ALPINE CITY PLANNING COMMISSION MEETING

NOTICE is hereby given that the **PLANNING COMMISSION** of Alpine City, Utah will hold a **Public Meeting** on **Tuesday, February 15, 2022 at 7:00 pm at City Hall, 20 North Main Street, Alpine, Utah.**

The public may attend the meeting in person or view the meeting via the **Alpine City YouTube Channel**. A direct link to the channel can be found on the home page of the Alpine City website: **alpinecity.org**

I. GENERAL BUSINESS
- A. Welcome and Roll Call: Jane Griener
- B. Prayer/Opening Comments: Ethan Allen
- C. Pledge of Allegiance: Jane Griener

II. PUBLIC COMMENT

Any person wishing to comment on any item not on the agenda may address the Planning Commission. Comments may be given in person at the meeting.

III. REPORTS AND PRESENTATIONS
- **A. Land Use Training – Jordan Cullimore with The Office of the Property Rights Ombudsman**

IV. ACTION ITEMS
- **A. Public Hearing – Trail Master Plan Update – Lambert Park**
- **B. Public Hearing – Amendment to Alpine City Standard Specifications and Details – Canyon Crest Widening**
- **C. Public Hearing – Amendment to Transportation Master Plan Map – Canyon Crest Widening**
- **D. Public Hearing – Ordinance 2022-04 Design Standards and Sub. Definitions – Canyon Crest Widening**
- **E. Public Hearing – Ordinance 2022-03 Accessory Structures & Swimming Pools**
- **F. Public Hearing – Ordinance 2022-05 Accessory Dwelling Unit Requirements**

V. COMMUNICATIONS

VI. APPROVAL OF PLANNING COMMISSION MINUTES: January 18, 2022

ADJOURN

Chair Jane Griener
February 11, 2022

THE PUBLIC IS INVITED TO ATTEND ALL PLANNING COMMISSION MEETINGS. If you need a special accommodation to participate in the meeting, please call the City Recorder's Office at 801-756-6347 ext. 5.

CERTIFICATION OF POSTING. The undersigned duly appointed recorder does hereby certify that the above agenda notice was posted at Alpine City Hall, 20 North Main, Alpine, UT. It was also sent by e-mail to The Daily Herald located in Provo, UT a local newspaper circulated in Alpine, UT. This agenda is also available on the City's web site at www.alpinecity.org and on the Utah Public Meeting Notices website at www.utah.gov/pmn/index.html.

PUBLIC MEETING AND PUBLIC HEARING ETIQUETTE

Please remember all public meetings and public hearings are now recorded.

- All comments **must** be recognized by the Chairperson and addressed through the microphone.
- When speaking to the Planning Commission, please stand, speak slowly and clearly into the microphone, and state your name and address for the recorded record.
- Be respectful to others and refrain from disruptions during the meeting. Please refrain from conversation with others in the audience as the microphones are very sensitive and can pick up whispers in the back of the room.
- Keep comments constructive and not disruptive.
- Avoid verbal approval or dissatisfaction of the ongoing discussion (i.e., booing or applauding).
- Exhibits (photos, petitions, etc.) given to the City become the property of the City.
- Please silence all cellular phones, beepers, pagers or other noise making devices.
- Be considerate of others who wish to speak by limiting your comments to a reasonable length, and avoiding repetition of what has already been said. Individuals may be limited to two minutes and group representatives may be limited to five minutes.
- Refrain from congregating near the doors or in the lobby area outside the council room to talk as it can be very noisy and disruptive. If you must carry on conversation in this area, please be as quiet as possible. (The doors must remain open during a public meeting/hearing.)

Public Hearing vs. Public Meeting

If the meeting is a **public hearing**, the public may participate during that time and may present opinions and evidence for the issue for which the hearing is being held. In a public hearing there may be some restrictions on participation such as time limits.

Anyone can observe a **public meeting**, but there is no right to speak or be heard there - the public participates in presenting opinions and evidence at the pleasure of the body conducting the meeting.

ALPINE PLANNING COMMISSION AGENDA

SUBJECT: Public Hearing – Trail Master Plan Update – Lambert Park

FOR CONSIDERATION ON: 15 February 2022

PETITIONER: Trail Committee

ACTION REQUESTED BY PETITIONER: Approve changes to the trail system in the south end of Lambert Park.

BACKGROUND INFORMATION:
The trail committee is proposing changes to the trail system in the south end of Lambert Park, the area around the water tank. The proposed changes are primarily to improve sustainability of the trail system, create better trails for the users of the park, and to design trails in such a way to discourage shooting activity on forest land.

The changes to the trail system would include the creation of two new flow trails (downhill bike only), one hiking only trail, and one mixed use trail. Other existing trails that are not sustainable would be reclaimed and revegetated. Utility roads would not be impacted by the proposed changes.

STAFF RECOMMENDATION:
Hold a public hearing and make a recommendation to the City Council.

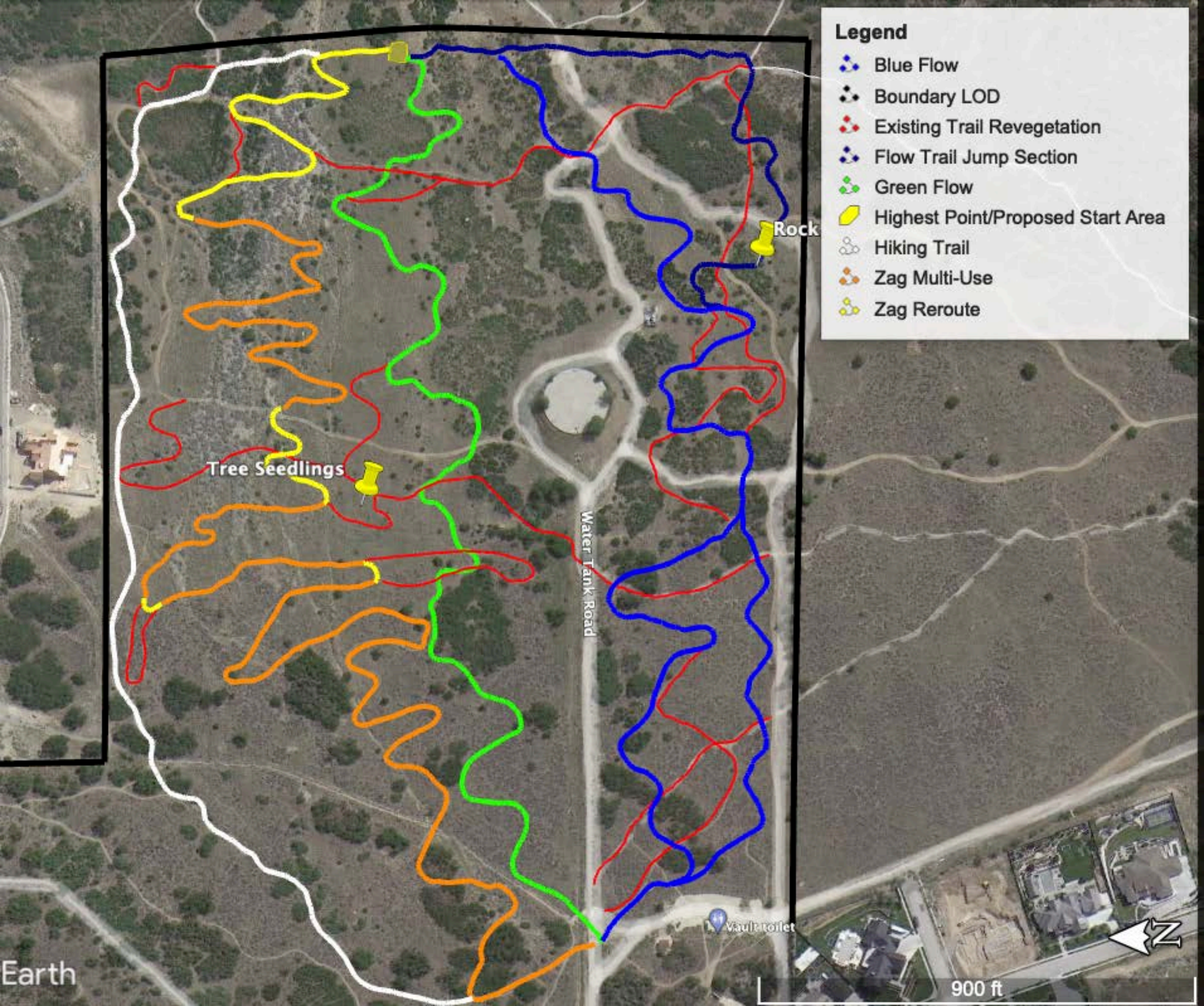
SAMPLE MOTION TO APPROVE:
I move to recommend that the trail master plan update for Lambert Park be adopted as proposed.

SAMPLE MOTION TO APPROVE WITH CONDITIONS:
I move to recommend that the trail master plan update for Lambert Park be adopted with the following conditions:

- ***Insert Finding***

SAMPLE MOTION TO TABLE/DENY:
I move to recommend that the trail master plan update for Lambert Park be tabled (or denied) based on the following:

- ***Insert Finding***


Legend
Blue Flow
Boundary LOD
Existing Trail Revegetation
Flow Trail Jump Section
Green Flow
Highest Point/Proposed Start Area
Hiking Trail
Zag Multi-Use
Zag Reroute
Rock
Tree Seedlings
Water Tank Road
Vault toilet
Earth
900 ft
N

SHAPESHIFT
TERRAIN PARKS

Estimate

168 Countryside Cir
Park City, UT 84098
435.640.5698
bryce@shapedirt.com

Date: Jan 30, 2022
Estimate #: 01

Prepared for:	**Project**
Alpine City Attn: Jed Muhlestein 20 N Main St Alpine, UT 84004	Lambert Park MTB Flow Trails

New Master Trail Plan Proposal

- **Green Level** flow trail | 0.58 mi | $5.90/LF
- **Blue Level** flow trail | 0.62 mi | $6.30/LF
- **Jump Enhanced** flow trail | 0.29 mi | $6.30/LF + $850/jump (x5)
- **Lower Wild Cat** Rehab | 0.20 | $4.50/LF
- Reroute sections of **Zag** | 0.29 mi reroute sections only | $5.00/LF
- Widen and Rehab **Zag** for multi-use | 0.95 mi | $3.20/LF
- Rehab and reroute **Ziggy** trail | hiking only | 0.50 mi | $3.20/LF
- Trail revegetation TBD

Total Estimate: $89,495.60

The estimates above are for natural surface trails that include native materials only. No imported material such as wooden structures, ramps, culverts, or any other man-made structure is included in the pricing above. All linear feet figures are estimates, actual LF will vary. The pricing above does not include trail maps for kiosks or trail signage.

Billing based on linear feet of trail constructed and billed monthly.

Shapeshift will warrant issues related to drainage (pooling) for a period of 1 year from completion. Overgrowth of weeds and trail impact from heavy use is not warrantied.

Accepted By_____ Print_____ Date_____

PLANNING COMMISSION AGENDA

SUBJECT: MAG Project – Canyon Crest Widening

FOR CONSIDERATION ON: 15 FEBRUARY 2022

PETITIONER: Staff

ACTION REQUESTED BY PETITIONER: Review ordinance modifications as required by MAG for a MAG funded project to widen Canyon Crest Road

BACKGROUND INFORMATION:

Canyon Crest road is one of Alpine City's main arterial roads and means of ingress/egress outside the city. During peak hour morning and afternoon time periods this road sees significant traffic congestion. In 2018 Alpine, Highland, and Lehi teamed together and submitted a proposal to Mountainland Association of Governments (MAG) to do a North Utah County/SR-92 traffic study. The purpose of the study was to identify projects that would alleviate traffic congestion north of SR-92. The proposal was accepted, and the study was completed shortly thereafter.

The study looked at all the major intersections along SR-92, from I-15 in Lehi to the mouth of American Fork Canyon. The study shows a need to add lanes at the intersection of 4800 W / SR-92 and extend those improvements northward into Alpine. This means expanding the current cross section of Canyon Crest Rd from a three-lane road to a five-lane road. The expansion would result in two travel lanes in both directions with a middle turn lane.

The project will be proposed to be phased into three parts. The first phase would include intersection improvements at the intersection of 4800 W / SR-92 and extend those improvements (adding lanes) to Healey Boulevard in Alpine. If approved, the project would be funded over the next five years and constructed shortly thereafter, assuming all required right-of-way is purchased. The estimated cost for Phase 1 is $8,944,000 (2025). There is a 6.77% match requirement. Alpine City would only be responsible for matching the portion of roadway costs that is constructed in Alpine City limits.

In order for the project to move forward, Alpine City's General Plan must support a 5-lane arterial road at this location. The General Plan itself does not need to be modified, but several documents it references would need to be. Changes must be made to the Transportation Master Plan Map, Standard Specifications and Details, and Development Code. The specifics on those changes are found in the Staff report.

<u>MAG requires these changes to be made prior to Final Concept Application due date on March 17, 2022.</u>

STAFF RECOMMENDATION:
Review Staff findings and make a motion

ALPINE CITY
STAFF REPORT
January 25, 2022

To: Alpine Planning Commission and City Council

From: Staff

Prepared By: Jed Muhlestein, City Engineer
Engineering & Public Works Department

Re: 4800 West/Canyon Crest Road Expansion - Project Funding Support

Canyon Crest road is one of Alpine City's main arterial roads. During peak hour morning and afternoon time periods this road sees significant traffic congestion. This congestion originates at the intersection of SR-92 and 4800 West (in Highland) and, at times, extends northward on Canyon Crest Rd to Ridge Drive in Alpine. Nearly one mile long. This is not the only road which sees congestion, but it is the worst. See Appendix A for congestion photos.

In 2018 Alpine, Highland, and Lehi teamed together and submitted a proposal to Mountainland Association of Governments (MAG) to do a North Utah County/SR-92 traffic study (see Appendix D). The purpose of the study was to identify projects that would alleviate traffic congestion north of SR-92. The proposal was accepted, and the study was completed shortly thereafter.

The study looked at all the major intersections along SR-92, from I-15 in Lehi to the mouth of American Fork Canyon. It also investigated the impacts certain potential new road connections between Alpine/Highland/Lehi would have on the congestion of SR-92. In the end, one of the top projects highlighted was the need to add lanes at the intersection of 4800 W / SR-92 and extend those improvements northward into Alpine. This means expanding the current cross section of Canyon Crest Rd from a three-lane road to a five-lane road. The proposed cross section is shown in Figure 1. To make the project as cost effective as possible, it is intended to expand the road from the west curb, leaving as much of the westerly curb/gutter and sidewalk in place. Having said that, there are places where the westerly side will be reconstructed.

Figure 2 shows the overall project idea and how it will be phased into three parts. Phase 1 (red) would be the priority over the next five years for funding and project kickoff. The estimated cost is $8,944,000 (See Figure 5). There is a 6.77% match requirement. Alpine City would only be responsible for matching the portion of roadway costs that is in Alpine City limits.

FIGURE 1 – PROPOSED CANYON CREST CROSS-SECTION

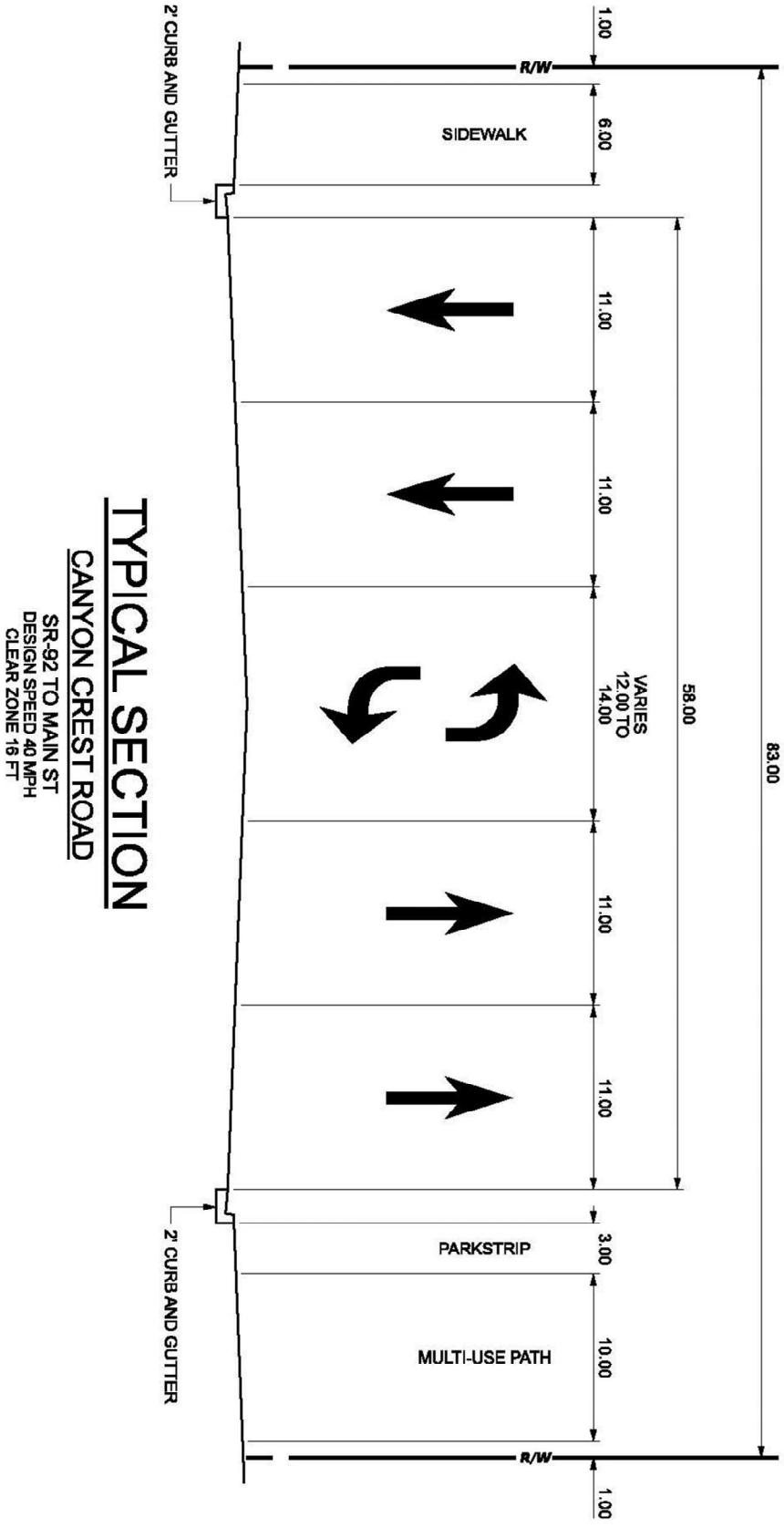
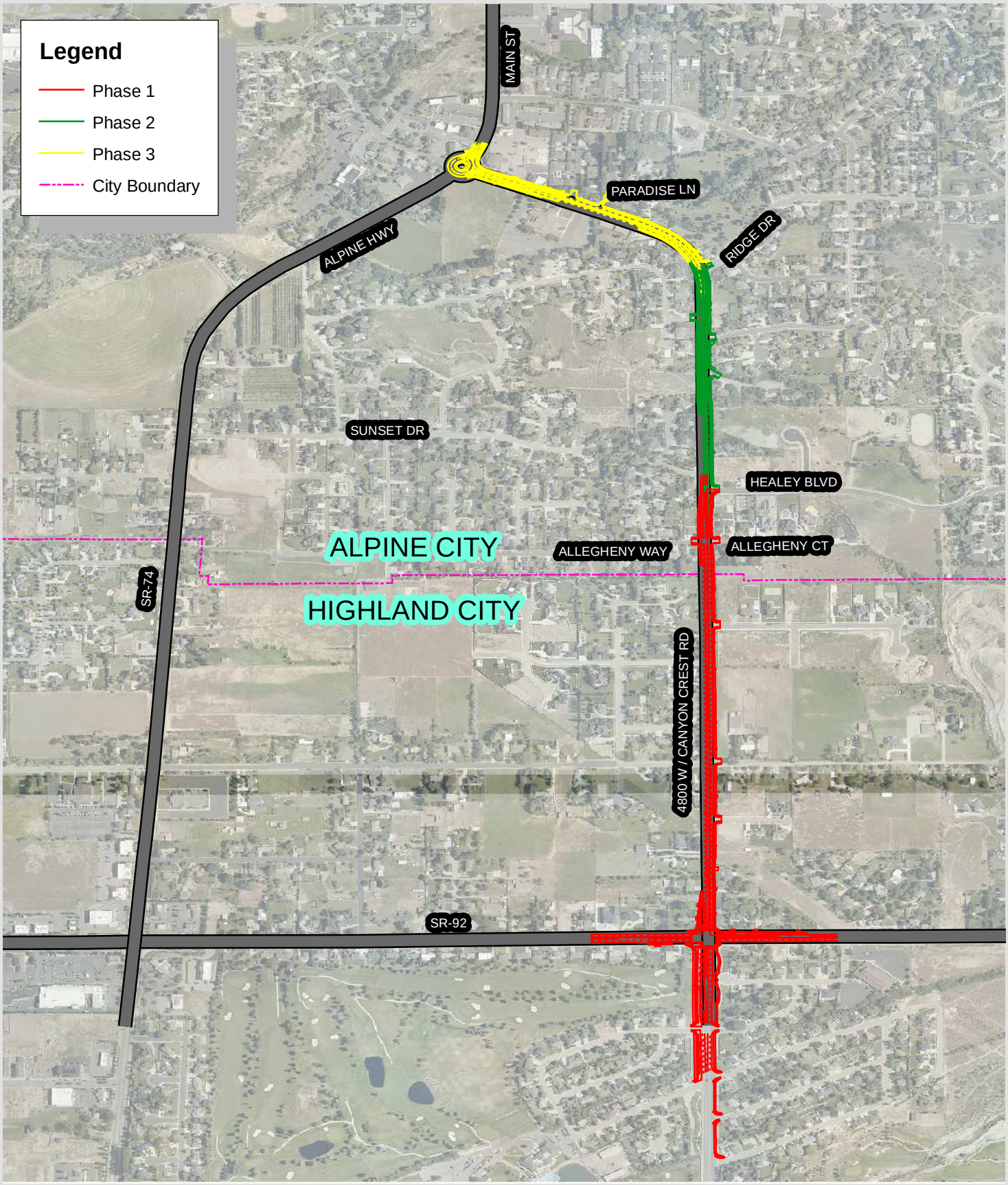


FIGURE 2 - PROJECT PHASING



Canyon Crest Expansion
PROJECT PHASING

N

Date: 11/2/2021

How was the proposed roadway cross-section in Figure 1 derived?

When expansion of Canyon Crest Road was first discussed, Avenue Consultants was asked to provide a concept plan that would be ideal for traffic and pedestrians. The ideal cross section is shown in Figure 3 (page 6). This section included 5' bike lanes/shoulders, a 4' park strip, and 3' of right-of-way property beyond the multiuse path. This cross section is 13' wider than what was settled upon in the end (Figure 1). This cross section would have required buying several properties and removing some existing houses. With some refinement, the cross section was reduced to the bare minimum required for traffic flow. Bike lanes were removed (the multiuse trail was not removed). The park strip was reduced to 3' from 4' and removed completely in certain sections where right-of-way and building setbacks were tight. The 3' clear space behind the multiuse path was reduced from 3' to 1'. The refined design will not require any homes to be bought and removed.

What does this project mean for Alpine residents owning property along the corridor?

Expansion of the roadway will require right-of-way acquisition from several Alpine City properties along the corridor. This not only means acquiring property but using the acquired property to build the proposed roadway platform. Existing landscaping, fences, trees, retaining walls… all would be removed and replaced with the roadway cross section as shown in Figure 1. To give a better idea of the impacts, Appendix B shows more detailed diagrams of the concept plan overlaid onto existing properties.

What does this project do for all Alpine residents?

The project will benefit all residents who travel this road for many years to come as it provides the much-needed room for the traffic generated by mostly Alpine City residents. It would extend to the round-a-bout, a 10' wide concrete multiuse trail system that currently terminates at the SR-92 intersection. Connection to this trail system is important for the north Utah County Active Transportation system, as that trail system connects to many others as it traverses further into Highland City. See Figure 4 on page 7.

