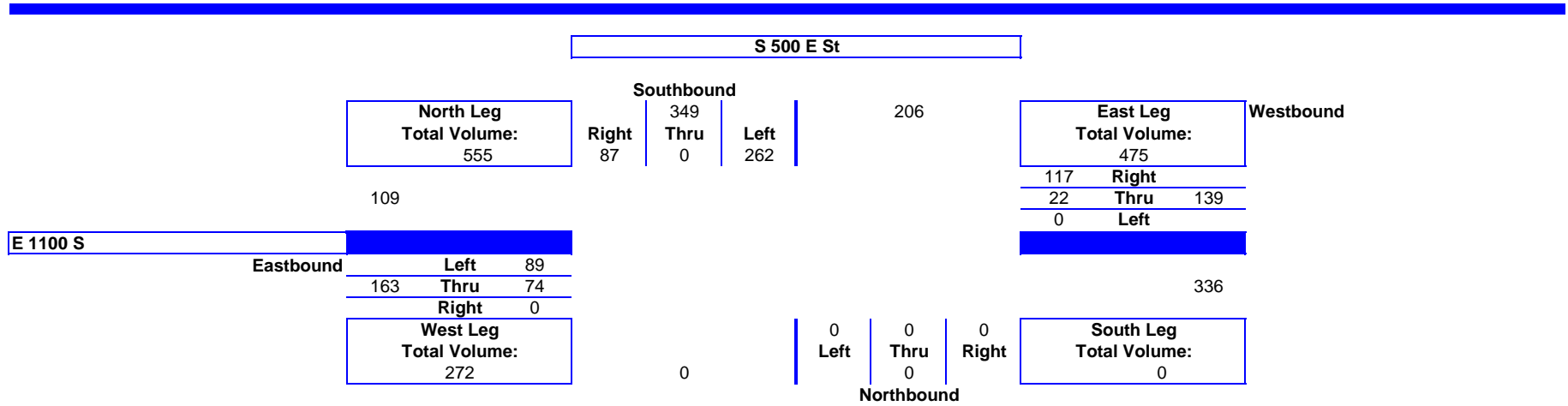
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **S 500 E St**
 Date: **Wednesday, September 4, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **E 1100 S**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	30	0	28	0	0	8	14	0	0	0	0	2	29	13	0	0	122	
07:15 AM	07:30 AM	30	0	17	0	0	6	15	0	0	0	0	0	26	12	0	0	106	
07:30 AM	07:45 AM	41	0	16	0	0	5	16	0	0	0	0	1	32	7	0	0	117	
07:45 AM	08:00 AM	78	0	28	0	0	6	29	0	0	0	0	1	23	23	0	0	187	532
08:00 AM	08:15 AM	78	0	19	0	0	10	45	0	0	0	0	1	23	22	0	0	197	607
08:15 AM	08:30 AM	51	0	19	0	0	5	25	0	0	0	0	0	19	18	0	1	137	638
08:30 AM	08:45 AM	55	0	21	0	0	1	18	0	0	0	0	0	24	11	0	0	130	651
08:45 AM	09:00 AM	63	0	18	0	0	9	33	0	0	0	0	0	20	15	0	0	158	622



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
262	0	87	0	22	117	0	0	0	89	74	0	
349			139			0			163			
Trucks: 0%			Trucks: 0%			Trucks: 0%			Trucks: 1%			
Peak Hour: 07:45 AM to 8:45 AM						Peak Vol: 651			PHF: 0.83			

TRAFFIC COUNT SUMMARY



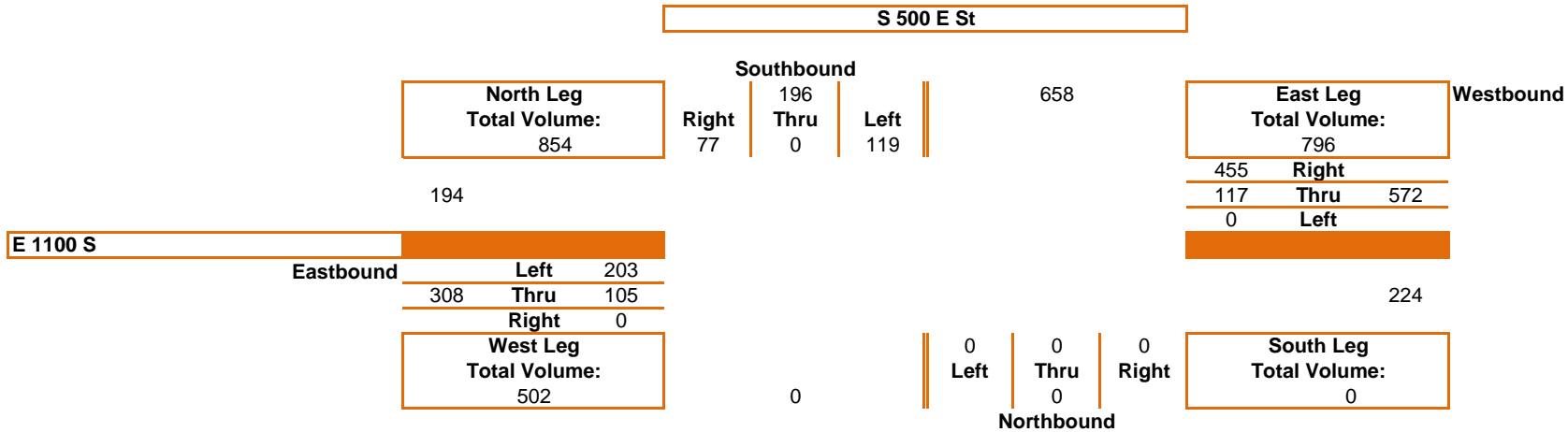
Updated September 13, 2019

City: **Americam Fork**
 N-S Street: **S 500 E St**
 Date: **Wednesday, September 4, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **E 1100 S**

For Use with Jamar PetraPro Software

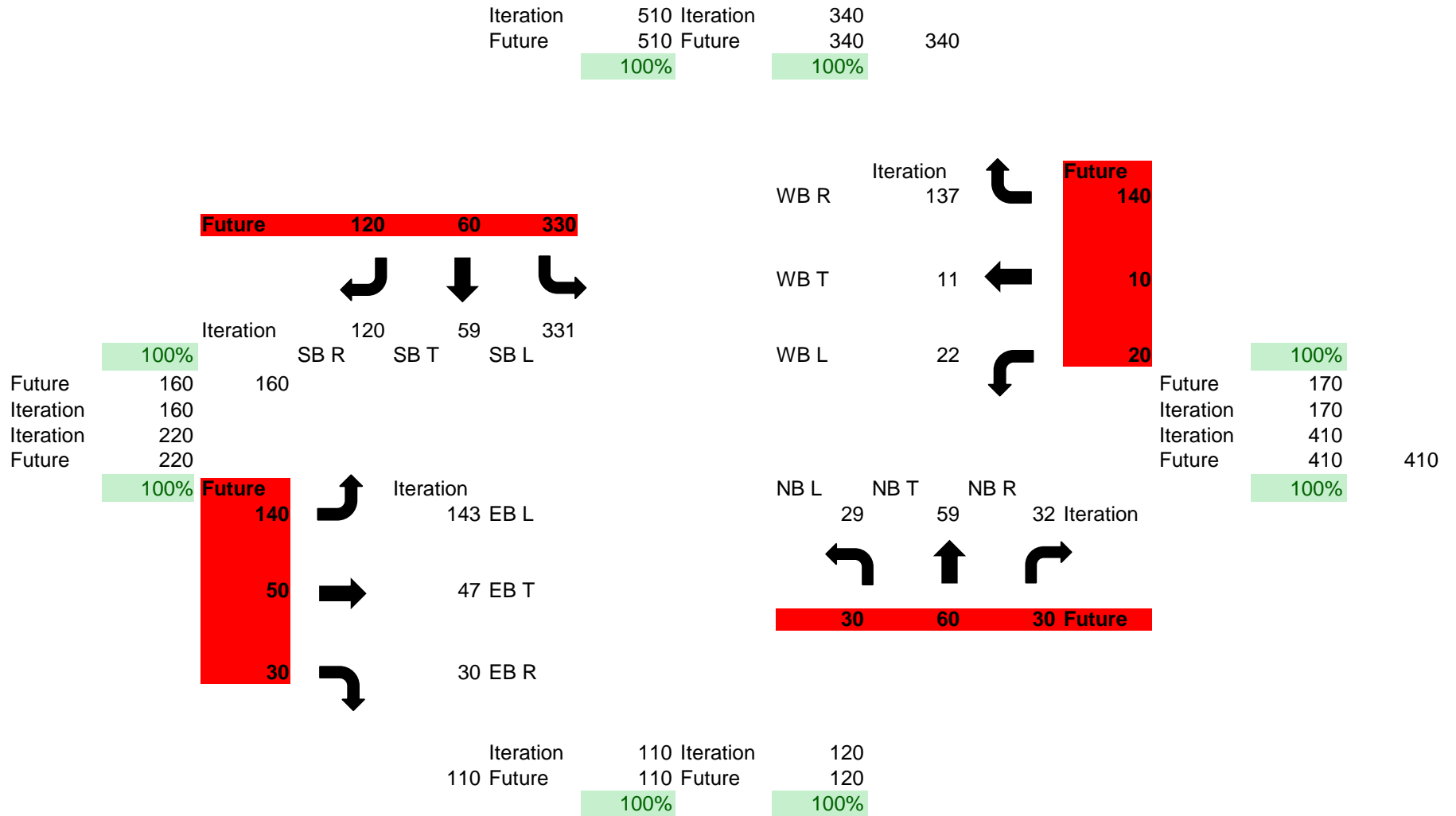
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	47	0	31	0	0	14	103	0	0	0	0	0	21	9	0	0	225	
04:15 PM	04:30 PM	44	0	23	0	0	17	58	0	0	0	0	0	27	12	0	0	181	
04:30 PM	04:45 PM	16	0	19	0	0	26	115	0	0	0	0	0	25	10	0	0	211	
04:45 PM	05:00 PM	15	0	13	0	0	17	89	0	0	0	0	0	40	25	0	0	199	816
05:00 PM	05:15 PM	23	0	18	0	0	38	173	0	0	0	0	0	67	20	0	0	339	930
05:15 PM	05:30 PM	40	0	16	0	0	31	109	0	0	0	0	0	68	36	0	0	300	1049
05:30 PM	05:45 PM	41	0	30	0	0	31	84	0	0	0	0	0	28	24	0	0	238	1076
05:45 PM	06:00 PM	36	0	25	0	0	15	51	0	0	0	0	0	22	20	0	0	169	1046



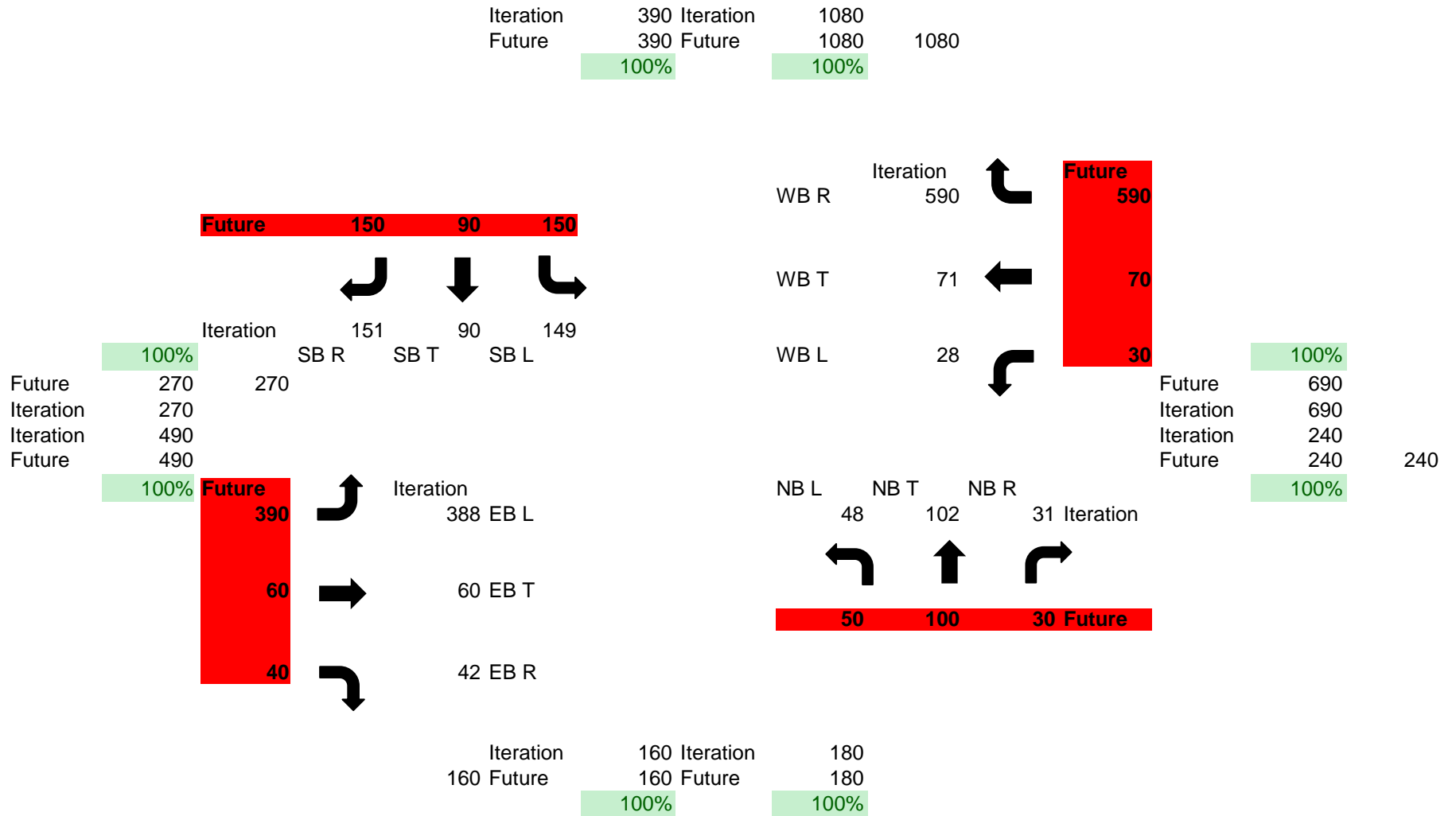
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
119	0	77	0	117	455	0	0	0	203	105	0	
196			572			0			308			
Trucks:			Trucks:			Trucks:			Trucks:			
0%			0%			0%			0%			
Peak Hour: 04:45 PM to 5:45 PM						Peak Vol: 1076						PHF: 0.79

2030 AM: 1100 S & 500 E



2030 PM: 1100 S & 500 E



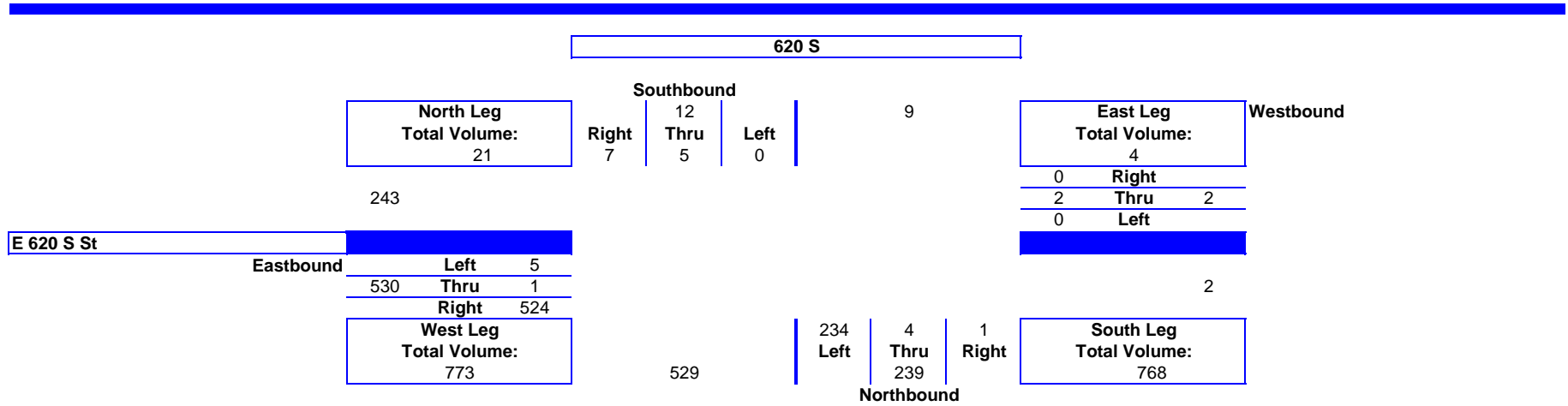
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **620 S**
 Date: **Wednesday, September 4, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **E 620 S St**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	0	1	2	1	0	0	0	0	7	0	0	0	1	0	46	0	57	
07:15 AM	07:30 AM	0	0	0	0	0	0	0	0	13	0	0	0	0	0	35	1	48	
07:30 AM	07:45 AM	0	1	3	0	1	0	0	0	9	0	0	0	0	0	80	2	94	
07:45 AM	08:00 AM	0	1	5	0	0	0	0	0	9	0	0	0	1	0	142	0	158	357
08:00 AM	08:15 AM	0	1	1	1	0	0	0	0	43	0	0	0	2	0	152	0	199	499
08:15 AM	08:30 AM	0	2	0	0	0	2	0	0	133	1	1	0	0	1	146	0	286	737
08:30 AM	08:45 AM	0	1	1	0	0	0	0	0	49	3	0	0	2	0	84	1	140	783
08:45 AM	09:00 AM	0	1	3	0	0	1	0	0	31	0	1	0	1	0	84	0	122	747



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	5	7	0	2	0	234	4	1	5	1	524	
12			2			239			530			
Trucks:			Trucks:			Trucks:			Trucks:			
8%			0%			0%			0%			
Peak Hour: 07:45 AM to 8:45 AM						Peak Vol: 783			PHF: 0.68			

TRAFFIC COUNT SUMMARY



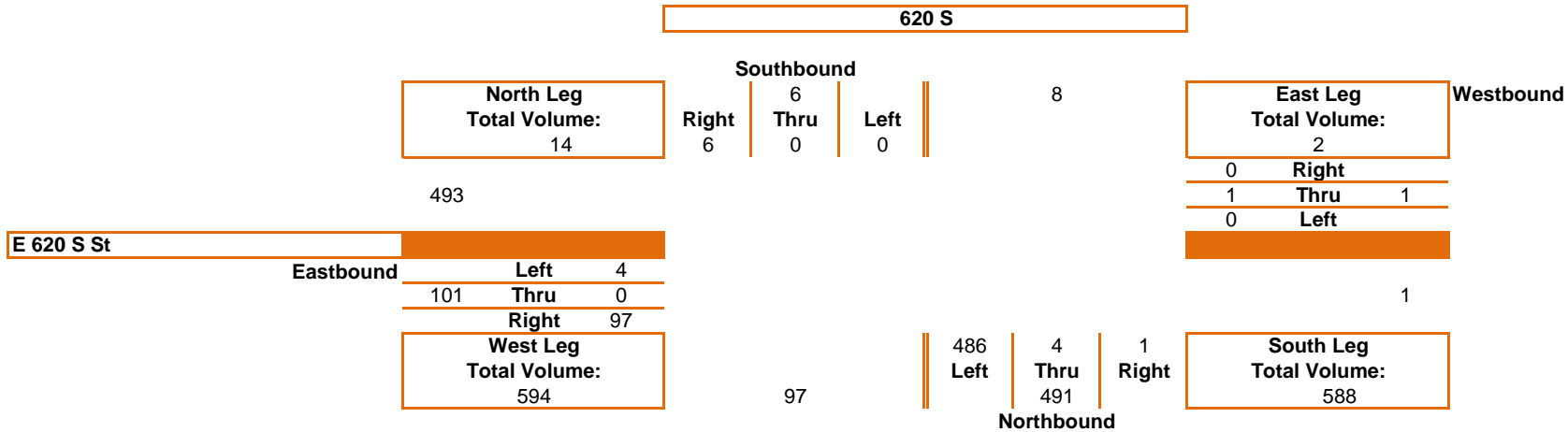
City: **American Fork**
 N-S Street: **620 S**
 Date: **Wednesday, September 4, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **E 620 S St**

For Use with Jamar PetraPro Software

Updated September 13, 2019

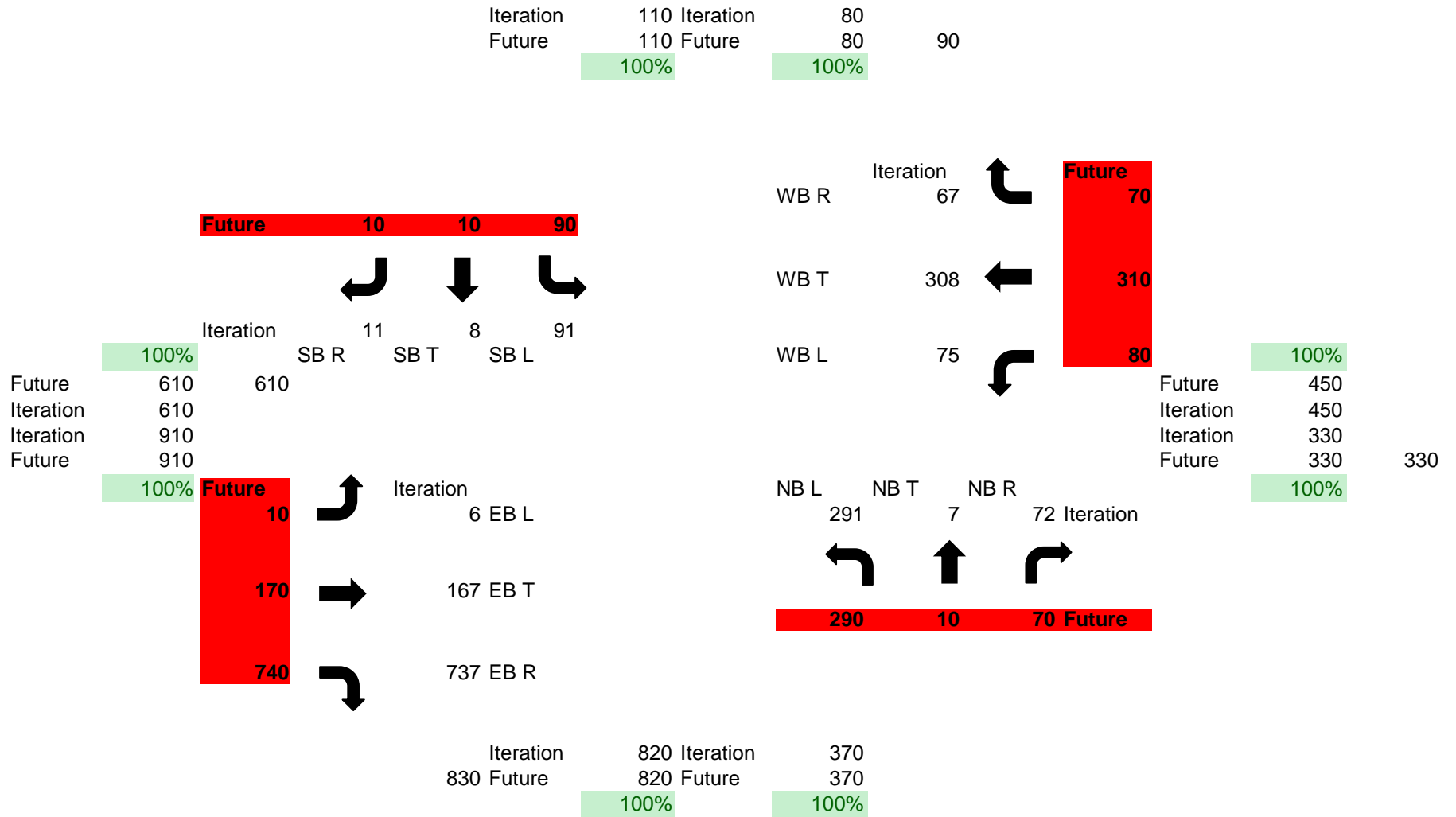
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	0	0	1	0	0	0	0	1	99	0	0	0	0	0	25	0	125	
04:15 PM	04:30 PM	0	0	0	0	0	1	0	0	86	2	0	0	3	1	23	0	116	
04:30 PM	04:45 PM	0	0	1	0	0	0	0	1	98	0	0	0	1	0	21	0	121	
04:45 PM	05:00 PM	0	0	4	0	0	0	0	2	106	1	0	0	0	0	16	0	127	489
05:00 PM	05:15 PM	0	0	0	0	0	0	0	0	166	1	0	0	1	0	29	0	197	561
05:15 PM	05:30 PM	0	0	1	0	0	1	0	1	116	2	1	0	2	0	31	0	154	599
05:30 PM	05:45 PM	0	1	0	0	0	0	0	0	70	2	0	0	3	0	20	0	96	574
05:45 PM	06:00 PM	0	0	4	0	0	0	0	0	55	0	0	0	2	0	23	0	84	531



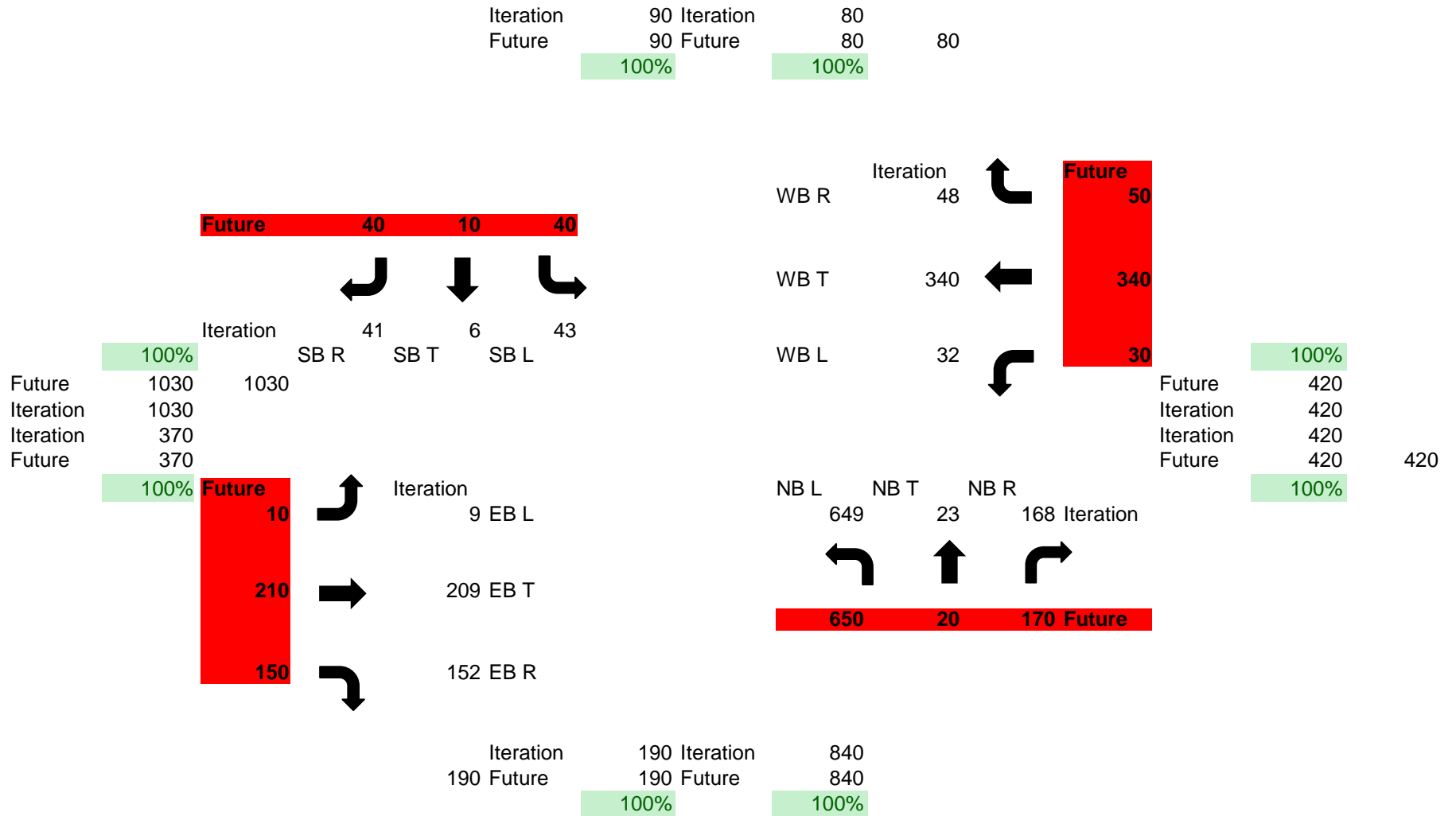
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES											
Southbound			Westbound			Northbound			Eastbound		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
0	0	6	0	1	0	486	4	1	4	0	97
6			1			491			101		
Trucks:			Trucks:			Trucks:			Trucks:		
0%			400%			0%			0%		
Peak Hour:						Peak Vol:					
04:30 PM to 5:30 PM						599 PHF: 0.76					

2030 AM: 620 S & 600 E



2030 PM: 620 S & 600 E



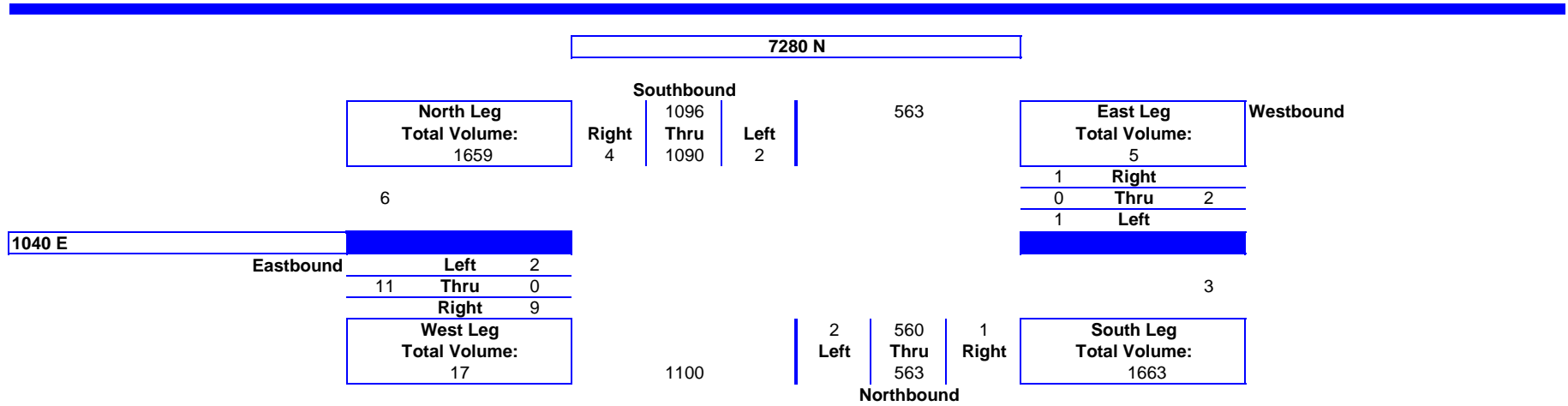
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **7280 N**
 Date: **Wednesday, September 18, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **1040 E**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	0	128	0	0	0	0	0	0	1	103	0	0	1	0	3	0	236	
07:15 AM	07:30 AM	0	217	0	0	0	0	0	0	1	135	0	0	0	0	2	0	355	
07:30 AM	07:45 AM	0	250	0	0	0	0	0	0	0	175	1	0	0	0	0	0	426	
07:45 AM	08:00 AM	1	284	3	0	1	0	1	0	0	155	0	0	0	0	4	0	449	1466
08:00 AM	08:15 AM	1	295	0	0	0	0	0	0	1	120	0	0	0	0	1	0	418	1648
08:15 AM	08:30 AM	0	261	1	0	0	0	0	0	1	110	0	0	2	0	4	0	379	1672
08:30 AM	08:45 AM	0	270	0	0	1	0	0	0	1	101	0	0	1	0	4	0	378	1624
08:45 AM	09:00 AM	0	216	1	0	0	0	0	0	1	127	0	0	3	0	2	0	350	1525



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2	1090	4	1	0	1	2	560	1	2	0	9	
1096			2			563			11			
Trucks:			Trucks:			Trucks:			Trucks:			
0%			0%			0%			0%			
Peak Hour:						Peak Vol:						PHF:
07:30 AM to 8:30 AM						1672						0.93

TRAFFIC COUNT SUMMARY



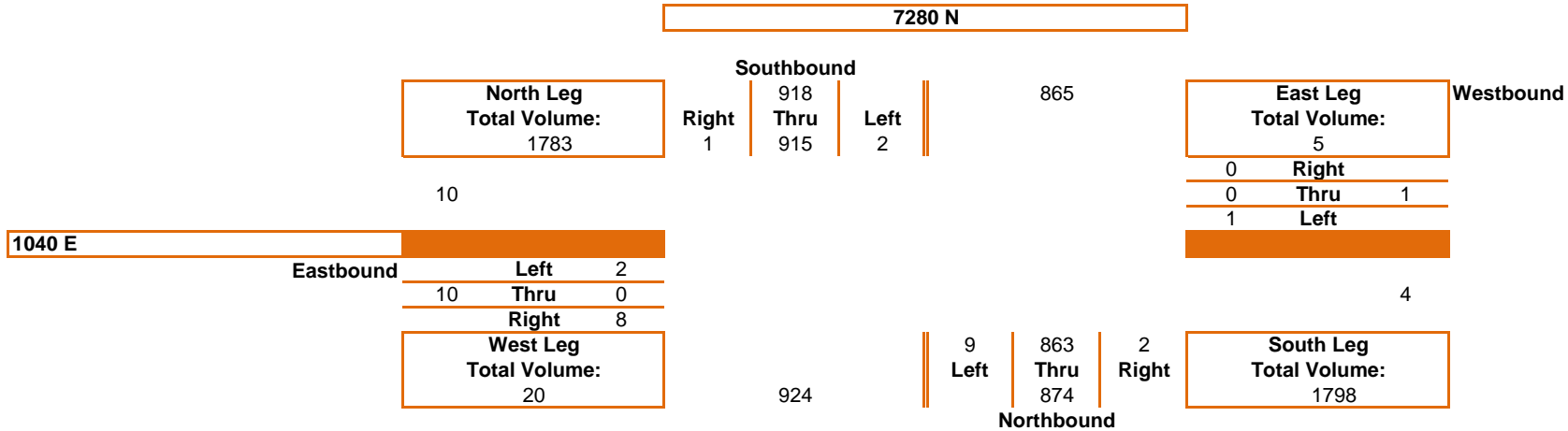
City: **American Fork**
 N-S Street: **7280 N**
 Date: **Wednesday, September 18, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **1040 E**

For Use with Jamar PetraPro Software

Updated September 13, 2019

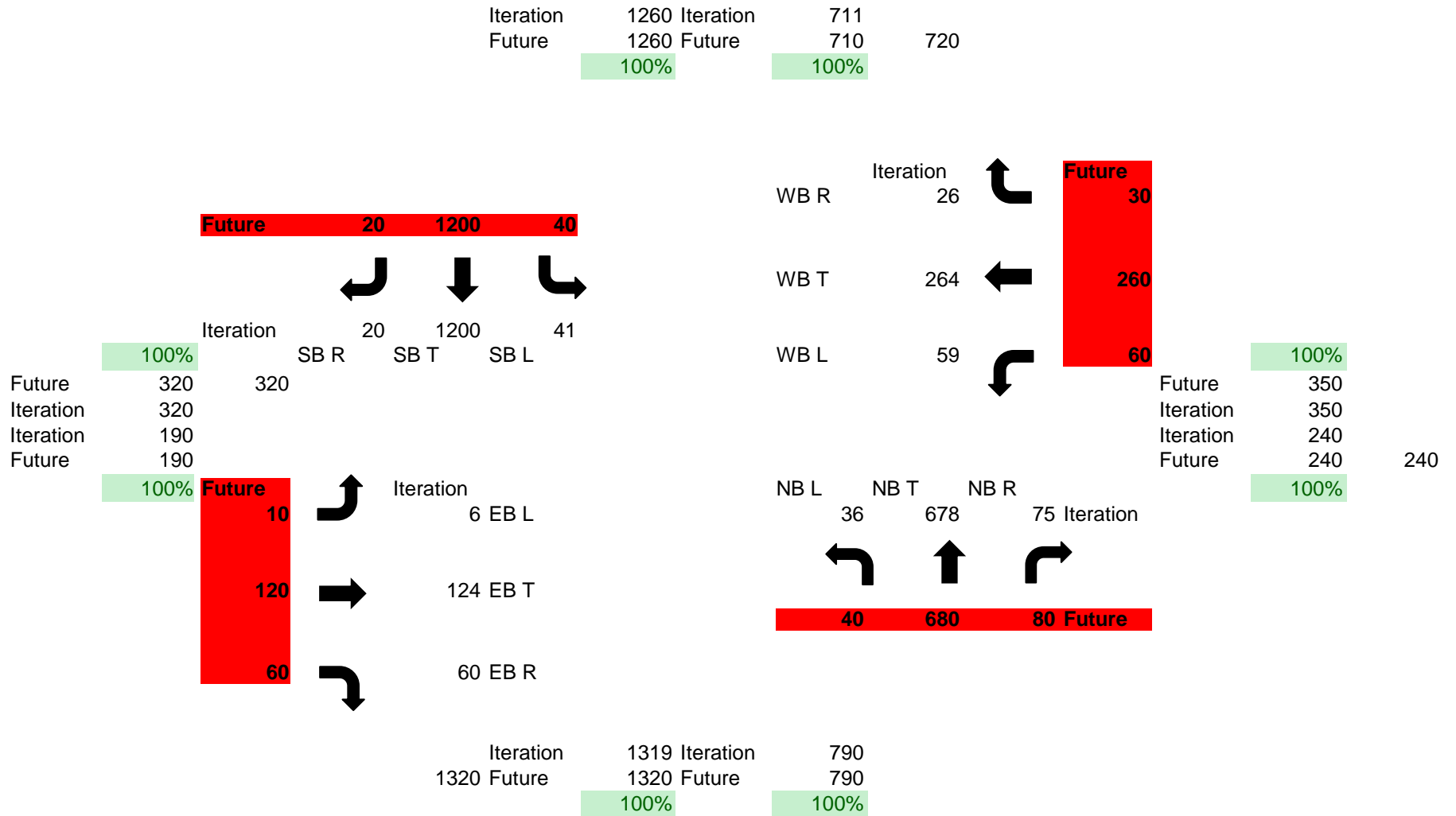
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	0	224	1	0	0	0	2	0	0	203	0	0	0	0	5	0	435	
04:15 PM	04:30 PM	0	216	1	0	0	0	0	0	3	214	0	0	1	0	2	0	437	
04:30 PM	04:45 PM	0	213	1	0	0	0	0	0	3	170	0	0	1	0	2	1	390	
04:45 PM	05:00 PM	2	202	0	0	1	0	0	0	3	201	1	0	1	0	0	0	411	1673
05:00 PM	05:15 PM	0	246	0	0	0	0	0	0	1	226	0	0	0	0	2	0	475	1713
05:15 PM	05:30 PM	0	240	1	0	0	0	0	0	4	229	1	0	0	0	2	0	477	1753
05:30 PM	05:45 PM	0	227	0	0	0	0	0	0	1	207	0	0	1	0	4	0	440	1803
05:45 PM	06:00 PM	0	216	0	0	1	0	1	0	2	190	0	0	0	0	1	0	411	1803



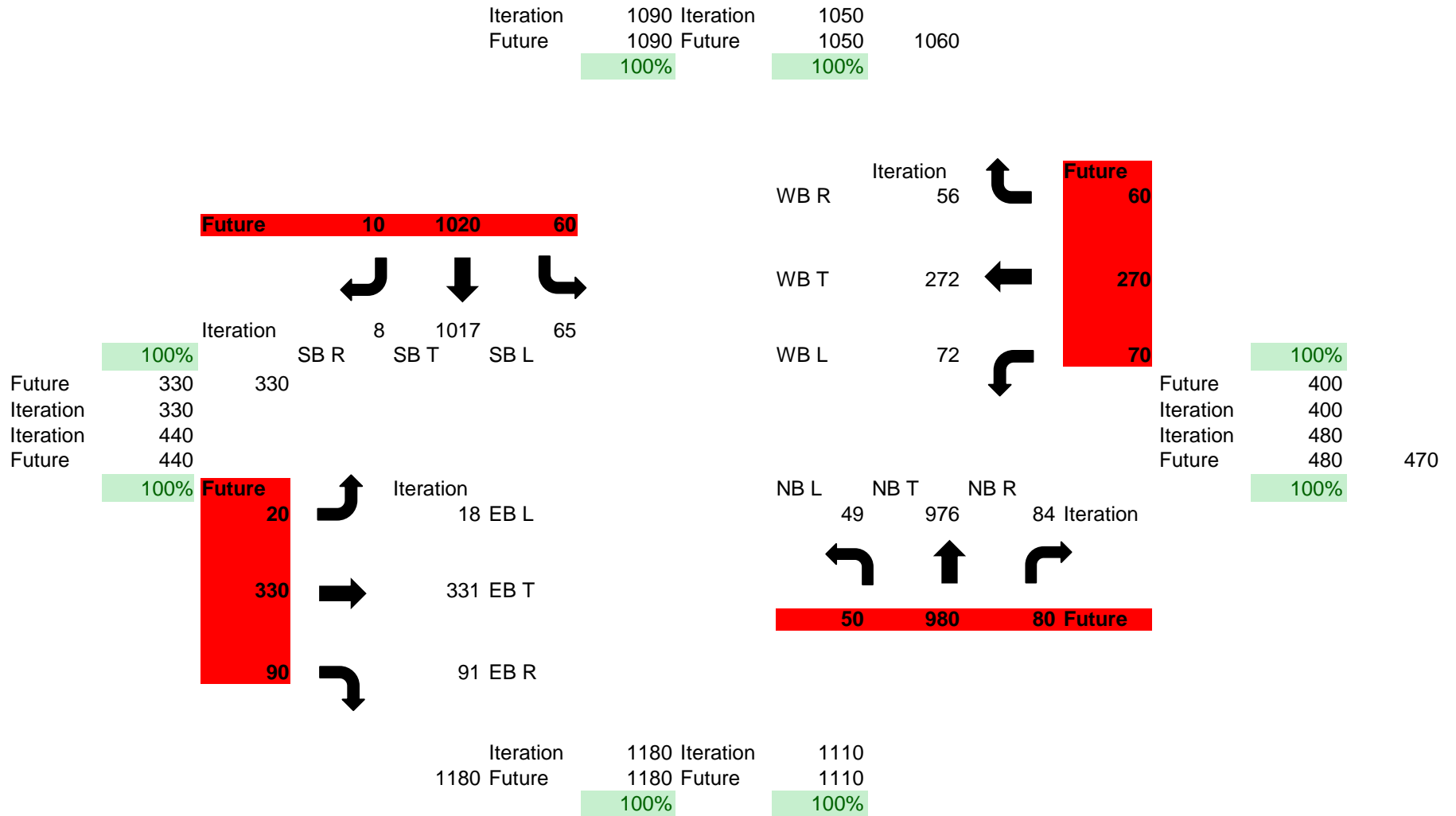
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2	915	1	1	0	0	9	863	2	2	0	8	
918			1			874			10			
Trucks: 0%			Trucks: 0%			Trucks: 0%			Trucks: 0%			
Peak Hour: 04:45 PM to 5:45 PM						Peak Vol: 1803						PHF: 0.94

2030 AM: 7280 N & 1040 E



2030 PM: 7280 N & 1040 E



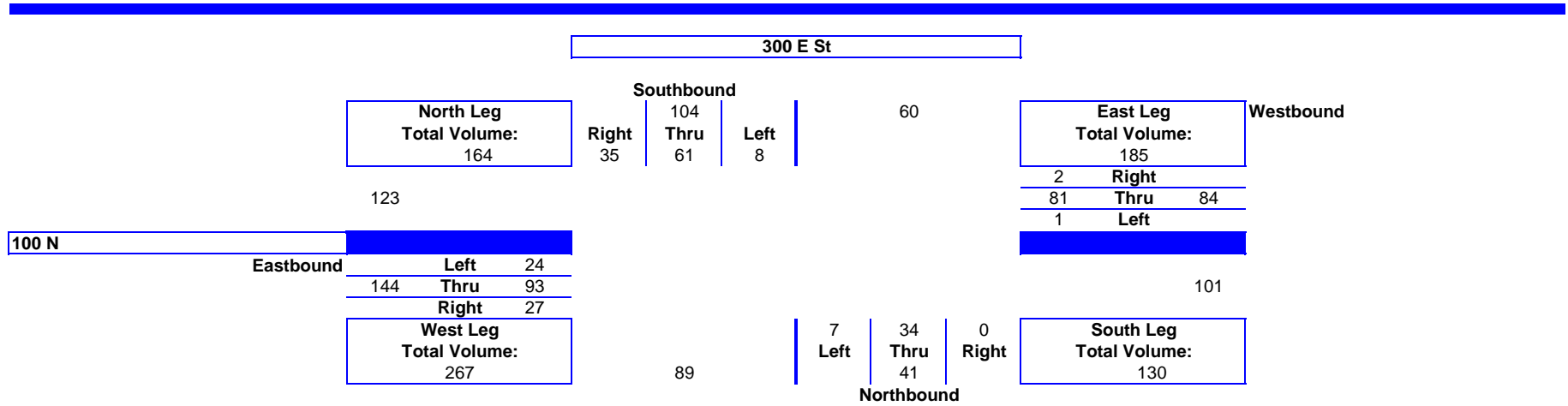
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **300 E St**
 Date: **Monday, September 23, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **100 N**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	1	6	5	2	0	15	1	0	5	11	1	0	3	8	3	1	59	
07:15 AM	07:30 AM	0	18	9	0	0	18	0	0	3	14	0	0	8	16	2	0	88	
07:30 AM	07:45 AM	0	16	11	0	0	14	1	3	3	14	0	0	7	20	5	0	91	
07:45 AM	08:00 AM	3	21	11	0	0	30	1	1	1	8	0	0	5	27	7	0	114	352
08:00 AM	08:15 AM	3	11	7	0	1	16	0	0	2	6	0	1	1	25	7	0	79	372
08:15 AM	08:30 AM	2	13	6	0	0	21	0	2	1	6	0	0	11	21	8	0	89	373
08:30 AM	08:45 AM	2	9	9	0	0	16	0	0	6	9	0	0	5	15	8	0	79	361
08:45 AM	09:00 AM	2	15	5	0	0	21	1	0	4	5	1	0	10	21	9	0	94	341



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
8	61	35	1	81	2	7	34	0	24	93	27	
104			84			41			144			
Trucks: 0%			Trucks: 7%			Trucks: 2%			Trucks: 0%			
Peak Hour: 07:30 AM to 8:30 AM						Peak Vol: 373						PHF: 0.82

TRAFFIC COUNT SUMMARY



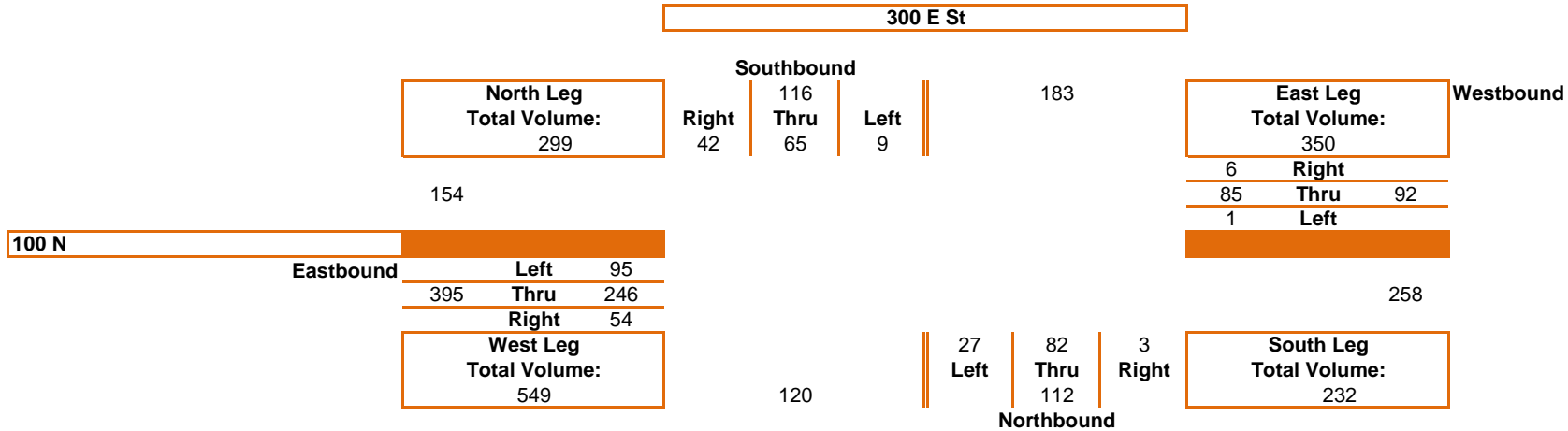
City: **American Fork**
 N-S Street: **300 E St**
 Date: **Tuesday, September 24, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **100 N**

For Use with Jamar PetraPro Software

Updated September 13, 2019

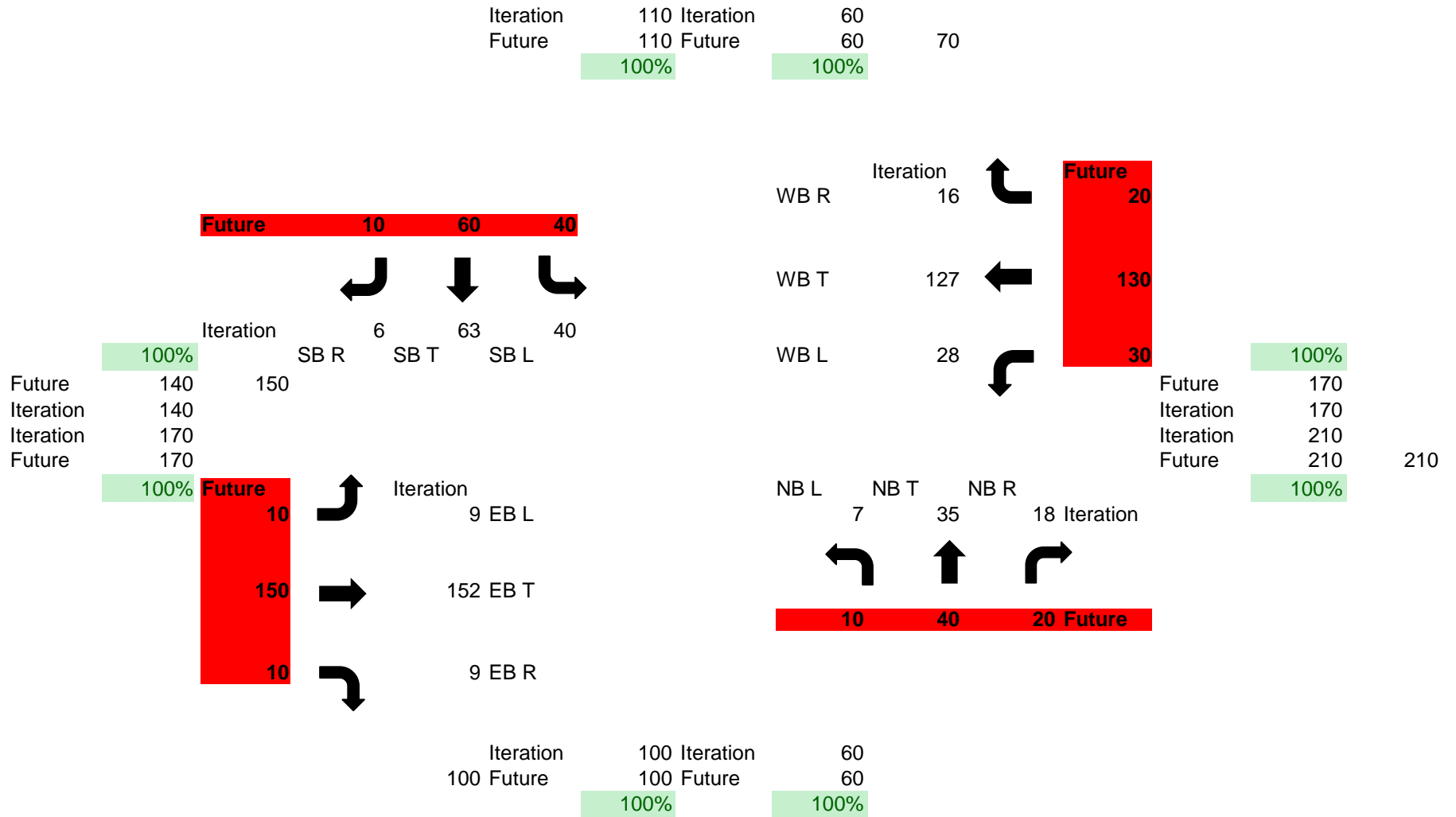
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	2	12	8	0	0	26	1	0	6	13	1	0	17	52	19	0	157	
04:15 PM	04:30 PM	2	10	4	0	0	37	0	0	9	18	2	0	20	58	15	0	175	
04:30 PM	04:45 PM	2	10	14	0	0	29	0	0	3	11	0	0	22	54	13	0	158	
04:45 PM	05:00 PM	1	19	9	0	1	40	0	0	4	14	0	0	10	61	4	0	163	653
05:00 PM	05:15 PM	2	8	9	0	0	16	1	0	7	15	1	0	20	53	9	0	141	637
05:15 PM	05:30 PM	2	25	8	0	1	26	3	0	8	20	1	0	24	58	14	0	190	652
05:30 PM	05:45 PM	1	16	13	0	0	21	0	0	4	22	1	0	31	70	17	0	196	690
05:45 PM	06:00 PM	4	16	12	0	0	22	2	0	8	25	0	0	20	65	14	0	188	715



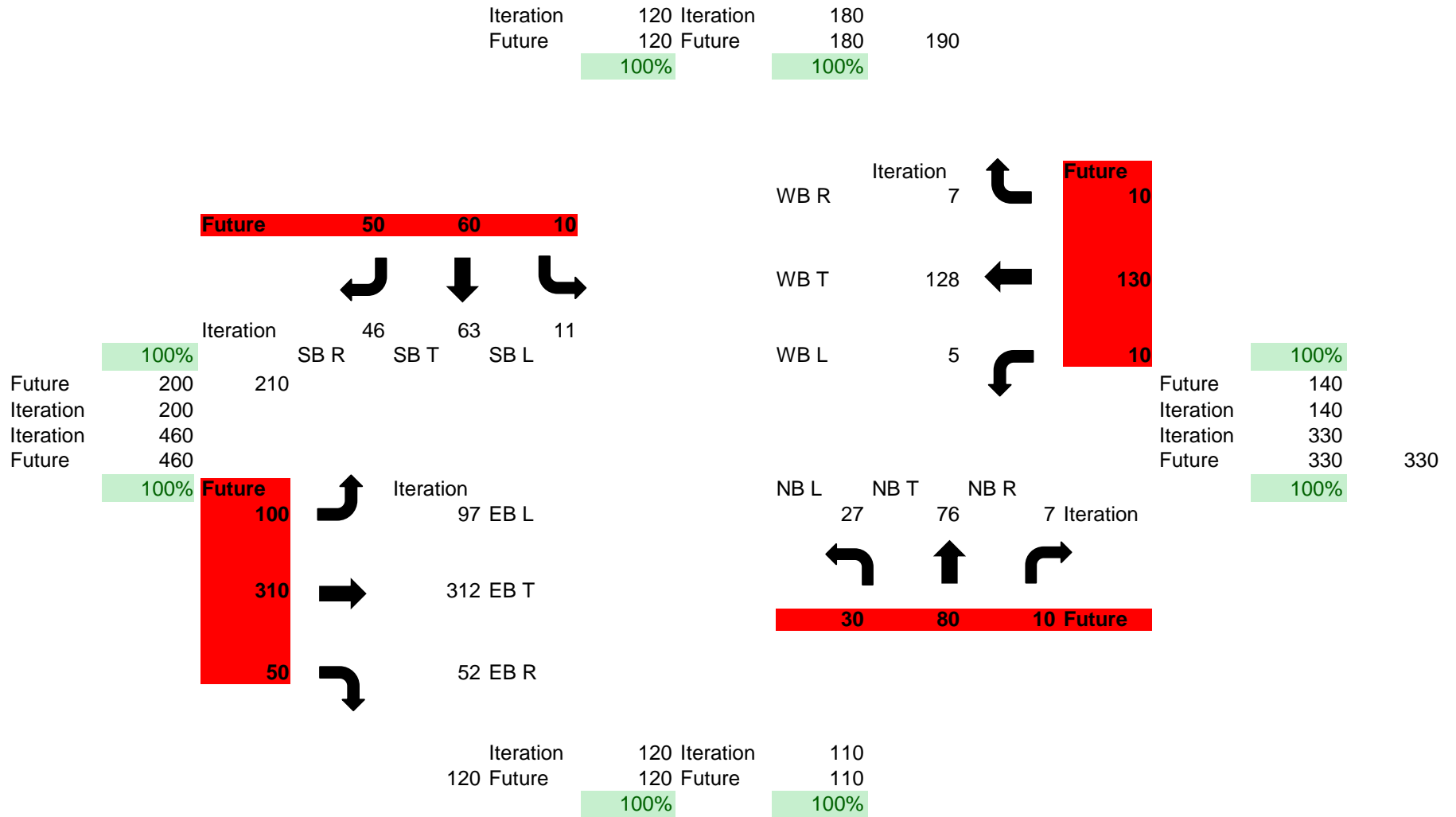
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES											
Southbound			Westbound			Northbound			Eastbound		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
9	65	42	1	85	6	27	82	3	95	246	54
116			92			112			395		
Trucks: 0%			Trucks: 0%			Trucks: 0%			Trucks: 0%		
Peak Hour:			05:00 PM to 6:00 PM			Peak Vol:			715 PHF: 0.91		

2030 PM: 7280 N & 1040 E



2030 PM: 7280 N & 1040 E



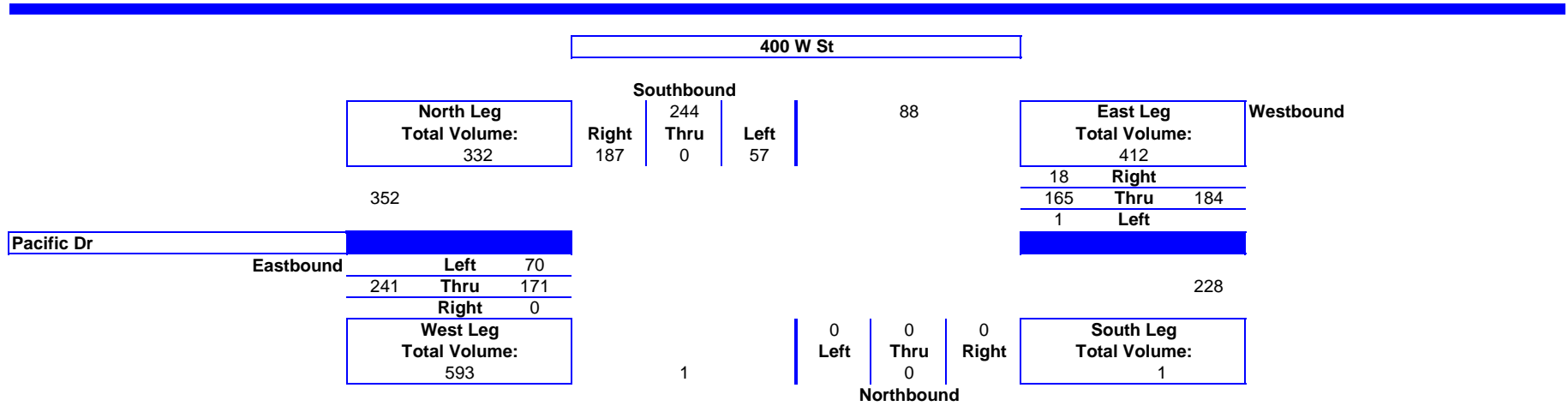
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **400 W St**
 Date: **Tuesday, November 19, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **Pacific Dr**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	8	0	39	0	0	33	1	0	0	2	0	0	13	35	0	0	131	
07:15 AM	07:30 AM	15	0	42	0	0	36	5	0	0	0	0	0	14	32	0	0	144	
07:30 AM	07:45 AM	11	1	34	0	0	33	3	0	0	0	0	1	19	45	0	0	146	
07:45 AM	08:00 AM	16	0	54	0	0	50	2	0	0	0	0	0	20	43	0	0	185	606
08:00 AM	08:15 AM	15	0	52	0	1	44	2	1	0	0	0	0	15	40	0	0	169	644
08:15 AM	08:30 AM	17	0	40	0	0	36	7	0	0	0	0	0	20	44	0	0	164	664
08:30 AM	08:45 AM	9	0	41	0	0	35	7	0	0	0	0	0	15	44	0	0	151	669
08:45 AM	09:00 AM	20	1	30	0	0	54	4	0	0	1	0	1	17	46	0	0	173	657



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57	0	187	1	165	18	0	0	0	70	171	0	
244			184			0			241			
Trucks:			Trucks:			Trucks:			Trucks:			
0%			1%			0%			0%			
Peak Hour: 07:45 AM to 8:45 AM						Peak Vol: 669			PHF: 0.90			

TRAFFIC COUNT SUMMARY



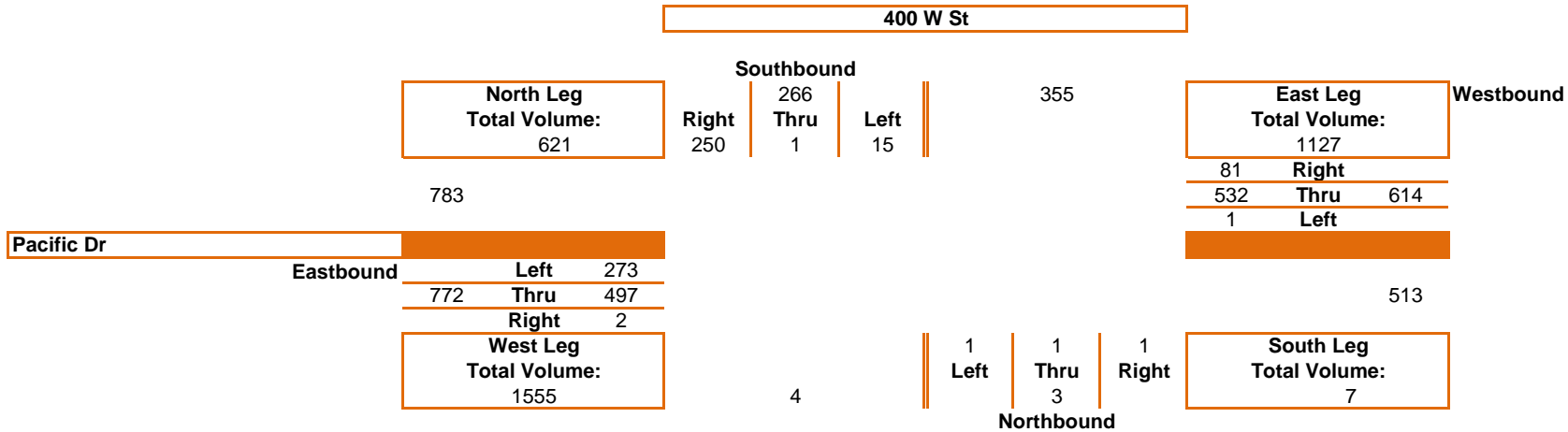
City: **American Fork**
 N-S Street: **400 W St**
 Date: **Tuesday, November 19, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **Pacific Dr**

For Use with Jamar PetraPro Software

Updated September 13, 2019

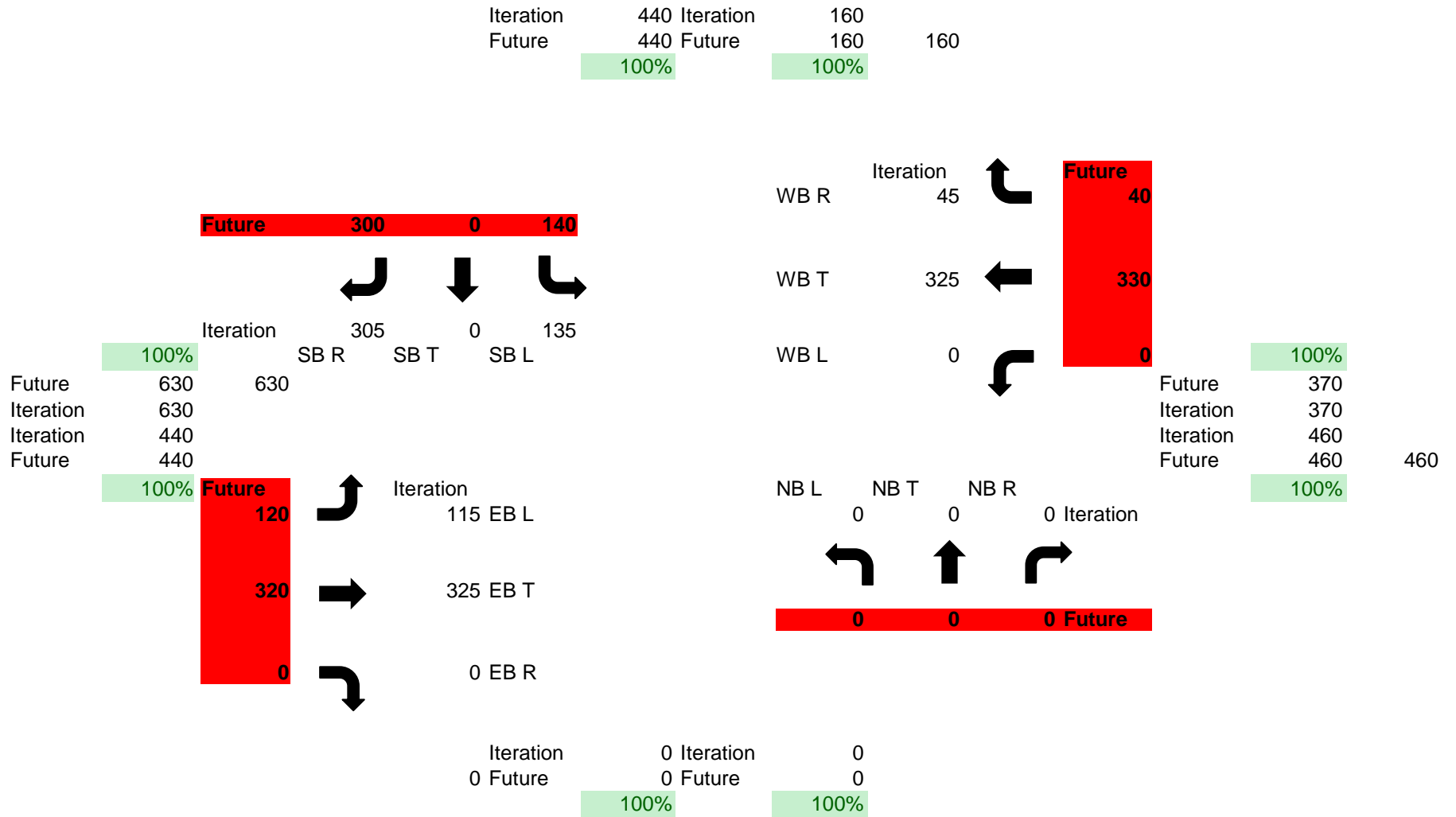
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	2	0	51	0	2	109	16	0	0	0	0	0	67	102	2	0	351	
04:15 PM	04:30 PM	6	0	62	0	1	127	14	0	0	0	1	0	70	107	3	0	391	
04:30 PM	04:45 PM	2	0	57	0	0	129	20	0	0	0	1	0	46	124	0	0	379	
04:45 PM	05:00 PM	3	0	54	0	0	111	20	0	1	0	1	0	62	141	0	0	393	1514
05:00 PM	05:15 PM	5	1	61	0	0	142	20	0	0	0	0	0	74	104	1	0	408	1571
05:15 PM	05:30 PM	5	0	59	0	1	154	16	0	0	1	0	0	61	113	1	0	411	1591
05:30 PM	05:45 PM	2	0	76	0	0	125	25	0	0	0	0	0	76	139	0	0	443	1655
05:45 PM	06:00 PM	6	1	60	0	0	104	19	2	0	0	1	0	75	122	0	0	388	1650



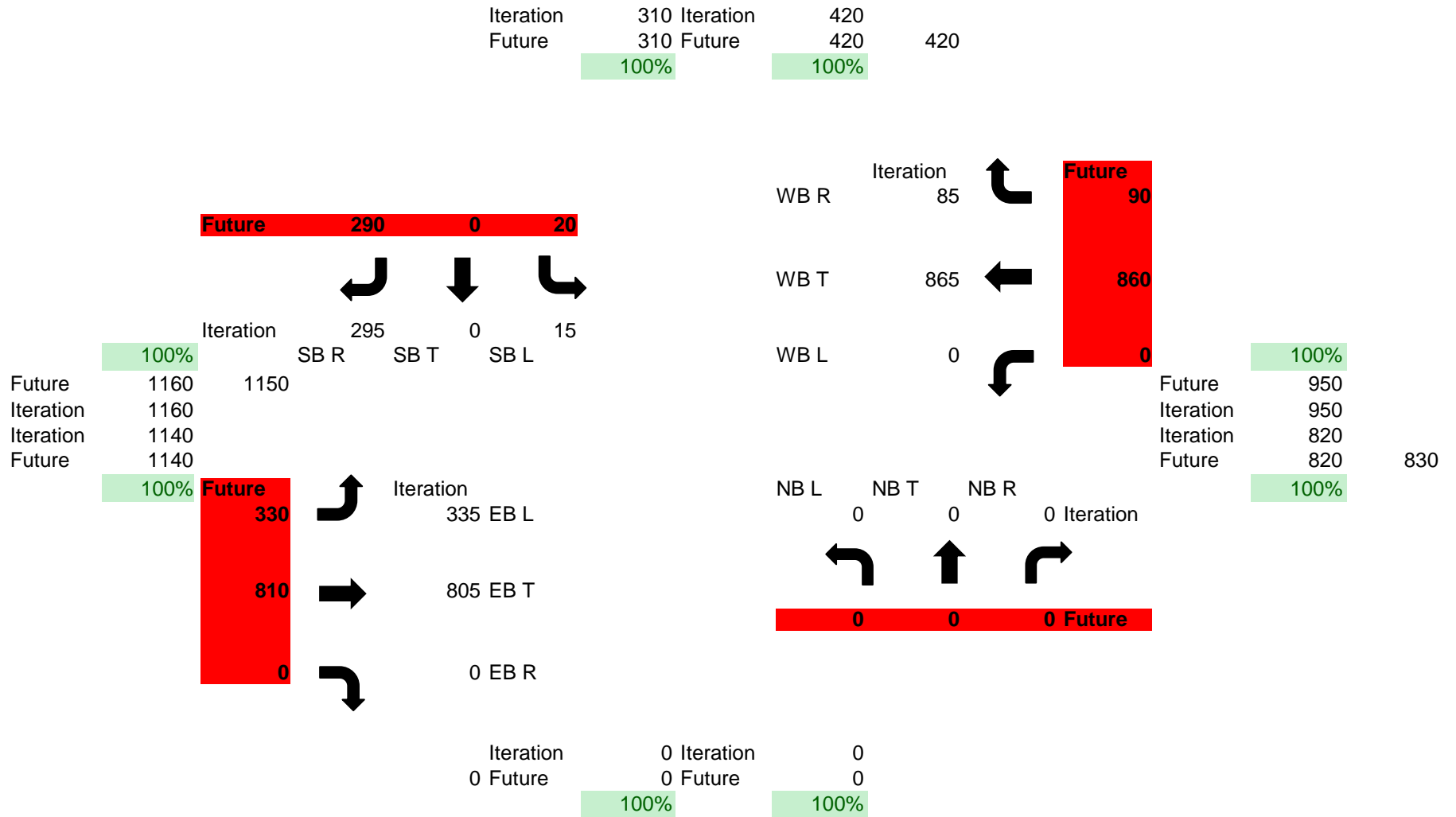
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES											
Southbound			Westbound			Northbound			Eastbound		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
15	1	250	1	532	81	1	1	1	273	497	2
266			614			3			772		
Trucks: 0%			Trucks: 0%			Trucks: 0%			Trucks: 0%		
Peak Hour:			04:45 PM to 5:45 PM			Peak Vol:			1655 PHF: 0.93		

2030 AM: 400 W & Pacific Drive



2030 PM: 400 W & Pacific Drive



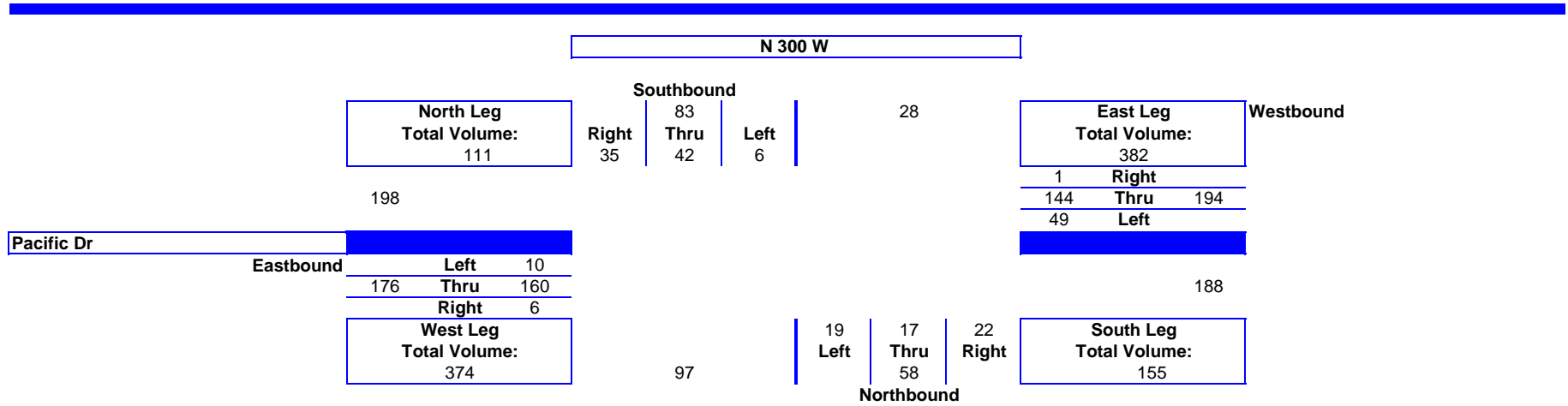
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **N 300 W**
 Date: **Thursday, September 12, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **Pacific Dr**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	0	6	2	0	1	30	0	0	1	4	8	0	1	28	3	0	84	
07:15 AM	07:30 AM	0	10	6	0	7	31	0	0	7	6	7	1	3	44	6	0	127	
07:30 AM	07:45 AM	2	11	13	1	8	33	0	0	3	5	6	0	0	41	2	0	124	
07:45 AM	08:00 AM	2	13	9	0	12	40	0	0	3	2	6	0	4	43	2	0	136	471
08:00 AM	08:15 AM	2	7	7	1	23	28	1	0	5	6	5	0	2	36	1	0	123	510
08:15 AM	08:30 AM	0	11	6	0	6	43	0	0	8	4	5	0	4	40	1	0	128	511
08:30 AM	08:45 AM	0	3	9	0	5	28	1	0	3	1	2	0	1	39	4	0	96	483
08:45 AM	09:00 AM	2	7	6	0	6	38	0	0	3	7	7	0	1	46	4	0	127	474



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
6	42	35	49	144	1	19	17	22	10	160	6	
83			194			58			176			
Trucks:			Trucks:			Trucks:			Trucks:			
2%			0%			0%			0%			
Peak Hour: 07:30 AM to 8:30 AM						Peak Vol: 511			PHF: 0.94			

TRAFFIC COUNT SUMMARY



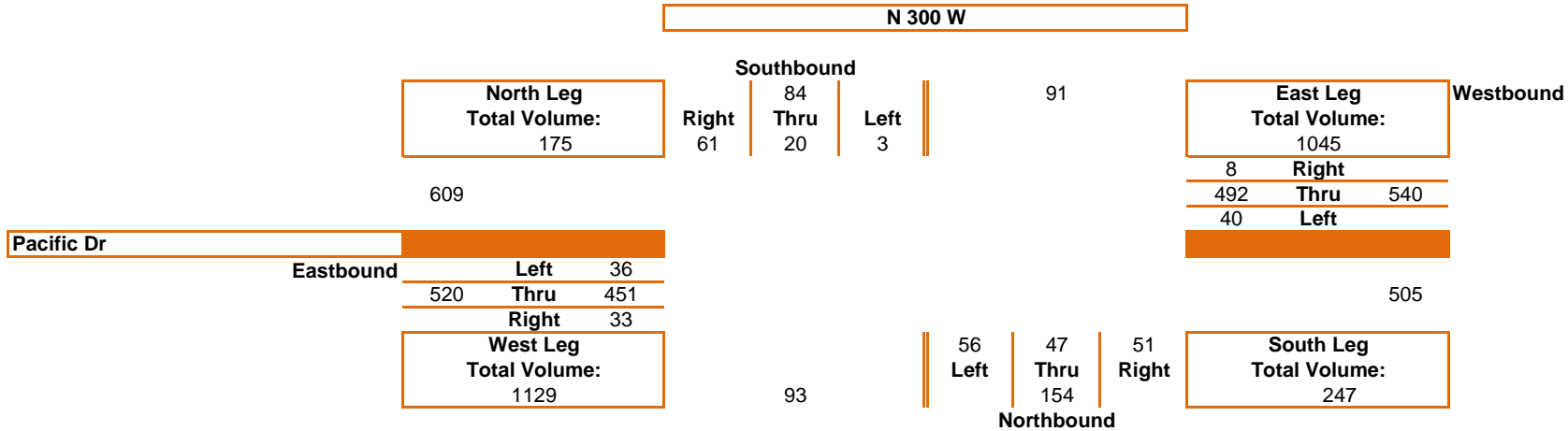
City: **American Fork**
 N-S Street: **N 300 W**
 Date: **Thursday, September 12, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **Pacific Dr**

For Use with Jamar PetraPro Software

Updated September 13, 2019

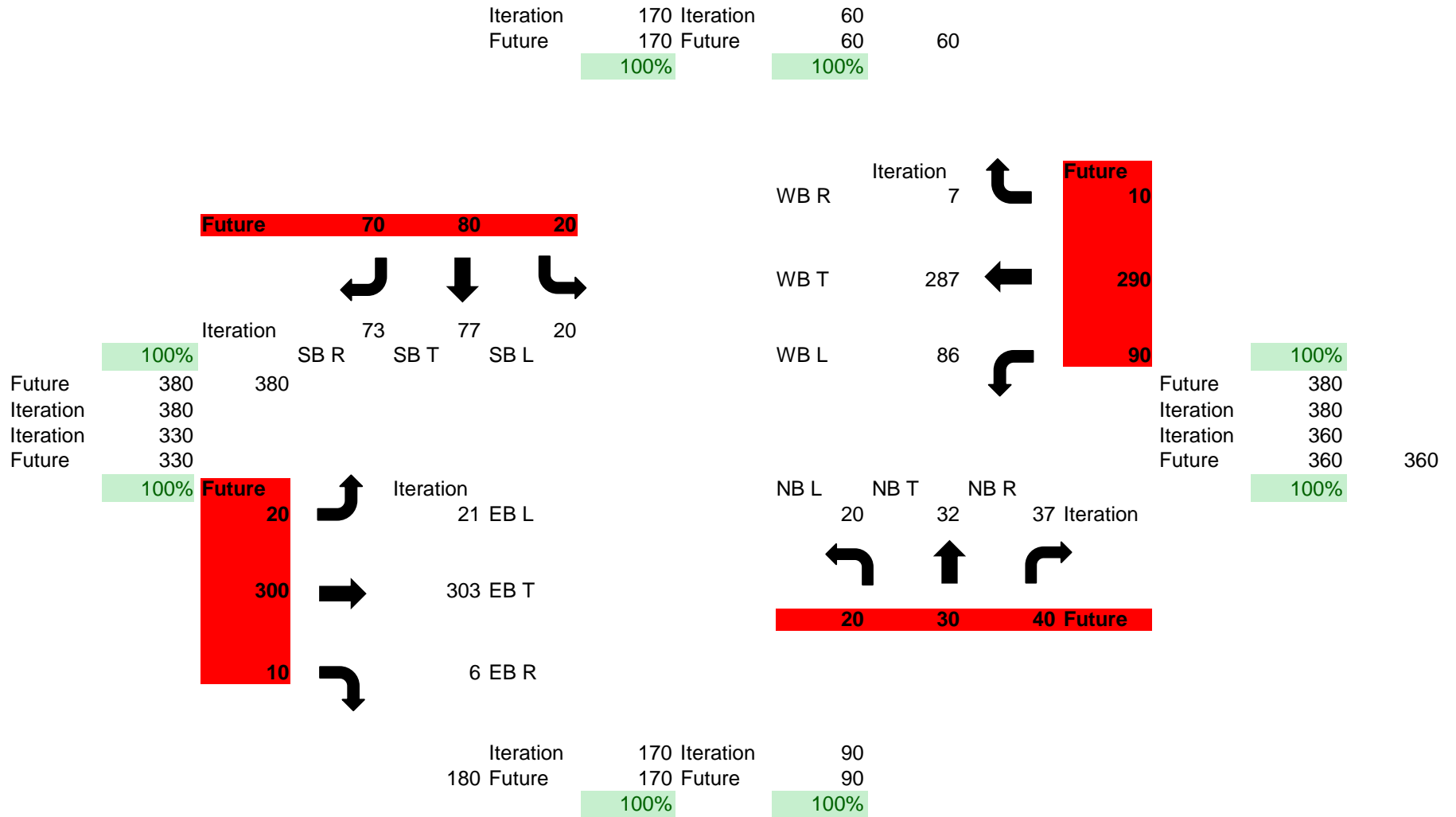
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	1	6	10	0	4	99	2	0	7	10	12	0	4	95	5		255	
04:15 PM	04:30 PM	1	2	20	0	8	100	3	0	2	8	13	0	6	102	7		272	
04:30 PM	04:45 PM	1	3	12	1	8	87	0	0	8	6	9	0	8	121	3		266	
04:45 PM	05:00 PM	1	9	15	0	6	108	1	0	12	8	10	1	6	114	8		298	1091
05:00 PM	05:15 PM	0	4	18	1	11	132	2	0	10	11	15	0	9	110	3		325	1161
05:15 PM	05:30 PM	2	4	12	0	9	131	1	0	14	10	11	0	10	126	10		340	1229
05:30 PM	05:45 PM	0	9	15	0	10	118	2	0	18	12	17	0	10	99	9		319	1282
05:45 PM	06:00 PM	1	3	16	0	10	111	3	0	14	14	8	0	7	116	11		314	1298



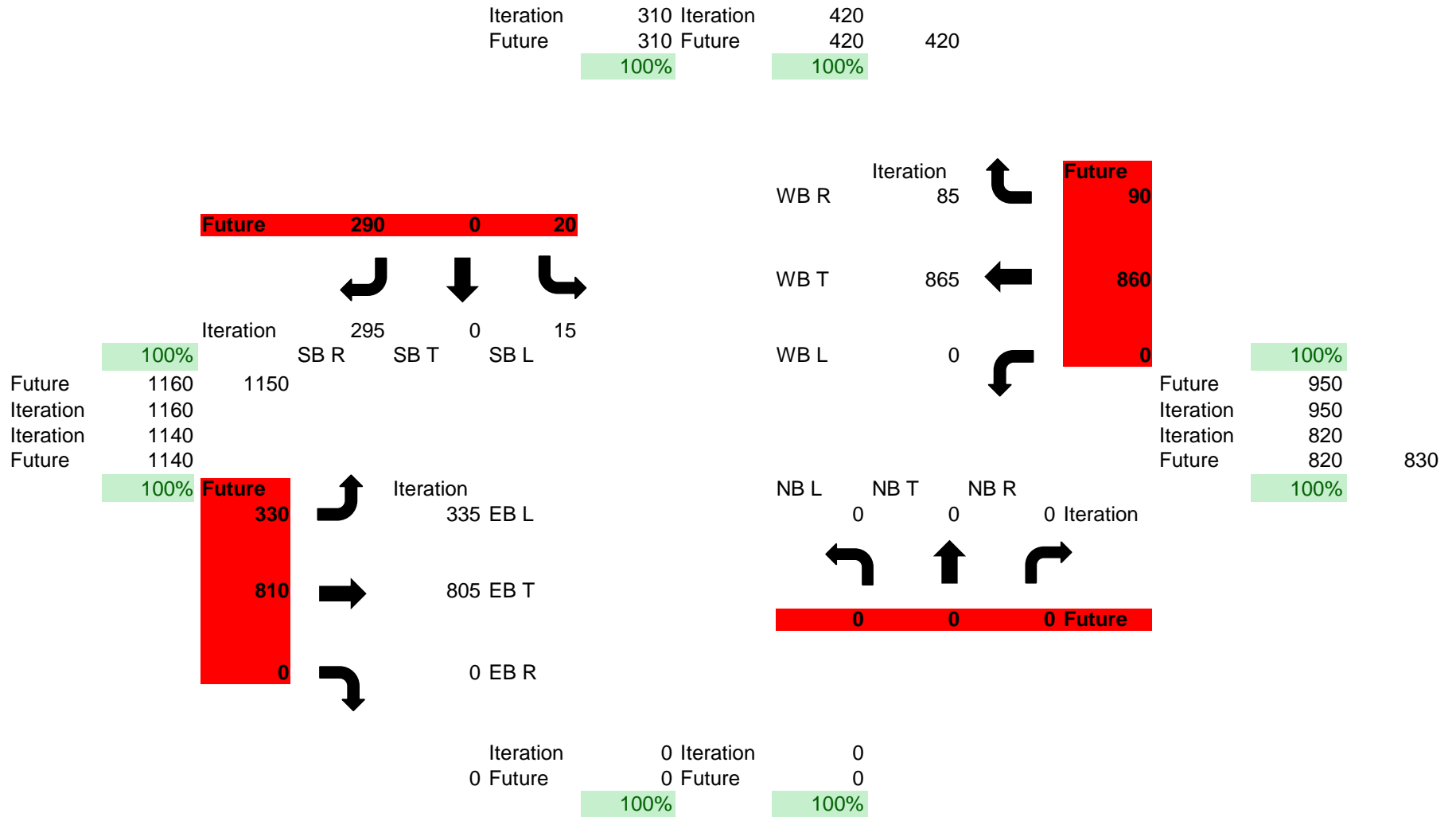
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	20	61	40	492	8	56	47	51	36	451	33	
84			540			154			520			
Trucks:			Trucks:			Trucks:			Trucks:			
1%			0%			0%			0%			
Peak Hour:						Peak Vol:						PHF:
05:00 PM to 6:00 PM						1298						0.95

2030 AM: 300 W & Pacific Drive



2030 PM: 400 W & Pacific Drive



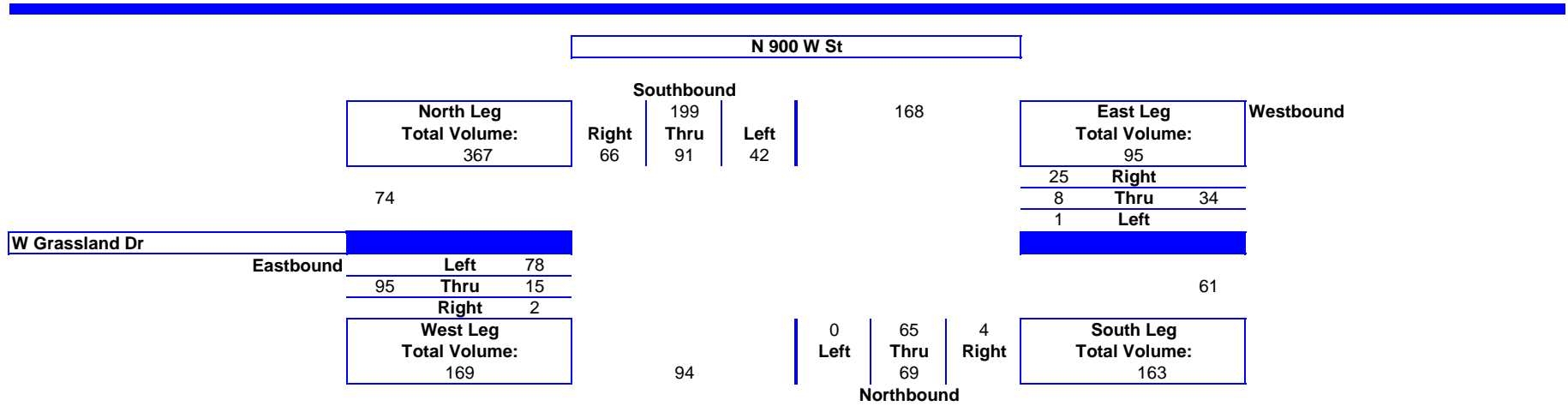
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **N 900 W St**
 Date: **Tuesday, September 17, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **W Grassland Dr**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	2	12	9	0	0	1	0	0	0	4	0	0	12	3	0	0	43	
07:15 AM	07:30 AM	1	13	7	0	0	4	4	0	0	4	0	0	6	0	2	0	41	
07:30 AM	07:45 AM	5	11	10	0	1	1	4	0	0	10	0	0	8	3	0	0	53	
07:45 AM	08:00 AM	7	17	18	0	2	0	4	0	0	14	0	0	8	2	1	0	73	210
08:00 AM	08:15 AM	10	23	22	0	0	3	6	0	0	7	1	0	14	4	0	0	90	257
08:15 AM	08:30 AM	7	23	12	0	0	2	4	0	0	17	1	0	15	1	0	0	82	298
08:30 AM	08:45 AM	8	29	16	0	1	3	4	0	0	22	1	0	21	4	2	0	111	356
08:45 AM	09:00 AM	17	16	16	0	0	0	11	0	0	19	1	0	28	6	0	0	114	397



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
42	91	66	1	8	25	0	65	4	78	15	2	
199			34			69			95			
Trucks: 0%			Trucks: 0%			Trucks: 0%			Trucks: 0%			
Peak Hour: 08:00 AM to 9:00 AM						Peak Vol: 397			PHF: 0.87			

TRAFFIC COUNT SUMMARY



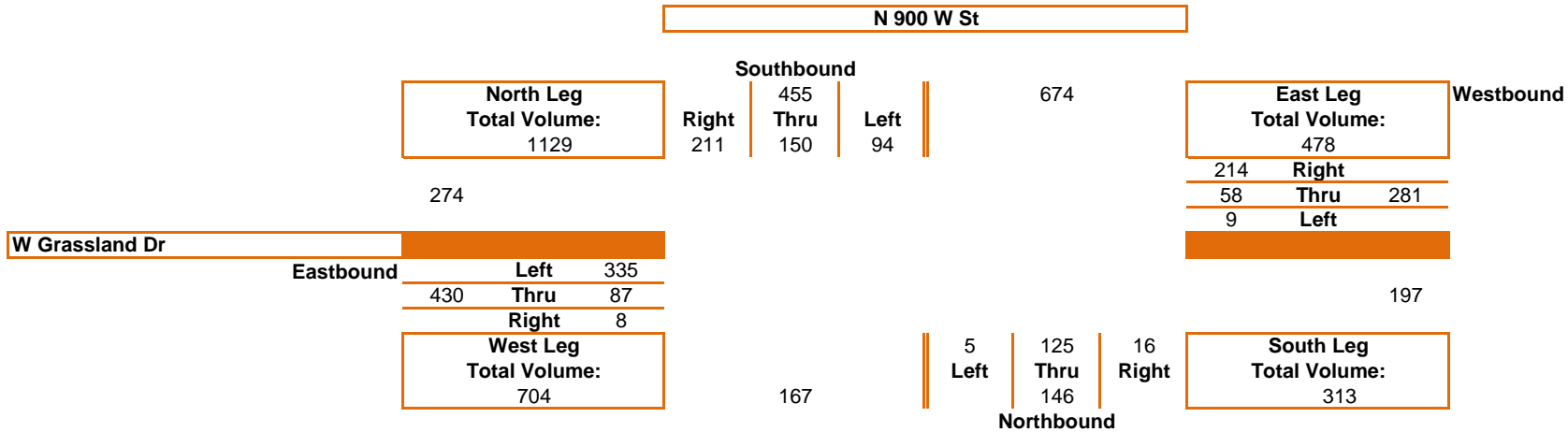
Updated September 13, 2019

City: **American Fork**
 N-S Street: **N 900 W St**
 Date: **Tuesday, September 17, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **W Grassland Dr**

For Use with Jamar PetraPro Software

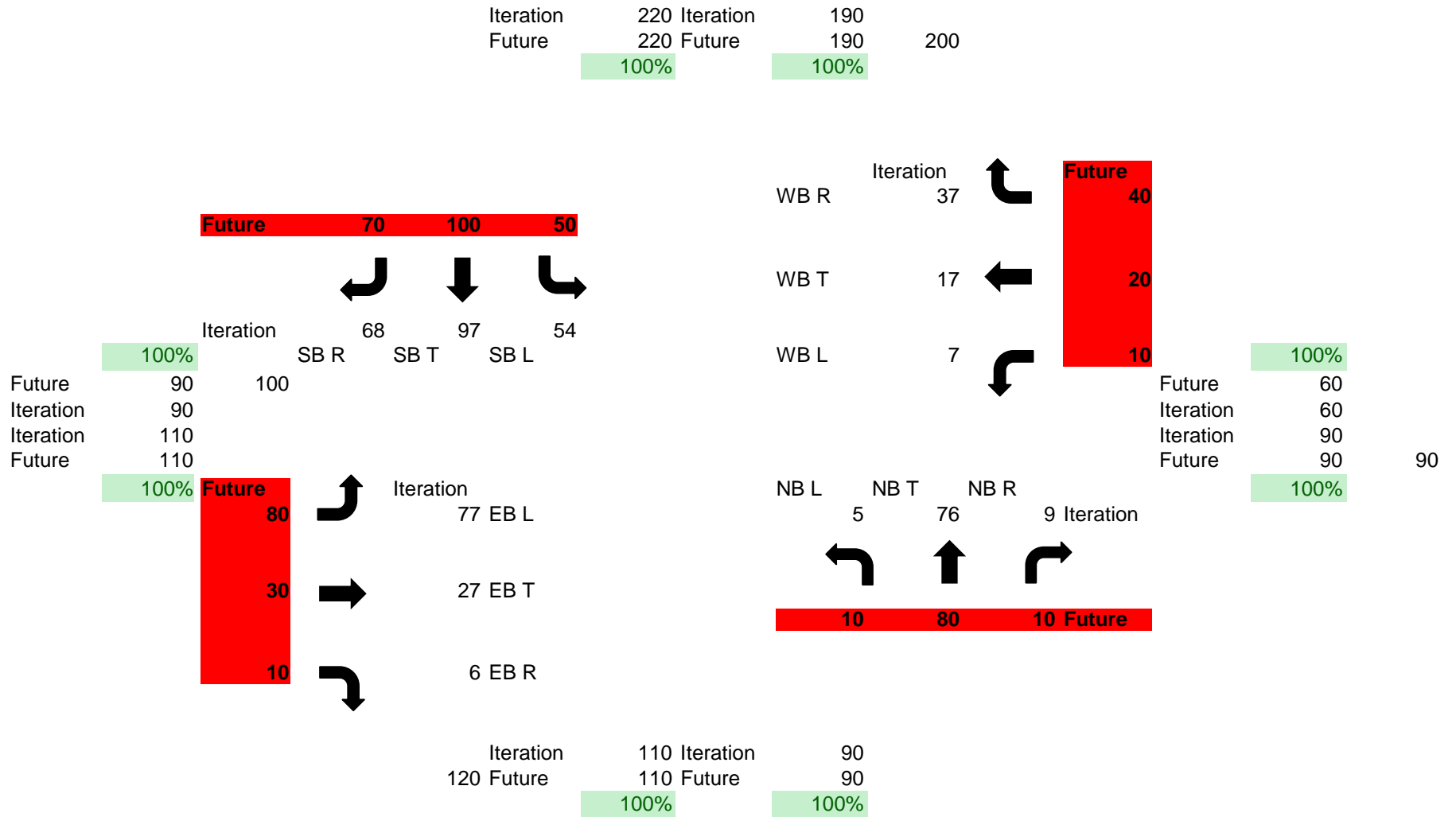
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	20	34	46	0	1	14	62	0	3	45	5	0	112	27	5	0	374	
04:15 PM	04:30 PM	24	40	55	0	4	15	55	0	1	24	2	0	80	20	1	0	321	
04:30 PM	04:45 PM	30	37	64	0	2	17	52	0	1	30	3	0	59	20	1	0	316	
04:45 PM	05:00 PM	20	39	46	0	2	12	45	0	0	26	6	0	84	20	1	0	301	1312
05:00 PM	05:15 PM	17	34	41	0	2	14	62	0	0	22	3	0	85	19	5	0	304	1242
05:15 PM	05:30 PM	25	43	36	0	2	14	60	0	0	29	4	0	78	16	3	0	310	1231
05:30 PM	05:45 PM	24	30	39	0	5	16	56	0	0	22	1	0	73	13	1	0	280	1195
05:45 PM	06:00 PM	23	33	44	0	3	14	72	0	1	36	3	0	81	11	0	0	321	1215



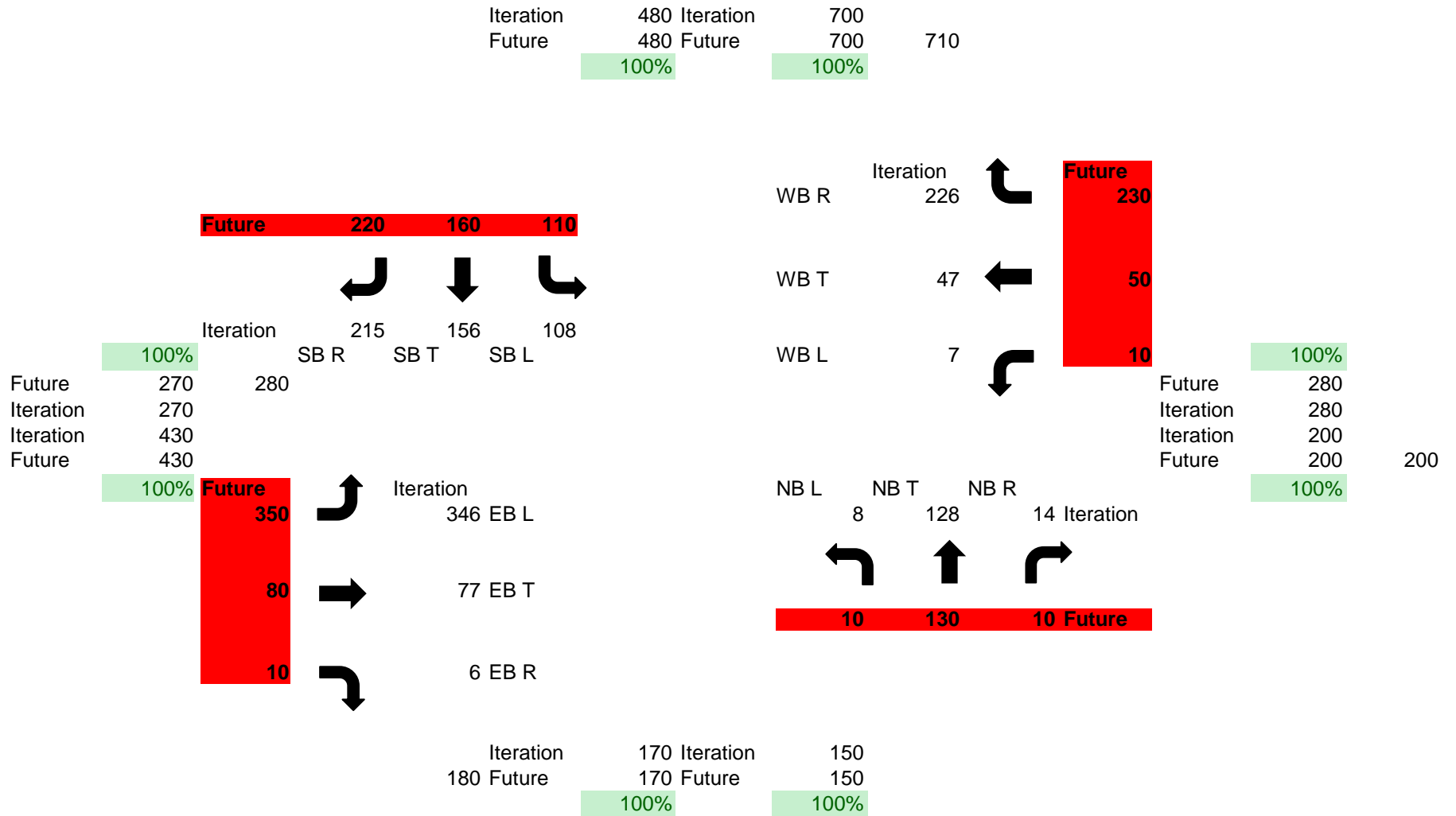
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES														
Southbound			Westbound			Northbound			Eastbound					
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
94	150	211	9	58	214	5	125	16	335	87	8			
455			281			146			430					
Trucks:			0%			0%			0%			0%		
Peak Hour:						04:00 PM to 5:00 PM			Peak Vol:			1312 PHF: 0.88		

2030 AM: 900 W & Grassland Drive



2030 PM: 900 W & Grassland Drive



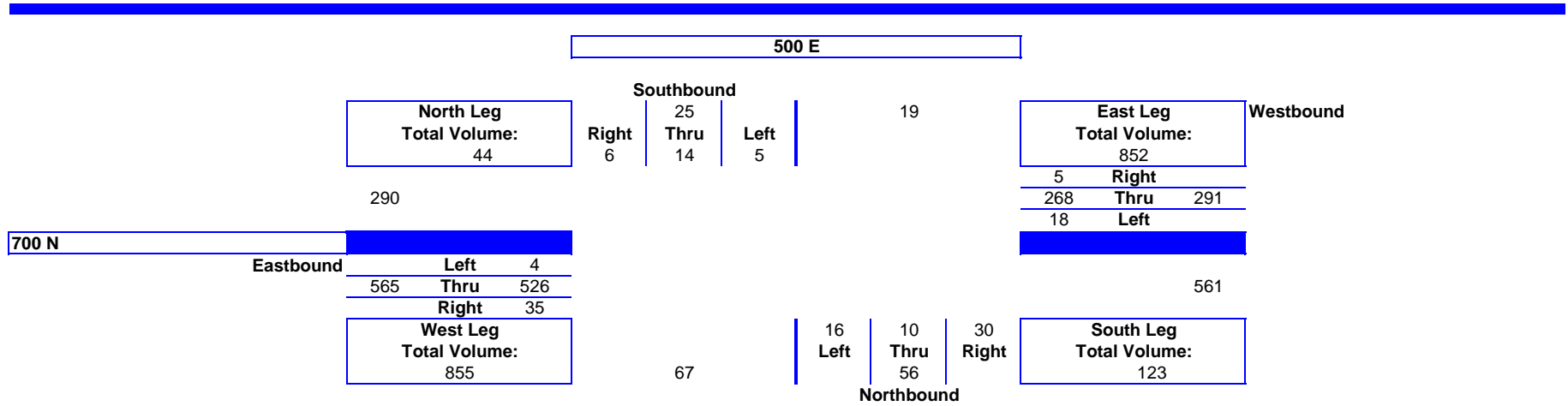
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **500 E**
 Date: **Thursday, September 19, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **700 N**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	4	5	0	1	3	29	1	3	1	2	1	1	0	105	4	0	155	
07:15 AM	07:30 AM	1	3	2	0	6	34	0	0	3	1	3	1	1	161	8	0	223	
07:30 AM	07:45 AM	1	4	0	0	4	73	3	0	7	4	13	0	0	136	12	0	257	
07:45 AM	08:00 AM	0	4	4	0	1	89	2	0	3	3	8	1	3	119	9	0	245	880
08:00 AM	08:15 AM	3	3	0	0	7	72	0	0	3	2	6	0	0	110	6	1	212	937
08:15 AM	08:30 AM	0	7	2	0	6	39	0	0	1	2	4	1	1	63	10	0	135	849
08:30 AM	08:45 AM	0	2	0	0	2	32	0	0	2	1	5	0	0	42	3	0	89	681
08:45 AM	09:00 AM	2	3	2	0	5	39	1	0	3	2	3	0	2	66	3	0	131	567



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
5	14	6	18	268	5	16	10	30	4	526	35	
25			291			56			565			
Trucks:			0%			Trucks:			0%			
Peak Hour:			07:15 AM to 8:15 AM			Peak Vol:			937			
						PHF:			0.91			

TRAFFIC COUNT SUMMARY



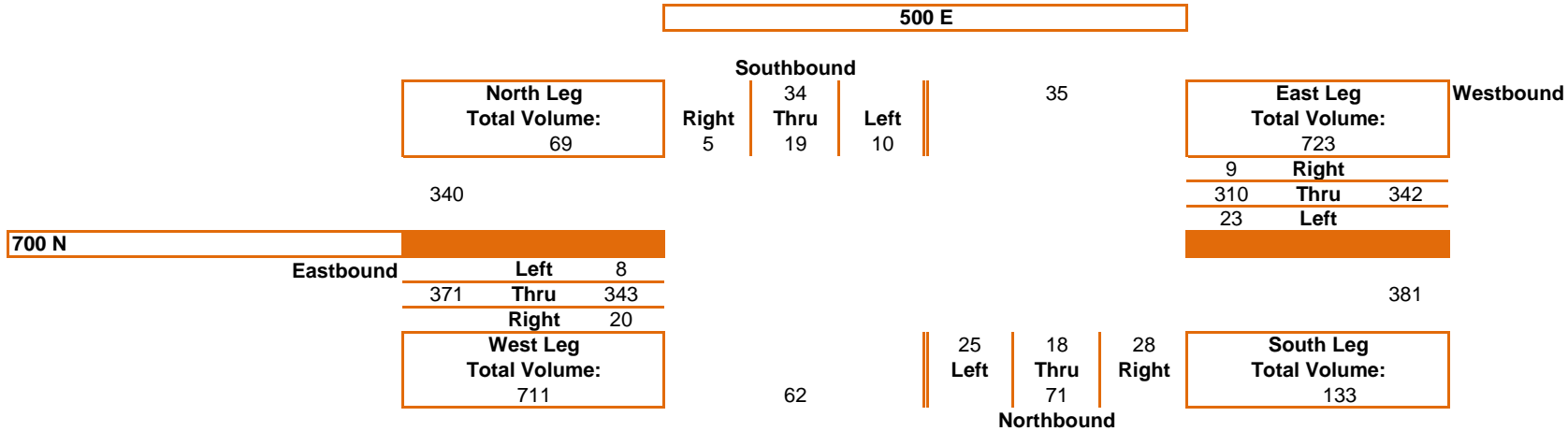
City: **American Fork**
 N-S Street: **500 E**
 Date: **Thursday, September 19, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **700 N**

For Use with Jamar PetraPro Software

Updated September 13, 2019

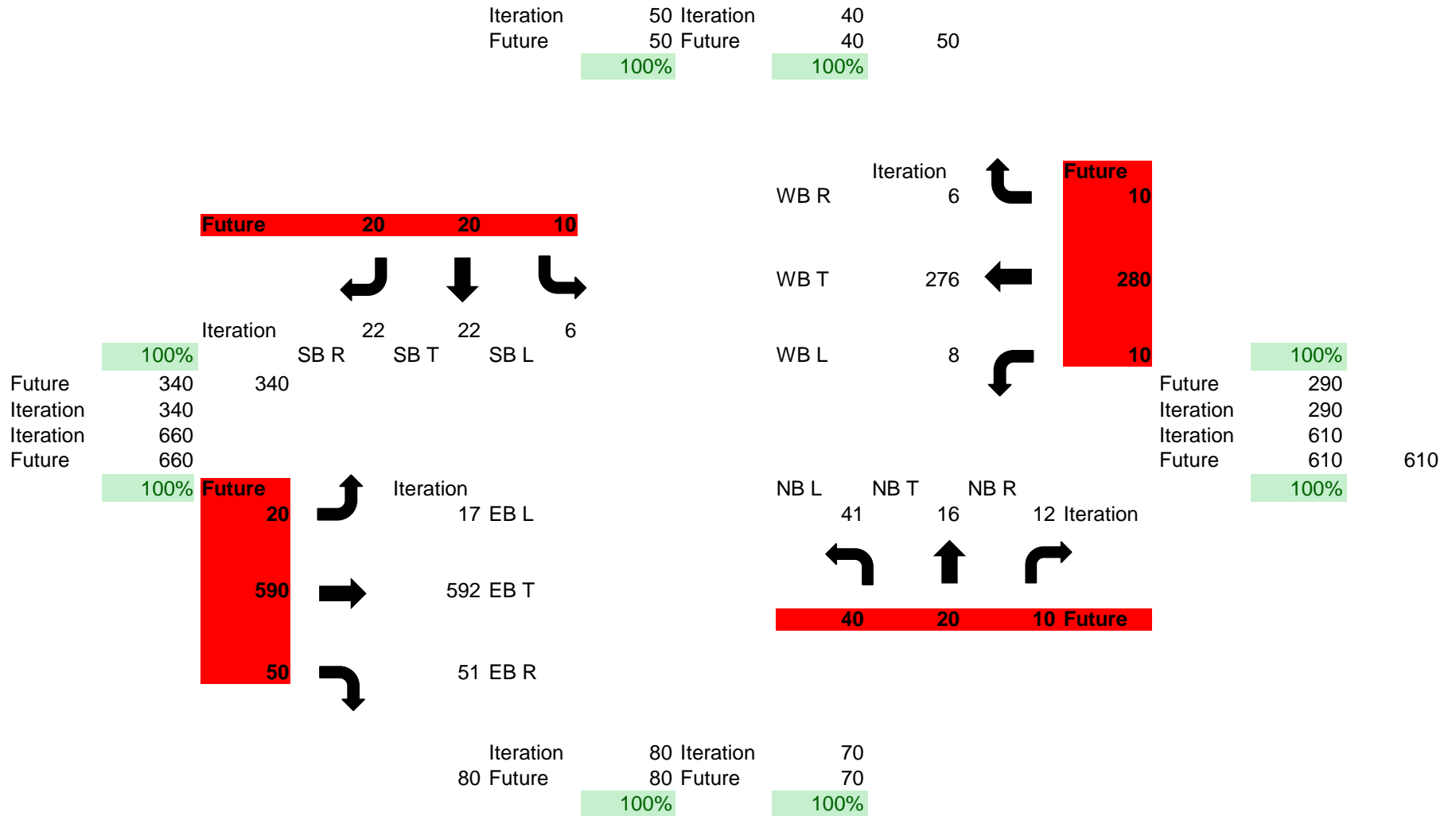
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	0	1	0	0	4	77	1	0	7	2	5	0	0	53	8	0	158	
04:15 PM	04:30 PM	3	2	1	0	6	65	2	0	6	4	6	0	6	66	3	0	170	
04:30 PM	04:45 PM	3	1	3	0	6	70	1	0	6	4	11	0	1	63	0	0	169	
04:45 PM	05:00 PM	1	3	1	0	7	79	3	0	6	4	5	0	3	101	4	0	217	714
05:00 PM	05:15 PM	4	6	1	0	9	94	3	0	2	7	6	0	3	75	2	0	212	768
05:15 PM	05:30 PM	2	8	1	0	4	70	1	0	6	4	8	1	0	68	6	0	178	776
05:30 PM	05:45 PM	3	2	2	0	3	67	2	0	11	3	9	0	2	99	8	0	211	818
05:45 PM	06:00 PM	1	6	1	0	5	59	2	0	6	6	7	0	3	63	8	0	167	768



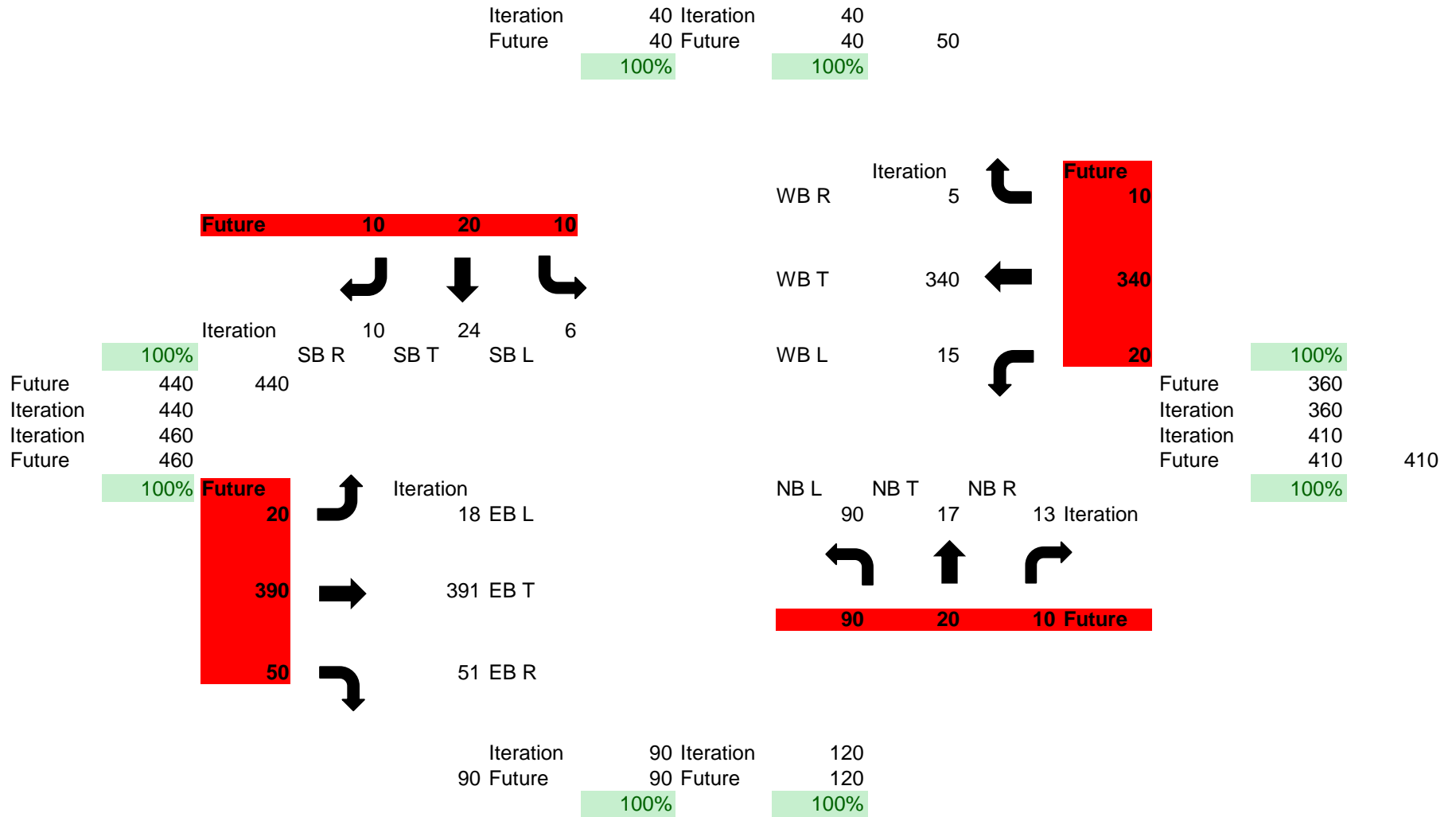
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES													
Southbound			Westbound			Northbound			Eastbound				
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
10	19	5	23	310	9	25	18	28	8	343	20		
34			342			71			371				
Trucks:			Trucks:			Trucks:			Trucks:				
0%			0%			1%			0%				
Peak Hour: 04:45 PM to 5:45 PM						Peak Vol: 818						PHF: 0.94	

2030 AM: 500 E & 700 N



2030 PM: 500 E & 700 N



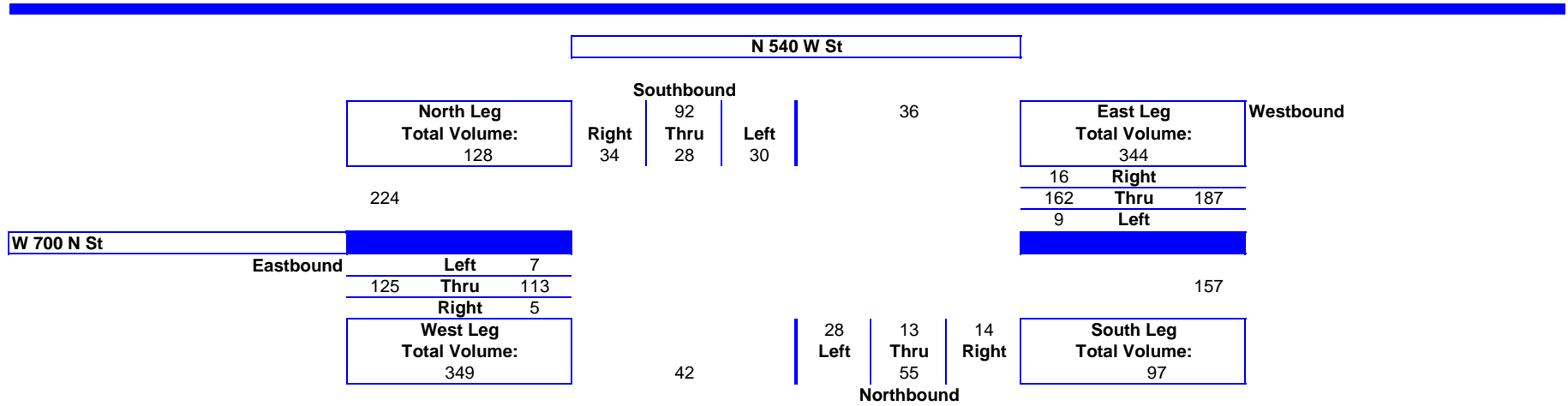
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **N 540 W St**
 Date: **Tuesday, September 17, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **W 700 N St**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	3	6	6	0	1	16	0	3	6	2	1	2	1	17	1	3	60	
07:15 AM	07:30 AM	8	7	7	0	2	29	1	1	8	2	4	0	1	14	1	0	84	
07:30 AM	07:45 AM	5	10	9	1	0	37	1	0	8	1	2	0	1	21	2	0	97	
07:45 AM	08:00 AM	12	6	10	0	2	38	8	0	8	6	5	0	4	51	0	0	150	391
08:00 AM	08:15 AM	5	5	8	0	5	58	6	0	4	4	3	0	1	27	2	0	128	459
08:15 AM	08:30 AM	6	4	6	0	0	32	1	0	6	4	0	0	6	15	3	2	83	458
08:30 AM	08:45 AM	2	3	8	0	0	23	1	0	5	1	0	0	2	14	2	0	61	422
08:45 AM	09:00 AM	7	6	7	0	3	40	4	2	6	1	1	0	4	15	1	2	95	367



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES																																			
Southbound			Westbound			Northbound			Eastbound																										
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right																								
30	28	34	9	162	16	28	13	14	7	113	5																								
92			187			55			125																										
Trucks:			1%			Trucks:			1%			Trucks:			0%			Trucks:			0%														
Peak Hour:						07:15 AM to 8:15 AM						Peak Vol:						459						PHF:						0.77					

TRAFFIC COUNT SUMMARY



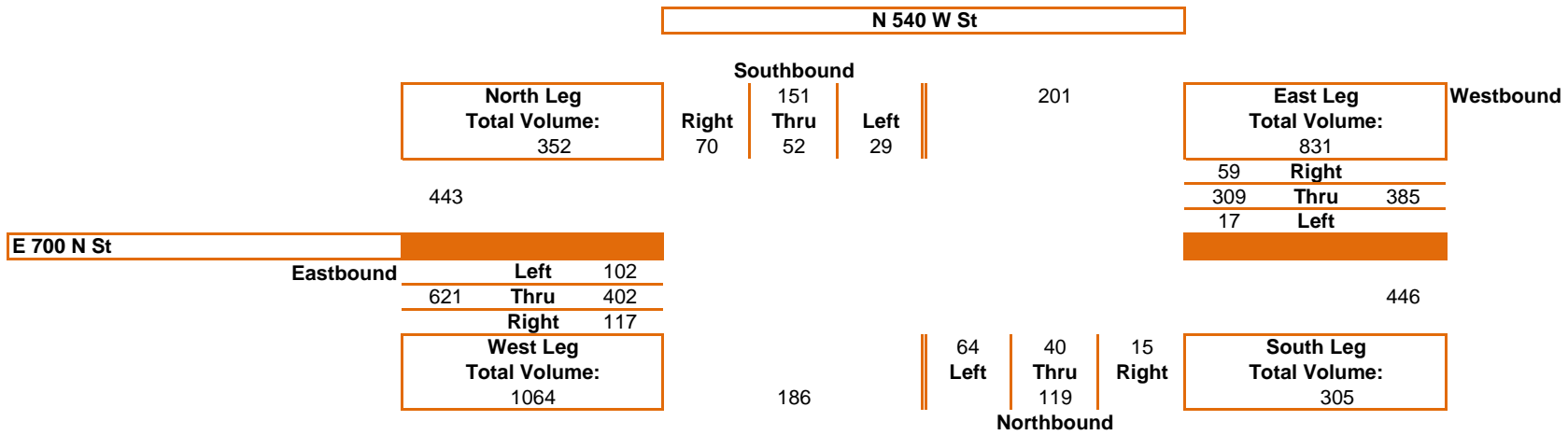
Updated September 13, 2019

City: **American Fork**
 N-S Street: **N 540 W St**
 Date: **Tuesday, September 17, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **E 700 N St**

For Use with Jamar PetraPro Software

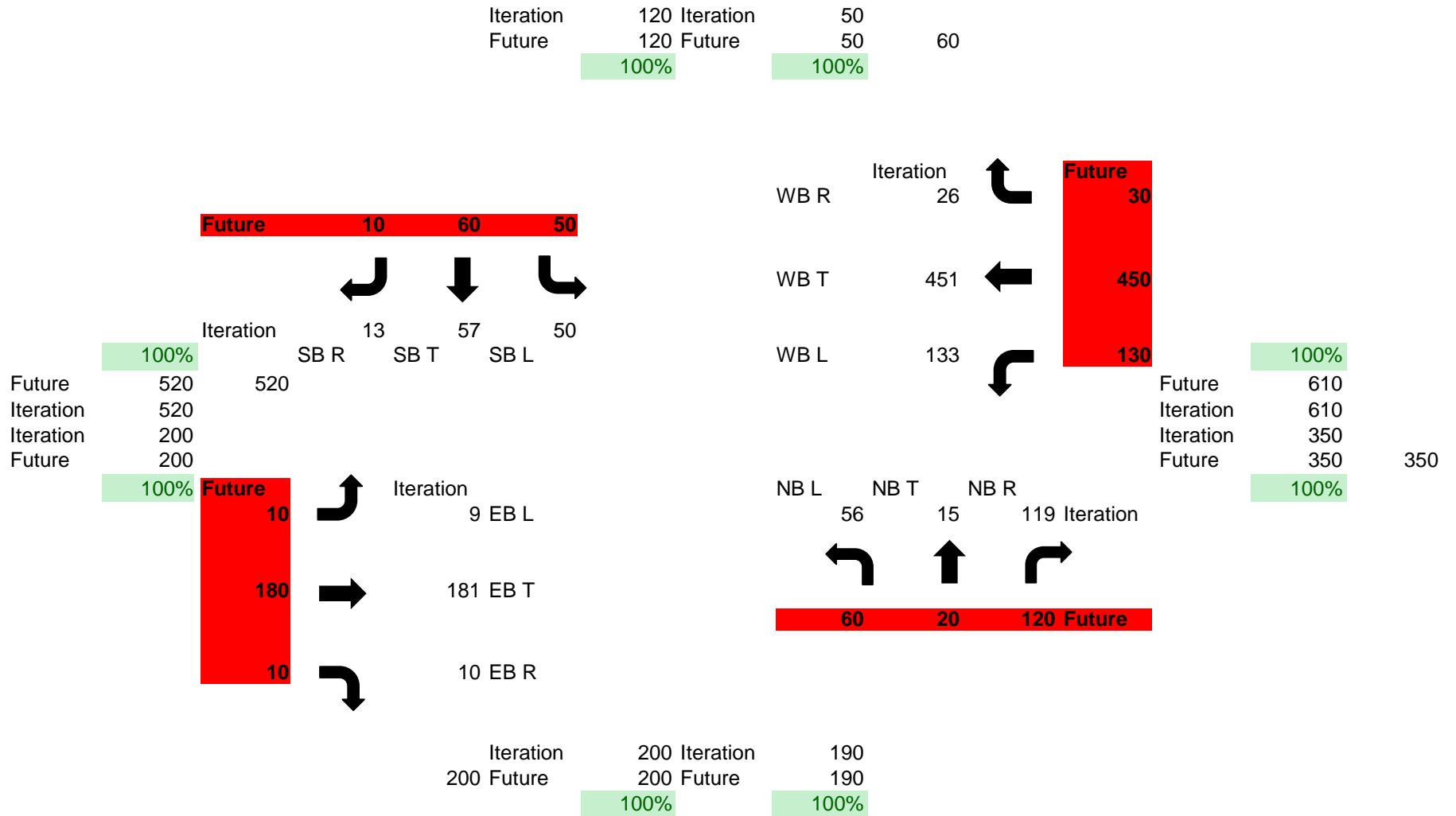
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	1	5	9	0	3	42	4	0	1	6	3	0	9	42	11	0	136	
04:15 PM	04:30 PM	5	4	8	0	0	50	8	0	9	5	3	1	11	45	13	0	161	
04:30 PM	04:45 PM	2	5	7	0	3	49	6	0	10	8	2	0	7	37	8	0	144	
04:45 PM	05:00 PM	3	11	10	0	1	31	7	1	8	6	1	0	16	51	15	0	160	601
05:00 PM	05:15 PM	5	6	9	0	3	40	9	0	9	3	1	1	14	57	17	0	173	638
05:15 PM	05:30 PM	3	6	9	0	0	37	6	0	4	6	0	0	12	50	12	0	145	622
05:30 PM	05:45 PM	3	3	8	0	6	31	7	1	7	3	6	1	12	54	20	1	160	638
05:45 PM	06:00 PM	7	4	6	0	2	32	9	0	4	0	2	0	16	60	11	1	153	631



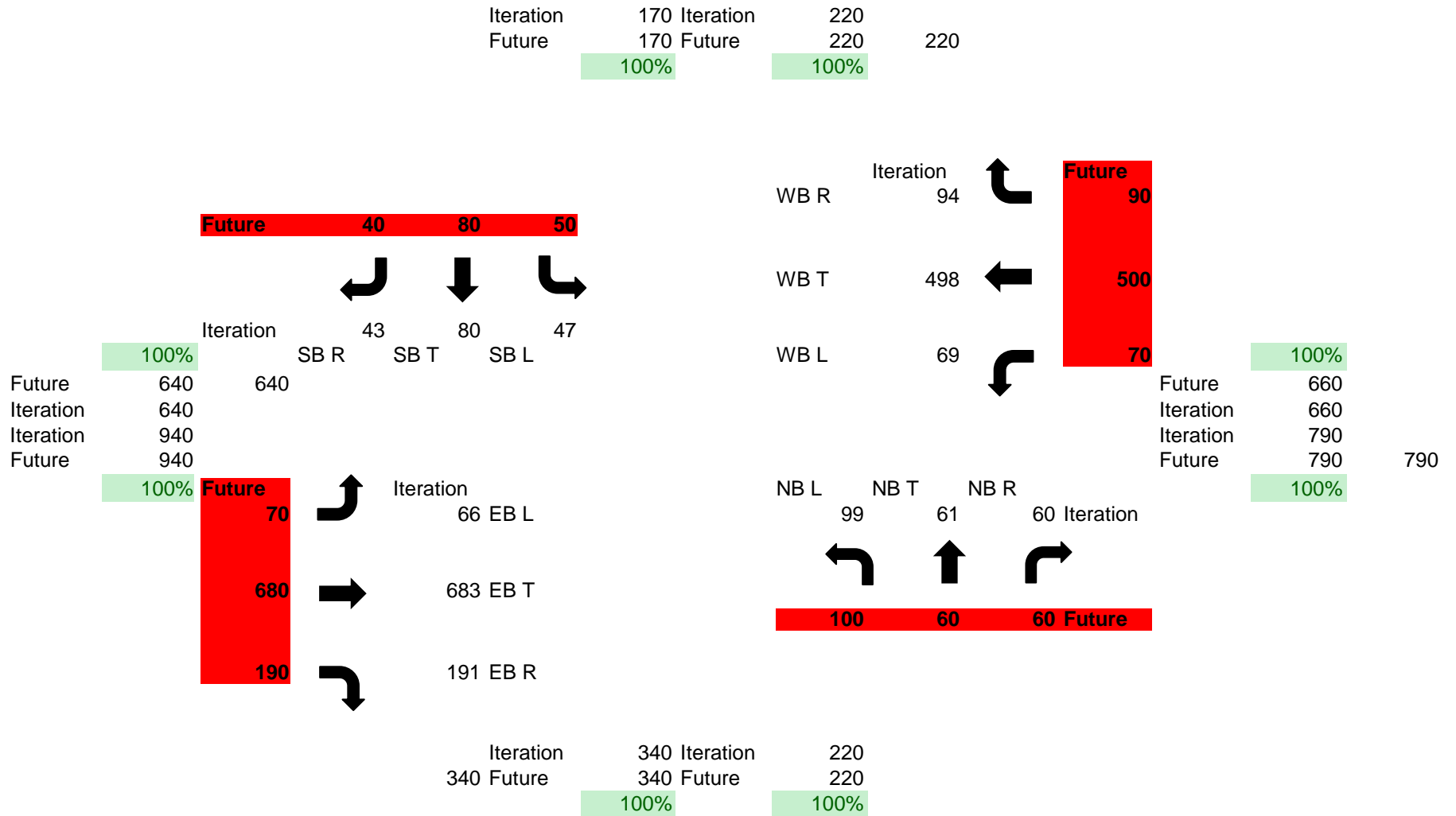
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES											
Southbound			Westbound			Northbound			Eastbound		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
29	52	70	17	309	59	64	40	15	102	402	117
151			385			119			621		
Trucks: 0%			Trucks: 1%			Trucks: 3%			Trucks: 0%		
Peak Hour: 09:00 AM to 10:00 AM			Peak Vol: 1276			PHF: 0.92					

2030 AM: 540 W & 700 N



2030 PM: 540 W & 700 N



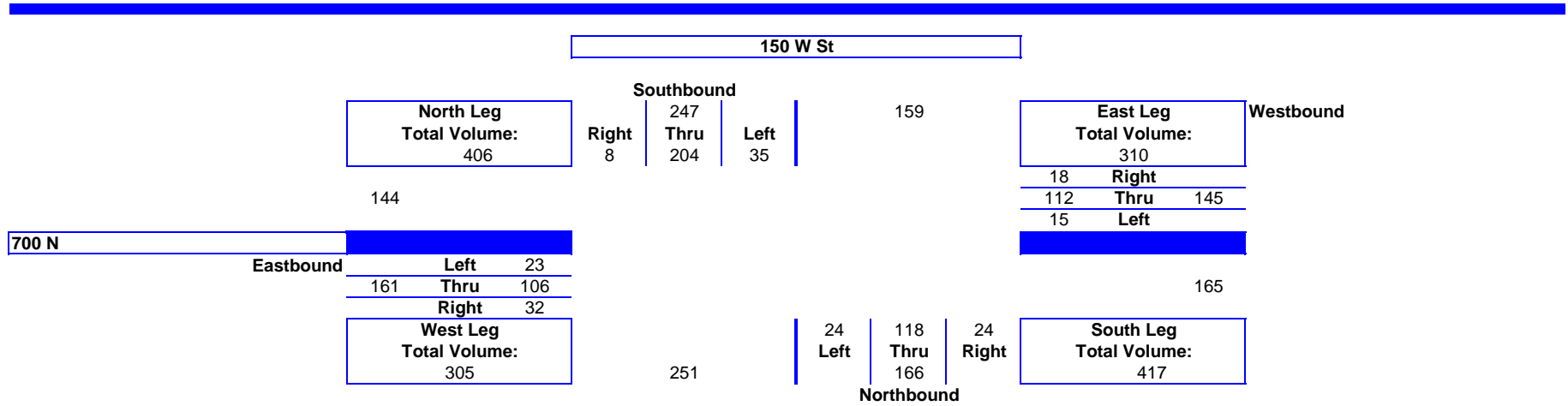
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **150 W St**
 Date: **Friday, September 20, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **700 N**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	3	23	0	0	1	9	1	0	2	15	2	0	0	34	8	0	98	
07:15 AM	07:30 AM	7	24	1	0	2	13	1	0	6	9	0	0	2	34	11	0	110	
07:30 AM	07:45 AM	9	28	1	1	6	20	3	7	5	22	2	0	4	27	7	0	134	
07:45 AM	08:00 AM	12	66	3	2	4	30	6	3	6	54	19	0	10	30	16	0	256	598
08:00 AM	08:15 AM	13	72	2	0	3	41	6	0	8	30	1	0	4	31	6	0	217	717
08:15 AM	08:30 AM	1	38	2	0	2	21	3	0	5	12	2	0	5	18	3	0	112	719
08:30 AM	08:45 AM	4	14	1	0	0	16	0	0	0	11	1	0	0	28	4	0	79	664
08:45 AM	09:00 AM	4	12	0	0	2	16	7	0	2	9	1	0	3	16	5	0	77	485



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
35	204	8	15	112	18	24	118	24	23	106	32	
247			145			166			161			
Trucks:			Trucks:			Trucks:			Trucks:			
1%			7%			0%			0%			
Peak Hour: 07:30 AM to 8:30 AM						Peak Vol: 719			PHF: 0.70			

TRAFFIC COUNT SUMMARY



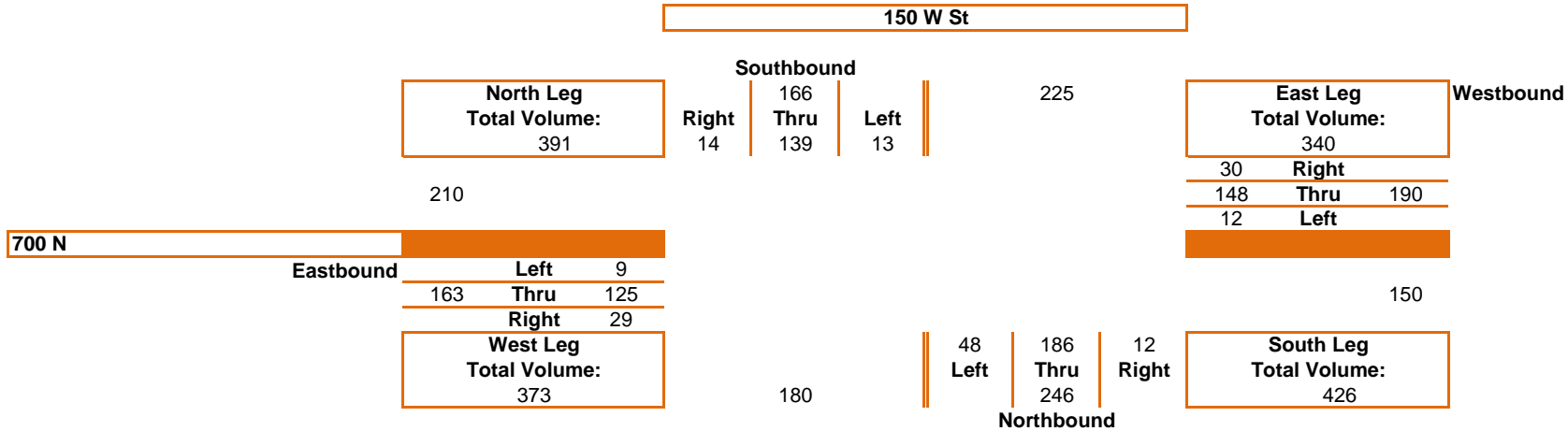
City: **American Fork**
 N-S Street: **150 W St**
 Date: **Friday, September 20, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **700 N**

For Use with Jamar PetraPro Software

Updated September 13, 2019

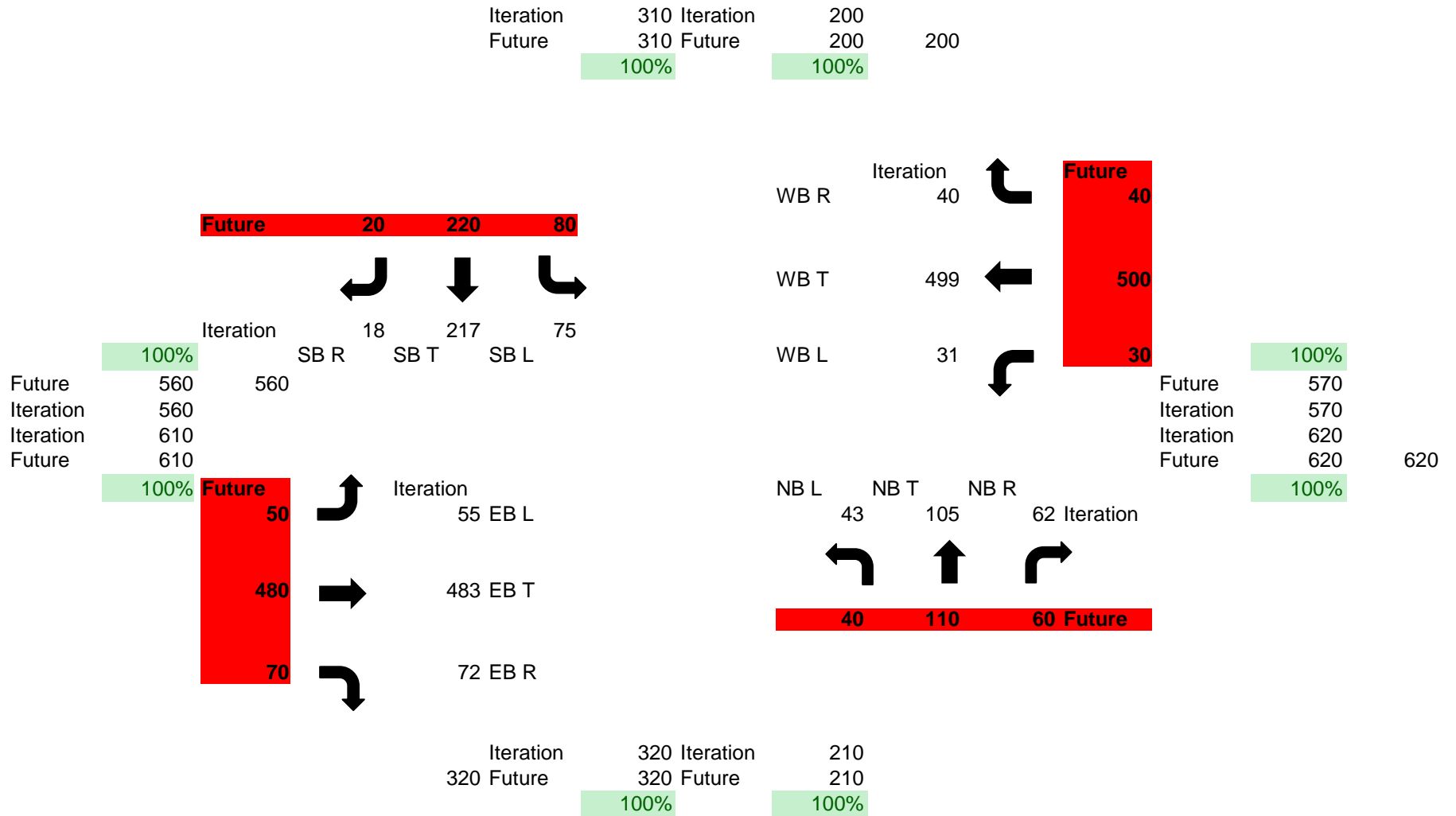
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	2	34	2	0	1	26	3	0	5	41	1	0	2	24	4	0	145	
04:15 PM	04:30 PM	0	23	4	0	3	35	6	0	5	21	3	0	0	38	9	0	147	
04:30 PM	04:45 PM	4	33	2	0	3	30	8	0	11	31	2	0	4	41	7	0	176	
04:45 PM	05:00 PM	1	30	7	0	7	32	5	0	7	29	4	0	4	32	9	0	167	635
05:00 PM	05:15 PM	3	23	5	0	7	38	6	0	14	50	3	0	2	32	7	0	190	680
05:15 PM	05:30 PM	0	36	4	0	1	38	8	0	11	54	3	0	5	31	8	0	199	732
05:30 PM	05:45 PM	5	36	1	0	1	40	8	0	10	42	4	0	0	32	6	0	185	741
05:45 PM	06:00 PM	5	44	4	0	3	32	8	0	13	40	2	0	2	30	8	0	191	765



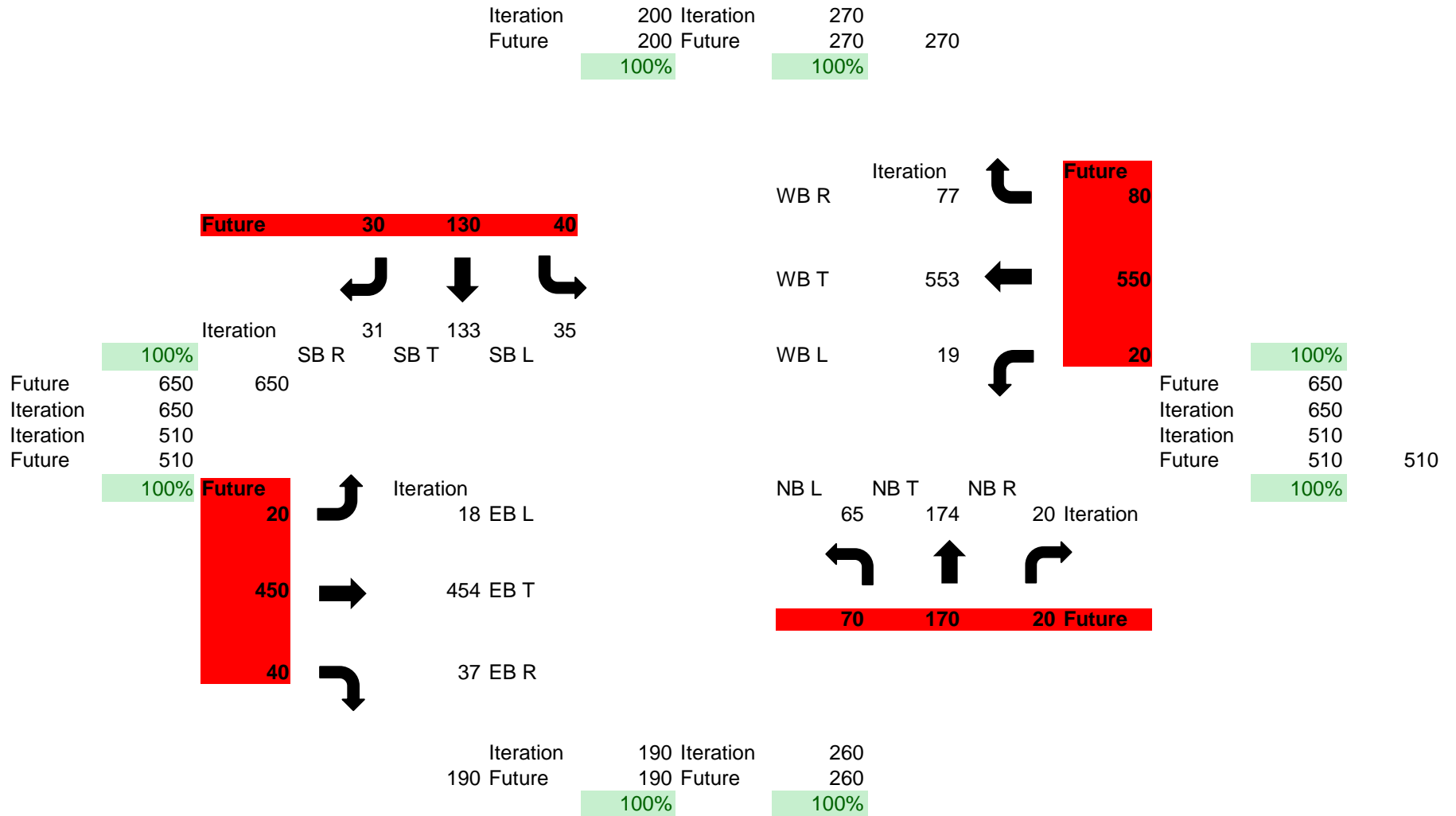
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES													
Southbound			Westbound			Northbound			Eastbound				
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
13	139	14	12	148	30	48	186	12	9	125	29		
166			190			246			163				
Trucks:			Trucks:			Trucks:			Trucks:				
0%			0%			0%			0%				
Peak Hour: 05:00 PM to 6:00 PM						Peak Vol: 765						PHF: 0.96	