What is Staff looking for from the Alpine City Council?

Staff is seeking the support of the Alpine City Council for this project. Proposing a project that will be impactful to residents who own property along this corridor is not an easy task for Staff and has not been taken lightly. A great deal of coordination and effort has occurred between MAG staff, UDOT, Avenue Consultants, and Highland City to make sure that what is being proposed will be the least impactful to residents owning property along this corridor. Yet, the project will impact those residents. Some more than others. There may be residents that do not want to sell property to allow the project to move forward. Staff needs to know that if such a situation arises, the City Council would be willing to take the steps necessary to acquire needed right-of-way.

What does MAG require of Alpine City to move forward?

MAG requires the City to have an updated General Plan which includes a 5-lane road on Canyon Crest prior to March 17, 2022 (see Appendix D, Project Approval Time-Line.)

Specifically, what does the City need to change so the General Plan would comply with MAG's requirements?

Staff is proposing a new "Major Arterial" street classification which shows a 5-lane roadway cross section. This proposal requires three code changes which are:

1) A new "Major Arterial" street classification is proposed on the Transportation Master Plan Map;
2) A new "Street Cross-Section (Major Arterial)" detail is proposed to be added to the Standard Specification and Details;
3) A new definition for "Major Arterial" is proposed in section 4.07.040 of the Development Code.

All these items are included in Appendix E for review.

STAFF RECOMMENDATION

Review staff report and findings and make a recommendation to City Council to either approve or deny the proposed changes. Findings are outlined below.

Findings for a Positive Motion:

A. The proposed changes would enable the MAG funded project to move forward which has the following benefits:
    a. Being a MAG funded project, the City will only be responsible for 6.77% of the costs of the project that resides in Alpine City limits;
    b. The project will reduce traffic congestion on Canyon Crest;
    c. The project will reduce traffic congestion at the intersection of SR-92 and 4800 West;
    d. The project connects existing trails in Highland to Alpine with a 10-foot wide multi-use path;
    e. Less congestion should result in less traffic incidents along this section of roadway.

Findings for Negative Motion:

A. **Insert finding**

MODEL MOTIONS

SAMPLE MOTIONS TO APPROVE

I motion to recommend approval of the proposed changes to the Transportation Master Plan Map, Standard Specifications and Details, and Ordinances 4.03.010 & 4.07.040 as proposed.

SAMPLE MOTION TO APPROVE with changes or TABLE or DENY

I motion to recommend approval (or table or recommend denial) of the proposed Transportation Master Plan Map, Standard Specifications and Details, and Ordinances 4.03.010 & 4.07.040 with the following conditions:

- **Insert finding**

FIGURE 3 – IDEAL CANYON CREST CROSS-SECTION

(This cross section was revised; the proposed cross section for the project is shown in Figure 1)

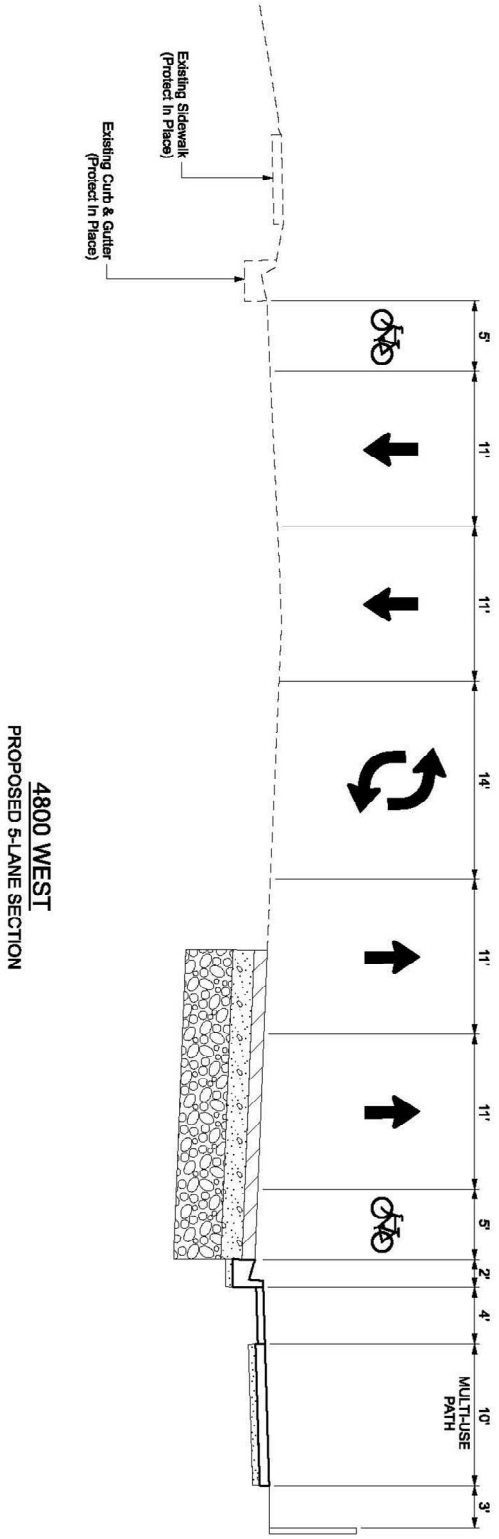


FIGURE 4 – CURRENT MAG ACTIVE TRANSPORTATION MAP

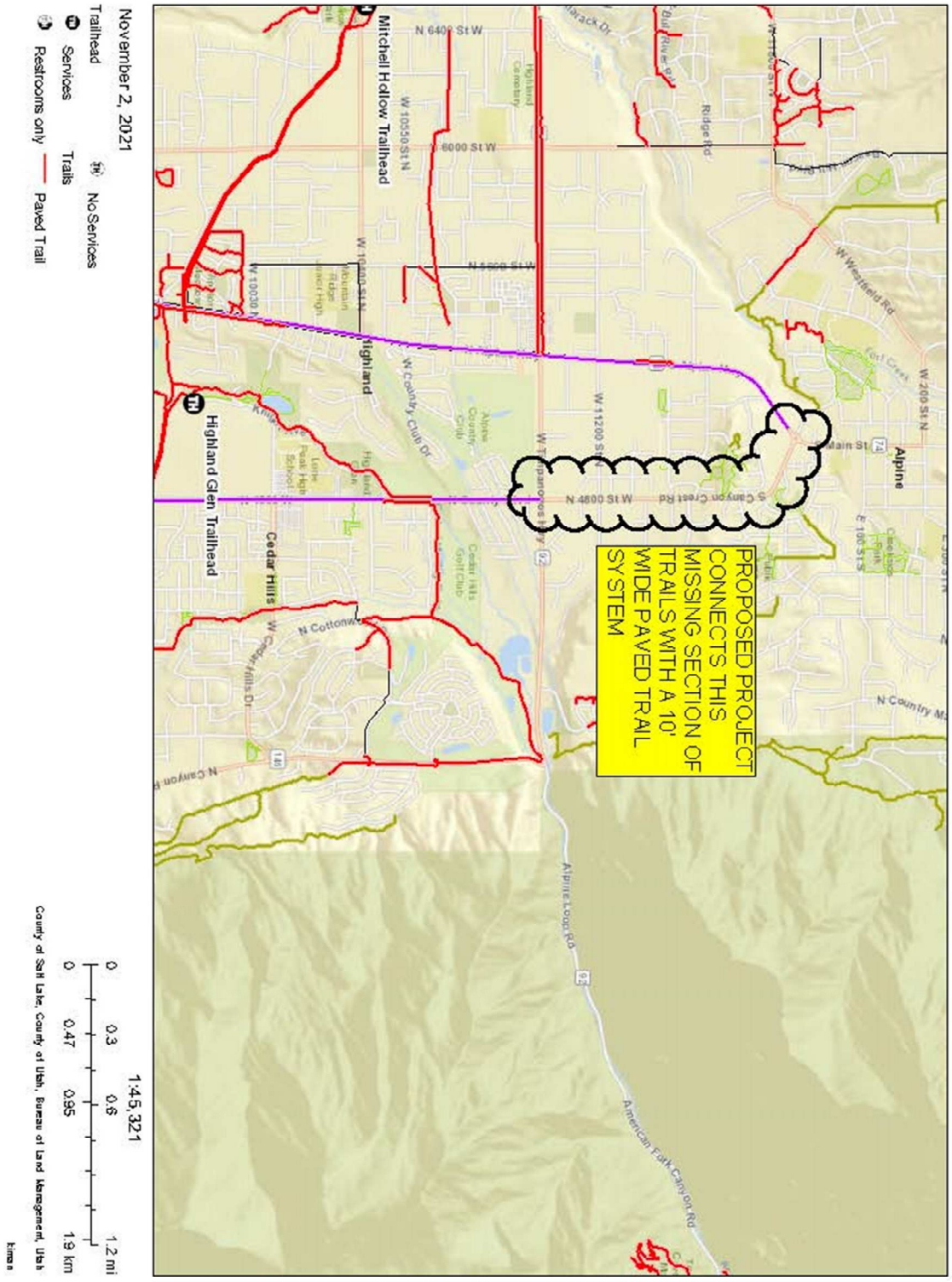


FIGURE 5

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 North Regional Traffic Study
Canyon Crest; SR-92 to Main Street (phase 1)
Cost Estimate - Concept Level

Prepared By: David Webb **Date** 10/15/2021

Proposed Project Scope: **Widen Canyon Crest to a 5-lane section from SR-92 to Main Street.**

Approximate Route Reference Mile Post (BEGIN) =	n/a	(END) =	n/a
Project Length =	1.207	miles	6,373 ft
Current FY Year (July-June) =	2021		
Assumed Construction FY Year =	2025		
Construction Items Inflation Factor =	1.18	4 yrs for inflation	
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	3.25%		
Assumed Yearly Inflation for Right of Way (%/yr) =	4.0%		
Items not Estimated (% of Construction) =	30.0%		
Preliminary Engineering (% of Construction + Incentives) =	14.0%		
Construction Engineering (% of Construction + Incentives) =	10.0%		

Construction Items		**Cost**	**Remarks**
Public Information Services		$10,000	
Roadway and Drainage		$2,902,111	
Traffic and Safety		$79,678	
Structures		$0	
Environmental Mitigation		$59,000	
ITS		$0	
	Subtotal	$3,050,789	
	Items not Estimated (30%)	$915,237	
	Construction Subtotal	**$3,966,026**	
P.E. Cost	**P.E. Subtotal**	**$566,304**	14%
C.E. Cost	**C.E. Subtotal**	**$404,503**	10%
Right of Way	**Right of Way Subtotal**	$1,166,747	
Utilities	**Utilities Subtotal**	$1,032,100	
Incentives	**Incentives Subtotal**	$79,000	
Miscellaneous	**Miscellaneous Subtotal**	**$0**	

Cost Estimate (ePM screen 505)		**2021**		**2025**
P.E.		**$566,000**		**$643,000**
Right of Way		**$1,167,000**		**$1,365,000**
Utilities		**$1,032,000**		**$1,222,000**
Construction		**$3,966,000**		**$4,698,000**
C.E.		**$405,000**		**$460,000**
Incentives		**$79,000**		**$94,000**
Aesthetics	**0.75%**	**$30,000**		**$36,000**
Change Order Contingency	**9.00%**	**$360,000**		**$426,000**
UDOT Oversight		**$0**		**$0**
Miscellaneous		**$0**		**$0**
	TOTAL	**$7,605,000**	**TOTAL**	**$8,944,000**

PROPOSED COMMISSION REQUEST	**TOTAL**	**$7,605,000**	**TOTAL**	**$8,944,000**

Project Assumptions/Risks

1 Pavement design: 8" HMA, 6" UTBC, 12" GB

2 Roadway excavation includes asphalt removal

3 Typical Section: (2)11-ft lanes, 14-ft TWLT lane, (2)11-ft lanes, no shoulder, 2-ft Curb and Gutter, 3-ft parkstrip, 10-ft path

4 3-ft parkstrip removed as needed to reduce ROW impacts

5 Most widening completed to east maintaing existing edge of pavement on the west

6

7

8

9

10

11

12

13

14

APPENDIX A
Photos of congestion along 4800 West / Canyon Crest Road

4800 West

(looking Northward)

Oct. 29, 2021

(approx. 7:30 am)

4800 West

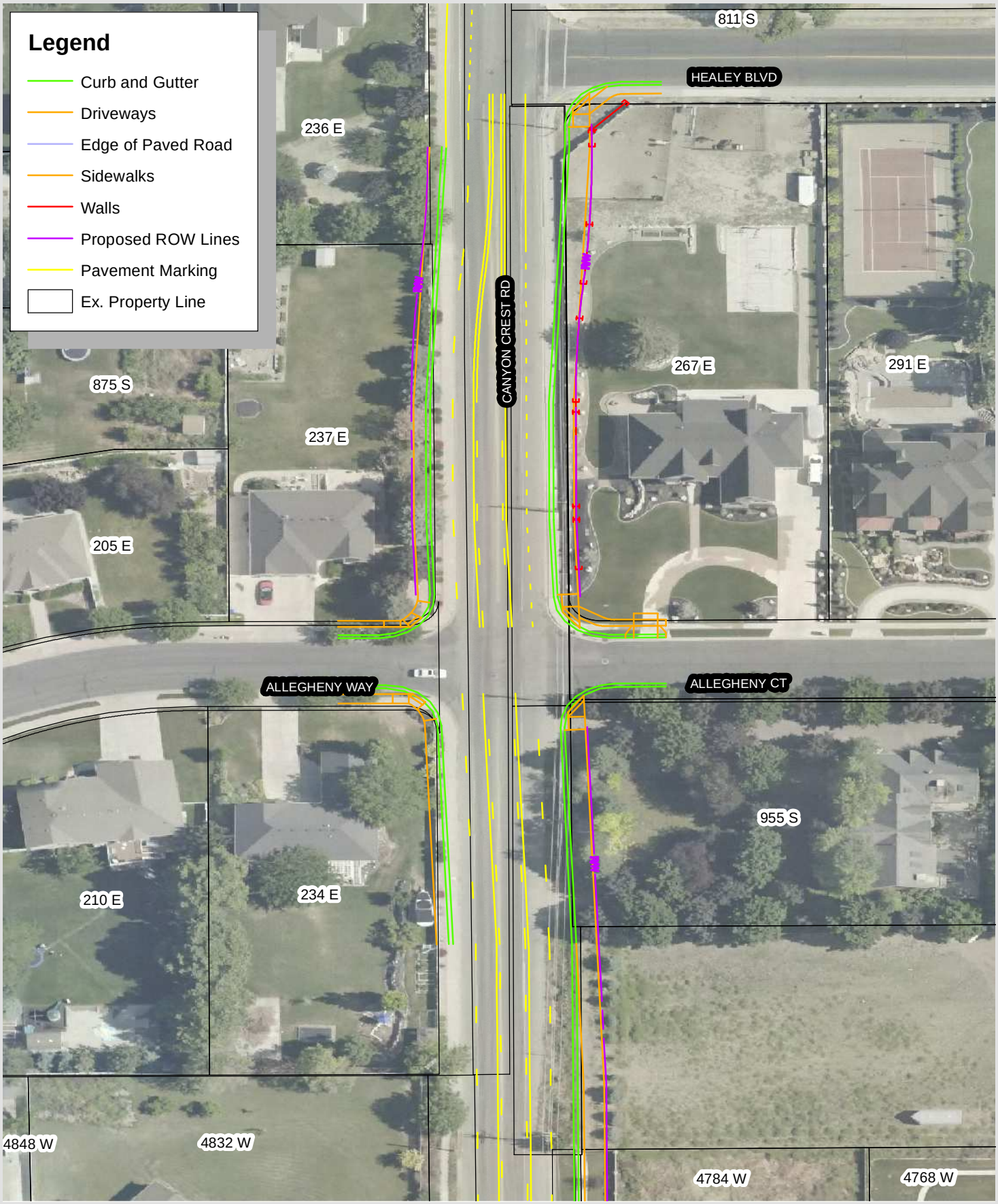
(looking Southward)

Nov. 2, 2021

(approx. 3:50 pm)


PRELIMINARY
NOT FOR CONSTRUCTION
10/18/2021
SR-129 (4800 WEST)
COUNTRY CLUB DR
VISTA DR
COUNTRY CLUB DR
PAVE CUT

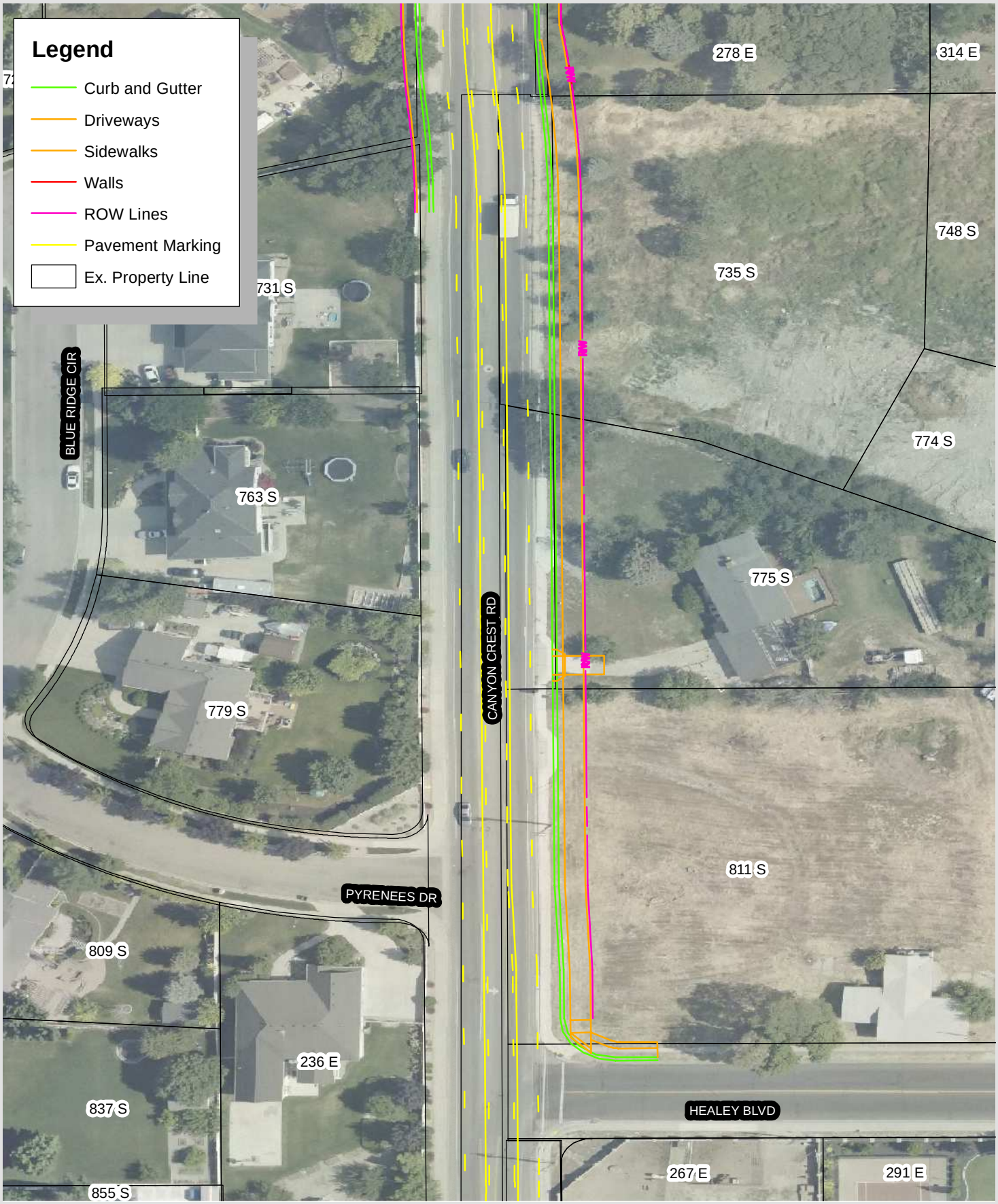
APPENDIX B
Concept Plan – Individual Property Analysis