2030 AM: 150 W & 700 N



2030 PM: 150 W & 700 N



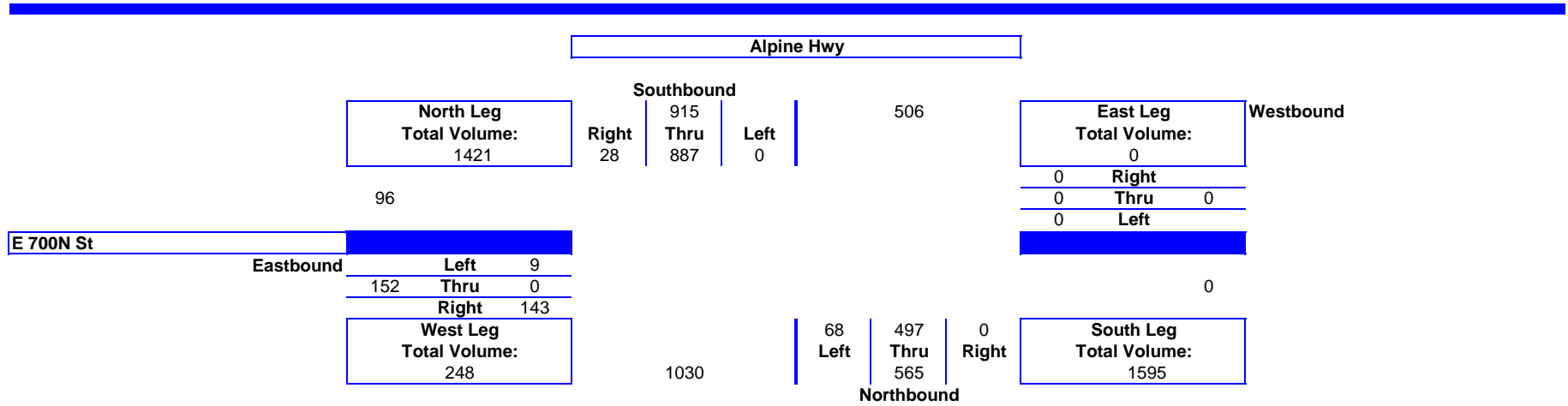
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **Alpine Hwy**
 Date: **Tuesday, September 10, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **E 700N St**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	0	133	0	0	0	0	0	0	11	74	0	0	0	0	33	0	251	
07:15 AM	07:30 AM	0	220	2	0	0	0	0	0	11	102	0	0	1	0	43	0	379	
07:30 AM	07:45 AM	0	201	4	0	0	0	0	0	19	132	0	0	1	0	36	0	393	
07:45 AM	08:00 AM	0	216	9	0	0	0	0	0	17	153	0	0	2	0	31	0	428	1451
08:00 AM	08:15 AM	0	250	13	0	0	0	0	0	21	110	0	0	5	0	33	0	432	1632
08:15 AM	08:30 AM	0	138	6	0	0	0	0	0	16	88	0	0	0	0	17	0	265	1518
08:30 AM	08:45 AM	0	138	5	0	0	0	0	0	13	84	0	0	7	0	28	0	275	1400
08:45 AM	09:00 AM	0	155	5	0	0	0	0	0	16	107	0	0	0	0	23	0	306	1278



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	887	28	0	0	0	68	497	0	9	0	143	
915			0			565			152			
Trucks:			Trucks:			Trucks:			Trucks:			
0%			0%			0%			0%			
Peak Hour: 07:15 AM to 8:15 AM						Peak Vol: 1632			PHF: 0.94			

TRAFFIC COUNT SUMMARY



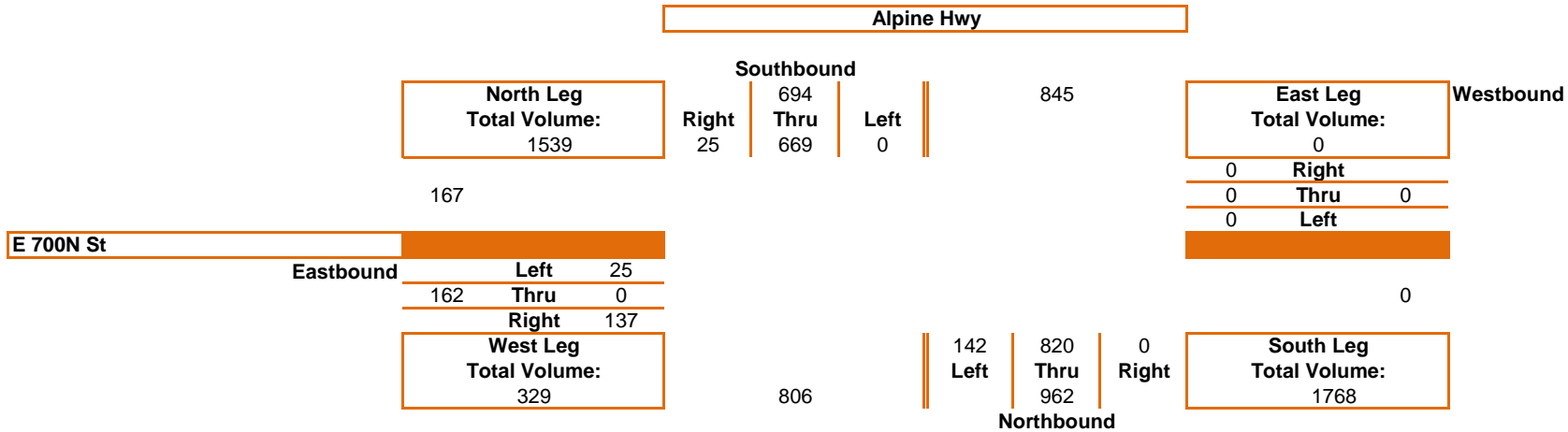
Updated September 13, 2019

City: **American Fork**
 N-S Street: **Alpine Hwy**
 Date: **Tuesday, September 10, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **E 700N St**

For Use with Jamar PetraPro Software

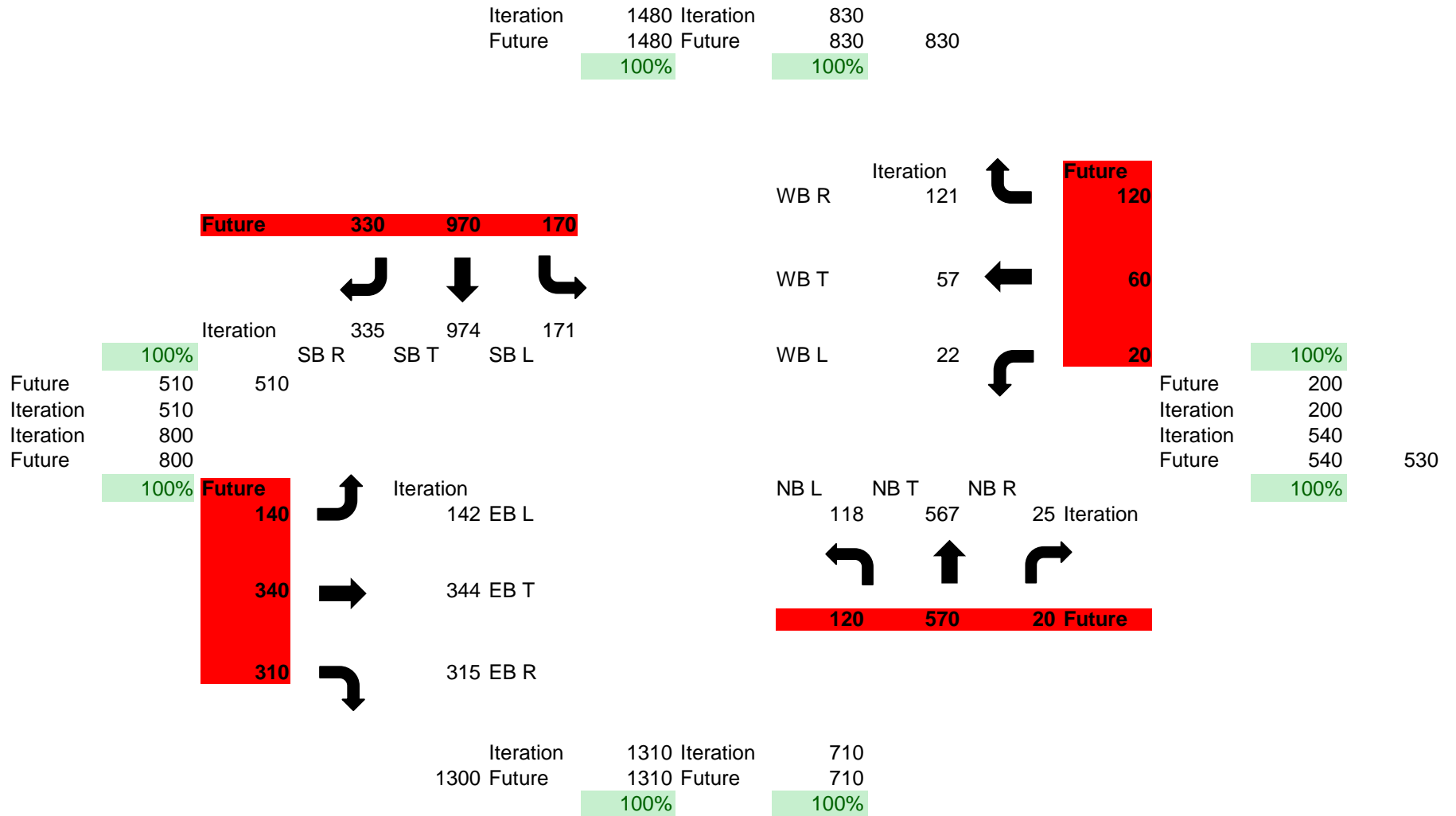
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	0	189	4	0	0	0	0	0	33	193	0	0	4	0	29	0	452	
04:15 PM	04:30 PM	0	151	9	0	0	0	0	0	42	195	0	0	4	0	36	0	437	
04:30 PM	04:45 PM	0	171	3	0	0	0	0	0	33	176	0	0	0	0	24	0	407	
04:45 PM	05:00 PM	0	170	6	0	0	0	0	0	34	195	0	0	7	0	31	0	443	1739
05:00 PM	05:15 PM	0	152	3	0	0	0	0	0	33	191	0	0	2	0	31	0	412	1699
05:15 PM	05:30 PM	0	169	9	0	0	0	0	0	31	222	0	0	7	0	31	0	469	1731
05:30 PM	05:45 PM	0	178	7	0	0	0	0	0	44	212	0	0	9	0	44	0	494	1818
05:45 PM	06:00 PM	0	164	3	0	0	0	0	0	24	199	0	0	5	0	43	0	438	1813



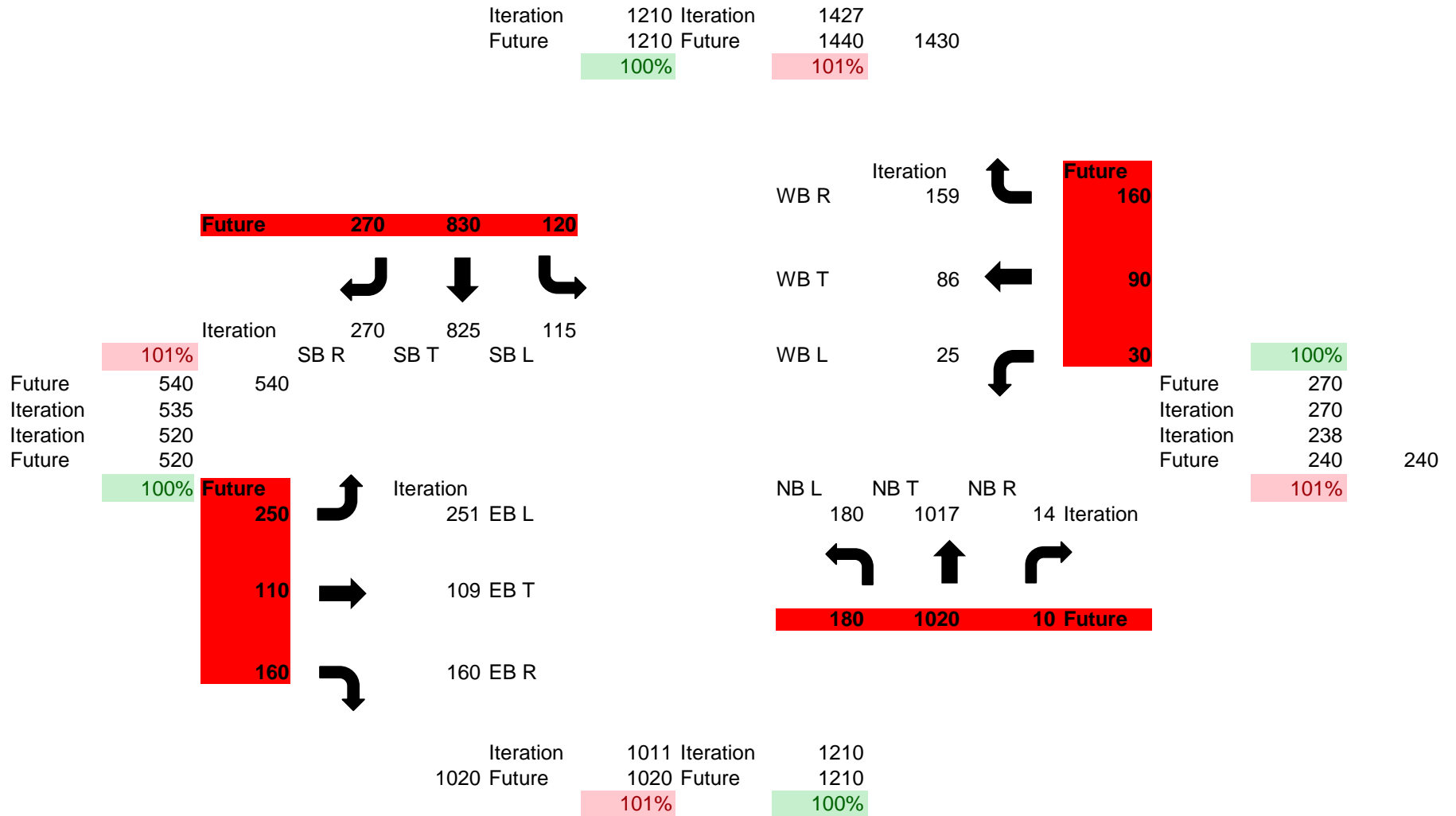
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES											
Southbound			Westbound			Northbound			Eastbound		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
0	669	25	0	0	0	142	820	0	25	0	137
694			0			962			162		
Trucks: 0%			Trucks: 0%			Trucks: 0%			Trucks: 0%		
Peak Hour: 04:45 PM to 5:45 PM			Peak Vol: 1818			PHF: 0.92					

2030 AM: Alpine Hwy & 700 N



2030 PM: Alpine Hwy & 700 N



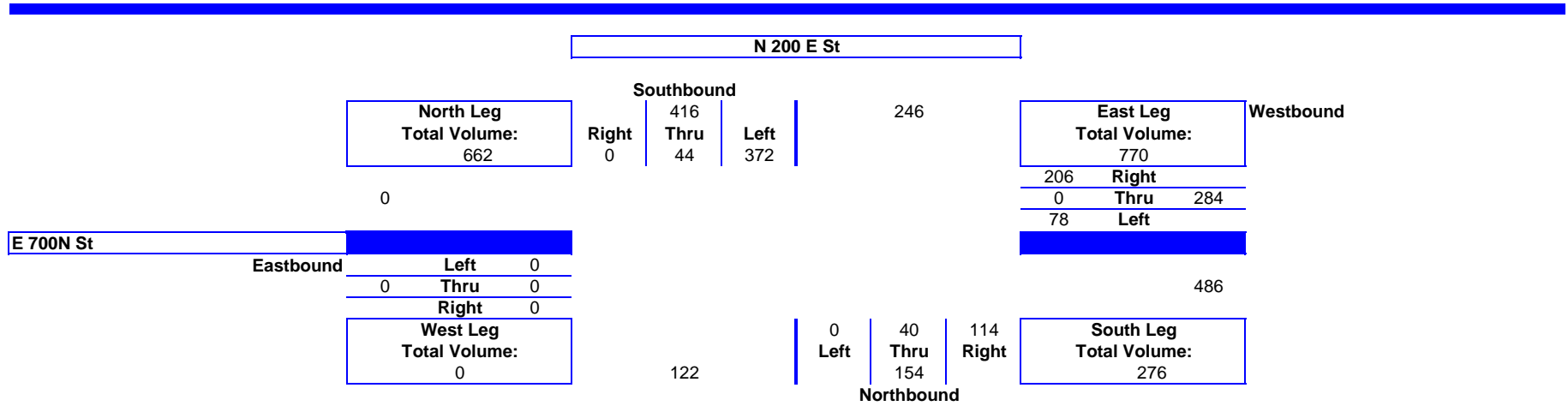
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **N 200 E St**
 Date: **Wednesday, September 4, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **E 700N St**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	77	1	0	0	11	0	22	0	0	2	25	0	0	0	0	0	138	
07:15 AM	07:30 AM	132	9	0	0	10	0	36	0	0	6	34	0	0	0	0	0	227	
07:30 AM	07:45 AM	95	7	0	0	19	0	66	1	0	12	22	1	0	0	0	0	221	
07:45 AM	08:00 AM	59	8	0	0	27	0	64	2	0	10	25	0	0	0	0	0	193	779
08:00 AM	08:15 AM	86	20	0	0	22	0	40	1	0	12	33	0	0	0	0	0	213	854
08:15 AM	08:30 AM	36	10	0	0	19	0	32	0	0	4	15	0	0	0	0	0	116	743
08:30 AM	08:45 AM	23	12	0	0	9	0	22	0	0	2	17	0	0	0	0	0	85	607
08:45 AM	09:00 AM	40	9	0	0	17	0	16	0	0	3	23	0	0	0	0	0	108	522



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
372	44	0	78	0	206	0	40	114	0	0	0	
416			284			154			0			
Trucks: 0%			Trucks: 1%			Trucks: 1%			Trucks: 0%			
Peak Hour: 07:15 AM to 8:15 AM						Peak Vol: 854						PHF: 0.94

TRAFFIC COUNT SUMMARY



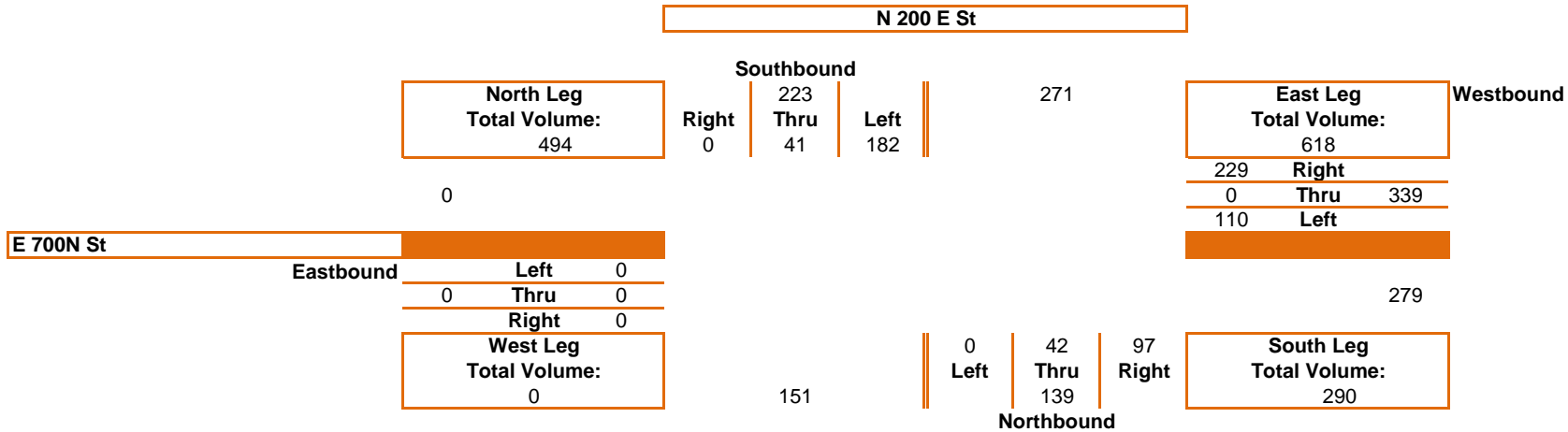
Updated September 13, 2019

City: **American fork**
 N-S Street: **N 200 E St**
 Date: **Wednesday, September 4, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **E 700N St**

For Use with Jamar PetraPro Software

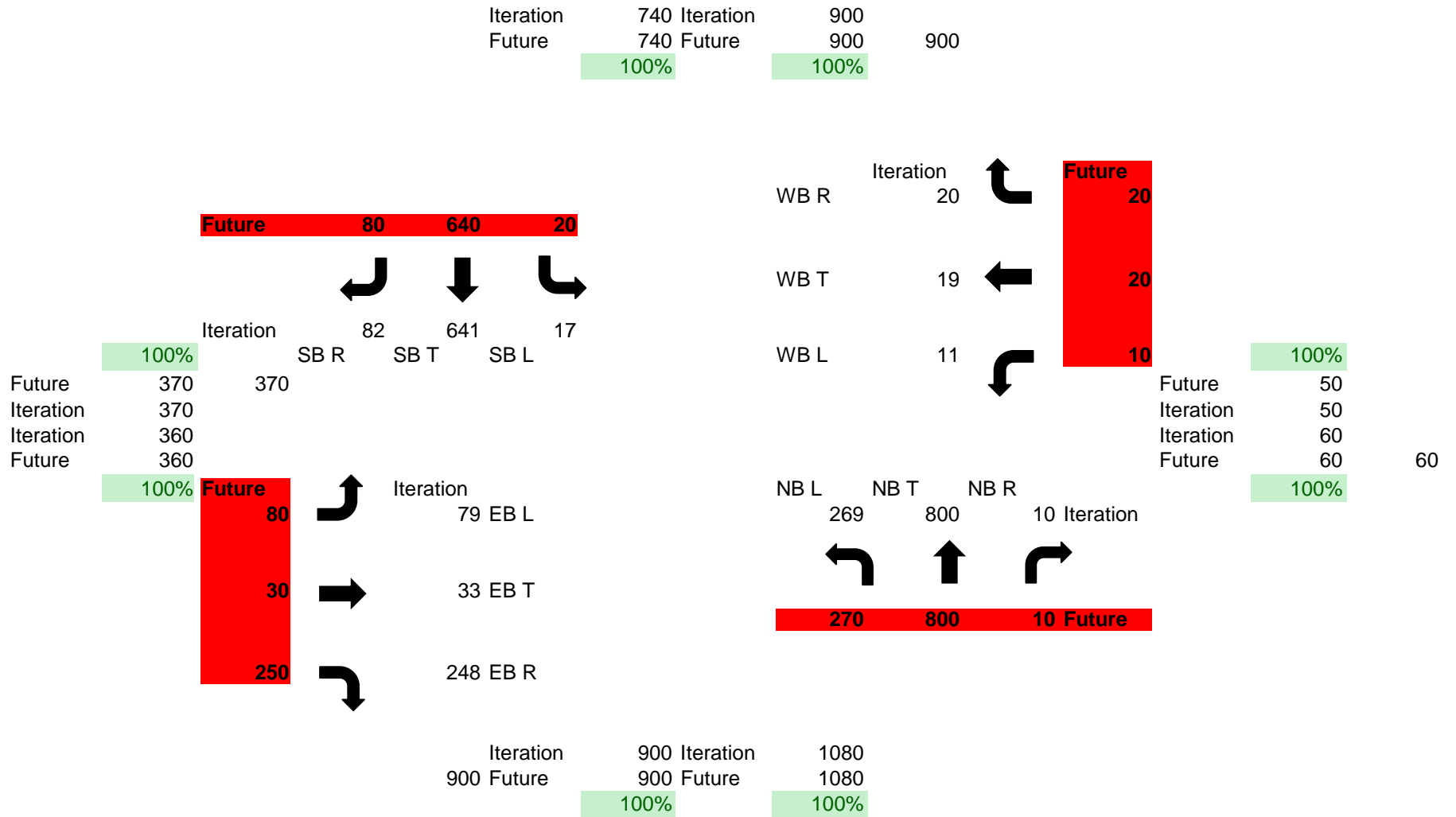
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	30	6	0	0	21	0	24	0	0	7	23	0	0	0	0	0	111	
04:15 PM	04:30 PM	36	9	1	0	23	0	51	0	0	8	35	0	0	0	0	0	163	
04:30 PM	04:45 PM	40	16	0	0	22	0	43	0	0	11	21	0	0	0	0	1	153	
04:45 PM	05:00 PM	57	10	0	0	33	0	49	0	0	7	28	0	0	0	0	0	184	611
05:00 PM	05:15 PM	34	9	0	0	36	0	76	0	0	11	26	0	0	0	0	0	192	692
05:15 PM	05:30 PM	39	9	0	0	18	0	62	0	0	15	20	0	0	0	0	0	163	692
05:30 PM	05:45 PM	52	13	0	0	23	0	42	0	0	9	23	0	0	0	0	0	162	701
05:45 PM	06:00 PM	42	14	0	0	23	0	45	0	0	5	28	0	0	0	0	0	157	674



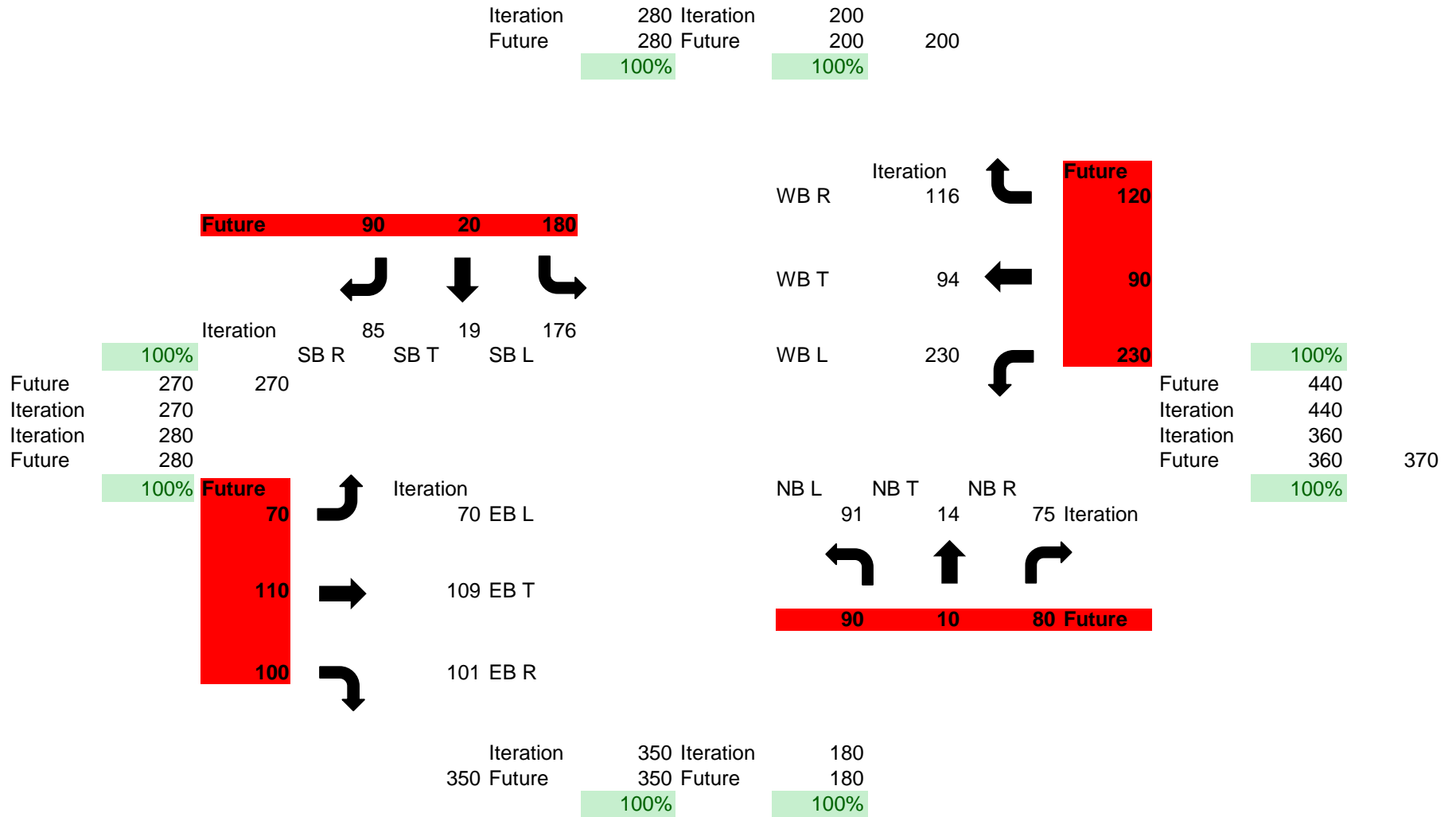
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES											
Southbound			Westbound			Northbound			Eastbound		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
182	41	0	110	0	229	0	42	97	0	0	0
223			339			139			0		
Trucks:			0%			Trucks:			0%		
Peak Hour:			04:45 PM to 5:45 PM			Peak Vol:			701		
						PHF:			0.91		

2030 AM: Alpine Hwy & 700 N



2030 PM: 200 E & 700 N



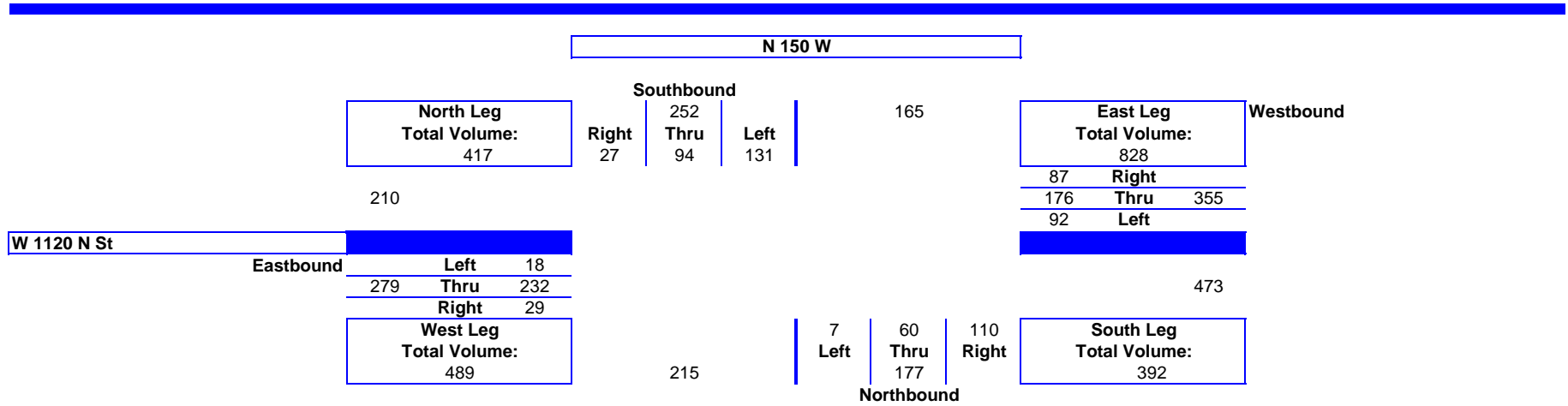
TRAFFIC COUNT SUMMARY

City: **American Fork**
 N-S Street: **N 150 W**
 Date: **Tuesday, September 10, 2019**
 Begin Time: **07:00 AM**
 Interval Length: **15 min**

E-W Street: **W 1120 N St**



Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
07:00 AM	07:15 AM	38	14	6	0	1	10	7	0	1	7	5	0	5	34	6	0	134	
07:15 AM	07:30 AM	35	18	3	0	1	13	9	0	0	11	6	2	4	49	1	0	150	
07:30 AM	07:45 AM	29	15	5	8	8	19	10	1	0	15	11	0	2	46	7	2	167	
07:45 AM	08:00 AM	31	26	13	41	37	62	29	4	3	19	59	0	10	78	13	5	380	831
08:00 AM	08:15 AM	36	35	6	17	46	82	39	4	4	15	34	0	2	59	8	1	366	1063
08:15 AM	08:30 AM	12	20	3	1	8	21	15	0	4	8	6	1	3	22	4	0	126	1039
08:30 AM	08:45 AM	17	17	1	1	0	14	6	0	1	13	1	0	3	33	0	0	106	978
08:45 AM	09:00 AM	20	15	7	0	3	14	9	1	2	12	4	0	7	16	4	0	113	711



OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1

ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
131	94	27	92	176	87	7	60	110	18	232	29	
252			355			177			279			
Trucks:			Trucks:			Trucks:			Trucks:			
26%			3%			1%			3%			
Peak Hour: 07:15 AM to 8:15 AM						Peak Vol: 1063						PHF: 0.70

TRAFFIC COUNT SUMMARY



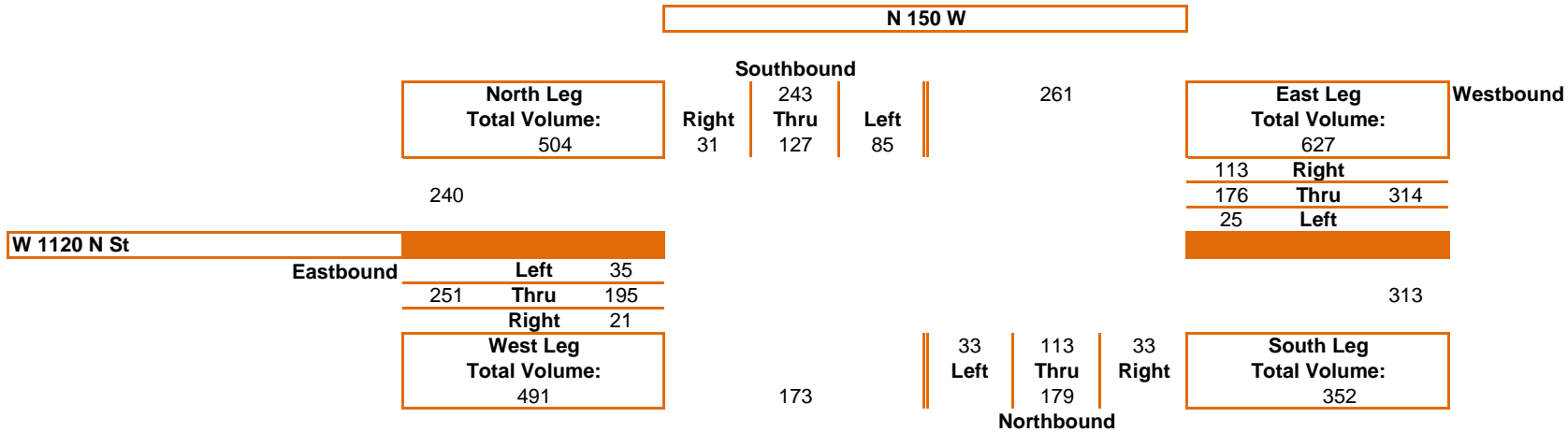
Updated September 13, 2019

City: **American Fork**
 N-S Street: **N 150 W**
 Date: **Tuesday, September 10, 2019**
 Begin Time: **04:00 PM**
 Interval Length: **15 min**

E-W Street: **W 1120 N St**

For Use with Jamar PetraPro Software

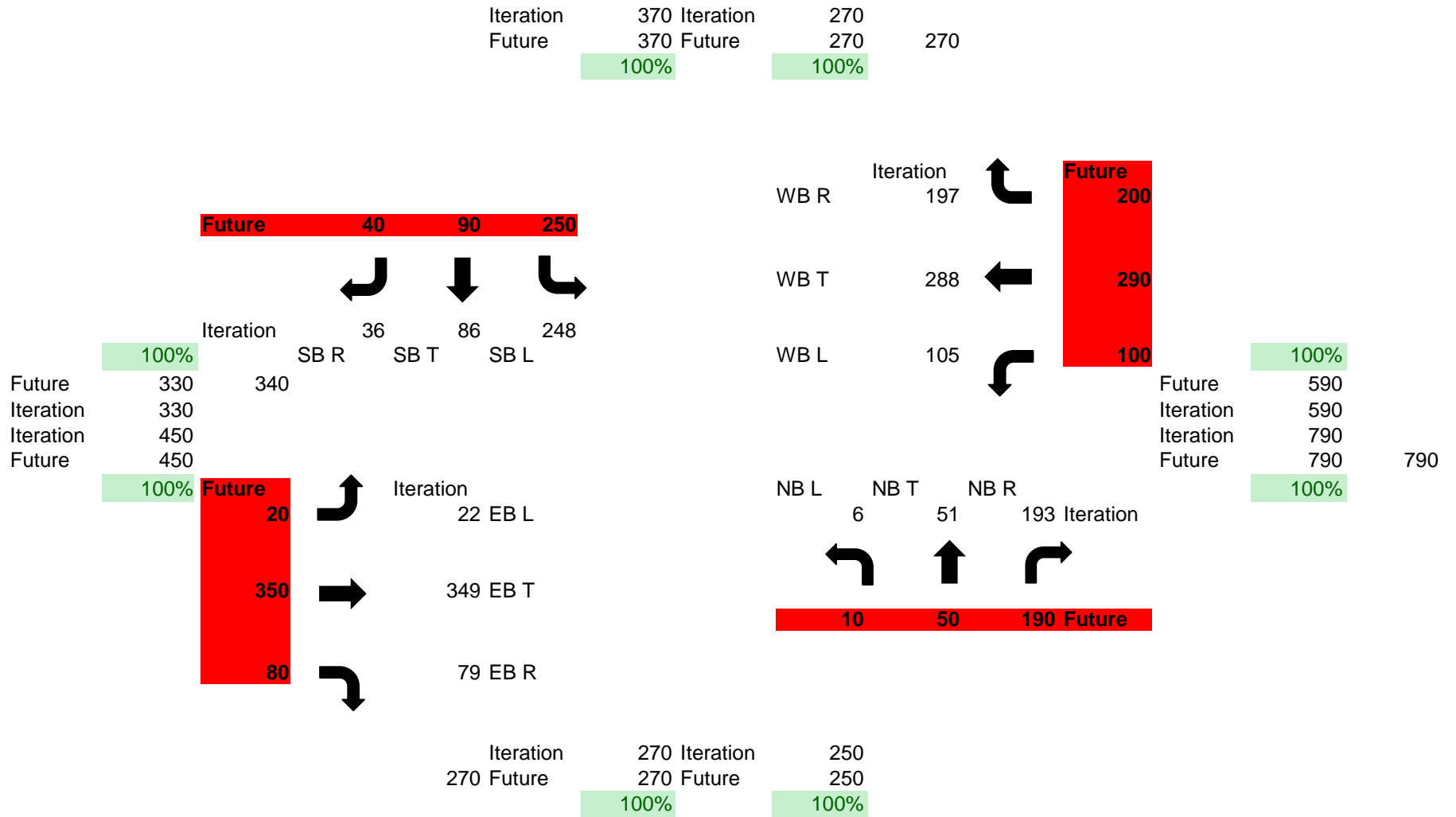
Time Interval		SB				WB				NB				EB				Total All Moves	Hourly Totals
		Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
04:00 PM	04:15 PM	9	31	11	2	7	51	23	1	1	19	3	0	6	32	2	0	195	
04:15 PM	04:30 PM	16	16	9	0	2	42	22	0	2	25	4	0	9	44	5	0	196	
04:30 PM	04:45 PM	30	33	15	5	7	49	16	0	2	24	7	0	9	49	5	0	246	
04:45 PM	05:00 PM	27	31	7	1	5	47	27	0	3	29	6	1	11	49	6	0	248	885
05:00 PM	05:15 PM	18	21	7	0	5	45	29	0	10	29	5	2	4	48	6	0	227	917
05:15 PM	05:30 PM	27	31	7	2	9	40	23	2	4	29	13	0	14	59	6	0	262	983
05:30 PM	05:45 PM	19	37	10	0	5	37	23	4	8	25	5	0	5	42	3	0	219	956
05:45 PM	06:00 PM	21	38	7	0	6	54	38	0	11	30	10	0	12	46	6	0	279	987



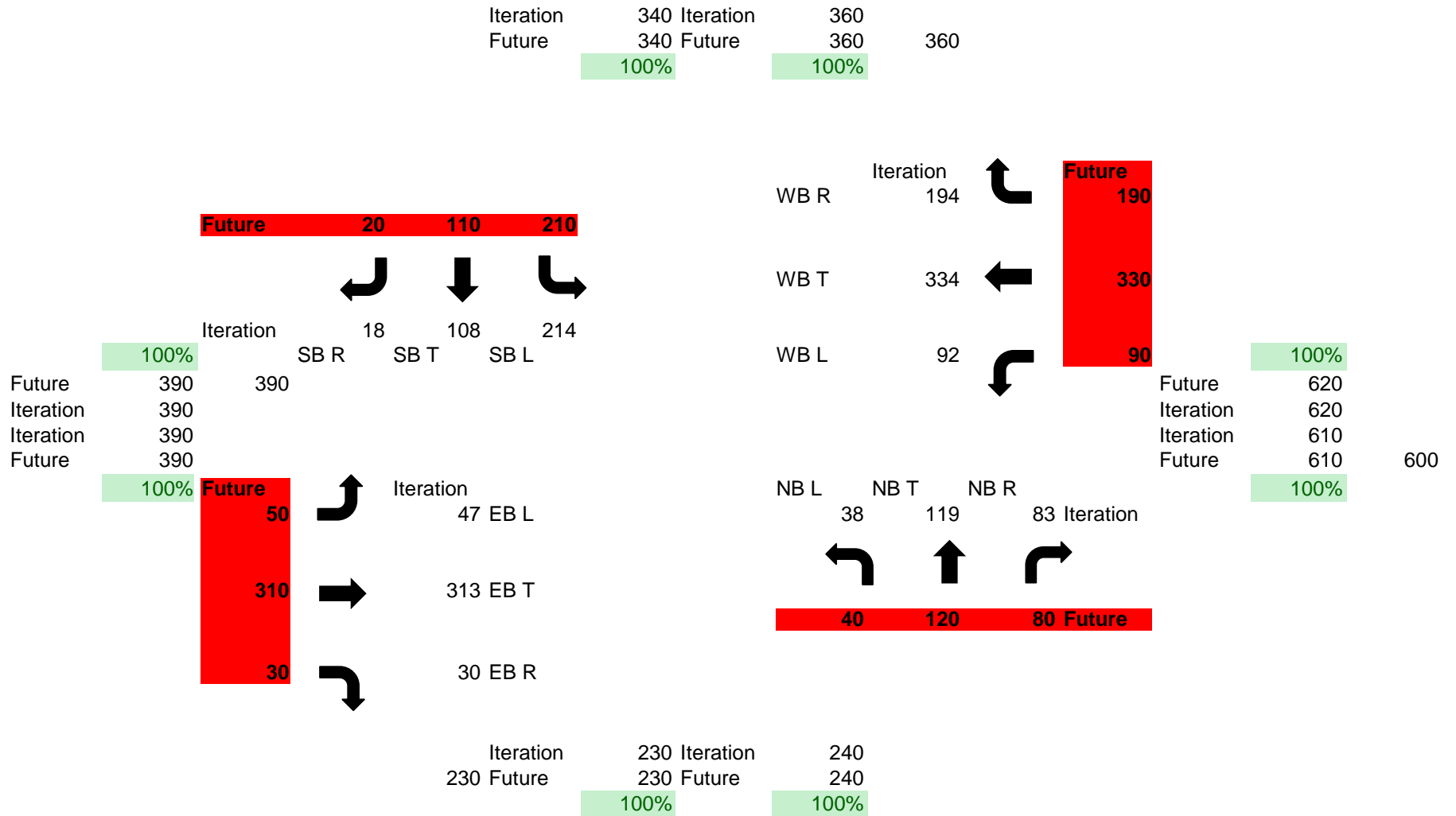
OPTIONAL Adjustment Factors	
Monthly:	1.00
Daily:	1.00
Interval:	1.00
Count:	1.00
Total:	1


ADJUSTED PEAK HOUR TRAFFIC VOLUMES												
Southbound			Westbound			Northbound			Eastbound			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
85	127	31	25	176	113	33	113	33	35	195	21	
243			314			179			251			
Trucks:			Trucks:			Trucks:			Trucks:			
1%			2%			1%			0%			
Peak Hour: 05:00 PM to 6:00 PM						Peak Vol: 987						PHF: 0.88

2030 AM: 150 W & 1120 N



2030 PM: 150 W & 1120 N





Synchro 10 Reports

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	157	0	7	159	0	0
Future Vol, veh/h	157	0	7	159	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	171	0	8	173	0	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	171	0	360
Stage 1	-	-	-	-	171
Stage 2	-	-	-	-	189
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1406	-	639
Stage 1	-	-	-	-	859
Stage 2	-	-	-	-	843
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1406	-	635
Mov Cap-2 Maneuver	-	-	-	-	635
Stage 1	-	-	-	-	854
Stage 2	-	-	-	-	843

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1406	-
HCM Lane V/C Ratio	-	-	-	0.005	-
HCM Control Delay (s)	0	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	252	1	1	346	3	9
Future Vol, veh/h	252	1	1	346	3	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	274	1	1	376	3	10

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	275	0	653
Stage 1	-	-	-	-	275
Stage 2	-	-	-	-	378
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1288	-	432
Stage 1	-	-	-	-	771
Stage 2	-	-	-	-	693
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1288	-	432
Mov Cap-2 Maneuver	-	-	-	-	432
Stage 1	-	-	-	-	770
Stage 2	-	-	-	-	693

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	641	-	-	1288	-
HCM Lane V/C Ratio	0.02	-	-	0.001	-
HCM Control Delay (s)	10.7	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Intersection Delay, s/veh	14
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	370	10	10	320	10	40	60	10	10	10	40
Future Vol, veh/h	30	370	10	10	320	10	40	60	10	10	10	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	402	11	11	348	11	43	65	11	11	11	43
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.9	13.6	10.7	9.6
HCM LOS	C	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	36%	7%	3%	17%
Vol Thru, %	55%	90%	94%	17%
Vol Right, %	9%	2%	3%	67%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	110	410	340	60
LT Vol	40	30	10	10
Through Vol	60	370	320	10
RT Vol	10	10	10	40
Lane Flow Rate	120	446	370	65
Geometry Grp	1	1	1	1
Degree of Util (X)	0.202	0.62	0.523	0.106
Departure Headway (Hd)	6.097	5.011	5.093	5.856
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	588	722	710	610
Service Time	4.144	3.04	3.124	3.908
HCM Lane V/C Ratio	0.204	0.618	0.521	0.107
HCM Control Delay	10.7	15.9	13.6	9.6
HCM Lane LOS	B	C	B	A
HCM 95th-tile Q	0.7	4.3	3.1	0.4

Intersection	
Intersection Delay, s/veh	75.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	80	330	10	10	470	100	10	200	30	80	30	70
Future Vol, veh/h	80	330	10	10	470	100	10	200	30	80	30	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	87	359	11	11	511	109	11	217	33	87	33	76
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	48.1	135	22.1	18.5
HCM LOS	E	F	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	19%	2%	44%
Vol Thru, %	83%	79%	81%	17%
Vol Right, %	12%	2%	17%	39%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	240	420	580	180
LT Vol	10	80	10	80
Through Vol	200	330	470	30
RT Vol	30	10	100	70
Lane Flow Rate	261	457	630	196
Geometry Grp	1	1	1	1
Degree of Util (X)	0.57	0.901	1.21	0.44
Departure Headway (Hd)	8.482	7.598	6.911	8.764
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	428	479	523	413
Service Time	6.482	5.598	5.002	6.764
HCM Lane V/C Ratio	0.61	0.954	1.205	0.475
HCM Control Delay	22.1	48.1	135	18.5
HCM Lane LOS	C	E	F	C
HCM 95th-tile Q	3.5	10.1	23.4	2.2

HCM 6th Signalized Intersection Summary

3: 700 W & 200 S

12/05/2019

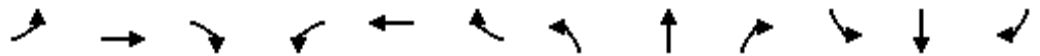


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	30	370	10	10	320	10	40	60	10	10	10	40
Future Volume (veh/h)	30	370	10	10	320	10	40	60	10	10	10	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	402	11	11	348	11	43	65	11	11	11	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	511	13	88	532	16	356	503	76	176	190	533
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.50	0.50	0.50	0.50	0.50	0.50
Sat Flow, veh/h	71	1702	45	20	1774	55	493	1007	153	164	381	1065
Grp Volume(v), veh/h	446	0	0	370	0	0	119	0	0	65	0	0
Grp Sat Flow(s),veh/h/ln	1817	0	0	1849	0	0	1653	0	0	1611	0	0
Q Serve(g_s), s	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	10.1	0.0	0.0	7.8	0.0	0.0	1.6	0.0	0.0	0.9	0.0	0.0
Prop In Lane	0.07		0.02	0.03		0.03	0.36		0.09	0.17		0.66
Lane Grp Cap(c), veh/h	631	0	0	637	0	0	935	0	0	899	0	0
V/C Ratio(X)	0.71	0.00	0.00	0.58	0.00	0.00	0.13	0.00	0.00	0.07	0.00	0.00
Avail Cap(c_a), veh/h	807	0	0	818	0	0	935	0	0	899	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.5	0.0	0.0	13.8	0.0	0.0	6.0	0.0	0.0	5.9	0.0	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.0	0.8	0.0	0.0	0.3	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	0.0	2.9	0.0	0.0	0.5	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.5	0.0	0.0	14.6	0.0	0.0	6.3	0.0	0.0	6.0	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		446			370			119				65
Approach Delay, s/veh		16.5			14.6			6.3				6.0
Approach LOS		B			B			A				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.0		18.0		27.0		18.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		3.6		12.1		2.9		9.8				
Green Ext Time (p_c), s		0.5		1.4		0.2		1.4				
Intersection Summary												
HCM 6th Ctrl Delay				13.9								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary

3: 700 W & 200 S

12/05/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	80	330	10	10	470	100	10	200	30	80	30	70
Future Volume (veh/h)	80	330	10	10	470	100	10	200	30	80	30	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	359	11	11	511	109	11	217	33	87	33	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	155	515	15	71	599	126	79	676	99	340	142	246
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	191	1276	36	10	1483	312	25	1563	230	569	328	568
Grp Volume(v), veh/h	457	0	0	631	0	0	261	0	0	196	0	0
Grp Sat Flow(s),veh/h/ln	1503	0	0	1805	0	0	1818	0	0	1465	0	0
Q Serve(g_s), s	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	13.6	0.0	0.0	17.5	0.0	0.0	5.2	0.0	0.0	3.9	0.0	0.0
Prop In Lane	0.19		0.02	0.02		0.17	0.04		0.13	0.44		0.39
Lane Grp Cap(c), veh/h	685	0	0	796	0	0	854	0	0	728	0	0
V/C Ratio(X)	0.67	0.00	0.00	0.79	0.00	0.00	0.31	0.00	0.00	0.27	0.00	0.00
Avail Cap(c_a), veh/h	828	0	0	968	0	0	854	0	0	728	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.3	0.0	0.0	15.0	0.0	0.0	10.3	0.0	0.0	10.0	0.0	0.0
Incr Delay (d2), s/veh	1.5	0.0	0.0	3.8	0.0	0.0	0.9	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	0.0	6.8	0.0	0.0	2.0	0.0	0.0	1.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.9	0.0	0.0	18.8	0.0	0.0	11.3	0.0	0.0	10.9	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		457			631			261				196
Approach Delay, s/veh		14.9			18.8			11.3				10.9
Approach LOS		B			B			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		28.3		26.7		28.3		26.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.5		27.5		18.5		27.5				
Max Q Clear Time (g_c+I1), s		7.2		15.6		5.9		19.5				
Green Ext Time (p_c), s		1.1		2.5		0.9		2.7				
Intersection Summary												
HCM 6th Ctrl Delay				15.3								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary

1: Pioneer Crossing & 1020 W St

12/05/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑↑		↖	↑↑↑↑	↗		↕		↖	↗	
Traffic Volume (veh/h)	310	3170	50	30	1130	70	120	20	20	90	20	240
Future Volume (veh/h)	310	3170	50	30	1130	70	120	20	20	90	20	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	337	3446	54	33	1228	76	130	22	22	98	22	261
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	426	3724	58	130	2397	744	176	30	20	462	34	403
Arrive On Green	0.12	0.57	0.57	0.03	0.47	0.47	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1781	6575	103	1781	5106	1585	385	110	72	1362	125	1479
Grp Volume(v), veh/h	337	2525	975	33	1228	76	174	0	0	98	0	283
Grp Sat Flow(s),veh/h/ln	1781	1609	1852	1781	1702	1585	567	0	0	1362	0	1604
Q Serve(g_s), s	7.9	41.9	42.5	0.8	14.8	2.4	10.3	0.0	0.0	0.0	0.0	13.7
Cycle Q Clear(g_c), s	7.9	41.9	42.5	0.8	14.8	2.4	24.0	0.0	0.0	4.8	0.0	13.7
Prop In Lane	1.00		0.06	1.00		1.00	0.75		0.13	1.00		0.92
Lane Grp Cap(c), veh/h	426	2733	1049	130	2397	744	226	0	0	462	0	437
V/C Ratio(X)	0.79	0.92	0.93	0.25	0.51	0.10	0.77	0.00	0.00	0.21	0.00	0.65
Avail Cap(c_a), veh/h	654	2737	1051	167	2397	744	226	0	0	462	0	437
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.7	17.4	17.5	20.7	16.3	13.0	38.0	0.0	0.0	25.1	0.0	28.3
Incr Delay (d2), s/veh	3.7	6.0	14.0	1.0	0.2	0.1	22.1	0.0	0.0	1.0	0.0	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	15.2	20.0	0.4	5.5	0.8	5.1	0.0	0.0	1.7	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.4	23.3	31.5	21.7	16.5	13.1	60.1	0.0	0.0	26.1	0.0	35.6
LnGrp LOS	B	C	C	C	B	B	E	A	A	C	A	D
Approach Vol, veh/h		3837			1337			174				381
Approach Delay, s/veh		24.9			16.4			60.1				33.2
Approach LOS		C			B			E				C
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		28.0	6.2	53.9		28.0	14.8	45.4				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		24.0	4.0	50.0		24.0	22.0	32.0				
Max Q Clear Time (g_c+I1), s		26.0	2.8	44.5		15.7	9.9	16.8				
Green Ext Time (p_c), s		0.0	0.0	5.4		1.3	0.8	7.9				
Intersection Summary												
HCM 6th Ctrl Delay			24.5									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary

1: Pioneer Crossing & 1020 W St

12/05/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑↑		↖	↑↑↑↑	↗		↕		↖	↗	
Traffic Volume (veh/h)	270	1630	60	10	2650	170	20	110	70	60	100	310
Future Volume (veh/h)	270	1630	60	10	2650	170	20	110	70	60	100	310
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	293	1772	65	11	2880	185	22	120	76	65	109	337
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	260	4134	152	212	2785	865	36	118	63	149	95	294
Arrive On Green	0.11	0.64	0.64	0.01	0.55	0.55	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1781	6418	235	1781	5106	1585	0	498	267	1187	402	1244
Grp Volume(v), veh/h	293	1332	505	11	2880	185	218	0	0	65	0	446
Grp Sat Flow(s),veh/h/ln	1781	1609	1828	1781	1702	1585	765	0	0	1187	0	1646
Q Serve(g_s), s	12.0	14.9	14.9	0.3	60.0	6.6	0.0	0.0	0.0	0.0	0.0	26.0
Cycle Q Clear(g_c), s	12.0	14.9	14.9	0.3	60.0	6.6	26.0	0.0	0.0	19.0	0.0	26.0
Prop In Lane	1.00		0.13	1.00		1.00	0.10		0.35	1.00		0.76
Lane Grp Cap(c), veh/h	260	3108	1178	212	2785	865	217	0	0	149	0	389
V/C Ratio(X)	1.13	0.43	0.43	0.05	1.03	0.21	1.00	0.00	0.00	0.44	0.00	1.15
Avail Cap(c_a), veh/h	260	3108	1178	259	2785	865	217	0	0	149	0	389
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.4	9.6	9.6	11.0	25.0	12.9	38.0	0.0	0.0	39.3	0.0	42.0
Incr Delay (d2), s/veh	94.7	0.1	0.2	0.1	26.6	0.1	62.4	0.0	0.0	9.1	0.0	91.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	4.9	5.6	0.1	29.3	2.3	8.8	0.0	0.0	2.0	0.0	20.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	133.1	9.7	9.9	11.1	51.6	13.0	100.4	0.0	0.0	48.4	0.0	133.7
LnGrp LOS	F	A	A	B	F	B	F	A	A	D	A	F
Approach Vol, veh/h		2130			3076			218			511	
Approach Delay, s/veh		26.7			49.2			100.4			122.9	
Approach LOS		C			D			F			F	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		30.0	5.1	74.9		30.0	16.0	64.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		26.0	4.0	68.0		26.0	12.0	60.0				
Max Q Clear Time (g_c+I1), s		28.0	2.3	16.9		28.0	14.0	62.0				
Green Ext Time (p_c), s		0.0	0.0	21.6		0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			49.3									
HCM 6th LOS			D									

Intersection						
Int Delay, s/veh	10.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	89	74	22	117	262	87
Future Vol, veh/h	89	74	22	117	262	87
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	80	24	127	285	95

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	151	0	-	0	362 88
Stage 1	-	-	-	-	88 -
Stage 2	-	-	-	-	274 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1430	-	-	-	637 970
Stage 1	-	-	-	-	935 -
Stage 2	-	-	-	-	772 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1430	-	-	-	592 970
Mov Cap-2 Maneuver	-	-	-	-	592 -
Stage 1	-	-	-	-	869 -
Stage 2	-	-	-	-	772 -

Approach	EB	WB	SB
HCM Control Delay, s	4.2	0	17.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1430	-	-	-	656
HCM Lane V/C Ratio	0.068	-	-	-	0.578
HCM Control Delay (s)	7.7	0	-	-	17.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	3.7

Intersection						
Int Delay, s/veh	9.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	203	105	117	455	119	77
Future Vol, veh/h	203	105	117	455	119	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	221	114	127	495	129	84

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	622	0	-	0	931
Stage 1	-	-	-	-	375
Stage 2	-	-	-	-	556
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	959	-	-	-	296
Stage 1	-	-	-	-	695
Stage 2	-	-	-	-	574
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	959	-	-	-	223
Mov Cap-2 Maneuver	-	-	-	-	223
Stage 1	-	-	-	-	524
Stage 2	-	-	-	-	574

Approach	EB	WB	SB
HCM Control Delay, s	6.5	0	41.1
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	959	-	-	-	302
HCM Lane V/C Ratio	0.23	-	-	-	0.705
HCM Control Delay (s)	9.9	0	-	-	41.1
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.9	-	-	-	5

HCM 6th TWSC
3: 1100 S & 500 E

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Intersection

Int Delay, s/veh 107.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	140	50	30	20	10	140	30	60	30	330	60	120
Future Vol, veh/h	140	50	30	20	10	140	30	60	30	330	60	120
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	152	54	33	22	11	152	33	65	33	359	65	130

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	163	0	0	87
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1416	-	-	1509
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1416	-	-	1509
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5	0.9	18.2	208
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	402	1416	-	-	1509	-	-	405
HCM Lane V/C Ratio	0.324	0.107	-	-	0.014	-	-	1.369
HCM Control Delay (s)	18.2	7.8	0	-	7.4	0	-	208
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	1.4	0.4	-	-	0	-	-	26.5

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	183.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	390	60	40	30	70	590	50	100	30	150	90	150
Future Vol, veh/h	390	60	40	30	70	590	50	100	30	150	90	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	424	65	43	33	76	641	54	109	33	163	98	163
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

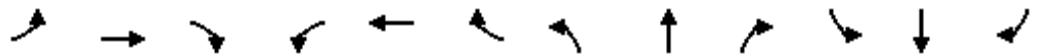
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	156.7	307.3	26.9	71.6
HCM LOS	F	F	D	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	28%	80%	4%	38%
Vol Thru, %	56%	12%	10%	23%
Vol Right, %	17%	8%	86%	38%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	180	490	690	390
LT Vol	50	390	30	150
Through Vol	100	60	70	90
RT Vol	30	40	590	150
Lane Flow Rate	196	533	750	424
Geometry Grp	1	1	1	1
Degree of Util (X)	0.514	1.236	1.612	0.965
Departure Headway (Hd)	11.936	9.756	8.38	10.027
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	305	378	442	365
Service Time	9.936	7.756	6.38	8.027
HCM Lane V/C Ratio	0.643	1.41	1.697	1.162
HCM Control Delay	26.9	156.7	307.3	71.6
HCM Lane LOS	D	F	F	F
HCM 95th-tile Q	2.8	19.6	39.4	10.6

HCM 6th Signalized Intersection Summary

3: 1100 S & 500 E

12/05/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	140	50	30	20	10	140	30	60	30	330	60	120
Future Volume (veh/h)	140	50	30	20	10	140	30	60	30	330	60	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	54	33	22	11	152	33	65	33	359	65	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	292	81	42	99	38	277	294	561	259	672	124	209
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	886	399	206	108	190	1372	333	897	414	893	199	335
Grp Volume(v), veh/h	239	0	0	185	0	0	131	0	0	554	0	0
Grp Sat Flow(s),veh/h/ln	1491	0	0	1670	0	0	1644	0	0	1426	0	0
Q Serve(g_s), s	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.4	0.0	0.0
Cycle Q Clear(g_c), s	7.7	0.0	0.0	5.3	0.0	0.0	1.5	0.0	0.0	12.0	0.0	0.0
Prop In Lane	0.64		0.14	0.12		0.82	0.25		0.25	0.65		0.23
Lane Grp Cap(c), veh/h	414	0	0	415	0	0	1115	0	0	1006	0	0
V/C Ratio(X)	0.58	0.00	0.00	0.45	0.00	0.00	0.12	0.00	0.00	0.55	0.00	0.00
Avail Cap(c_a), veh/h	617	0	0	646	0	0	1115	0	0	1006	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.6	0.0	0.0	18.8	0.0	0.0	4.0	0.0	0.0	5.8	0.0	0.0
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.8	0.0	0.0	0.2	0.0	0.0	2.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.0	1.9	0.0	0.0	0.4	0.0	0.0	2.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	0.0	0.0	19.5	0.0	0.0	4.2	0.0	0.0	8.0	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		239			185			131				554
Approach Delay, s/veh		20.8			19.5			4.2				8.0
Approach LOS		C			B			A				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.2		15.1		37.2		15.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.7		18.3		32.7		18.3				
Max Q Clear Time (g_c+I1), s		3.5		9.7		14.0		7.3				
Green Ext Time (p_c), s		0.8		0.9		3.8		0.8				
Intersection Summary												
HCM 6th Ctrl Delay				12.2								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary

3: 1100 S & 500 E

12/05/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕			↕	
Traffic Volume (veh/h)	390	60	40	30	70	590	50	100	30	150	90	150
Future Volume (veh/h)	390	60	40	30	70	590	50	100	30	150	90	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	424	65	43	33	76	641	54	109	33	163	98	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	401	45	30	288	625	753	199	377	101	278	162	223
Arrive On Green	0.47	0.47	0.47	0.47	0.47	0.47	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	618	95	63	441	1317	1585	327	1004	270	519	431	594
Grp Volume(v), veh/h	532	0	0	109	0	641	196	0	0	424	0	0
Grp Sat Flow(s),veh/h/ln	775	0	0	1758	0	1585	1601	0	0	1544	0	0
Q Serve(g_s), s	26.6	0.0	0.0	0.0	0.0	21.4	0.0	0.0	0.0	9.2	0.0	0.0
Cycle Q Clear(g_c), s	28.5	0.0	0.0	1.9	0.0	21.4	4.5	0.0	0.0	13.7	0.0	0.0
Prop In Lane	0.80		0.08	0.30		1.00	0.28		0.17	0.38		0.38
Lane Grp Cap(c), veh/h	476	0	0	913	0	753	677	0	0	662	0	0
V/C Ratio(X)	1.12	0.00	0.00	0.12	0.00	0.85	0.29	0.00	0.00	0.64	0.00	0.00
Avail Cap(c_a), veh/h	476	0	0	913	0	753	677	0	0	662	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.7	0.0	0.0	8.8	0.0	13.9	13.1	0.0	0.0	15.8	0.0	0.0
Incr Delay (d2), s/veh	77.4	0.0	0.0	0.1	0.0	9.2	1.1	0.0	0.0	4.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.8	0.0	0.0	0.7	0.0	8.2	1.9	0.0	0.0	5.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.1	0.0	0.0	8.8	0.0	23.1	14.2	0.0	0.0	20.5	0.0	0.0
LnGrp LOS	F	A	A	A	A	C	B	A	A	C	A	A
Approach Vol, veh/h		532			750			196			424	
Approach Delay, s/veh		97.1			21.0			14.2			20.5	
Approach LOS		F			C			B			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.0		33.0		27.0		33.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		22.5		28.5		22.5		28.5				
Max Q Clear Time (g_c+I1), s		6.5		30.5		15.7		23.4				
Green Ext Time (p_c), s		1.0		0.0		1.6		1.6				

Intersection Summary

HCM 6th Ctrl Delay	41.5
HCM 6th LOS	D

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	1	524	0	2	0	234	4	1	0	5	7
Future Vol, veh/h	5	1	524	0	2	0	234	4	1	0	5	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	1	570	0	2	0	254	4	1	0	5	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	2	0	0	571	0	0	305	298	286	301	583	2
Stage 1	-	-	-	-	-	-	296	296	-	2	2	-
Stage 2	-	-	-	-	-	-	9	2	-	299	581	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1620	-	-	1002	-	-	647	614	753	651	424	1082
Stage 1	-	-	-	-	-	-	712	668	-	1021	894	-
Stage 2	-	-	-	-	-	-	1012	894	-	710	500	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1620	-	-	1002	-	-	633	611	753	644	422	1082
Mov Cap-2 Maneuver	-	-	-	-	-	-	633	611	-	644	422	-
Stage 1	-	-	-	-	-	-	708	665	-	1016	894	-
Stage 2	-	-	-	-	-	-	999	894	-	701	498	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0			14.6			10.6		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	633	1620	-	-	1002	-	-	655
HCM Lane V/C Ratio	0.41	0.003	-	-	-	-	-	0.02
HCM Control Delay (s)	14.6	7.2	0	-	0	-	-	10.6
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	2	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	8.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	0	97	0	1	0	486	4	1	0	0	6
Future Vol, veh/h	4	0	97	0	1	0	486	4	1	0	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	105	0	1	0	528	4	1	0	0	7

Major/Minor	Minor2		Minor1			Major1		Major2				
Conflicting Flow All	1065	1065	4	1117	1068	5	7	0	0	5	0	0
Stage 1	4	4	-	1061	1061	-	-	-	-	-	-	-
Stage 2	1061	1061	-	56	7	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	200	223	1080	185	222	1078	1614	-	-	1616	-	-
Stage 1	1018	892	-	271	300	-	-	-	-	-	-	-
Stage 2	271	300	-	956	890	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	148	150	1080	125	149	1078	1614	-	-	1616	-	-
Mov Cap-2 Maneuver	148	150	-	125	149	-	-	-	-	-	-	-
Stage 1	684	892	-	182	202	-	-	-	-	-	-	-
Stage 2	181	202	-	863	890	-	-	-	-	-	-	-

Approach	EB		WB			NB		SB		
HCM Control Delay, s	9.8		29.3			8.2		0		
HCM LOS	A		D							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1614	-	-	864	149	1616	-	-
HCM Lane V/C Ratio	0.327	-	-	0.127	0.007	-	-	-
HCM Control Delay (s)	8.3	0	-	9.8	29.3	0	-	-
HCM Lane LOS	A	A	-	A	D	A	-	-
HCM 95th %tile Q(veh)	1.4	-	-	0.4	0	0	-	-

Intersection

Int Delay, s/veh 168.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	170	740	80	310	70	290	10	70	90	10	10
Future Vol, veh/h	10	170	740	80	310	70	290	10	70	90	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	185	804	87	337	76	315	11	76	98	11	11

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	413	0	0	989
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1146	-	-	699
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1146	-	-	699
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.9	\$ 797.6	156.5
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	153	1146	-	-	699	-	-	118
HCM Lane V/C Ratio	2.629	0.009	-	-	0.124	-	-	1.013
HCM Control Delay (s)	\$ 797.6	8.2	0	-	10.9	0	-	156.5
HCM Lane LOS	F	A	A	-	B	A	-	F
HCM 95th %tile Q(veh)	35.4	0	-	-	0.4	-	-	6.8

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	479											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	210	150	30	340	50	650	20	170	40	10	40
Future Vol, veh/h	10	210	150	30	340	50	650	20	170	40	10	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	228	163	33	370	54	707	22	185	43	11	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	424	0	0	391	0	0	822	822	310	898	876	397
Stage 1	-	-	-	-	-	-	332	332	-	463	463	-
Stage 2	-	-	-	-	-	-	490	490	-	435	413	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1135	-	-	1168	-	-	~ 293	309	730	260	287	652
Stage 1	-	-	-	-	-	-	~ 681	644	-	579	564	-
Stage 2	-	-	-	-	-	-	~ 560	549	-	600	594	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1135	-	-	1168	-	-	~ 255	294	730	176	273	652
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 255	294	-	176	273	-
Stage 1	-	-	-	-	-	-	~ 672	636	-	571	543	-
Stage 2	-	-	-	-	-	-	~ 493	529	-	427	586	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.6			\$ 977.7			24.9		
HCM LOS							F			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	295	1135	-	-	1168	-	-	277
HCM Lane V/C Ratio	3.095	0.01	-	-	0.028	-	-	0.353
HCM Control Delay (s)	\$ 977.7	8.2	0	-	8.2	0	-	24.9
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	81.5	0	-	-	0.1	-	-	1.5

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th Signalized Intersection Summary

3: 620 S & 600 E

12/05/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↔		↖	↗			↕	
Traffic Volume (veh/h)	10	170	740	80	310	70	290	10	70	90	10	10
Future Volume (veh/h)	10	170	740	80	310	70	290	10	70	90	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	185	804	87	337	76	315	11	76	98	11	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	79	858	753	150	504	105	665	77	529	489	55	44
Arrive On Green	0.47	0.47	0.47	0.47	0.47	0.47	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	34	1806	1585	167	1061	220	1390	204	1412	1012	147	117
Grp Volume(v), veh/h	196	0	804	500	0	0	315	0	87	120	0	0
Grp Sat Flow(s),veh/h/ln	1839	0	1585	1448	0	0	1390	0	1616	1276	0	0
Q Serve(g_s), s	0.0	0.0	28.5	7.0	0.0	0.0	4.4	0.0	2.1	3.1	0.0	0.0
Cycle Q Clear(g_c), s	3.7	0.0	28.5	14.6	0.0	0.0	9.6	0.0	2.1	5.3	0.0	0.0
Prop In Lane	0.06		1.00	0.17		0.15	1.00		0.87	0.82		0.09
Lane Grp Cap(c), veh/h	937	0	753	758	0	0	665	0	606	588	0	0
V/C Ratio(X)	0.21	0.00	1.07	0.66	0.00	0.00	0.47	0.00	0.14	0.20	0.00	0.00
Avail Cap(c_a), veh/h	937	0	753	758	0	0	665	0	606	588	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.2	0.0	15.8	11.7	0.0	0.0	14.6	0.0	12.4	13.7	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	52.4	2.1	0.0	0.0	2.4	0.0	0.5	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	19.4	4.5	0.0	0.0	3.4	0.0	0.8	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.3	0.0	68.2	13.8	0.0	0.0	17.0	0.0	12.9	14.5	0.0	0.0
LnGrp LOS	A	A	F	B	A	A	B	A	B	B	A	A
Approach Vol, veh/h		1000			500			402			120	
Approach Delay, s/veh		56.7			13.8			16.1			14.5	
Approach LOS		E			B			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.0		33.0		27.0		33.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		22.5		28.5		22.5		28.5				
Max Q Clear Time (g_c+I1), s		11.6		30.5		7.3		16.6				
Green Ext Time (p_c), s		1.1		0.0		0.5		3.1				
Intersection Summary												
HCM 6th Ctrl Delay			35.5									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary

3: 620 S & 600 E

12/05/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↔		↖	↗			↕	
Traffic Volume (veh/h)	10	210	150	30	340	50	650	20	170	40	10	40
Future Volume (veh/h)	10	210	150	30	340	50	650	20	170	40	10	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	228	163	33	370	54	707	22	185	43	11	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	59	511	445	72	417	59	919	102	862	403	118	359
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	30	1823	1585	73	1486	209	1350	171	1440	557	197	600
Grp Volume(v), veh/h	239	0	163	457	0	0	707	0	207	97	0	0
Grp Sat Flow(s),veh/h/ln	1853	0	1585	1768	0	0	1350	0	1611	1353	0	0
Q Serve(g_s), s	0.0	0.0	6.1	10.0	0.0	0.0	26.6	0.0	4.4	0.1	0.0	0.0
Cycle Q Clear(g_c), s	7.8	0.0	6.1	18.6	0.0	0.0	31.2	0.0	4.4	4.5	0.0	0.0
Prop In Lane	0.05		1.00	0.07		0.12	1.00		0.89	0.44		0.44
Lane Grp Cap(c), veh/h	570	0	445	548	0	0	919	0	964	880	0	0
V/C Ratio(X)	0.42	0.00	0.37	0.83	0.00	0.00	0.77	0.00	0.21	0.11	0.00	0.00
Avail Cap(c_a), veh/h	586	0	458	563	0	0	919	0	964	880	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.1	0.0	21.5	25.8	0.0	0.0	12.0	0.0	6.9	6.4	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.5	10.2	0.0	0.0	6.2	0.0	0.5	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	2.2	8.9	0.0	0.0	9.3	0.0	1.4	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	0.0	22.0	36.0	0.0	0.0	18.1	0.0	7.4	6.6	0.0	0.0
LnGrp LOS	C	A	C	D	A	A	B	A	A	A	A	A
Approach Vol, veh/h		402			457			914				97
Approach Delay, s/veh		22.3			36.0			15.7				6.6
Approach LOS		C			D			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.0		25.4		49.0		25.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		44.5		21.5		44.5		21.5				
Max Q Clear Time (g_c+I1), s		33.2		9.8		6.5		20.6				
Green Ext Time (p_c), s		3.3		1.5		0.6		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				21.6								
HCM 6th LOS				C								

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↑↑	↕	↕	↑↑	
Traffic Vol, veh/h	2	0	9	1	0	1	2	560	1	2	1090	4
Future Vol, veh/h	2	0	9	1	0	1	2	560	1	2	1090	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	10	1	0	1	2	609	1	2	1185	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1500	1805	595	1210	1806	305	1189	0	0	610	0	0
Stage 1	1191	1191	-	613	613	-	-	-	-	-	-	-
Stage 2	309	614	-	597	1193	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	84	78	447	138	78	691	583	-	-	965	-	-
Stage 1	199	259	-	446	481	-	-	-	-	-	-	-
Stage 2	676	481	-	456	258	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	83	78	447	134	78	691	583	-	-	965	-	-
Mov Cap-2 Maneuver	83	78	-	134	78	-	-	-	-	-	-	-
Stage 1	198	258	-	445	480	-	-	-	-	-	-	-
Stage 2	673	480	-	445	257	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	20.2		21.2		0		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	583	-	-	249	224	965	-
HCM Lane V/C Ratio	0.004	-	-	0.048	0.01	0.002	-
HCM Control Delay (s)	11.2	-	-	20.2	21.2	8.7	-
HCM Lane LOS	B	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0	-

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↑↑	↕	↕	↑↑	
Traffic Vol, veh/h	2	0	8	1	0	0	9	863	2	2	915	1
Future Vol, veh/h	2	0	8	1	0	0	9	863	2	2	915	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	9	1	0	0	10	938	2	2	995	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1489	1960	498	1460	1958	469	996	0	0	940	0	0
Stage 1	1000	1000	-	958	958	-	-	-	-	-	-	-
Stage 2	489	960	-	502	1000	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	86	63	518	90	63	541	690	-	-	725	-	-
Stage 1	261	319	-	276	334	-	-	-	-	-	-	-
Stage 2	529	333	-	520	319	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	85	62	518	87	62	541	690	-	-	725	-	-
Mov Cap-2 Maneuver	85	62	-	87	62	-	-	-	-	-	-	-
Stage 1	257	318	-	272	329	-	-	-	-	-	-	-
Stage 2	521	328	-	510	318	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	19.6		46.9		0.1		0	
HCM LOS	C		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	690	-	-	257	87	725	-
HCM Lane V/C Ratio	0.014	-	-	0.042	0.012	0.003	-
HCM Control Delay (s)	10.3	-	-	19.6	46.9	10	-
HCM Lane LOS	B	-	-	C	E	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↑↑	↕	↕	↑↑	
Traffic Vol, veh/h	10	120	60	60	260	30	40	680	80	40	1200	20
Future Vol, veh/h	10	120	60	60	260	30	40	680	80	40	1200	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	130	65	65	283	33	43	739	87	43	1304	22

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1998	2313	663	1628	2237	370	1326	0	0	826	0	0
Stage 1	1401	1401	-	825	825	-	-	-	-	-	-	-
Stage 2	597	912	-	803	1412	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	35	~ 37	404	68	~ 42	627	517	-	-	800	-	-
Stage 1	147	205	-	333	385	-	-	-	-	-	-	-
Stage 2	456	351	-	343	~ 203	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 32	404	-	~ 36	627	517	-	-	800	-	-
Mov Cap-2 Maneuver	-	~ 32	-	-	~ 36	-	-	-	-	-	-	-
Stage 1	135	194	-	305	353	-	-	-	-	-	-	-
Stage 2	79	322	-	89	~ 192	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0.6	0.3
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	517	-	-	-	800	-	-
HCM Lane V/C Ratio	0.084	-	-	-	0.054	-	-
HCM Control Delay (s)	12.6	-	-	-	9.8	-	-
HCM Lane LOS	B	-	-	-	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-	0.2	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↑↑	↕	↕	↑↑	
Traffic Vol, veh/h	20	330	90	70	270	60	50	980	80	60	1020	10
Future Vol, veh/h	20	330	90	70	270	60	50	980	80	60	1020	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	359	98	76	293	65	54	1065	87	65	1109	11

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2032	2505	560	2037	2423	533	1120	0	0	1152	0	0
Stage 1	1245	1245	-	1173	1173	-	-	-	-	-	-	-
Stage 2	787	1260	-	864	1250	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	33	~ 28	472	~ 33	~ 32	491	619	-	-	602	-	-
Stage 1	184	~ 244	-	204	~ 264	-	-	-	-	-	-	-
Stage 2	351	~ 240	-	315	~ 243	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 23	472	-	~ 26	491	619	-	-	602	-	-
Mov Cap-2 Maneuver	-	~ 23	-	-	~ 26	-	-	-	-	-	-	-
Stage 1	168	~ 218	-	186	~ 241	-	-	-	-	-	-	-
Stage 2	-	~ 219	-	-	~ 217	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s					0.5		0.6	
HCM LOS	-		-					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	619	-	-	-	602	-	-
HCM Lane V/C Ratio	0.088	-	-	-	0.108	-	-
HCM Control Delay (s)	11.4	-	-	-	11.7	-	-
HCM Lane LOS	B	-	-	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-	0.4	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary

3: 7280 N & 1040 E

12/05/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↕
Traffic Volume (veh/h)	10	120	60	60	260	30	40	680	80	40	1200	20
Future Volume (veh/h)	10	120	60	60	260	30	40	680	80	40	1200	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	130	65	65	283	33	43	739	87	43	1304	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	314	149	139	371	40	266	1961	875	432	1973	33
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.55	0.55	0.55	0.55	0.55	0.55
Sat Flow, veh/h	36	1174	558	203	1385	151	413	3554	1585	663	3576	60
Grp Volume(v), veh/h	206	0	0	381	0	0	43	739	87	43	648	678
Grp Sat Flow(s),veh/h/ln	1767	0	0	1739	0	0	413	1777	1585	663	1777	1860
Q Serve(g_s), s	0.0	0.0	0.0	5.3	0.0	0.0	4.1	5.9	1.3	2.0	12.8	12.8
Cycle Q Clear(g_c), s	4.8	0.0	0.0	10.1	0.0	0.0	16.9	5.9	1.3	7.8	12.8	12.8
Prop In Lane	0.05		0.32	0.17		0.09	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	549	0	0	550	0	0	266	1961	875	432	980	1026
V/C Ratio(X)	0.38	0.00	0.00	0.69	0.00	0.00	0.16	0.38	0.10	0.10	0.66	0.66
Avail Cap(c_a), veh/h	725	0	0	724	0	0	266	1961	875	432	980	1026
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.1	0.0	0.0	17.0	0.0	0.0	13.9	6.3	5.3	8.5	7.9	7.9
Incr Delay (d2), s/veh	0.4	0.0	0.0	1.9	0.0	0.0	1.3	0.6	0.2	0.5	3.5	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.0	3.8	0.0	0.0	0.4	1.7	0.4	0.3	4.3	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.5	0.0	0.0	18.8	0.0	0.0	15.2	6.9	5.5	9.0	11.4	11.2
LnGrp LOS	B	A	A	B	A	A	B	A	A	A	B	B
Approach Vol, veh/h		206			381			869			1369	
Approach Delay, s/veh		15.5			18.8			7.2			11.2	
Approach LOS		B			B			A			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		32.0		17.8		32.0		17.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		27.5		18.5		27.5		18.5				
Max Q Clear Time (g_c+I1), s		18.9		6.8		14.8		12.1				
Green Ext Time (p_c), s		3.8		0.9		7.4		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				11.3								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary

3: 7280 N & 1040 E

12/05/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↕
Traffic Volume (veh/h)	20	330	90	70	270	60	50	980	80	60	1020	10
Future Volume (veh/h)	20	330	90	70	270	60	50	980	80	60	1020	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	359	98	76	293	65	54	1065	87	65	1109	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	93	443	117	154	387	79	286	1731	772	286	1756	17
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.49	0.49	0.49	0.49	0.49	0.49
Sat Flow, veh/h	38	1393	368	198	1216	249	503	3554	1585	488	3605	36
Grp Volume(v), veh/h	479	0	0	434	0	0	54	1065	87	65	547	573
Grp Sat Flow(s),veh/h/ln	1799	0	0	1662	0	0	503	1777	1585	488	1777	1864
Q Serve(g_s), s	0.5	0.0	0.0	0.0	0.0	0.0	4.1	10.1	1.4	5.2	10.5	10.5
Cycle Q Clear(g_c), s	11.3	0.0	0.0	10.8	0.0	0.0	14.6	10.1	1.4	15.3	10.5	10.5
Prop In Lane	0.05		0.20	0.18		0.15	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	654	0	0	621	0	0	286	1731	772	286	865	908
V/C Ratio(X)	0.73	0.00	0.00	0.70	0.00	0.00	0.19	0.62	0.11	0.23	0.63	0.63
Avail Cap(c_a), veh/h	797	0	0	748	0	0	286	1731	772	286	865	908
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.6	0.0	0.0	14.3	0.0	0.0	14.2	8.7	6.4	14.3	8.8	8.8
Incr Delay (d2), s/veh	2.8	0.0	0.0	2.3	0.0	0.0	1.5	1.6	0.3	1.8	3.5	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	0.0	3.8	0.0	0.0	0.5	3.2	0.4	0.6	3.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.4	0.0	0.0	16.5	0.0	0.0	15.7	10.3	6.7	16.1	12.3	12.1
LnGrp LOS	B	A	A	B	A	A	B	B	A	B	B	B
Approach Vol, veh/h		479			434			1206			1185	
Approach Delay, s/veh		17.4			16.5			10.3			12.4	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.0		19.2		27.0		19.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		22.5		18.5		22.5		18.5				
Max Q Clear Time (g_c+I1), s		16.6		13.3		17.3		12.8				
Green Ext Time (p_c), s		3.8		1.4		3.3		1.4				
Intersection Summary												
HCM 6th Ctrl Delay				12.9								
HCM 6th LOS				B								

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	24	93	27	1	81	2	7	34	0	8	61	35
Future Vol, veh/h	24	93	27	1	81	2	7	34	0	8	61	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	101	29	1	88	2	8	37	0	9	66	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	90	0	0	130	0	0	311	260	116	277	273	89
Stage 1	-	-	-	-	-	-	168	168	-	91	91	-
Stage 2	-	-	-	-	-	-	143	92	-	186	182	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1505	-	-	1455	-	-	642	645	936	675	634	969
Stage 1	-	-	-	-	-	-	834	759	-	916	820	-
Stage 2	-	-	-	-	-	-	860	819	-	816	749	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1505	-	-	1455	-	-	558	632	936	635	621	969
Mov Cap-2 Maneuver	-	-	-	-	-	-	558	632	-	635	621	-
Stage 1	-	-	-	-	-	-	818	745	-	899	819	-
Stage 2	-	-	-	-	-	-	759	818	-	761	735	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.2			0.1			11.3			11		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	618	1505	-	-	1455	-	-	708
HCM Lane V/C Ratio	0.072	0.017	-	-	0.001	-	-	0.16
HCM Control Delay (s)	11.3	7.4	0	-	7.5	0	-	11
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.6

Intersection												
Int Delay, s/veh	6.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	95	246	54	1	85	6	27	82	3	9	65	42
Future Vol, veh/h	95	246	54	1	85	6	27	82	3	9	65	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	103	267	59	1	92	7	29	89	3	10	71	46

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	99	0	0	326	0	0	659	604	297	647	630	96
Stage 1	-	-	-	-	-	-	503	503	-	98	98	-
Stage 2	-	-	-	-	-	-	156	101	-	549	532	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1494	-	-	1234	-	-	377	412	742	384	399	960
Stage 1	-	-	-	-	-	-	551	541	-	908	814	-
Stage 2	-	-	-	-	-	-	846	811	-	520	526	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1494	-	-	1234	-	-	286	377	742	293	365	960
Mov Cap-2 Maneuver	-	-	-	-	-	-	286	377	-	293	365	-
Stage 1	-	-	-	-	-	-	504	495	-	831	813	-
Stage 2	-	-	-	-	-	-	735	810	-	388	481	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.8			0.1			20.4			15.8		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	354	1494	-	-	1234	-	-	459
HCM Lane V/C Ratio	0.344	0.069	-	-	0.001	-	-	0.275
HCM Control Delay (s)	20.4	7.6	0	-	7.9	0	-	15.8
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.5	0.2	-	-	0	-	-	1.1

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	150	10	30	130	20	10	40	20	40	60	10
Future Vol, veh/h	10	150	10	30	130	20	10	40	20	40	60	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	163	11	33	141	22	11	43	22	43	65	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	163	0	0	174	0	0	447	420	169	441	414	152
Stage 1	-	-	-	-	-	-	191	191	-	218	218	-
Stage 2	-	-	-	-	-	-	256	229	-	223	196	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1416	-	-	1403	-	-	522	525	875	527	529	894
Stage 1	-	-	-	-	-	-	811	742	-	784	723	-
Stage 2	-	-	-	-	-	-	749	715	-	780	739	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1416	-	-	1403	-	-	453	507	875	467	510	894
Mov Cap-2 Maneuver	-	-	-	-	-	-	453	507	-	467	510	-
Stage 1	-	-	-	-	-	-	804	735	-	777	704	-
Stage 2	-	-	-	-	-	-	654	696	-	709	732	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			1.3			12.4			14.1		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	565	1416	-	-	1403	-	-	513
HCM Lane V/C Ratio	0.135	0.008	-	-	0.023	-	-	0.233
HCM Control Delay (s)	12.4	7.6	0	-	7.6	0	-	14.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.9

Intersection												
Int Delay, s/veh	7.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	100	310	50	10	130	10	30	80	10	10	60	50
Future Vol, veh/h	100	310	50	10	130	10	30	80	10	10	60	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	109	337	54	11	141	11	33	87	11	11	65	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	152	0	0	391	0	0	810	756	364	800	778	147
Stage 1	-	-	-	-	-	-	582	582	-	169	169	-
Stage 2	-	-	-	-	-	-	228	174	-	631	609	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1429	-	-	1168	-	-	298	337	681	303	328	900
Stage 1	-	-	-	-	-	-	499	499	-	833	759	-
Stage 2	-	-	-	-	-	-	775	755	-	469	485	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1429	-	-	1168	-	-	214	301	681	214	293	900
Mov Cap-2 Maneuver	-	-	-	-	-	-	214	301	-	214	293	-
Stage 1	-	-	-	-	-	-	450	450	-	751	751	-
Stage 2	-	-	-	-	-	-	658	747	-	336	437	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.7			0.5			27.9			18.7		
HCM LOS							D			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	285	1429	-	-	1168	-	-	391
HCM Lane V/C Ratio	0.458	0.076	-	-	0.009	-	-	0.334
HCM Control Delay (s)	27.9	7.7	0	-	8.1	0	-	18.7
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	2.3	0.2	-	-	0	-	-	1.4

HCM 6th TWSC
6: Pacific Dr./Pacific Dr & 400 W

12/05/2019

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	70	171	1	1	178	19	1	1	1	57	1	187
Future Vol, veh/h	70	171	1	1	178	19	1	1	1	57	1	187
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	78	190	1	1	198	21	1	1	1	63	1	208

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	219	0	0	191	0	0	662	568	191	559	558	209
Stage 1	-	-	-	-	-	-	347	347	-	211	211	-
Stage 2	-	-	-	-	-	-	315	221	-	348	347	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1350	-	-	1383	-	-	375	432	851	440	438	831
Stage 1	-	-	-	-	-	-	669	635	-	791	728	-
Stage 2	-	-	-	-	-	-	696	720	-	668	635	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1350	-	-	1383	-	-	268	407	851	419	412	831
Mov Cap-2 Maneuver	-	-	-	-	-	-	268	407	-	419	412	-
Stage 1	-	-	-	-	-	-	630	598	-	745	727	-
Stage 2	-	-	-	-	-	-	521	719	-	627	598	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0	13.9	13.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	407	1350	-	-	1383	-	-	674
HCM Lane V/C Ratio	0.008	0.058	-	-	0.001	-	-	0.404
HCM Control Delay (s)	13.9	7.8	-	-	7.6	-	-	13.9
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	2

HCM 6th TWSC
6: Pacific Dr & 400 W

12/05/2019

Intersection												
Int Delay, s/veh	12											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	273	497	2	1	532	81	1	1	1	15	1	250
Future Vol, veh/h	273	497	2	1	532	81	1	1	1	15	1	250
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	294	534	2	1	572	87	1	1	1	16	1	269

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	659	0	0	536	0	0	1876	1784	535	1742	1742	616
Stage 1	-	-	-	-	-	-	1123	1123	-	618	618	-
Stage 2	-	-	-	-	-	-	753	661	-	1124	1124	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	929	-	-	1032	-	-	55	82	545	68	87	491
Stage 1	-	-	-	-	-	-	250	281	-	477	481	-
Stage 2	-	-	-	-	-	-	402	460	-	249	281	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	929	-	-	1032	-	-	19	56	545	50	59	491
Mov Cap-2 Maneuver	-	-	-	-	-	-	19	56	-	50	59	-
Stage 1	-	-	-	-	-	-	171	192	-	326	481	-
Stage 2	-	-	-	-	-	-	181	460	-	169	192	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	3.8			0			100.2			62.5		
HCM LOS							F			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	41	929	-	-	1032	-	-	322
HCM Lane V/C Ratio	0.079	0.316	-	-	0.001	-	-	0.888
HCM Control Delay (s)	100.2	10.7	-	-	8.5	-	-	62.5
HCM Lane LOS	F	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.2	1.4	-	-	0	-	-	8.3

HCM 6th TWSC
6: Pacific Dr & 400 W

12/05/2019

Intersection												
Int Delay, s/veh	57.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	120	320	1	1	330	40	1	1	1	140	1	300
Future Vol, veh/h	120	320	1	1	330	40	1	1	1	140	1	300
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	130	348	1	1	359	43	1	1	1	152	1	326

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	402	0	0	349	0	0	1155	1013	349	993	992	381
Stage 1	-	-	-	-	-	-	609	609	-	383	383	-
Stage 2	-	-	-	-	-	-	546	404	-	610	609	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1157	-	-	1210	-	-	174	239	694	224	246	666
Stage 1	-	-	-	-	-	-	482	485	-	640	612	-
Stage 2	-	-	-	-	-	-	522	599	-	482	485	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1157	-	-	1210	-	-	81	212	694	203	218	666
Mov Cap-2 Maneuver	-	-	-	-	-	-	81	212	-	203	218	-
Stage 1	-	-	-	-	-	-	428	431	-	568	611	-
Stage 2	-	-	-	-	-	-	266	598	-	426	431	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0	27.7	160.5
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	162	1157	-	-	1210	-	-	385
HCM Lane V/C Ratio	0.02	0.113	-	-	0.001	-	-	1.245
HCM Control Delay (s)	27.7	8.5	-	-	8	-	-	160.5
HCM Lane LOS	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.1	0.4	-	-	0	-	-	20.5

HCM 6th TWSC
6: Pacific Dr & 400 W

12/05/2019

Intersection												
Int Delay, s/veh	163.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	330	810	1	1	865	85	1	1	1	20	1	290
Future Vol, veh/h	330	810	1	1	865	85	1	1	1	20	1	290
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	359	880	1	1	940	92	1	1	1	22	1	315

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	1032	0	0	881	0	0	2745	2633	881	2588	2587	986
Stage 1	-	-	-	-	-	-	1599	1599	-	988	988	-
Stage 2	-	-	-	-	-	-	1146	1034	-	1600	1599	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	673	-	-	767	-	-	13	24	346	~ 17	25	~ 301
Stage 1	-	-	-	-	-	-	133	166	-	297	325	-
Stage 2	-	-	-	-	-	-	242	309	-	133	166	-
Platoon blocked, %		-	-	-	-	-						
Mov Cap-1 Maneuver	673	-	-	767	-	-	-	11	346	~ 9	12	~ 301
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	11	-	~ 9	12	-
Stage 1	-	-	-	-	-	-	62	78	-	139	325	-
Stage 2	-	-	-	-	-	-	-	309	-	61	78	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.7	0		\$ 1244.6
HCM LOS			-	F

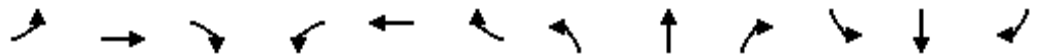
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	673	-	-	767	-	-	95
HCM Lane V/C Ratio	-	0.533	-	-	0.001	-	-	3.558
HCM Control Delay (s)	-	16.3	-	-	9.7	-	-	\$ 1244.6
HCM Lane LOS	-	C	-	-	A	-	-	F
HCM 95th %tile Q(veh)	-	3.2	-	-	0	-	-	34.1

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary

6: Pacific Dr & 400 W

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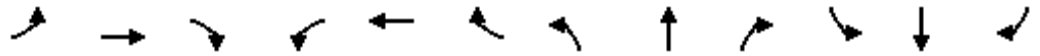


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	320	1	1	330	40	1	1	1	140	1	300
Future Volume (veh/h)	120	320	1	1	330	40	1	1	1	140	1	300
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	130	348	1	1	359	43	1	1	1	152	1	326
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	400	712	2	443	626	75	268	258	198	278	36	395
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	983	1864	5	1032	1639	196	368	688	528	399	96	1056
Grp Volume(v), veh/h	130	0	349	1	0	402	3	0	0	479	0	0
Grp Sat Flow(s),veh/h/ln	983	0	1869	1032	0	1835	1585	0	0	1552	0	0
Q Serve(g_s), s	4.5	0.0	5.2	0.0	0.0	6.4	0.0	0.0	0.0	7.8	0.0	0.0
Cycle Q Clear(g_c), s	10.9	0.0	5.2	5.3	0.0	6.4	0.0	0.0	0.0	10.2	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.11	0.33		0.33	0.32		0.68
Lane Grp Cap(c), veh/h	400	0	714	443	0	701	723	0	0	709	0	0
V/C Ratio(X)	0.32	0.00	0.49	0.00	0.00	0.57	0.00	0.00	0.00	0.68	0.00	0.00
Avail Cap(c_a), veh/h	503	0	911	551	0	894	883	0	0	882	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.3	0.0	8.7	10.7	0.0	9.0	7.2	0.0	0.0	10.4	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.5	0.0	0.0	0.7	0.0	0.0	0.0	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.6	0.0	0.0	1.9	0.0	0.0	0.0	2.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.8	0.0	9.2	10.7	0.0	9.8	7.2	0.0	0.0	11.8	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	B	A	A
Approach Vol, veh/h		479			403			3			479	
Approach Delay, s/veh		10.4			9.8			7.2			11.8	
Approach LOS		B			A			A			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		18.3		18.6		18.3		18.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		2.0		12.9		12.2		8.4				
Green Ext Time (p_c), s		0.0		1.3		1.6		1.7				
Intersection Summary												
HCM 6th Ctrl Delay				10.7								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary

6: Pacific Dr & 400 W

12/05/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	330	810	1	1	865	85	1	1	1	20	1	290
Future Volume (veh/h)	330	810	1	1	865	85	1	1	1	20	1	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	359	880	1	1	940	92	1	1	1	22	1	315
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	322	1440	2	417	1292	126	80	78	59	42	7	228
Arrive On Green	0.77	0.77	0.77	0.77	0.77	0.77	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	547	1868	2	630	1677	164	260	509	384	63	45	1477
Grp Volume(v), veh/h	359	0	881	1	0	1032	3	0	0	338	0	0
Grp Sat Flow(s),veh/h/ln	547	0	1870	630	0	1841	1153	0	0	1584	0	0
Q Serve(g_s), s	57.4	0.0	24.5	0.1	0.0	35.1	0.0	0.0	0.0	11.4	0.0	0.0
Cycle Q Clear(g_c), s	92.5	0.0	24.5	24.6	0.0	35.1	0.2	0.0	0.0	18.5	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.09	0.33		0.33	0.07		0.93
Lane Grp Cap(c), veh/h	322	0	1441	417	0	1419	218	0	0	276	0	0
V/C Ratio(X)	1.12	0.00	0.61	0.00	0.00	0.73	0.01	0.00	0.00	1.22	0.00	0.00
Avail Cap(c_a), veh/h	322	0	1441	417	0	1419	218	0	0	276	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.46	0.00	0.46	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	36.7	0.0	6.0	11.3	0.0	7.2	43.0	0.0	0.0	51.8	0.0	0.0
Incr Delay (d2), s/veh	85.4	0.0	0.8	0.0	0.0	0.9	0.1	0.0	0.0	128.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.4	0.0	8.2	0.0	0.0	11.5	0.1	0.0	0.0	18.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	122.1	0.0	6.7	11.3	0.0	8.1	43.1	0.0	0.0	180.4	0.0	0.0
LnGrp LOS	F	A	A	B	A	A	D	A	A	F	A	A
Approach Vol, veh/h		1240			1033			3				338
Approach Delay, s/veh		40.1			8.1			43.1				180.4
Approach LOS		D			A			D				F
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.0		97.0		23.0		97.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.5		92.5		18.5		92.5				
Max Q Clear Time (g_c+I1), s		2.2		94.5		20.5		37.1				
Green Ext Time (p_c), s		0.0		0.0		0.0		12.6				
Intersection Summary												
HCM 6th Ctrl Delay				45.6								
HCM 6th LOS				D								

HCM 6th TWSC
3: 300 W & Pacific Dr

12/05/2019

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	13	208	8	49	144	1	19	17	22	6	42	35
Future Vol, veh/h	13	208	8	49	144	1	19	17	22	6	42	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	226	9	53	157	1	21	18	24	7	46	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	158	0	0	235	0	0	565	523	231	544	527	158
Stage 1	-	-	-	-	-	-	259	259	-	264	264	-
Stage 2	-	-	-	-	-	-	306	264	-	280	263	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1422	-	-	1332	-	-	436	459	808	450	456	887
Stage 1	-	-	-	-	-	-	746	694	-	741	690	-
Stage 2	-	-	-	-	-	-	704	690	-	727	691	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1422	-	-	1332	-	-	369	436	808	407	433	887
Mov Cap-2 Maneuver	-	-	-	-	-	-	369	436	-	407	433	-
Stage 1	-	-	-	-	-	-	739	687	-	734	662	-
Stage 2	-	-	-	-	-	-	602	662	-	680	684	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			2			13.4			12.8		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	493	1422	-	-	1332	-	-	549
HCM Lane V/C Ratio	0.128	0.01	-	-	0.04	-	-	0.164
HCM Control Delay (s)	13.4	7.6	-	-	7.8	-	-	12.8
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.1	-	-	0.6

HCM 6th TWSC
3: 300 W & Pacific Dr

12/05/2019

Intersection												
Int Delay, s/veh	14.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	36	451	33	40	492	8	56	47	51	3	20	61
Future Vol, veh/h	36	451	33	40	492	8	56	47	51	3	20	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	39	490	36	43	535	9	61	51	55	3	22	66

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	544	0	0	526	0	0	1256	1216	508	1265	1230	540
Stage 1	-	-	-	-	-	-	586	586	-	626	626	-
Stage 2	-	-	-	-	-	-	670	630	-	639	604	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1025	-	-	1041	-	-	148	181	565	146	178	542
Stage 1	-	-	-	-	-	-	496	497	-	472	477	-
Stage 2	-	-	-	-	-	-	446	475	-	464	488	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1025	-	-	1041	-	-	110	167	565	95	164	542
Mov Cap-2 Maneuver	-	-	-	-	-	-	110	167	-	95	164	-
Stage 1	-	-	-	-	-	-	477	478	-	454	457	-
Stage 2	-	-	-	-	-	-	357	456	-	360	469	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.6	110.4	21
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	175	1025	-	-	1041	-	-	316
HCM Lane V/C Ratio	0.957	0.038	-	-	0.042	-	-	0.289
HCM Control Delay (s)	110.4	8.7	-	-	8.6	-	-	21
HCM Lane LOS	F	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	7.5	0.1	-	-	0.1	-	-	1.2

HCM 6th TWSC
3: 300 W & Pacific Dr

12/05/2019

Intersection												
Int Delay, s/veh	10											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	25	415	15	90	290	10	20	30	40	20	80	70
Future Vol, veh/h	25	415	15	90	290	10	20	30	40	20	80	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	451	16	98	315	11	22	33	43	22	87	76

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	326	0	0	467	0	0	1111	1035	459	1068	1038	321
Stage 1	-	-	-	-	-	-	513	513	-	517	517	-
Stage 2	-	-	-	-	-	-	598	522	-	551	521	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1234	-	-	1094	-	-	186	232	602	199	231	720
Stage 1	-	-	-	-	-	-	544	536	-	541	534	-
Stage 2	-	-	-	-	-	-	489	531	-	519	532	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1234	-	-	1094	-	-	103	206	602	149	206	720
Mov Cap-2 Maneuver	-	-	-	-	-	-	103	206	-	149	206	-
Stage 1	-	-	-	-	-	-	532	524	-	529	486	-
Stage 2	-	-	-	-	-	-	327	483	-	442	520	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	2	33.4	41.6
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	222	1234	-	-	1094	-	-	274
HCM Lane V/C Ratio	0.441	0.022	-	-	0.089	-	-	0.674
HCM Control Delay (s)	33.4	8	-	-	8.6	-	-	41.6
HCM Lane LOS	D	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	2.1	0.1	-	-	0.3	-	-	4.4

HCM 6th TWSC
3: 300 W & Pacific Dr

12/05/2019

Intersection												
Int Delay, s/veh	575.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	60	720	40	70	770	20	70	80	90	10	40	110
Future Vol, veh/h	60	720	40	70	770	20	70	80	90	10	40	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	65	783	43	76	837	22	76	87	98	11	43	120

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	859	0	0	826	0	0	2017	1946	805	2027	1956	848
Stage 1	-	-	-	-	-	-	935	935	-	1000	1000	-
Stage 2	-	-	-	-	-	-	1082	1011	-	1027	956	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	782	-	-	805	-	-	~ 43	~ 65	382	43	64	361
Stage 1	-	-	-	-	-	-	318	344	-	293	321	-
Stage 2	-	-	-	-	-	-	263	317	-	283	336	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	782	-	-	805	-	-	~ 8	~ 54	382	-	53	361
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 8	~ 54	-	-	53	-
Stage 1	-	-	-	-	-	-	292	315	-	269	291	-
Stage 2	-	-	-	-	-	-	135	287	-	140	308	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.8	\$ 4981.2	
HCM LOS			F	-

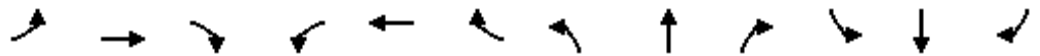
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	23	782	-	-	805	-	-	-
HCM Lane V/C Ratio	11.342	0.083	-	-	0.095	-	-	-
HCM Control Delay (s)	\$ 4981.2	10	-	-	9.9	-	-	-
HCM Lane LOS	F	B	-	-	A	-	-	-
HCM 95th %tile Q(veh)	32.7	0.3	-	-	0.3	-	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary

3: 300 W & Pacific Dr

12/05/2019

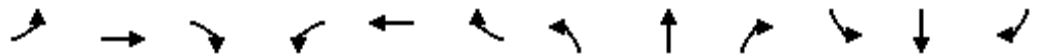


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	415	15	90	290	10	20	30	40	20	80	70
Future Volume (veh/h)	25	415	15	90	290	10	20	30	40	20	80	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	451	16	98	315	11	22	33	43	22	87	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	419	679	24	301	679	24	197	284	300	127	386	296
Arrive On Green	0.25	0.25	0.25	0.38	0.38	0.38	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	1054	1795	64	926	1796	63	234	674	710	90	916	701
Grp Volume(v), veh/h	27	0	467	98	0	326	98	0	0	185	0	0
Grp Sat Flow(s),veh/h/ln	1054	0	1859	926	0	1859	1618	0	0	1707	0	0
Q Serve(g_s), s	1.0	0.0	10.2	4.5	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.9	0.0	10.2	14.7	0.0	6.0	1.6	0.0	0.0	3.1	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.03	0.22		0.44	0.12		0.41
Lane Grp Cap(c), veh/h	419	0	703	301	0	703	781	0	0	810	0	0
V/C Ratio(X)	0.06	0.00	0.66	0.33	0.00	0.46	0.13	0.00	0.00	0.23	0.00	0.00
Avail Cap(c_a), veh/h	442	0	744	322	0	744	781	0	0	810	0	0
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.78	0.00	0.78	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.6	0.0	14.2	18.1	0.0	10.6	8.0	0.0	0.0	8.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.6	0.6	0.0	0.5	0.3	0.0	0.0	0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	4.2	0.9	0.0	2.0	0.5	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	0.0	15.9	18.7	0.0	11.0	8.3	0.0	0.0	9.1	0.0	0.0
LnGrp LOS	B	A	B	B	A	B	A	A	A	A	A	A
Approach Vol, veh/h		494			424			98			185	
Approach Delay, s/veh		15.9			12.8			8.3			9.1	
Approach LOS		B			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.5		21.5		23.5		21.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		3.6		12.2		5.1		16.7				
Green Ext Time (p_c), s		0.4		1.5		0.8		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				13.1								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary

3: 300 W & Pacific Dr

12/05/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	720	40	70	770	20	70	80	90	10	40	110
Future Volume (veh/h)	60	720	40	70	770	20	70	80	90	10	40	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	65	783	43	76	837	22	76	87	98	11	43	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	947	52	232	978	26	182	204	185	75	147	353
Arrive On Green	0.54	0.54	0.54	0.54	0.54	0.54	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	643	1757	96	663	1814	48	335	657	597	37	474	1135
Grp Volume(v), veh/h	65	0	826	76	0	859	261	0	0	174	0	0
Grp Sat Flow(s),veh/h/ln	643	0	1853	663	0	1862	1589	0	0	1645	0	0
Q Serve(g_s), s	5.8	0.0	22.2	6.5	0.0	23.7	2.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	29.5	0.0	22.2	28.7	0.0	23.7	7.6	0.0	0.0	4.8	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.03	0.29		0.38	0.06		0.69
Lane Grp Cap(c), veh/h	213	0	999	232	0	1004	571	0	0	575	0	0
V/C Ratio(X)	0.31	0.00	0.83	0.33	0.00	0.86	0.46	0.00	0.00	0.30	0.00	0.00
Avail Cap(c_a), veh/h	219	0	1016	238	0	1021	571	0	0	575	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.00	0.79	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	24.4	0.0	11.5	23.4	0.0	11.8	16.8	0.0	0.0	15.9	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	4.5	0.8	0.0	7.2	2.6	0.0	0.0	1.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	8.4	1.0	0.0	9.7	3.1	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.1	0.0	16.0	24.2	0.0	19.0	19.4	0.0	0.0	17.3	0.0	0.0
LnGrp LOS	C	A	B	C	A	B	B	A	A	B	A	A
Approach Vol, veh/h		891			935			261				174
Approach Delay, s/veh		16.7			19.5			19.4				17.3
Approach LOS		B			B			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.2		36.8		23.2		36.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.1		32.9		18.1		32.9				
Max Q Clear Time (g_c+I1), s		9.6		31.5		6.8		30.7				
Green Ext Time (p_c), s		1.0		0.9		0.7		1.4				
Intersection Summary												
HCM 6th Ctrl Delay				18.2								
HCM 6th LOS				B								

Existing AM

Intersection					
Intersection Delay, s/veh	3.6				
Intersection LOS	A				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	2	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	103	37	75	217	
Demand Flow Rate, veh/h	105	38	76	221	
Vehicles Circulating, veh/h	149	159	150	10	
Vehicles Exiting, veh/h	82	67	104	187	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	3.9	3.4	3.6	3.4	
Approach LOS	A	A	A	A	
Lane	Left	Left	Left	Left	Right
Designated Moves	LTR	LTR	LTR	L	TR
Assumed Moves	LTR	LTR	LTR	L	TR
RT Channelized					
Lane Util	1.000	1.000	1.000	0.213	0.787
Follow-Up Headway, s	2.609	2.609	2.609	2.535	2.535
Critical Headway, s	4.976	4.976	4.976	4.544	4.544
Entry Flow, veh/h	105	38	76	47	174
Cap Entry Lane, veh/h	1185	1173	1184	1407	1407
Entry HV Adj Factor	0.978	0.969	0.981	0.979	0.983
Flow Entry, veh/h	103	37	75	46	171
Cap Entry, veh/h	1159	1137	1162	1377	1383
V/C Ratio	0.089	0.032	0.064	0.033	0.124
Control Delay, s/veh	3.9	3.4	3.6	2.9	3.6
LOS	A	A	A	A	A
95th %tile Queue, veh	0	0	0	0	0

HCM 6th Roundabout
3: Grassland Dr & 300 W

12/05/2019

Existing PM

Intersection					
Intersection Delay, s/veh	7.2				
Intersection LOS	A				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	2	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	468	306	158	494	
Demand Flow Rate, veh/h	477	312	161	504	
Vehicles Circulating, veh/h	280	515	572	79	
Vehicles Exiting, veh/h	303	218	185	748	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	8.8	9.2	7.1	4.4	
Approach LOS	A	A	A	A	
Lane	Left	Left	Left	Left	Right
Designated Moves	LTR	LTR	LTR	LT	R
Assumed Moves	LTR	LTR	LTR	LT	R
RT Channelized					
Lane Util	1.000	1.000	1.000	0.536	0.464
Follow-Up Headway, s	2.609	2.609	2.609	2.535	2.535
Critical Headway, s	4.976	4.976	4.976	4.544	4.544
Entry Flow, veh/h	477	312	161	270	234
Cap Entry Lane, veh/h	1037	816	770	1322	1322
Entry HV Adj Factor	0.981	0.980	0.983	0.981	0.979
Flow Entry, veh/h	468	306	158	265	229
Cap Entry, veh/h	1018	800	757	1296	1293
V/C Ratio	0.460	0.382	0.209	0.204	0.177
Control Delay, s/veh	8.8	9.2	7.1	4.5	4.3
LOS	A	A	A	A	A
95th %tile Queue, veh	2	2	1	1	1

Existing AM

Intersection

Int Delay, s/veh 1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	526	35	18	268	5	16	10	30	5	14	6
Future Vol, veh/h	4	526	35	18	268	5	16	10	30	5	14	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	572	38	20	291	5	17	11	33	5	15	7

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	296	0	0	610
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1265	-	-	969
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1265	-	-	969
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	18.4	18.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	330	1265	-	-	969	-	-	286
HCM Lane V/C Ratio	0.184	0.003	-	-	0.02	-	-	0.095
HCM Control Delay (s)	18.4	7.9	0	-	8.8	0	-	18.9
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	0.3

Existing PM

Intersection

Int Delay, s/veh 2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	343	20	23	310	9	25	18	28	10	19	5
Future Vol, veh/h	8	343	20	23	310	9	25	18	28	10	19	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	373	22	25	337	10	27	20	30	11	21	5

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	347	0	0	395
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1212	-	-	1164
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1212	-	-	1164
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.5	17.3	18
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	370	1212	-	-	1164	-	-	314
HCM Lane V/C Ratio	0.209	0.007	-	-	0.021	-	-	0.118
HCM Control Delay (s)	17.3	8	0	-	8.2	0	-	18
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.8	0	-	-	0.1	-	-	0.4

2030 AM

Intersection

Int Delay, s/veh 3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	590	50	10	280	10	40	20	10	10	20	20
Future Vol, veh/h	20	590	50	10	280	10	40	20	10	10	20	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	641	54	11	304	11	43	22	11	11	22	22

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	315	0	0	695
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1245	-	-	901
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1245	-	-	901
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	33	21
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	203	1245	-	-	901	-	-	279
HCM Lane V/C Ratio	0.375	0.017	-	-	0.012	-	-	0.195
HCM Control Delay (s)	33	7.9	0	-	9	0	-	21
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.6	0.1	-	-	0	-	-	0.7

2030 PM

Intersection

Int Delay, s/veh 5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	390	50	20	340	10	90	20	10	10	20	10
Future Vol, veh/h	20	390	50	20	340	10	90	20	10	10	20	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	424	54	22	370	11	98	22	11	11	22	11

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	381	0	0	478
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1177	-	-	1084
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1177	-	-	1084
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.5	37.3	20
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	237	1177	-	-	1084	-	-	284
HCM Lane V/C Ratio	0.55	0.018	-	-	0.02	-	-	0.153
HCM Control Delay (s)	37.3	8.1	0	-	8.4	0	-	20
HCM Lane LOS	E	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	3	0.1	-	-	0.1	-	-	0.5

Existing AM

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	113	5	9	162	16	28	13	14	30	28	34
Future Vol, veh/h	7	113	5	9	162	16	28	13	14	30	28	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	123	5	10	176	17	30	14	15	33	30	37

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	193	0	0	128	0	0	380	355	126	361	349	185
Stage 1	-	-	-	-	-	-	142	142	-	205	205	-
Stage 2	-	-	-	-	-	-	238	213	-	156	144	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1380	-	-	1458	-	-	578	571	924	595	575	857
Stage 1	-	-	-	-	-	-	861	779	-	797	732	-
Stage 2	-	-	-	-	-	-	765	726	-	846	778	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1380	-	-	1458	-	-	525	563	924	568	567	857
Mov Cap-2 Maneuver	-	-	-	-	-	-	525	563	-	568	567	-
Stage 1	-	-	-	-	-	-	856	774	-	792	726	-
Stage 2	-	-	-	-	-	-	696	720	-	812	773	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.4			11.7			11.6		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	601	1380	-	-	1458	-	-	648
HCM Lane V/C Ratio	0.099	0.006	-	-	0.007	-	-	0.154
HCM Control Delay (s)	11.7	7.6	0	-	7.5	0	-	11.6
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.5

Existing PM

Intersection												
Int Delay, s/veh	22.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	102	402	117	17	309	59	64	40	15	29	52	70
Future Vol, veh/h	102	402	117	17	309	59	64	40	15	29	52	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	111	437	127	18	336	64	70	43	16	32	57	76

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	400	0	0	564	0	0	1194	1159	501	1156	1190	368
Stage 1	-	-	-	-	-	-	723	723	-	404	404	-
Stage 2	-	-	-	-	-	-	471	436	-	752	786	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1159	-	-	1008	-	-	163	196	570	174	188	677
Stage 1	-	-	-	-	-	-	417	431	-	623	599	-
Stage 2	-	-	-	-	-	-	573	580	-	402	403	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1159	-	-	1008	-	-	92	164	570	118	158	677
Mov Cap-2 Maneuver	-	-	-	-	-	-	92	164	-	118	158	-
Stage 1	-	-	-	-	-	-	358	370	-	535	585	-
Stage 2	-	-	-	-	-	-	449	567	-	296	346	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.4			0.4			164.1			56		
HCM LOS							F			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	123	1159	-	-	1008	-	-	223
HCM Lane V/C Ratio	1.052	0.096	-	-	0.018	-	-	0.736
HCM Control Delay (s)	164.1	8.4	0	-	8.6	0	-	56
HCM Lane LOS	F	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	7.4	0.3	-	-	0.1	-	-	5

HCM 6th TWSC
3: 700 N & 540 W

12/05/2019

2030 AM

Intersection

Int Delay, s/veh 17.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	180	10	130	450	30	60	20	120	50	60	10
Future Vol, veh/h	10	180	10	130	450	30	60	20	120	50	60	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	196	11	141	489	33	65	22	130	54	65	11

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	522	0	0	207
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1044	-	-	1364
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1044	-	-	1364
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	1.7	48.1	71.1
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	287	1044	-	-	1364	-	-	173
HCM Lane V/C Ratio	0.757	0.01	-	-	0.104	-	-	0.754
HCM Control Delay (s)	48.1	8.5	0	-	7.9	0	-	71.1
HCM Lane LOS	E	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	5.7	0	-	-	0.3	-	-	4.8

HCM 6th TWSC
3: 700 N & 540 W

12/05/2019

2030 PM

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	70	680	190	70	500	90	100	60	60	50	80	40
Future Vol, veh/h	70	680	190	70	500	90	100	60	60	50	80	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	76	739	207	76	543	98	109	65	65	54	87	43

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	641	0	0	946
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	943	-	-	725
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	943	-	-	725
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	1.1		
HCM LOS				

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	943	-	-	725	-	-	-
HCM Lane V/C Ratio	-	0.081	-	-	0.105	-	-	-
HCM Control Delay (s)	-	9.2	0	-	10.5	0	-	-
HCM Lane LOS	-	A	A	-	B	A	-	-
HCM 95th %tile Q(veh)	-	0.3	-	-	0.4	-	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary

3: 700 N & 540 W

12/05/2019

2030 AM + Mit



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	180	10	130	450	30	60	20	120	50	60	10
Future Volume (veh/h)	10	180	10	130	450	30	60	20	120	50	60	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	196	11	141	489	33	65	22	130	54	65	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	256	613	34	488	605	41	261	123	406	357	395	58
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	880	1754	98	1175	1732	117	341	284	935	539	910	134
Grp Volume(v), veh/h	11	0	207	141	0	522	217	0	0	130	0	0
Grp Sat Flow(s),veh/h/ln	880	0	1853	1175	0	1849	1561	0	0	1583	0	0
Q Serve(g_s), s	0.5	0.0	3.4	4.1	0.0	10.6	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.1	0.0	3.4	7.5	0.0	10.6	3.5	0.0	0.0	1.8	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.06	0.30		0.60	0.42		0.08
Lane Grp Cap(c), veh/h	256	0	647	488	0	646	790	0	0	810	0	0
V/C Ratio(X)	0.04	0.00	0.32	0.29	0.00	0.81	0.27	0.00	0.00	0.16	0.00	0.00
Avail Cap(c_a), veh/h	330	0	804	587	0	802	790	0	0	810	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.3	0.0	9.9	12.7	0.0	12.2	7.6	0.0	0.0	7.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.3	0.3	0.0	5.0	0.9	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	1.1	0.9	0.0	4.3	1.1	0.0	0.0	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.3	0.0	10.2	13.0	0.0	17.3	8.5	0.0	0.0	7.6	0.0	0.0
LnGrp LOS	B	A	B	B	A	B	A	A	A	A	A	A
Approach Vol, veh/h		218			663			217			130	
Approach Delay, s/veh		10.5			16.4			8.5			7.6	
Approach LOS		B			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		19.0		22.5		19.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		5.5		13.1		3.8		12.6				
Green Ext Time (p_c), s		1.0		0.5		0.5		1.9				
Intersection Summary												
HCM 6th Ctrl Delay				13.0								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary

3: 700 N & 540 W

12/05/2019

2030 PM + Mit



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	680	190	70	500	90	100	60	60	50	80	40
Future Volume (veh/h)	70	680	190	70	500	90	100	60	60	50	80	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	739	207	76	543	98	109	65	65	54	87	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	366	789	221	156	866	156	265	157	127	181	274	117
Arrive On Green	0.56	0.56	0.56	0.56	0.56	0.56	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	788	1406	394	593	1542	278	613	524	425	364	914	390
Grp Volume(v), veh/h	76	0	946	76	0	641	239	0	0	184	0	0
Grp Sat Flow(s),veh/h/ln	788	0	1799	593	0	1820	1562	0	0	1668	0	0
Q Serve(g_s), s	4.7	0.0	31.6	4.9	0.0	15.5	2.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.2	0.0	31.6	36.5	0.0	15.5	7.4	0.0	0.0	5.2	0.0	0.0
Prop In Lane	1.00		0.22	1.00		0.15	0.46		0.27	0.29		0.23
Lane Grp Cap(c), veh/h	366	0	1010	156	0	1022	549	0	0	572	0	0
V/C Ratio(X)	0.21	0.00	0.94	0.49	0.00	0.63	0.44	0.00	0.00	0.32	0.00	0.00
Avail Cap(c_a), veh/h	366	0	1010	156	0	1022	549	0	0	572	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.5	0.0	13.2	31.1	0.0	9.6	18.4	0.0	0.0	17.7	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	15.3	2.4	0.0	1.2	2.5	0.0	0.0	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	14.3	1.3	0.0	5.3	3.1	0.0	0.0	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.8	0.0	28.5	33.4	0.0	10.9	20.9	0.0	0.0	19.2	0.0	0.0
LnGrp LOS	B	A	C	C	A	B	C	A	A	B	A	A
Approach Vol, veh/h		1022			717			239				184
Approach Delay, s/veh		27.6			13.3			20.9				19.2
Approach LOS		C			B			C				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		24.0		41.0		24.0		41.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		19.5		36.5		19.5		36.5				
Max Q Clear Time (g_c+I1), s		9.4		33.6		7.2		38.5				
Green Ext Time (p_c), s		1.0		1.9		0.8		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				21.4								
HCM 6th LOS				C								

Existing AM

Intersection

Int Delay, s/veh 8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	106	32	15	112	18	24	118	24	35	204	8
Future Vol, veh/h	23	106	32	15	112	18	24	118	24	35	204	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	115	35	16	122	20	26	128	26	38	222	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	567	509	227	571	500	141	231	0	0	154	0	0
Stage 1	303	303	-	193	193	-	-	-	-	-	-	-
Stage 2	264	206	-	378	307	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	434	467	812	432	473	907	1337	-	-	1426	-	-
Stage 1	706	664	-	809	741	-	-	-	-	-	-	-
Stage 2	741	731	-	644	661	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	323	443	812	318	449	907	1337	-	-	1426	-	-
Mov Cap-2 Maneuver	323	443	-	318	449	-	-	-	-	-	-	-
Stage 1	691	643	-	792	725	-	-	-	-	-	-	-
Stage 2	591	716	-	490	641	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.6		16.9		1.1		1.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1337	-	-	460	458	1426	-
HCM Lane V/C Ratio	0.02	-	-	0.38	0.344	0.027	-
HCM Control Delay (s)	7.7	0	-	17.6	16.9	7.6	0
HCM Lane LOS	A	A	-	C	C	A	A
HCM 95th %tile Q(veh)	0.1	-	-	1.8	1.5	0.1	-

Existing PM

Intersection

Int Delay, s/veh 9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	125	29	12	148	30	48	186	12	13	139	14
Future Vol, veh/h	9	125	29	12	148	30	48	186	12	13	139	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	136	32	13	161	33	52	202	13	14	151	15

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	597	506	159	584	507	209	166	0	0	215	0	0
Stage 1	187	187	-	313	313	-	-	-	-	-	-	-
Stage 2	410	319	-	271	194	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	415	469	886	423	468	831	1412	-	-	1355	-	-
Stage 1	815	745	-	698	657	-	-	-	-	-	-	-
Stage 2	619	653	-	735	740	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	276	444	886	299	443	831	1412	-	-	1355	-	-
Mov Cap-2 Maneuver	276	444	-	299	443	-	-	-	-	-	-	-
Stage 1	781	737	-	669	629	-	-	-	-	-	-	-
Stage 2	424	626	-	572	732	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	18.9	1.5	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1412	-	-	470	463	1355	-
HCM Lane V/C Ratio	0.037	-	-	0.377	0.446	0.01	-
HCM Control Delay (s)	7.6	0	-	17.2	18.9	7.7	0
HCM Lane LOS	A	A	-	C	C	A	A
HCM 95th %tile Q(veh)	0.1	-	-	1.7	2.3	0	-

2030 AM

Intersection	
Intersection Delay, s/veh	168.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	50	480	70	30	500	40	40	110	60	80	220	20
Future Vol, veh/h	50	480	70	30	500	40	40	110	60	80	220	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	522	76	33	543	43	43	120	65	87	239	22
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	240.2	212.4	27.9	46.3
HCM LOS	F	F	D	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	8%	5%	25%
Vol Thru, %	52%	80%	88%	69%
Vol Right, %	29%	12%	7%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	210	600	570	320
LT Vol	40	50	30	80
Through Vol	110	480	500	220
RT Vol	60	70	40	20
Lane Flow Rate	228	652	620	348
Geometry Grp	1	1	1	1
Degree of Util (X)	0.567	1.451	1.383	0.816
Departure Headway (Hd)	11.218	8.87	9.02	10.379
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	324	417	409	351
Service Time	9.218	6.87	7.02	8.379
HCM Lane V/C Ratio	0.704	1.564	1.516	0.991
HCM Control Delay	27.9	240.2	212.4	46.3
HCM Lane LOS	D	F	F	E
HCM 95th-tile Q	3.3	30.2	26.8	7.1

2030 PM

Intersection	
Intersection Delay, s/veh	143
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	450	40	20	550	80	70	170	20	40	130	30
Future Vol, veh/h	20	450	40	20	550	80	70	170	20	40	130	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	489	43	22	598	87	76	185	22	43	141	33
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	120.8	242.2	29.9	23.9
HCM LOS	F	F	D	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	27%	4%	3%	20%
Vol Thru, %	65%	88%	85%	65%
Vol Right, %	8%	8%	12%	15%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	260	510	650	200
LT Vol	70	20	20	40
Through Vol	170	450	550	130
RT Vol	20	40	80	30
Lane Flow Rate	283	554	707	217
Geometry Grp	1	1	1	1
Degree of Util (X)	0.66	1.154	1.464	0.524
Departure Headway (Hd)	9.79	8.437	7.886	10.218
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	373	432	466	357
Service Time	7.79	6.437	5.886	8.218
HCM Lane V/C Ratio	0.759	1.282	1.517	0.608
HCM Control Delay	29.9	120.8	242.2	23.9
HCM Lane LOS	D	F	F	C
HCM 95th-tile Q	4.5	18.3	33.9	2.9

HCM 6th Signalized Intersection Summary

3: 700 N & 100 W

12/05/2019

2030 AM + Mit



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	480	70	30	500	40	40	110	60	80	220	20
Future Volume (veh/h)	50	480	70	30	500	40	40	110	60	80	220	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	522	76	33	543	43	43	120	65	87	239	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	253	656	95	241	703	56	163	412	196	211	532	44
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	829	1596	232	820	1711	135	192	992	472	298	1280	106
Grp Volume(v), veh/h	54	0	598	33	0	586	228	0	0	348	0	0
Grp Sat Flow(s),veh/h/ln	829	0	1829	820	0	1846	1656	0	0	1684	0	0
Q Serve(g_s), s	3.1	0.0	14.8	1.9	0.0	14.2	0.0	0.0	0.0	1.5	0.0	0.0
Cycle Q Clear(g_c), s	17.3	0.0	14.8	16.7	0.0	14.2	4.4	0.0	0.0	7.2	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.07	0.19		0.29	0.25		0.06
Lane Grp Cap(c), veh/h	253	0	751	241	0	758	770	0	0	786	0	0
V/C Ratio(X)	0.21	0.00	0.80	0.14	0.00	0.77	0.30	0.00	0.00	0.44	0.00	0.00
Avail Cap(c_a), veh/h	304	0	865	292	0	874	770	0	0	786	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.6	0.0	13.4	20.7	0.0	13.2	10.1	0.0	0.0	10.9	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	4.6	0.3	0.0	3.8	1.0	0.0	0.0	1.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	5.9	0.4	0.0	5.6	1.7	0.0	0.0	2.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.0	0.0	17.9	20.9	0.0	16.9	11.1	0.0	0.0	12.7	0.0	0.0
LnGrp LOS	C	A	B	C	A	B	B	A	A	B	A	A
Approach Vol, veh/h		652			619			228			348	
Approach Delay, s/veh		18.2			17.1			11.1			12.7	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		26.0		25.8		26.0		25.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		21.5		24.5		21.5		24.5				
Max Q Clear Time (g_c+I1), s		6.4		19.3		9.2		18.7				
Green Ext Time (p_c), s		1.2		2.0		1.7		2.0				

Intersection Summary

HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary

3: 700 N & 100 W

12/05/2019

2030 PM + Mit



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	450	40	20	550	80	70	170	20	40	130	30
Future Volume (veh/h)	20	450	40	20	550	80	70	170	20	40	130	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	489	43	22	598	87	76	185	22	43	141	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	220	753	66	326	709	103	211	471	50	162	476	100
Arrive On Green	0.44	0.44	0.44	0.44	0.44	0.44	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	757	1695	149	872	1596	232	323	1219	130	209	1232	259
Grp Volume(v), veh/h	22	0	532	22	0	685	283	0	0	217	0	0
Grp Sat Flow(s),veh/h/ln	757	0	1844	872	0	1829	1671	0	0	1700	0	0
Q Serve(g_s), s	1.4	0.0	12.0	1.1	0.0	17.7	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	19.1	0.0	12.0	13.0	0.0	17.7	6.0	0.0	0.0	4.4	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.13	0.27		0.08	0.20		0.15
Lane Grp Cap(c), veh/h	220	0	819	326	0	812	731	0	0	738	0	0
V/C Ratio(X)	0.10	0.00	0.65	0.07	0.00	0.84	0.39	0.00	0.00	0.29	0.00	0.00
Avail Cap(c_a), veh/h	318	0	1059	440	0	1051	731	0	0	738	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.6	0.0	11.5	16.6	0.0	13.1	11.8	0.0	0.0	11.4	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.9	0.1	0.0	5.1	1.5	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	4.2	0.2	0.0	6.9	2.4	0.0	0.0	1.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.8	0.0	12.4	16.7	0.0	18.2	13.4	0.0	0.0	12.4	0.0	0.0
LnGrp LOS	C	A	B	B	A	B	B	A	A	B	A	A
Approach Vol, veh/h		554			707			283				217
Approach Delay, s/veh		12.8			18.1			13.4				12.4
Approach LOS		B			B			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		25.0		28.1		25.0		28.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		20.5		30.5		20.5		30.5				
Max Q Clear Time (g_c+I1), s		8.0		21.1		6.4		19.7				
Green Ext Time (p_c), s		1.3		2.5		1.0		3.7				

Intersection Summary

HCM 6th Ctrl Delay	15.0
HCM 6th LOS	B

Existing AM

Intersection

Int Delay, s/veh 4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	143	68	497	887	28
Future Vol, veh/h	9	143	68	497	887	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	155	74	540	964	30

Major/Minor

	Minor2	Major1	Major2			
Conflicting Flow All	1667	979	994	0	-	0
Stage 1	979	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	106	303	696	-	-	-
Stage 1	364	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	90	303	696	-	-	-
Mov Cap-2 Maneuver	90	-	-	-	-	-
Stage 1	309	-	-	-	-	-
Stage 2	499	-	-	-	-	-

Approach

	EB	NB	SB
HCM Control Delay, s	38.4	1.3	0
HCM LOS	E		




Minor Lane/Major Mvmt

	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	696	-	266	-	-
HCM Lane V/C Ratio	0.106	-	0.621	-	-
HCM Control Delay (s)	10.8	0	38.4	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0.4	-	3.8	-	-

Existing PM

Intersection

Int Delay, s/veh 10.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	137	142	820	669	25
Future Vol, veh/h	25	137	142	820	669	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	149	154	891	727	27

Major/Minor

	Minor2	Major1	Major2			
Conflicting Flow All	1940	741	754	0	-	0
Stage 1	741	-	-	-	-	-
Stage 2	1199	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	72	416	856	-	-	-
Stage 1	471	-	-	-	-	-
Stage 2	286	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	46	416	856	-	-	-
Mov Cap-2 Maneuver	46	-	-	-	-	-
Stage 1	303	-	-	-	-	-
Stage 2	286	-	-	-	-	-

Approach

	EB	NB	SB
HCM Control Delay, s	104	1.5	0
HCM LOS	F		

Minor Lane/Major Mvmt

	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	856	-	186	-	-
HCM Lane V/C Ratio	0.18	-	0.947	-	-
HCM Control Delay (s)	10.1	0	104	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.7	-	7.5	-	-

HCM 6th AWSC
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Intersection	
Intersection Delay, s/veh	805.6
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	140	340	310	20	60	120	120	570	20	170	970	330
Future Vol, veh/h	140	340	310	20	60	120	120	570	20	170	970	330
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	152	370	337	22	65	130	130	620	22	185	1054	359
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	487.2	63.9	431.9	1258.2
HCM LOS	F	F	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	17%	18%	10%	12%
Vol Thru, %	80%	43%	30%	66%
Vol Right, %	3%	39%	60%	22%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	710	790	200	1470
LT Vol	120	140	20	170
Through Vol	570	340	60	970
RT Vol	20	310	120	330
Lane Flow Rate	772	859	217	1598
Geometry Grp	1	1	1	1
Degree of Util (X)	1.824	1.977	0.561	3.719
Departure Headway (Hd)	19.326	15.362	28.986	13.5
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	201	249	128	288
Service Time	17.326	13.362	26.986	11.5
HCM Lane V/C Ratio	3.841	3.45	1.695	5.549
HCM Control Delay	431.9	487.2	63.9	1258.2
HCM Lane LOS	F	F	F	F
HCM 95th-tile Q	24.4	33.8	2.7	94.6

2030 PM

Intersection	
Intersection Delay, s/veh	866.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	250	110	160	30	90	160	180	1020	10	120	830	270
Future Vol, veh/h	250	110	160	30	90	160	180	1020	10	120	830	270
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	272	120	174	33	98	174	196	1109	11	130	902	293
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	262.6	96.3	1090.3	1079.4
HCM LOS	F	F	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	48%	11%	10%
Vol Thru, %	84%	21%	32%	68%
Vol Right, %	1%	31%	57%	22%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1210	520	280	1220
LT Vol	180	250	30	120
Through Vol	1020	110	90	830
RT Vol	10	160	160	270
Lane Flow Rate	1315	565	304	1326
Geometry Grp	1	1	1	1
Degree of Util (X)	3.326	1.411	0.787	3.302
Departure Headway (Hd)	16.927	20.435	29.056	16.846
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	237	187	128	239
Service Time	14.927	18.435	27.056	14.846
HCM Lane V/C Ratio	5.549	3.021	2.375	5.548
HCM Control Delay	1090.3	262.6	96.3	1079.4
HCM Lane LOS	F	F	F	F
HCM 95th-tile Q	65.9	15.2	4.6	65.5

HCM 6th Signalized Intersection Summary
 4: 700 N & Alpine Hwy

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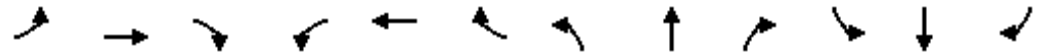


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	340	310	20	60	120	120	570	20	170	970	330
Future Volume (veh/h)	140	340	310	20	60	120	120	570	20	170	970	330
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	370	337	22	65	130	130	620	22	185	1054	359
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	298	451	382	112	274	232	169	1045	886	455	1074	910
Arrive On Green	0.05	0.24	0.24	0.15	0.15	0.15	0.05	0.56	0.56	0.06	0.57	0.57
Sat Flow, veh/h	1781	1870	1585	741	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	152	370	337	22	65	130	130	620	22	185	1054	359
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	741	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.0	18.7	20.5	2.9	3.1	7.6	3.1	21.9	0.6	4.4	55.0	12.5
Cycle Q Clear(g_c), s	5.0	18.7	20.5	12.1	3.1	7.6	3.1	21.9	0.6	4.4	55.0	12.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	298	451	382	112	274	232	169	1045	886	455	1074	910
V/C Ratio(X)	0.51	0.82	0.88	0.20	0.24	0.56	0.77	0.59	0.02	0.41	0.98	0.39
Avail Cap(c_a), veh/h	298	514	436	137	337	285	170	1045	886	516	1074	910
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	35.9	36.6	46.1	37.8	39.7	23.8	14.6	9.9	11.0	20.8	11.7
Incr Delay (d2), s/veh	1.4	9.1	17.0	0.8	0.4	2.1	18.7	2.5	0.1	0.6	23.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	9.5	9.6	0.6	1.4	3.1	2.5	9.4	0.2	1.6	28.5	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	45.0	53.6	46.9	38.2	41.8	42.5	17.0	9.9	11.6	44.1	13.0
LnGrp LOS	D	D	D	D	D	D	D	B	A	B	D	B
Approach Vol, veh/h		859			217			772			1598	
Approach Delay, s/veh		46.9			41.2			21.1			33.3	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	60.4		28.6	9.4	61.9	9.5	19.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	9.9	49.1		27.5	5.0	54.0	5.0	18.0				
Max Q Clear Time (g_c+I1), s	6.4	23.9		22.5	5.1	57.0	7.0	14.1				
Green Ext Time (p_c), s	0.2	4.6		1.6	0.0	0.0	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay				34.5								
HCM 6th LOS				C								

HCM 6th Signalized Intersection Summary
 4: 700 N & Alpine Hwy

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	250	110	160	30	90	160	180	1020	10	120	830	270
Future Volume (veh/h)	250	110	160	30	90	160	180	1020	10	120	830	270
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	272	120	174	33	98	174	196	1109	11	130	902	293
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	260	398	338	245	398	338	266	1304	1105	201	1304	1105
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.70	0.70	0.70	0.70	0.70	0.70
Sat Flow, veh/h	1107	1870	1585	1085	1870	1585	468	1870	1585	503	1870	1585
Grp Volume(v), veh/h	272	120	174	33	98	174	196	1109	11	130	902	293
Grp Sat Flow(s),veh/h/ln	1107	1870	1585	1085	1870	1585	468	1870	1585	503	1870	1585
Q Serve(g_s), s	16.9	5.4	9.7	2.6	4.4	9.7	41.5	44.1	0.2	25.6	28.2	6.9
Cycle Q Clear(g_c), s	21.3	5.4	9.7	8.0	4.4	9.7	69.7	44.1	0.2	69.7	28.2	6.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	260	398	338	245	398	338	266	1304	1105	201	1304	1105
V/C Ratio(X)	1.05	0.30	0.52	0.13	0.25	0.52	0.74	0.85	0.01	0.65	0.69	0.27
Avail Cap(c_a), veh/h	260	398	338	245	398	338	266	1304	1105	201	1304	1105
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	33.1	34.8	36.5	32.7	34.8	29.4	11.3	4.6	37.4	8.9	5.6
Incr Delay (d2), s/veh	68.8	0.4	1.4	0.2	0.3	1.4	16.5	7.1	0.0	15.1	3.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.4	2.5	3.8	0.7	2.0	3.8	5.7	17.7	0.1	4.0	10.8	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	112.7	33.5	36.1	36.7	33.0	36.1	46.0	18.4	4.6	52.4	11.9	6.2
LnGrp LOS	F	C	D	D	C	D	D	B	A	D	B	A
Approach Vol, veh/h		566			305			1316			1325	
Approach Delay, s/veh		72.4			35.2			22.4			14.6	
Approach LOS		E			D			C			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		74.2		25.8		74.2		25.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		69.7		21.3		69.7		21.3				
Max Q Clear Time (g_c+I1), s		71.7		23.3		71.7		11.7				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.9				
Intersection Summary												
HCM 6th Ctrl Delay				28.6								
HCM 6th LOS				C								

Existing AM

Intersection						
Int Delay, s/veh	12.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	78	206	40	114	372	44
Future Vol, veh/h	78	206	40	114	372	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	85	224	43	124	404	48

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	961	105	0	0	167	0
Stage 1	105	-	-	-	-	-
Stage 2	856	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	284	949	-	-	1411	-
Stage 1	919	-	-	-	-	-
Stage 2	416	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	201	949	-	-	1411	-
Mov Cap-2 Maneuver	201	-	-	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	416	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.3	0	7.7
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	469	1411
HCM Lane V/C Ratio	-	-	0.658	0.287
HCM Control Delay (s)	-	-	26.3	8.6
HCM Lane LOS	-	-	D	A
HCM 95th %tile Q(veh)	-	-	4.7	1.2

Existing PM

Intersection

Int Delay, s/veh 9.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	110	229	42	97	182	41
Future Vol, veh/h	110	229	42	97	182	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	120	249	46	105	198	45

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	540	99	0	0	151
Stage 1	99	-	-	-	-
Stage 2	441	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	503	957	-	-	1430
Stage 1	925	-	-	-	-
Stage 2	648	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	432	957	-	-	1430
Mov Cap-2 Maneuver	432	-	-	-	-
Stage 1	794	-	-	-	-
Stage 2	648	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.2	0	6.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	686	1430
HCM Lane V/C Ratio	-	-	0.537	0.138
HCM Control Delay (s)	-	-	16.2	7.9
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	3.2	0.5