Phase1 - Sheet 1
Canyon Crest Expansion

N

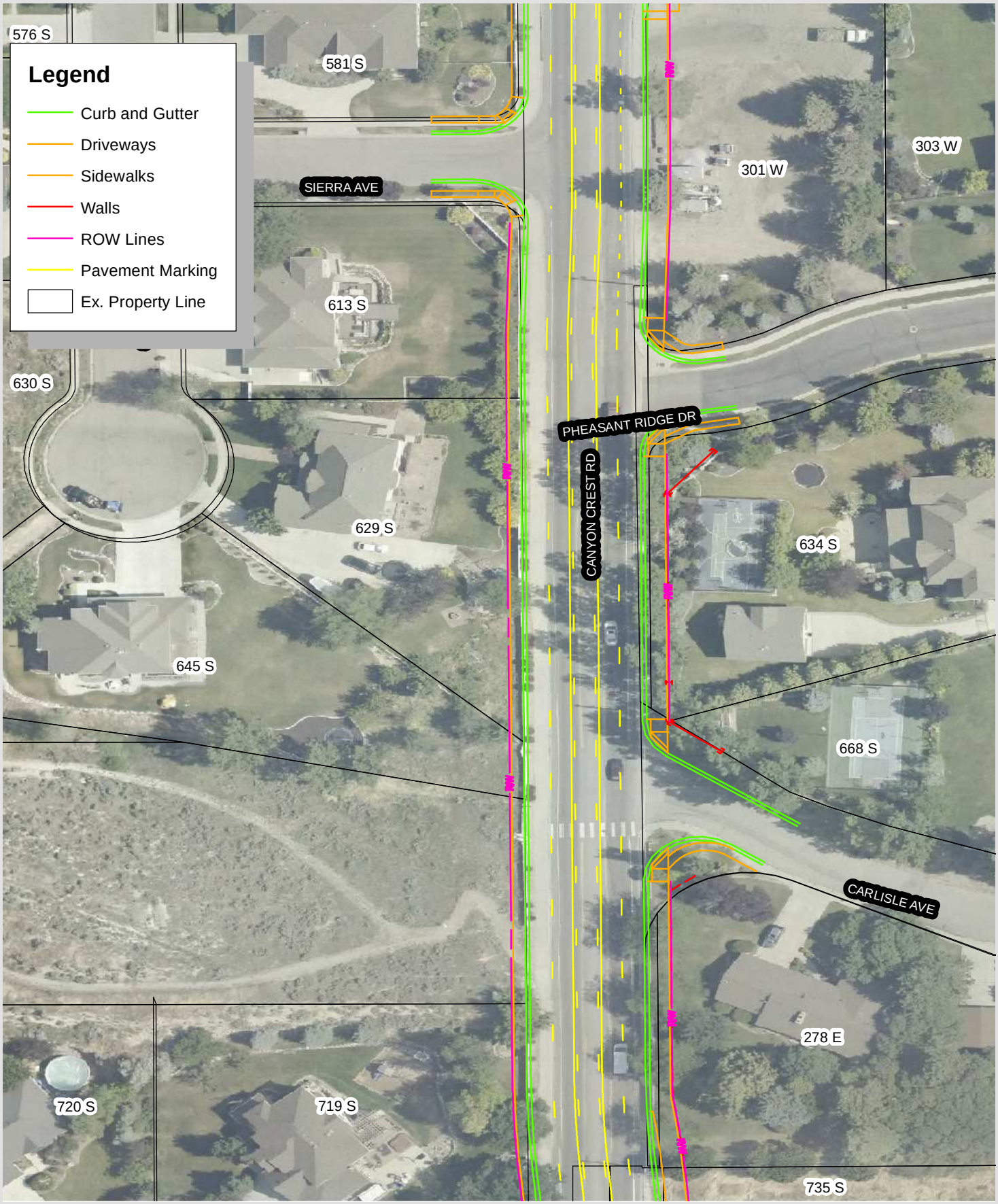
Date: 11/1/2021



Phase 2 - Sheet 1
Canyon Crest Expansion

N

Date: 11/1/2021



Phase 2 - Sheet 2
Canyon Crest Expansion

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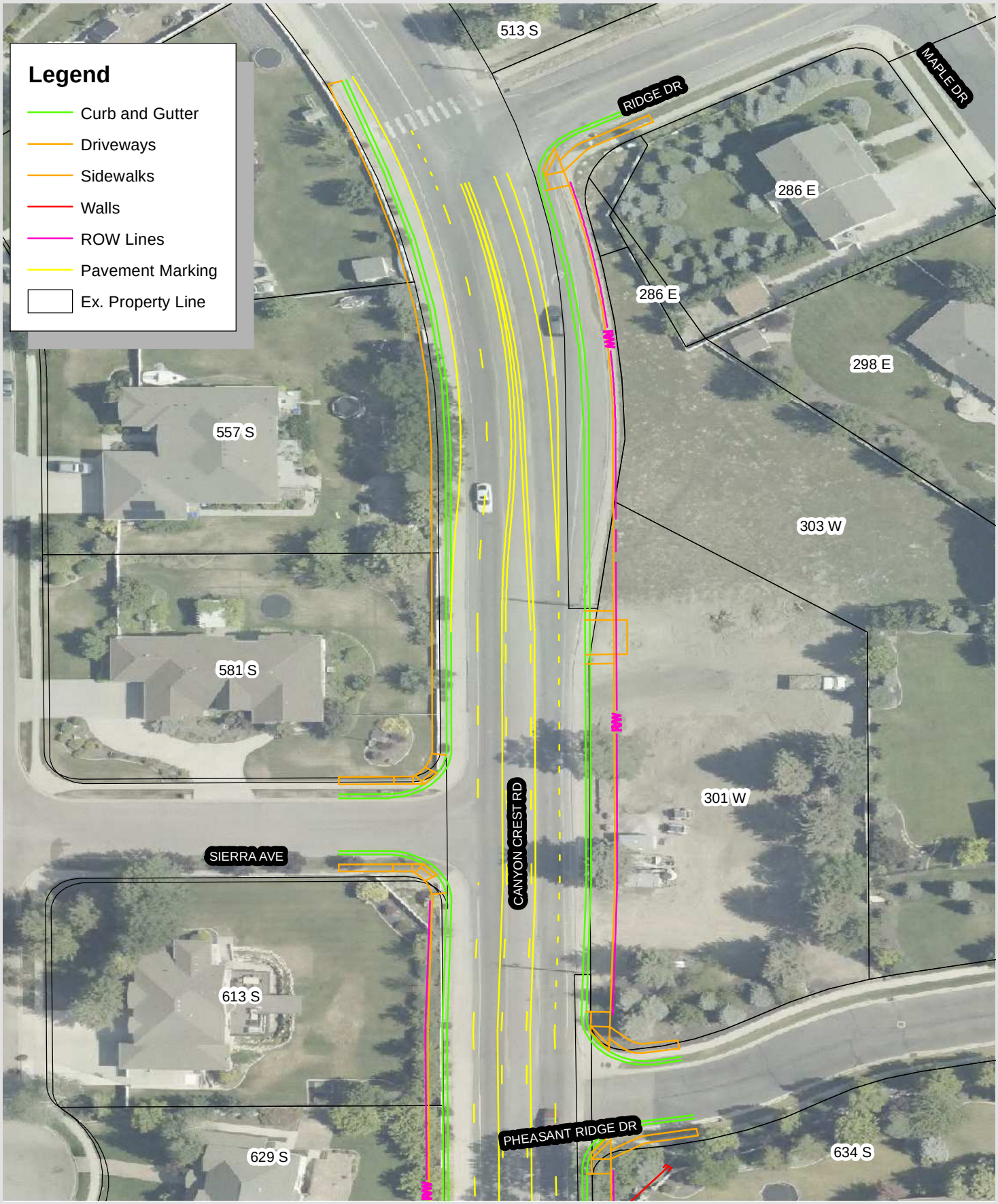
Date: 11/1/2021

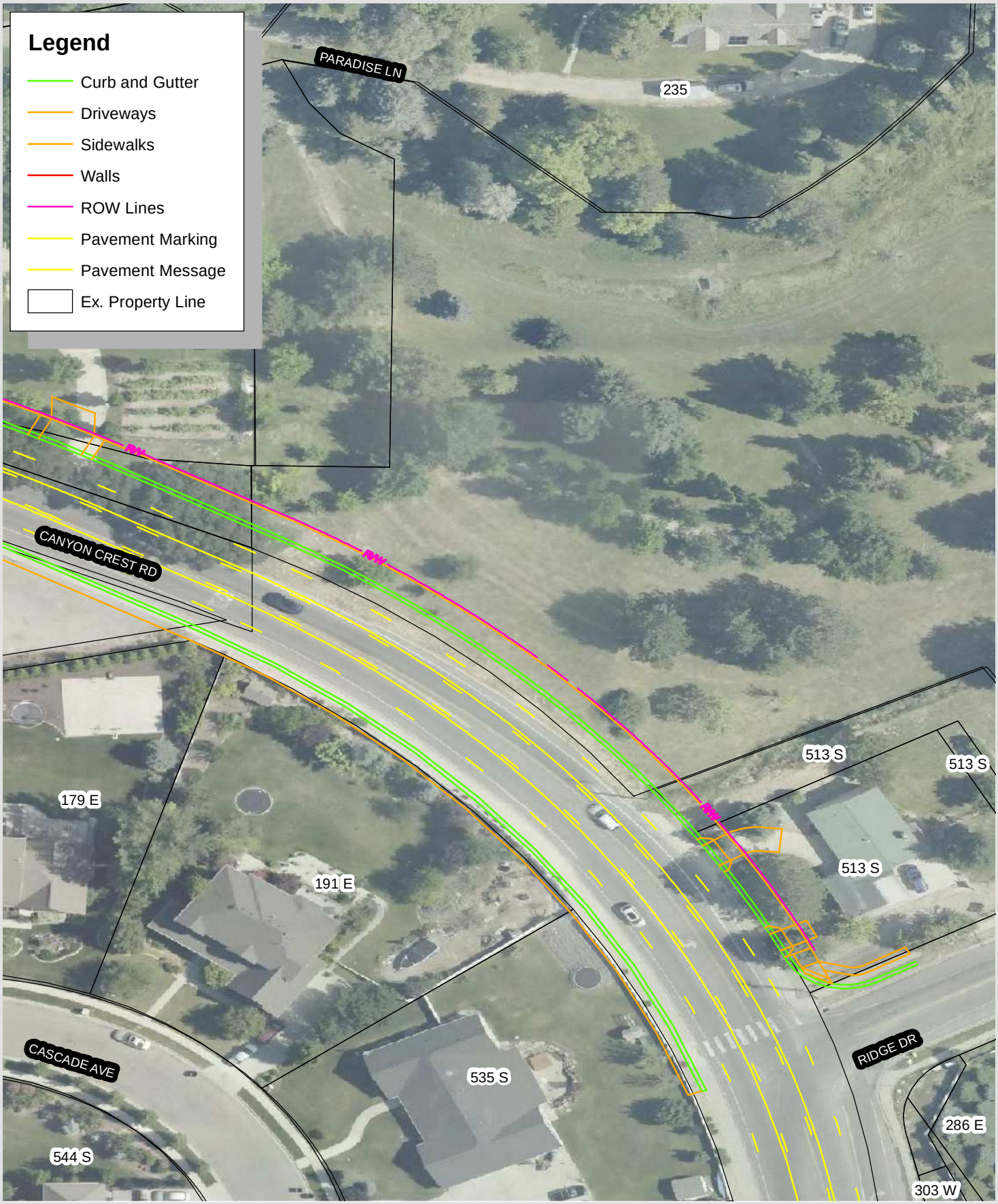


Phase 2 - Sheet 3
Canyon Crest Expansion

ALPINE CITY
ESTABLISHED 1850

N

Date: 11/1/2021



Phase 3 - Sheet 1
Canyon Crest Expansion

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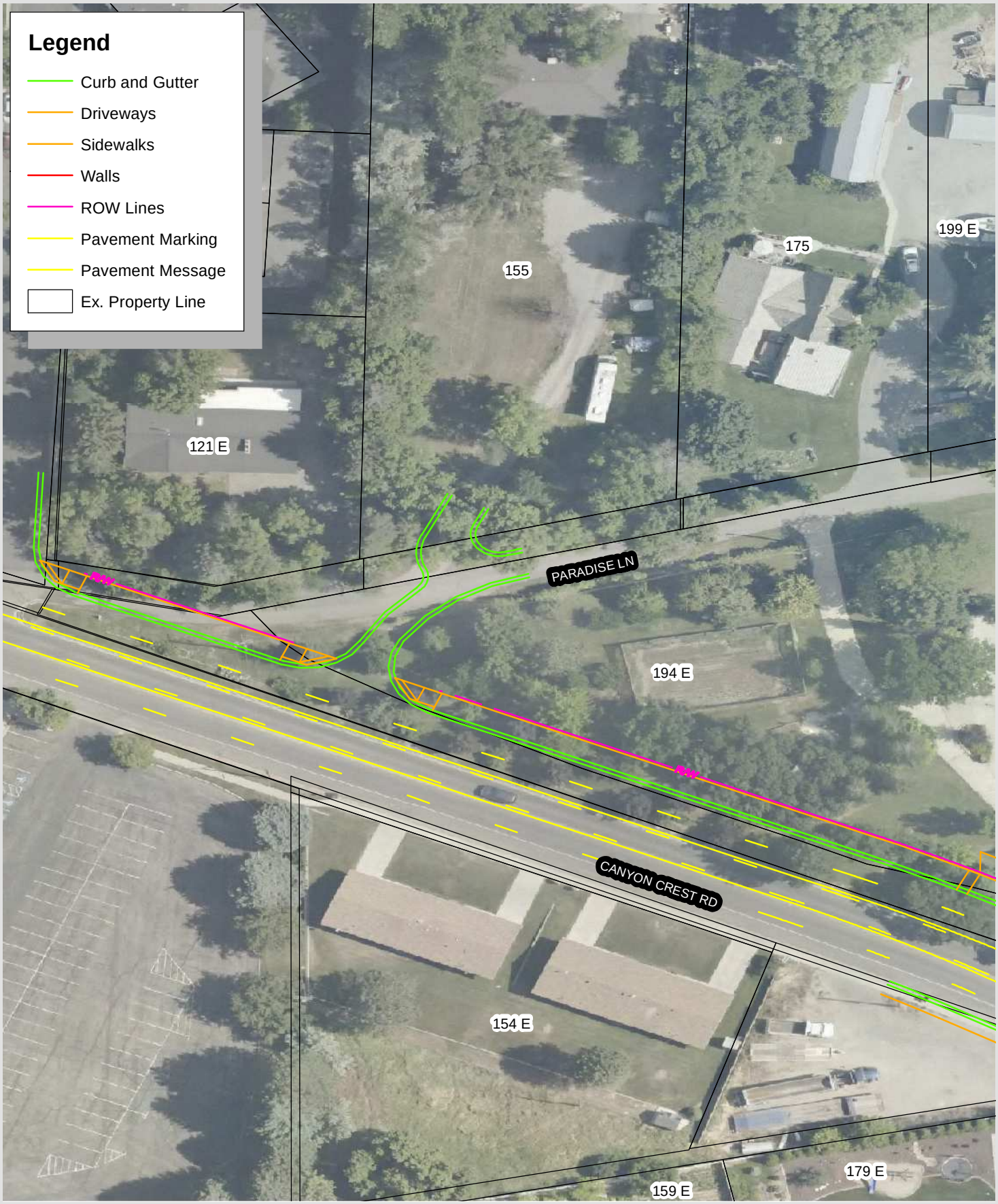
Date: 11/1/2021



Phase 3 - Sheet 2
Canyon Crest Expansion

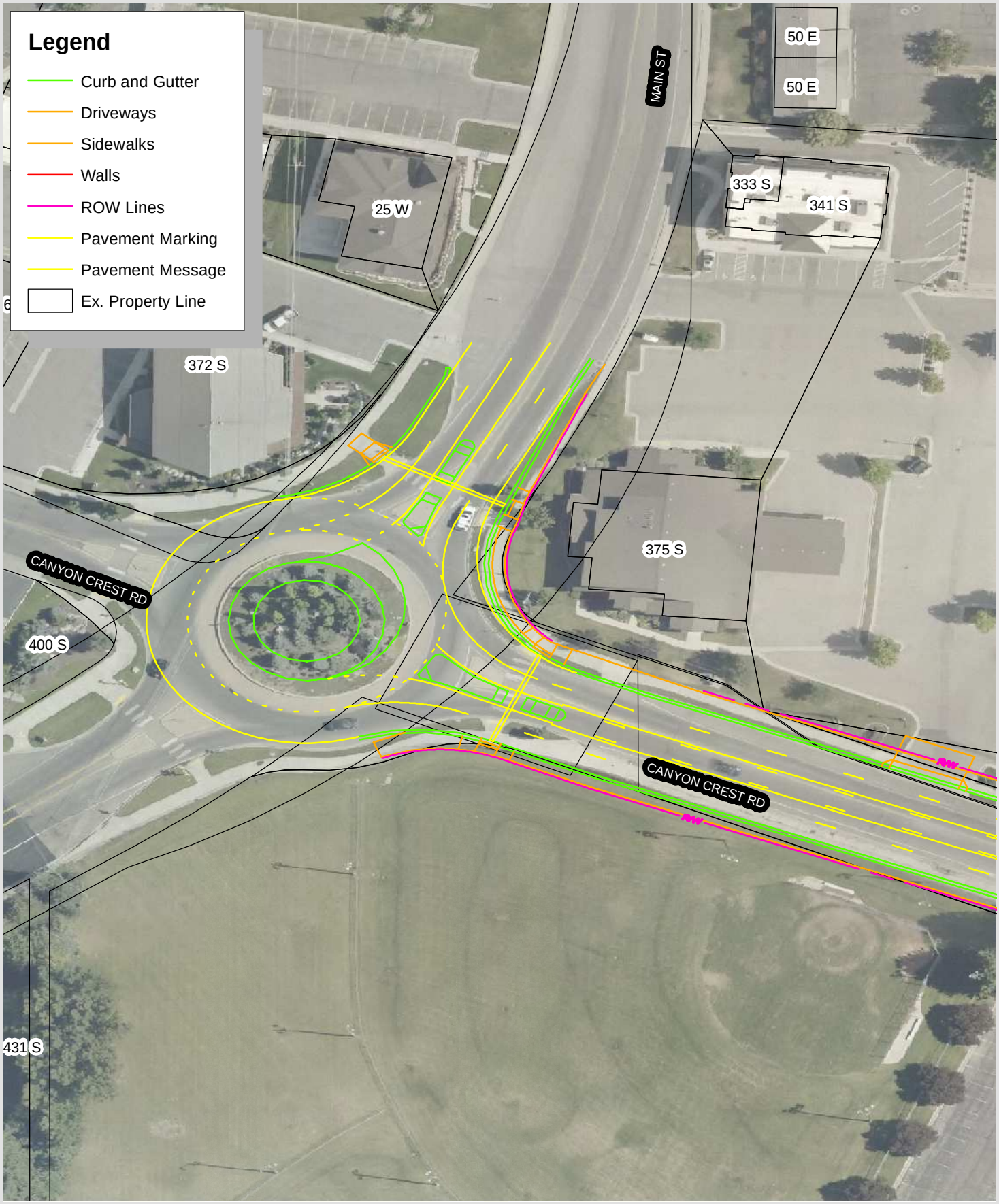
N

Date: 11/1/2021

Phase 3 - Sheet 3
Canyon Crest Expansion

N

Date: 11/2/2021



Phase 3 - Sheet 4
Canyon Crest Expansion

N

Date: 11/2/2021

APPENDIX C
Project Approval Time-Line

Kickoff

- Eligibility
- Funding
- Schedule
- Process

MPO TAC Meeting | MPO RPC Meeting | Due Date | MAG Staff Action

Schedule

Kickoff Meetings

TAC Kickoff	27-Sep 2021
RPC Kickoff	7-Oct

Project Idea Application

Draft Idea Application Due	1-Nov
Sponsor Idea Reviews with MPO Staff	8-10 Nov
Final Idea Application Due	2-Dec
TAC Review Projects/MPO Score	10-Jan 2022
RPC Review Projects/MPO Score	3-Fec

Concept Application

Draft Concept Application Due	10-Feb
Sponsor Review with MPO Staff	21-24 Feb
Final Concept Application Due	17-Mar

Concept Reviews

MPO Review Concepts for Accuracy, Address Questions	21-Mar-7-Apr
TAC / MPO Staff Field Review	11-12-Apr
Technical Review Scores and Evaluation Released	20-Apr

Project Priority List

TAC Create Project Priority List	25-April
RPC Review Project Priority List	5-May
RPC Approve Project Priority List	5-Jun

TIP Approval-Project Funding

MPO Staff Apply Funding to Project Priority List	9-23 Jun
Draft TIP Released to Public Comment	1-Jul
Draft TIP Public Comment Meeting	14-Jul
TAC Recommends TIP Approval	25-Jul
RPC Approves TIP	4-Aug

APPENDIX D
SR-92 Access & Circulation Study (2022)

S.R. 92 Access & Circulation Study

January 2022

MAG
Expert Resources. Enriching Lives.

UDOT
Keeping Utah Moving

ALPINE CITY
ESTABLISHED 1850

HIGHLAND CITY

LEHI CITY

S.R. 92 Access & Circulation Study

prepared by

Avenue Consultants

January 6, 2022

Table of Contents

1 Summary of Findings 1
2 Introduction 2
3 Analysis Methodology 2
3.1 Travel Demand Modeling 2
3.2 Traffic Operations Analysis 4
3.3 Measures of Effectiveness 5
4 Street Connectivity 5
4.1 Connectivity Benefits 5
4.2 Study Area Connectivity Options 7
4.2.1 11800 North 8
4.2.2 Long Drive & Ranch Drive 9
4.2.3 High Bench Road 10
4.3 Study Area Connectivity Analysis 10
5 S.R. 92 Intersection Analysis 11
5.1 Existing Conditions 12
5.2 Future 2050 Conditions 12
5.2.1 Highland Boulevard 13
5.2.2 6000 West 14
5.2.3 6400 West 15
5.2.4 5300 West (S.R. 74) 16
5.2.5 North County Boulevard (S.R. 129) 17
6 Roadway Widening Analysis 18
7 Concept Designs 18
7.1 6000 West 18
7.2 5300 West (S.R. 74) 19
7.3 4800 West/Canyon Crest Road 20
8 Conclusions 20

List of Figures

Figure 1: Study Area....3
Figure 2: Street Connectivity Benefits....6
Figure 3: Potential Connection Locations....7
Figure 4: 11800 North Connection....8
Figure 5: Long Drive / Ranch Drive Connections....9
Figure 6: High Bench Road Connection....10
Figure 7: Highland Boulevard Intersection LOS....13
Figure 8: 6000 West Intersection LOS....14
Figure 9: 6400 West Intersection LOS....15
Figure 10: 5300 West (S.R. 74) Intersection LOS....16
Figure 11: North County Boulevard (S.R. 129) Intersection LOS....17
Figure 12: 6000 West Intersection Concept Design....18
Figure 13: 5300 West (S.R. 74) Intersection Concept Design....19
Figure 14: North County Boulevard (S.R. 129) Intersection Concept Design....20

List of Tables

Table 1. Intersection Level of Service Criteria....5
Table 2. S.R. 92 Intersection Volumes With and Without Connections....11
Table 3. Existing Intersection Level of Service / Delay Results....12
Table 4. 4800 West/Canyon Crest Road Phase Limits and Cost Estimates....20

1 SUMMARY OF FINDINGS

The Utah Department of Transportation, Mountainland Association of Governments, and the cities of Lehi, Highland, and Alpine joined commissioned a study to evaluate traffic operations and connectivity for the eastern portion of State Route 92 (Timpanogos Highway). The study considered major intersection from Lehi Center Street to Canyon Road. Several off-corridor locations were evaluated where existing streets could be extended or connected to improve the overall street network connectivity in the area. The *Utah Street Connectivity Guide* describes how good street connectivity provides benefits to mobility, transportation choices, emergency services, safety, and the economy.

Three specific locations were evaluated for increased street connectivity. From a traffic volume perspective, they generally reduced projected future volumes on S.R. 92 by a few percentage points and would result in slightly better operational performance on the corridor. However, even with relatively minor traffic performance benefits, the connections should still be seriously considered due to the other benefits that good street connectivity can provide.

Currently, traffic on the S.R. 92 generally operates well with minor exceptions at 5300 West (S.R. 74) and Canyon Road. A traffic signal at Canyon Road will fix the issues there and should be able to accommodate future demand as well. A recent study found that a signal is warranted at Canyon Road. By 2050 the major intersections from Highland Boulevard to North County Boulevard are all projected to operate at LOS E or F if no modifications are made. Three travel lanes in each direction will be needed on S.R. 92 from the Commuter Lanes on the west through the 5300 West intersection on the east to meet the anticipated traffic demands. The geometric intersection improvements identified for each intersection are:

- **Highland Boulevard** – Dual westbound left turn lanes, which would require some widening on the south side of the intersection to accommodate two receiving lanes.
- **6000 West** – Three eastbound and westbound through lanes and exclusive northbound and southbound right turn lanes. The analysis shows that exclusive right turn lanes would not be needed to achieve LOS D, but they would be valuable for safety and driver comfort and should still be considered.
- **6400 West** – Three eastbound and westbound through lanes.
- **5300 West (S.R. 74)** – Three eastbound and westbound through lanes and dual eastbound left turn lanes ***or*** two northbound and southbound through lanes and dual eastbound left turn lanes.
- **4800 West/North County Boulevard (S.R. 129)** – Two northbound and southbound through lanes.

A need was also identified for widening one the main access roads to Alpine. 4800 West/Canyon Crest Road was selected as the preferred roadway due to slightly higher future volumes and better regional connectivity since it connects to North County Boulevard, which provides good access to I-15.

Concept designs and cost estimates were prepared for improvement options selected by the study team for the 6000 West, 5300 West, and the 4800 West/Canyon Crest Road widening, which includes improvements to the S.R. 92 intersection. A phasing analysis was not completed, but since the 5300 West intersection already operates at LOS E, it would be the location with the highest priority. The concept design for 5300 West is quite robust with additional through lanes on all four legs and dual eastbound left turn lanes. Those improvements could also be phased which would lower the initial cost but would result in additional projects at that same intersection in the future when more improvements are needed.

2 INTRODUCTION

In collaboration with Utah Department of Transportation (UDOT), Mountainland Association of Governments (MAG), Lehi City, Highland City, and Alpine City, an access and circulation study was conducted for the eastern portion of S.R. 92 (Timpanogos Highway). The study primarily considered major intersections from Lehi Center Street to Canyon Road. Several roadway connectivity options were evaluated to understand how they would affect traffic patterns and support the roadway grid network. Concept designs and cost estimates were prepared for roadway widening projects at three separate intersections. ***Figure 1*** shows the study area.

3 ANALYSIS METHODOLOGY

The analyses performed for this study used the jointly owned and maintained Wasatch Front Regional Council (WFRC)/Mountainland Associated of Governments (MAG) travel demand model and the Synchro traffic operations analysis software. This section describes how each of these tools were used.

3.1 Travel Demand Modeling

The WFRC/MAG travel demand model (TDM) is a tool used to predict future travel and traffic volumes for the Wasatch Front area. WFRC and MAG are the Metropolitan Planning Organizations for the Wasatch Front and are responsible for coordinating transportation planning in the region. MAG is responsible for Utah County and WFRC for Weber, Davis, and Salt Lake Counties. Version 8.3.1 of the travel demand model was used for this study.

The travel demand model has two primary inputs: land use data and transportation system data. The land use data consists of residential and employment data for the entire region. This data is prepared in geographic blocks called Traffic Analysis Zones (TAZs). The travel model inputs are prepared for a base year, which in this case was 2019, and for a future year, which in this case was 2050. These projections are used by the MPOs to develop the Regional Transportation Plan (RTP), which is the plan for the development of the future transportation system. The RTP includes a list of projects that are planned to meet future transportation needs over a 20+ year horizon. The future land use projections for the study area were reviewed with representatives from each city to ensure that the RTP projections still conformed with city plans. ***Appendix A*** contains figures showing the assumed study area population and employment growth.

Using the land use and transportation system inputs, the travel model predicts how many trips will be generated in the region, where those trips are going, the mode by which they will be made, and the transportation facilities that will be used to get there.

MODEL CALIBRATION

A segment-by-segment comparison was made between model volumes and observed traffic volumes. Daily volume data was obtained from UDOT for the study area, including published *Traffic on Utah Highways* volumes and volumes from UDOT's Automated Traffic Signal Performances Measures (ATSPM) system. A review of the initial base year travel demand model results showed that the model was low on most roads in the study area, including S.R. 92, 5300 West (S.R. 74), North County Boulevard (S.R. 129), and Canyon Road. Testing showed that free-flow speed adjustments were not sufficient to bring the model volumes up to the observed target volumes. Therefore, adjustments were made to the trip generation rates in the study area to increase the number of vehicles on the roadway network and bring the model volumes closer to their target values.

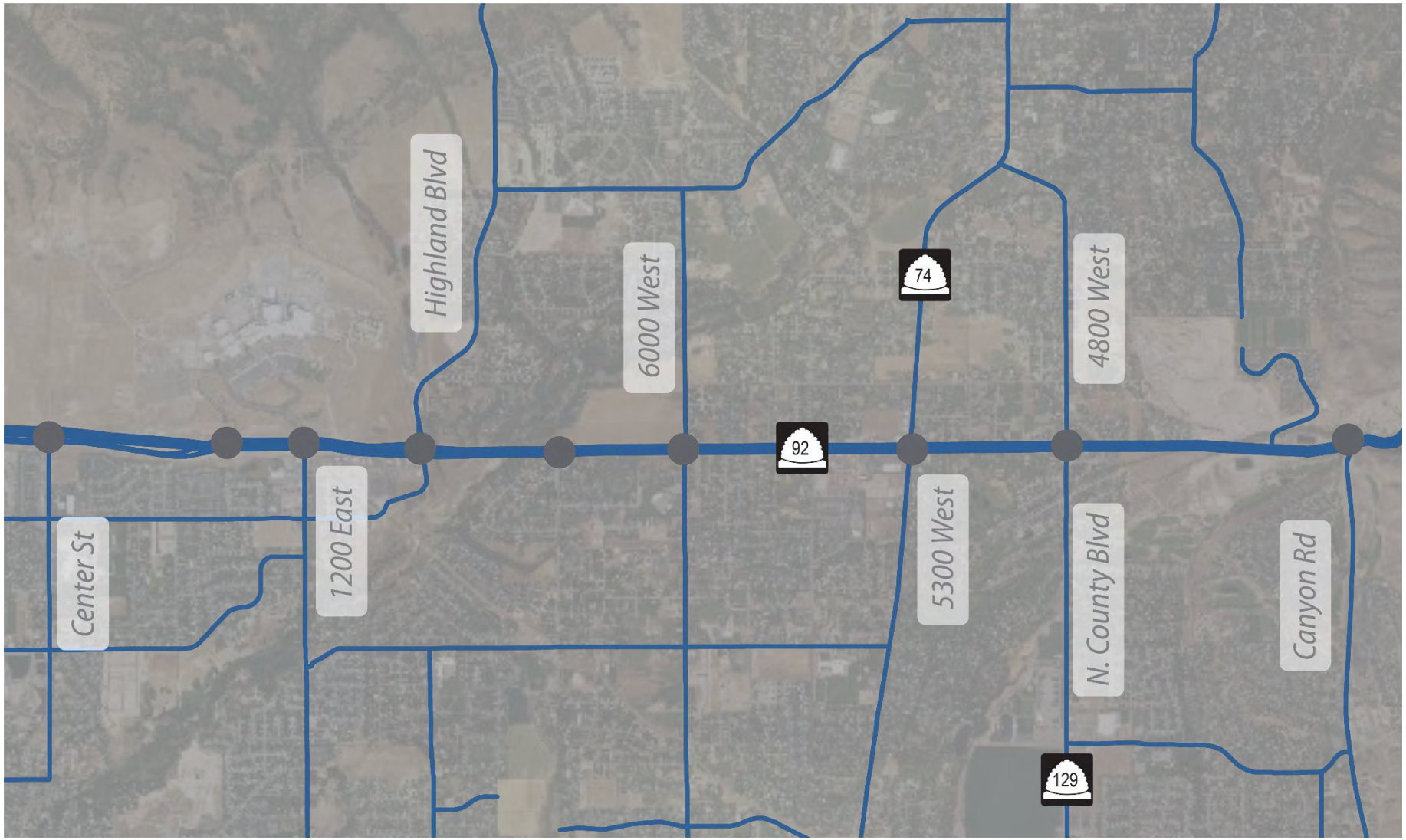


Figure 1: Study Area

3.2 Traffic Operations Analysis

The Synchro software was used to evaluate traffic operations. Synchro is a deterministic signal timing and traffic analysis tool that was selected for this study because it allows for the evaluation of individual intersections based on *Highway Capacity Manual* (HCM) guidelines.

Existing Traffic Volumes

To prepare the Synchro model, initial existing traffic volumes were collected on Tuesday, August 4, 2020. Due on construction on the east end of the corridor, supplemental traffic volumes were collected where the construction had taken place on Tuesday, September 1, 2020. Intersection turning movement counts were collected between 7:00 AM and 9:00 AM and between 4:00 PM and 6:00 PM at:

- Timpanogos Highway (S.R. 92) & Lehi Center Street
- Timpanogos Highway (S.R. 92) & Micron Delivery Access
- Timpanogos Highway (S.R. 92) & 1200 East
- Timpanogos Highway (S.R. 92) & Highland Boulevard
- Timpanogos Highway (S.R. 92) & 6400 West
- Timpanogos Highway (S.R. 92) & 6000 West
- Timpanogos Highway (S.R. 92) & Alpine Highway (S.R. 74)
- Timpanogos Highway (S.R. 92) & North County Boulevard (S.R. 129)
- Timpanogos Highway (S.R. 92) & Canyon Road
- Timpanogos Highway Commuter Lane (S.R. 92) & Center Street Offramps
- Timpanogos Highway Commuter Lane (S.R. 92) & WB Highland Drive Onramp
- Timpanogos Highway Commuter Lane (S.R. 92) & 1200 East Ramps

Generally, the peak hours were determined to be from 7:15 AM to 8:15 AM for the AM peak and 5:00 PM to 6:00 PM for the PM peak. Due to the coronavirus pandemic, 2020 traffic volumes were lower than normal conditions, particularly during the peak hours. ATSPM data was used to compare 2019 traffic volumes to 2020 from which volume adjustment factors were developed for the S.R. 92 corridor. The AM peak hour volumes were increased by an average of 27% and the PM peak hour volumes by an average of 12%. The adjusted volumes were then balanced along the corridor to ensure that the volume leaving one intersection was the same as the volume arriving at the next intersection. ***Appendix B*** contains a figure showing the adjusted and balance estimated 2020 peak hour intersection volumes.

Existing Signal Timing

Existing traffic signal timing data were obtained from the UDOT Traffic Operations Center and entered into the Synchro models. The intersections were modeled based on existing conditions, including the number of lanes, exclusive turn lanes, storage lengths and movement volumes. The study area was modeled as a network; however, the analysis was completed for each intersection independently.

Future Traffic Volumes

Estimated AM and PM peak hour volumes were developed for 2050 using principles described in the National Highway Cooperative Research Program (NCHRP) Report 255 document. The 2050 peak hour intersection volumes were developed from the existing adjusted and balanced peak hour traffic volumes. The WFRC/MAG travel demand model was run for the base year (2019) and for the future year (2050) and the difference between these models was used to estimate the traffic increase for the inbound and outbound direction for each intersection leg. The turning movement volumes were then balanced to ensure the correct number of inbound and outbound vehicles on each leg of the intersection. The 2050 future volumes are found in ***Appendix B***.

3.3 Measures of Effectiveness

Measures of Effectiveness (MOE) are used to evaluate the analysis objectives and compare the results of the various concepts. They quantify the results of the analysis and is often expressed as levels on how well the concept will perform.

For each Synchro analysis, the intersection results were calculated by Synchro following the procedures and equations described in the 2010 HCM. Two key measures of effectiveness were extracted from the Synchro models. The first was average delay per vehicle for the overall intersection and for each turning movement, which was used to determine level of service (LOS), as described in the HCM. LOS describes the operating performance of an intersection or roadway, is measured quantitatively, and is reported on a scale from A to F, with A representing the best performance and F the worst. For signalized intersections, the overall intersection LOS is most commonly reported, while for unsignalized intersections, LOS is most commonly reported based for the approach with the highest delay. ***Table 1*** provides a brief explanation for each LOS and the associated average delay per vehicle for unsignalized and signalized intersections.

Table 1. Intersection Level of Service Criteria

LOS	Description	2050 PM Peak Hour	
		Unsignalized	Signalized
A	Free Flow Operations / Insignificant Delay	0 ≤ 10	0 ≤ 10
B	Smooth Operations / Short Delays	>10.0 and ≤ 15.0	> 10 and ≤ 20
C	Stable Operations / Acceptable Delays	>15.0 and ≤ 25.0	> 20 and ≤ 35
D	Approaching Unstable Operations / Tolerable Delays	>25.0 and ≤ 35.0	> 35 and ≤ 55
E	Unstable Operations / Significant Delays Begin	>35.0 and ≤ 50.0	> 55 and ≤ 80
F	Very Poor Operations / Excessive Delays Occur	> 50.0	> 80

Source: *Highway Capacity Manual 2010*, Transportation Research Board National Research Council, Washington D.C

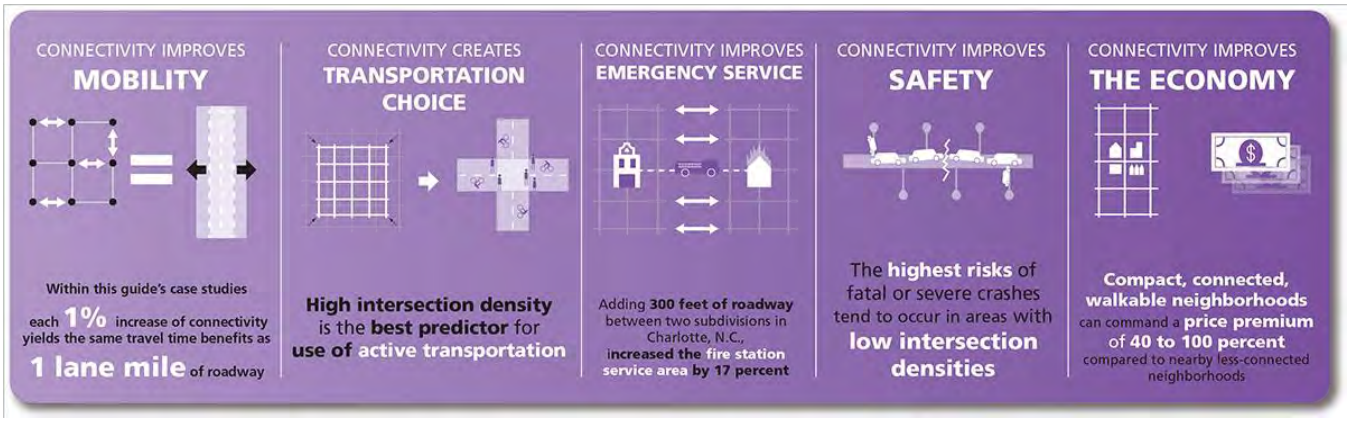
The second key measure of effectiveness extracted from Synchro was the estimated 95th percentile queue length for each turning movement at the study intersections. This represents the vehicle queue length that would only be exceeded five percent of the time during the analysis period. It helps identify issues such as queuing between intersections and queues that exceed their available storage.

4 STREET CONNECTIVITY

The 2019-2050 MAG RTP identifies roadway connectivity and building out the grid network as essential for accommodating long-term travel in the region. Several locations in the study area but on the S.R. 92 corridor were identified where roads could be built to increase connectivity. This section briefly describes the benefits of connectivity and describes the identified locations within the study area.

4.1 Connectivity Benefits

In 2017, the major transportation agencies on the Wasatch Front published the *Utah Street Connectivity Guide*. This document makes the case for connectivity, provides tools for connectivity, and provides a design guide and case studies. The guide clearly illustrates that street connectivity is an important principle that can provide numerous benefits to a community. ***Figure 2*** is an infographic from the guide that summarizes the benefits of street connectivity.



Source: *Utah Street Connectivity Guide*, March 2017, page 4

Figure 2: Street Connectivity Benefits

As shown in the figure, good street connectivity provides benefits to mobility, transportation choices, emergency services, safety, and the economy. A subsequent UDOT research project performed by the University of Utah states that, "improving street connectivity at a neighborhood level could be considered as a viable community development strategy to mitigate congestion on major arteries without compromising road safety.[1]"

[1] Street Network Connectivity, Traffic Congestion, and Traffic Safety, Utah Department of Transportation, September 2020

4.2 Study Area Connectivity Options

Three study area connectivity options were identified and analyzed. The three options include connections at 11800 North near the Micron facility, 5710 West in Highland, and High Bench Road in Alpine. The general location of the three potential connections is shown in ***Figure 3***.

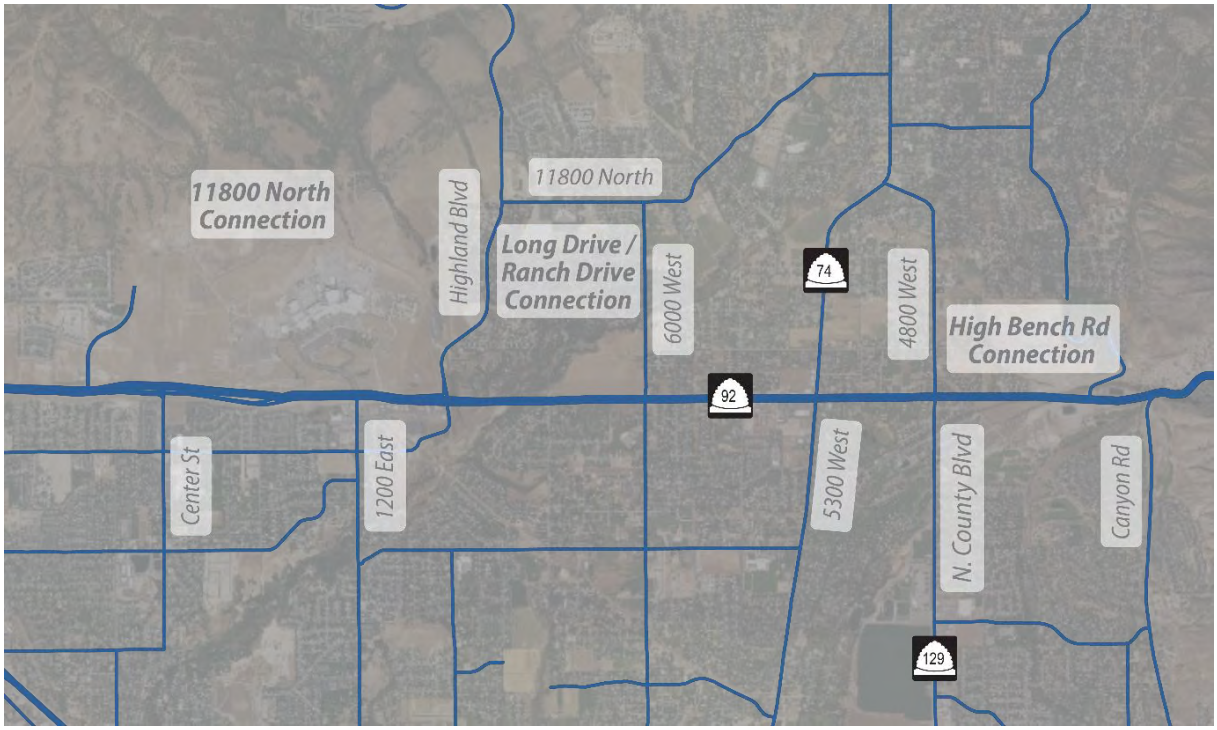


Figure 3: Potential Connection Locations

4.2.1 11800 North

The 11800 North connection would extend the existing Highland 11800 North collector road to the west into Lehi up and around the Micron facility before connecting to Lehi 500 West. The existing 11800 North is a two-lane road with a posted speed limit of 35 mph. Looping the connection north of the Micron facility would likely require the road to briefly leave Lehi City and enter Draper City, which may complicate the funding and construction of the connection. ***Figure 4*** conceptually illustrates the 11800 North connection.

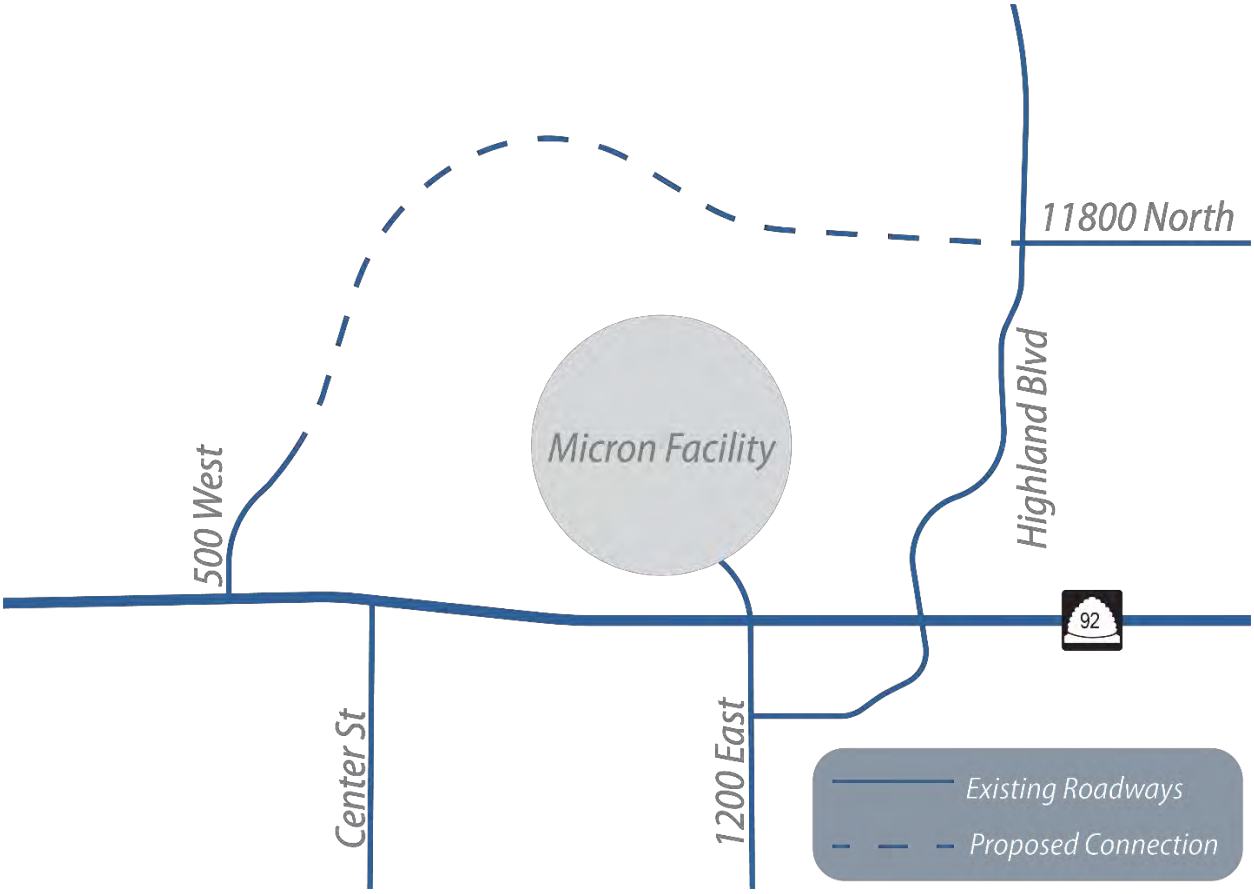


Figure 4: 11800 North Connection

4.2.2 Long Drive & Ranch Drive

The Long Drive and Ranch Drive connections are the extensions of two separate, intersecting roads. The Long Drive connection would extend that road west approximately a half-mile to connect to 6000 West. Penn Brooke Lane would also be extended south to connect to Long Drive. The existing Long Drive is a local road with a 25-mph speed limit. The Ranch Drive connection would extend that road to the east approximately a third of a mile to S.R. 74 (5300 West). ***Figure 5*** conceptually illustrates the Long Drive and Ranch Drive connections.

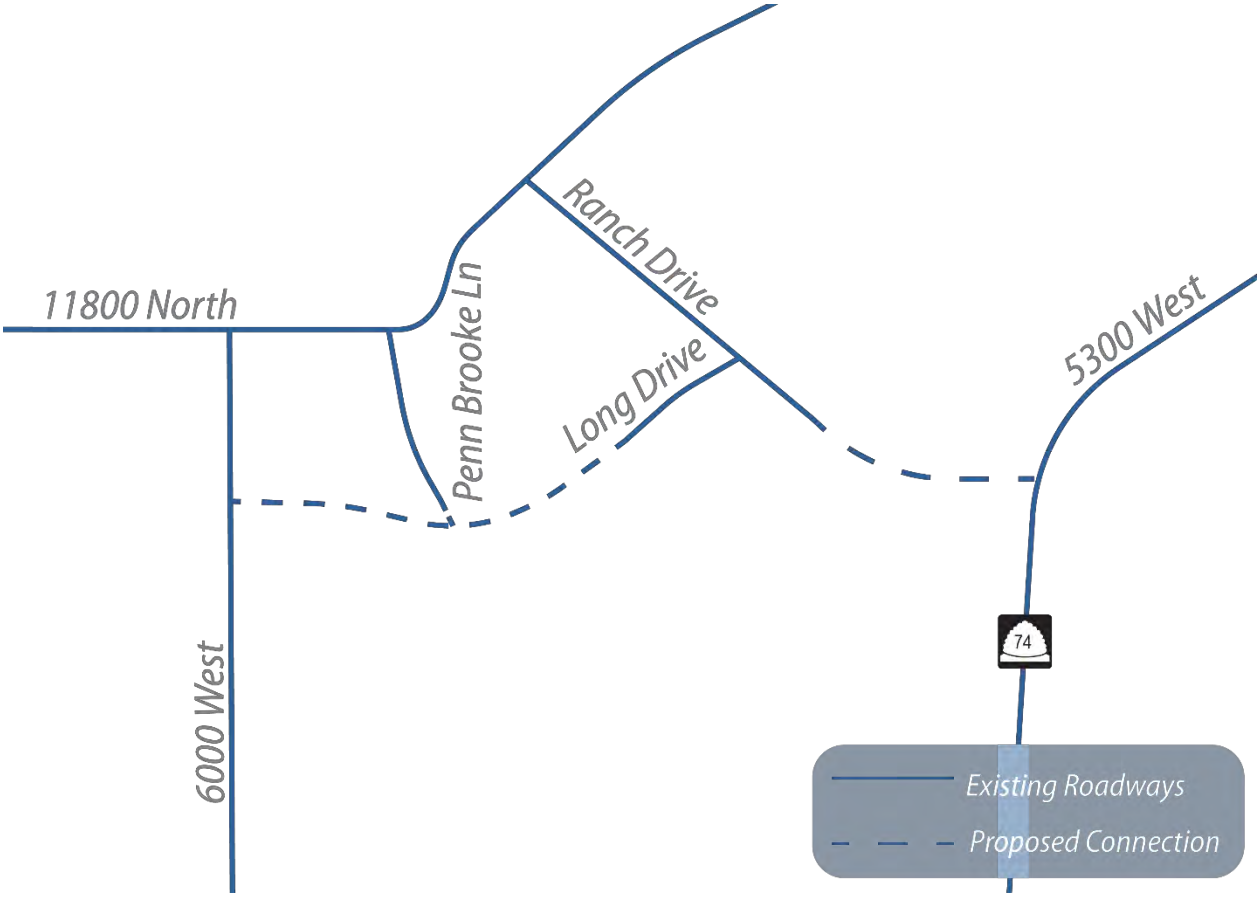


Figure 5: Long Drive / Ranch Drive Connections

4.2.3 High Bench Road

The High Bench Road connection would extend the existing High Bench Road in Alpine south to S.R. 92 in Highland. High Bench Road in Alpine lines up with Park Drive in Highland with a 650-foot gap between the two roads; however, the cities' preference is to have the connection cut through the existing gravel pit for a more direct connection to S.R. 92. This would require the closure of the gravel pit before the connection could be built, so it could be a long time until then. Another issue with this connection is the difference in elevation between S.R. 92 and High Bench Road. According to Google Earth, there is a difference of approximately 125 feet in elevation in the 0.5-mile connection, which would result in a fairly steep road in places. ***Figure 6*** conceptually illustrates the High Bench Road connection.