2030 AM

Intersection	
Intersection Delay, s/veh	374.1
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	80	30	250	10	20	20	270	800	10	20	640	80
Future Vol, veh/h	80	30	250	10	20	20	270	800	10	20	640	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	87	33	272	11	22	22	293	870	11	22	696	87
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	35.9	18	579.4	263
HCM LOS	E	C	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	22%	20%	3%
Vol Thru, %	74%	8%	40%	86%
Vol Right, %	1%	69%	40%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1080	360	50	740
LT Vol	270	80	10	20
Through Vol	800	30	20	640
RT Vol	10	250	20	80
Lane Flow Rate	1174	391	54	804
Geometry Grp	1	1	1	1
Degree of Util (X)	2.234	0.755	0.133	1.508
Departure Headway (Hd)	7.638	9.308	13.024	8.486
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	493	391	277	434
Service Time	5.638	7.308	11.024	6.486
HCM Lane V/C Ratio	2.381	1	0.195	1.853
HCM Control Delay	579.4	35.9	18	263
HCM Lane LOS	F	E	C	F
HCM 95th-tile Q	77.8	6.1	0.5	34

2030 PM

Intersection	
Intersection Delay, s/veh	26.2
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	70	110	100	230	90	120	90	10	80	180	20	90
Future Vol, veh/h	70	110	100	230	90	120	90	10	80	180	20	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	76	120	109	250	98	130	98	11	87	196	22	98
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	19	38.6	15.4	21.1
HCM LOS	C	E	C	C

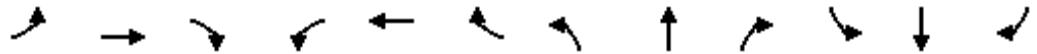
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	25%	52%	62%
Vol Thru, %	6%	39%	20%	7%
Vol Right, %	44%	36%	27%	31%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	180	280	440	290
LT Vol	90	70	230	180
Through Vol	10	110	90	20
RT Vol	80	100	120	90
Lane Flow Rate	196	304	478	315
Geometry Grp	1	1	1	1
Degree of Util (X)	0.401	0.579	0.868	0.62
Departure Headway (Hd)	7.387	6.85	6.53	7.081
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	485	527	555	508
Service Time	5.458	4.912	4.582	5.14
HCM Lane V/C Ratio	0.404	0.577	0.861	0.62
HCM Control Delay	15.4	19	38.6	21.1
HCM Lane LOS	C	C	E	C
HCM 95th-tile Q	1.9	3.6	9.6	4.2

HCM 6th Signalized Intersection Summary

4: 200 E & 700 N

12/05/2019

2030 AM + Mit



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	80	30	250	10	20	20	270	800	10	20	640	80
Future Volume (veh/h)	80	30	250	10	20	20	270	800	10	20	640	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	33	272	11	22	22	293	870	11	22	696	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	324	35	287	94	172	172	409	1290	16	352	1141	143
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.70	0.70	0.70	0.70	0.70	0.70
Sat Flow, veh/h	1362	174	1437	1074	858	858	691	1843	23	630	1630	204
Grp Volume(v), veh/h	87	0	305	11	0	44	293	0	881	22	0	783
Grp Sat Flow(s),veh/h/ln	1362	0	1612	1074	0	1716	691	0	1866	630	0	1834
Q Serve(g_s), s	5.0	0.0	16.8	0.9	0.0	1.9	34.7	0.0	24.1	1.9	0.0	20.1
Cycle Q Clear(g_c), s	6.9	0.0	16.8	17.7	0.0	1.9	54.8	0.0	24.1	26.0	0.0	20.1
Prop In Lane	1.00		0.89	1.00		0.50	1.00		0.01	1.00		0.11
Lane Grp Cap(c), veh/h	324	0	322	94	0	343	409	0	1306	352	0	1284
V/C Ratio(X)	0.27	0.00	0.95	0.12	0.00	0.13	0.72	0.00	0.67	0.06	0.00	0.61
Avail Cap(c_a), veh/h	324	0	322	94	0	343	409	0	1306	352	0	1284
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.4	0.0	35.5	44.3	0.0	29.6	21.4	0.0	7.7	15.1	0.0	7.1
Incr Delay (d2), s/veh	0.4	0.0	36.1	0.5	0.0	0.2	10.3	0.0	2.8	0.3	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	9.7	0.3	0.0	0.8	6.4	0.0	8.7	0.3	0.0	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.8	0.0	71.6	44.8	0.0	29.7	31.7	0.0	10.5	15.4	0.0	9.2
LnGrp LOS	C	A	E	D	A	C	C	A	B	B	A	A
Approach Vol, veh/h		392			55			1174				805
Approach Delay, s/veh		63.0			32.7			15.8				9.4
Approach LOS		E			C			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		67.5		22.5		67.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		63.0		18.0		63.0		18.0				
Max Q Clear Time (g_c+I1), s		56.8		18.8		28.0		19.7				
Green Ext Time (p_c), s		4.1		0.0		7.2		0.0				

Intersection Summary

HCM 6th Ctrl Delay	21.7
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary

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12/05/2019

2030 PM + Mit



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	110	100	230	90	120	90	10	80	180	20	90
Future Volume (veh/h)	70	110	100	230	90	120	90	10	80	180	20	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	120	109	250	98	130	98	11	87	196	22	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	477	330	300	478	267	354	649	77	606	669	126	563
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	1153	903	820	1152	729	967	1272	181	1432	1297	299	1332
Grp Volume(v), veh/h	76	0	229	250	0	228	98	0	98	196	0	120
Grp Sat Flow(s),veh/h/ln	1153	0	1723	1152	0	1696	1272	0	1613	1297	0	1631
Q Serve(g_s), s	2.2	0.0	4.1	8.6	0.0	4.2	2.2	0.0	1.6	4.7	0.0	2.0
Cycle Q Clear(g_c), s	6.4	0.0	4.1	12.8	0.0	4.2	4.2	0.0	1.6	6.2	0.0	2.0
Prop In Lane	1.00		0.48	1.00		0.57	1.00		0.89	1.00		0.82
Lane Grp Cap(c), veh/h	477	0	630	478	0	620	649	0	682	669	0	690
V/C Ratio(X)	0.16	0.00	0.36	0.52	0.00	0.37	0.15	0.00	0.14	0.29	0.00	0.17
Avail Cap(c_a), veh/h	543	0	729	544	0	717	649	0	682	669	0	690
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.2	0.0	9.9	14.6	0.0	9.9	8.9	0.0	7.5	9.5	0.0	7.6
Incr Delay (d2), s/veh	0.2	0.0	0.4	0.9	0.0	0.4	0.5	0.0	0.4	1.1	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	1.3	2.0	0.0	1.3	0.6	0.0	0.5	1.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	0.0	10.2	15.4	0.0	10.3	9.4	0.0	8.0	10.6	0.0	8.2
LnGrp LOS	B	A	B	B	A	B	A	A	A	B	A	A
Approach Vol, veh/h		305			478			196			316	
Approach Delay, s/veh		10.8			13.0			8.7			9.7	
Approach LOS		B			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		20.1		22.5		20.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		6.2		8.4		8.2		14.8				
Green Ext Time (p_c), s		0.6		1.1		0.9		0.8				
Intersection Summary												
HCM 6th Ctrl Delay				11.0								
HCM 6th LOS				B								

Existing AM

Intersection	
Intersection Delay, s/veh	14.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↵		↵	↵		↵	↵		↵	↵	
Traffic Vol, veh/h	18	232	29	92	176	87	7	60	110	131	94	27
Future Vol, veh/h	18	232	29	92	176	87	7	60	110	131	94	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	252	32	100	191	95	8	65	120	142	102	29
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	16.5	14.8	13.1	12.8
HCM LOS	C	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	35%	0%	89%	0%	67%	0%	78%
Vol Right, %	0%	65%	0%	11%	0%	33%	0%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	170	18	261	92	263	131	121
LT Vol	7	0	18	0	92	0	131	0
Through Vol	0	60	0	232	0	176	0	94
RT Vol	0	110	0	29	0	87	0	27
Lane Flow Rate	8	185	20	284	100	286	142	132
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.016	0.35	0.04	0.531	0.2	0.513	0.301	0.253
Departure Headway (Hd)	7.801	6.824	7.329	6.739	7.211	6.466	7.608	6.937
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	459	527	489	536	498	557	473	518
Service Time	5.54	4.563	5.065	4.475	4.949	4.202	5.345	4.674
HCM Lane V/C Ratio	0.017	0.351	0.041	0.53	0.201	0.513	0.3	0.255
HCM Control Delay	10.7	13.2	10.4	16.9	11.8	15.8	13.6	12
HCM Lane LOS	B	B	B	C	B	C	B	B
HCM 95th-tile Q	0	1.6	0.1	3.1	0.7	2.9	1.3	1

Existing PM

Intersection	
Intersection Delay, s/veh	13.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↵		↵	↵		↵	↵		↵	↵	
Traffic Vol, veh/h	35	195	21	25	176	113	33	113	33	85	127	31
Future Vol, veh/h	35	195	21	25	176	113	33	113	33	85	127	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	212	23	27	191	123	36	123	36	92	138	34
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	13.6	15.6	12.1	12.3
HCM LOS	B	C	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	77%	0%	90%	0%	61%	0%	80%
Vol Right, %	0%	23%	0%	10%	0%	39%	0%	20%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	33	146	35	216	25	289	85	158
LT Vol	33	0	35	0	25	0	85	0
Through Vol	0	113	0	195	0	176	0	127
RT Vol	0	33	0	21	0	113	0	31
Lane Flow Rate	36	159	38	235	27	314	92	172
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.074	0.297	0.075	0.424	0.053	0.54	0.187	0.316
Departure Headway (Hd)	7.417	6.745	7.083	6.504	6.981	6.194	7.279	6.629
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	480	528	503	549	510	578	490	538
Service Time	5.216	4.543	4.873	4.294	4.765	3.977	5.073	4.422
HCM Lane V/C Ratio	0.075	0.301	0.076	0.428	0.053	0.543	0.188	0.32
HCM Control Delay	10.8	12.4	10.5	14.1	10.2	16.1	11.8	12.5
HCM Lane LOS	B	B	B	B	B	C	B	B
HCM 95th-tile Q	0.2	1.2	0.2	2.1	0.2	3.2	0.7	1.3

2030 AM

Intersection	
Intersection Delay, s/veh	81.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	20	350	80	100	290	200	10	50	190	250	90	40
Future Vol, veh/h	20	350	80	100	290	200	10	50	190	250	90	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	380	87	109	315	217	11	54	207	272	98	43
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	102.1	124	27	28.9
HCM LOS	F	F	D	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	21%	0%	81%	0%	59%	0%	69%
Vol Right, %	0%	79%	0%	19%	0%	41%	0%	31%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	240	20	430	100	490	250	130
LT Vol	10	0	20	0	100	0	250	0
Through Vol	0	50	0	350	0	290	0	90
RT Vol	0	190	0	80	0	200	0	40
Lane Flow Rate	11	261	22	467	109	533	272	141
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.03	0.638	0.055	1.105	0.274	1.221	0.716	0.344
Departure Headway (Hd)	10.646	9.532	9.663	9.004	9.478	8.657	10.236	9.482
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	338	381	373	407	382	426	356	382
Service Time	8.346	7.232	7.363	6.704	7.178	6.357	7.936	7.182
HCM Lane V/C Ratio	0.033	0.685	0.059	1.147	0.285	1.251	0.764	0.369
HCM Control Delay	13.7	27.6	12.9	106.3	15.7	146.1	35	17.1
HCM Lane LOS	B	D	B	F	C	F	D	C
HCM 95th-tile Q	0.1	4.2	0.2	15.8	1.1	20.7	5.3	1.5

2030 PM

Intersection	
Intersection Delay, s/veh	67.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↷		↶	↷	
Traffic Vol, veh/h	50	310	30	90	330	190	40	120	80	210	110	20
Future Vol, veh/h	50	310	30	90	330	190	40	120	80	210	110	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	337	33	98	359	207	43	130	87	228	120	22
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	39.6	129.9	20.3	21.6
HCM LOS	E	F	C	C

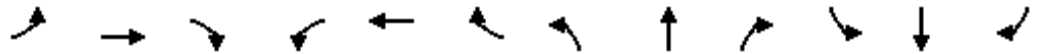
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	60%	0%	91%	0%	63%	0%	85%
Vol Right, %	0%	40%	0%	9%	0%	37%	0%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	200	50	340	90	520	210	130
LT Vol	40	0	50	0	90	0	210	0
Through Vol	0	120	0	310	0	330	0	110
RT Vol	0	80	0	30	0	190	0	20
Lane Flow Rate	43	217	54	370	98	565	228	141
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.114	0.521	0.132	0.842	0.236	1.239	0.577	0.334
Departure Headway (Hd)	10.052	9.233	9.284	8.699	8.675	7.893	9.726	9.09
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	359	393	389	418	414	463	374	398
Service Time	7.752	6.933	6.984	6.399	6.434	5.651	7.426	6.79
HCM Lane V/C Ratio	0.12	0.552	0.139	0.885	0.237	1.22	0.61	0.354
HCM Control Delay	14	21.5	13.4	43.4	14.1	150	24.9	16.3
HCM Lane LOS	B	C	B	E	B	F	C	C
HCM 95th-tile Q	0.4	2.9	0.5	8.1	0.9	22.8	3.5	1.4

HCM 6th Signalized Intersection Summary

3: 150 W & 1120 N

12/05/2019

2030 AM + Mit



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	20	350	80	100	290	200	10	50	190	250	90	40
Future Volume (veh/h)	20	350	80	100	290	200	10	50	190	250	90	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	380	87	109	315	217	11	54	207	272	98	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	243	420	96	253	428	295	469	99	379	451	558	245
Arrive On Green	0.29	0.29	0.29	0.06	0.42	0.42	0.29	0.29	0.29	0.10	0.45	0.45
Sat Flow, veh/h	872	1473	337	1781	1032	711	1248	339	1298	1781	1232	541
Grp Volume(v), veh/h	22	0	467	109	0	532	11	0	261	272	0	141
Grp Sat Flow(s),veh/h/ln	872	0	1810	1781	0	1742	1248	0	1637	1781	0	1773
Q Serve(g_s), s	1.5	0.0	17.0	2.8	0.0	17.5	0.4	0.0	9.2	6.5	0.0	3.2
Cycle Q Clear(g_c), s	10.2	0.0	17.0	2.8	0.0	17.5	0.4	0.0	9.2	6.5	0.0	3.2
Prop In Lane	1.00		0.19	1.00		0.41	1.00		0.79	1.00		0.30
Lane Grp Cap(c), veh/h	243	0	516	253	0	723	469	0	477	451	0	803
V/C Ratio(X)	0.09	0.00	0.90	0.43	0.00	0.74	0.02	0.00	0.55	0.60	0.00	0.18
Avail Cap(c_a), veh/h	257	0	544	273	0	769	469	0	477	451	0	803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	23.5	17.0	0.0	16.8	17.3	0.0	20.4	15.8	0.0	11.1
Incr Delay (d2), s/veh	0.2	0.0	18.1	1.2	0.0	3.5	0.1	0.0	4.4	2.3	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	9.3	1.1	0.0	7.0	0.1	0.0	3.9	2.9	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	0.0	41.6	18.2	0.0	20.3	17.4	0.0	24.8	18.0	0.0	11.6
LnGrp LOS	C	A	D	B	A	C	B	A	C	B	A	B
Approach Vol, veh/h		489			641			272			413	
Approach Delay, s/veh		40.9			19.9			24.5			15.8	
Approach LOS		D			B			C			B	
Timer - Assigned Phs	1	2	3	4		6		8				
Phs Duration (G+Y+Rc), s	11.0	24.4	8.9	24.0		35.4		32.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s	6.5	19.9	5.1	20.5		30.9		30.1				
Max Q Clear Time (g_c+I1), s	8.5	11.2	4.8	19.0		5.2		19.5				
Green Ext Time (p_c), s	0.0	1.0	0.0	0.5		0.8		2.7				

Intersection Summary

HCM 6th Ctrl Delay	25.3
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary

3: 150 W & 1120 N

12/05/2019

2030 PM + Mit



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	50	310	30	90	330	190	40	120	80	210	110	20
Future Volume (veh/h)	50	310	30	90	330	190	40	120	80	210	110	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	337	33	98	359	207	43	130	87	228	120	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	216	563	55	377	389	224	490	287	192	441	482	88
Arrive On Green	0.05	0.34	0.34	0.06	0.35	0.35	0.04	0.27	0.27	0.08	0.31	0.31
Sat Flow, veh/h	1781	1677	164	1781	1113	642	1781	1045	699	1781	1538	282
Grp Volume(v), veh/h	54	0	370	98	0	566	43	0	217	228	0	142
Grp Sat Flow(s),veh/h/ln	1781	0	1841	1781	0	1755	1781	0	1744	1781	0	1820
Q Serve(g_s), s	1.4	0.0	12.0	2.5	0.0	22.2	1.2	0.0	7.4	5.7	0.0	4.2
Cycle Q Clear(g_c), s	1.4	0.0	12.0	2.5	0.0	22.2	1.2	0.0	7.4	5.7	0.0	4.2
Prop In Lane	1.00		0.09	1.00		0.37	1.00		0.40	1.00		0.15
Lane Grp Cap(c), veh/h	216	0	618	377	0	613	490	0	479	441	0	571
V/C Ratio(X)	0.25	0.00	0.60	0.26	0.00	0.92	0.09	0.00	0.45	0.52	0.00	0.25
Avail Cap(c_a), veh/h	260	0	667	410	0	648	543	0	479	441	0	571
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.5	0.0	19.8	15.0	0.0	22.4	17.3	0.0	21.6	18.5	0.0	18.3
Incr Delay (d2), s/veh	0.6	0.0	1.3	0.4	0.0	18.4	0.1	0.0	3.1	1.1	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	5.0	1.0	0.0	11.5	0.5	0.0	3.3	2.7	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	0.0	21.1	15.4	0.0	40.8	17.4	0.0	24.7	19.5	0.0	19.4
LnGrp LOS	B	A	C	B	A	D	B	A	C	B	A	B
Approach Vol, veh/h		424			664			260			370	
Approach Delay, s/veh		20.7			37.1			23.5			19.5	
Approach LOS		C			D			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	24.2	8.8	28.6	7.4	27.0	7.8	29.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.7	19.7	5.6	26.0	5.0	20.4	5.1	26.5				
Max Q Clear Time (g_c+I1), s	7.7	9.4	4.5	14.0	3.2	6.2	3.4	24.2				
Green Ext Time (p_c), s	0.0	0.8	0.0	1.8	0.0	0.6	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay				27.2								
HCM 6th LOS				C								



Sidra Reports

LANE SUMMARY

 Site: AF [L3 AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 500 East													
Lane 1 ^d	130	3.0	740	0.176	100	6.8	LOS A	0.7	18.6	Full	1600	0.0	0.0
Approach	130	3.0		0.176		6.8	LOS A	0.7	18.6				
East: 1100 South													
Lane 1	33	3.0	1091	0.030	100	3.6	LOS A	0.1	2.8	Full	1600	0.0	0.0
Lane 2 ^d	152	3.0	1091	0.140	100	4.5	LOS A	0.6	14.6	Short	100	0.0	NA
Approach	185	3.0		0.140		4.4	LOS A	0.6	14.6				
North: 500 East													
Lane 1 ^d	554	3.0	1251	0.443	100	7.4	LOS A	3.0	76.5	Full	1600	0.0	0.0
Approach	554	3.0		0.443		7.4	LOS A	3.0	76.5				
West: 1100 South													
Lane 1 ^d	239	3.0	839	0.285	100	7.4	LOS A	1.3	33.5	Full	1600	0.0	0.0
Approach	239	3.0		0.285		7.4	LOS A	1.3	33.5				
Intersection	1109	3.0		0.443		6.8	LOS A	3.0	76.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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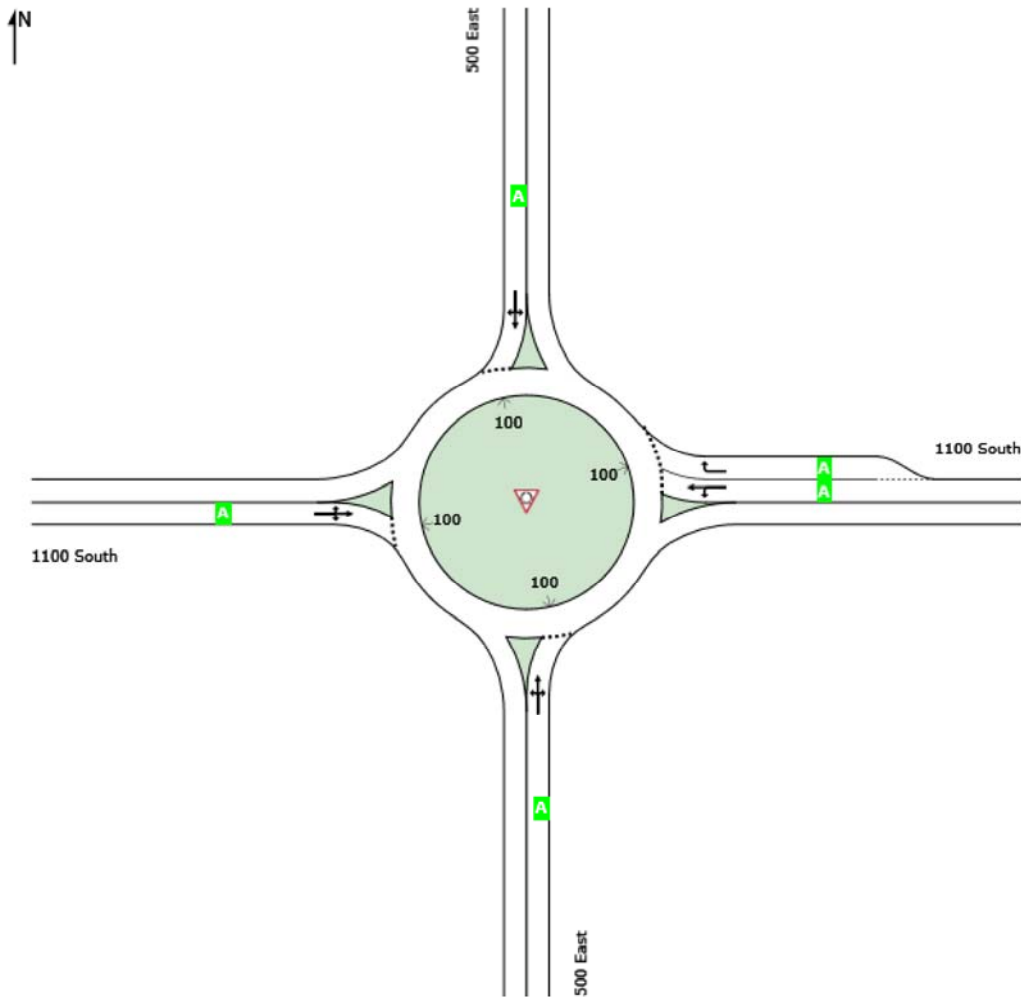
LANE LEVEL OF SERVICE

Lane Level of Service

 Site: AF [L3 AM]

New Site
 Site Category: (None)
 Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

 Site: AF [L3 PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 500 East													
Lane 1 ^d	196	3.0	675	0.290	100	8.9	LOS A	1.2	31.7	Full	1600	0.0	0.0
Approach	196	3.0		0.290		8.9	LOS A	1.2	31.7				
East: 1100 South													
Lane 1	109	3.0	795	0.137	100	5.9	LOS A	0.5	13.2	Full	1600	0.0	0.0
Lane 2 ^d	641	3.0	795	0.806	100	24.5	LOS C	11.8	301.9	Short	100	0.0	NA
Approach	750	3.0		0.806		21.8	LOS C	11.8	301.9				
North: 500 East													
Lane 1 ^d	424	3.0	1129	0.376	100	7.0	LOS A	2.2	55.1	Full	1600	0.0	0.0
Approach	424	3.0		0.376		7.0	LOS A	2.2	55.1				
West: 1100 South													
Lane 1 ^d	533	3.0	984	0.541	100	10.6	LOS B	4.4	111.4	Full	1600	0.0	0.0
Approach	533	3.0		0.541		10.6	LOS B	4.4	111.4				
Intersection	1902	3.0		0.806		14.0	LOS B	11.8	301.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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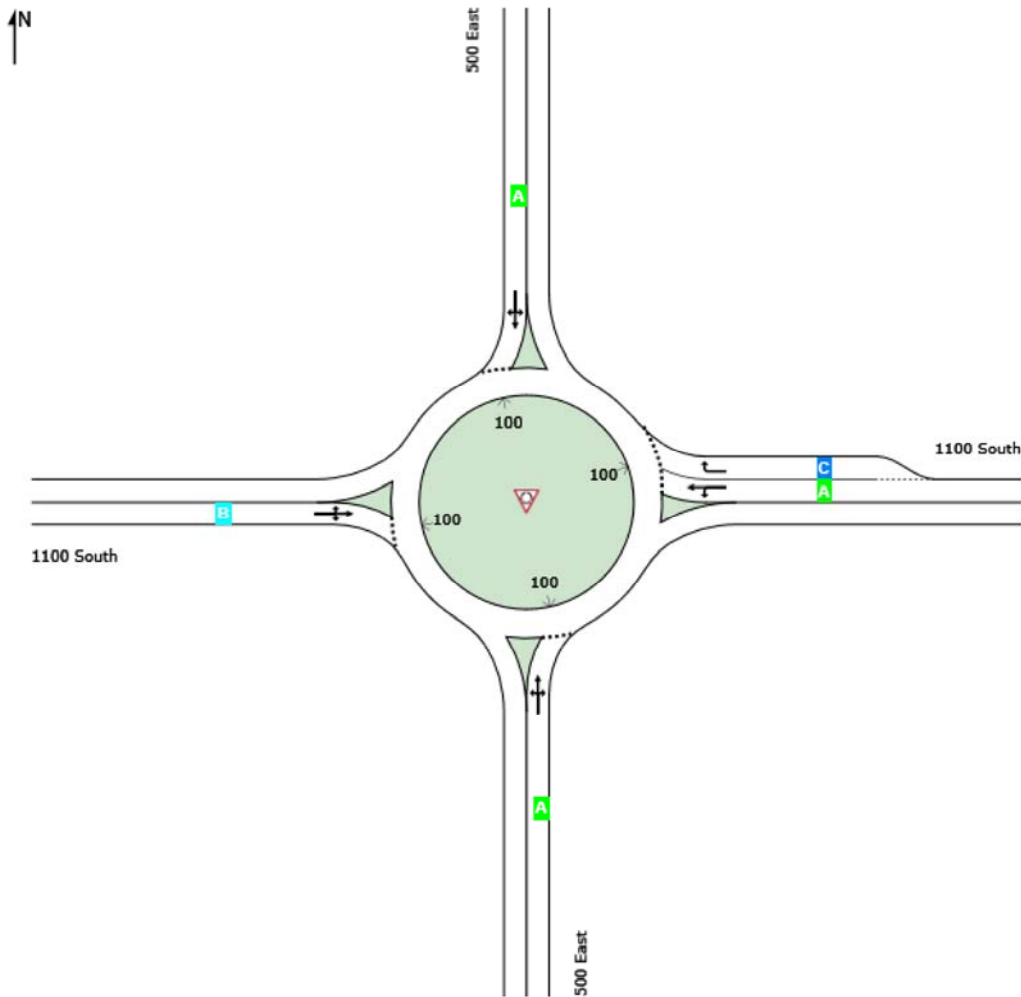
LANE LEVEL OF SERVICE

Lane Level of Service

 Site: AF [L3 PM]

New Site
 Site Category: (None)
 Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	C	A	B	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

 Site: AF [L9AM]

New Site
 Site Category: (None)
 Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 900 West													
Lane 1 ^d	76	3.0	660	0.115	100	6.7	LOS A	0.4	11.4	Full	1600	0.0	0.0
Approach	76	3.0		0.115		6.7	LOS A	0.4	11.4				
East: Grassland Drive													
Lane 1 ^d	326	3.0	1223	0.267	100	5.3	LOS A	1.4	35.9	Full	1600	0.0	0.0
Approach	326	3.0		0.267		5.3	LOS A	1.4	35.9				
North: 900 West													
Lane 1 ^d	54	3.0	919	0.059	100	4.5	LOS A	0.2	6.1	Full	1600	0.0	0.0
Approach	54	3.0		0.059		4.5	LOS A	0.2	6.1				
West: Grassland Drive													
Lane 1 ^d	717	3.0	1280	0.560	100	9.1	LOS A	4.7	121.0	Full	1600	0.0	0.0
Approach	717	3.0		0.560		9.1	LOS A	4.7	121.0				
Intersection	1174	3.0		0.560		7.7	LOS A	4.7	121.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

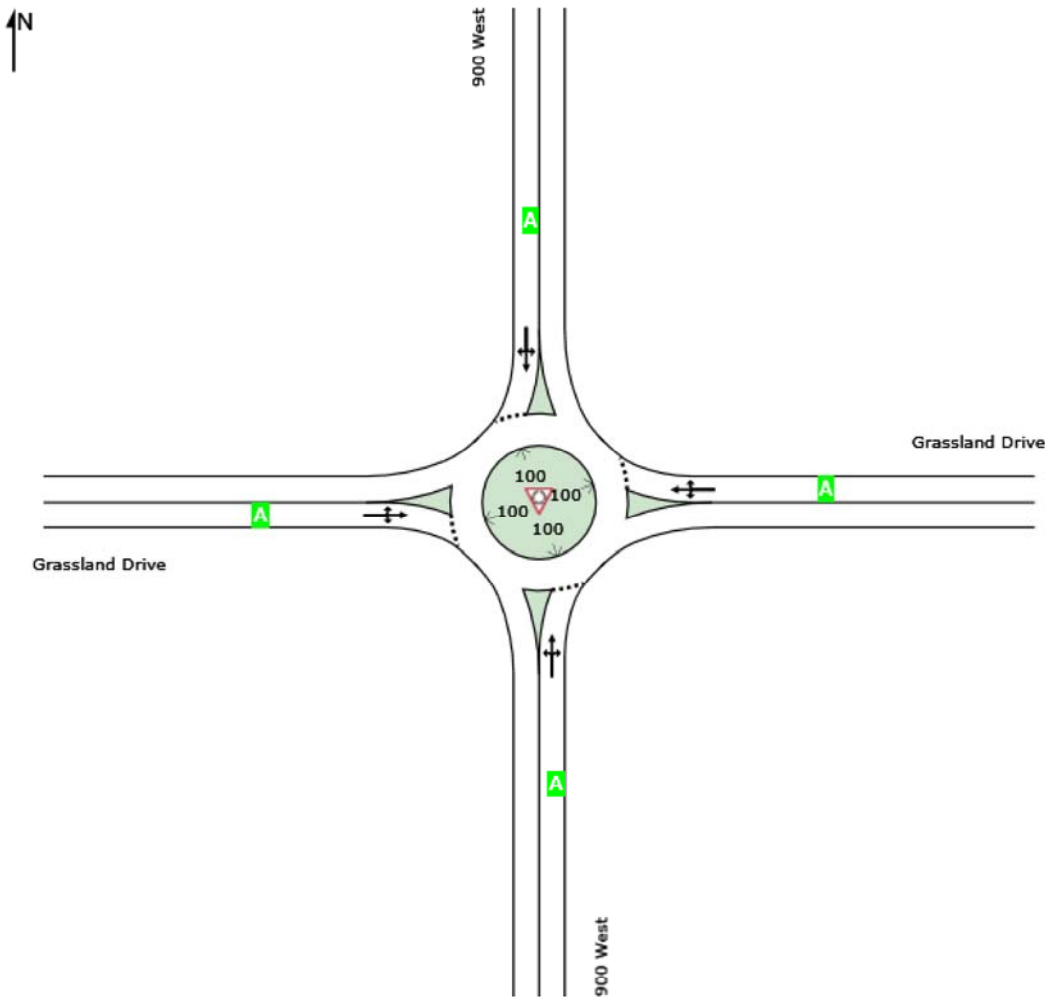
LANE LEVEL OF SERVICE

Lane Level of Service

 Site: AF [L9 AM]

New Site
 Site Category: (None)
 Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

 Site: AF [L9 PM]

New Site
 Site Category: (None)
 Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 900 West													
Lane 1 ^d	130	3.0	829	0.157	100	5.9	LOS A	0.7	16.8	Full	1600	0.0	0.0
Approach	130	3.0		0.157		5.9	LOS A	0.7	16.8				
East: Grassland Drive													
Lane 1 ^d	402	3.0	1155	0.348	100	6.5	LOS A	2.0	50.2	Full	1600	0.0	0.0
Approach	402	3.0		0.348		6.5	LOS A	2.0	50.2				
North: 900 West													
Lane 1 ^d	43	3.0	801	0.054	100	5.0	LOS A	0.2	5.4	Full	1600	0.0	0.0
Approach	43	3.0		0.054		5.0	LOS A	0.2	5.4				
West: Grassland Drive													
Lane 1 ^d	500	3.0	1265	0.395	100	6.7	LOS A	2.5	64.1	Full	1600	0.0	0.0
Approach	500	3.0		0.395		6.7	LOS A	2.5	64.1				
Intersection	1076	3.0		0.395		6.5	LOS A	2.5	64.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

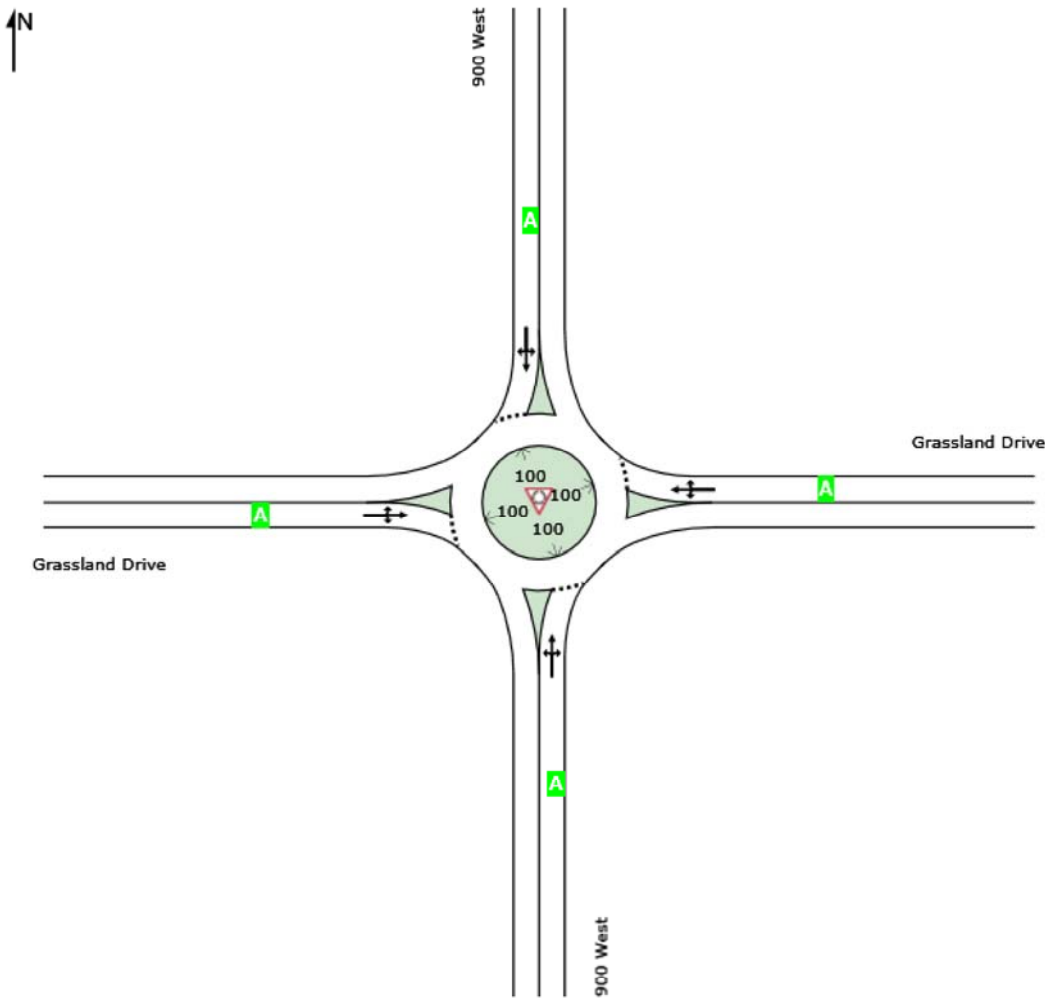
LANE LEVEL OF SERVICE

Lane Level of Service

 Site: AF [L9 PM]

New Site
 Site Category: (None)
 Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

 Site: AF [L 11 AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 540 West													
Lane 1 ^d	217	3.0	1019	0.213	100	5.6	LOS A	1.0	25.4	Full	1600	0.0	0.0
Approach	217	3.0		0.213		5.6	LOS A	1.0	25.4				
East: 700 North													
Lane 1 ^d	630	3.0	1258	0.501	100	8.2	LOS A	3.3	85.4	Full	1600	0.0	0.0
Lane 2	33	3.0	1258	0.026	100	3.1	LOS A	0.1	2.5	Short	200	0.0	NA
Approach	663	3.0		0.501		8.0	LOS A	3.3	85.4				
North: 540 West													
Lane 1 ^d	130	3.0	645	0.202	100	8.0	LOS A	0.8	20.8	Full	1600	0.0	0.0
Approach	130	3.0		0.202		8.0	LOS A	0.8	20.8				
West: 700 North													
Lane 1 ^d	207	3.0	1080	0.191	100	5.1	LOS A	0.8	20.8	Full	1600	0.0	0.0
Lane 2	11	3.0	1080	0.010	100	3.4	LOS A	0.0	0.9	Short	200	0.0	NA
Approach	217	3.0		0.191		5.0	LOS A	0.8	20.8				
Intersection	1228	3.0		0.501		7.0	LOS A	3.3	85.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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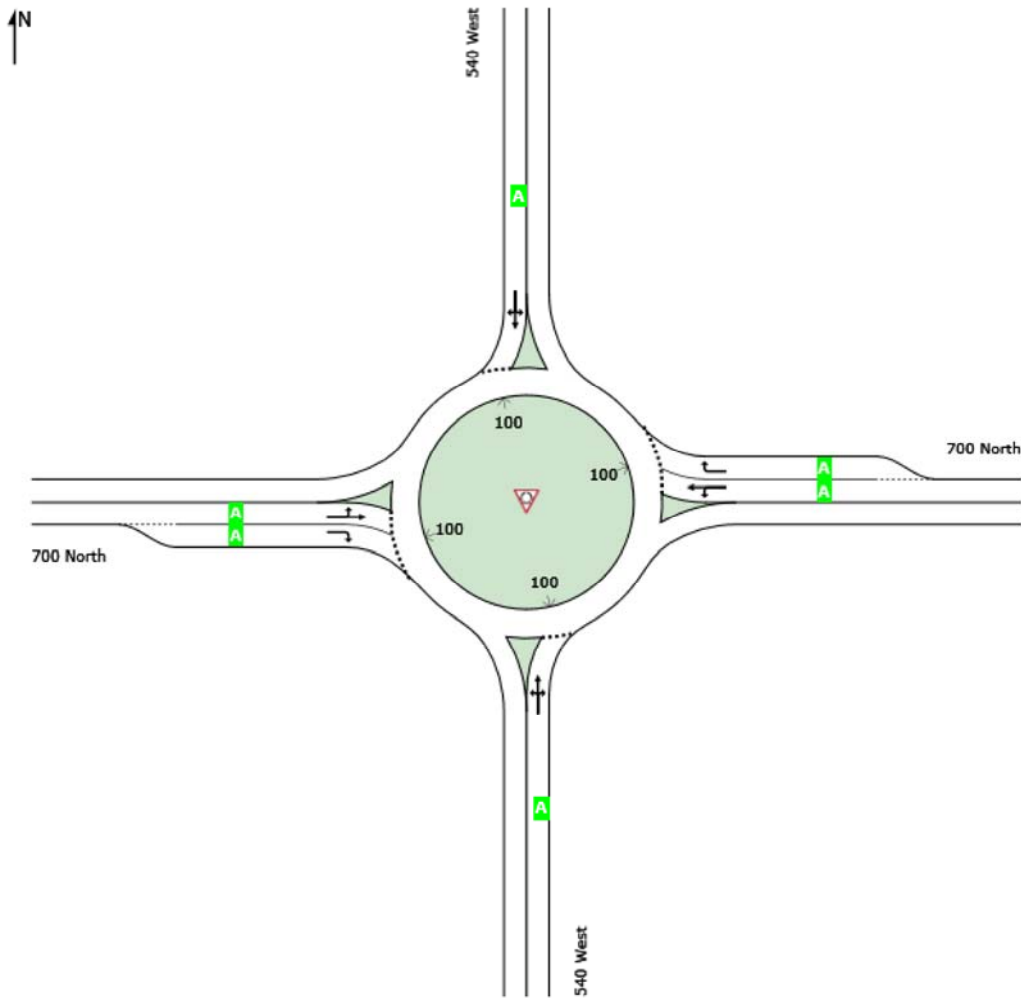
LANE LEVEL OF SERVICE

Lane Level of Service

 Site: AF [L 11 AM]

New Site
 Site Category: (None)
 Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

 Site: AF [L 11 PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 540 West													
Lane 1 ^d	239	3.0	537	0.445	100	14.2	LOS B	2.3	59.1	Full	1600	0.0	0.0
Approach	239	3.0		0.445		14.2	LOS B	2.3	59.1				
East: 700 North													
Lane 1 ^d	620	3.0	1091	0.568	100	10.4	LOS B	4.5	114.5	Full	1600	0.0	0.0
Lane 2	98	3.0	1091	0.090	100	4.1	LOS A	0.4	9.0	Short	200	0.0	NA
Approach	717	3.0		0.568		9.5	LOS A	4.5	114.5				
North: 540 West													
Lane 1 ^d	185	3.0	623	0.296	100	9.7	LOS A	1.2	31.7	Full	1600	0.0	0.0
Approach	185	3.0		0.296		9.7	LOS A	1.2	31.7				
West: 700 North													
Lane 1 ^d	815	3.0	1124	0.725	100	14.8	LOS B	12.4	317.8	Full	1600	0.0	0.0
Lane 2	207	3.0	1124	0.184	100	4.8	LOS A	0.8	20.1	Short	200	0.0	NA
Approach	1022	3.0		0.725		12.8	LOS B	12.4	317.8				
Intersection	2163	3.0		0.725		11.6	LOS B	12.4	317.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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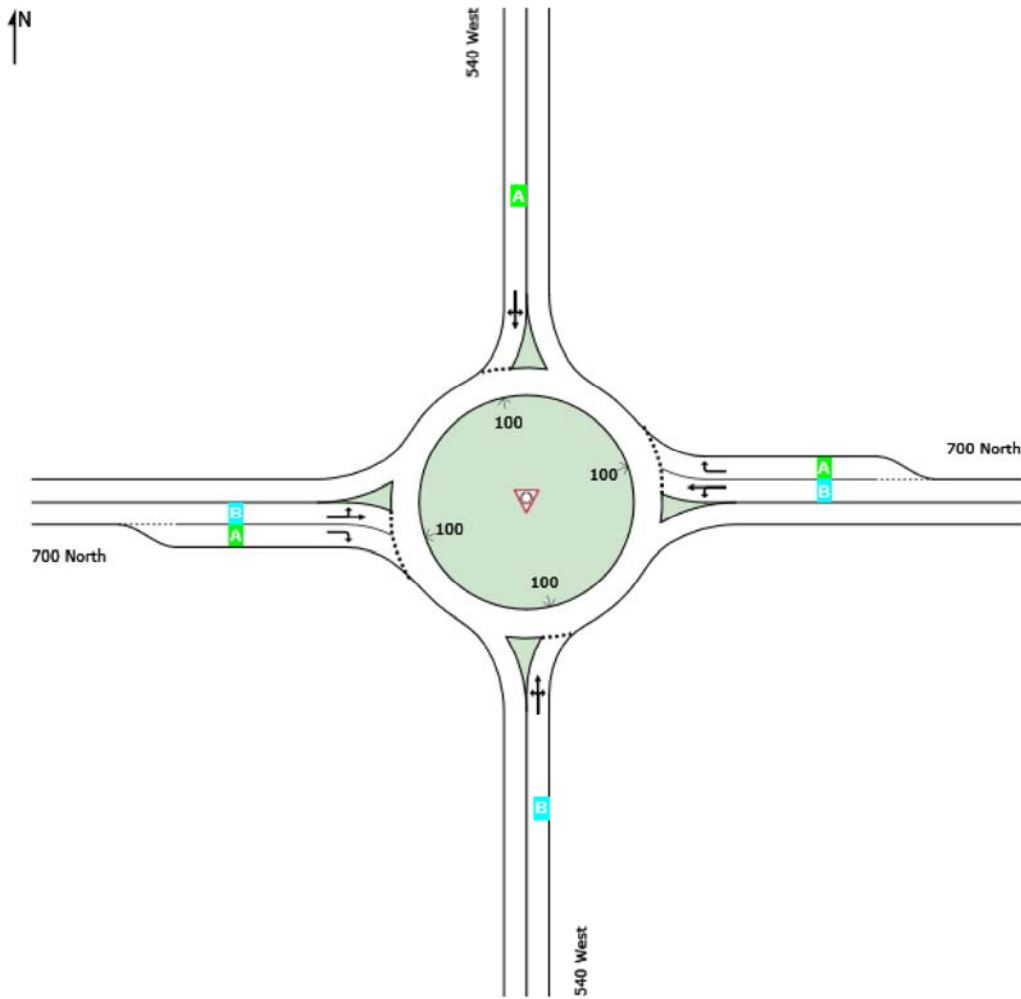
LANE LEVEL OF SERVICE

Lane Level of Service

 Site: AF [L 11 PM]

New Site
 Site Category: (None)
 Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	A	A	B	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

 Site: AF [L12 AM]

New Site
 Site Category: (None)
 Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 100 West													
Lane 1 ^d	228	3.0	668	0.342	100	9.9	LOS A	1.6	40.4	Full	1600	0.0	0.0
Approach	228	3.0		0.342		9.9	LOS A	1.6	40.4				
East: 700 North													
Lane 1 ^d	620	3.0	1066	0.581	100	10.9	LOS B	4.6	118.5	Full	1600	0.0	0.0
Approach	620	3.0		0.581		10.9	LOS B	4.6	118.5				
North: 100 West													
Lane 1 ^d	348	3.0	699	0.498	100	12.6	LOS B	3.2	82.7	Full	1600	0.0	0.0
Approach	348	3.0		0.498		12.6	LOS B	3.2	82.7				
West: 700 North													
Lane 1 ^d	652	3.0	919	0.710	100	16.4	LOS C	10.3	262.6	Full	1600	0.0	0.0
Approach	652	3.0		0.710		16.4	LOS C	10.3	262.6				
Intersection	1848	3.0		0.710		13.0	LOS B	10.3	262.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

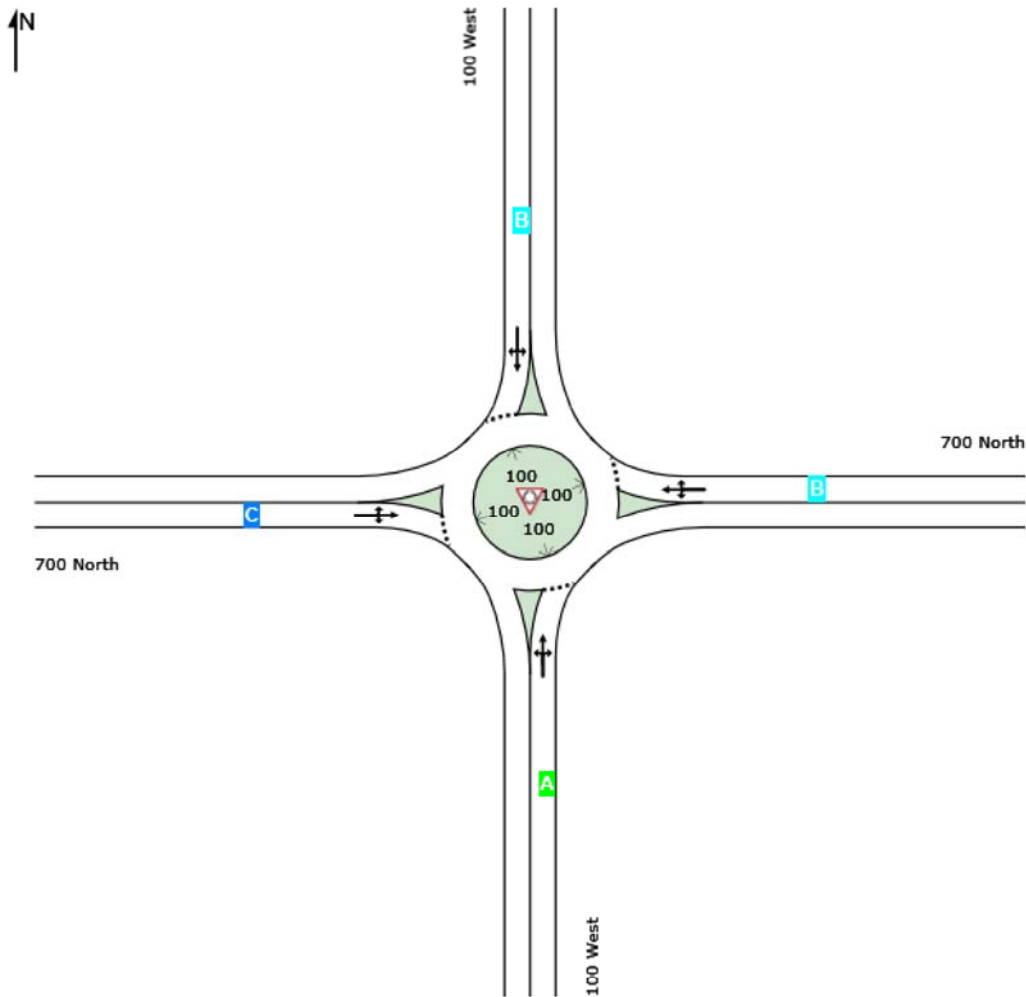
LANE LEVEL OF SERVICE

Lane Level of Service

 Site: AF [L12 AM]

New Site
 Site Category: (None)
 Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	B	B	C	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

 Site: AF [L12 PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 100 West													
Lane 1 ^d	283	3.0	748	0.378	100	9.6	LOS A	1.9	48.8	Full	1600	0.0	0.0
Approach	283	3.0		0.378		9.6	LOS A	1.9	48.8				
East: 700 North													
Lane 1 ^d	707	3.0	996	0.710	100	15.5	LOS C	11.3	288.4	Full	1600	0.0	0.0
Approach	707	3.0		0.710		15.5	LOS C	11.3	288.4				
North: 100 West													
Lane 1 ^d	217	3.0	645	0.337	100	10.1	LOS B	1.5	39.2	Full	1600	0.0	0.0
Approach	217	3.0		0.337		10.1	LOS B	1.5	39.2				
West: 700 North													
Lane 1 ^d	554	3.0	1078	0.514	100	9.4	LOS A	3.4	86.8	Full	1600	0.0	0.0
Approach	554	3.0		0.514		9.4	LOS A	3.4	86.8				
Intersection	1761	3.0		0.710		11.9	LOS B	11.3	288.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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Organisation: HORROCKS ENGINEERS | Processed: Wednesday, December 4, 2019 3:29:42 PM

Project: C:\Users\traffic\Desktop\American Fork Roundabouts.sip8

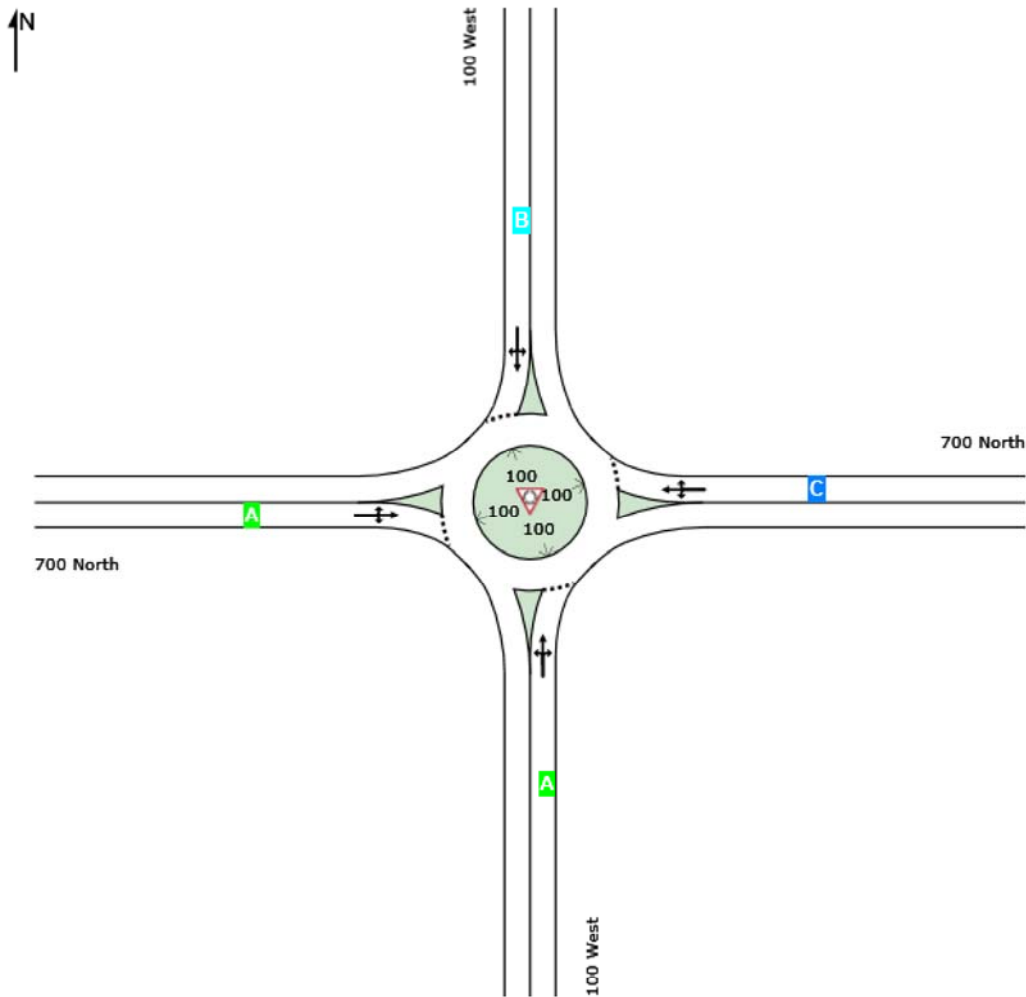
LANE LEVEL OF SERVICE

Lane Level of Service

 Site: AF [L12 PM]

New Site
 Site Category: (None)
 Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	C	B	A	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.
 Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
 LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).
 Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
 HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

 Site: AF [L14 AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 200 East													
Lane 1 ^d	1163	3.0	1208	0.963	100	36.4	LOS E	59.1	1514.1	Full	1600	0.0	3.4
Lane 2	11	3.0	1208	0.009	100	3.1	LOS A	0.0	0.9	Short	100	0.0	NA
Approach	1174	3.0		0.963		36.1	LOS E	59.1	1514.1				
East: 700 North													
Lane 1 ^d	33	3.0	427	0.076	100	9.5	LOS A	0.3	6.4	Full	1600	0.0	0.0
Lane 2	22	3.0	427	0.051	100	9.1	LOS A	0.2	4.2	Short	100	0.0	NA
Approach	54	3.0		0.076		9.4	LOS A	0.3	6.4				
North: 200 East													
Lane 1 ^d	717	3.0	1016	0.706	100	15.1	LOS C	10.5	268.6	Full	1600	0.0	0.0
Lane 2	87	3.0	1016	0.086	100	4.3	LOS A	0.3	8.4	Short	100	0.0	NA
Approach	804	3.0		0.706		13.9	LOS B	10.5	268.6				
West: 700 North													
Lane 1	120	3.0	697	0.172	100	7.1	LOS A	0.6	16.4	Full	1600	0.0	0.0
Lane 2 ^d	272	3.0	697	0.390	100	10.4	LOS B	1.9	48.6	Short	100	0.0	NA
Approach	391	3.0		0.390		9.4	LOS A	1.9	48.6				
Intersection	2424	3.0		0.963		23.8	LOS C	59.1	1514.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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Project: C:\Users\traffic\Desktop\American Fork Roundabouts.sip8

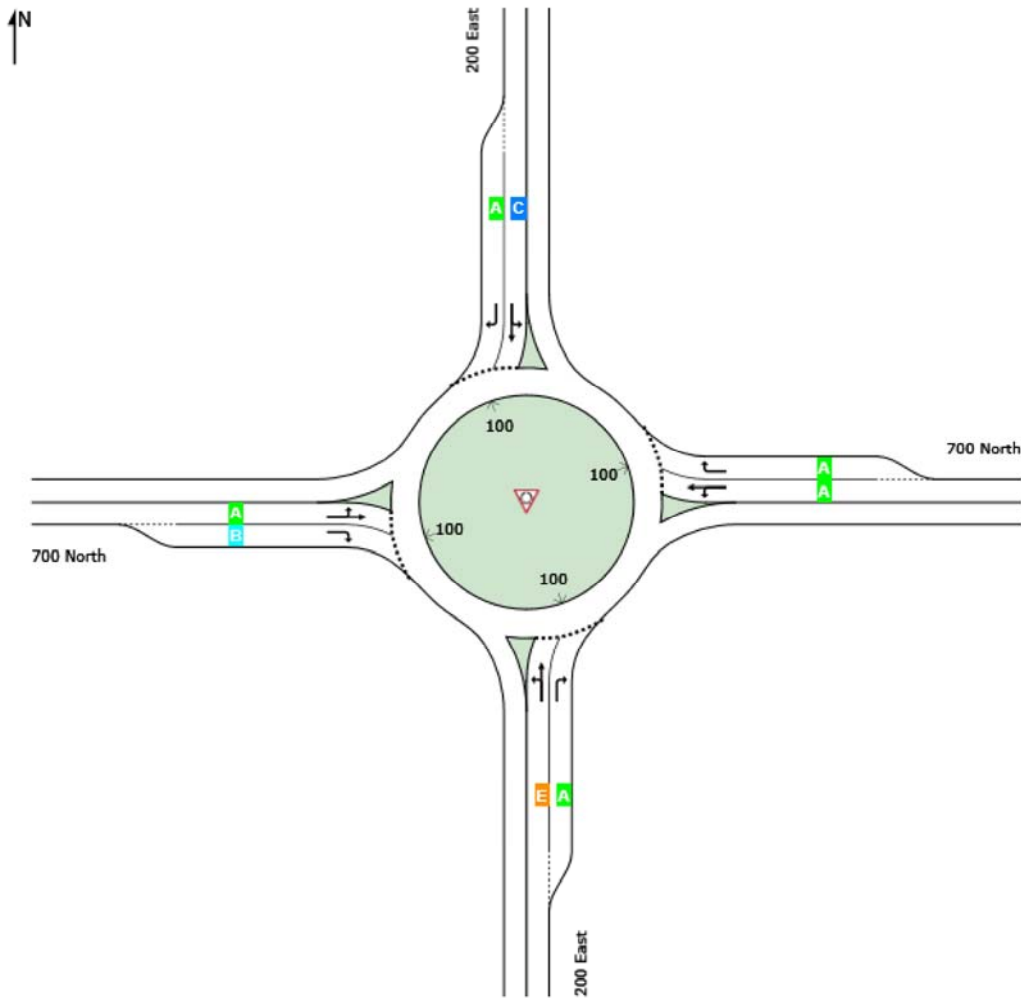
LANE LEVEL OF SERVICE

Lane Level of Service

 Site: AF [L14 AM]

New Site
 Site Category: (None)
 Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	E	A	B	A	C



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.
 Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
 LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).
 Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
 HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

 Site: AF [L14 PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 200 East													
Lane 1 ^d	109	3.0	955	0.114	100	4.8	LOS A	0.4	11.3	Full	1600	0.0	0.0
Lane 2	87	3.0	955	0.091	100	4.6	LOS A	0.3	8.9	Short	100	0.0	NA
Approach	196	3.0		0.114		4.7	LOS A	0.4	11.3				
East: 700 North													
Lane 1 ^d	348	3.0	1159	0.300	100	5.9	LOS A	1.5	37.3	Full	1600	0.0	0.0
Lane 2	130	3.0	1159	0.113	100	4.1	LOS A	0.5	11.6	Short	100	0.0	NA
Approach	478	3.0		0.300		5.4	LOS A	1.5	37.3				
North: 200 East													
Lane 1 ^d	217	3.0	908	0.239	100	6.4	LOS A	1.0	25.7	Full	1600	0.0	0.0
Lane 2	98	3.0	908	0.108	100	5.0	LOS A	0.4	10.5	Short	100	0.0	NA
Approach	315	3.0		0.239		6.0	LOS A	1.0	25.7				
West: 700 North													
Lane 1 ^d	196	3.0	890	0.220	100	6.3	LOS A	0.9	23.1	Full	1600	0.0	0.0
Lane 2	109	3.0	890	0.122	100	5.2	LOS A	0.5	12.0	Short	100	0.0	NA
Approach	304	3.0		0.220		5.9	LOS A	0.9	23.1				
Intersection	1293	3.0		0.300		5.6	LOS A	1.5	37.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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Project: C:\Users\traffic\Desktop\American Fork Roundabouts.sjp8

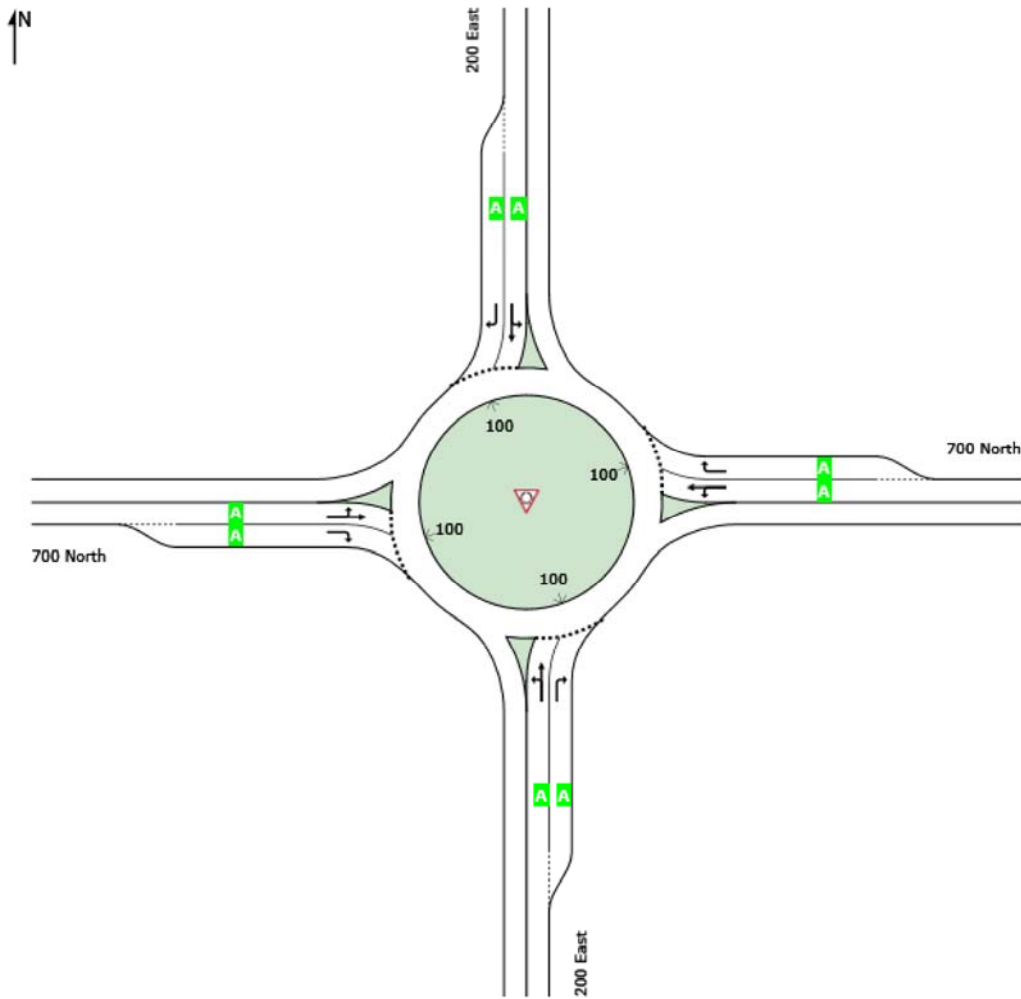
LANE LEVEL OF SERVICE

Lane Level of Service

 Site: AF [L14 PM]

New Site
 Site Category: (None)
 Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.
 Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
 LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).
 Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
 HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.2

900 West & Grasslands Dr (Roundabout)

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	8,000	\$32,000
Clearing and Grubbing	Acre	\$2,000	2	\$3,306
Roadway Excavation	C.Y.	\$11	9,333	\$98,000
HMA Concrete	Ton	\$85	1,085	\$92,225
Untreated Base Course	C.Y.	\$10	519	\$5,185
Granular Borrow	C.Y.	\$40	1,037	\$41,481
Curb and Gutter (2.5' width)	L.F.	\$23	2,000	\$45,000
Sidewalk (5' width)	L.F.	\$25	2,500	\$62,500
Drainage	L.F.	\$45	2,000	\$90,000
Right of Way	S.F.	\$4.00	72,000	\$288,000
Restriping	L.F.	\$5	1,000	\$5,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$1,262,697
Mobilization (10% of Construction)	Lump	10%	126,270	\$126,270
Contingency (15% of Construction)	Lump	15%	189,405	\$189,405
Subtotal				\$1,578,372

Preconstruction Engineering	8%	\$101,016
Construction Engineering	8%	\$101,016

Total Project Costs	\$1,781,000
----------------------------	--------------------

American Fork City's Responsibility via Impact Fee's	100%
	\$1,781,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granual Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.3

700 North New Road: 100 East to 200 East New Major Collector (3 Lanes)

Major Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	18,519	\$74,076
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	2	\$4,464
Roadway Excavation	C.Y.	\$11	5,787	\$60,765
HMA Concrete	Ton	\$85	2,018	\$171,554
Untreated Base Course	C.Y.	\$10	1,543	\$15,432
Granular Borrow	C.Y.	\$40	1,157	\$46,297
Curb and Gutter (2.5' width)	L.F.	\$23	2,315	\$52,085
Sidewalk (5' width)	L.F.	\$30	2,315	\$69,446
Drainage	L.F.	\$45	2,315	\$104,169
Right of Way	S.F.	\$4.00	97,225	\$388,899
Restriping	L.F.	\$5	1,157	\$5,787
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$992,975
Mobilization (10% of Construction)	Lump	10%	99,297	\$99,297
Contingency (15% of Construction)	Lump	15%	148,946	\$148,946
Subtotal				\$1,241,218

Preconstruction Engineering	8%	\$79,438
Construction Engineering	8%	\$79,438

Total Project Costs	\$1,401,000
----------------------------	--------------------

American Fork City's Responsibility via Impact Fee's	100.00%
	\$1,401,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026
Match MAG Grant

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.4

New Roundabout: 980 North & 550 West

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576
Construction Engineering	8%	\$40,576

Total Project Costs	\$716,000
----------------------------	------------------

American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.5

400 West Widen: 300 North to Pacific Dr With New Traffic Signal: Pacific Drive & 400 West

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	711	\$2,844
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	185	\$1,944
HMA Concrete	Ton	\$85	52	\$4,392
Untreated Base Course	C.Y.	\$10	49	\$494
Granular Borrow	C.Y.	\$40	37	\$1,481
Curb and Gutter (2.5' width)	L.F.	\$23	400	\$9,000
Sidewalk (5' width)	L.F.	\$25	400	\$10,000
Drainage	L.F.	\$45	400	\$18,000
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	400	\$2,000
Railroad Crossing	Lump	\$300,000	1	\$300,000
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$650,156
Mobilization (10% of Construction)	Lump	10%	65,016	\$65,016
Contingency (15% of Construction)	Lump	15%	97,523	\$97,523
Subtotal				\$812,695

Preconstruction Engineering	8%	\$52,012
Construction Engineering	8%	\$52,012

Total Project Costs	\$917,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$917,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.6

700 North: 900 West to 100 East Upgrades to Major Collector (2 to 3 Lanes)

Major Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$30	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	7,200	\$36,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$36,000
Mobilization (10% of Construction)	Lump	10%	3,600	\$3,600
Contingency (15% of Construction)	Lump	15%	5,400	\$5,400
Subtotal				\$45,000

Preconstruction Engineering	8%	\$2,880
Construction Engineering	8%	\$2,880

Total Project Costs	\$51,000
----------------------------	-----------------

American Fork City's Responsibility via Impact Fee's	100.00%
	\$51,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026
Legacy Road Restriping

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.7

1100 North Widen: North County Blvd to East City-Limits

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	25,000	\$100,000
Removal of Existing Asphalt	S.F.	\$4	4,189	\$16,756
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	1,565	\$16,431
HMA Concrete	Ton	\$85	437	\$37,110
Untreated Base Course	C.Y.	\$10	417	\$4,173
Granular Borrow	C.Y.	\$40	313	\$12,519
Curb and Gutter (2.5' width)	L.F.	\$23	2,600	\$58,500
Sidewalk (5' width)	L.F.	\$25	2,600	\$65,000
Drainage	L.F.	\$45	2,600	\$117,000
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	1,300	\$6,500
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$433,987
Mobilization (10% of Construction)	Lump	10%	43,399	\$43,399
Contingency (15% of Construction)	Lump	15%	65,098	\$65,098
Subtotal				\$542,484

Preconstruction Engineering	8%	\$34,719
Construction Engineering	8%	\$34,719

Total Project Costs	\$612,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$612,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.8

State St Widen: Main St to 900 W

Principal Arterial

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	80,596	\$322,382
Removal of Existing Asphalt	S.F.	\$4	41,977	\$167,908
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	8,862	\$93,049
HMA Concrete	Ton	\$85	3,091	\$262,697
Untreated Base Course	C.Y.	\$10	1,772	\$17,724
Granular Borrow	C.Y.	\$40	4,431	\$177,236
Curb and Gutter (2.5' width)	L.F.	\$23	10,074	\$226,675
Sidewalk (5' width)	L.F.	\$25	10,074	\$251,861
Drainage	L.F.	\$45	10,074	\$453,350
Right of Way	S.F.	\$4.00	125,931	\$503,723
Restriping	L.F.	\$5	1,041	\$5,205
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$2,481,809
Mobilization (10% of Construction)	Lump	10%	248,181	\$248,181
Contingency (15% of Construction)	Lump	15%	372,271	\$372,271
Subtotal				\$3,102,262

Preconstruction Engineering	8%	\$198,545
Construction Engineering	8%	\$198,545

Total Project Costs	\$3,500,000
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American Fork City's Responsibility via Impact Fee's	0%
	\$0

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	6
Granular Borrow Thickness (in) =	15
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: UDOT
Comp Year: 2026
Matched to MAG Cost

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.9

New Traffic Signal: 500 East & 400 South

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$300,000
Mobilization (10% of Construction)	Lump	10%	30,000	\$30,000
Contingency (15% of Construction)	Lump	15%	45,000	\$45,000
Subtotal				\$375,000

Preconstruction Engineering	8%	\$24,000
Construction Engineering	8%	\$24,000

Total Project Costs	\$423,000
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American Fork City's Responsibility via Impact Fee's	0%
	\$0

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Traffic Signal
Funding: UDOT
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1

1280 North New Road: North County Blvd to 1030 East

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	16,000	\$64,000
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	2	\$3,306
Roadway Excavation	C.Y.	\$11	3,889	\$40,833
HMA Concrete	Ton	\$85	1,085	\$92,225
Untreated Base Course	C.Y.	\$10	1,037	\$10,370
Granular Borrow	C.Y.	\$40	778	\$31,111
Curb and Gutter (2.5' width)	L.F.	\$23	2,000	\$45,000
Sidewalk (5' width)	L.F.	\$25	2,000	\$50,000
Drainage	L.F.	\$45	2,000	\$90,000
Right of Way	S.F.	\$4.00	72,000	\$288,000
Restriping	L.F.	\$5	1,000	\$5,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$719,846
Mobilization (10% of Construction)	Lump	10%	71,985	\$71,985
Contingency (15% of Construction)	Lump	15%	107,977	\$107,977
Subtotal				\$899,807

Preconstruction Engineering	8%	\$57,588
Construction Engineering	8%	\$57,588

Total Project Costs	\$1,015,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$1,015,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.11

620 South New Road: 600 East to East City-Limits

Arterial

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	49,600	\$198,400
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	7	\$14,233
Roadway Excavation	C.Y.	\$11	20,093	\$210,972
HMA Concrete	Ton	\$85	7,007	\$595,620
Untreated Base Course	C.Y.	\$10	4,019	\$40,185
Granular Borrow	C.Y.	\$40	10,046	\$401,852
Curb and Gutter (2.5' width)	L.F.	\$23	6,200	\$139,500
Sidewalk (5' width)	L.F.	\$25	6,200	\$155,000
Drainage	L.F.	\$45	6,200	\$279,000
Right of Way	S.F.	\$4.00	310,000	\$1,240,000
Restriping	L.F.	\$5	2,200	\$11,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$3,285,762
Mobilization (10% of Construction)	Lump	10%	328,576	\$328,576
Contingency (15% of Construction)	Lump	15%	492,864	\$492,864
Subtotal				\$4,107,203

Preconstruction Engineering	8%	\$262,861
Construction Engineering	8%	\$262,861

Total Project Costs	\$4,633,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$4,633,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	6
Granular Borrow Thickness (in) =	15
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.12

620 South Widen: 500 East to 600 East

Arterial

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	950	\$21,375
Sidewalk (5' width)	L.F.	\$25	950	\$23,750
Drainage	L.F.	\$45	950	\$42,750
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	950	\$4,750
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$92,625
Mobilization (10% of Construction)	Lump	10%	9,263	\$9,263
Contingency (15% of Construction)	Lump	15%	13,894	\$13,894
Subtotal				\$115,781

Preconstruction Engineering	8%	\$7,410
Construction Engineering	8%	\$7,410

Total Project Costs	\$131,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$131,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	6
Granular Borrow Thickness (in) =	15
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.14

300 West Widen (300 North to Pacific Drive) & New Traffic Signal: Pacific Drive & 300 West

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	810	\$4,050
Railroad Crossing	Lump	\$300,000	1	\$300,000
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$604,050
Mobilization (10% of Construction)	Lump	10%	60,405	\$60,405
Contingency (15% of Construction)	Lump	15%	90,608	\$90,608
Subtotal				\$755,063

Preconstruction Engineering	8%	\$48,324
Construction Engineering	8%	\$48,324

Total Project Costs	\$852,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$852,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Traffic Signal
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.15

Pacific Dr Extension New Road: Pioneer Crossing to Meadow Lane

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	714,959	\$2,859,836
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	74	\$147,719
Roadway Excavation	C.Y.	\$11	173,775	\$1,824,635
HMA Concrete	Ton	\$85	48,483	\$4,121,069
Untreated Base Course	C.Y.	\$10	46,340	\$463,399
Granular Borrow	C.Y.	\$40	34,755	\$1,390,198
Curb and Gutter (2.5' width)	L.F.	\$23	89,370	\$2,010,822
Sidewalk (5' width)	L.F.	\$25	89,370	\$2,234,247
Drainage	L.F.	\$45	89,370	\$4,021,645
Right of Way	S.F.	\$4.00	3,217,316	\$12,869,263
Restriping	L.F.	\$5	1,500	\$7,500
Bridge/Culvert	S.F.	\$225	15,600	\$3,510,000
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$35,460,334
Mobilization (10% of Construction)	Lump	10%	3,546,033	\$3,546,033
Contingency (15% of Construction)	Lump	15%	5,319,050	\$5,319,050
Subtotal				\$44,325,417

Preconstruction Engineering	8%	\$2,836,827
Construction Engineering	8%	\$2,836,827

Total Project Costs	\$50,000,000
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American Fork City's Responsibility via Impact Fee's	0%
	\$0

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: UDOT
Comp Year: 2026
Matched to MAG Cost

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.16

100 East Widen: Main St to 9800 North

Arterial

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	454,180	\$1,816,720
Removal of Existing Asphalt	S.F.	\$4	205,012	\$820,047
Clearing and Grubbing	Acre	\$2,000	12	\$23,460
Roadway Excavation	C.Y.	\$11	13,142	\$137,989
HMA Concrete	Ton	\$85	4,583	\$389,572
Untreated Base Course	C.Y.	\$10	2,628	\$26,284
Granular Borrow	C.Y.	\$40	6,571	\$262,836
Curb and Gutter (2.5' width)	L.F.	\$23	56,773	\$1,277,381
Sidewalk (5' width)	L.F.	\$25	56,773	\$1,419,313
Drainage	L.F.	\$45	56,773	\$2,554,763
Right of Way	S.F.	\$4.00	510,953	\$2,043,810
Restriping	L.F.	\$5	1,500	\$7,500
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$10,779,675
Mobilization (10% of Construction)	Lump	10%	1,077,967	\$1,077,967
Contingency (15% of Construction)	Lump	15%	1,616,951	\$1,616,951
Subtotal				\$13,474,593

Preconstruction Engineering	8%	\$862,374
Construction Engineering	8%	\$862,374

Total Project Costs	\$15,200,000
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American Fork City's Responsibility via Impact Fee's	0%
	\$0

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	6
Granular Borrow Thickness (in) =	15
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: UDOT
Comp Year: 2026
Matched to MAG Cost

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.17

300 East Widen: 300 North to 200 South

Major Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	4,926	\$51,722
HMA Concrete	Ton	\$85	1,718	\$146,023
Untreated Base Course	C.Y.	\$10	1,314	\$13,136
Granular Borrow	C.Y.	\$40	985	\$39,407
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$30	3,800	\$114,000
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	3,800	\$19,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$383,288
Mobilization (10% of Construction)	Lump	10%	38,329	\$38,329
Contingency (15% of Construction)	Lump	15%	57,493	\$57,493
Subtotal				\$479,110

Preconstruction Engineering	8%	\$30,663
Construction Engineering	8%	\$30,663

Total Project Costs	\$541,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$541,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

American Fork City Impact Fee Facilities Plan

Project No. 1.18

State St: 500 East to East City-Limits Upgrades to Principal Arterial

Principal Arterial

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	173,118	\$692,472
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	31	\$62,098
Roadway Excavation	C.Y.	\$11	94,173	\$988,817
HMA Concrete	Ton	\$85	32,843	\$2,791,641
Untreated Base Course	C.Y.	\$10	18,835	\$188,346
Granular Borrow	C.Y.	\$40	47,087	\$1,883,460
Curb and Gutter (2.5' width)	L.F.	\$23	21,640	\$486,894
Sidewalk (5' width)	L.F.	\$25	21,640	\$540,994
Drainage	L.F.	\$45	21,640	\$973,789
Right of Way	S.F.	\$4.00	1,352,485	\$5,409,939
Restriping	L.F.	\$5	4,800	\$24,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$14,042,450
Mobilization (10% of Construction)	Lump	10%	1,404,245	\$1,404,245
Contingency (15% of Construction)	Lump	15%	2,106,367	\$2,106,367
Subtotal				\$17,553,062

Preconstruction Engineering	8%	\$1,123,396
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Construction Engineering	8%	\$1,123,396
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Total Project Costs	\$19,800,000
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American Fork City's Responsibility via Impact Fee's	6.77%
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6.77%

\$1,340,000

Overall Assumptions:

HMA Pavement Density (pcf) = **155**
HMA Thickness (in) = **5**
Untreated Base Course Thickness (in) = **6**
Granular Borrow Thickness (in) = **15**
Roadway Excavation Depth (ft) = **2.5**
Number of Sidewalks (No.) = **2**

Project Parameters:

Imp Type: **Capacity Improvement**
Funding: **MAG/American Fork**
Comp Year: **2026**
Matched to MAG Cost

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.20

1020 West New Road: Pioneer Crossing to 200 South

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	316,941	\$1,267,763
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	33	\$65,484
Roadway Excavation	C.Y.	\$11	77,034	\$808,859
HMA Concrete	Ton	\$85	21,493	\$1,826,866
Untreated Base Course	C.Y.	\$10	20,542	\$205,425
Granular Borrow	C.Y.	\$40	15,407	\$616,274
Curb and Gutter (2.5' width)	L.F.	\$23	39,618	\$891,396
Sidewalk (5' width)	L.F.	\$25	39,618	\$990,440
Drainage	L.F.	\$45	39,618	\$1,782,791
Right of Way	S.F.	\$4.00	1,426,233	\$5,704,932
Restriping	L.F.	\$5	4,800	\$24,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$14,184,228
Mobilization (10% of Construction)	Lump	10%	1,418,423	\$1,418,423
Contingency (15% of Construction)	Lump	15%	2,127,634	\$2,127,634
Subtotal				\$17,730,286

Preconstruction Engineering	8%	\$1,134,738
Construction Engineering	8%	\$1,134,738

Total Project Costs	\$20,000,000
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American Fork City's Responsibility via Impact Fee's	6.77%
	\$1,354,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: MAG/American Fork
Comp Year: 2026
Matched to MAG Cost

Project #: 6308.1810
 Project: 200 South Intermodal Improvements
 Location: American Fork, Utah

By: RLK
 Date: 2/21/2019
 Filename: CRA estimate.xls

CRA Estimate

ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
North Trail Railroad Crossing (Separate Project)				
Construction Costs	Lump	1	\$50,000.00	\$50,000.00
Railroad Costs	Lump	1	\$200,000.00	\$200,000.00
Consulting Costs	Lump	1	\$50,000.00	\$50,000.00
Contingency			20%	\$60,000.00
North Trail Railroad Crossing Subtotal				\$360,000.00
200 South Consulting Fees				
Design	Lump	1	\$500,000.00	\$500,000.00
Water Rights Consulting	Lump	1	\$50,000.00	\$50,000.00
Construction Administration	Lump	1	\$250,000.00	\$250,000.00
Quality Assurance	Lump	1	\$100,000.00	\$100,000.00
Contingency			20%	\$180,000.00
200 South Consulting Fees Subtotal				\$1,080,000.00
Right of Way / Easement Acquisition				
Right of Way Acquisition	SF	275,000	\$3.50	\$962,500.00
Easement Acquisition	SF	62,000	\$0.35	\$21,700.00
Contingency			20%	\$196,840.00
Right of Way / Easement Acquisition Subtotal				\$1,190,000.00
Road and Excavation				
Mobilization	Lump	1	\$1,000,000.00	\$1,000,000.00
Quality Control	Lump	1	\$200,000.00	\$200,000.00
Traffic Control	Lump	1	\$125,000.00	\$125,000.00
Erosion Control/SWPPP	Lump	1	\$200,000.00	\$200,000.00
Survey Layout	Lump	1	\$125,000.00	\$125,000.00
Road Survey Monument	Each	10	\$600.00	\$6,000.00
Traffic Sign Removal	Each	10	\$200.00	\$2,000.00
Traffic Sign Relocation	Each	10	\$450.00	\$4,500.00
Fence Removal	LF	2,500	\$2.50	\$6,250.00
Fence Relocation	LF	7,500	\$7.00	\$52,500.00
Stone Wall Removal	LF	100	\$5.00	\$500.00
Asphalt Removal	SY	1,000	\$30.00	\$30,000.00
Concrete Removal	SY	1,000	\$32.00	\$32,000.00
Curb and Gutter Removal	LF	1,000	\$4.00	\$4,000.00
Clearing and Grubbing	SF	600,000	\$0.12	\$72,000.00
Material Excavation & Transport	CY	10,000	\$3.50	\$35,000.00
Material Export	CY	20,000	\$10.00	\$200,000.00
Soft Spot Stabilization (Contingency Item)	SY	12,000	\$18.00	\$216,000.00
Scarify & Recompact Subgrade	SF	550,000	\$0.06	\$33,000.00
Granular Borrow - Plan Quantity	CY	20,000	\$16.00	\$320,000.00
Untreated Base Course - Plan Quantity	CY	10,000	\$26.00	\$260,000.00
Asphalt Concrete	Ton	16,000	\$75.00	\$1,200,000.00
Type E Curb and Gutter	LF	14,500	\$16.00	\$232,000.00
Type F Mountable Curb and Gutter	LF	400	\$16.00	\$6,400.00
Type P Curb Wall	LF	9,000	\$16.00	\$144,000.00
Concrete Flatwork	SF	20,000	\$5.00	\$100,000.00
Concrete Sidewalk	SF	155,000	\$5.00	\$775,000.00
Pedestrian Underpass Structure w/ Retaining Walls	Lump	1	\$500,000.00	\$500,000.00
Plowable End Section	Each	8	\$1,500.00	\$12,000.00
Concrete Driveway (6" Concrete on 6" Base)	Each	8	\$5,000.00	\$40,000.00
Tactile / Truncated Dome	Each	60	\$300.00	\$18,000.00
Traffic Sign	Each	80	\$350.00	\$28,000.00
5 Strand Barbed Wire Fence	Each	2,500	\$5.00	\$12,500.00
20' Fence Gate	Each	8	\$800.00	\$6,400.00
Truncated Domes	Each	45	\$300.00	\$13,500.00
Striping	Lump	1	\$25,000.00	\$25,000.00
Contingency			20%	\$1,207,310.00
Road and Excavation Subtotal				\$7,250,000.00

Utilities and Drainage

Storm Drain

Lower/Raise Lid and Add Collar	Each	5	\$850.00	\$4,250.00
Curb Inlet Box	Each	6	\$4,500.00	\$27,000.00
3'x3' Curb Inlet Combo Box	Each	30	\$4,500.00	\$135,000.00
4'x4' Curb Inlet Combo Box	Each	1	\$4,500.00	\$4,500.00
4' Manhole	Each	8	\$3,500.00	\$28,000.00
5' Manhole	Each	25	\$4,000.00	\$100,000.00
7' Manhole	Each	8	\$7,500.00	\$60,000.00
12" RCP Storm Drain Pipe (Class III)	LF	2,200	\$32.00	\$70,400.00
24" RCP Storm Drain Pipe (Class III)	LF	1,200	\$48.00	\$57,600.00
30" RCP Storm Drain Pipe (Class III)	LF	2,300	\$64.00	\$147,200.00
36" RCP Storm Drain Pipe (Class III)	LF	1,500	\$80.00	\$120,000.00
54" RCP Storm Drain Pipe (Class III)	LF	2,200	\$220.00	\$484,000.00
54" Concrete Pipe End Section	Each	2	\$5,000.00	\$10,000.00
30" Rip Rap	CY	100	\$95.00	\$9,500.00
18F Snout Treatment Device	Each	35	\$850.00	\$29,750.00
Storm Drain Subtotal				\$1,287,200.00

Groundwater / Land Drain

Remove 8" Pipe	LF	100	\$16.00	\$1,600.00
Remove 10" Pipe	LF	50	\$17.00	\$850.00
Remove 12" Pipe	LF	200	\$18.00	\$3,600.00
Remove 15" Pipe	LF	30	\$20.00	\$600.00
Remove 18" Pipe	LF	500	\$22.00	\$11,000.00
Remove 24" Pipe	LF	2,250	\$24.00	\$54,000.00
Remove 36" Pipe	LF	100	\$26.00	\$2,600.00
Remove Inlet Box	Each	2	\$2,000.00	\$4,000.00
Remove SDMH	Each	8	\$2,500.00	\$20,000.00
Remove Concrete Weir Structure	Each	4	\$2,500.00	\$10,000.00
Remove Pipe Headwall	Each	20	\$2,000.00	\$40,000.00
4' Manhole	Each	24	\$4,500.00	\$108,000.00
COB with Control Gates	Each	8	\$6,500.00	\$52,000.00
24" RCP Storm Drain Pipe (Class III)	LF	6,400	\$48.00	\$307,200.00
Groundwater / Land Drain Subtotal				\$615,450.00

Culinary Water

Lower/Raise Lid and Add Collar	Each	25	\$850.00	\$21,250.00
Remove 6" Pipe	LF	300	\$18.00	\$5,400.00
Remove 8" Pipe	LF	160	\$18.00	\$2,880.00
Remove 12" Pipe	LF	4,200	\$20.00	\$84,000.00
Remove Fire Hydrant	Each	4	\$1,500.00	\$6,000.00
Replace Water Service	Each	10	\$1,200.00	\$12,000.00
Jack and Bore for 30" Culinary Water Pipe under Railroad	LF	135	\$2,000.00	\$270,000.00
6" PVC C-900 Class 200 Culinary Water Pipe w/ Fittings	LF	1,200	\$22.00	\$26,400.00
8" PVC C-900 Class 200 Culinary Water Pipe w/ Fittings	LF	800	\$35.00	\$28,000.00
10" PVC C-900 Class 200 Culinary Water Pipe w/ Fittings	LF	800	\$40.00	\$32,000.00
12" PVC C-900 Class 200 Culinary Water Pipe w/ Fittings	LF	1,200	\$42.00	\$50,400.00
16" Ductile Iron Class 350 Culinary Water Pipe w/ Fittings	LF	1,500	\$90.00	\$135,000.00
20" Ductile Iron Class 350 Culinary Water Pipe w/ Fittings	LF	1,300	\$150.00	\$195,000.00
30" Ductile Iron Class 350 Culinary Water Pipe w/ Fittings	LF	4,500	\$250.00	\$1,125,000.00
6" Culinary Valve	Each	23	\$1,200.00	\$27,600.00
8" Culinary Valve	Each	13	\$1,800.00	\$23,400.00
10" Culinary Valve	Each	5	\$2,000.00	\$10,000.00
12" Culinary Valve	Each	12	\$2,000.00	\$24,000.00
16" Culinary Valve	Each	5	\$3,500.00	\$17,500.00
24" Culinary Valve	Each	2	\$6,000.00	\$12,000.00
30" Culinary Valve	Each	28	\$12,000.00	\$336,000.00
FH Assembly	Each	22	\$5,500.00	\$121,000.00
Culinary Water Subtotal				\$2,564,830.00

Secondary Water					
Lower/Raise Lid and Add Collar	Each	25	\$850.00	\$21,250.00	
Replace Irrigation Service	Each	25	\$1,200.00	\$30,000.00	
6" PVC C-900 Class 200 Culinary Water Pipe w/ Fittings	LF	100	\$22.00	\$2,200.00	
8" PVC C-900 Class 200 Culinary Water Pipe w/ Fittings	LF	6,800	\$35.00	\$238,000.00	
12" PVC C-900 Class 200 Culinary Water Pipe w/ Fittings	LF	100	\$42.00	\$4,200.00	
6" Culinary Valve	Each	1	\$1,200.00	\$1,200.00	
8" Culinary Valve	Each	60	\$1,800.00	\$108,000.00	
12" Culinary Valve	Each	1	\$2,000.00	\$2,000.00	
Secondary Water Subtotal				\$406,850.00	
Sewer					
Lower/Raise Lid and Add Collar	Each	10	\$850.00	\$8,500.00	
48" Sanitary Sewer Manhole	Each	6	\$3,200.00	\$19,200.00	
60" Sanitary Sewer Manhole	Each	12	\$4,000.00	\$48,000.00	
8" PVC Sewer Pipe (SDR-35)	LF	2,500	\$50.00	\$125,000.00	
10" PVC Sewer Pipe (SDR-35)	LF	100	\$55.00	\$5,500.00	
12" PVC Sewer Pipe (SDR-35)	LF	3,000	\$60.00	\$180,000.00	
Sewer Subtotal				\$386,200.00	
Contingency (All Utilities/Drainage)			20%	\$1,052,106.00	
Utilities and Drainage Subtotal				\$6,320,000.00	
Landscaping					
200 South Landscaping					
Specialty Pavement Upgrade 1 (Band Around Tree Grate)	SF	6,500	\$8.00	\$52,000.00	
Specialty Pavement Upgrade 2 (Between Tree Grates)	SF	15,000	\$8.00	\$120,000.00	
Raised Planters	LF	2,400	\$200.00	\$480,000.00	
Deciduous Tree (2" cal.)	Each	220	\$400.00	\$88,000.00	
Ornamental Tree (2" cal.)	Each	130	\$350.00	\$45,500.00	
Evergreen Tree (8' ht.)	Each	5	\$400.00	\$2,000.00	
Sod with Topsoil	SF	9,500	\$1.00	\$9,500.00	
Landscape Bed with Plants, Topsoil, Fabric, & Mulch	SF	12,000	\$5.00	\$60,000.00	
Native Seed	SF	82,000	\$0.15	\$12,300.00	
Irrigation Service and Connection	Lump	1	\$15,000.00	\$15,000.00	
Irrigation System - Sod	SF	9,500	\$1.50	\$14,250.00	
Irrigation System - Drip	Lump	1	\$45,000.00	\$45,000.00	
Bench	Each	100	\$2,000.00	\$200,000.00	
Trash Receptacle	Each	100	\$1,750.00	\$175,000.00	
Tree Grate	Each	150	\$2,000.00	\$300,000.00	
200 South Landscaping Subtotal				\$1,618,550.00	
Trail Landscaping					
Specialty Pavement Upgrade 1 (Band Around Tree Grate)	SF	6,500	\$8.00	\$52,000.00	
Specialty Pavement Upgrade 2 (Between Tree Grates)	SF	30,000	\$8.00	\$240,000.00	
Raised Planters	LF	1,000	\$200.00	\$200,000.00	
Deciduous Tree (2" cal.)	Each	85	\$400.00	\$34,000.00	
Ornamental Tree (2" cal.)	Each	80	\$350.00	\$28,000.00	
Landscape Bed with Plants, Topsoil, Fabric, & Mulch	SF	25,000	\$5.00	\$125,000.00	
Irrigation System - Drip	Lump	1	\$60,000.00	\$60,000.00	
Bench	Each	15	\$2,000.00	\$30,000.00	
Trash Receptacle	Each	10	\$1,750.00	\$17,500.00	
Bike Rack	Each	5	\$1,250.00	\$6,250.00	
Tree Grate	Each	65	\$2,000.00	\$130,000.00	
Trail Landscaping Subtotal				\$922,750.00	
Contingency (All Landscaping)			20%	\$508,260.00	
Landscaping Subtotal				\$3,050,000.00	

Lighting					
Luminaire System					
Luminaire Pole, Arm, and Fixture	Each	65	\$4,200.00	\$273,000.00	
Dual Luminaire Pole, Arm, and Fixture	Each	35	\$6,200.00	\$217,000.00	
Foundation	Each	100	\$1,500.00	\$150,000.00	
Type I Junction Box	Each	70	\$900.00	\$63,000.00	
Type II Junction Box	Each	40	\$1,200.00	\$48,000.00	
2" Conduit and Wire	LF	16000	\$13.00	\$208,000.00	
Dual Meter Underground Service Pedestal	Each	10	\$4,800.00	\$48,000.00	
Tunnel Lighting	Lump	1	\$50,000.00	\$50,000.00	
Luminaire System Subtotal				\$1,057,000.00	
Tree Grate Lighting System					
Tree Grate Fixture	Each	400	\$650.00	\$260,000.00	
Modification of Tree Grate	Each	200	\$500.00	\$100,000.00	
Type I Junction Box	Each	210	\$900.00	\$189,000.00	
2" Conduit and Wire	LF	7200	\$7.00	\$50,400.00	
Roundabout Spot Lighting	Lump	1	\$15,000.00	\$15,000.00	
Dual Meter Underground Service Pedestal	Each	6	\$4,800.00	\$28,800.00	
Tree Grate Lighting System Subtotal				\$643,200.00	
Christmas Tree Lighting System					
3" Conduit and Wire	LF	7200	\$12.00	\$86,400.00	
Fuse Disconnect (within Junction Box)	Each	200	\$5.00	\$1,000.00	
Christmas Tree Lighting System Subtotal				\$87,400.00	
Contingency (All Lighting)			20%	\$357,520.00	
Lighting Subtotal				\$2,150,000.00	
Fiber/ATMS					
Type III Junction Box	Each	65	\$1,500.00	\$97,500.00	
7 Multi-Duct Conduit with Tracer Wire (Orange)	LF	8500	\$16.00	\$136,000.00	
7 Multi-Duct Conduit with Tracer Wire (Blue)	LF	8500	\$16.00	\$136,000.00	
Contingency			20%	\$73,900.00	
Fiber/ATMS Subtotal				\$443,400.00	
Signalization					
Type II Junction Box (Divided)	Each	15	\$1,200.00	\$18,000.00	
Type III Junction Box (Divided)	Each	5	\$1,500.00	\$7,500.00	
6 - 2" Conduits with Pull Tape	LF	2500	\$18.00	\$45,000.00	
Signal Intersection System	Lump	5	\$175,000.00	\$875,000.00	
Contingency			20%	\$189,100.00	
Signalization Subtotal				\$1,134,600.00	
TOTAL ESTIMATED CRA COST				\$23,000,000.00	

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.23

New Traffic Signal: 1120 North & 150 West

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$300,000
Mobilization (10% of Construction)	Lump	10%	30,000	\$30,000
Contingency (15% of Construction)	Lump	15%	45,000	\$45,000
Subtotal				\$375,000

Preconstruction Engineering	8%	\$24,000
Construction Engineering	8%	\$24,000

Total Project Costs	\$423,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$423,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Traffic Signal
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.24

New Roundabout: 700 North & 540 West

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576
Construction Engineering	8%	\$40,576

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.25

New Roundabout: 700 North & 100 West

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576
Construction Engineering	8%	\$40,576

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.26

New Traffic Signal: 700 North & 100 East

Major Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	3,200	\$12,800
Removal of Existing Asphalt	S.F.	\$4	1,067	\$4,267
Clearing and Grubbing	Acre	\$2,000	0	\$37
Roadway Excavation	C.Y.	\$11	111	\$1,167
HMA Concrete	Ton	\$85	39	\$3,294
Untreated Base Course	C.Y.	\$10	30	\$296
Granular Borrow	C.Y.	\$40	22	\$889
Curb and Gutter (2.5' width)	L.F.	\$23	400	\$9,000
Sidewalk (5' width)	L.F.	\$30	400	\$12,000
Drainage	L.F.	\$45	400	\$18,000
Right of Way	S.F.	\$4.00	800	\$3,200
Restriping	L.F.	\$5	1,200	\$6,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$370,949
Mobilization (10% of Construction)	Lump	10%	37,095	\$37,095
Contingency (15% of Construction)	Lump	15%	55,642	\$55,642
Subtotal				\$463,686

Preconstruction Engineering	8%	\$29,676
Construction Engineering	8%	\$29,676

Total Project Costs	\$524,000
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American Fork City's Responsibility via Impact Fee's	0%
	\$0

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: UDOT
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.27

New Traffic Signal: 700 North & 200 East

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	4,800	\$19,200
Removal of Existing Asphalt	S.F.	\$4	1,000	\$4,000
Clearing and Grubbing	Acre	\$2,000	0	\$992
Roadway Excavation	C.Y.	\$11	333	\$3,500
HMA Concrete	Ton	\$85	93	\$7,905
Untreated Base Course	C.Y.	\$10	89	\$889
Granular Borrow	C.Y.	\$40	67	\$2,667
Curb and Gutter (2.5' width)	L.F.	\$23	600	\$13,500
Sidewalk (5' width)	L.F.	\$25	600	\$15,000
Drainage	L.F.	\$45	600	\$27,000
Right of Way	S.F.	\$4.00	21,600	\$86,400
Restriping	L.F.	\$5	62	\$310
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$481,362
Mobilization (10% of Construction)	Lump	10%	48,136	\$48,136
Contingency (15% of Construction)	Lump	15%	72,204	\$72,204
Subtotal				\$601,703

Preconstruction Engineering	8%	\$38,509
Construction Engineering	8%	\$38,509

Total Project Costs	\$679,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$679,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.28

New Traffic Signal: Pioneer Crossing & 1020 West

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$300,000
Mobilization (10% of Construction)	Lump	10%	30,000	\$30,000
Contingency (15% of Construction)	Lump	15%	45,000	\$45,000
Subtotal				\$375,000

Preconstruction Engineering	8%	\$24,000
Construction Engineering	8%	\$24,000

Total Project Costs	\$423,000
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American Fork City's Responsibility via Impact Fee's	0%
	\$0

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Traffic Signal
Funding: UDOT
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.29

New Traffic Signal: 900 West & 550 North

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$300,000
Mobilization (10% of Construction)	Lump	10%	30,000	\$30,000
Contingency (15% of Construction)	Lump	15%	45,000	\$45,000
Subtotal				\$375,000

Preconstruction Engineering	8%	\$24,000
Construction Engineering	8%	\$24,000

Total Project Costs	\$423,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$423,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Traffic Signal
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.30

New Traffic Signal:600 East & 620 South

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$300,000
Mobilization (10% of Construction)	Lump	10%	30,000	\$30,000
Contingency (15% of Construction)	Lump	15%	45,000	\$45,000
Subtotal				\$375,000

Preconstruction Engineering	8%	\$24,000
Construction Engineering	8%	\$24,000

Total Project Costs	\$423,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$423,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Traffic Signal
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.32

New Traffic Signal: 200 South & 1020 West

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$300,000
Mobilization (10% of Construction)	Lump	10%	30,000	\$30,000
Contingency (15% of Construction)	Lump	15%	45,000	\$45,000
Subtotal				\$375,000

Preconstruction Engineering	8%	\$24,000
Construction Engineering	8%	\$24,000

Total Project Costs	\$423,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$423,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Traffic Signal
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.33

New Traffic Signal:500 East & 1100 South

Major Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	533	\$2,133
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	56	\$583
HMA Concrete	Ton	\$85	19	\$1,647
Untreated Base Course	C.Y.	\$10	15	\$148
Granular Borrow	C.Y.	\$40	11	\$444
Curb and Gutter (2.5' width)	L.F.	\$23	200	\$4,500
Sidewalk (5' width)	L.F.	\$30	200	\$6,000
Drainage	L.F.	\$45	200	\$9,000
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	21	\$103
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$324,559
Mobilization (10% of Construction)	Lump	10%	32,456	\$32,456
Contingency (15% of Construction)	Lump	15%	48,684	\$48,684
Subtotal				\$405,699

Preconstruction Engineering	8%	\$25,965
Construction Engineering	8%	\$25,965

Total Project Costs	\$458,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$458,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.34

New Roundabout: 100 East & 200 South

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	374,590	\$1,498,362
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$1,998,362
Mobilization (10% of Construction)	Lump	10%	199,836	\$199,836
Contingency (15% of Construction)	Lump	15%	299,754	\$299,754
Subtotal				\$2,497,952

Preconstruction Engineering	8%	\$159,869
Construction Engineering	8%	\$159,869

Total Project Costs	\$2,818,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$2,818,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granual Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026
Matched City

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.35

New Traffic Signal: Auto Mall Dr & 500 East

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	800	\$4,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$304,000
Mobilization (10% of Construction)	Lump	10%	30,400	\$30,400
Contingency (15% of Construction)	Lump	15%	45,600	\$45,600
Subtotal				\$380,000

Preconstruction Engineering	8%	\$24,320
Construction Engineering	8%	\$24,320

Total Project Costs	\$429,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$429,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Traffic Signal
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.36

New Roundabout: 200 South & Frontage Rd

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576
Construction Engineering	8%	\$40,576

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granual Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.37

New Roundabout: 300 West & Mahogany Dr

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Property Acquisition	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$807,200
Mobilization (10% of Construction)	Lump	10%	80,720	\$80,720
Contingency (15% of Construction)	Lump	15%	121,080	\$121,080
Subtotal				\$1,009,000

Preconstruction Engineering	8%	\$64,576
Construction Engineering	8%	\$64,576

Total Project Costs	\$1,139,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$1,139,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.38

New Traffic Signal: 860 East & 620 South

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$300,000
Mobilization (10% of Construction)	Lump	10%	30,000	\$30,000
Contingency (15% of Construction)	Lump	15%	45,000	\$45,000
Subtotal				\$375,000

Preconstruction Engineering	8%	\$24,000
Construction Engineering	8%	\$24,000

Total Project Costs	\$423,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$423,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Traffic Signal
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.39

Intersection Improvement: Sam White Ln & 860 East

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Intersection Improvement	Each	\$500,000	1	\$500,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$500,000
Mobilization (10% of Construction)	Lump	10%	50,000	\$50,000
Contingency (15% of Construction)	Lump	15%	75,000	\$75,000
Subtotal				\$625,000

Preconstruction Engineering	8%	\$40,000
Construction Engineering	8%	\$40,000

Total Project Costs	\$705,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$705,000

Overall Assumptions:

HMA Pavement Density (pcf) = **0**
 HMA Thickness (in) = **0**
 Untreated Base Course Thickness (in) = **0**
 Granular Borrow Thickness (in) = **0**
 Roadway Excavation Depth (ft) = **0**
 Number of Sidewalks (No.) = **0**

Project Parameters:

Imp Type: **Intersection Improvement**
 Funding: **American Fork**
 Comp Year: **2026**

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.41

Intersection Improvement: 300 North & 600 East

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Intersection Improvement	Each	\$500,000	1	\$500,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$500,000
Mobilization (10% of Construction)	Lump	10%	50,000	\$50,000
Contingency (15% of Construction)	Lump	15%	75,000	\$75,000
Subtotal				\$625,000

Preconstruction Engineering	8%	\$40,000
Construction Engineering	8%	\$40,000

Total Project Costs	\$705,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$705,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.42

New Traffic Signal: 200 South & Vineyard Connector

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$300,000
Mobilization (10% of Construction)	Lump	10%	30,000	\$30,000
Contingency (15% of Construction)	Lump	15%	45,000	\$45,000
Subtotal				\$375,000

Preconstruction Engineering	8%	\$24,000
Construction Engineering	8%	\$24,000

Total Project Costs	\$423,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$423,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Traffic Signal
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.43

Intersection Improvement: 200 South & 1300 West

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Intersection Improvement	Each	\$500,000	1	\$500,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$500,000
Mobilization (10% of Construction)	Lump	10%	50,000	\$50,000
Contingency (15% of Construction)	Lump	15%	75,000	\$75,000
Subtotal				\$625,000

Preconstruction Engineering	8%	\$40,000
Construction Engineering	8%	\$40,000

Total Project Costs	\$705,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$705,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.44

Intersection Improvement: 1100 West & 200 South

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Intersection Improvement	Each	\$500,000	1	\$500,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$500,000
Mobilization (10% of Construction)	Lump	10%	50,000	\$50,000
Contingency (15% of Construction)	Lump	15%	75,000	\$75,000
Subtotal				\$625,000

Preconstruction Engineering	8%	\$40,000
Construction Engineering	8%	\$40,000

Total Project Costs	\$705,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$705,000

Overall Assumptions:

HMA Pavement Density (pcf) = 0
HMA Thickness (in) = 0
Untreated Base Course Thickness (in) = 0
Granular Borrow Thickness (in) = 0
Roadway Excavation Depth (ft) = 0
Number of Sidewalks (No.) = 0

Project Parameters:

Imp Type: **Intersection Improvement**
Funding: **American Fork**
Comp Year: **2026**

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.45

Intersection Improvement: 900 West & 200 South

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Intersection Improvement	Each	\$500,000	1	\$500,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$500,000
Mobilization (10% of Construction)	Lump	10%	50,000	\$50,000
Contingency (15% of Construction)	Lump	15%	75,000	\$75,000
Subtotal				\$625,000

Preconstruction Engineering	8%	\$40,000
Construction Engineering	8%	\$40,000

Total Project Costs	\$705,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$705,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.46

1300 West New Road: Vineyard Connector to 200 South

Arterial

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	49,600	\$198,400
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	7	\$14,233
Roadway Excavation	C.Y.	\$11	20,093	\$210,972
HMA Concrete	Ton	\$85	7,007	\$595,620
Untreated Base Course	C.Y.	\$10	4,019	\$40,185
Granular Borrow	C.Y.	\$40	10,046	\$401,852
Curb and Gutter (2.5' width)	L.F.	\$23	6,200	\$139,500
Sidewalk (5' width)	L.F.	\$25	6,200	\$155,000
Drainage	L.F.	\$45	6,200	\$279,000
Right of Way	S.F.	\$4.00	310,000	\$1,240,000
Restriping	L.F.	\$5	3,100	\$15,500
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$3,290,262
Mobilization (10% of Construction)	Lump	10%	329,026	\$329,026
Contingency (25% of Construction)	Lump	25%	822,566	\$822,566
Subtotal				\$4,441,854

Preconstruction Engineering	8%	\$263,221
Construction Engineering	8%	\$263,221

Total Project Costs	\$4,969,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$4,969,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	6
Granular Borrow Thickness (in) =	15
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.47

350 South New Road: 700 West to Vineyard Connector

Arterial

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	72,000	\$288,000
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	10	\$19,835
Roadway Excavation	C.Y.	\$11	27,500	\$288,750
HMA Concrete	Ton	\$85	9,591	\$815,203
Untreated Base Course	C.Y.	\$10	5,500	\$55,000
Granular Borrow	C.Y.	\$40	13,750	\$550,000
Curb and Gutter (2.5' width)	L.F.	\$23	9,000	\$202,500
Sidewalk (5' width)	L.F.	\$25	9,000	\$225,000
Drainage	L.F.	\$45	9,000	\$405,000
Right of Way	S.F.	\$4.00	432,000	\$1,728,000
Restriping	L.F.	\$5	4,500	\$22,500
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$4,599,788
Mobilization (10% of Construction)	Lump	10%	459,979	\$459,979
Contingency (15% of Construction)	Lump	15%	689,968	\$689,968
Subtotal				\$5,749,735

Preconstruction Engineering	8%	\$367,983
Construction Engineering	8%	\$367,983

Total Project Costs	\$6,486,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$6,486,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	6
Granular Borrow Thickness (in) =	15
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.48

570 West Widen: 700 South to 200 south

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	86,400	\$345,600
Removal of Existing Asphalt	S.F.	\$4	10,800	\$43,200
Clearing and Grubbing	Acre	\$2,000	5	\$9,174
Roadway Excavation	C.Y.	\$11	12,000	\$126,000
HMA Concrete	Ton	\$85	3,348	\$284,580
Untreated Base Course	C.Y.	\$10	3,200	\$32,000
Granular Borrow	C.Y.	\$40	2,400	\$96,000
Curb and Gutter (2.5' width)	L.F.	\$23	10,800	\$243,000
Sidewalk (5' width)	L.F.	\$25	10,800	\$270,000
Drainage	L.F.	\$45	10,800	\$486,000
Right of Way	S.F.	\$4.00	199,800	\$799,200
Restriping	L.F.	\$5	5,400	\$27,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$2,761,754
Mobilization (10% of Construction)	Lump	10%	276,175	\$276,175
Contingency (15% of Construction)	Lump	15%	414,263	\$414,263
Subtotal				\$3,452,192

Preconstruction Engineering	8%	\$220,940
Construction Engineering	8%	\$220,940

Total Project Costs	\$3,895,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$3,895,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.49

1100 West New Road: 200 South to Vineyard Connector

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	45,565	\$182,260
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	5	\$9,414
Roadway Excavation	C.Y.	\$11	11,075	\$116,286
HMA Concrete	Ton	\$85	3,090	\$262,639
Untreated Base Course	C.Y.	\$10	2,953	\$29,533
Granular Borrow	C.Y.	\$40	2,215	\$88,599
Curb and Gutter (2.5' width)	L.F.	\$23	5,696	\$128,152
Sidewalk (5' width)	L.F.	\$25	5,696	\$142,391
Drainage	L.F.	\$45	5,696	\$256,303
Right of Way	S.F.	\$4.00	205,042	\$820,170
Restriping	L.F.	\$5	4,100	\$20,500
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$2,056,246
Mobilization (10% of Construction)	Lump	10%	205,625	\$205,625
Contingency (15% of Construction)	Lump	15%	308,437	\$308,437
Subtotal				\$2,570,307

Preconstruction Engineering	8%	\$164,500
Construction Engineering	8%	\$164,500

Total Project Costs	\$2,900,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$2,900,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026
Matched to MAG Cost

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.501

1100 West New Road: 700 South to 200 South

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	51,200	\$204,800
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	5	\$10,579
Roadway Excavation	C.Y.	\$11	12,444	\$130,667
HMA Concrete	Ton	\$85	3,472	\$295,120
Untreated Base Course	C.Y.	\$10	3,319	\$33,185
Granular Borrow	C.Y.	\$40	2,489	\$99,556
Curb and Gutter (2.5' width)	L.F.	\$23	6,400	\$144,000
Sidewalk (5' width)	L.F.	\$25	6,400	\$160,000
Drainage	L.F.	\$45	6,400	\$288,000
Right of Way	S.F.	\$4.00	230,400	\$921,600
Restriping	L.F.	\$5	3,200	\$16,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$2,303,506
Mobilization (10% of Construction)	Lump	10%	230,351	\$230,351
Contingency (15% of Construction)	Lump	15%	345,526	\$345,526
Subtotal				\$2,879,382

Preconstruction Engineering	8%	\$184,280
Construction Engineering	8%	\$184,280

Total Project Costs	\$3,248,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$3,248,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.51

900 West New Road: Vineyard Connector to 200 South

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	68,000	\$272,000
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	7	\$14,050
Roadway Excavation	C.Y.	\$11	16,528	\$173,542
HMA Concrete	Ton	\$85	4,611	\$391,956
Untreated Base Course	C.Y.	\$10	4,407	\$44,074
Granular Borrow	C.Y.	\$40	3,306	\$132,222
Curb and Gutter (2.5' width)	L.F.	\$23	8,500	\$191,250
Sidewalk (5' width)	L.F.	\$25	8,500	\$212,500
Drainage	L.F.	\$45	8,500	\$382,500
Right of Way	S.F.	\$4.00	306,000	\$1,224,000
Restriping	L.F.	\$5	4,250	\$21,250
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$3,059,344
Mobilization (10% of Construction)	Lump	10%	305,934	\$305,934
Contingency (15% of Construction)	Lump	15%	458,902	\$458,902
Subtotal				\$3,824,180

Preconstruction Engineering	8%	\$244,748
Construction Engineering	8%	\$244,748

Total Project Costs	\$4,314,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$4,314,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.52

700 West Widen: 200 South to Vineyard Connector

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	76,800	\$307,200
Removal of Existing Asphalt	S.F.	\$4	14,933	\$59,733
Clearing and Grubbing	Acre	\$2,000	2	\$3,967
Roadway Excavation	C.Y.	\$11	6,222	\$65,333
HMA Concrete	Ton	\$85	1,736	\$147,560
Untreated Base Course	C.Y.	\$10	1,659	\$16,593
Granular Borrow	C.Y.	\$40	1,244	\$49,778
Curb and Gutter (2.5' width)	L.F.	\$23	9,600	\$216,000
Sidewalk (5' width)	L.F.	\$25	9,600	\$240,000
Drainage	L.F.	\$45	9,600	\$432,000
Right of Way	S.F.	\$4.00	86,400	\$345,600
Restriping	L.F.	\$5	4,800	\$24,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$1,907,764
Mobilization (10% of Construction)	Lump	10%	190,776	\$190,776
Contingency (15% of Construction)	Lump	15%	286,165	\$286,165
Subtotal				\$2,384,705

Preconstruction Engineering	8%	\$152,621
Construction Engineering	8%	\$152,621

Total Project Costs	\$2,690,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$2,690,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.53

100 West Widen: 1500 South to Frontage Rd

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	131,200	\$524,800
Removal of Existing Asphalt	S.F.	\$4	18,222	\$72,889
Clearing and Grubbing	Acre	\$2,000	2	\$4,518
Roadway Excavation	C.Y.	\$11	16,704	\$175,389
HMA Concrete	Ton	\$85	4,660	\$396,128
Untreated Base Course	C.Y.	\$10	4,454	\$44,543
Granular Borrow	C.Y.	\$40	3,341	\$133,630
Curb and Gutter (2.5' width)	L.F.	\$23	16,400	\$369,000
Sidewalk (5' width)	L.F.	\$25	16,400	\$410,000
Drainage	L.F.	\$45	16,400	\$738,000
Right of Way	S.F.	\$4.00	98,400	\$393,600
Restriping	L.F.	\$5	8,200	\$41,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$3,303,497
Mobilization (10% of Construction)	Lump	10%	330,350	\$330,350
Contingency (15% of Construction)	Lump	15%	495,525	\$495,525
Subtotal				\$4,129,371

Preconstruction Engineering	8%	\$264,280
Construction Engineering	8%	\$264,280

Total Project Costs	\$4,658,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$4,658,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.54

Intersection Improvement: New Road & 700 South

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Intersection Improvement	Each	\$500,000	1	\$500,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$500,000
Mobilization (10% of Construction)	Lump	10%	50,000	\$50,000
Contingency (15% of Construction)	Lump	15%	75,000	\$75,000
Subtotal				\$625,000

Preconstruction Engineering	8%	\$40,000
Construction Engineering	8%	\$40,000

Total Project Costs	\$705,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$705,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.55

Intersection Improvement: 1300 West & 700 South

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Intersection Improvement	Each	\$500,000	1	\$500,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$500,000
Mobilization (10% of Construction)	Lump	10%	50,000	\$50,000
Contingency (15% of Construction)	Lump	15%	75,000	\$75,000
Subtotal				\$625,000

Preconstruction Engineering	8%	\$40,000
Construction Engineering	8%	\$40,000

Total Project Costs	\$705,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$705,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.56

New Roundabout: 1100 West & 700 South

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576
Construction Engineering	8%	\$40,576

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granual Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.57

New Roundabout: 900 West & 700 South

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576
Construction Engineering	8%	\$40,576

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granual Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.58

New Roundabout: 700 West & 700 South

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576
Construction Engineering	8%	\$40,576

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.59

New Roundabout: 700 south & 570 West

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576
Construction Engineering	8%	\$40,576

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granual Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.60

700 south New Road: 1730 West to 100 East

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	179,200	\$716,800
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	19	\$37,025
Roadway Excavation	C.Y.	\$11	43,556	\$457,333
HMA Concrete	Ton	\$85	12,152	\$1,032,920
Untreated Base Course	C.Y.	\$10	11,615	\$116,148
Granular Borrow	C.Y.	\$40	8,711	\$348,444
Curb and Gutter (2.5' width)	L.F.	\$23	22,400	\$504,000
Sidewalk (5' width)	L.F.	\$25	22,400	\$560,000
Drainage	L.F.	\$45	22,400	\$1,008,000
Right of Way	S.F.	\$4.00	806,400	\$3,225,600
Restriping	L.F.	\$5	11,200	\$56,000
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$8,062,271
Mobilization (10% of Construction)	Lump	10%	806,227	\$806,227
Contingency (15% of Construction)	Lump	15%	1,209,341	\$1,209,341
Subtotal				\$10,077,838

Preconstruction Engineering	8%	\$644,982
Construction Engineering	8%	\$644,982

Total Project Costs	\$11,368,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$11,368,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.61

New Roundabout: 100 West & 700 South

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576.00
Construction Engineering	8%	\$40,576.00

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.62

New Traffic Signal: Vineyard Connector & 1300 West

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$300,000
Mobilization (10% of Construction)	Lump	10%	30,000	\$30,000
Contingency (15% of Construction)	Lump	15%	45,000	\$45,000
Subtotal				\$375,000

Preconstruction Engineering	8%	\$24,000
Construction Engineering	8%	\$24,000

Total Project Costs	\$423,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$423,000

Overall Assumptions:

HMA Pavement Density (pcf) = **0**
 HMA Thickness (in) = **0**
 Untreated Base Course Thickness (in) = **0**
 Granular Borrow Thickness (in) = **0**
 Roadway Excavation Depth (ft) = **0**
 Number of Sidewalks (No.) = **0**

Project Parameters:

Imp Type: **Traffic Signal**
 Funding: **American Fork**
 Comp Year: **2026**

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.63

900 West New Road: 700 South to 700 West

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	68,800	\$275,200
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	7	\$14,215
Roadway Excavation	C.Y.	\$11	16,722	\$175,583
HMA Concrete	Ton	\$85	4,666	\$396,568
Untreated Base Course	C.Y.	\$10	4,459	\$44,593
Granular Borrow	C.Y.	\$40	3,344	\$133,778
Curb and Gutter (2.5' width)	L.F.	\$23	8,600	\$193,500
Sidewalk (5' width)	L.F.	\$25	8,600	\$215,000
Drainage	L.F.	\$45	8,600	\$387,000
Right of Way	S.F.	\$4.00	309,600	\$1,238,400
Restriping	L.F.	\$5	889	\$4,443
Bridge/Culvert	S.F.	\$225	10,800	\$2,430,000
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$5,508,279
Mobilization (10% of Construction)	Lump	10%	550,828	\$550,828
Contingency (15% of Construction)	Lump	15%	826,242	\$826,242
Subtotal				\$6,885,349

Preconstruction Engineering	8%	\$440,662
Construction Engineering	8%	\$440,662

Total Project Costs	\$7,767,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$7,767,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.64

New Traffic Signal: Vineyard Connector & 700 West

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$300,000
Mobilization (10% of Construction)	Lump	10%	30,000	\$30,000
Contingency (15% of Construction)	Lump	15%	45,000	\$45,000
Subtotal				\$375,000

Preconstruction Engineering	8%	\$24,000
Construction Engineering	8%	\$24,000

Total Project Costs	\$423,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$423,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Traffic Signal
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.65

1100 South New Road: 100 East to 700 South

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	64,000	\$256,000
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	7	\$13,223
Roadway Excavation	C.Y.	\$11	15,556	\$163,333
HMA Concrete	Ton	\$85	4,340	\$368,900
Untreated Base Course	C.Y.	\$10	4,148	\$41,481
Granular Borrow	C.Y.	\$40	3,111	\$124,444
Curb and Gutter (2.5' width)	L.F.	\$23	8,000	\$180,000
Sidewalk (5' width)	L.F.	\$25	8,000	\$200,000
Drainage	L.F.	\$45	8,000	\$360,000
Right of Way	S.F.	\$4.00	288,000	\$1,152,000
Restriping	L.F.	\$5	827	\$4,133
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$2,863,516
Mobilization (10% of Construction)	Lump	10%	286,352	\$286,352
Contingency (15% of Construction)	Lump	15%	429,527	\$429,527
Subtotal				\$3,579,395

Preconstruction Engineering	8%	\$229,081
Construction Engineering	8%	\$229,081

Total Project Costs	\$4,038,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$4,038,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.66

New Roundabout: 100 West & 1100 South Extension

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576.00
Construction Engineering	8%	\$40,576.00

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granual Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.67

New Traffic Signal: Vineyard Connector & 100 West

Traffic Signal

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	1	\$300,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$300,000
Mobilization (10% of Construction)	Lump	10%	30,000	\$30,000
Contingency (15% of Construction)	Lump	15%	45,000	\$45,000
Subtotal				\$375,000

Preconstruction Engineering	8%	\$24,000
Construction Engineering	8%	\$24,000

Total Project Costs	\$423,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$423,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Traffic Signal
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.68

100 west Widen: 1500 South to American Fork Marina

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	24,000	\$96,000
Removal of Existing Asphalt	S.F.	\$4	3,667	\$14,667
Clearing and Grubbing	Acre	\$2,000	1	\$2,066
Roadway Excavation	C.Y.	\$11	2,778	\$29,167
HMA Concrete	Ton	\$85	775	\$65,875
Untreated Base Course	C.Y.	\$10	741	\$7,407
Granular Borrow	C.Y.	\$40	556	\$22,222
Curb and Gutter (2.5' width)	L.F.	\$23	3,000	\$67,500
Sidewalk (5' width)	L.F.	\$25	3,000	\$75,000
Drainage	L.F.	\$45	3,000	\$135,000
Right of Way	S.F.	\$4.00	45,000	\$180,000
Restriping	L.F.	\$5	310	\$1,550
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$696,454
Mobilization (10% of Construction)	Lump	10%	69,645	\$69,645
Contingency (15% of Construction)	Lump	15%	104,468	\$104,468
Subtotal				\$870,568

Preconstruction Engineering	8%	\$55,716
Construction Engineering	8%	\$55,716

Total Project Costs	\$983,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$983,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.69

New Roundabout: Frontage Rd & 100 east

Major Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	21,600	\$86,400
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	3	\$5,207
Roadway Excavation	C.Y.	\$11	6,750	\$70,875
HMA Concrete	Ton	\$85	2,354	\$200,095
Untreated Base Course	C.Y.	\$10	1,800	\$18,000
Granular Borrow	C.Y.	\$40	1,350	\$54,000
Curb and Gutter (2.5' width)	L.F.	\$23	2,700	\$60,750
Sidewalk (5' width)	L.F.	\$30	2,700	\$81,000
Drainage	L.F.	\$45	2,700	\$121,500
Right of Way	S.F.	\$4.00	113,400	\$453,600
Restriping	L.F.	\$5	279	\$1,395
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$1,652,822
Mobilization (10% of Construction)	Lump	10%	165,282	\$165,282
Contingency (15% of Construction)	Lump	15%	247,923	\$247,923
Subtotal				\$2,066,027

Preconstruction Engineering	8%	\$92,226
Construction Engineering	8%	\$92,226

Total Project Costs	\$2,251,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$2,251,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.70

New Roundabout: 700 South Extension & 100 East

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576.00
Construction Engineering	8%	\$40,576.00

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.71

New Roundabout: 100 East & 1100 South

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576.00
Construction Engineering	8%	\$40,576.00

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.72

1100 South Widen: 100 East to 500 East

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	72,000	\$288,000
Removal of Existing Asphalt	S.F.	\$4	10,000	\$40,000
Clearing and Grubbing	Acre	\$2,000	2	\$4,959
Roadway Excavation	C.Y.	\$11	9,167	\$96,250
HMA Concrete	Ton	\$85	2,558	\$217,388
Untreated Base Course	C.Y.	\$10	2,444	\$24,444
Granular Borrow	C.Y.	\$40	1,833	\$73,333
Curb and Gutter (2.5' width)	L.F.	\$23	9,000	\$202,500
Sidewalk (5' width)	L.F.	\$25	9,000	\$225,000
Drainage	L.F.	\$45	9,000	\$405,000
Right of Way	S.F.	\$4.00	108,000	\$432,000
Restriping	L.F.	\$5	930	\$4,650
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$2,013,524
Mobilization (10% of Construction)	Lump	10%	201,352	\$201,352
Contingency (15% of Construction)	Lump	15%	302,029	\$302,029
Subtotal				\$2,516,905

Preconstruction Engineering	8%	\$161,082
Construction Engineering	8%	\$161,082

Total Project Costs	\$2,840,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$2,840,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.73

Intersection Improvement: State St & 860 East

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Intersection Improvement	Each	\$500,000	1	\$500,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$500,000
Mobilization (10% of Construction)	Lump	10%	50,000	\$50,000
Contingency (15% of Construction)	Lump	15%	75,000	\$75,000
Subtotal				\$625,000

Preconstruction Engineering	8%	\$40,000
Construction Engineering	8%	\$40,000

Total Project Costs	\$705,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$705,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.74

860 East Widen: State St to 1100 South

Major Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	94,400	\$377,600
Removal of Existing Asphalt	S.F.	\$4	14,422	\$57,689
Clearing and Grubbing	Acre	\$2,000	3	\$6,501
Roadway Excavation	C.Y.	\$11	17,481	\$183,556
HMA Concrete	Ton	\$85	6,097	\$518,217
Untreated Base Course	C.Y.	\$10	4,662	\$46,617
Granular Borrow	C.Y.	\$40	3,496	\$139,852
Curb and Gutter (2.5' width)	L.F.	\$23	11,800	\$265,500
Sidewalk (5' width)	L.F.	\$30	11,800	\$354,000
Drainage	L.F.	\$45	11,800	\$531,000
Right of Way	S.F.	\$4.00	141,600	\$566,400
Restriping	L.F.	\$5	1,219	\$6,097
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$3,053,028
Mobilization (10% of Construction)	Lump	10%	305,303	\$305,303
Contingency (15% of Construction)	Lump	15%	457,954	\$457,954
Subtotal				\$3,816,285

Preconstruction Engineering	8%	\$244,242
Construction Engineering	8%	\$244,242

Total Project Costs	\$4,305,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$4,305,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: Capacity Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.75

740 East New Road: 550 South to 620 South

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	8,000	\$32,000
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	1	\$1,653
Roadway Excavation	C.Y.	\$11	1,944	\$20,417
HMA Concrete	Ton	\$85	543	\$46,113
Untreated Base Course	C.Y.	\$10	519	\$5,185
Granular Borrow	C.Y.	\$40	389	\$15,556
Curb and Gutter (2.5' width)	L.F.	\$23	1,000	\$22,500
Sidewalk (5' width)	L.F.	\$25	1,000	\$25,000
Drainage	L.F.	\$45	1,000	\$45,000
Right of Way	S.F.	\$4.00	36,000	\$144,000
Restriping	L.F.	\$5	103	\$517
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$357,939
Mobilization (10% of Construction)	Lump	10%	35,794	\$35,794
Contingency (15% of Construction)	Lump	15%	53,691	\$53,691
Subtotal				\$447,424

Preconstruction Engineering	8%	\$28,635
Construction Engineering	8%	\$28,635

Total Project Costs	\$505,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$505,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.76

Quality Dr. New Road: 600 East to 860 East

Minor Collector

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	34,400	\$137,600
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	4	\$7,107
Roadway Excavation	C.Y.	\$11	8,361	\$87,792
HMA Concrete	Ton	\$85	2,333	\$198,284
Untreated Base Course	C.Y.	\$10	2,230	\$22,296
Granular Borrow	C.Y.	\$40	1,672	\$66,889
Curb and Gutter (2.5' width)	L.F.	\$23	4,300	\$96,750
Sidewalk (5' width)	L.F.	\$25	4,300	\$107,500
Drainage	L.F.	\$45	4,300	\$193,500
Right of Way	S.F.	\$4.00	154,800	\$619,200
Restriping	L.F.	\$5	444	\$2,222
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$1,539,140
Mobilization (10% of Construction)	Lump	10%	153,914	\$153,914
Contingency (15% of Construction)	Lump	15%	230,871	\$230,871
Subtotal				\$1,923,925

Preconstruction Engineering	8%	\$123,131
Construction Engineering	8%	\$123,131

Total Project Costs	\$2,171,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$2,171,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	4
Untreated Base Course Thickness (in) =	8
Granular Borrow Thickness (in) =	6
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.77

Intersection Improvement: Utah Valley Drive & 860 East

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	0	\$0
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Intersection Improvement	Each	\$500,000	1	\$500,000
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$500,000
Mobilization (10% of Construction)	Lump	10%	50,000	\$50,000
Contingency (15% of Construction)	Lump	15%	75,000	\$75,000
Subtotal				\$625,000

Preconstruction Engineering	8%	\$40,000
Construction Engineering	8%	\$40,000

Total Project Costs	\$705,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$705,000

Overall Assumptions:

HMA Pavement Density (pcf) = **0**
 HMA Thickness (in) = **0**
 Untreated Base Course Thickness (in) = **0**
 Granular Borrow Thickness (in) = **0**
 Roadway Excavation Depth (ft) = **0**
 Number of Sidewalks (No.) = **0**

Project Parameters:

Imp Type: **Intersection Improvement**
 Funding: **American Fork**
 Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.78

Vineyard Connector New Road: Pony Express Extension to West City Limits

Arterial

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	281,392	\$1,125,568
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	40	\$80,748
Roadway Excavation	C.Y.	\$11	113,990	\$1,196,893
HMA Concrete	Ton	\$85	39,754	\$3,379,086
Untreated Base Course	C.Y.	\$10	22,798	\$227,980
Granular Borrow	C.Y.	\$40	56,995	\$2,279,796
Curb and Gutter (2.5' width)	L.F.	\$23	35,174	\$791,415
Sidewalk (5' width)	L.F.	\$25	35,174	\$879,350
Drainage	L.F.	\$45	35,174	\$1,582,830
Right of Way	S.F.	\$4.00	1,758,700	\$7,034,800
Restriping	L.F.	\$5	3,635	\$18,173
Bridge/Culvert	S.F.	\$225	14,000	\$3,150,000
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$21,746,639
Mobilization (10% of Construction)	Lump	10%	2,174,664	\$2,174,664
Contingency (15% of Construction)	Lump	15%	3,261,996	\$3,261,996
Subtotal				\$27,183,299

Preconstruction Engineering	8%	\$1,739,731
Construction Engineering	8%	\$1,739,731

Total Project Costs	\$30,663,000
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American Fork City's Responsibility via Impact Fee's	6.77%
	\$2,076,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	6
Granular Borrow Thickness (in) =	15
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026
Matched to MAG Cost Plus Cost of Overpass

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.79

Pony Express Extension: Vineyard Connector to West City Limits

Arterial

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	146,337	\$585,350
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	21	\$41,993
Roadway Excavation	C.Y.	\$11	59,280	\$622,442
HMA Concrete	Ton	\$85	20,674	\$1,757,288
Untreated Base Course	C.Y.	\$10	11,856	\$118,560
Granular Borrow	C.Y.	\$40	29,640	\$1,185,605
Curb and Gutter (2.5' width)	L.F.	\$23	18,292	\$411,574
Sidewalk (5' width)	L.F.	\$25	18,292	\$457,305
Drainage	L.F.	\$45	18,292	\$823,148
Right of Way	S.F.	\$4.00	914,609	\$3,658,437
Restriping	L.F.	\$5	1,890	\$9,451
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	0	\$0
Construction Cost				\$9,671,153
Mobilization (10% of Construction)	Lump	10%	967,115	\$967,115
Contingency (15% of Construction)	Lump	15%	1,450,673	\$1,450,673
Subtotal				\$12,088,941

Preconstruction Engineering	8%	\$773,692
Construction Engineering	8%	\$773,692

Total Project Costs	\$13,637,000
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American Fork City's Responsibility via Impact Fee's	6.77%
	\$923,000

Overall Assumptions:

HMA Pavement Density (pcf) =	155
HMA Thickness (in) =	5
Untreated Base Course Thickness (in) =	6
Granular Borrow Thickness (in) =	15
Roadway Excavation Depth (ft) =	2.5
Number of Sidewalks (No.) =	2

Project Parameters:

Imp Type: New Road
Funding: American Fork
Comp Year: 2026
Matched to MAG Cost

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.80

New Roundabout: Pacific Drive & 700 West

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576
Construction Engineering	8%	\$40,576

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granual Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

**American Fork City
Impact Fee Facilities Plan**

Project No. 1.81

New Roundabout: 130 North & 600 West

Intersection Improvement

Costs

Item	Unit	Unit Cost	Quantity	Cost
Parkstrip	S.F.	\$4	0	\$0
Removal of Existing Asphalt	S.F.	\$4	0	\$0
Clearing and Grubbing	Acre	\$2,000	0	\$0
Roadway Excavation	C.Y.	\$11	0	\$0
HMA Concrete	Ton	\$85	0	\$0
Untreated Base Course	C.Y.	\$10	0	\$0
Granular Borrow	C.Y.	\$40	0	\$0
Curb and Gutter (2.5' width)	L.F.	\$23	0	\$0
Sidewalk (5' width)	L.F.	\$25	0	\$0
Drainage	L.F.	\$45	0	\$0
Right of Way	S.F.	\$4.00	1,800	\$7,200
Restriping	L.F.	\$5	0	\$0
Bridge/Culvert	S.F.	\$225	0	\$0
Traffic Signal	Each	\$300,000	0	\$0
Roundabout	Each	\$500,000	1	\$500,000
Construction Cost				\$507,200
Mobilization (10% of Construction)	Lump	10%	50,720	\$50,720
Contingency (15% of Construction)	Lump	15%	76,080	\$76,080
Subtotal				\$634,000

Preconstruction Engineering	8%	\$40,576
Construction Engineering	8%	\$40,576

Total Project Costs	\$716,000
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American Fork City's Responsibility via Impact Fee's	100%
	\$716,000

Overall Assumptions:

HMA Pavement Density (pcf) =	0
HMA Thickness (in) =	0
Untreated Base Course Thickness (in) =	0
Granular Borrow Thickness (in) =	0
Roadway Excavation Depth (ft) =	0
Number of Sidewalks (No.) =	0

Project Parameters:

Imp Type: Intersection Improvement
Funding: American Fork
Comp Year: 2026

Traffic Impact Study Requirements

When a Traffic Impact Study is required prepare the study according to the appropriate TIS level as shown below. The traffic study shall, at a minimum, incorporate American Fork principles and standards and national practices. Additional requirements and investigation may be imposed upon the applicant as necessary.

Permit Level / Traffic Study level I

Project ADT < 100 trips

No proposed modifications to traffic signals or roadway elements or geometry.

1. Study Area.

The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary.

The study area may be limited to or include property frontage and include neighboring and adjacent parcels. Identify site, cross, and next adjacent up and down stream access points within access category distance of property boundaries.

2. Design year.

Opening day of project

3. Analysis Conditions and Period

Identify site traffic volumes and characteristics.

Identify adjacent street(s) traffic volume and characteristics.

4. Identify right-of-way, geometric boundaries and physical conflicts.

Investigate existence of federal or state, no access or limited access control line.

5. Generate access point capacity analysis as necessary.

Analyze site and adjacent road traffic for the following time periods: weekday A.M. and P.M. peak hours including Saturday peak hours if required by the City Engineer. Identify special event peak hour as necessary (per roadway peak and site peak).

6. Design and Mitigation.

Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

Permit Level / Traffic Study Level II
Project ADT 100 to 500 trips

1. Study Area.

The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary. Intersection of site access drives with state highways and any signalized and unsignalized intersection within access category distance of property line. Include any identified queuing distance at site and study intersections

2. *Design Year*

Opening day of project

3. *Analysis Period*

Identify site and adjacent road traffic for weekday A.M. and P.M. peak hours (Saturdays if required by the City Engineer).

4. *Data Collection*

Identify site and adjacent street roadway and intersection geometries.
Identify adjacent street(s) traffic volume and characteristics.

5. *Conflict / Capacity Analysis*

Diagram flow of traffic at access point(s) for site and adjacent development.
Perform capacity analysis as determined by the City Engineer.

6. *Right-of-Way Access*

Identify right-of-way, geometric boundaries and physical conflicts.
Investigate existence of federal or state, no access or limited access control line.

7. *Design and Mitigation*

Determine and document safe and efficient operational design needs based on site and study area data.
Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

Project ADT 500 to 3,000 trips or peak hour < 500 trips.

1. Study Area

The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary. An acceptable traffic study boundary is 1/4-1/2 mile on each side of the project site per the City Engineer.

Intersection of site access drives with state highways and any signalized and unsignalized intersection within access category distance of property line. Include any identified queuing distance at site and study intersections.

2. Design Year

Opening day of project and five year after project completion.
Document and include all phases of development (includes out pad parcels).

3. Analysis Period

Analyze site and adjacent road traffic for weekday A.M. and P.M. peak hours including Saturday peak hours if identified as a high Saturday use.. Identify special event peak hour as necessary (adjacent roadway peak and site peak).

4. Data Collection

- a. Daily and Turning Movement counts.
- b. Identify site and adjacent street roadway and intersection geometries.
- c. Traffic control devices including traffic signals and regulatory signs.
- d. Traffic accident data

5. Trip Generation

Use equations or rates available in latest edition of ITE Trip Generation. Where developed equations are unavailable for intended land use, perform trip rate study and estimation following ITE procedures or develop justified trip rate agreed to by the Department.

6. Trip Distribution and Assignment

Document distribution and assignment of existing, site, background, and future traffic volumes on surrounding network of study area.

7. Conflict / Capacity Analysis

Diagram flow of traffic at access point(s) for site and adjacent development.
Perform capacity analysis for daily and peak hour volumes

8. Traffic Signal Impacts

For modified and proposed traffic signals:

- a. Traffic Signal Warrants as identified.
- b. Traffic Signal drawings as identified.
- c. Queuing Analysis

9. Design and Mitigation.

Determine and document safe and efficient operational design needs based on site and study area data. Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

Permit Level / Traffic Study Level III

Project ADT 3,000 to 10,000 trips or peak hour traffic 500 to 1,200 trips.

1. Study Area

The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary.

An acceptable traffic study boundary should be based on travel time or by market area influence. Intersection of site access drives with state highways and any intersection within 1/2 mile of property line on each side of project site.

2. Design Year

Opening day of project, five years and twenty years after opening.
Document and include all phases of development (includes out pad parcels).

3. Analysis period

For each design year analyze site and adjacent road traffic for weekday A.M. and P.M. peak hours including Saturday peak hours if identified as needed per the City Engineer. Identify special event peak hour as necessary (adjacent roadway peak and site peak).

4. Data Collection

- a. Daily and Turning movement counts.
- b. Identify site and adjacent street roadway and intersection geometries.
- c. Traffic control devices including traffic signals and regulatory signs.
- d. Automatic continuous traffic counts for at least 48 hours.
- e. Traffic accident data.

5. Trip Generation

Use equations or rates available in latest edition of ITE Trip Generation. Where developed equations are unavailable for intended land use, perform trip rate study and estimation following ITE procedures or develop justified trip rate agreed to by the Department.

6. Trip Distributions and Assignment

Document distribution and assignment of existing, site, background, and future traffic volumes on surrounding network of study area.

7. Capacity Analysis

- a. Level of Service (LOS) for all intersections.
- b. LOS for existing conditions, design year without project, design year with project.

8. Traffic Signal Impacts. For proposed Traffic Signals:

- a. Traffic Signal Warrants as identified.
- b. Traffic Signal drawings as identified.
- c. Queuing Analysis.
- d. Traffic Systems Analysis. Includes acceleration, deceleration and weaving.
- e. Traffic Coordination Analysis

10. Accident and Traffic Safety Analysis

Existing vs. as proposed development.

11. Design and Mitigation

Determine and document safe and efficient operational design needs based on site and study area data. Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

Permit Level / Traffic Study Level IV

Project ADT greater than 10,000 trips or peak hour traffic > 1,200 vehicles per hour.

1. Study Area

The study area, depending on the size and intensity of the development, will include the surrounding roadways ½ mile from the parcel boundary or reasonable travel time boundary.

2. Design Year

Opening day of project, five years and twenty years after opening.
Document and include all phases of development (includes out pad parcels).

3. Analysis period

For each design year analyze site and adjacent road traffic for weekday A.M. and P.M. peak hours including Saturday peak hours as needed per the City Engineer. Identify special event peak hour as necessary (adjacent roadway peak and site peak).

4. Data Collection

- a. Daily and Turning movement counts.
- b. Identify site and adjacent street roadway and intersection geometries.
- c. Traffic control devices including traffic signals and regulatory signs.
- d. Automatic continuous traffic counts for at least 24 hours or obtain ADT from local or state agencies
- e. Traffic accident data.

5. Trip Generation

Use equations or rates available in latest edition of ITE Trip Generation. Where developed equations are unavailable for intended land use, perform trip rate study and estimation following ITE procedures or develop justified trip rate agreed to by the Department.

6. Trip Distributions and Assignment

Document distribution and assignment of existing, site, background, and future traffic volumes on surrounding network of study area.

7. Capacity Analysis

- a. Level of Service (LOS) for all intersections.
- b. LOS for existing conditions, design year without project, design year with project.

8. Traffic Signal Impacts. For proposed traffic signals:

- a. Traffic Signal Warrants as identified.
- b. Traffic Signal drawings as identified.
- c. Queuing Analysis.
- d. Traffic Systems Analysis. Includes acceleration, deceleration and weaving.
- e. Traffic Coordination Analysis.

9. Accident and Traffic Safety Analysis. Existing vs. as proposed develop

10. Design and Mitigation

Determine and document safe and efficient operational design needs based on site and study area data. Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

10.8.2013

Memo

To

Andy Spencer, P.E.
City Engineer

From

Steven Lord
Project Manager

Re

American Fork
Transportation Element of
the General Plan –
Intersection Studies

Purpose and Introduction:

The purpose of this memorandum is to present the findings of the detailed intersection studies performed in conjunction with the American Fork Transportation Element of the General Plan. Each intersection was studied to determine if there are any existing deficiencies that the City should consider addressing immediately. The intersections considered in this memo are:

- Center Street & 200 South
- 200 South & 100 East
- Main Street & 500 East
- 700 East & 300 North
- 100 West & 700 North
- 700 North & 150 West
- 150 West & 1120 North

Center Street & 200 South



Center Street and 200 South is the intersection of two residential collector roads. The intersection is slightly skewed in the east-west direction. Each approach has one lane with enough room for a vehicle to pass on the right and make a right turn whilst the through lane is being blocked, although the approaches are not striped in this manner. Pedestrian crossings are painted on the north, south, and east approaches. Each road currently carries less than 2,000 vehicles per day. The intersection is currently stop controlled in the east-west direction with the north-south direction uncontrolled.