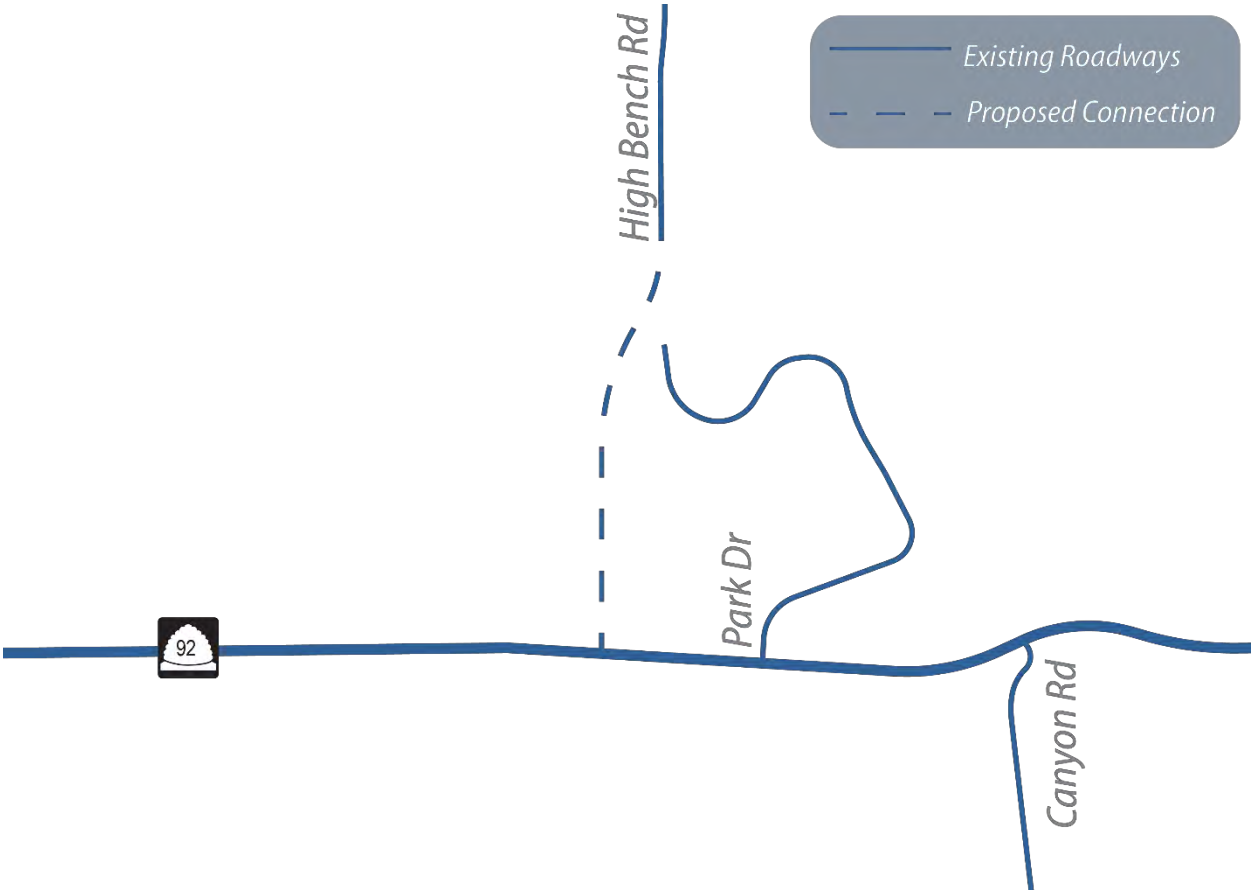


Figure 6: High Bench Road Connection

4.3 Study Area Connectivity Analysis

The MAG travel model was run for 2050 conditions with and without the three study area connections to understand the effect they would have on traffic patterns in the study area. The largest shift in traffic volumes would occur on the east side of the study area where several thousand vehicles per day would be diverted from 4800 West to High Bench Road, and similarly from North County Boulevard to Canyon Road.

S.R. 92 intersection traffic volumes were projected with and without the proposed connections. ***Table 2*** compares the projected 2050 PM peak hour total study area intersection volumes with and without the roadway connections. ***Appendix B*** contains a figure comparing the S.R. 92 intersection volumes between the two scenarios.

Table 2. S.R. 92 Intersection Volumes With and Without Connections

Intersection	2050 PM Peak Hour		% Change
	Without Connections	With Connections	
Timpanogos Highway (S.R. 92) & Center Street	3,480	3,370	-3.3
Timpanogos Highway (S.R. 92) & Micron Delivery Access	2,790	2,720	-2.5
Timpanogos Highway (S.R. 92) & 1200 West	5,230	5,170	-1.1
Timpanogos Highway (S.R. 92) & Highland Blvd	5,430	5,420	-0.2
Timpanogos Highway (S.R. 92) & 6400 West	5,300	5,320	0.4
Timpanogos Highway (S.R. 92) & 6000 West	5,890	5,630	-4.4
Timpanogos Highway (S.R. 92) & Alpine Highway (S.R. 74)	5,560	5,470	-1.6
Timpanogos Highway (S.R. 92) & N. County Blvd (S.R. 129)	4,770	4,690	-1.7
Timpanogos Highway (S.R. 92) & Canyon Rd	1,590	1,650	3.8

With the addition of the new connections, there would generally be a small decrease in traffic at S.R. 92 intersections in the study area. 6000 West would see the largest drop in traffic when the connections are added with volume reduction of 4.4 percent. The largest volume increase would be at Canyon Road at 3.8 percent, which would be due to traffic shifting from North County Boulevard.

A traffic analysis for the S.R. 92 study area intersections was performed for both sets of volumes, which revealed only minor differences in the intersection performance between the scenarios. While the traffic operations benefit associated with the potential connectors is projected to be somewhat limited, that does not mean that the connections should be removed from consideration. As discussed previously, there are other benefits associated with increased connectivity that are independent of traffic performance, including increased transportation choices, emergency response benefits, increased safety, and benefits to the economy. As such, the study area connectors should still be considered as part of a resilient transportation system.

5 S.R. 92 INTERSECTION ANALYSIS

The study intersections on S.R. 92 were analyzed to understand their traffic performance under existing conditions and future 2050 conditions without any modifications. For intersections that are expected to operate poorly in the future, various intersection modifications were analyzed for their ability to improve traffic performance.

5.1 Existing Conditions

The estimated delay and LOS for all the study intersections are shown below in ***Table 3***. Detailed LOS results can be found in ***Appendix C***.

Table 3. Existing Intersection Level of Service / Delay Results

Location	2020 AM Peak Hour		2020 PM Peak Hour	
	Worst Approach[2]	AM LOS / Delay[1]	Worst Approach[2]	PM LOS / Delay[1]
S.R. 92 & Center Street	-	B / 18	-	B / 19
S.R. 92 & Micron Delivery Entrance	SB	C / 22	SB	C / 18
S.R. 92 & 1200 East	-	C / 23	-	C / 26
S.R. 92 & Highland Boulevard	-	B / 14	-	C /24
S.R. 92 & 6400 West	-	A / 6	-	B / 11
S.R. 92 & 6000 West	-	C / 33	-	D / 49
S.R. 92 & 5600 West	NB	F / >100	NB	F / >100
S.R. 92 & 5300 West (S.R. 74)	-	D / 40	-	E / 65
S.R. 92 & North County Boulevard (S.R. 129)	-	D / 41	-	D / 36
S.R. 92 & Canyon Road	NB	D / 25	NB	F / >100

1. Average delay reported in seconds/vehicle
2. Worst approach delay is reported for unsignalized intersections

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

During the AM peak hour, all the signalized intersections operate at LOS D or better; however, there are individual movements at LOS E and F. During the PM peak hour, the signalized intersections except for 5300 West operate at LOS D or better. The intersection 5300 West operates at LOS E with 65 seconds of delay per vehicle and half of the turning movements at LOS E or F. The unsignalized intersections at 5600 West and Canyon Road operate at LOS F with over 100 seconds of delay per vehicle for vehicles on the northbound approach. Traffic signal warrant studies have recently been performed for each of those intersections. The Canyon Road intersection met the warrant criteria while the 5600 West intersection did not. Although the delay is high at 5600 West, the volumes on 5600 West are low, so the overall impact of the high delay is quite low.

5.2 Future 2050 Conditions

This section reports the intersection delay and LOS for each of the intersections within the study area for the future 2050 conditions. By 2050, AM peak hour volumes for the S.R. 92 study area intersections are anticipated to increase by 30-35 percent compared to existing and the PM peak hour volumes by 24-29 percent. Detailed volume information can be found in ***Appendix B.***

The No Build results are reported for each intersection followed by the results of the various improvement scenarios that were considered. Generally speaking, the S.R. 92 corridor volumes are projected to increase enough that widening to three travel lanes in each direction would be required for the corridor to operate at an acceptable LOS. Certain intersections also include other improvements such as dual left turn lanes. Intersections that are not reported in this section but are within the study area are not anticipated to need additional intersection improvements beyond their existing configuration. This is based on the assumption that Canyon Road would be signalized. All the results presented in this section assume that the study area connections

described in Section 4 are implemented. Detailed analysis results for analyses presented in the following sections can be found in ***Appendix C***.

5.2.1 Highland Boulevard

The Highland Boulevard intersection LOS for the PM peak hour for the 2050 with connections scenario is shown in ***Figure 7***. Without any intersection improvements, Highland Boulevard is expected to perform at LOS E with 74 seconds of delay per vehicle. By adding dual westbound left-turn lanes and protected/permissive phasing to the northbound and southbound approaches, the intersection is expected to perform at LOS D with 55 seconds of delay per vehicle.

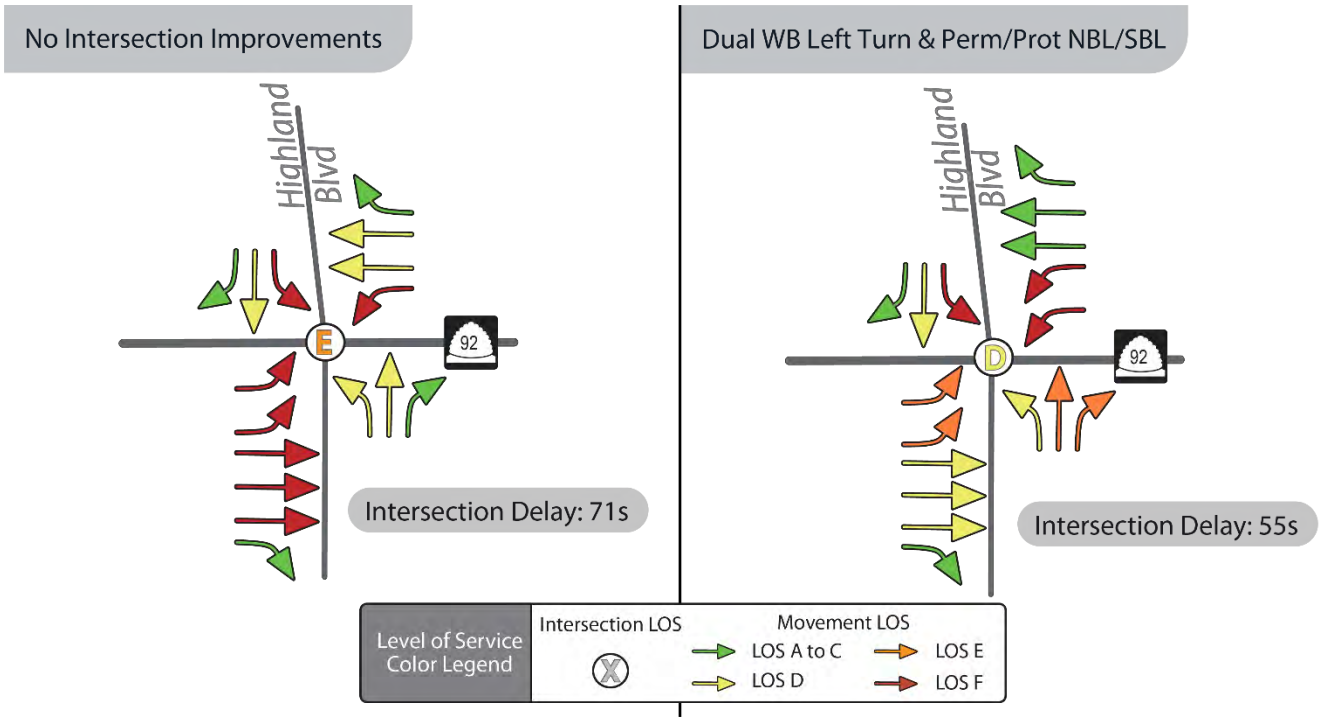


Figure 7: Highland Boulevard Intersection LOS

5.2.2 6000 West

The 6000 West intersection LOS for the PM peak hour for the 2050 with connections scenario is shown in ***Figure 8.*** Without any intersection improvements, 6000 West is expected to perform at LOS F with over 100 seconds of delay per vehicle. By adding a third eastbound and westbound through lane and right turn pockets to the northbound and southbound approaches, the intersection is expected to perform at LOS D with 49 seconds of delay per vehicle. The analysis shows that exclusive right turn lanes would not be needed to achieve LOS D, but they would be valuable for safety and driver comfort. Adding dual left turn lanes without three through lanes on S.R. 92 would be expected to operate at LOS E.

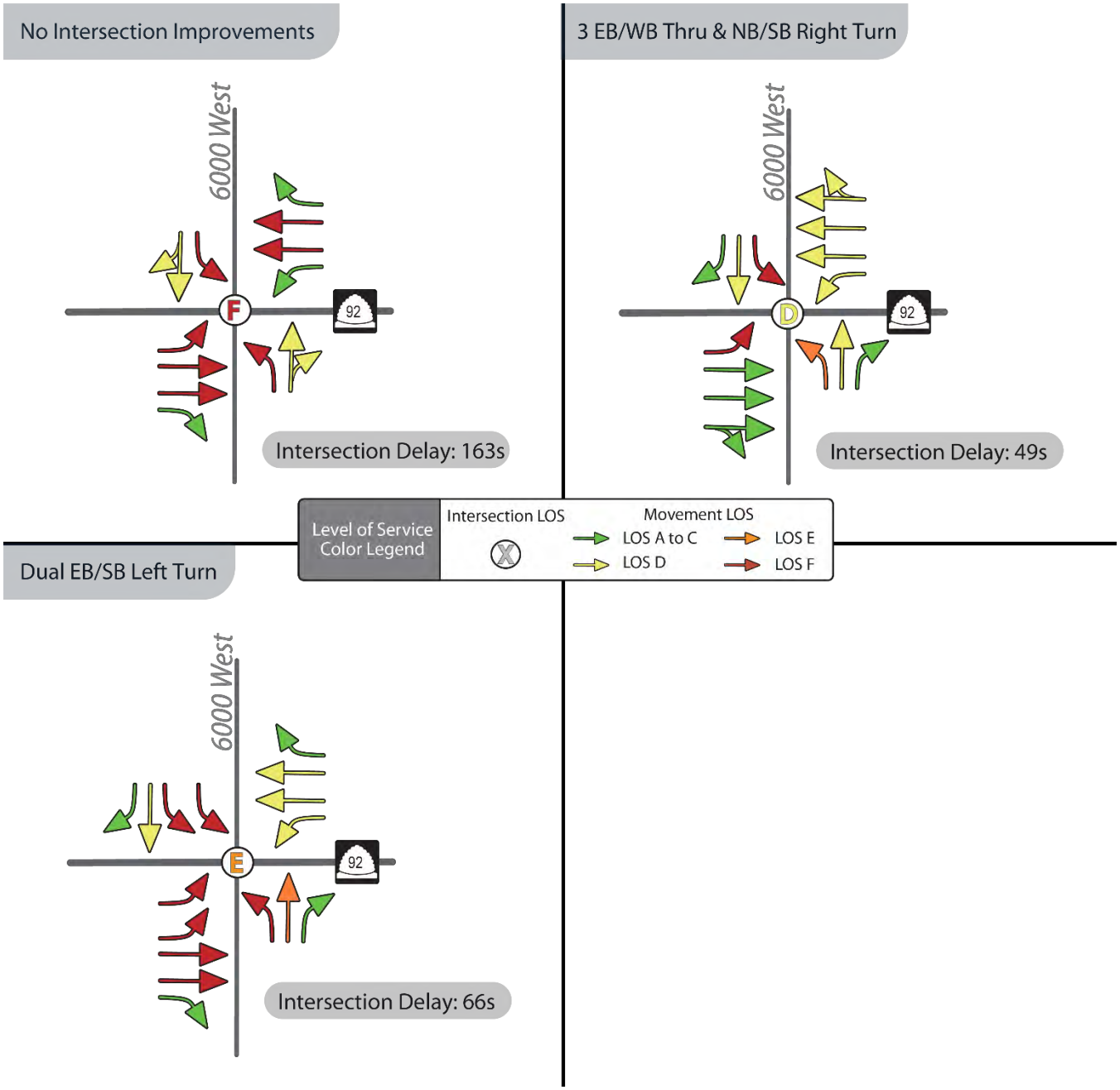


Figure 8: 6000 West Intersection LOS

5.2.3 6400 West

The 6400 West intersection LOS for the PM peak hour for the 2050 with connections scenario is shown in ***Figure 9.*** Without any intersection improvements, 6400 West is expected to perform at LOS E with over 63 seconds of delay per vehicle. By adding a third eastbound and westbound through lane, the intersection is expected to perform at LOS D with 37 seconds of delay per vehicle.

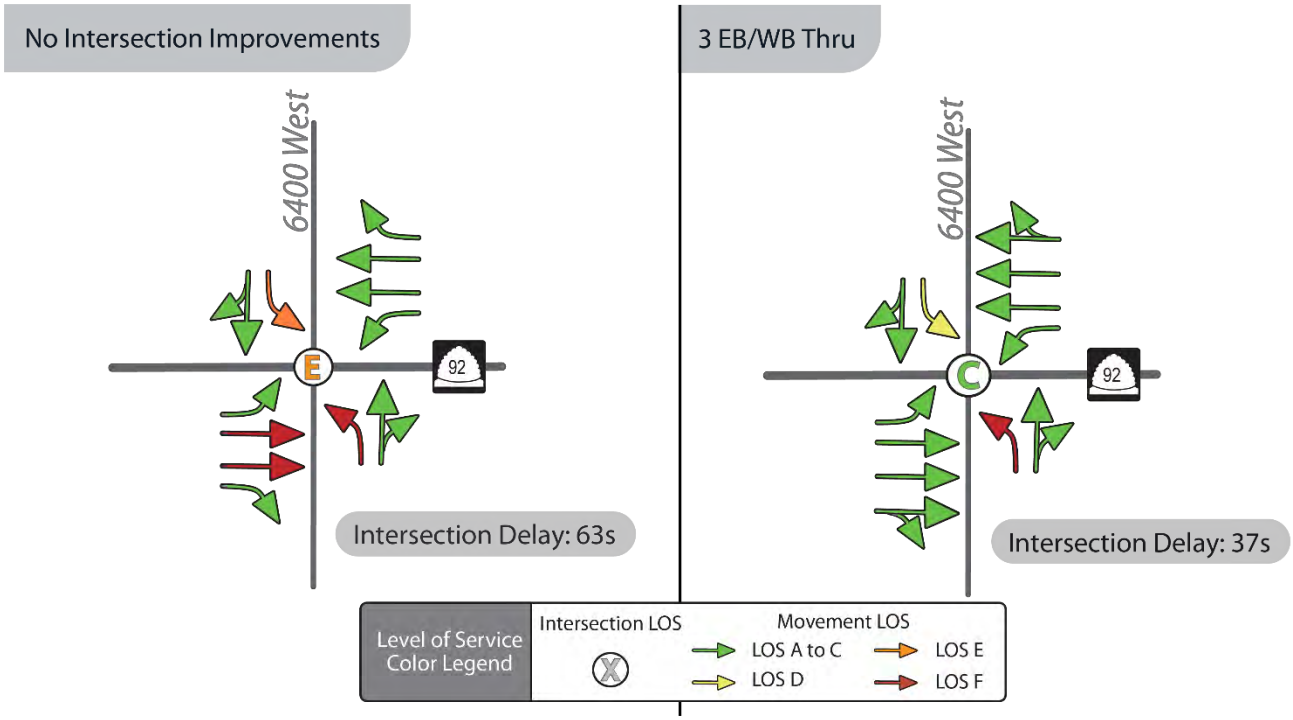


Figure 9: 6400 West Intersection LOS

5.2.4 5300 West (S.R. 74)

The 5300 West (S.R. 74) intersection LOS for the PM peak hour for the 2050 with connections scenario is shown in ***Figure 10***. Without any intersection improvements, 5300 West is expected to perform at LOS F with 72 seconds of delay per vehicle. By adding a third eastbound and westbound through lane and a dual eastbound left-turn, the intersection is expected to perform at LOS E with 56 seconds of delay per vehicle. Another option that would be expected to operate at LOS D is adding a second northbound and southbound through lane and a dual eastbound left-turn. Without the extra through lane on either leg, the intersection would still perform at LOS E with 80 seconds of delay per vehicle. A scenario with dual eastbound left-turn lanes, three eastbound and westbound through lanes, and two northbound and southbound through lanes was also analyzed which performs the best with 42 seconds of delay per vehicle.

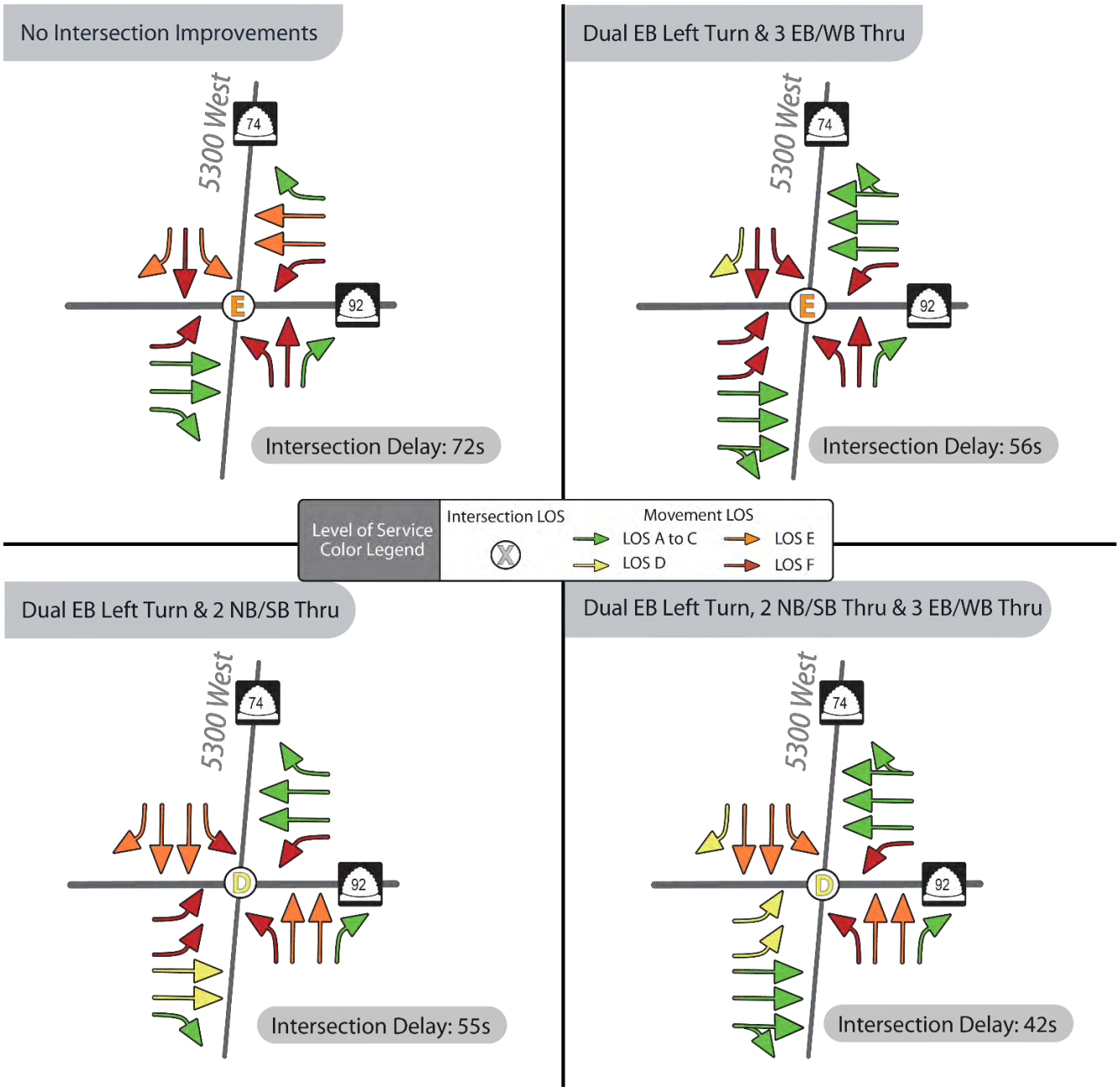


Figure 10: 5300 West (S.R. 74) Intersection LOS

5.2.5 North County Boulevard (S.R. 129)

The North County Boulevard (S.R. 129) intersection LOS for the PM peak hour for the 2050 with connections scenario is shown in ***Figure 11.*** Without any intersection improvements, 6000 West is expected to perform at LOS E with 68 seconds of delay per vehicle. By adding a second northbound and southbound through lane, the intersection is expected to perform at LOS D with 36 seconds of delay per vehicle. Another viable solution is to have dual southbound left turn lanes. Under this improvement, the intersection is expected to perform at LOS D with 44 seconds of delay per vehicle.

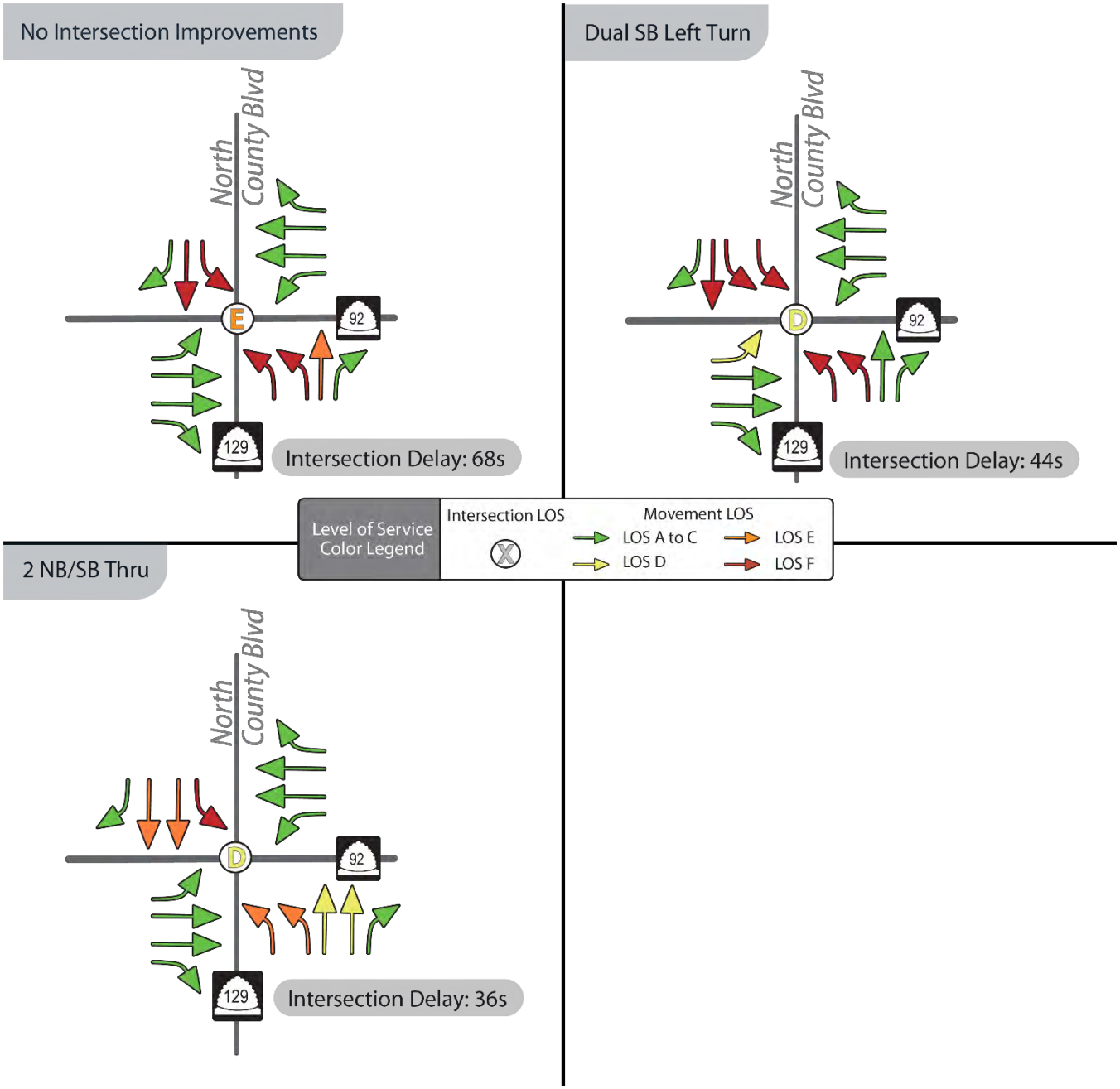


Figure 11: North County Boulevard (S.R. 129) Intersection LOS

6 ROADWAY WIDENING ANALYSIS

The travel modeling showed that there will be sufficient demand to for a four-lane road between Alpine and S.R. 92. A roadway widening analysis was completed to understand which roadways would benefit from widening to increase access and circulation within the study area. The widening analysis consisted of comparing existing and future roadway volumes. Both 5300 West (S.R. 74) and 4800 West/Canyon Crest Road were considered. Both roads are projected to have similar volumes widening either one could be justified. However, the study team didn't think it would be prudent to widen both roads, so 4800 West/Canyon Crest Road was chosen as the best candidate for widening as it had slightly higher future demand and connected directly to North County Boulevard (S.R. 129) which is a regional facility that provides good access to I-15.

7 CONCEPT DESIGNS

Concepts designs and cost estimates were prepared for intersection improvements at two of the study intersections and for the 4800 West/Canyon Crest Road widening. The two intersections selected by the study team were 6000 West and 5300 West (S.R. 74). The 4800 West/Canyon Crest Road widening included improvements to the S.R. 92 & North County Boulevard (S.R. 129) intersection. Plan sheets and a typical section for the widening concept design can be found in ***Appendix D***. Detailed cost estimates for the three concept designs can be found in ***Appendix E***.

7.1 6000 West

The concept design for 6000 West with three through lanes in each direction is shown in ***Figure 12***. As shown, the concept assumes shared through-right turn lanes on S.R. 92. These improvements are estimated to cost approximately $6.2 million in 2021 dollars and $7.3 million in 2025 dollars.

Figure 12: 6000 West Intersection Concept Design

7.2 5300 West (S.R. 74)

For 5300 West (S.R. 74), the study team chose to have a concept design prepared for an option with three east-west through lanes, two north-south through lanes, and dual left-turn lanes on S.R. 92. This option combines two options that were evaluated and would be expected to perform better than either option by themselves. The concept design for this new option is shown in ***Figure 13***. These improvements are estimated to cost approximately $11.4 million in 2021 dollars and $13.4 million in 2025 dollars.

Figure 13: 5300 West (S.R. 74) Intersection Concept Design

7.3 4800 West/Canyon Crest Road

As mentioned, concept designs for the widening of 4800 West/Canyon Crest Road can be found in ***Appendix D***. The concept design for S.R. 92 & North County Boulevard (S.R. 129) intersection is shown in ***Figure 14***. The concept includes two northbound and southbound through lanes.

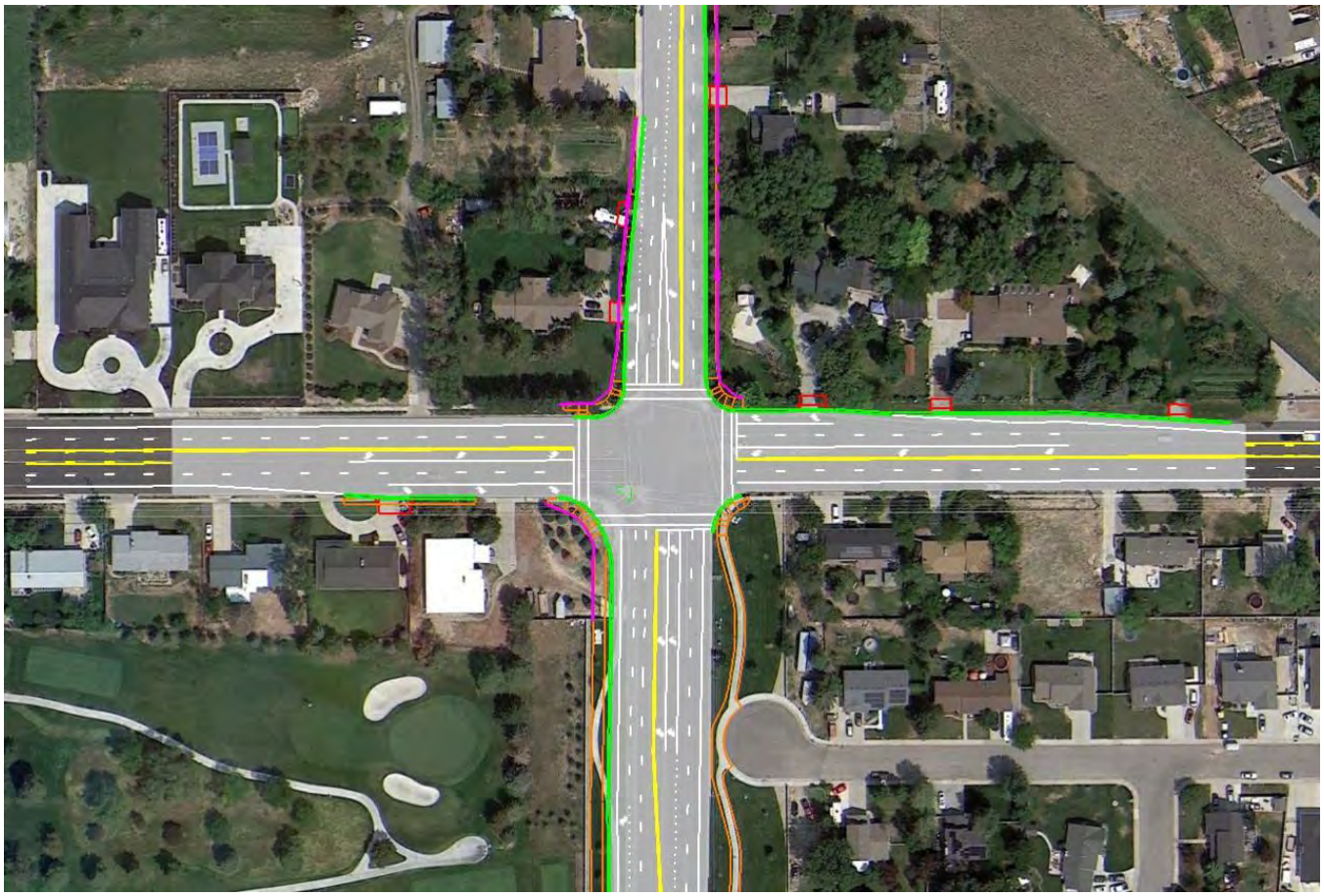


Figure 14: North County Boulevard (S.R. 129) Intersection Concept Design

Due to the size of the corridor and the cost to build the whole thing at once, the corridor was divided into three phases so that the widening could occur incrementally in a more financially feasible manner. The three phases and their estimated costs are shown in **Table 4.**

Table 4. 4800 West/Canyon Crest Road Phase Limits and Cost Estimates

Phase	Limits	Cost (2021 dollars)	Cost (2025 dollars)
1	Country Club Drive to Healey Boulevard	$7,605,000	$8,944,000
2	Healey Boulevard to Ridge Drive	$3,622,000	$4,259,000
3	Ridge Drive to Main Street	$2,753,000	$3,236,000

8 CONCLUSIONS

Per the *Utah Street Connectivity Guide* good street connectivity provides benefits to mobility, transportation choices, emergency services, safety, and the economy. Four potential connection options were identified to increase the street connectivity in Lehi, Highland and Alpine. The four connections at 11800 North, Long Drive,

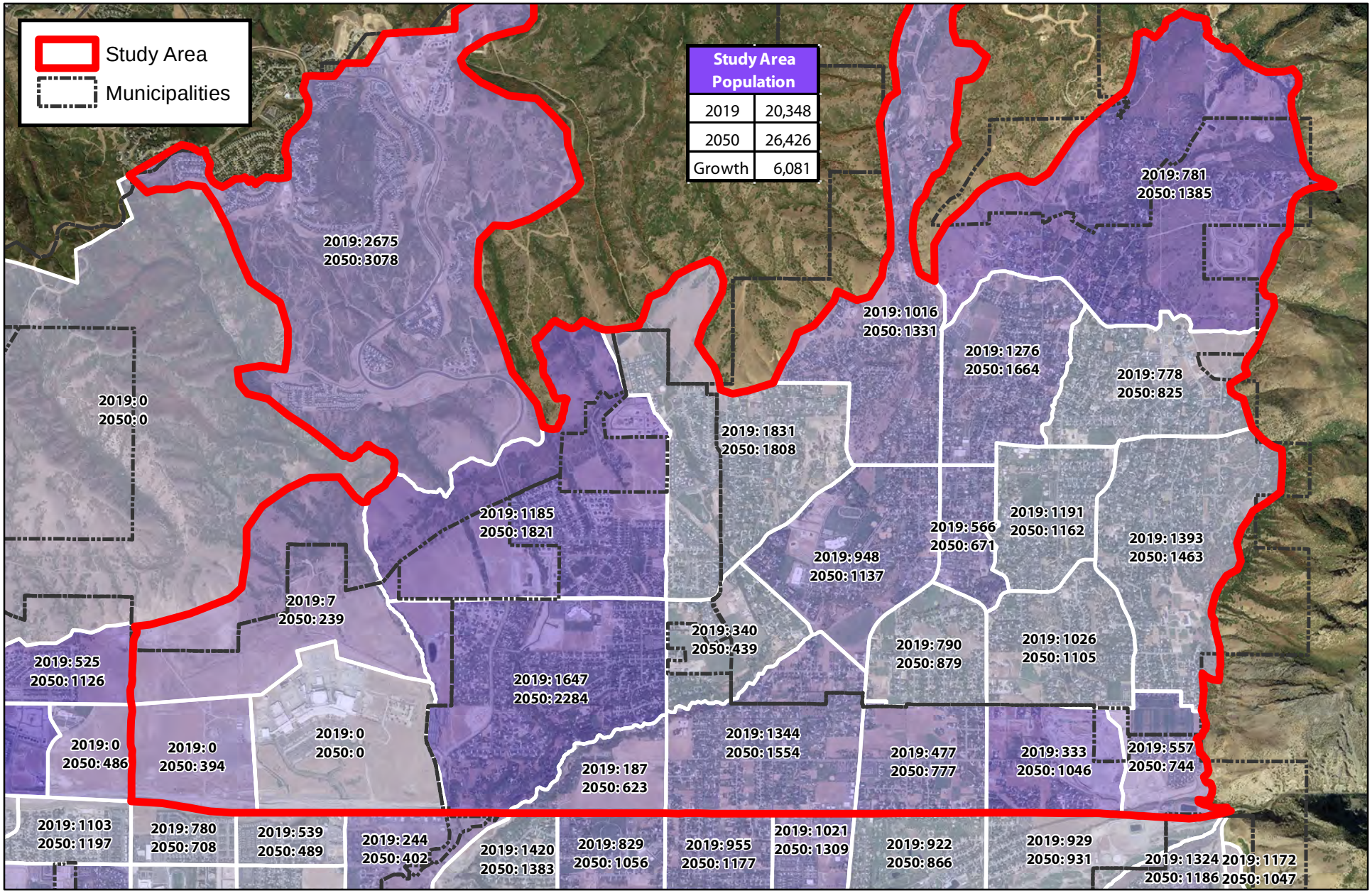
Ranch Drive, and High Bench Road would generally result in a minor decrease to future traffic volumes on S.R. 92 throughout the study area and a corresponding decrease in intersection delay. Even though the delay reduction would be relatively minor, the connections should still be seriously considered due to the other benefits that good street connectivity can provide.

Specific S.R. 92 intersection analyses were performed for 2050 future conditions with connections. Generally, the improvements required for the intersections to operate at acceptable LOS is widening S.R. 92 to three through lanes in the eastbound and westbound directions from the Express Lanes on the west through the 5300 West intersection on the east. Some intersections would also require additional left turn lanes or exclusive right turn lanes. With these improvements, each intersection would operate at LOS D or better within the study area. Because the 5300 West intersection currently operates at LOS E, it would have the highest priority for improvement. The improvements there could be phased, which would reduce the initial cost but would require additional work at the same location in the future. Concept designs and cost estimates for intersection improvements at 6000 West and 5300 West were prepared.

The study also determined there will be a need to widen one of the two primary road into Alpine (5300 West or 4800 West/Canyon Crest Road). The study team determined that the widening should be done on 4800 West/Canyon Crest Road due to slightly higher future volume projections and better regional connectivity. To make funding more manageable, the widening was divided into three phases. Concept designs and cost estimates were prepared for each phase of the widening.