The existing level of service at this intersection is A. The worst approach is the westbound approach, which experiences less than 10 seconds of delay per vehicle during the PM peak hour.

It would be advantageous to correct the skew in the intersection to improve perceived safety, but due to the cost involved and the low volumes is not recommended until volumes increase or crash data suggests there is more than just a perceived safety concern.

100 East & 200 South



100 East and 200 South is a north-south offset intersection of two residential collector roads. Each approach has one lane with enough room for a vehicle to pass on the right and make a right turn whilst the through lane is being blocked, although the approaches are not striped in this manner. Pedestrian crossings are painted on the north, south, and west approaches. The north and east approaches carry approximately 3,000 vehicles per day and the south and west approaches carry approximately 2,000 vehicles per day. The intersection is currently stop controlled in the north-south direction with the east-west direction uncontrolled.

The existing level of service at this intersection is B. The worst approach is the northbound approach, which experiences approximately 12 seconds of delay per vehicle during the PM peak hour. This intersection has been a concern for some time due to its offset and proximity to the elementary school. Although, no operational concerns exist today, an offset intersection can pose safety concerns and should be corrected where possible. This intersection has been master planned to be modified to eliminate the offset. It is recommended that this be accomplished as soon as funding comes available. This intersection is also likely to experience a significant increase in traffic in the future as the north-south route is made more direct and development occurs on the south side of I-15. As such, a traffic control signal is planned here for the future but should not be installed until the appropriate signal warrants are met as set forth in the Manual on Uniform Traffic Control Devices (MUTCD).

Main Street & 500 East

Main Street and 500 East is an intersection of two minor collector streets. Each approach has one lane with enough room for a vehicle to pass on the right and make a right turn whilst the through lane is being blocked, although the approaches are not striped in this manner. There are no pedestrian crossings at this intersection. Each approach carries approximately 5,000 vehicles per day. The intersection is currently stop controlled in the north-south direction with the east-west direction uncontrolled.

The existing level of service at this intersection is C. The worst approach is the northbound approach, which experiences approximately 21 seconds of delay per vehicle during the PM peak hour. This intersection is a concern due to its proximity to the railroad tracks on the west and south approaches. Although, no operational concerns exist today, as volumes increase in the future this intersection is likely to fail under its

existing configuration. 500 East is planned as a future 5-lane arterial street as part of the "Main Street Vision". It is likely that this intersection will need to be signalized in the future but a roundabout would also be a viable alternative. No immediate action is required but at some point in the future a full feasibility study should be performed in conjunction with the road widening to determine whether a signal or roundabout is most appropriate. Factors such as right-of-way constraints, vehicle queuing to the railroad tracks, and future transit expansion should be considered before a final decision is reached.

700 East & 300 North

700 East and 300 North is an intersection of two minor collector streets. Each approach has one lane with enough room for a vehicle to pass on the right and make a right turn whilst the through lane is being blocked, although the approaches are not striped in this manner. Pedestrian facilities are provided on the south and west approaches. 300 South carries approximately 6,000 vehicles per day and 700 East carries approximately 3,000 vehicles per day. The north leg of the intersection is an access to parking at American Fork High School. The intersection is currently stop controlled in the north-south direction with the east-west direction uncontrolled.

The existing level of service at this intersection is B. The worst approach is the southbound approach, which experiences approximately 13 seconds of delay per vehicle during the PM peak hour. The entrance to the high school poses unique challenges due to the inexperienced nature of many of the drivers using this intersection. Providing a signal at this location as traffic increases on 300 North would help provide a more comfortable intersection for inexperienced and experienced drivers alike. There is currently no need for improvements but it is likely that a signal would be warranted at this location in the future. A roundabout may also be considered but care should be taken to gauge public opinion and to analyze each alternative more thoroughly as future volumes become clearer.

700 North and 100 West/150 West

100 West and 150 West on 700 North are very close to each other. 150 West is a residential local street and 100 West is a Collector. 700 North is also a collector. Both 700 North and 100 West carry approximately 4,000 vehicles per day. Each approach has one lane with enough room for a vehicle to pass on the right and make a right turn whilst the through lane is being blocked, although the approaches are not striped in this manner. Pedestrian facilities are provided on the north and west approaches of each intersection. 150 West is stop controlled in the southbound direction and 100 West is stop controlled in the east-west direction.

The existing levels of service at these intersection are C for 100 West with 23 seconds of delay per vehicle on the eastbound approach, and B for 150 West with 11 seconds of delay per vehicle on the southbound approach. The master plan suggests that 700 North be connected across 100 East in the near future. This will significantly increase traffic on 700 North and it will be upgraded to a 3-lane major collector to accommodate the additional traffic. As this upgrade occurs the intersection at 100 West should also be considered for an upgrade to a signal pending the necessary signal warrant study according to MUTCD guidelines. A roundabout may also be considered here. If a signal is not immediately warranted at this location, it is likely that switching the stop controlled directions from east-west to north-south will help with traffic progression through the intersection. A further stop sign warrant study will be necessary at that point.

150 West and 1120 North

150 West is a continuation north of 100 West discussed in the previous section. 150 West is a collector street and 1120 North is also a collector. Both roads carry approximately 4,000 vehicles per day. Each approach has one lane with enough room for a vehicle to pass on the right and make a right turn whilst the through lane is being blocked, although the approaches are not striped in this manner. Pedestrian facilities are provided on the north and west approaches of the intersection. This intersection is 4-way stop controlled.

The existing level of service at this intersection is A. The worst approach is the northbound approach, which experiences less than 10 seconds of delay per vehicle during the PM peak hour. This intersection will function as a two-way stop controlled intersection and further study may be warranted to determine

if the 4-way stop could be replaced with 2-way stop control, most likely in the north-south direction. As traffic increases with the connection of 1120 north to 900 West in the future, a signal or roundabout is likely to be needed. This is unlikely to occur within the next few years and should be a long term planning goal for the city.

Conclusions:

None of the study intersections are operating significantly poorly enough to warrant immediate action although several will require modifications in the near future. It is recommended that these intersections be monitored regularly to assess the impacts of changing travel patterns as the City builds its master planned improvements.

Guidelines for Pedestrian Crossings Intersections and Mid-Block

A. Introduction

There are established guidelines as to the warranting of crosswalks or pedestrian crossings published by federal and state agencies. There are also specific school crosswalk zone requirements established by the State of Utah. The State has adopted the "Utah Traffic Controls for School Zones 2005 Edition; which is a supplement to Part 7 of the national Manual on Uniform Traffic Control Devices (MUTCD).

This document provides guidance on when to install or consider crosswalks at intersections or mid-block cross-walks. It is recommended to refer to national and state publications when considering the installation of crossings since theories, standards, and warrants change. Presented here are guidelines when to consider crossings.

Provided below is a reference American Fork City staff can quickly refer to as to when to install pedestrian crosswalks. There may be more complicated applications that will require an engineering study.

Safety always takes precedence!!! In downtown business areas, campuses, commercial areas, schools, near senior centers, or where pedestrian activity is encouraged or likely to occur, engineering judgment can be used to install crosswalks and a higher level of awareness through signage and pavement markings.

B. General Crosswalk Guidelines

Whether the proposed crosswalk is at an intersection or a mid-block intersection, the criteria listed below need to be satisfied in addition to warrant criteria detailed below and in the State and Federal versions or supplements of the MUTCD.

1. Marked crosswalks must connect to established sidewalks or paths at both ends
2. ADA accessible ramps shall be included at both ends of crosswalk installations unless there are engineering reasons why they cannot be provided.
3. Adequate street lighting must be provided for the safety of pedestrians
4. Street parking must be restricted adjacent to crosswalks to allow for adequate sight lines for both the motorists and the pedestrians. The MUTCD requires 50 feet of "no parking" on both the leading and trailing edge of the crosswalk as a minimum. An engineering study may be needed for more complicated crossings or other roadway features.
5. Marked crosswalks will not be installed on residential streets unless they are part of a Safe Routes To School (SRTS) program.

C. Pedestrian Crossings at Intersections

The criteria or guidelines below are in addition to the items in Section B and should be followed when considering installing crosswalks at intersections.

1. Crosswalks should be installed at all signalized intersections
 - a. It may not be feasible or practical to install crosswalks on all legs of an intersection but effort should be made to provide crossings at all legs.
 - b.
2. Four-way stop-controlled or “T” intersections require crosswalks on legs that connect pedestrian facilities.
 - a. Areas where crosswalks are not required include rural areas where there are gravel or dirt shoulders without pedestrian facilities or paths
 - b. In urban areas crosswalks at stop-controlled intersections are needed based on pedestrian volumes and connectivity of pedestrian facilities
 - c. Residential areas do not need marked crosswalks though ADA standards are required to be met.
3. Uncontrolled or partially controlled intersections are usually in residential areas or low speed/low volume roadways and do not need marked crosswalks.

D. Mid-Block Pedestrian Crossings

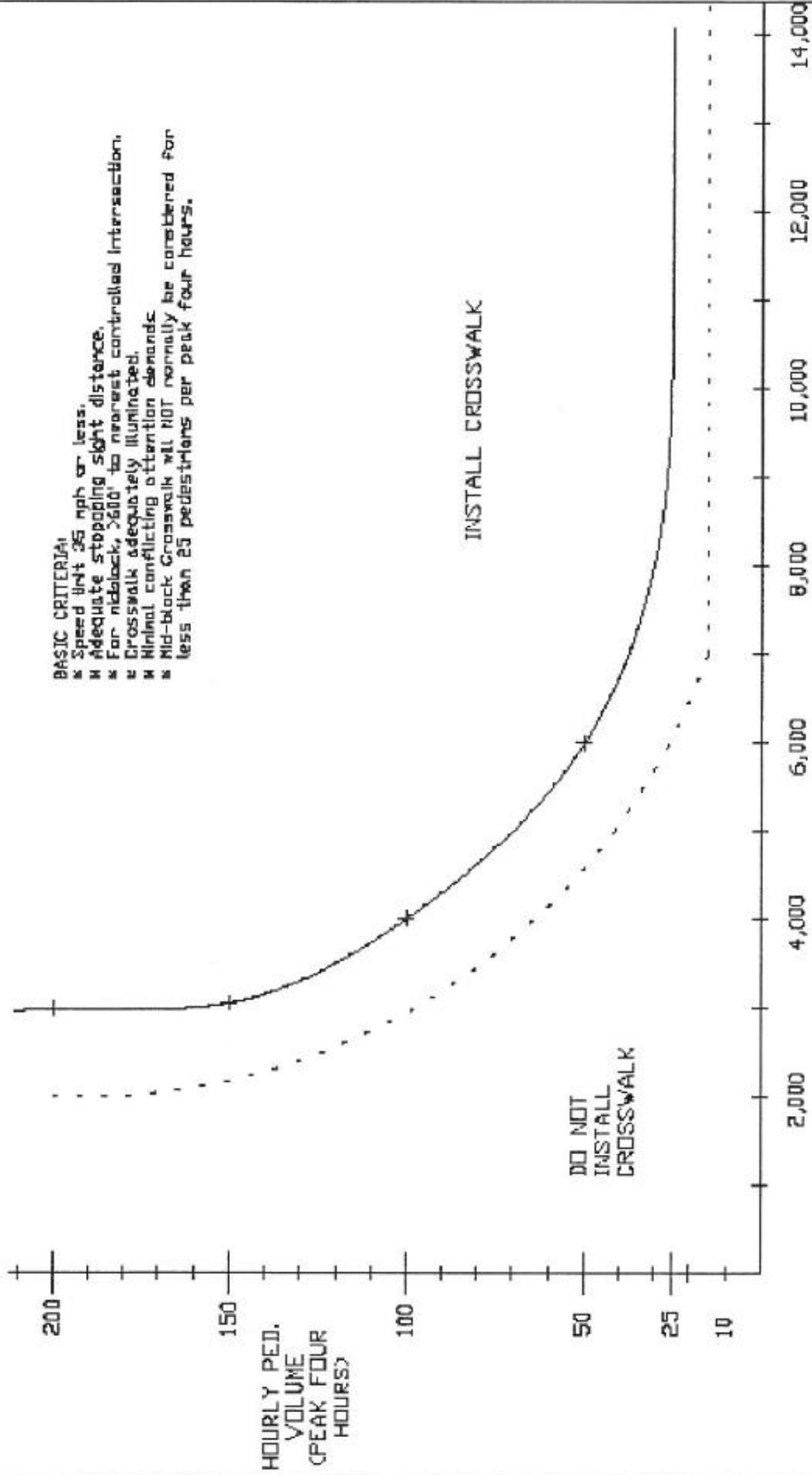
The criteria or guidelines below are in addition to the items in Section B and should be followed when considering installing mid-block crosswalks.

1. The crossing volume is not caused by a correctable gap in the sidewalk system.
2. There must be a minimum distance of 600 feet to the nearest protected crossing. A protected crossing is a crossing controlled by stop signs or signals or at a grade separation.
3. An engineering study indicates no unsafe visibility or site conditions would be created.
4. Posted speed limit is 35 mph or less and 85th percentile speed is within 5mph of the posted speed.
5. The pedestrian and vehicle volumes must cross in the “INSTALL CROSWALK” area of Chart 1 below.

CHART 1

--- LOCATIONS WITH PREDOMINANTLY YOUNG, ELDERLY OR HANDICAPPED PEDESTRIANS

— OTHER LOCATIONS



- BASIC CRITERIA:**
- * Speed limit 35 mph or less.
 - * Adequate stopping sight distance.
 - * For midblock, >600' to nearest controlled intersection.
 - * Crosswalk adequately illuminated.
 - * Minimal conflicting attention demands.
 - * Mid-block crosswalk will NOT normally be considered for less than 25 pedestrians per peak four hours.

1. IF USING ONLY THE PEAK HOUR, THRESHOLD MUST BE INCREASED BY 1.5.
2. FOR STREETS WITH MEDIAN, USE ONE-WAY DIRECTIONAL ADT VOLUMES.

900 East 700 North 4-Way STOP Warrant Study



Conducted By:

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ENGINEERS

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AMERICAN FORK CITY
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

275 East 200 North
American Fork, UT 84003



AMERICAN FORK CITY
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ENGINEERING DIVISION
275 East 200 North
American Fork, UT 84003

900 East 700 North 4-Way STOP Warrant Study

DATE: April 15, 2013
PREPARED BY: Horrocks Engineers

I INTRODUCTION:

This report has been created to show the findings of a 4-Way Stop warrant study conducted in March, 2013. This study intends to determine if a 4-Way Stop (aka: All-Way Stop) is warranted at the intersection of 900 East and 700 North, American Fork, following the completion of widening to North County Blvd.

The study included a review of this intersection's traffic patterns including traffic counts, turning-movement counts, its crash history as well as the intersection's site measurements, geometry and viewing angles.

In order to warrant a 4-Way Stop designation, an intersection should meet specified threshold indicators as set forth in the Utah Manual of Uniform Traffic Control Devices (MUTCD). One primary indicator is of approximately equal traffic volumes at two conflicting directions of travel through the intersection. However, other determining factors include the intersection's crash history, geometric layout, and peak hour volume, among others.

Guidance for multi-way stop applications is given in the Utah MUTCD, Sections 2B.04 and 2B.07.

II TRAFFIC DATA:

Traffic data for both 900 East and 700 North was collected on weekdays during peak hours during the month of March, 2013. MetroCount tube-count boxes were placed at each direction of the intersection. Also, turning-movement counts were taken during the PM Peak Hour (4:00 pm to 6:00 pm). A complete report of the data is included in Appendix B and a summary is given in Table I.

Table I: Average Daily Traffic Volume Approaching the Intersection

Road Name	AM Peak Volume	Noon-hour Volume	PM Peak Volume	Average Daily
700 NORTH - <i>eastbound</i>	331 / hour	191 / hour	357 / hour	3,758 / day
700 NORTH - <i>westbound</i>	201 / hour	150 / hour	261 / hour	2,600 / day
900 EAST - <i>northbound</i>	60 / hour	84 / hour	101 / hour	1,171 / day
900 EAST - <i>southbound</i>	208 / hour	188 / hour	250 / hour	2,671 / day
TOTALS	800 / hour	613 / hour	969 / hour	10,200 / day

Of note, the posted speed limit for both 900 East and 700 North is 25 mph. The 85th percentile measured speed was estimated to be 33 mph, and the average measured speed was estimated at 29 mph.

III ACCIDENT ANALYSIS:

Crash data available from the American Fork Police Department indicates that 3 of the past 6 years had five or more accidents which might have been avoided by the installation of a 4-Way Stop. (Refer to Table II.)

Table II: Accident Data Per Year

Year	# of Accidents
2006	2
2007	8
2008	4
2009	10
2010	2
2011	5
2012	4

IV OPERATIONS AND GEOMETRY:

The following conditions exist at the intersection of 900 East and 700 North:

Northbound and southbound traffic approaching the intersection on 900 East is subject to STOP signs. Eastbound and westbound traffic along 700 North is free-flowing.

For uncontrolled intersections, drivers from all approaching directions should be able to see conflicting vehicles with adequate time to stop to avoid a crash. The required sight distance for safe operations at an uncontrolled intersection is related to the vehicle speeds and the distances traveled during perception, reaction, and braking time.

Tables III and IV indicate geometric design concerns as observed in a 2010 report on this intersection. The intersection has remained unchanged since that time.

Table III: Geometric Design Elements

700 NORTH		
Posted Speed Limit:	25 mph	
Design Speed*:	30 mph	* posted speed limit plus 5 mph
Required "K" value:	19	Exhibit 3-76. A Policy on Geometric Design of Highways and Streets
Field "K" value:	48	
Stopping Sight Distance:	200 feet	Exhibit 3-76. A Policy on Geometric Design of Highways and Streets
Road slope in:	8.00%	
Road slope out:	-0.30%	
Minimum Sight Distance:	245 feet	AASHTO: A Policy on Geometric Design of Highways and Streets
Measured Sight Distance:	217 feet	Sight distance study completed on June 25, 2010.

Table IV: Geometric Design Elements

900 EAST		
Posted Speed Limit:	25 mph	
Design Speed*:	30 mph	* posted speed limit plus 5 mph
Required "K" value:	19	Exhibit 3-76. A Policy on Geometric Design of Highways and Streets
Field "K" value:	10	
Stopping Sight Distance:	200 feet	Exhibit 3-76. A Policy on Geometric Design of Highways and Streets
Road slope in:	12.00%	
Road slope out:	-1.45%	
Minimum Sight Distance:	335 feet	AASHTO: A Policy on Geometric Design of Highways and Streets
Measured Sight Distance:	80 feet	Sight distance study completed on June 25, 2010.

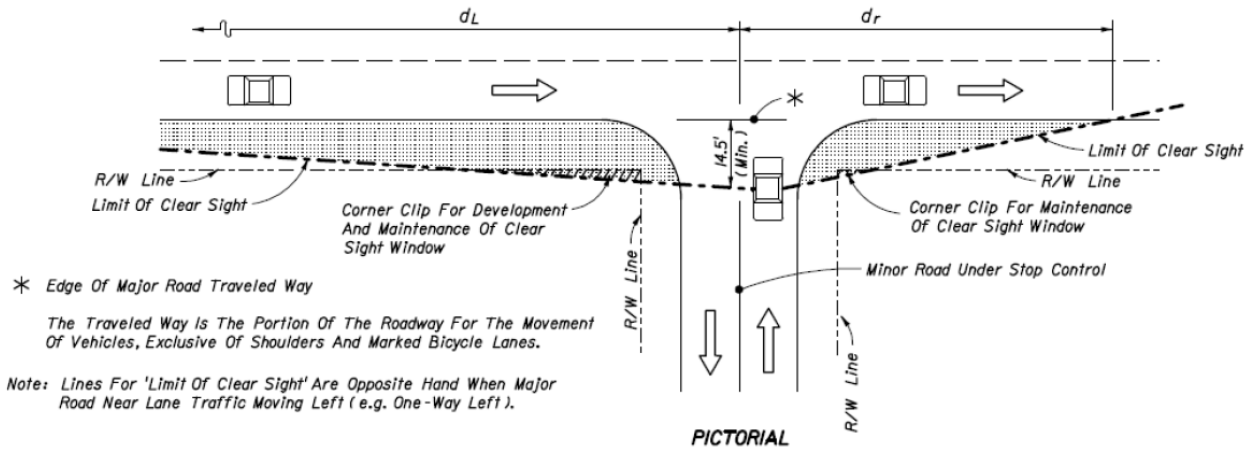
Traffic volumes during PM Peak Hour for March, 2013 are shown on Figure 1 below:



Figure 1: PM Peak Hour Traffic Volumes

Traffic volumes were counted March 26–28, 2013, during a week when local schools were in session.

As noted in Table IV, there is a sight-distance limitation for northbound/southbound movements that does not comply with AASHTO guidelines.



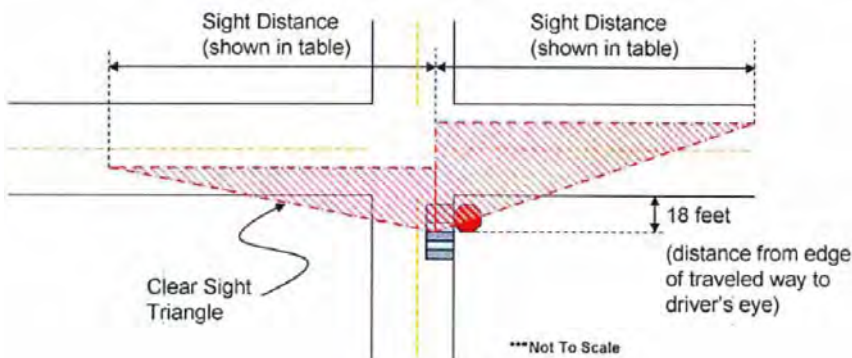
Intersection site distances for stop-controlled intersections include full-movement intersections where the minor street is stop-controlled, but the major street is free-flowing. Table V presents the sight distance required for full-movement intersections:

Table V: Intersection Sight Distance Requirements

Sight Distance Requirements - Two-Way, Stop-Controlled, Full-Movement Intersection (ft.)				
Design Vehicle	Major Street			
	Local	Minor Collector	Major Collector	Arterial
Passenger Car	335	390	470	625
Single Unit Truck	420	490	600	805
Combination Truck	510	595	720	950

Design Speed = 30 mph; 2-Lane Road
 Source: AASHTO: A Policy on Geometric Design of Highways and Streets (2001 Ed.), Case B1 (pp. 660–667)

Figure 3 (below) shows the intersection Sight Distance Triangles for stop-controlled minor approaches, similar to the intersection of 900 East and 700 North.



Field measurements for this intersection have not changed since the previous study in 2010. The following figure – an aerial map taken from the previous study – shows the sight distances measured at the intersection and the minimum required sight distances (the yellow and blue triangles) according to AASHTO guidelines.

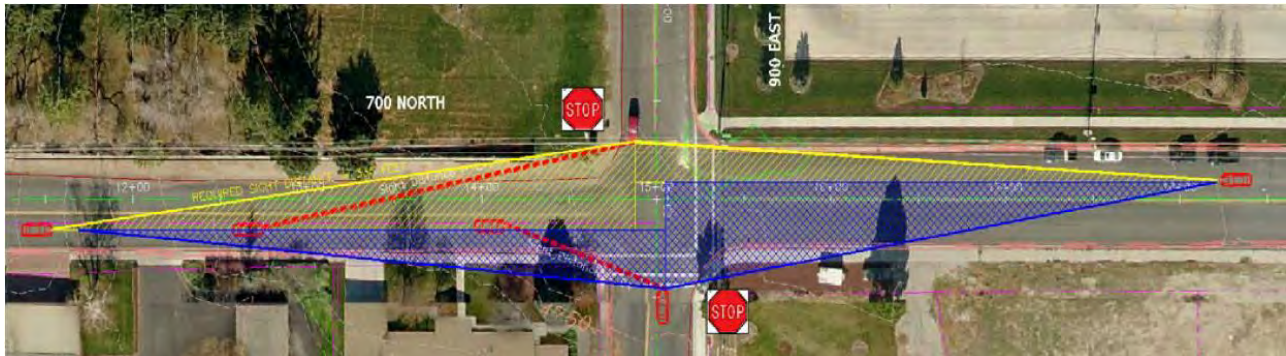


Figure 4: Sight Distances – Required vs. Measured

AASHTO: A Policy on Geometric Design of Highways and Streets, states the following for “Case E— Intersections With All-Way Stop Control”:

At intersections with all-way stop control, the first stopped vehicle on one approach should be visible to the drivers of the first stopped vehicles on each of the other approaches. There are no other sight distance criteria applicable to intersections with all-way stop control and, indeed, all-way stop control may be the best option at a limited number of intersections where sight distance for other control types cannot be attained.

As illustrated by Figure 4, the measured sight distances indicate that traffic signals or a 4-Way Stop (aka: All-Way Stop) might be warranted at this intersection due to inadequate sight distances. However, as shown in Table I, and as indicated in Section VI of this report, this is not yet considered a “high-volume” intersection, as would warrant a traffic signal.

V TRAFFIC CONDITIONS:

Traffic count data was collected and analyzed using MetroCount Traffic Executive and Synchro 8 in order to ascertain whether the overall movement through the intersection met the conditions set by the Utah Manual of Uniform Traffic Control Devices (MUTCD) for establishing a signalized or 4-Way Stop intersection.

Turning movements recorded at the intersection provided the following data (Figures 5 and 6; Appendix C) for Existing (2013) Average Time Delay, Existing (2013) Peak Hour Traffic Volumes:



Figure 5: Existing (2013) Background PM Peak Hour – Traffic Volumes



Figure 6: Existing (2013) Background PM Peak Hour – Average Time Delay (seconds)

Un-signalized intersections are generally stop-controlled. Areas where there is a predominate major street may be two-way stop-controlled, meaning only the minor street traffic must stop. In cases where traffic volumes are more evenly distributed or where sight distances may be limited, four-way stop-controlled intersections are common. “Level of Service” (LOS) for an un-signalized intersection is assigned based on the average control at the worst approach (always a stopped approach) of the intersection. An un-signalized intersection operating at LOS D means that the average vehicle waiting at one of the stop-controlled approaches will wait no longer than 35 seconds before proceeding through the intersection. This delay may be caused by large volumes of traffic on the major street resulting in fewer gaps in traffic for a vehicle to turn into, or from queued vehicles waiting at the stop sign.

Table VI: Un-signalized Intersection LOS Criteria

Level of Service	Average Control Delay (sec/veh)
A	≤ 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

Synchro 8 analysis of this intersection yielded the following results (Table VII, Appendix C):

Table VII: Existing (2013) Traffic Conditions

700 North Classification:	Major Collector	<i>American Fork City Transportation Master Plan</i>
900 East Classification:	Minor Collector	<i>American Fork City Transportation Master Plan</i>
Posted Speed Limit:	25 mph	
700 North Condition:	Free-flow	
900 East Condition:	Stop-controlled	
Level Of Service:	C	<i>Based on 16-second NB delay</i>
Delays Westbound:	0.5 seconds	
Delays Eastbound:	2.8 seconds	
Delays Northbound:	16 seconds	
Delays Southbound:	14.2 seconds	
Average Delay:	6.7 seconds	

Assuming a 4-Way STOP were installed at 900 East and 700 North, a Synchro 8 analysis yields the following results (Figure 7, Table VIII; Appendix C):



Figure 7: Existing (2013) Background PM Peak Hour – 4-Way Stop – Average Time Delay (seconds)

Table VIII: 4-Way Stop Condition

700 North Classification:	Major Collector	<i>American Fork City Transportation Master Plan</i>
900 East Classification:	Minor Collector	<i>American Fork City Transportation Master Plan</i>
Posted Speed Limit:	25 mph	
700 North Condition:	Free-flow	
900 East Condition:	Stop-controlled	
Level Of Service:	B	<i>Based on 11.3-second EB delay</i>
Delays Westbound:	9.9 seconds	
Delays Eastbound:	11.3 seconds	
Delays Northbound:	9.2 seconds	
Delays Southbound:	9.7 seconds	
Average Delay:	10.3 seconds	

The installation of a 4-Way STOP control may affect this intersection’s level of service in the long-term. However, a Synchro 8 analysis projects that a 4-Way STOP control at this intersection will experience no worse than a level of service (LOS) D through the year 2040.

VI TRAFFIC SIGNAL WARRANT RESULTS

Installation of a traffic signal may be justified when any of 8 warranting criteria are met. The Utah MUTCD outlines these warrants in Section 4C. A summary of the analysis for a traffic signal warrant is given in Table IX below:

Table IX: Traffic Signal Warrant Summary*

Warrant	Description	Condition	Comment
1	8-hour Vehicle Volume	NOT MET	<i>At no time does volume of 700 North exceed 500/hour</i>
2	4-hour Vehicle Volume	NOT MET	<i>Volumes for both streets fall below the criteria</i>
3	Peak-hour Volume	NOT MET	<i>No excessive waiting observed on 900 East</i>
4	Pedestrian Volume	NOT MET	<i>Low pedestrian traffic through this intersection</i>
5	School Crossing	–	<i>Not applicable</i>
6	Coordinated Signal System	–	<i>Not applicable</i>
7	Crash Experience	NOT MET	<i>Condition C is not met for 80% vehicles/hr volume</i>
8	Roadway Network	NOT MET	<i>Volumes do not exceed 1,000 vehicles/hr for 5 hours</i>

* Based on criteria outlined in the Utah MUTCD, Section 4C

Since none of the warrants were met, a traffic signal is not recommended for the intersection of 900 East and 700 North.

VII 4-WAY STOP WARRANT RESULTS

The Utah Manual of Uniform Traffic Control Devices (MUTCD) gives the following guidance relative to “Multi-Way Stop Applications”:

Multi-way stop control can be useful as a safety measure at intersections if certain traffic conditions exist. Safety concerns associated with multi-way stops include pedestrians, bicyclists, and all road users expecting other road users to stop. Multi-way stop control is used where the volume of traffic on the intersecting roads is approximately equal.

The Utah MUTCD suggest three main criteria to be considered in the engineering study for a 4-Way STOP (aka: Multi-Way STOP) control. These criteria are summarized in Table X, below:

Table X: Multi-Way STOP Warrant Summary*

Criteria	Description	Condition	Comment
A	Pending Traffic Signal	–	<i>Not applicable</i>
B	Crash Analysis	MET	<i>5+ crashes reported in a 12-month period</i>
C.1	Major Street Volume	MET	<i>Combined approach volumes exceed 300 vehicles/hour</i>
C.2	Minor Street Volume	MET	<i>Combined approach volumes exceed 200 vehicles/hour</i>
C.3	85th-Percentile Speed	NOT MET	<i>85th-percentile speed does not exceed 40 mph</i>

* Based on Utah MUTCD, Section 2B.07 – Multi-Way Stop Applications

The MUTCD also recommends consideration of “locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also

required to stop.” As outlined in Section IV of this report, restricted sight distances for vehicles entering 700 North from 900 East implies that this additional criterion is also met.

VIII CONCLUSIONS AND RECOMMENDATIONS

A 4-Way STOP control (aka: all-way / multi-way stop) is appropriate at the intersection of 900 East and 700 North based on the following met criteria:

- *Limited visibility:* Drivers, after stopping, can't see conflicting traffic unless the cross-traffic stops.
- *High Number of Accidents:* Five or more reported crashes in a 12-month period.
- *Balanced volumes:* Each of the intersecting streets has about the same volume of cars.
- *High Volume of Cars:* 200+ vehicles per hour approach from both the north and south, and 300+ vehicles per hour approach from both the east and west for 8-hours on each of the intersecting streets.

The findings of this study, conducted in March, 2013, do not greatly differ from those of the study conducted in 2010. While it appears that the overall volume approaching the intersection has increased since 2010, after the completion of North County Blvd widening, the increase is not so marked as to warrant signaling the intersection. While the traffic volumes are not perfectly balanced between the two roads of the intersection, there is certainly enough volume from the southbound minor street to satisfy consideration of traffic flow in all directions. More significant, however, is this intersection's limited sight distance and the number of crashes which have occurred at this intersection over the past 6 years. Since 2007, this intersection has experienced 5 or more crashes per year 3 times.

In accordance with the guidance of the Utah MUTCD, and based upon traffic analyses of the data gathered at the intersection of 900 East and 700 North, American Fork, UT, the following action is recommended:

- **Install All-Way STOP controls at this intersection.**

Precautionary steps should be taken when changing the signage of an intersection. There will be a period of time when accidents may occur due to lack of awareness by drivers who do not notice the new signs. To prevent these types of accidents, the following steps are recommended:

1. Use of Variable-Message Sign (VMS) Boards for two weeks before the installation of signs to warn drivers about the change to the intersection's traffic signing
2. Installation of permanent warning advisory signs, W3-1A (STOP symbol with an arrow "ahead")
3. Striping the words STOP AHEAD
4. Striping the word STOP at the stop bar line
5. Installation of a temporary sign with the word "NEW" as outlined in the Utah MUTCD, Sections 2A.15 and 2C.62.

Once a 4-Way (All-Way) Stop has been implemented at this intersection, it is not recommended to go back to a 2-Way Stop condition in case of complaints received from residents (which can be common during the first weeks of implementation).

VIII CONSTRUCTION OPTIONS AND OPINION OF PROBABLE COST

Since the recommendations for installing a 4-Way STOP controlled intersection at 900 East and 700 North have not changed, the construction options have not changed either. The following data repeats the options and cost analyses as previously admonished in the 2010 study:

OPTION 1: MAKE NO CHANGES



Figure 8: Existing Conditions

The existing conditions include a NO CONTROL movement for the east- and westbound movements and STOP sign controls for the north- and southbound movement (See Figure 5, 6, and Table VII).

Estimated Cost: \$0.00

OPTION 2: 4-WAY (aka: ALL-WAY) STOP WITHOUT STREET IMPROVEMENTS

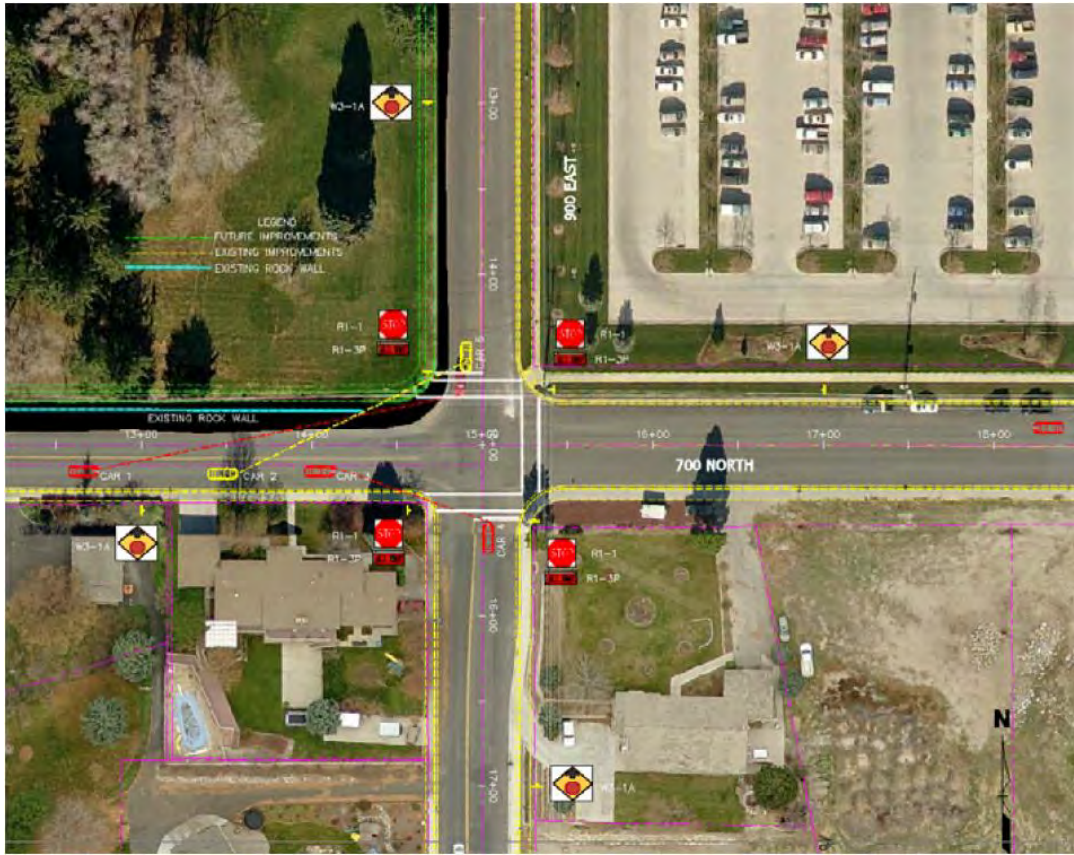


Figure 9: 4-WAY STOP signs without road improvements

Option 2: Opinion of Probable Cost:

Item	Description	Quantity	Unit	Unit Price	Total
1	Install R1-1 (High Intensity) sign	2	each	\$60.00	\$120.00
2	Install R1-4 (High Intensity) sign	4	each	\$12.60	\$50.40
3	Install W3-1A (High Intensity) sign	4	each	\$64.35	\$257.40
4	Square tube post	6	each	\$40.00	\$240.00
Subtotal:					\$667.80
10% Contingency:					\$66.78
Total:					\$734.58

OPTION 3: 4-WAY (aka: ALL-WAY) STOP WITH STREET IMPROVEMENTS



Figure 10: 4-WAY STOP signs with road improvements

Option 3: Opinion of Probable Cost:

Item	Description	Quantity	Unit	Unit Price	Total
1	Install R1-1 (High Intensity) sign	2	each	\$60.00	\$120.00
2	Install R1-4 (High Intensity) sign	4	each	\$12.60	\$50.40
3	Install W3-1A (High Intensity) sign	4	each	\$64.35	\$257.40
4	Square tube post	6	each	\$40.00	\$240.00
5	Construct standard 4-foot wide sidewalk	685	LF	\$16.00	\$10,960.00
6	Construct standard curb and gutter	695	LF	\$16.00	\$11,120.00
7	Saw cut existing asphalt	700	LF	\$2.00	\$1,400.00
8	4" Asphalt	60	CY	\$95.00	\$5,700.00
9	8" Granular Fill	120	CY	\$6.00	\$720.00
10	ADA ramp	125	SF	\$8.00	\$1,000.00
11	Clearing and Grading	1	LS	\$1,000.00	\$1,000.00
12	Mobilization	1	LS	\$2,500.00	\$2,500.00
13	Traffic Control	1	LS	\$1,000.00	\$1,000.00
Subtotal:					\$36,067.80
10% Contingency:					\$3,606.78
Total:					\$39,674.58

OPTION 4: TWO-WAY STOP PLUS ROAD IMPROVEMENTS INCLUDING A RETAINING WALL

This option adds a block retaining wall adjacent to the historic rock wall. This option includes the removal of 20 feet of the historic wall constructed in the 1930s and listed with the Utah State Historic Preservation Office. Based on the fact that sight distance is mainly dictated by the changes on the vertical elevation of the road, removing the historic wall does not provide any significant improvement to the traffic safety of the intersection.

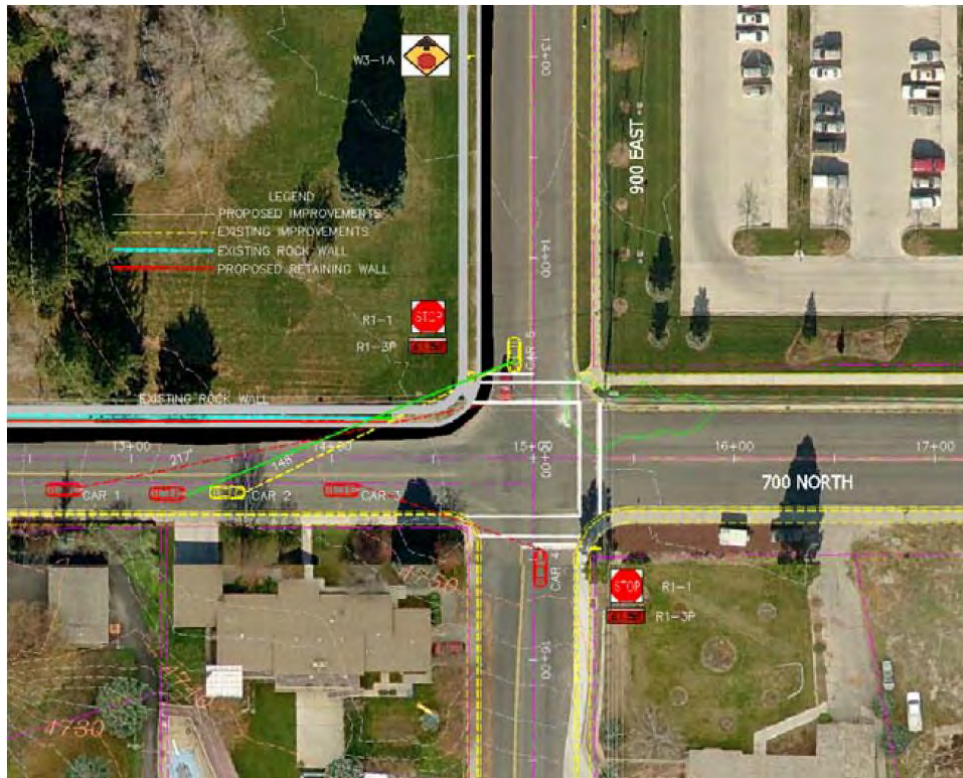


Figure 11: TWO-WAY STOP signs plus road improvements

Option 4: Opinion of Probable Cost:

Item	Description	Quantity	Unit	Unit Price	Total
1	Install R1-1 (High Intensity) sign	2	<i>each</i>	\$60.00	\$120.00
2	Install R1-4 (High Intensity) sign	4	<i>each</i>	\$12.60	\$50.40
3	Install W3-1A (High Intensity) sign	4	<i>each</i>	\$64.35	\$257.40
4	Square tube post	6	<i>each</i>	\$40.00	\$240.00
5	Construct standard 4-foot wide sidewalk	685	LF	\$16.00	\$10,960.00
6	Construct standard curb and gutter	695	LF	\$16.00	\$11,120.00
7	Saw cut existing asphalt	700	LF	\$2.00	\$1,400.00
8	4" Asphalt	60	CY	\$95.00	\$5,700.00
9	8" Granular Fill	120	CY	\$6.00	\$720.00
10	ADA ramp	125	SF	\$8.00	\$1,000.00
11	Construct block retaining wall	272	LF	\$60.00	\$16,320.00
12	Remove 20 feet of historic rock wall	20	LF	\$100.00	\$2,000.00
13	Clearing and Grading	1	LS	\$1,000.00	\$1,000.00
14	Mobilization	1	LS	\$2,500.00	\$2,500.00
15	Traffic Control	1	LS	\$1,000.00	\$1,000.00
				Subtotal:	\$54,387.80
				10% Contingency:	\$5,438.78
				Total:	\$59,826.58

APPENDIX A
Signage Reference



R 1-1



R 1-4



W3-1A

APPENDIX B
Traffic Movement Data

MetroCount Traffic Executive
Vehicle Counts (Virtual Day)

VirtVehicleCount-52 -- English (ENU)

Datasets:

Site: [Box 1_-_] ~625 N. 900 E., AF – South of Intersection
Direction: 7 - North bound A>B, South bound B>A. Lane: 0
Survey Duration: 13:18 Monday, March 25, 2013 => 10:20 Friday, April 05, 2013
Zone:
File: Box 1_-_05Apr2013.EC0 (Plus)
Identifier: DD252GHQ MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15275)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 0:00 Tuesday, March 26, 2013 => 1:00 Friday, March 29, 2013
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 5 - 100 mph.
Direction: North (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F2)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 3518 / 17666 (19.91%)

*** Virtual Day - Total=1171, 15 minute drops**

	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
	5	0	2	1	10	20	28	60	48	62	53	60	78	61	82	100	89	95	96	82	61	48	21	9
	2	0	0	0	1	5	5	13	12	18	11	13	25	15	20	28	26	27	25	22	15	13	5	2
	1	0	1	0	2	5	5	11	8	13	15	15	19	18	24	16	19	22	25	24	20	12	8	4
	1	0	0	0	4	5	9	15	10	16	14	13	21	14	19	31	18	24	23	18	17	14	5	2
	1	0	0	1	4	5	9	21	18	14	12	19	13	14	19	25	26	22	23	18	9	9	3	2

AM Peak 1145 - 1245 (85), AM PHF=0.84 PM Peak 1530 - 1630 (101), PM PHF=0.81

Numbers have been rounded to the nearest integer.

APPENDIX B
Traffic Movement Data

MetroCount Traffic Executive
Vehicle Counts (Virtual Day)

VirtVehicleCount-53 -- English (ENU)

Datasets:

Site: [Box 2_-_] ~1000 E. 700 N., AF – East of Intersection
Direction: 8 - East bound A>B, West bound B>A. Lane: 0
Survey Duration: 13:20 Monday, March 25, 2013 => 10:25 Friday, April 05, 2013
Zone:
File: Box 2_-_05Apr2013.EC0 (Plus)
Identifier: CH465X6W MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15275)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 0:00 Tuesday, March 26, 2013 => 1:00 Friday, March 29, 2013
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 5 - 100 mph.
Direction: West (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F2)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 7803 / 32765 (23.82%)

*** Virtual Day - Total=2600, 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
5	4	2	5	34	44	56	173	148	153	126	132	140	132	157	260	225	259	207	144	87	60	36	11
1	0	1	0	2	4	10	26	45	40	32	27	31	31	30	68	62	64	46	49	25	12	11	5
1	1	1	2	5	10	8	33	43	43	33	35	32	42	38	69	48	76	56	41	20	18	9	2
0	1	0	1	14	14	17	59	25	37	32	34	46	31	50	65	55	61	51	32	23	14	10	1
2	2	0	2	14	17	20	55	36	32	28	36	31	28	39	59	59	57	54	23	18	16	6	2

AM Peak 0730 - 0830 (201), AM PHF=0.85 PM Peak 1645 - 1745 (261), PM PHF=0.85

Numbers have been rounded to the nearest integer.

APPENDIX B
Traffic Movement Data

MetroCount Traffic Executive
Vehicle Counts (Virtual Day)

VirtVehicleCount-54 -- English (ENU)

Datasets:

Site: [Box 3_-_] ~800 N. 900 E., AF – North of Intersection
Direction: 7 - North bound A>B, South bound B>A. Lane: 0
Survey Duration: 13:21 Monday, March 25, 2013 => 10:28 Friday, April 05, 2013
Zone:
File: Box 3_-_05Apr2013.EC0 (Plus)
Identifier: DD24V0HT MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15275)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 0:00 Tuesday, March 26, 2013 => 1:00 Friday, March 29, 2013
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 5 - 100 mph.
Direction: South (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F2)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 8017 / 31627 (25.35%)

*** Virtual Day - Total=2671, 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
5	1	2	3	11	29	55	196	124	147	139	171	178	129	225	220	236	227	188	146	103	82	39	15
2	1	0	0	2	5	5	24	35	36	31	38	35	37	38	43	45	59	47	41	25	30	17	5
2	0	0	1	2	7	18	44	26	41	32	41	52	32	58	52	57	54	44	37	24	22	10	3
2	1	2	1	4	7	14	60	26	34	33	40	49	31	67	64	58	59	46	36	25	16	7	4
0	0	0	1	3	9	18	68	36	36	43	52	42	29	62	61	76	55	52	32	29	15	5	4

AM Peak 0715 - 0815 (208), AM PHF=0.76 PM Peak 1615 - 1715 (250), PM PHF=0.83

Numbers have been rounded to the nearest integer.

APPENDIX B
Traffic Movement Data

MetroCount Traffic Executive
Vehicle Counts (Virtual Day)

VirtVehicleCount-55 -- English (ENU)

Datasets:

Site: [Box 4_-_] ~860 E. 700 N., AF – West of Intersection
Direction: 8 - East bound A>B, West bound B>A. Lane: 0
Survey Duration: 13:22 Monday, March 25, 2013 => 10:30 Friday, April 05, 2013
Zone:
File: Box 4_-_05Apr2013.EC0 (Plus)
Identifier: DD15ABV2 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15275)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 0:00 Tuesday, March 26, 2013 => 1:00 Friday, March 29, 2013
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 5 - 100 mph.
Direction: East (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F2)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 11284 / 48399 (23.31%)

*** Virtual Day - Total=3758, 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
9	5	4	3	35	40	74	270	220	200	145	165	182	175	319	316	302	337	357	252	164	110	52	20
3	3	1	1	2	3	9	32	77	56	40	36	52	40	52	89	74	94	94	89	39	36	24	8
3	0	1	0	6	12	16	46	62	53	30	38	45	49	95	68	67	85	83	64	30	27	10	7
3	1	1	0	12	12	22	116	33	46	36	39	41	46	83	81	78	75	81	50	43	24	8	3
1	1	2	2	15	14	27	76	48	45	39	53	43	40	89	78	82	82	100	50	51	22	10	3

AM Peak 0730 - 0830 (331), AM PHF=0.71 PM Peak 1800 - 1900 (357), PM PHF=0.90

Numbers have been rounded to the nearest integer.

APPENDIX B
Traffic Movement Data

MetroCount Traffic Executive
Speed Statistics

SpeedStat-43 -- English (ENU)

Datasets:

Site: [Box 1_-_] ~625 N. 900 E., AF
Direction: 7 - North bound A>B, South bound B>A. Lane: 0
Survey Duration: 13:18 Monday, March 25, 2013 => 10:20 Friday, April 05, 2013
Zone:
File: Box 1_-_05Apr2013.EC0 (Plus)
Identifier: DD252GHQ MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15275)
Data type: Axle sensors - Paired (Class/Speed/Count)

Site: [Box 2_-_] ~1000 E. 700 N., AF
Direction: 8 - East bound A>B, West bound B>A. Lane: 0
Survey Duration: 13:20 Monday, March 25, 2013 => 10:25 Friday, April 05, 2013
Zone:
File: Box 2_-_05Apr2013.EC0 (Plus)
Identifier: CH465X6W MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15275)
Data type: Axle sensors - Paired (Class/Speed/Count)

Site: [Box 3_-_] ~800 N. 900 E., AF
Direction: 7 - North bound A>B, South bound B>A. Lane: 0
Survey Duration: 13:21 Monday, March 25, 2013 => 10:28 Friday, April 05, 2013
Zone:
File: Box 3_-_05Apr2013.EC0 (Plus)
Identifier: DD24V0HT MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15275)
Data type: Axle sensors - Paired (Class/Speed/Count)

Site: [Box 4_-_] ~860 E. 700 N., AF
Direction: 8 - East bound A>B, West bound B>A. Lane: 0
Survey Duration: 13:22 Monday, March 25, 2013 => 10:30 Friday, April 05, 2013
Zone:
File: Box 4_-_05Apr2013.EC0 (Plus)
Identifier: DD15ABV2 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15275)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 0:00 Tuesday, March 26, 2013 => 1:00 Friday, March 29, 2013
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 5 - 100 mph.
Direction: North, East, South, West (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F2)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 61129 / 130457 (46.86%)

APPENDIX B
Traffic Movement Data

Speed Statistics (continued)

SpeedStat-43

Site: Box 1_-_0.0NS Box 2_-_0.0EW Box 3_-_0.0NS Box 4_-_0.0EW
Description: Multiple sites - See Header sheet for site descriptions.
Filter time: 0:00 Tuesday, March 26, 2013 => 1:00 Friday, March 29, 2013
Scheme: Vehicle classification (Scheme F2)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12 13) Dir(NESW) Sp(5,100) Headway(>0)

Vehicles = 61129
Posted speed limit = 25 mph, **Exceeding** = 50934 (83.32%), **Mean Exceeding** = 29.88 mph
Maximum = 60.6 mph, **Minimum** = 5.6 mph, **Mean** = 28.7 mph
85% Speed = 32.7 mph, **95% Speed** = 35.1 mph, **Median** = 28.6 mph
10 mph Pace = 24 - 34, **Number in Pace** = 49309 (80.66%)
Variance = 17.17, **Standard Deviation** = 4.14 mph

Speed Bins (Partial days)

Speed	Bin	Below	Above	Energy	vMult	n * vMult
0 - 5	0 0.0%	0 0.0%	61129 100.0%	0.00	0.00	0.00
5 - 10	50 0.1%	50 0.1%	61079 99.9%	0.00	0.00	0.00
10 - 15	298 0.5%	348 0.6%	60781 99.4%	0.00	0.00	0.00
15 - 20	885 1.4%	1233 2.0%	59896 98.0%	0.00	0.00	0.00
20 - 25	8962 14.7%	10195 16.7%	50934 83.3%	0.00	0.00	0.00
25 - 30	28922 47.3%	39117 64.0%	22012 36.0%	0.00	0.00	0.00
30 - 35	18582 30.4%	57699 94.4%	3430 5.6%	0.00	0.00	0.00
35 - 40	3135 5.1%	60834 99.5%	295 0.5%	0.00	0.00	0.00
40 - 45	260 0.4%	61094 99.9%	35 0.1%	0.00	0.00	0.00
45 - 50	27 0.0%	61121 100.0%	8 0.0%	0.00	0.00	0.00
50 - 55	7 0.0%	61128 100.0%	1 0.0%	0.00	0.00	0.00
55 - 60	0 0.0%	61128 100.0%	1 0.0%	0.00	0.00	0.00
60 - 65	1 0.0%	61129 100.0%	0 0.0%	0.00	0.00	0.00
65 - 70	0 0.0%	61129 100.0%	0 0.0%	0.00	0.00	0.00
70 - 75	0 0.0%	61129 100.0%	0 0.0%	0.00	0.00	0.00
75 - 80	0 0.0%	61129 100.0%	0 0.0%	0.00	0.00	0.00
80 - 85	0 0.0%	61129 100.0%	0 0.0%	0.00	0.00	0.00
85 - 90	0 0.0%	61129 100.0%	0 0.0%	0.00	0.00	0.00
90 - 95	0 0.0%	61129 100.0%	0 0.0%	0.00	0.00	0.00
95 - 100	0 0.0%	61129 100.0%	0 0.0%	0.00	0.00	0.00

Total Speed Rating = 0.00
Total Moving Energy (Estimated) = 0.00

















Speed limit fields (Partial days)

Limit	Below	Above
0 25 (PSL)	10195 16.7%	50934 83.3%

APPENDIX C
Synchro 8 Analysis

HCM Unsignalized Intersection Capacity Analysis
3: 900 East & 700 North

















4/18/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	84	170	12	9	158	6	5	66	13	6	64	104
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	91	185	13	10	172	7	5	72	14	7	70	113
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	178			198			716	572	191	618	575	175
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178			198			716	572	191	618	575	175
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			98	82	98	98	83	87
cM capacity (veh/h)	1398			1375			246	399	850	322	398	868
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	289	188	91	189								
Volume Left	91	10	5	7								
Volume Right	13	7	14	113								
cSH	1398	1375	418	581								
Volume to Capacity	0.07	0.01	0.22	0.33								
Queue Length 95th (ft)	5	1	21	35								
Control Delay (s)	2.8	0.5	16.0	14.2								
Lane LOS	A	A	C	B								
Approach Delay (s)	2.8	0.5	16.0	14.2								
Approach LOS			C	B								
Intersection Summary												
Average Delay			6.7									
Intersection Capacity Utilization			45.2%		ICU Level of Service				A			
Analysis Period (min)			15									

APPENDIX C
Synchro 8 Analysis

HCM Unsignalized Intersection Capacity Analysis
3: 900 East & 700 North

4/18/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	84	170	12	9	158	6	5	66	13	6	64	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	91	185	13	10	172	7	5	72	14	7	70	113
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	289	188	91	189								
Volume Left (vph)	91	10	5	7								
Volume Right (vph)	13	7	14	113								
Hadj (s)	0.07	0.02	-0.05	-0.32								
Departure Headway (s)	5.0	5.1	5.4	5.0								
Degree Utilization, x	0.40	0.27	0.14	0.26								
Capacity (veh/h)	683	659	588	660								
Control Delay (s)	11.3	9.9	9.2	9.7								
Approach Delay (s)	11.3	9.9	9.2	9.7								
Approach LOS	B	A	A	A								
Intersection Summary												
Delay			10.3									
Level of Service			B									
Intersection Capacity Utilization			45.2%	ICU Level of Service	A							
Analysis Period (min)			15									

900 East 300 North 4-Way STOP Warrant Study



Conducted By:

HORROCKS
ENGINEERS

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Pleasant Grove, UT 84062

AMERICAN FORK CITY
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
275 East 200 North
American Fork, UT 84003



AMERICAN FORK CITY
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
275 East 200 North
American Fork, UT 84003

900 East 300 North 4-Way STOP Warrant Study

DATE: April 15, 2013
PREPARED BY: Horrocks Engineers

I INTRODUCTION:

This report has been created to show the findings of a 4-Way Stop warrant study conducted in April, 2013. This study intends to determine if a 4-Way Stop (aka: All-Way Stop) is warranted at the intersection of 900 East and 300 North, American Fork, following the completion of widening to North County Blvd. Please note that 900 East is also called Mary Pulley Drive, but for purposes of this report, it will only be referred to as 900 East.

The study included a review of this intersection's traffic patterns including turning-movement counts, its crash history as well as the intersection's site measurements, geometry and viewing angles.

In order to warrant a 4-Way Stop designation, an intersection should meet specified threshold indicators as set forth in the Utah Manual of Uniform Traffic Control Devices (MUTCD). One primary indicator is of approximately equal traffic volumes at two conflicting directions of travel through the intersection. However, other determining factors include the intersection's crash history, geometric layout, and peak hour volume, among others.

Guidance for multi-way stop applications is given in the Utah MUTCD, Sections 2B.04 and 2B.07.

II TRAFFIC DATA:

Traffic data for both 900 East and 300 North was collected on weekdays during peak hours during the month of April, 2013. Turning-movement counts were taken during the PM Peak Hour (4:00 pm to 6:00 pm). A complete report of the data is included in Appendix B and a summary is given in Table I.

Table I: Traffic Volume Approaching the Intersection - PM Peak (4–6 pm)

Road Name	PM Peak Volume
300 NORTH - <i>eastbound</i>	352 / hour
300 NORTH - <i>westbound</i>	256 / hour
900 EAST - <i>northbound</i>	45 / hour
900 EAST - <i>southbound</i>	99 / hour
TOTALS	752 / hour

Of note, the posted speed limit for both 900 East and 300 North is 25 mph. Traffic speeds were not measured at this intersection; however, by observation, speeds through the free-flowing direction of the intersection (300 North) were not excessive during the PM Peak Hour.

III ACCIDENT ANALYSIS:

Crash data available from the American Fork Police Department indicates none of the past 6 years had a five or more accidents. (Refer to Table II.)

Table II: Accident Data Per Year

Year	# of Accidents
2007	4
2008	2
2009	1
2010	4
2011	3
2012	2

IV OPERATIONS AND GEOMETRY:

The following conditions exist at the intersection of 900 East and 300 North:
Northbound and southbound traffic approaching the intersection on 900 East is subject to STOP signs.
Eastbound and westbound traffic along 300 North is free-flowing.

For uncontrolled intersections, drivers from all approaching directions should be able to see conflicting vehicles with adequate time to stop to avoid a crash. The required sight distance for safe operations at an uncontrolled intersection is related to the vehicle speeds and the distances traveled during perception, reaction, and braking time.

Tables III and IV indicate geometric design conclusions as observed at this intersection.

Table III: Geometric Design Elements

300 NORTH		
Posted Speed Limit:	25 mph	
Design Speed*:	30 mph	<i>* posted speed limit plus 5 mph</i>
Required "K" value:	–	<i>Not relevant on non-vertically curved roads</i>
Field "K" value:	–	
Stopping Sight Distance:	200 feet	<i>Exhibit 3-1. A Policy on Geometric Design of Highways and Streets</i>
Road slope in:	–	<i>Not a significant factor</i>
Road slope out:	–	<i>Not a significant factor</i>
Minimum Sight Distance:	245 feet	<i>AASHTO: A Policy on Geometric Design of Highways and Streets</i>
Measured Sight Distance:	> 275 ft	

Table IV: Geometric Design Elements

900 EAST		
Posted Speed Limit:	25 mph	
Design Speed*:	30 mph	<i>* posted speed limit plus 5 mph</i>
Required "K" value:	–	<i>Not relevant on non-vertically curved roads</i>
Field "K" value:	–	
Stopping Sight Distance:	200 feet	<i>Exhibit 3-1. A Policy on Geometric Design of Highways and Streets</i>
Road slope in:	–	<i>Not a significant factor</i>
Road slope out:	–	<i>Not a significant factor</i>
Minimum Sight Distance:	335 feet	<i>AASHTO: A Policy on Geometric Design of Highways and Streets</i>
Measured Sight Distance:	> 600 ft	

Traffic volumes during PM Peak Hour for April, 2013 are shown on Figure 1 below:



Figure 1: PM Peak Hour Traffic Volumes

Continuous, multi-day traffic volumes were not assessed at this intersection.

As noted in Tabled III and IV, the sight-distance requirements specified by AASHTO guidelines for this type of intersection are met. Field measurements for sight distance were measured by identifying landmarks visible at each approach of the intersection and subsequently measuring distances using Google Earth.

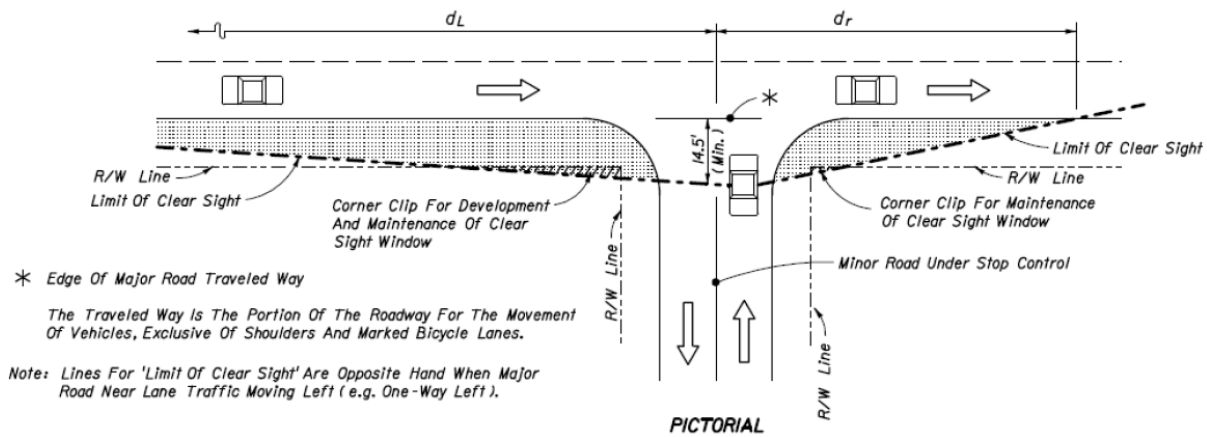


Figure 2: Example Departure Sight Distance Triangle

Intersection site distances for stop controlled intersections include full-movement intersections where the minor street is stop-controlled, but the major street is free-flowing. Table V shows the sight distance required for full-movement intersections:

Table V: Intersection Sight Distance Requirements

Sight Distance Requirements - Two-Way, Stop-Controlled, Full-Movement Intersection (ft.)				
Design Vehicle	Major Street			
	Local	Minor Collector	Major Collector	Arterial
Passenger Car	335	390	470	625
Single Unit Truck	420	490	600	805
Combination Truck	510	595	720	950

Design Speed = 30 mph; 2-Lane Road
 Source: AASHTO: A Policy on Geometric Design of Highways and Streets (2001 Ed.), Case B1 (pp. 660–667)

Figure 3 (below) shows the intersection Sight Distance Triangles for stop-controlled minor approaches, similar to the intersection of 900 East and 300 North.

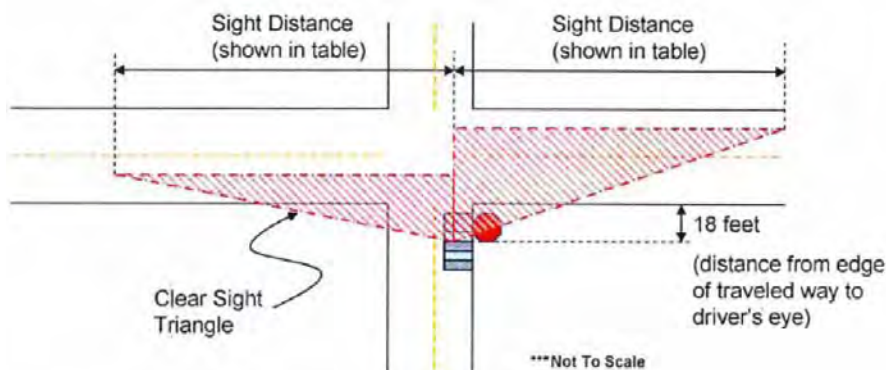


Figure 3: Sight Distance Triangle for Minor Approaches

AASHTO: *A Policy on Geometric Design of Highways and Streets*, states the following for “Case E—Intersections With All-Way Stop Control”:

At intersections with all-way stop control, the first stopped vehicle on one approach should be visible to the drivers of the first stopped vehicles on each of the other approaches. There are no other sight distance criteria applicable to intersections with all-way stop control and, indeed, all-way stop control may be the best option at a limited number of intersections where sight distance for other control types cannot be attained.

Sight distances for this intersection are adequate, which indicates that neither traffic signals nor a 4-Way Stop (aka: All-Way Stop) would likely be warranted at this intersection due to inadequate sight distances. Neither is this yet considered a “high-volume” intersection, as would warrant a traffic signal.

V TRAFFIC CONDITIONS:

Traffic count data was collected and analyzed using Synchro 8 in order to ascertain whether the overall movement through the intersection met the conditions set by the Utah Manual of Uniform Traffic Control Devices (MUTCD) for establishing a signalized or 4-Way Stop intersection.

Turning movements recorded at the intersection provided the following data (Figures 4 and 5; Appendix C) for Existing (2013) Average Time Delay, Existing (2013) Peak Hour Traffic Volumes:



Figure 4: Existing (2013) Background PM Peak Hour – Traffic Volumes



Figure 5: Existing (2013) Background PM Peak Hour – Average Time Delay (seconds)

Un-signalized intersections are generally stop-controlled. Areas where there is a predominate major street may be two-way stop-controlled, meaning only the minor street traffic must stop. In cases where traffic volumes are more evenly distributed or where sight distances may be limited, four-way stop-controlled intersections are common. “Level of Service” (LOS) for an un-signalized intersection is assigned based on the average control at the worst approach (always a stopped approach) of the intersection. An un-signalized intersection operating at LOS D means that the average vehicle waiting at one of the stop-controlled approaches will wait no longer than 35 seconds before proceeding through the intersection. This delay may be caused by large volumes of traffic on the major street resulting in fewer gaps in traffic for a vehicle to turn into, or from queued vehicles waiting at the stop sign.

Table VI: Un-signalized Intersection LOS Criteria

Level of Service	Average Control Delay (sec/veh)
A	≤ 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

Synchro 8 analysis of this intersection yielded the following results (Table VI; Appendix C):

Table VII: Existing (2013) Traffic Conditions

300 North Classification:	Major Collector	<i>American Fork City Transportation Master Plan</i>
900 East Classification:	Minor Collector	<i>American Fork City Transportation Master Plan</i>
Posted Speed Limit:	25 mph	
300 North Condition:	Free-flow	
900 East Condition:	Stop-controlled	
Level Of Service:	C	<i>Based on 17.9-second NB delay</i>
Delays Westbound:	0.2 seconds	
Delays Eastbound:	2.1 seconds	
Delays Northbound:	17.9 seconds	
Delays Southbound:	13.5 seconds	
Average Delay:	3.9 seconds	

Table VII: Existing (2013) Traffic Conditions

700 North Classification:	Major Collector	<i>American Fork City Transportation Master Plan</i>
900 East Classification:	Minor Collector	<i>American Fork City Transportation Master Plan</i>
Posted Speed Limit:	25 mph	
700 North Condition:	Free-flow	
900 East Condition:	Stop-controlled	
Level Of Service:	C	<i>Based on 16-second NB delay</i>
Delays Westbound:	0.5 seconds	
Delays Eastbound:	2.8 seconds	
Delays Northbound:	16 seconds	
Delays Southbound:	14.2 seconds	
Average Delay:	6.7 seconds	

Assuming a 4-Way STOP were installed at 900 East and 300 North, a Synchro 8 analysis yields the following results (Figure 6, Table VII; Appendix C):



Figure 6: Existing (2013) Background PM Peak Hour – 4-Way Stop – Average Time Delay (seconds)

Table VIII: 4-Way Stop Condition

300 North Classification:	Major Collector	<i>American Fork City Transportation Master Plan</i>
900 East Classification:	Minor Collector	<i>American Fork City Transportation Master Plan</i>
Posted Speed Limit:	25 mph	
300 North Condition:	Free-flow	
900 East Condition:	Stop-controlled	
Level Of Service:	B	<i>Based on 12.3-second EB delay</i>
Delays Westbound:	10.6 seconds	
Delays Eastbound:	12.3 seconds	
Delays Northbound:	9.1 seconds	
Delays Southbound:	9.1 seconds	
Average Delay:	11.1 seconds	

With its current Two-Way STOP configuration, a Synchro 8 analysis projects this intersection will experience no worse than a level of service (LOS) D through the year 2040.

VI 4-WAY STOP WARRANT RESULTS

The Utah Manual of Uniform Traffic Control Devices (MUTCD) gives the following guidance relative to “Multi-Way Stop Applications”:

Multi-way stop control can be useful as a safety measure at intersections if certain traffic conditions exist. Safety concerns associated with multi-way stops include pedestrians, bicyclists, and all road users expecting other road users to stop. Multi-way stop control is used where the volume of traffic on the intersecting roads is approximately equal.

The Utah MUTCD suggest three main criteria to be considered in the engineering study for a 4-Way STOP (aka: Multi-Way STOP) control. These criteria are summarized in Table IX, below:

Table IX: Multi-Way STOP Warrant Summary*

Criteria	Description	Condition	Comment
A	Pending Traffic Signal	–	<i>Not applicable</i>
B	Crash Analysis	NOT MET	<i>5+ crashes reported in a 12-month period</i>
C.1	Major Street Volume	NOT MET	<i>Combined approach volumes exceed 300 vehicles/hour</i>
C.2	Minor Street Volume	NOT MET	<i>Combined approach volumes exceed 200 vehicles/hour</i>
C.3	85th-Percentile Speed	NOT MET	<i>85th-percentile speed does not exceed 40 mph</i>

* Based on Utah MUTCD, Section 2B.07 – Multi-Way Stop Applications

The MUTCD also recommends consideration of “locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop.” As outlined in Section IV of this report, there are not restricted sight distances at this intersection as to meet this criterion.

VII CONCLUSIONS AND RECOMMENDATIONS

The following criteria should typically be met to warrant installation of a 4-Way (aka: All-Way) STOP control at an intersection of the type as found at 900 East and 300 North:

- *Limited visibility:* Drivers, after stopping, can't see conflicting traffic unless the cross-traffic stops.
- *High Number of Accidents:* Five or more reported crashes in a 12-month period.
- *Balanced volumes:* Each of the intersecting streets has about the same volume of cars.
- *High Volume of Cars:* 200+ vehicles per hour approach from both the north and south, and 300+ vehicles per hour approach from both the east and west for 8-hours on each of the intersecting streets.