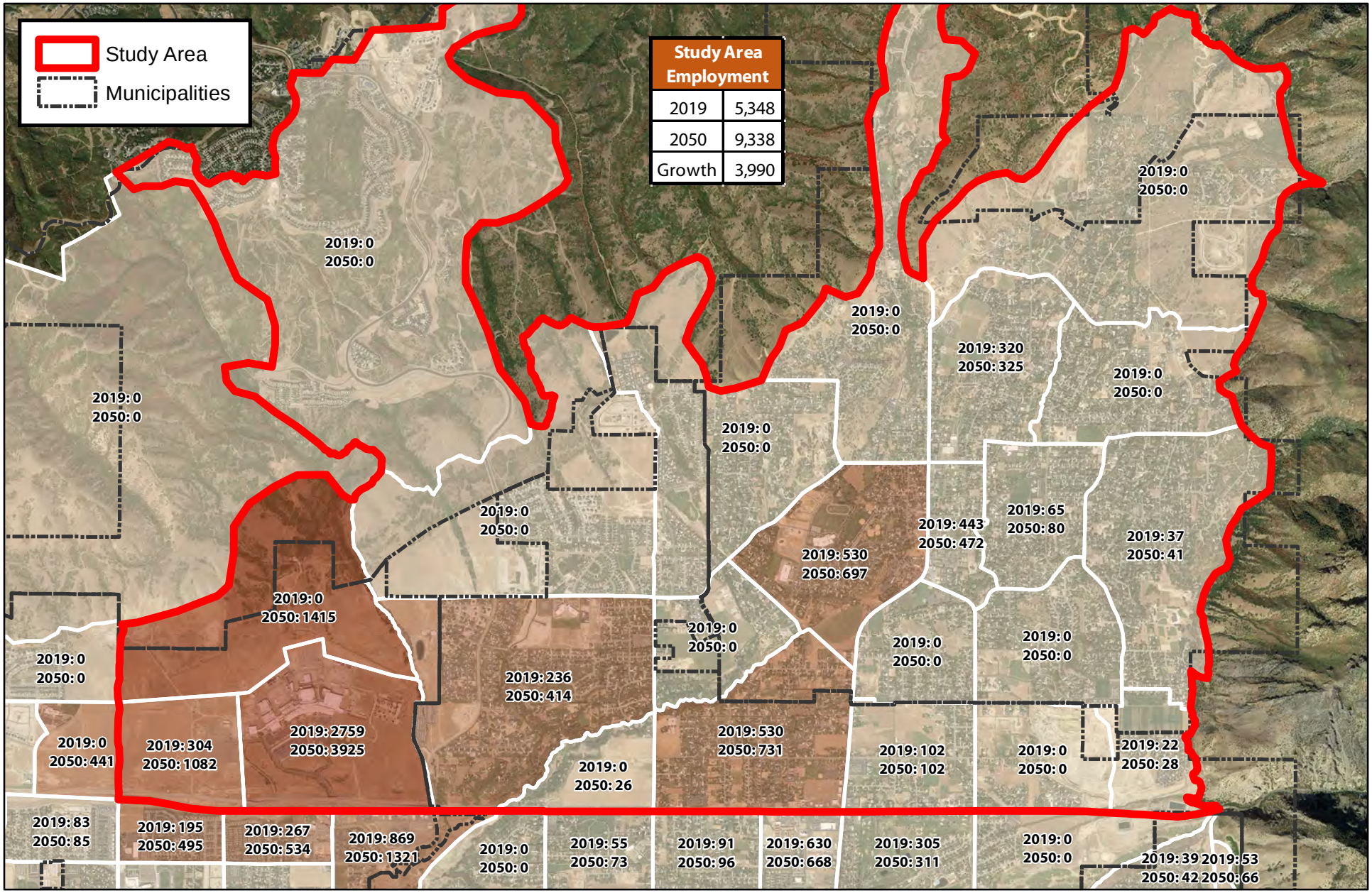
Appendix A

Population and Employment Growth



Total Population Growth 2019-2050

SR-92 North Regional Traffic Study

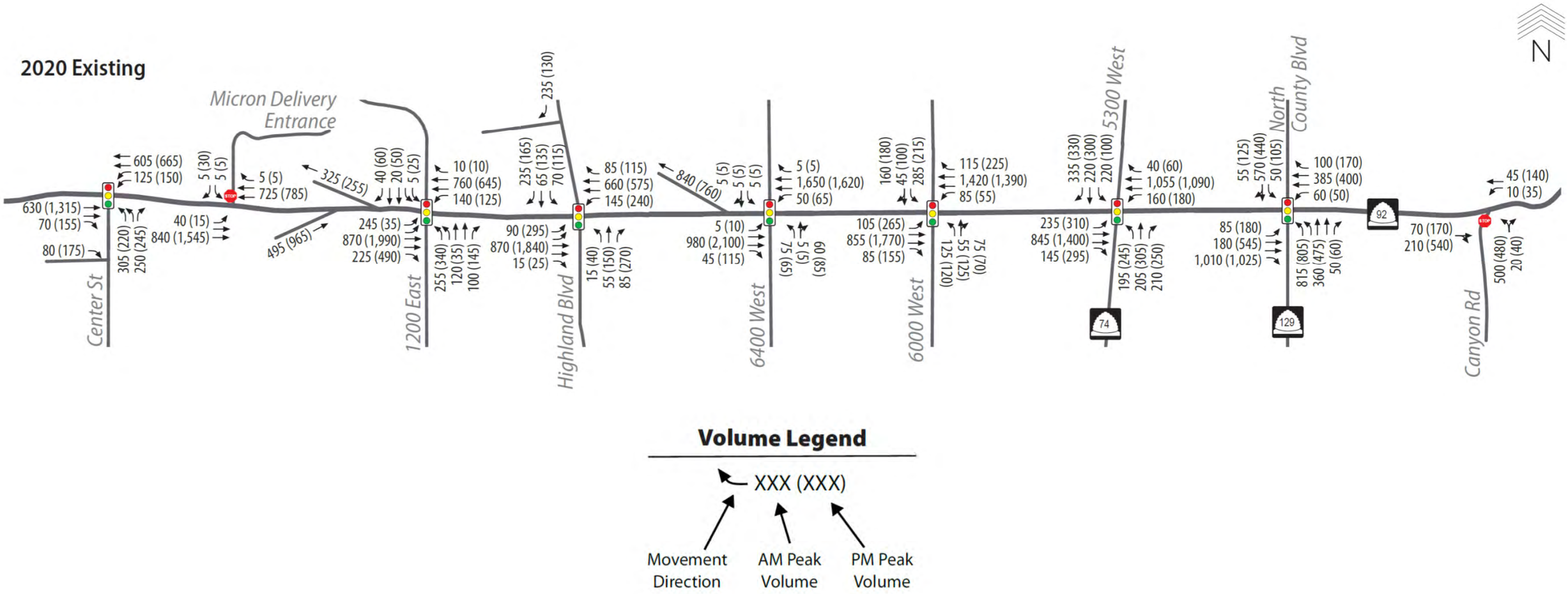


Total Employment Growth 2019-2050

SR-92 North Regional Traffic Study

Appendix B

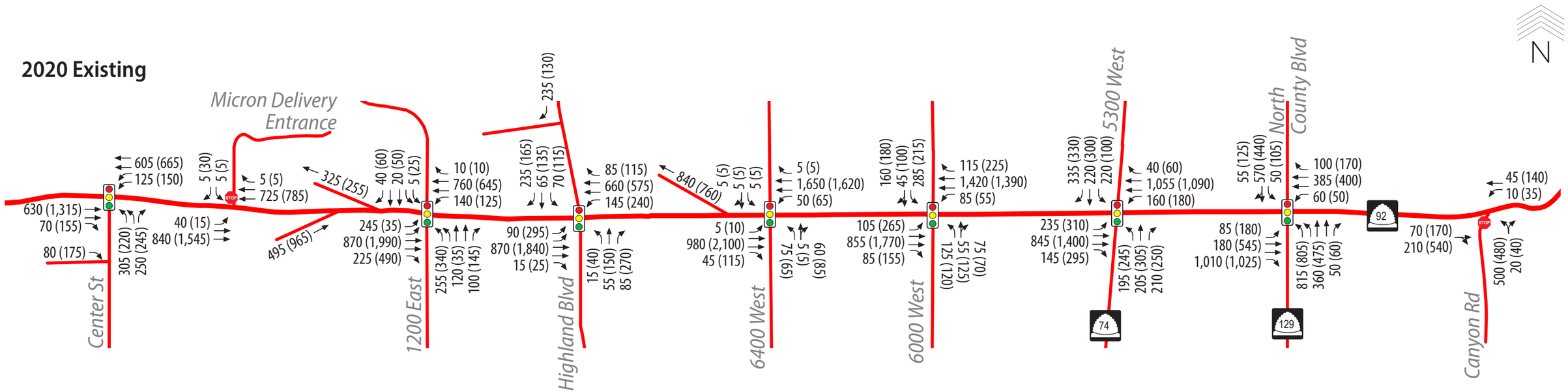
Traffic Volumes



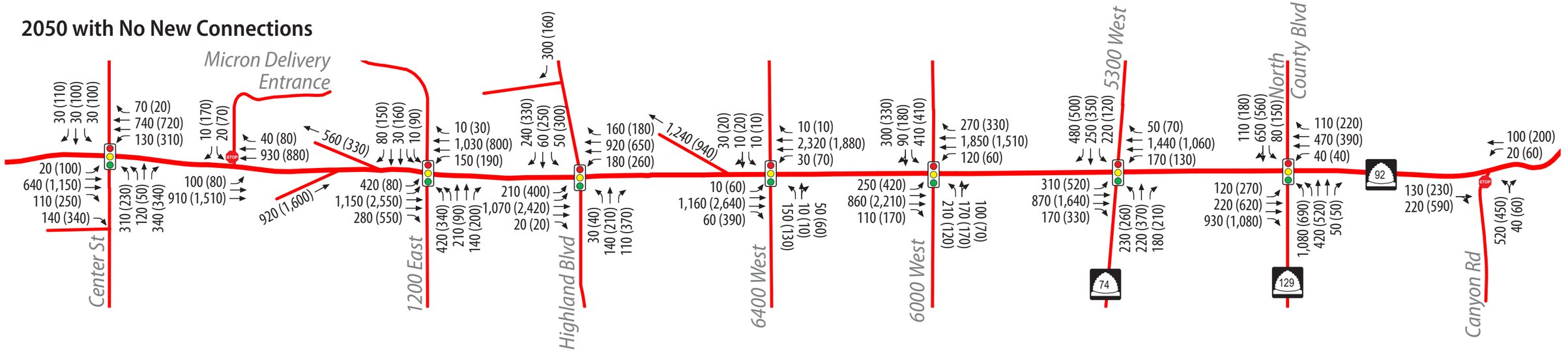
Weekday Peak Hour Volumes

SR-92 North Regional Traffic Study

2020 Existing



2050 with No New Connections



Volume Legend

XXX (XXX)

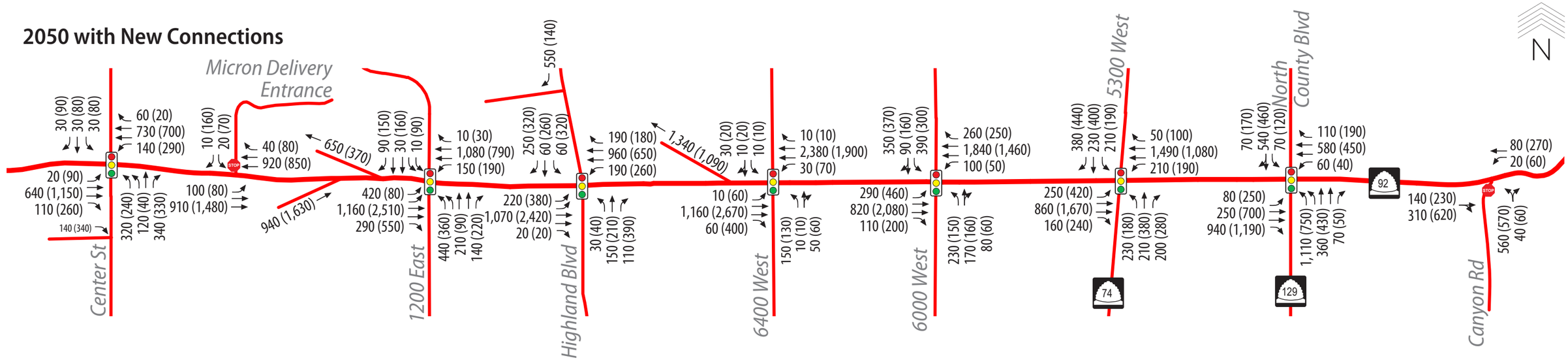
- Movement Direction
- AM Peak Volume
- PM Peak Volume

2020 Existing volumes based on 2020 traffic counts adjusted to reflect pre-pandemic conditions

Weekday Peak Hour Volumes

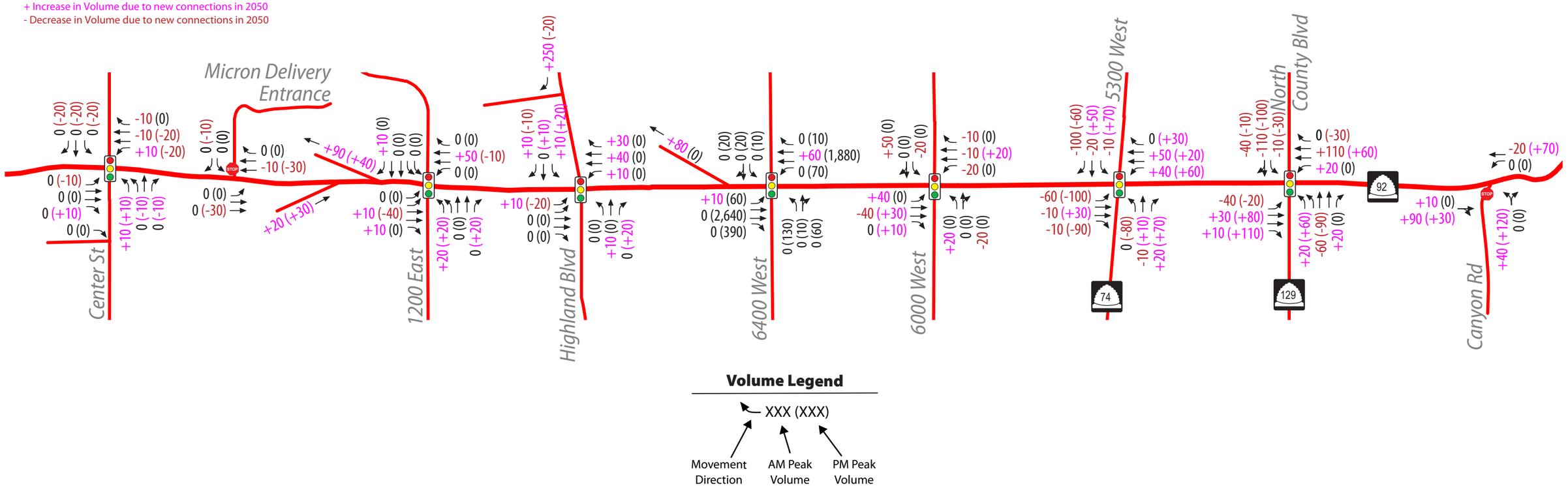
SR-92 North Regional Traffic Study

2050 with New Connections



Change in Volumes Due to New Connections

+ Increase in Volume due to new connections in 2050
- Decrease in Volume due to new connections in 2050



Volume Legend

XXX (XXX)

Movement Direction | AM Peak Volume | PM Peak Volume

Weekday Peak Hour Volumes

SR-92 North Regional Traffic Study

Appendix C

Intersection LOS Results

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	630	70	125	605	305	250
Future Volume (vph)	630	70	125	605	305	250
Satd. Flow (prot)	3539	1583	3433	3539	3433	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	3433	1583
Satd. Flow (RTOR)		76				272
Lane Group Flow (vph)	685	76	136	658	332	272
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4
Total Split (s)	45.0	45.0	20.0	65.0	35.0	35.0
Total Lost Time (s)	7.1	7.1	7.4	7.0	6.7	6.7
Act Effct Green (s)	58.7	58.7	7.3	73.5	12.8	12.8
Actuated g/C Ratio	0.59	0.59	0.07	0.74	0.13	0.13
v/c Ratio	0.33	0.08	0.55	0.25	0.75	0.62
Control Delay	11.8	3.0	39.4	6.2	53.0	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	3.0	39.4	6.2	53.0	11.4
LOS	B	A	D	A	D	B
Approach Delay	11.0			11.9	34.3	
Approach LOS	B			B	C	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 43 (43%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 47.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 101: Center Street & SR-92

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	840	725	5	5	5
Future Vol, veh/h	40	840	725	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	100	90	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	43	913	788	5	5	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	788	0	-	0	1331	394
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	543	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	827	-	-	-	146	605
Stage 1	-	-	-	-	409	-
Stage 2	-	-	-	-	546	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	827	-	-	-	138	605
Mov Cap-2 Maneuver	-	-	-	-	138	-
Stage 1	-	-	-	-	409	-
Stage 2	-	-	-	-	518	-

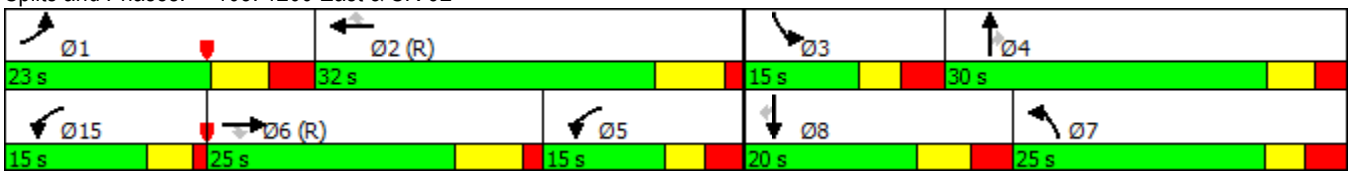
Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	21.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	827	-	-	-	138	605
HCM Lane V/C Ratio	0.053	-	-	-	0.039	0.009
HCM Control Delay (s)	9.6	-	-	-	32.2	11
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	870	225	140	760	10	255	120	100	5	20	40
Future Volume (vph)	245	870	225	140	760	10	255	120	100	5	20	40
Satd. Flow (prot)	3433	5085	1583	1770	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	1770	3539	1583	3433	3539	1583	3433	3539	1583
Satd. Flow (RTOR)			243			238			313			311
Lane Group Flow (vph)	266	946	245	152	826	11	277	130	109	5	22	43
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5 15	2		7	4		3	8	
Permitted Phases			6			2			4			8
Total Split (s)	23.0	25.0	25.0		32.0	32.0	25.0	30.0	30.0	15.0	20.0	20.0
Total Lost Time (s)	7.7	6.5	6.5		6.6	6.6	6.2	6.1	6.1	6.4	7.1	7.1
Act Effct Green (s)	10.8	38.1	38.1	16.6	47.9	47.9	11.1	18.6	18.6	5.0	5.0	5.0
Actuated g/C Ratio	0.11	0.38	0.38	0.17	0.48	0.48	0.11	0.19	0.19	0.05	0.05	0.05
v/c Ratio	0.72	0.49	0.33	0.52	0.49	0.01	0.73	0.20	0.20	0.03	0.12	0.11
Control Delay	51.9	21.8	3.6	32.7	11.6	0.0	53.9	34.4	0.8	45.6	47.1	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	21.8	3.6	32.7	11.6	0.0	53.9	34.4	0.8	45.6	47.1	0.6
LOS	D	C	A	C	B	A	D	C	A	D	D	A
Approach Delay		24.2			14.8			37.8			18.4	
Approach LOS		C			B			D			B	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 48 (48%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 23.3	Intersection LOS: C
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 103: 1200 East & SR-92



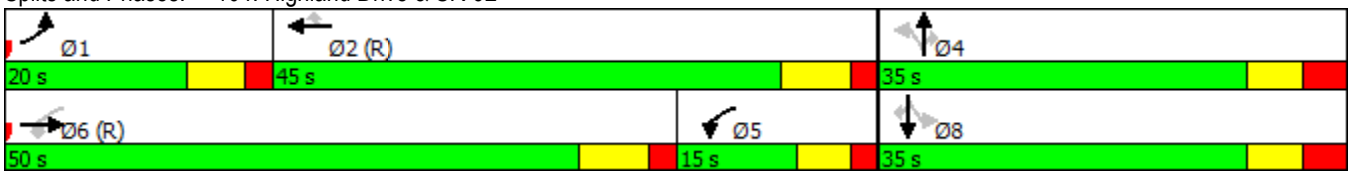
Lane Group	Ø5	Ø15
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	5	15
Permitted Phases		
Total Split (s)	15.0	15.0
Total Lost Time (s)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	870	15	145	660	85	15	55	85	75	65	235
Future Volume (vph)	90	870	15	145	660	85	15	55	85	75	65	235
Satd. Flow (prot)	3433	5085	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.950			0.278			0.711			0.718		
Satd. Flow (perm)	3433	5085	1583	518	3539	1583	1324	1863	1583	1337	1863	1583
Satd. Flow (RTOR)			130			121			197			255
Lane Group Flow (vph)	98	946	16	158	717	92	16	60	92	82	71	255
Turn Type	Prot	NA	Perm	D.P+P	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6	6		2	4		4	8		8
Total Split (s)	20.0	50.0	50.0	15.0	45.0	45.0	35.0	35.0	35.0	35.0	35.0	35.0
Total Lost Time (s)	6.5	7.3	7.3	6.1	7.3	7.3	7.6	7.6	7.6	7.6	7.6	7.6
Act Effct Green (s)	7.1	60.0	60.0	70.1	63.7	63.7	10.1	10.1	10.1	10.1	10.1	10.1
Actuated g/C Ratio	0.07	0.60	0.60	0.70	0.64	0.64	0.10	0.10	0.10	0.10	0.10	0.10
v/c Ratio	0.40	0.31	0.02	0.33	0.32	0.09	0.12	0.32	0.27	0.61	0.38	0.66
Control Delay	65.3	2.0	0.0	11.4	15.3	4.9	40.3	44.5	2.0	60.9	46.2	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.3	2.0	0.0	11.4	15.3	4.9	40.3	44.5	2.0	60.9	46.2	13.7
LOS	E	A	A	B	B	A	D	D	A	E	D	B
Approach Delay		7.8			13.7			20.8			28.9	
Approach LOS		A			B			C			C	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 91 (91%), Referenced to phase 2:WBT and 6:EBWB, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 55.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 104: Highland Drive & SR-92



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	980	45	50	1650	5	75	5	60	5	5	5
Future Volume (vph)	5	980	45	50	1650	5	75	5	60	5	5	5
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1604	0	1770	1723	0
Flt Permitted	0.111			0.238			0.751			0.711		
Satd. Flow (perm)	207	3539	1583	443	3539	1583	1399	1604	0	1324	1723	0
Satd. Flow (RTOR)			104			49		65			5	
Lane Group Flow (vph)	5	1065	49	54	1793	5	82	70	0	5	10	0
Turn Type	Perm	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6		6	6		2	4			8		
Total Split (s)	51.0	51.0	51.0	15.0	66.0	66.0	34.0	34.0		34.0	34.0	
Total Lost Time (s)	7.0	7.0	7.0	5.0	7.0	7.0	7.5	7.5		7.5	7.5	
Act Effct Green (s)	71.3	71.3	71.3	76.2	79.6	79.6	9.8	9.8		9.8	9.8	
Actuated g/C Ratio	0.71	0.71	0.71	0.76	0.80	0.80	0.10	0.10		0.10	0.10	
v/c Ratio	0.03	0.42	0.04	0.13	0.64	0.00	0.60	0.33		0.04	0.06	
Control Delay	1.4	3.0	0.1	2.9	5.6	0.0	60.5	15.6		38.8	29.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	1.4	3.0	0.1	2.9	5.6	0.0	60.5	15.6		38.8	29.8	
LOS	A	A	A	A	A	A	E	B		D	C	
Approach Delay		2.8			5.5			39.8			32.8	
Approach LOS		A			A			D			C	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 97 (97%), Referenced to phase 2:WBT and 6:EBWB, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 6.4	Intersection LOS: A
Intersection Capacity Utilization 68.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 105: 6400 West & SR-92

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	855	85	85	1420	115	125	55	75	285	45	160
Future Volume (vph)	105	855	85	85	1420	115	125	55	75	285	45	160
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1701	0	1770	1645	0
Flt Permitted	0.085			0.230			0.545			0.666		
Satd. Flow (perm)	158	3539	1583	428	3539	1583	1015	1701	0	1241	1645	0
Satd. Flow (RTOR)			115			115		66			172	
Lane Group Flow (vph)	114	929	92	92	1543	125	136	142	0	310	223	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	2		6	6		2	4			8		
Total Split (s)	15.0	52.0	52.0	15.0	52.0	52.0	33.0	33.0		33.0	33.0	
Total Lost Time (s)	5.8	6.9	6.9	6.0	6.9	6.9	7.5	7.5		7.5	7.5	
Act Effct Green (s)	55.4	49.8	49.8	56.2	47.2	47.2	25.5	25.5		25.5	25.5	
Actuated g/C Ratio	0.55	0.50	0.50	0.56	0.47	0.47	0.26	0.26		0.26	0.26	
v/c Ratio	0.57	0.53	0.11	0.28	0.92	0.15	0.53	0.29		0.98	0.41	
Control Delay	22.4	29.0	7.3	10.5	35.8	4.2	40.7	18.3		84.9	10.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	22.4	29.0	7.3	10.5	35.8	4.2	40.7	18.3		84.9	10.9	
LOS	C	C	A	B	D	A	D	B		F	B	
Approach Delay		26.6			32.2			29.3			54.0	
Approach LOS		C			C			C			D	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 81 (81%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 33.4	Intersection LOS: C
Intersection Capacity Utilization 91.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 106: 6000 West & SR-92

Intersection	
Int Delay, s/veh	10.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	1185	25	25	1555	5	35	0	35	5	0	30
Future Vol, veh/h	5	1185	25	25	1555	5	35	0	35	5	0	30
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	200	-	275	170	-	-	100	-	100	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	5	1288	27	27	1690	5	38	0	38	5	0	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1696	0	0	1288	0	0	2198	3049	644	2402	3046	848
Stage 1	-	-	-	-	-	-	1299	1299	-	1747	1747	-
Stage 2	-	-	-	-	-	-	899	1750	-	655	1299	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
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	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	372	-	-	534	-	-	~ 25	12	416	17	12	305
Stage 1	-	-	-	-	-	-	171	230	-	89	138	-
Stage 2	-	-	-	-	-	-	300	138	-	421	230	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	372	-	-	534	-	-	~ 21	11	416	15	11	305
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 21	11	-	15	11	-
Stage 1	-	-	-	-	-	-	169	227	-	88	131	-
Stage 2	-	-	-	-	-	-	254	131	-	377	227	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	$ 394.8	65
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	NBLn3	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	21	-	416	372	-	-	534	-	-	15	-	305
HCM Lane V/C Ratio	1.812	-	0.091	0.015	-	-	0.051	-	-	0.362	-	0.107
HCM Control Delay (s)	$ 775.1	0	14.5	14.8	-	-	12.1	-	-	$ 345.9	0	18.2
HCM Lane LOS	F	A	B	B	-	-	B	-	-	F	A	C
HCM 95th %tile Q(veh)	5	-	0.3	0	-	-	0.2	-	-	1	-	0.4

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	845	145	160	1055	40	195	205	210	220	220	335
Future Volume (vph)	235	845	145	160	1055	40	195	205	210	220	220	335
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.080			0.213			0.341			0.368		
Satd. Flow (perm)	149	3539	1583	397	3539	1583	635	1863	1583	685	1863	1583
Satd. Flow (RTOR)			130			123			228			278
Lane Group Flow (vph)	255	918	158	174	1147	43	212	223	228	239	239	364
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Total Split (s)	25.0	65.0	65.0	25.0	65.0	65.0	25.0	30.0	30.0	25.0	30.0	30.0
Total Lost Time (s)	5.9	7.2	7.2	6.3	7.2	7.2	6.0	7.0	7.0	6.1	7.0	7.0
Act Effct Green (s)	67.1	49.9	49.9	56.7	44.9	44.9	35.2	19.0	19.0	35.7	19.3	19.3
Actuated g/C Ratio	0.55	0.41	0.41	0.46	0.37	0.37	0.29	0.15	0.15	0.29	0.16	0.16
v/c Ratio	0.86	0.64	0.22	0.57	0.89	0.07	0.66	0.78	0.52	0.71	0.82	0.75
Control Delay	60.4	31.8	7.1	22.7	46.3	0.2	43.2	71.6	11.1	46.3	74.9	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.4	31.8	7.1	22.7	46.3	0.2	43.2	71.6	11.1	46.3	74.9	24.8
LOS	E	C	A	C	D	A	D	E	B	D	E	C
Approach Delay		34.4			41.9			41.7			45.1	
Approach LOS		C			D			D			D	

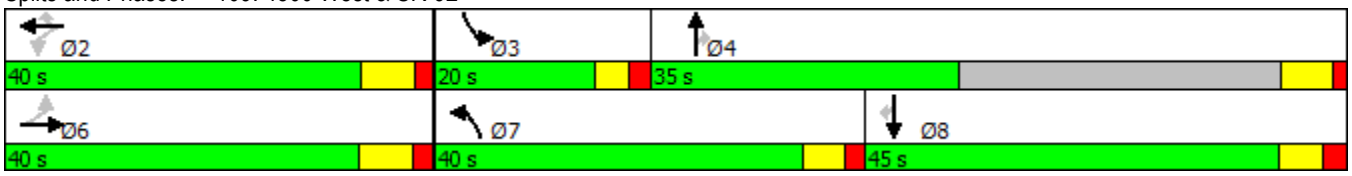
Intersection Summary	
Cycle Length: 145	
Actuated Cycle Length: 122.8	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 40.1	Intersection LOS: D
Intersection Capacity Utilization 87.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 108: 5300 West (SR-74) & SR-92