In accordance with the guidance of the Utah MUTCD, and based upon traffic analyses of the data gathered at the intersection of 900 East and 300 North, American Fork, UT, the following action is recommended:

- **Make no changes to this intersection.**

It is observed that this intersection provides a school crossing during school hours. Caution should be taken to assure safe crossing of student pedestrians during AM and NOON Peak Hours in accordance with the Utah MUTCD, Chapter 7.

APPENDIX A
Signage Reference



R 1-1



R 1-4















W3-1A

APPENDIX C
Synchro 8 Analysis

HCM Unsignalized Intersection Capacity Analysis
8: 900 East & 300 North













4/18/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	73	251	28	5	243	8	17	17	11	9	22	68
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	79	273	30	5	264	9	18	18	12	10	24	74
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	273			303			812	730	288	747	741	268
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			303			812	730	288	747	741	268
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			92	94	98	97	93	90
cM capacity (veh/h)	1290			1258			241	326	751	294	321	770
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	383	278	49	108								
Volume Left	79	5	18	10								
Volume Right	30	9	12	74								
cSH	1290	1258	328	529								
Volume to Capacity	0.06	0.00	0.15	0.20								
Queue Length 95th (ft)	5	0	13	19								
Control Delay (s)	2.1	0.2	17.9	13.5								
Lane LOS	A	A	C	B								
Approach Delay (s)	2.1	0.2	17.9	13.5								
Approach LOS			C	B								
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			49.3%	ICU Level of Service							A	
Analysis Period (min)			15									

APPENDIX C
Synchro 8 Analysis

HCM Unsignalized Intersection Capacity Analysis
8: 900 East & 300 North

4/18/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	73	251	28	5	243	8	17	17	11	9	22	68
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	79	273	30	5	264	9	18	18	12	10	24	74
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	383	278	49	108								
Volume Left (vph)	79	5	18	10								
Volume Right (vph)	30	9	12	74								
Hadj (s)	0.03	0.02	-0.04	-0.36								
Departure Headway (s)	4.7	4.8	5.6	5.2								
Degree Utilization, x	0.50	0.37	0.08	0.16								
Capacity (veh/h)	732	713	545	607								
Control Delay (s)	12.3	10.6	9.1	9.1								
Approach Delay (s)	12.3	10.6	9.1	9.1								
Approach LOS	B	B	A	A								
Intersection Summary												
Delay			11.1									
Level of Service			B									
Intersection Capacity Utilization			49.3%	ICU Level of Service	A							
Analysis Period (min)			15									

HORROCKS

ENGINEERS

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(801) 763-5100

March 7, 2013

American Fork City
Public Works Department
275 East 200 North
American Fork, UT 84003
(801) 763-3060

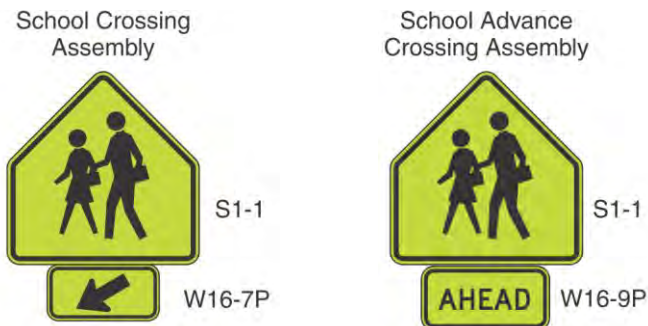
Dear Mr. Spencer:

The following memorandum details the observations of ten school zones throughout American Fork. These observations were taken on February 25th and 26th, 2013 with the intent to assess traffic flow and signage; particularly along student walking routes and near crosswalks. Items that could pose a potential hazard to pedestrians or which are not in compliance with the Utah Department of Transportation School Zone Manual (SZM) or the U.S. Federal Highway Administration's Manual of Uniform Traffic Control Devices (MUTCD, Part 7 – Traffic Controls for School Zones) are noted.

American Fork High School

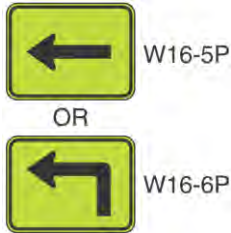
Address: 510 N. 600 E., American Fork, UT 84003

Overall, signage along the walking routes for American Fork is done well. "No Parking" signs along 600 E. are well placed to help drivers see students approaching crosswalks. "School Crossing" (S1-1/W16-7P) and "School Advance Crossing" (W16-9P) signs are posted at appropriate distances do their corresponding crosswalks.



It is observed that there is no posted speed reduction through this school zone. The word "SCHOOL" is painted onto the roadway at the start and end of the school zone; however, the paint is rather faded and difficult to see. Additionally, the northbound direction of the intersection at 700 North would benefit from a

School Advance Crossing sign as described in SZM 7B.25, paragraph 01: *“If a school zone is located on a cross street in close proximity to the intersection, School Zone (S1-1) signs with supplemental arrow (W16-5P or W16-6P) plaques may be installed on each approach of the street or highway to warn road users making a turn onto the cross street that they will encounter a school zone soon after making the turn.”* (See also MUTCD, 7B.08, paragraph 03, and SZM, Appendix A, Figures A3 and A10.)



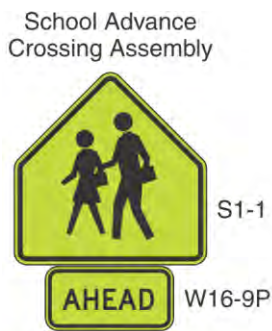
American Fork Junior High School

Address: 1120 N. 20 W., American Fork, UT 84003

Through this school zone, signage was well posted for crosswalks at nearly all locations. “School” is painted onto the road to signal the beginning of the school zone; however, the paint is faded and not easily seen.

Compliance Issues:

There ought to be a School Advance Crossing sign (S1-1/W16-9P) headed northbound toward the school crossing at 100 E. 1120 N., per SZM, 7B.11 (MUTCD, 7B.11). Additionally, when headed southbound toward the same intersections, the School Advance Crossing sign has been twisted 90° and does not face oncoming traffic.



Aristotle Academy

Address: 704 S. 600 E., American Fork, UT 84003

This school is located in the east end of the old supermarket building just southeast of the Cal Ranch store. The parking lot is partially fenced off. It appears to be primarily a drop-off and pick-up facility.

Compliance Issues:

There are no signs to indicate a school zone in the area and no crosswalks are available. However, it is unclear whether these are required for this school.

Barratt Elementary School

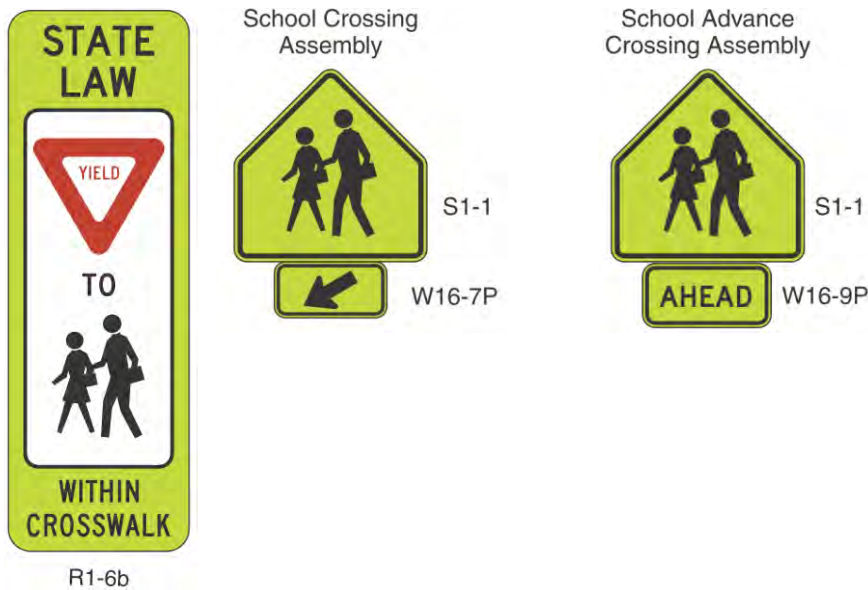
Address: 168 N. 900 E., American Fork, UT 84003

Speed suppression through the use of speed humps is used widely through the surrounding neighborhood and leading up to the school. Warning signs for the speed humps and a reduced speed limit of 10 mph are posted throughout. Also, “no parking” signs posted are where appropriate along 900 E.

There is an RS1-6b sign (similar to R1-6a, below) posted for eastbound traffic on 300 N.; however, it would also be useful to have one facing the westbound traffic.

Compliance Issues:

The 900 E. southbound School Advance Crossing (W16-9P) sign is obscured by a tree. Of additional note, the School Crossing (S1-1/W16-7P) sign for northbound traffic along 900 E. is set back from the road and nestled between parking stalls. Though it is technically still alongside the road, the sign is difficult to see and children entering the crosswalk are hidden by parked cars. Refer to SZM 7B.17.



Dan Peterson School

Address: 169 N. 1100 E., American Fork, UT 84003

Though there is no school zone starting/ending road signage, it is clearly marked where a “handicapped crosswalk” is ahead. The crosswalk coincides with a traffic light. There is an S1-1/W16-2aP (“500 FEET”) sign utilized for northbound traffic on 1100 E. Otherwise, there is no indication of reduced speed limits through the area.



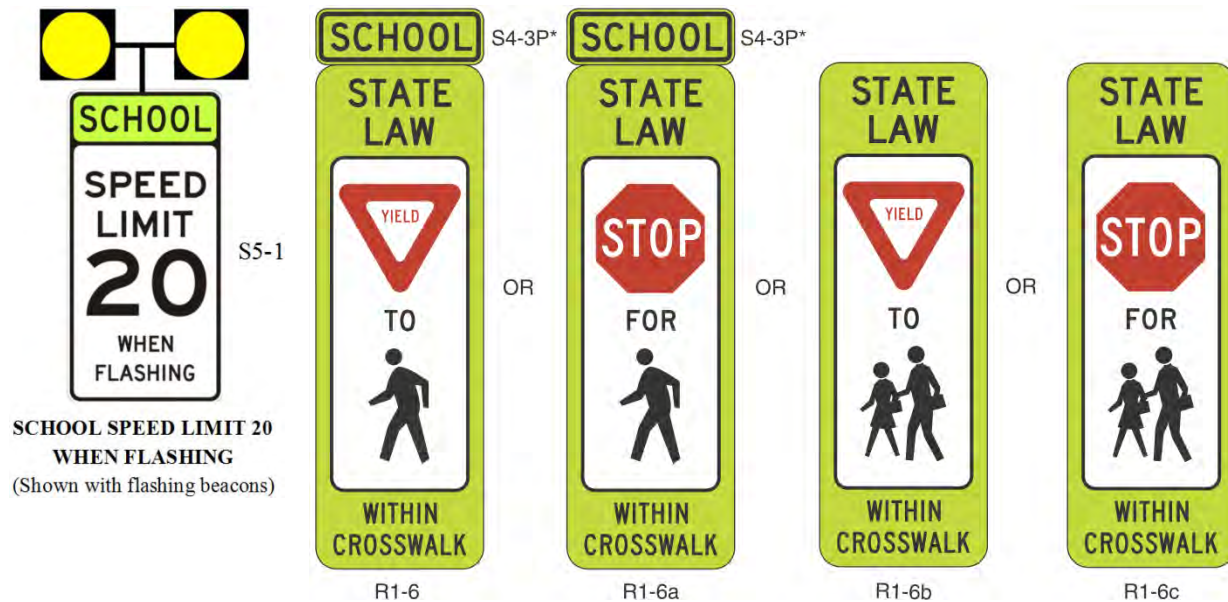
Forbes School

Address: 198 E. 300 N., American Fork, UT 84003

The Forbes school marks the start and end of the school zone with posted signs. Additionally, a flashing sign which reduces the speed limit to 20 mph (S5-1) is posted. School Crossing and School Advance Crossing signs are well posted. It is recommended to use a UDOT RS1-6x (similar to R1-6x sign below) at the southbound approach to 200 N. 200 E., per SZM, 7B.12 (MUTCD 7B.12).

Compliance Issues:

One School Crossing sign (S1-1) is somewhat obscured by a tree. This particular sign is located on the westbound stretch of 300 N. (in front of the Northampton House).



*Reduced size signs: S4-3P 12x4 inches

Greenwood Elementary School

Address: 168 N. 900 E., American Fork, UT 84003

Overall, very good signage is utilized throughout the walking routes of this school. Of note: There are no “start-” or “end-” school-zone signs apparent, nor any required speed reductions through the zone. However, “SCHOOL” is painted onto the street to indicate the school zone’s boundaries.

Legacy Elementary School

Address: 28 E. 1340 N., American Fork, UT

The school zone is marked with painted "SCHOOL" designations on the pavement, but no posted signs. Along 150 W., signage is very well posted. A crossing guard is present in addition to an S5-1 flashing School Zone/Speed Limit Reduction sign.

As noted in SZM, 7B.25, paragraph 01, and Figures A3, A10 (MUTCD 7B.08, paragraph 03), a School Crossing Assembly (S1-1) sign with a supplemental arrow (W16-5P or W16-6P) would be beneficial on the 70 E. northbound approach.



Major safety issues exist for the crosswalk located at Center St. and 1340 N. as noted below.

Compliance Issues:

The crosswalk at Center St. has insufficient gaps between groups of traffic, per SZM, 7A.03 (MUTCD 7A.03).

The school crosswalk at Center St. and 1340 N. is congested with parked cars and cars queued up to pick up children at the school. Children consistently (and suddenly) enter the crosswalk between parked cars and it is difficult to see them.

Also, the westbound Crossing Advance sign (W16-9P – indicating the upcoming crosswalk at 150 W.) is obscured by a tree.

(Photos on following page)

Possible Solutions:

Use a crossing guard at the Center St. crosswalk, per SZM, 7D (MUTCD, 7D).

Utilize a crosswalk signal to stop traffic at the Center St. crosswalk upon push-button request or at set intervals (refer to MUTCD, 4C.06, 4E).

Greatly widen the "no parking" zones on the north and south curbs adjacent to the crosswalk at Center St., per SZM, 7B.17 (MUTCD, 7B.17). Also refer to MUTCD, sections 2B.46, 2B.47, and 2B.48.

Photos:



Legacy School Center Street traffic queuing as school lets out.



Legacy School Center Street crosswalk as school lets out.

Odyssey Charter School

Address: 738 E. Quality Dr., American Fork, UT 84003

The school is located at the end of a dead-end street with no markings to signal the start or end of a school zone. There are few sidewalks along this street and no apparent crosswalks; as such, there are no signs indicating crosswalks. This appears to be strictly a drop-off/pick-up facility.

If students are walking a route to and from this school, the above items should be addressed.

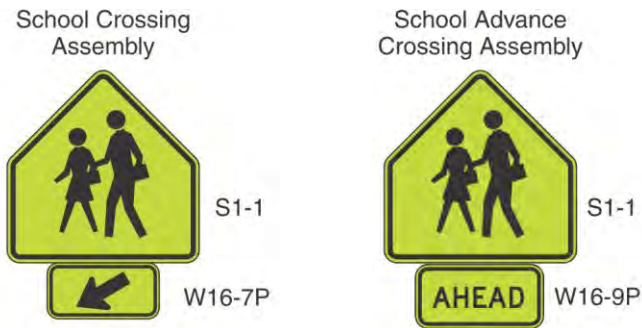
Shelley School

Address: 95 W. 300 N., American Fork, UT 84003

A standing RS1-6b sign is being used at the crosswalk in front of the school. "No Parking" designations are well posted along the curb in front of the school.

Compliance Issues:

Along 300 N., the westbound School Crossing sign (S1-1/W16-7P) is obscured by a tree and the eastbound School Advance Crossing sign (S1-1/W16-9P) is missing. Refer to SZM, 7B.11 (MUTCD, 7B.11).



Please let us know if you have any questions or concerns regarding the observations or analysis presented within this memorandum.

Best regards,

Horrocks Engineers

drh

Public Comment Matrix

Document Title		American Fork Transportation Element of the General Plan		Preparer	S. Lord	Date	February 12, 2013
#	Date	Name	Comment	Response		Notes	
1	January 15 2013	Andrew Rosenvall	It seems as though the AF city Land Use Plan is more up to date than then the transportation plan linked on the city website so I'll comment on that.	Thank you for your email regarding the American Fork City Transportation Element of the General Plan. As we move further into the process of planning transportation in the City I will address your comments. Your input is incredibly valuable to the overall process and we welcome any further input you may have. I would like to personally invite you to a public open house next Tuesday, January 22nd from 5pm - 7pm in the Senior Center on Main Street. I will be in attendance and would welcome the opportunity to discuss your comments and questions in person. Again, thank you for your valuable input.		Comment received by email: andrewrosenvall@gmail.com	
2	January 15 2013	Andrew Rosenvall	I like how Pleasant Grove specifies how many lanes each of their categories of roads use as well as how they identify potential stop light and round-about upgrades to intersections. I'd like American Fork to implement something similar in their transportation master planning maps.	Specific lane configurations and potential signal/roundabout locations will be identified in the plan.		Comment received by email: andrewrosenvall@gmail.com	

Document Title		American Fork Transportation Element of the General Plan		Preparer	S. Lord	Date	February 12, 2013
#	Date	Name	Comment	Response		Notes	
3	January 15 2013	Andrew Rosenvall	Also I especially like the Mountainland Association of Governments 30 year transportation plan with how it identifies roadway expansions, new construction, as well as a 3 phase approximate timeline for completion associated with estimated funding compared to estimated costs. In addition I'd like a table of 20 yrs of previous transportation budgets to demonstrate trend-lines of available money for improvement projects	The Capital Facilities Plan will identify a planned approach to implementing the recommended roadway improvements as well as identifying funding sources. A table of previous transportation budgets will not be included but as budgets are a matter of public record, they are available on request.		Comment received by email: andrewrosenvall@gmail.com	
4	January 15 2013	Andrew Rosenvall	Main street UDOT and MAG did not include AF's main street plan in their latest revision even though it was approved by the city council in Oct. 2011 I'm curious about how that happened.	The Main Street Vision in on the MAG website and the 2020 Mountainland Metropolitan Transportation Study. Both MAG and UDOT participated in the Main Street study.		Comment received by email: andrewrosenvall@gmail.com	
5	January 15 2013	Andrew Rosenvall	Murdock Canal connector should be specified on your map as it will probably at least be partially on AF land and as it appears it will be built within the next year or two, according to resent transportation open houses.	The Murdock Connector is identified as an important east-west roadway for the City and is included in the plan.		Comment received by email: andrewrosenvall@gmail.com	

Document Title			American Fork Transportation Element of the General Plan	Preparer	S. Lord	Date	February 12, 2013
#	Date	Name	Comment	Response			Notes
6	January 15 2013	Andrew Rosenvall	I'm curious about 1st west in that there's enough traffic need to build a crossing of I-15 and yet it retains minor collector status between the south frontage road and state street. If this crossing is completed then 1st west will be the only continuous north south route traveling from the lake to traverse mountain not considered an artery or a major collector. I think the plan underestimates the number of people who may use 1st west in the future, regardless of efforts to encourage them to use the Alpine Highway(1st east) or 9th west. Also at one point the City was requesting a Interchange with I15 between 5th east and Main, 1st west seems the most likely candidate since 1st east would be too close to 5th east.	There will not be another crossing over the Freeway at 100 West. This was precluded by the I-15 CORE project due to the steep grade change that would be needed. It is unlikely that a 3 rd crossing between Pleasant Grove Boulevard and 500 East will ever be a viable option. The City has a resolution asking for a crossing between the Main Street and 500 East interchanges but no plans for another interchange.			Comment received by email: andrewrosenvall@gmail.com

Document Title		American Fork Transportation Element of the General Plan		Preparer	S. Lord	Date	February 12, 2013
#	Date	Name	Comment	Response		Notes	
7	January 15 2013	Andrew Rosenvall	However the new diverging diamond interchanges seem to be able to easily handle the capacity thus reducing the need for this new interchange, but I'm concerned about congestion at 5th east and State Street, particularly the left turn from NB 5th to EB State seems to be LOS F in the evening. I'd use 2nd and or 4th south as congestion reducing alternates if only there weren't as many stop signs, Or perhaps I'd use 5 east and Pacific Ave. if those roads were improved and favored for traffic.	The City is looking into solutions for the 500 East/State Street intersection. This solution will require a separate study and cooperation from UDOT. The Main Street Vision study is designed to discourage the northbound left turn movement at this intersection and encourage the use of Pacific Drive as an alternate to State Street.		Comment received by email: andrewrosenvall@gmail.com	
8	January 15 2013	Andrew Rosenvall	On 1st East NB during peak traffic times of 4:30 pm to 6 pm I frequently have to wait several light cycles at both Pacific Ave and 3rd [North]. This appears to a LOS F condition that may require road expansion in this area sooner than expected. I know the North County Boulevard was supposed to reduce this traffic, I suppose I should give it a few months as I haven't checked on whether NCB has been completed yet.	The City is currently working with UDOT to study this intersection.		Comment received by email: andrewrosenvall@gmail.com	

Document Title		American Fork Transportation Element of the General Plan		Preparer	S. Lord	Date	February 12, 2013
#	Date	Name	Comment	Response		Notes	
9	January 15 2013	Andrew Rosenvall	The alignment of the Vineyard Connector into Pioneer crossing is very awkward and probably adds several minutes of time to those trying to get to the meadows shopping area. I would have preferred the 570 West alignment where it connected with the Main St /State St. intersection.	UDOT is studying this intersection.		Comment received by email: andrewrosenvall@gmail.com	
10	January 15 2013	Andrew Rosenvall	I'm curious about 620 S being such a short Arterial. I would like to see it continue west to 100E as a 2 to 3 lane frontage road to I-15 so that there would yet another alternate to 5th east and State street.	The alternative suggested would likely require lots of right-of-way takes, city parks, and would therefore be unlikely to pass through the federal funding process.		Comment received by email: andrewrosenvall@gmail.com	
11	January 15 2013	Andrew Rosenvall	What is the projected timeline for completion of the 7th North connection between 1st and 2nd west, as well as the extension of 1120 N across Mitchell Hollow?	The 7 th North connection will be presented to MAG for funding in January. Utilities are being installed in the 1120 North connection pending City Council approval.		Comment received by email: andrewrosenvall@gmail.com	
12	January 22 2013	Anonymous	560 West at Pacific Drive need to off the drawing board & get built across the railroad tracks once & for all. This crossing has been put on the books for 30+/- yrs. Its past time to get it built!!	This is currently on the plan and will be completed as soon as feasible.		Comment received on comment card at open house.	

Document Title		American Fork Transportation Element of the General Plan		Preparer	S. Lord	Date	February 12, 2013
#	Date	Name	Comment	Response		Notes	
13	January 24 2013	Andrew Rosenvall	When will the maps that were on display at the open house be available on line? Would you email me some copies.	The maps are available on request at any time and will be published online as they are completed.		Comment received by email: andrewrosenvall@gmail.com	
14	January 23 2013	John Miller	The existing intersection of 400 W and Pacific Dr is failing. It is impossible to turn EB on Pacific during peak hours and difficult during non-peak times. In addition, WB traffic on 300 turning South onto 400 W is typically backed up because of the que length on 400 W. There is a existing curb cut on Pacific Dr at 540 W but no rail crossing. It may be beneficial to align the intersection with the front or rear access of the retail center on the South side of Pacific Dr at this location (this would allow more left hand turn length). There is currently a empty lot just north of the rail tracks that was used as a staging area during the PI project that could be purchased to realign the intersection anywhere along this section of Pacific Drive.	The plan shows a realignment of the major connection to Pacific Drive. The previous Master Plan showed a major road connecting to Pacific Drive via 400 West. The new plan shows this connection being made at 300 West. This will improve the southbound storage length between Pacific Drive and 300 North. It will also allow for better signal spacing on Pacific Drive. 300 West is also a preferred north-south corridor as it extends north to 500 North and south across the freeway to the FrontRunner station.		Comment received by email: milljohn72@gmail.com	

Document Title			American Fork Transportation Element of the General Plan	Preparer	S. Lord	Date	February 12, 2013
#	Date	Name	Comment	Response			Notes
15	January 23 2013	John Miller	1120 N is a vital E/W route on the West side of the city. Currently, 700 N is the only main collector in this section of town. The signalized intersection at 700 N and 900 W has greatly improved the safety and helped eliminate the backup on 700 N. However, the volumes are still very high for a residential two lane collector. From your traffic counts, two lane 700 N carries 1/2 the traffic volume as the 5 lane N County Blvd. The majority of the traffic on 700 N is residential with numerous driveways. Opening 1120 N should alleviate much of the traffic on 700 N by sharing the load between these two planned collectors. In addition, it will open another E/W route on the West side of the city. With the installation of the new high pressure gas line on West end of 700 N, it would be advantageous to provide another alternative route in case of a disaster.	The 1120 North connection to 900 West is a very high priority for east-west connectivity in the City and is planned for construction in the first phase of projects.			Comment received by email: milljohn72@gmail.com

To: **Andy Spencer, PE**
American Fork City Engineer

From: **Kelly Ash, PE**

Date: **June 13, 2013**

Memorandum

Subject: **Review & Recommendations Regarding Previous 300 West Traffic Study**

As part of the American Fork City Transportation Master Plan update, Horrocks Engineers was asked to review a previous traffic study performed for the intersections along 300 West and 200 South directly adjacent to the crossing under I-15 (including a "North Intersection" and a "South Intersection" in relation to the I-15 crossing). This memorandum summarizes our review the memorandum and analysis performed by Hales Engineering dated March 2, 2011.

We agree with the general conclusions of the previous study as follows:

- The traffic volumes used in the analysis were comparable to the traffic volumes forecasts used to update the City's Transportation Master Plan.
- The Synchro analysis performed provided an appropriate representation of the Level of Service (LOS) for each alternative at each intersection individually; however, the analysis did not address potential queuing issues that could be associated with the two closely spaced intersections or potential platooning issues as a result of the closely spaced railroad crossing and traffic signal on Main St.
- There is currently an intersection sight distance restriction for the Mahogany Dr approach to the North Intersection.
 - Historic crash data does not reflect an issue as a result of the limited sight distance; however lack of crash data may be the result of low traffic volumes. As traffic volumes increase, the limited sight distance for the North Intersection may become more of an issue and should be regularly evaluated.
 - Hales Engineers recommended a short-term improvement to update the North Intersection to a four-way stop to temporarily address the sight distance issue with minimal impact to the overall capacity of the intersection. Another potential alternative not addressed by the previous study would be to invoke an Intelligent Transportation System (ITS) solution. This could be accomplished by installing radar detection on all four legs of the intersection. As a vehicle approaches the stop bar on the side street, warning signs with flashing beacons on the main approaches could be activated that say "Watch for Entering Traffic When Flashing." Similarly, as traffic approaches on the collector road, a "blank-out" sign beneath the stop sign could be activated with a message saying "Cross Traffic Does Not Stop." This alternative eliminates the need to stop along the main collector and thus maintains the hierarchy of roadway functional classification.
- At least one of the crashes described in the previous study occurred at night. Although not recommended in the previous study, the City may consider installing intersection lighting for both of these intersections. In addition, the City may consider providing day-time tunnel lighting under the structure to reduce the lighting contrast between the dark tunnel and the daylight as drivers enter and exit the tunnel and attempt to navigate through the adjacent intersections.
- From a capacity standpoint, the dual roundabout option is expected to provide the least delay and will minimize conflict points within the intersections thereby improving safety. From a pedestrian standpoint, stop signs are likely the safest alternative since driver would be required to stop prior to the conflict point;

2162 West Grove Parkway Suite 400 Pleasant Grove, UT 84062 Telephone (801) 763-5100

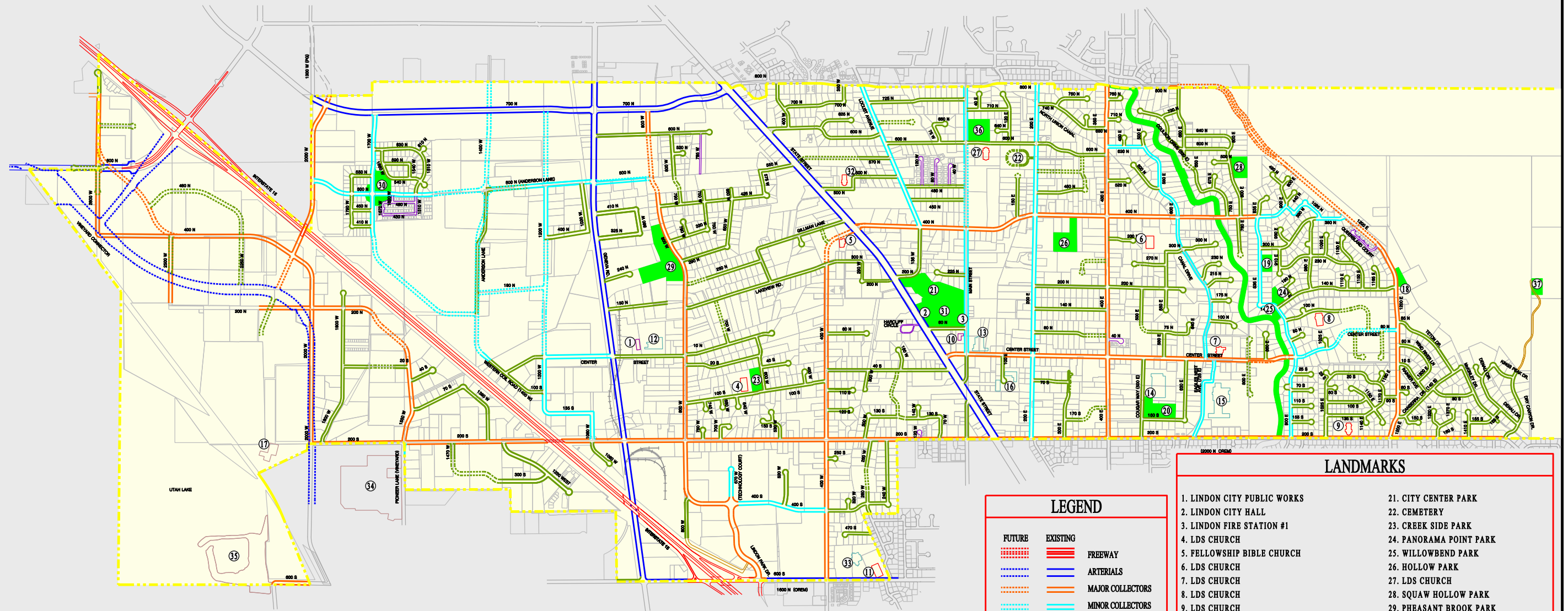
however, the roundabout option could be designed to safely and adequately accommodate pedestrians with proper sight distance and signing. Further study should be done to evaluate the overall pedestrian treatment and utilization through this area. The previous study mentioned a potential school crossing through this area as recommended by a Safe Routes to School Study for Greenwood Elementary School. Depending on actual pedestrian demands and traffic volumes, a school crossing with a crossing guard may be necessary in the future.

- The previous study indicated that “future traffic volumes will create poor LOS at the study intersections.” Although the LOS is expected to deteriorate, further analysis is recommended at a later date to determine the best alternative as conditions may change over time. The future study should include cost/benefit ratio comparisons, queuing/platooning analysis, and other warrant analyses to determine the best solution for the City. From a planning perspective, the dual roundabout option could be a viable solution to the future growth in traffic demand while improving safety for years to come.

LINDON CITY STREET MASTER PLAN MAP

NOVEMBER 2011

SCALE 1" = 2000'



LEGEND

FUTURE	EXISTING	
---	---	FREEWAY
---	---	ARTERIALS
---	---	MAJOR COLLECTORS
---	---	MINOR COLLECTORS
---	---	LOCAL
---	---	PRIVATE
---	---	OTHER PUBLIC

NOTE: FUTURE STREETS ARE SHOWN IN APPROXIMATE LOCATION

--- CITY BOUNDARY

NOTE: WHEN THE CONNECTION OF GILLMAN LANE IS MADE TO 400 WEST STREET, IT WILL NO LONGER EXTEND TO STATE STREET.

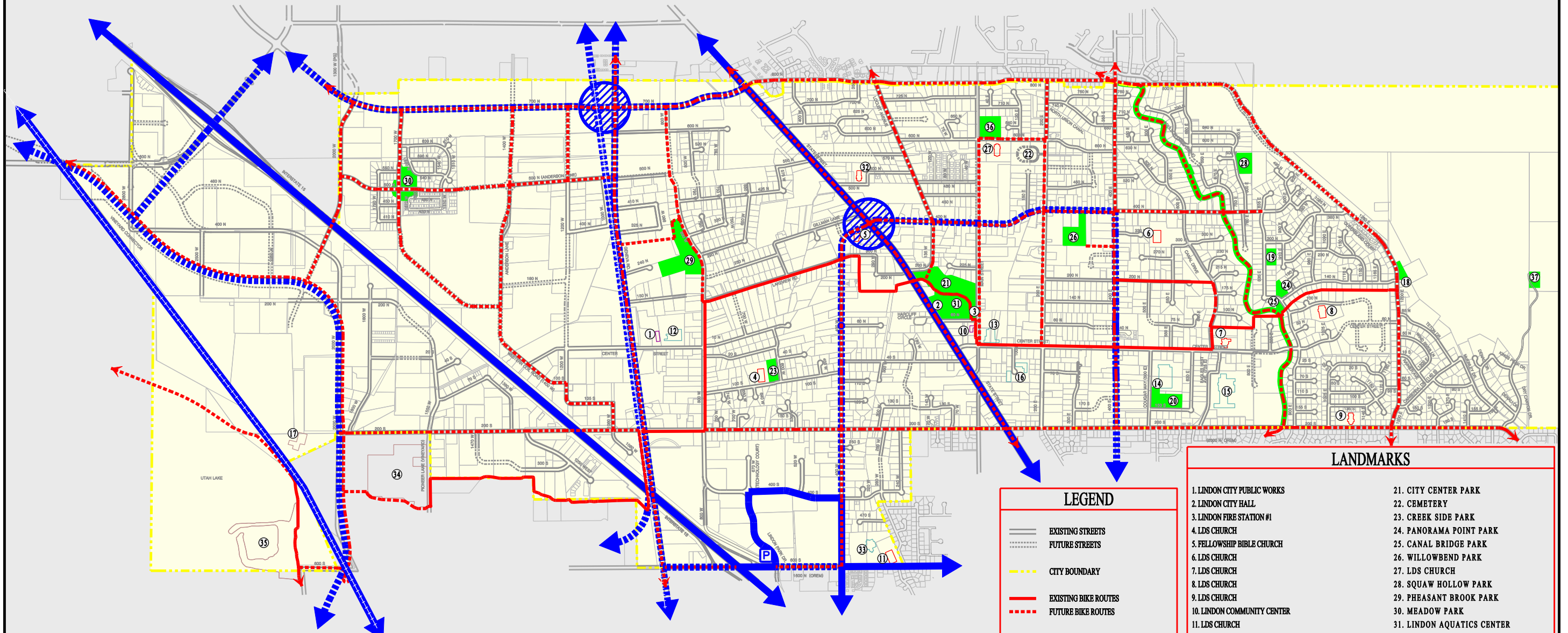
LANDMARKS

- | | |
|--|-------------------------------------|
| 1. LINDON CITY PUBLIC WORKS | 21. CITY CENTER PARK |
| 2. LINDON CITY HALL | 22. CEMETERY |
| 3. LINDON FIRE STATION #1 | 23. CREEK SIDE PARK |
| 4. LDS CHURCH | 24. PANORAMA POINT PARK |
| 5. FELLOWSHIP BIBLE CHURCH | 25. WILLOWBEND PARK |
| 6. LDS CHURCH | 26. HOLLOW PARK |
| 7. LDS CHURCH | 27. LDS CHURCH |
| 8. LDS CHURCH | 28. SQUAW HOLLOW PARK |
| 9. LDS CHURCH | 29. PHEASANT BROOK PARK |
| 10. LINDON COMMUNITY CENTER | 30. MEADOW PARK |
| 11. LDS CHURCH | 31. LINDON AQUATICS CENTER |
| 12. LDS CHURCH CANNERY | 32. LDS CHURCH |
| 13. LINDON ELEMENTARY | 33. KARL MAESER ACADEMY |
| 14. ROCKY MOUNTAIN ELEMENTARY | 34. LAKESIDE POWER PLANT (VINEYARD) |
| 15. OAK CANYON JR. HIGH | 35. LINDON MARINA |
| 16. TIMPANOGOS ACADEMY | 36. FRYER PARK |
| 17. NORTH POINT WASTE TRANSFER STATION | 37. DRY CANYON TRAILHEAD |
| 18. EQUESTRIAN STAGING AREA | |
| 19. WATER TANK PARK | |
| 20. PIONEER PARK | |

LINDON CITY ALTERNATIVE TRANSPORTATION MASTER PLAN MAP

NOVEMBER 2011

SCALE 1" = 2000'



LEGEND

- EXISTING STREETS
- - - FUTURE STREETS
- - - CITY BOUNDARY
- EXISTING BIKE ROUTES
- - - FUTURE BIKE ROUTES
- EXISTING TRANSIT CORRIDOR
- - - FUTURE TRANSIT CORRIDOR
- COMMUTER RAIL
- - - FUTURE LIGHT RAIL
- ⊙ FUTURE TRANSIT NODE
- P EXISTING PARK-N-RIDE LOT

LANDMARKS

1. LINDON CITY PUBLIC WORKS	21. CITY CENTER PARK
2. LINDON CITY HALL	22. CEMETERY
3. LINDON FIRE STATION #1	23. CREEK SIDE PARK
4. LDS CHURCH	24. PANORAMA POINT PARK
5. FELLOWSHIP BIBLE CHURCH	25. CANAL BRIDGE PARK
6. LDS CHURCH	26. WILLOWBEND PARK
7. LDS CHURCH	27. LDS CHURCH
8. LDS CHURCH	28. SQUAW HOLLOW PARK
9. LDS CHURCH	29. PHEASANT BROOK PARK
10. LINDON COMMUNITY CENTER	30. MEADOW PARK
11. LDS CHURCH	31. LINDON AQUATICS CENTER
12. LDS CHURCH CANNERY	32. LDS CHURCH
13. LINDON ELEMENTARY	33. KARL MAESER ACADEMY
14. ROCKY MOUNTAIN ELEMENTARY	34. LAKESIDE POWER PLANT (VINEYARD)
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16. TIMPANOGOS ACADEMY	36. FRYER PARK
17. NORTH POINT WASTE TRANSFER STATION	37. DRY CANYON TRAILHEAD
18. EQUESTRIAN STAGING AREA	
19. WATER TANK PARK	
20. PIONEER PARK	

Pleasant Grove City Street Master Plan

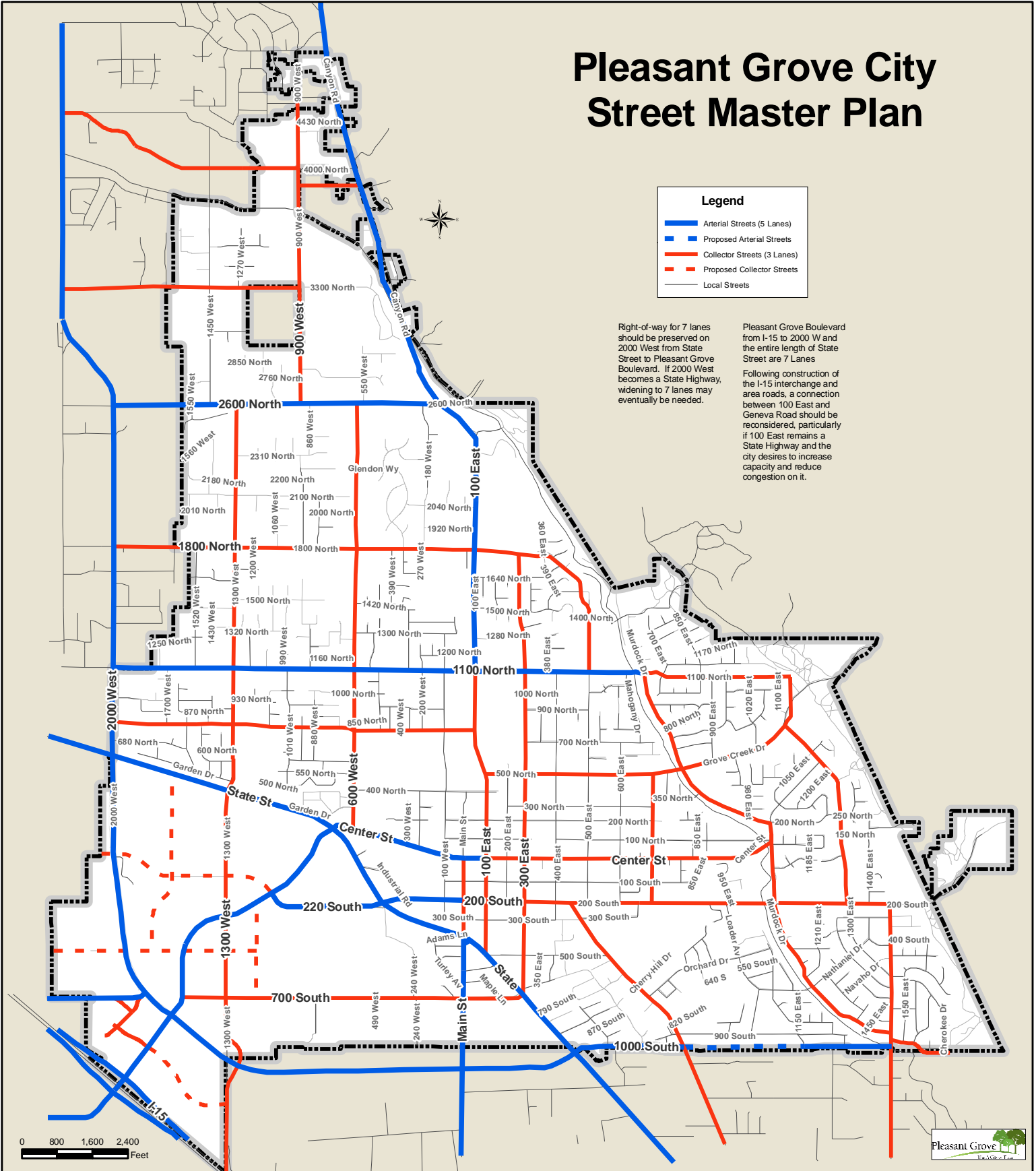
Legend

- Arterial Streets (5 Lanes)
- - - Proposed Arterial Streets
- Collector Streets (3 Lanes)
- - - Proposed Collector Streets
- Local Streets

Right-of-way for 7 lanes should be preserved on 2000 West from State Street to Pleasant Grove Boulevard. If 2000 West becomes a State Highway, widening to 7 lanes may eventually be needed.

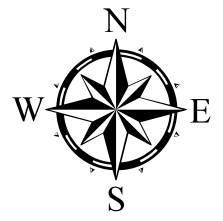
Pleasant Grove Boulevard from I-15 to 2000 W and the entire length of State Street are 7 Lanes

Following construction of the I-15 interchange and area roads, a connection between 100 East and Geneva Road should be reconsidered, particularly if 100 East remains a State Highway and the city desires to increase capacity and reduce congestion on it.



0 800 1,600 2,400 Feet

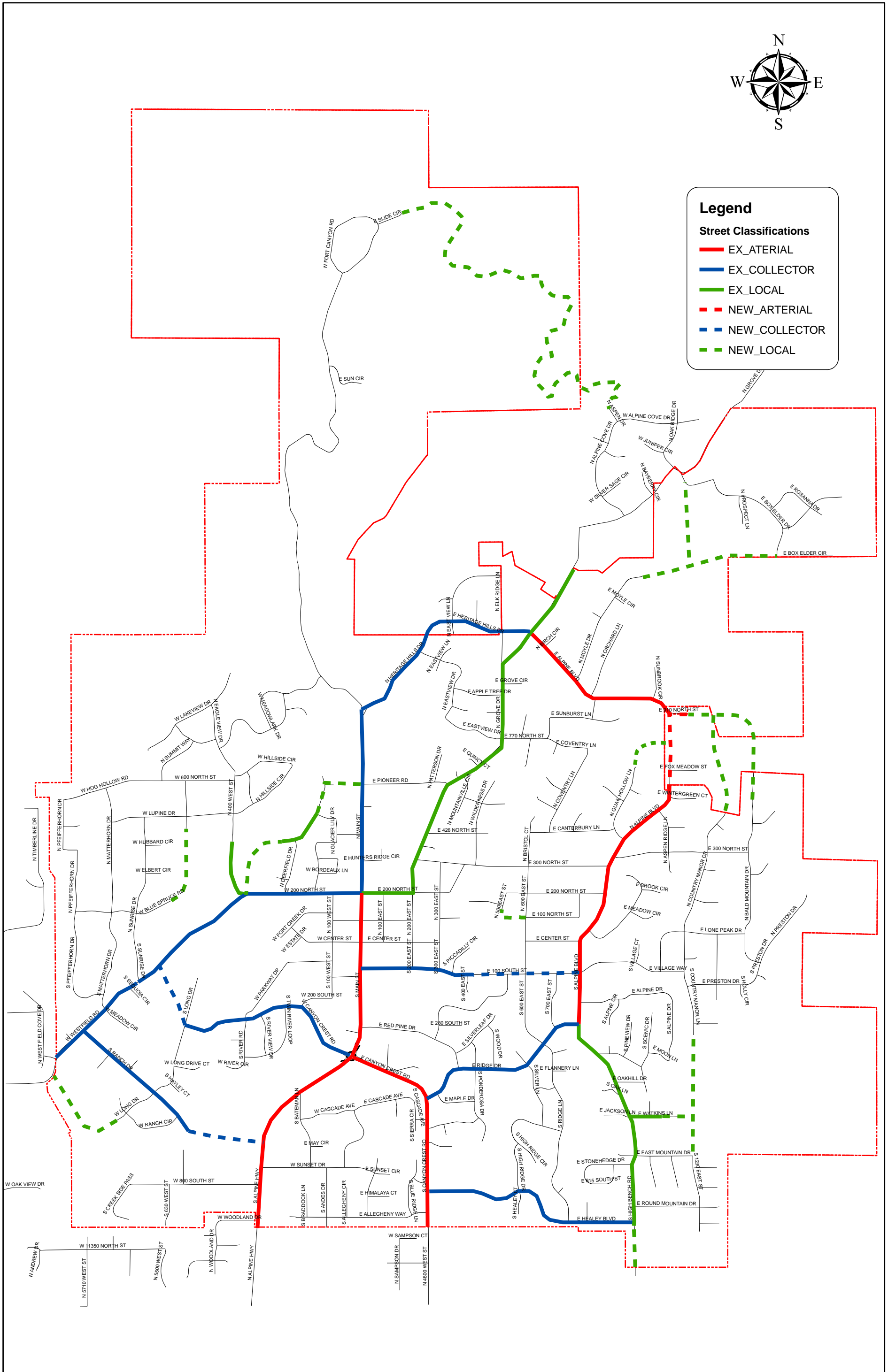




Legend

Street Classifications

- EX_ATERIAL (Solid red line)
- EX_COLLECTOR (Solid blue line)
- EX_LOCAL (Solid green line)
- NEW_ARTERIAL (Dashed red line)
- NEW_COLLECTOR (Dashed blue line)
- NEW_LOCAL (Dashed green line)

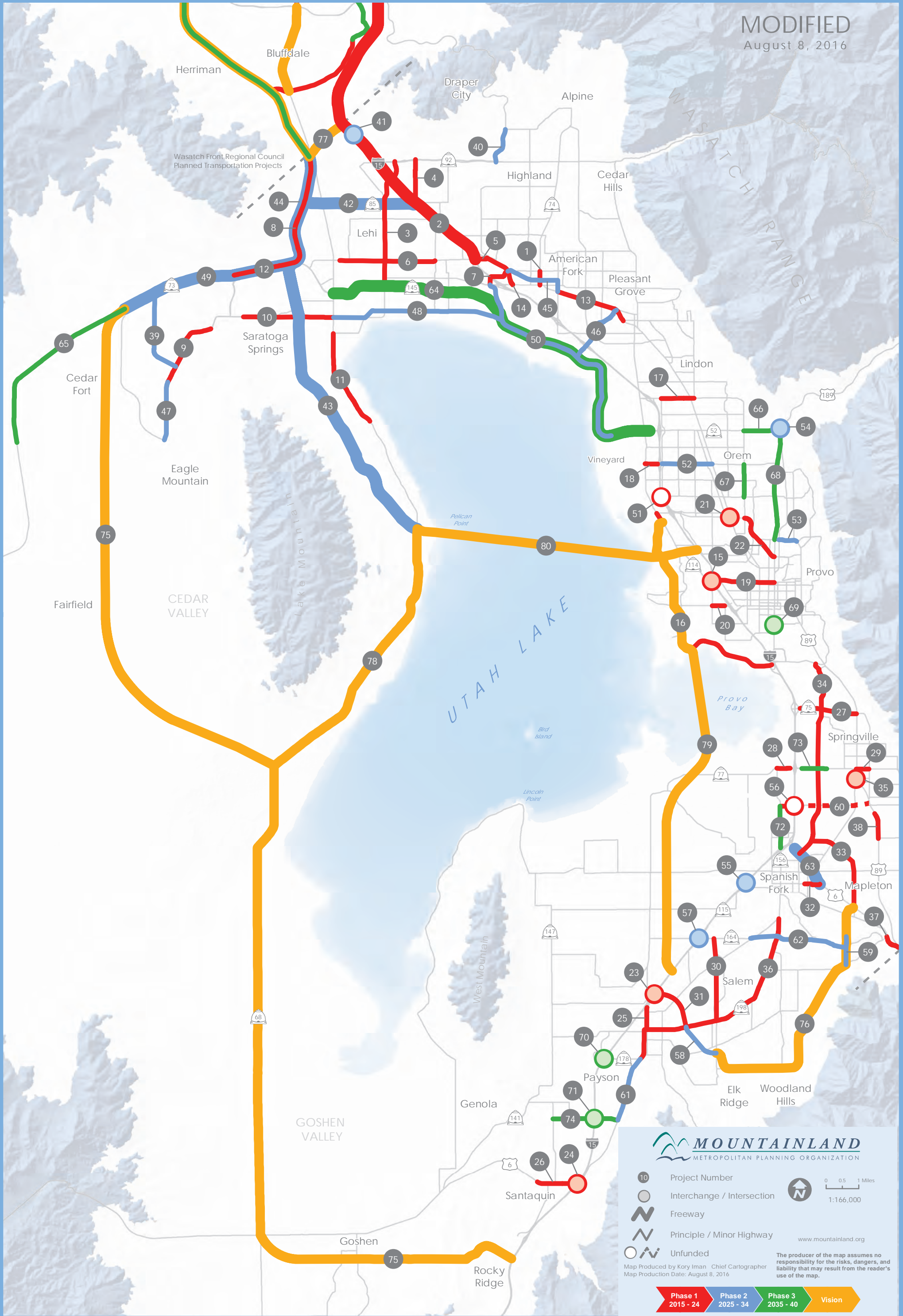


Highways

TransPlan40

Regional Transportation Plan
2015-2040 Plan for the Provo/Orem
Metropolitan Area

MODIFIED
August 8, 2016



MOUNTAINLAND
METROPOLITAN PLANNING ORGANIZATION

- Project Number
- Interchange / Intersection
- Freeway
- Principle / Minor Highway
- Unfunded

0 0.5 1 Miles
1:166,000

Map Produced by Kory Iman Chief Cartographer
Map Production Date: August 8, 2016
www.mountainland.org

The producer of the map assumes no responsibility for the risks, dangers, and liability that may result from the reader's use of the map.

Phase 1 2015 - 24 Phase 2 2025 - 34 Phase 3 2035 - 40 Vision

Highway Projects

No.	Project Description	Cost Millions	No.	Project Description	Cost Millions
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Phase 1 | 2024

Phase 2 | 2034

NORTH PROJECTS

1	American Fork 100 E SR74 State ST to AF 300 N Widen to 4 Lanes, add buffered bike lanes	3.5
2	I-15 Freeway Draper to Lehi Draper 12300 S to Lehi Main ST (cost UC only) Reconstruct FWY, & Interchanges, Widen to 10 Lanes + HOV	429
3	Lehi 2300 W Timpanogos HWY to Pioneer Crossing Wden and New 4 Lanes (6 north of 2100 N) , I-15 FWY Bridge, add buffered bike lanes	59.7
4	Lehi 1200 W Timpanogos HWY to Lehi 2100 N Wden to 4 Lanes	10.1
5	Lehi Main ST SR73 State ST to Lehi 850 E Wden to 7 Lanes	4.5
6	Lehi Main ST/Crossroads BLVD Lehi to Saratoga Springs Commerce DR to Lehi 500 W Wden to 4 Lanes, add buffered bike lanes	32.4
7	Meadows Connection RD American Fork State ST to Pioneer Crossing New 2 Lane Road, New I-15 Bridge	19.7
8	Mountain View Frontage RD SR85 UT/SL Co. line to SS Porter Rockwell PKWY, Bluffdale to SR73, Saratoga Springs New 4 Lanes	45
9	Pony Express PKWY Eagle Mountain Mountain Ash WY to EMtn 5600 N Wden to 4 Lanes, add trail	17.3
10	Pony Express PKWY Eagle Mtn to Saratoga Springs Smith Ranch RD to Redwood RD Wden to 4 Lanes, add trail	30.8
11	Redwood RD SR68 Saratoga Springs SSprings 400 S to Stillwater DR Wden to 4 Lanes, add buffered bike lanes	30.4
12	SR73 Eagle Mountain to Saratoga Springs Ranches PKWY to Mountain View Frontage RD Wden to 6 Lanes, add trail	54.5
13	State ST US89 American Fork to Pleasant Grove AF 500 E to Pleasant Grove BLVD Wden to 6 Lanes, add buffered bike lanes	21.5
14	State ST US89 Lehi to American Fork Lehi Main ST to American Fork Main ST Wden to 6 Lanes, add buffered bike lanes	12

CENTRAL PROJECTS

15	I-15/Provo 820 N Interchange New Interchange	45
16	Lakeview PKWY/Geneva RD Orem to Provo University PKWY to I-15/University AVE Interchange University Pkwy New Lanes Vary 2-4, add trail	75.9
17	Orem 1600 N Orem 1200 W to Orem 400 W Wden to 4 Lanes, add bike lanes	10.3
18	Orem Center ST Geneva RD to I-15 FWY Wden to 4 Lanes, add bike lanes	3.2
19	Provo 820 N Geneva RD to University AVE Wden to 4 Lanes	25.3
20	Provo Center ST SR114 Geneva RD to Provo 1600 W Wden to 4 Lanes	3.5
21	State ST/University PKWY, Orem New Grade Separated Intersection	38
22	University PKWY SR265 Orem to Provo Orem 800 E to University AVE Wden to 6 Lanes, add trail on north side	51.2

SOUTH PROJECTS

23	I-15/Payson Main ST Interchange Interchange Modification Possibly add Connections to Main ST and SR198	45
24	I-15/Santaquin Main ST Interchange Interchange Modification	45
25	Payson Main ST SR115 I-15 FWY to Payson 100 N Possibly Wden to 5 Lanes depending on I-15 Interchange EIS	6.4
26	Santaquin Main ST US6 Santaquin 500 W to I-15 FWY Wden to 4 Lanes	10.7
27	Springville 1400 N SR75 I-15 FWY to Springville Main ST Wden to 4 Lanes, 2 Bridges Reconstructed, add trail	37.5
28	Springville 400 S SR77 I-15 FWY to SF Main ST Wden to 5 Lanes	4.4
29	Springville 400 S Springville Main ST to 400 E Wden to 4 Lanes, Additional Turn Lanes at Main ST	2.7
30	Elk Ridge DR Salem UC 8000 S to SR198 New 2 Lanes, add bike lanes	8
31	Nebo Beltway RD Payson I-15 FWY to SR198 Possible New 5 Lanes depending on I-15 Interchange EIS	12.1
32	Spanish Fork Center ST 900 E to US6 Wden to 4 Lanes, Wden RR Bridge, add trail	3.8
33	Spanish Fork PKWY Spanish Fork Canyon CR PKWY to Canyon RD New and Wden to 4 Lanes	28.7
34	Springville 1200 W/Canyon Creek PKWY, SpFork Provo 1860 S to US6 New and Wden to 4 Lanes, add trail	63.6
35	Springville Main ST/US89/SR51 Interchange Reconstruct Interchange	25.3
36	SR198 Spanish Fork/Salem/Payson Arrowhead Trail to Payson 800 S Wden to 4 Lanes, add trail	68.5
37	US6 Spanish Fork Powerhouse RD to Diamond Fork RD (cost in MPO only) Wden to 4 Lanes	16
38	US89 Mapleton Mapleton 1600 N to Maple ST Wden to 4 Lanes, buffered bike lanes	6.6

UNFUNDED

51	I-15/Orem 800 S Interchange New HOV Interchange to UVU, Trail/Side Path	72.7
56	I-15/Springville 1600 S/SpFork 2700 N Interchange New Interchange	69
60	Springville 1600 S/Spanish Fork 2700 N Spanish Fork Main ST to US89 New and Wden to 4 Lanes, New RR Bridges	64.1

NORTH PROJECTS

39	Airport RD Eagle Mountain SR73 to Pony Express PKWY New 4 Lanes	23.1
40	Highland BLVD Highland 11800 N to Timpanogos HWY Wden to 4 Lanes	11.8
41	I-15/Traverse Mountain Interchange, Lehi New Interchange into Traverse Mountain	49.6
42	Lehi 2100 N Freeway SR85 Mountain View FWY to I-15 FWY New 6 Lanes, and System Interchanges, Buffered Bke Lanes, Trail Extension	105
43	Mountain View FWY Extension SR85 Saratoga Springs SR73 FWY to Harbor PKWY New 4 Lanes, Interchanges North of Still Water PKWY	442.9
44	Mountain View FWY SR85 UT/SL Co. line to S. Springs Porter Rockwell PKWY to SR73 FWY New 6 Lanes, Trail	250.9
45	Pacific DR/American Fork 500 E Pioneer Crossing to State ST Wden to 4 Lanes	10.9
46	Pleasant Grove BLVD Vineyard Connector RD to State ST New and Wden Varies 4-6 Lanes	20.5
47	Pony Express PKWY Eagle Mountain EMtn 5600 N to Eagle Mountain BLVD New 4 Lanes	11.9
48	Pony Express PKWY Saratoga Springs to PI Grove Redwood RD to Vineyard Connector RD New 4 Lanes	64.8
49	SR73 Freeway Eagle Mountain to Saratoga Springs Mountain BLVD to Mountain View FWY New 6 Lanes FWY, Frontage RDs Lanes Vary, Trail	297.2
50	Vineyard Connector RD SR52 Vineyard to Am. Fork Vineyard Main ST to Pioneer Crossing New 4 Lanes	123.2

CENTRAL PROJECTS

52	Orem Center ST I-15 FWY to State ST Wden to 6 Lanes	16.8
53	Provo 2230 N Provo Canyon RD to Temple DR Wden to 4 Lanes	3.8
54	University AVE/Orem 800 N Intersection Intersection Modification	38

SOUTH PROJECTS

55	I-15/Spanish Fork Center ST Interchange New Interchange	48.1
57	I-15/UC 8000 S Interchange Interchange Modification	45
58	Nebo Beltway RD Payson SR198 to Elk Ridge DR New 2 Lanes	14.8
59	Spanish Fork 2300 E SR198 to UC 8800 N New and Wden 2 Lanes	17.9
61	SR198 Payson Payson 800 S to UC 12400 S Wden to 4 Lanes	8.8
62	UC 8000 S Spanish Fork Arrowhead Trail to Spanish Fork 2300 E New 2 Lanes	45.1
63	US6 Expressway Spanish Fork I-15 FWY to Spanish Fork Center ST 4 Lane Expressway, 2-2 Lane Frontage RDs	90.8

No.	Project Description	Millions
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Phase 3 | 2040

NORTH PROJECTS

64	Pioneer Crossing/Vineyard EXPWY Vineyard to Lehi Connect Two Roads, Widen to 6 Lanes	554.6
65	SR73 Eagle Mountain/Cedar Fort EM 3400 N to Airport RD Wden to 4 Lanes	49.8

CENTRAL PROJECTS

66	Orem 800 N SR52 Orem 800 E to University AVE, Provo Wden to 7 Lanes	12.9
67	Orem 800 E Orem Center ST to Orem 800 S Wden to 4 Lanes	19.9
68	University AVE US189, Provo Provo 2230 N to Orem 800 N Wden to 7 Lanes	31.4
69	University AVE Viaduct US189, Provo Provo 500 S to 900 S Reconstruct Bridge, Wden to 6 Lanes	27.5

SOUTH PROJECTS

70	I-15/Payson 800 S Interchange Interchange Modification	45
71	I-15/UC12400 S Interchange Santaquin New Interchange	45
72	Spanish Fork Main ST Spanish Fork 2700 N to I-15 FWY Wden to 4 Lanes	7.4
73	Springville 400 S SR77 I-15 FWY to Springville 950 W Wden to 6 Lanes	7.3
74	UC 12400 S Santaquin Santaquin Center ST to SR198 Wden to 4 Lanes	27.8

No.	Project Description	Millions
Vision Options (not phased)		
75	Cedar Valley Corridor Eagle Mountain to Santaquin HWY 73 FWY, Eagle Mountain to I-15 Santaquin Possible west valley bypass FWY to I-15	
76	Nebo Beltway RD Elk Ridge to Spanish Fork Elk Ridge DR to US-6, Spanish Fork Possible 4 Lane Arterial	
77	Point of the Mountain FWY, Lehi I-15 to Mountain View FWY Possible 6 Lane FWY, Bridge	
78	Redwood RD South Corridor Saratoga Springs Utah Lake Bridge to Cedar Valley Corridor Possible west bypass FWY to I-15	
79	South Wasatch Corridor I-15 FWY, Provo/Orem to I-15, Payson Possible Provo Bay crossing between Provo and Payson	
80	Utah Lake Bridge Provo/Orem to Saratoga Springs I-15 FWY, Provo/Orem to Mountain View FWY, Siga. Springs Possible east/west FWY link bridge over Utah Lake	

ORDINANCE NO. 2017-10-59

AN ORDINANCE AMENDING SECTION 15.01.1720 OF THE DEVELOPMENT AND CONSTRUCTION STANDARDS OF AMERICAN FORK, UTAH, RELATING TO PRIVATE STREET CROSS SECTIONS; AMENDING FIGURE 17.7.507-A OF THE AMERICAN FORK CITY DEVELOPMENT CODE, RELATING TO PRIVATE ROADWAY STANDARDS FOR THE PLANNED COMMUNITY ZONE; AMENDING SECTION 17.7.505.E OF THE AMERICAN FORK CITY DEVELOPMENT CODE, RELATING TO VEHICULAR ACCESS WITHIN INNER BLOCK COTTAGE DEVELOPMENT PROJECTS; AND PROVIDING FOR THE ENFORCEMENT OF THE AMENDMENTS.

BE IT ORDAINED BY THE CITY COUNCIL OF AMERICAN FORK CITY, UTAH, AS FOLLOWS:

PART I

TEXT OF ORDINANCE

SECTION 1. Section 15.01.1720 of the Development and Construction Standards of American Fork, Utah, relating to detailed drawings of minimum standards for private roadways is hereby amended by replacing the existing drawing with Figure 1 of this ordinance.

SECTION 2. Figure 17.7.507-A of the American Fork City Development Code is hereby amended by replacing the existing figure with Figure 1 of this ordinance.

SECTION 3. Section 17.7.505.E of the American Fork City Development Code is hereby amended to read as follows:

E. *Vehicular Access*

1. *Street Standards.* Each lot or building site area within an inner-block cottage development project shall abut upon and be served by an adequate street which is dedicated to the city and conforms to one of the following:
 - a. *Standard inner-block cross-section.* Sixty-two foot (62') right-of-way with thirty-two feet (32') feet of paved travel surface and an eight foot (8') wide planter strip, a two foot (2') concrete curb, gutter and five foot (5') wide sidewalk, both sides. This alternative would be applicable within any inner-block project, and shall be the preferred option for all private streets.
 - b. *Alternate A.* Fifty-two foot (52') right-of-way with ~~thirty-six~~ thirty-two feet (32') of paved travel surface, a three foot (3') wide landscaped or stamped

colored concrete park-strip, a two foot (2') concrete curb and gutter on both sides, and a five foot (5') wide sidewalk on both sides. This option shall only be used as permitted by the Planning Commission and as recommended by the City Engineer.

The minimum driveway length shall be twenty-five feet (25') long.

2. *Cul-de-sac.* Where inner-block access streets are not continuous, said streets shall terminate in a cul-de-sac having a radius of not less than sixty-three feet (63') or fifty-eight feet (58') accordingly. This cul-de-sac shall consist of a fifty-foot radius top back of curb with all other areas covered with an asphalt or concrete pavement, and a sidewalk providing pedestrian access to every lot for the entire width of the lot in a separate sidewalk easement.
3. *Entry street.* Access routes into inner-block areas shall comply with the applicable minimum cross-section standard set forth above and, where the access route is situated adjacent to one or more existing dwellings, the minimum distance between the access street right-of-way and existing adjacent dwelling(s) shall comply with the minimum requirements for corner lots in the underlying zone.
4. *Street alignment.* The alignment of the proposed street system should provide ready and convenient vehicular and pedestrian circulation within the project area.

PART II

PENALTY AND ADOPTION

SECTION 1 – Conflicting Provisions. Whenever any detail drawing adopted by this Ordinance conflict with the provisions of any other detail drawing previously adopted by ordinance or resolution, the terms set forth in the detail drawing adopted by this ordinances shall prevail.

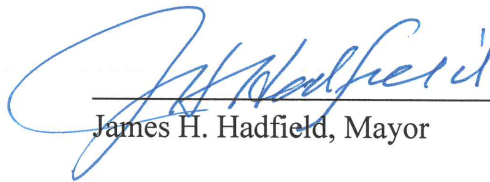
SECTION 2 – Provisions Severable. This Ordinance and the various sections, clauses and paragraphs are hereby declared to be severable. If any part, sentence, clause or phrase is adjudged to be unconstitutional or invalid it is hereby declared that the remainder of the ordinance shall not be affected thereby.

SECTION 3 – Amendment to be Added to Development and Construction Standards. The City Council hereby authorizes and directs that insert pages reflecting the provisions enacted hereby shall be made and placed in the Official copies of the American Fork Development and Construction Standards in the office of the City Recorder.

SECTION 4 – Penalty. Hereafter these amendments shall be construed as part of the Development And Construction Standards of American Fork City, Utah, to the same effect as if originally a part thereof, and all provisions of said Code shall be applicable thereto, including, but not limited to, the enforcement, violation and penalty provisions.

SECTION 5 – Effective Date. This Ordinance shall take effect upon its passage and publication as required by law.

PASSED AND ORDERED PUBLISHED BY THE CITY COUNCIL OF AMERICAN FORK CITY, UTAH, THIS 24 DAY OF OCTOBER 2017.


James H. Hadfield, Mayor

ATTEST:


Terilyn Lurker, City Recorder

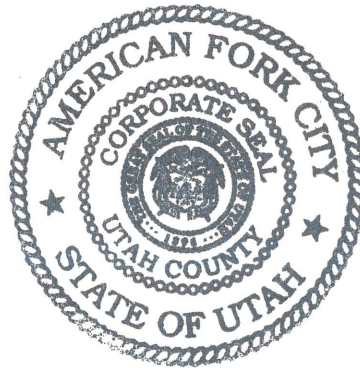
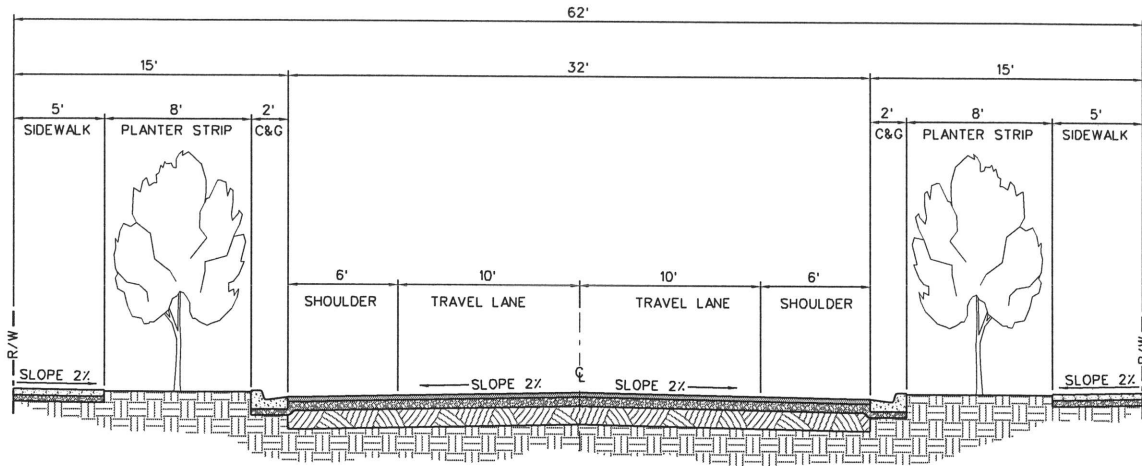
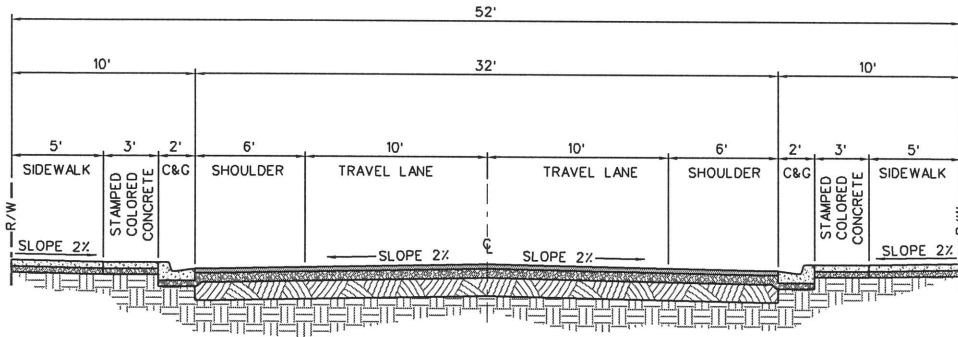


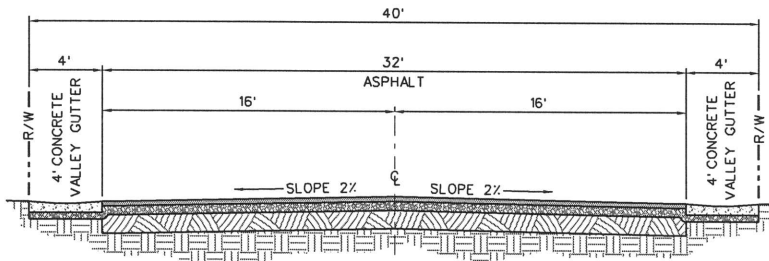
FIGURE 1



**PRIVATE STREET CROSS SECTION
(LANDSCAPED PLANTER STRIP WITH TREE)**



**PRIVATE STREET CROSS SECTION
(STAMPED COLORED CONCRETE PARK STRIP - NO TREE)**



ALLEY CROSS SECTION



JU-B ENGINEERS, INC.

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FILE: 50-16-055_FIG 1_PVT
JUB PROJ. #: 50-16-055
DRAWN BY: EEA
DESIGN BY: JMC
CHECKED BY: MLC



**PRIVATE STREETS & ALLEY
CROSS SECTIONS**

AMERICAN FORK CITY CORPORATION
AMERICAN FORK, UTAH

SHEET

FIG-1

NO	REVISION DESCRIPTION	BY	APR	DATE	LAST UPDATED: 8/4/2017

Plot Date: 8/4/2017
 Date Created: 8/2/2017
 File Name: I:\PROJECTS\PUBLIC\AMERICAN FORK\50-16-055-AMERICAN FORK - STANDARD DRAWING ASSISTANCE\CAD\SHEETS\50-16-055_FIG 1_PVT.DGN