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	180	1010	60	385	100	815	360	50	50	570	55
Future Volume (vph)	85	180	1010	60	385	100	815	360	50	50	570	55
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.415			0.629			0.950			0.950		
Satd. Flow (perm)	773	3539	1583	1172	3539	1583	3433	1863	1583	1770	1863	1583
Satd. Flow (RTOR)			606			127			80			131
Lane Group Flow (vph)	92	196	1098	65	418	109	886	391	54	54	620	60
Turn Type	Perm	NA	Free	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		Free	2		2			4			8
Total Split (s)	40.0	40.0		40.0	40.0	40.0	40.0	35.0	35.0	20.0	45.0	45.0
Total Lost Time (s)	7.0	7.0		6.8	6.8	6.8	5.8	6.3	6.3	5.2	6.6	6.6
Act Effct Green (s)	33.0	33.0	124.0	33.2	33.2	33.2	33.2	67.4	67.4	7.2	38.4	38.4
Actuated g/C Ratio	0.27	0.27	1.00	0.27	0.27	0.27	0.27	0.54	0.54	0.06	0.31	0.31
v/c Ratio	0.45	0.21	0.69	0.21	0.44	0.21	0.97	0.39	0.06	0.53	1.07	0.10
Control Delay	46.6	36.3	2.5	37.9	39.7	5.1	67.4	18.7	1.6	75.0	100.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	36.3	2.5	37.9	39.7	5.1	67.4	18.7	1.6	75.0	100.3	0.4
LOS	D	D	A	D	D	A	E	B	A	E	F	A
Approach Delay		10.2			33.1			50.4			90.3	
Approach LOS		B			C			D			F	

Intersection Summary	
Cycle Length: 125	
Actuated Cycle Length: 124	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 41.3	Intersection LOS: D
Intersection Capacity Utilization 94.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 109: 4800 West & SR-92



Intersection	
Int Delay, s/veh	15.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	70	210	10	45	500	20
Future Vol, veh/h	70	210	10	45	500	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	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	76	228	11	49	543	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	304	0	261	190
Stage 1	-	-	-	-	190	-
Stage 2	-	-	-	-	71	-
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	-	-	1257	-	728	852
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	952	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1257	-	722	852
Mov Cap-2 Maneuver	-	-	-	-	722	-
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	944	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	25.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	726	-	-	1257	-
HCM Lane V/C Ratio	0.779	-	-	0.009	-
HCM Control Delay (s)	25.1	-	-	7.9	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	7.6	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1315	155	150	665	220	245
Future Volume (vph)	1315	155	150	665	220	245
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	5.0
Minimum Split (s)	22.1	22.1	12.4	22.0	11.7	11.7
Total Split (s)	60.0	60.0	20.0	80.0	40.0	40.0
Total Split (%)	50.0%	50.0%	16.7%	66.7%	33.3%	33.3%
Yellow Time (s)	5.6	5.6	4.7	5.5	3.0	3.0
All-Red Time (s)	1.5	1.5	2.7	1.5	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.4	7.0	6.7	6.7
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	78.0	78.0	8.9	94.4	11.9	11.9
Actuated g/C Ratio	0.65	0.65	0.07	0.79	0.10	0.10
v/c Ratio	0.62	0.15	0.64	0.26	0.70	0.75
Control Delay	14.7	1.9	86.1	1.0	63.3	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	1.9	86.1	1.0	63.3	24.9
LOS	B	A	F	A	E	C
Approach Delay	13.4			16.7	43.1	
Approach LOS	B			B	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 100 (83%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 19.4	Intersection LOS: B
Intersection Capacity Utilization 64.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 101: Center Street & SR-92

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	1545	785	5	5	30
Future Vol, veh/h	15	1545	785	5	5	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	100	90	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	16	1679	853	5	5	33

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	853	0	-	0	1725	427
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	872	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	782	-	-	-	80	576
Stage 1	-	-	-	-	378	-
Stage 2	-	-	-	-	369	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	782	-	-	-	78	576
Mov Cap-2 Maneuver	-	-	-	-	78	-
Stage 1	-	-	-	-	378	-
Stage 2	-	-	-	-	361	-

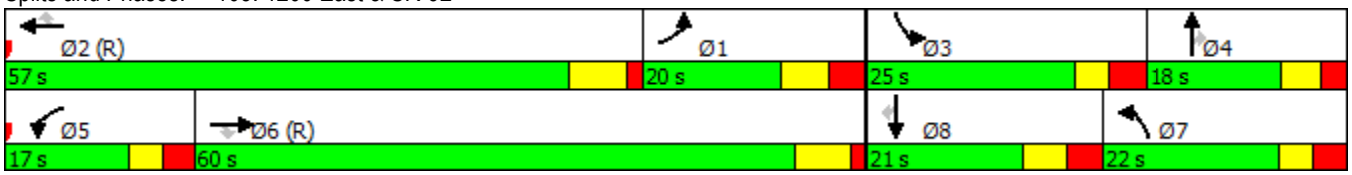
Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	17.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	782	-	-	-	78	576
HCM Lane V/C Ratio	0.021	-	-	-	0.07	0.057
HCM Control Delay (s)	9.7	-	-	-	54.6	11.6
HCM Lane LOS	A	-	-	-	F	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	1990	490	125	645	10	340	35	145	25	50	60
Future Volume (vph)	35	1990	490	125	645	10	340	35	145	25	50	60
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2			4			8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	12.7	44.5	44.5	10.9	40.6	40.6	11.2	11.1	11.1	11.4	12.1	12.1
Total Split (s)	20.0	60.0	60.0	17.0	57.0	57.0	22.0	18.0	18.0	25.0	21.0	21.0
Total Split (%)	16.7%	50.0%	50.0%	14.2%	47.5%	47.5%	18.3%	15.0%	15.0%	20.8%	17.5%	17.5%
Yellow Time (s)	4.3	5.0	5.0	3.0	5.1	5.1	3.0	3.6	3.6	3.0	4.0	4.0
All-Red Time (s)	3.4	1.5	1.5	2.9	1.5	1.5	3.2	2.5	2.5	3.4	3.1	3.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.7	6.5	6.5	5.9	6.6	6.6	6.2	6.1	6.1	6.4	7.1	7.1
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	9.4	62.5	62.5	12.4	68.7	68.7	16.3	19.7	19.7	5.1	5.6	5.6
Actuated g/C Ratio	0.08	0.52	0.52	0.10	0.57	0.57	0.14	0.16	0.16	0.04	0.05	0.05
v/c Ratio	0.14	0.82	0.56	0.75	0.35	0.01	0.80	0.07	0.36	0.19	0.33	0.23
Control Delay	47.1	26.4	9.2	70.3	12.7	0.0	63.1	41.5	3.5	58.5	60.5	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	26.4	9.2	70.3	12.7	0.0	63.1	41.5	3.5	58.5	60.5	2.0
LOS	D	C	A	E	B	A	E	D	A	E	E	A
Approach Delay		23.4			21.8			45.0			34.1	
Approach LOS		C			C			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 58 (48%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 26.3	Intersection LOS: C
Intersection Capacity Utilization 77.2%	ICU Level of Service D
Analysis Period (min) 15	

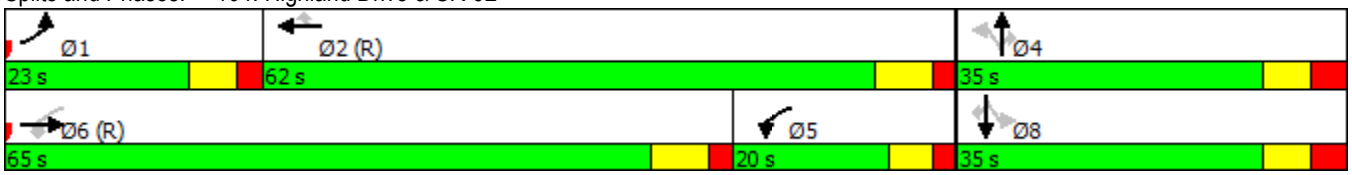
Splits and Phases: 103: 1200 East & SR-92



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	1840	25	240	575	115	40	150	270	115	135	165
Future Volume (vph)	295	1840	25	240	575	115	40	150	270	115	135	165
Turn Type	Prot	NA	Perm	D.P+P	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6	6		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	29.3	29.3	11.1	22.3	22.3	43.6	43.6	43.6	12.6	12.6	12.6
Total Split (s)	23.0	65.0	65.0	20.0	62.0	62.0	35.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	19.2%	54.2%	54.2%	16.7%	51.7%	51.7%	29.2%	29.2%	29.2%	29.2%	29.2%	29.2%
Yellow Time (s)	4.3	5.2	5.2	4.0	5.2	5.2	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.2	2.1	2.1	2.1	2.1	2.1	3.4	3.4	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	7.3	7.3	6.1	7.3	7.3	7.6	7.6	7.6	7.6	7.6	7.6
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	15.0	68.2	68.2	83.3	66.7	66.7	16.9	16.9	16.9	16.9	16.9	16.9
Actuated g/C Ratio	0.12	0.57	0.57	0.69	0.56	0.56	0.14	0.14	0.14	0.14	0.14	0.14
v/c Ratio	0.75	0.69	0.03	0.97	0.32	0.13	0.27	0.62	0.71	0.87	0.56	0.48
Control Delay	74.8	2.7	0.0	82.6	20.2	7.4	47.6	57.8	22.9	95.8	55.0	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.8	2.7	0.0	82.6	20.2	7.4	47.6	57.8	22.9	95.8	55.0	10.2
LOS	E	A	A	F	C	A	D	E	C	F	E	B
Approach Delay		12.6			34.7			36.4			48.5	
Approach LOS		B			C			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 107 (89%), Referenced to phase 2:WBT and 6:EBWB, Start of 1st Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 24.3	Intersection LOS: C
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 104: Highland Drive & SR-92



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	10	2100	115	65	1620	5	65	5	5	5
Future Volume (vph)	10	2100	115	65	1620	5	65	5	5	5
Turn Type	Perm	NA	Perm	D.P+P	NA	Perm	Perm	NA	Perm	NA
Protected Phases		6		5	2			4		8
Permitted Phases	6		6	6		2	4		8	
Detector Phase	6	6	6	5	2	2	4	4	8	8
Switch Phase										
Minimum Initial (s)	15.0	15.0	15.0	5.0	15.0	15.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	10.0	22.0	22.0	31.5	31.5	33.5	33.5
Total Split (s)	70.0	70.0	70.0	15.0	85.0	85.0	35.0	35.0	35.0	35.0
Total Split (%)	58.3%	58.3%	58.3%	12.5%	70.8%	70.8%	29.2%	29.2%	29.2%	29.2%
Yellow Time (s)	5.0	5.0	5.0	3.0	5.0	5.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	5.0	7.0	7.0	7.5	7.5	7.5	7.5
Lead/Lag	Lag	Lag	Lag	Lead						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	86.5	86.5	86.5	93.5	95.5	95.5	10.0	10.0	10.0	10.0
Actuated g/C Ratio	0.72	0.72	0.72	0.78	0.80	0.80	0.08	0.08	0.08	0.08
v/c Ratio	0.07	0.89	0.11	0.47	0.63	0.00	0.61	0.45	0.05	0.07
Control Delay	2.1	15.3	0.3	32.2	1.9	0.0	74.2	17.8	48.8	36.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.1	15.3	0.3	32.2	1.9	0.0	74.2	17.8	48.8	36.3
LOS	A	B	A	C	A	A	E	B	D	D
Approach Delay		14.4			3.0			41.6		40.5
Approach LOS		B			A			D		D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 2 (2%), Referenced to phase 2:WBT and 6:EBWB, Start of 1st Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 80.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 105: 6400 West & SR-92

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	265	1770	155	55	1390	225	120	125	215	100
Future Volume (vph)	265	1770	155	55	1390	225	120	125	215	100
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA	Perm	NA
Protected Phases	1	6		5	2			4		8
Permitted Phases	2		6	6		2	4		8	
Detector Phase	1	6	6	5	2	2	4	4	8	8
Switch Phase										
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.8	22.9	22.9	11.0	22.9	22.9	32.5	32.5	32.5	32.5
Total Split (s)	15.0	67.0	67.0	15.0	67.0	67.0	38.0	38.0	38.0	38.0
Total Split (%)	12.5%	55.8%	55.8%	12.5%	55.8%	55.8%	31.7%	31.7%	31.7%	31.7%
Yellow Time (s)	4.3	5.4	5.4	4.5	5.4	5.4	5.6	5.6	5.6	5.6
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.9	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	6.9	6.9	6.0	6.9	6.9	7.5	7.5	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	71.5	66.4	66.4	72.3	60.1	60.1	29.4	29.4	29.4	29.4
Actuated g/C Ratio	0.60	0.55	0.55	0.60	0.50	0.50	0.24	0.24	0.24	0.24
v/c Ratio	1.34	0.98	0.18	0.40	0.85	0.29	0.79	0.47	0.97	0.65
Control Delay	195.3	44.5	8.4	18.4	32.0	8.8	75.2	38.1	96.3	37.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	195.3	44.5	8.4	18.4	32.0	8.8	75.2	38.1	96.3	37.9
LOS	F	D	A	B	C	A	E	D	F	D
Approach Delay		60.2			28.4			52.2		63.3
Approach LOS		E			C			D		E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 84 (70%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.34	
Intersection Signal Delay: 48.6	Intersection LOS: D
Intersection Capacity Utilization 99.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 106: 6000 West & SR-92

Intersection	
Int Delay, s/veh	31.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	1955	70	25	1625	15	25	0	45	5	0	20
Future Vol, veh/h	30	1955	70	25	1625	15	25	0	45	5	0	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	200	-	275	170	-	-	100	-	100	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	33	2125	76	27	1766	16	27	0	49	5	0	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1783	0	0	2125	0	0	3128	4027	1063	2957	4019	891
Stage 1	-	-	-	-	-	-	2190	2190	-	1829	1829	-
Stage 2	-	-	-	-	-	-	938	1837	-	1128	2190	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
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	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	344	-	-	253	-	-	~ 5	3	219	6	3	285
Stage 1	-	-	-	-	-	-	46	82	-	79	126	-
Stage 2	-	-	-	-	-	-	284	125	-	218	82	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	344	-	-	253	-	-	~ 4	2	219	~ 4	2	285
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 4	2	-	~ 4	2	-
Stage 1	-	-	-	-	-	-	42	74	-	71	113	-
Stage 2	-	-	-	-	-	-	234	112	-	153	74	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	$ 1559	$ 361.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	NBLn3	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	4	-	219	344	-	-	253	-	-	4	-	285
HCM Lane V/C Ratio	6.793	-	0.223	0.095	-	-	0.107	-	-	1.359	-	0.076
HCM Control Delay (s)	$ 4318.2	0	26.1	16.6	-	-	20.9	-	-	$ 1731.9	0	18.7
HCM Lane LOS	F	A	D	C	-	-	C	-	-	F	A	C
HCM 95th %tile Q(veh)	5	-	0.8	0.3	-	-	0.4	-	-	1.5	-	0.2

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	310	1400	295	180	1090	60	245	305	250	100	300	330
Future Volume (vph)	310	1400	295	180	1090	60	245	305	250	100	300	330
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.9	27.2	27.2	11.3	31.2	31.2	11.0	30.0	30.0	11.1	33.0	33.0
Total Split (s)	33.0	55.0	55.0	15.0	37.0	37.0	17.0	38.0	38.0	12.0	34.0	34.0
Total Split (%)	27.3%	45.5%	45.5%	12.4%	30.6%	30.6%	14.0%	31.4%	31.4%	9.9%	28.1%	28.1%
Yellow Time (s)	3.8	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9
All-Red Time (s)	2.1	2.3	2.3	2.3	2.3	2.3	2.0	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	7.2	7.2	6.3	7.2	7.2	6.0	7.0	7.0	6.1	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	64.9	48.2	48.2	51.1	38.9	38.9	41.0	29.0	29.0	30.8	24.0	24.0
Actuated g/C Ratio	0.54	0.40	0.40	0.42	0.32	0.32	0.34	0.24	0.24	0.25	0.20	0.20
v/c Ratio	0.92	1.08	0.43	0.86	1.04	0.10	1.08	0.75	0.50	0.49	0.89	0.62
Control Delay	63.1	83.9	12.4	64.8	79.2	0.3	112.9	53.3	12.9	36.6	72.3	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	83.9	12.4	64.8	79.2	0.3	112.9	53.3	12.9	36.6	72.3	10.5
LOS	E	F	B	E	E	A	F	D	B	D	E	B
Approach Delay		70.1			73.7			58.9			39.5	
Approach LOS		E			E			E			D	

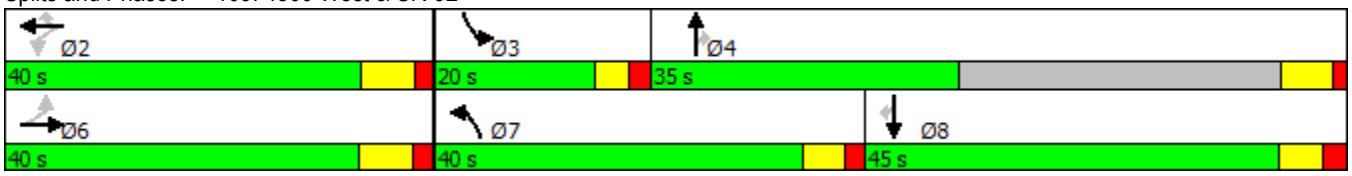
Intersection Summary	
Cycle Length: 121	
Actuated Cycle Length: 121	
Offset: 16 (13%), Referenced to phase 2:WBTL and 6:EBTL, Start of 1st Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 64.7	Intersection LOS: E
Intersection Capacity Utilization 100.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 108: 5300 West (SR-74) & SR-92

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	545	1025	50	400	170	805	475	60	105	440	125
Future Volume (vph)	180	545	1025	50	400	170	805	475	60	105	440	125
Turn Type	Perm	NA	Free	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		Free	2		2			4			8
Detector Phase	6	6		2	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	25.0	25.0		24.8	24.8	24.8	10.8	24.3	24.3	10.2	24.6	24.6
Total Split (s)	40.0	40.0		40.0	40.0	40.0	40.0	35.0	35.0	20.0	45.0	45.0
Total Split (%)	32.0%	32.0%		32.0%	32.0%	32.0%	32.0%	28.0%	28.0%	16.0%	36.0%	36.0%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	4.8	4.8	3.2	4.1	4.1
All-Red Time (s)	2.0	2.0		1.8	1.8	1.8	1.8	1.5	1.5	2.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		6.8	6.8	6.8	5.8	6.3	6.3	5.2	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max		Max	Max	Max	None	None	None	None	None	None
Act Effct Green (s)	33.2	33.2	118.3	33.4	33.4	33.4	31.7	56.0	56.0	10.5	33.8	33.8
Actuated g/C Ratio	0.28	0.28	1.00	0.28	0.28	0.28	0.27	0.47	0.47	0.09	0.29	0.29
v/c Ratio	0.90	0.60	0.70	0.36	0.43	0.32	0.95	0.59	0.08	0.73	0.90	0.25
Control Delay	84.3	41.0	2.6	45.2	37.7	6.6	62.9	26.2	2.9	79.6	61.8	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.3	41.0	2.6	45.2	37.7	6.6	62.9	26.2	2.9	79.6	61.8	7.1
LOS	F	D	A	D	D	A	E	C	A	E	E	A
Approach Delay		23.0			29.8			47.2			54.4	
Approach LOS		C			C			D			D	

Intersection Summary	
Cycle Length: 125	
Actuated Cycle Length: 118.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 36.2	Intersection LOS: D
Intersection Capacity Utilization 91.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 109: 4800 West & SR-92



Intersection	
Int Delay, s/veh	87.7

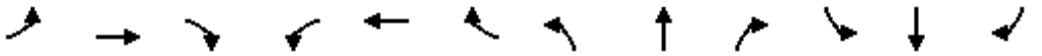
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	170	540	35	140	480	40
Future Vol, veh/h	170	540	35	140	480	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	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	185	587	38	152	522	43

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	772	0	706	478
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	228	-
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	-	-	843	-	~ 402	587
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	810	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	843	-	~ 384	587
Mov Cap-2 Maneuver	-	-	-	-	~ 384	-
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	773	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	236.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	394	-	-	843	-
HCM Lane V/C Ratio	1.435	-	-	0.045	-
HCM Control Delay (s)	236.2	-	-	9.5	-
HCM Lane LOS	F	-	-	A	-
HCM 95th %tile Q(veh)	28.8	-	-	0.1	-

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

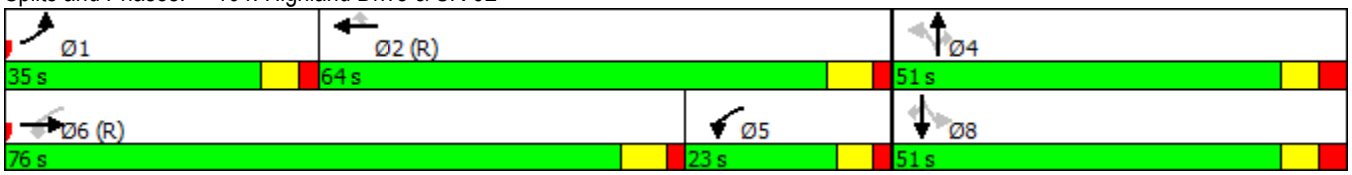


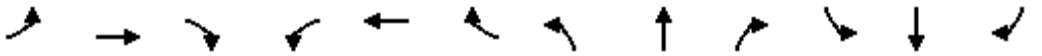
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	2420	20	260	650	180	40	210	370	300	250	330
Future Volume (vph)	400	2420	20	260	650	180	40	210	370	300	250	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	435		450	260		280	100		170	280		180
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	280			125			80			100		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.950			0.058			0.437			0.505		
Satd. Flow (perm)	3433	5085	1583	108	3539	1583	814	1863	1583	941	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87			196			220			359
Link Speed (mph)		50			50			25			25	
Link Distance (ft)		1343			952			1887			477	
Travel Time (s)		18.3			13.0			51.5			13.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	435	2630	22	283	707	196	43	228	402	326	272	359
Shared Lane Traffic (%)												
Lane Group Flow (vph)	435	2630	22	283	707	196	43	228	402	326	272	359
Turn Type	Prot	NA	Perm	D.P+P	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6	6		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	29.3	29.3	11.1	22.3	22.3	43.6	43.6	43.6	12.6	12.6	12.6
Total Split (s)	35.0	76.0	76.0	23.0	64.0	64.0	51.0	51.0	51.0	51.0	51.0	51.0
Total Split (%)	23.3%	50.7%	50.7%	15.3%	42.7%	42.7%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%
Yellow Time (s)	4.3	5.2	5.2	4.0	5.2	5.2	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.2	2.1	2.1	2.1	2.1	2.1	3.4	3.4	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	7.3	7.3	6.1	7.3	7.3	7.6	7.6	7.6	7.6	7.6	7.6
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	23.1	68.7	68.7	86.8	62.1	62.1	43.4	43.4	43.4	43.4	43.4	43.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.15	0.46	0.46	0.58	0.41	0.41	0.29	0.29	0.29	0.29	0.29	0.29
v/c Ratio	0.82	1.13	0.03	1.14	0.48	0.25	0.18	0.42	0.65	1.20	0.50	0.50
Control Delay	83.1	84.1	0.0	141.2	39.0	10.4	42.7	46.1	26.0	164.4	48.3	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.1	84.1	0.0	141.2	39.0	10.4	42.7	46.1	26.0	164.4	48.3	6.4
LOS	F	F	A	F	D	B	D	D	C	F	D	A
Approach Delay		83.4			58.7			33.9			72.1	
Approach LOS		F			E			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 80.6 (54%), Referenced to phase 2:WBT and 6:EBWB, Start of 1st Green			
Natural Cycle: 125			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 70.9		Intersection LOS: E	
Intersection Capacity Utilization 112.7%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 104: Highland Drive & SR-92



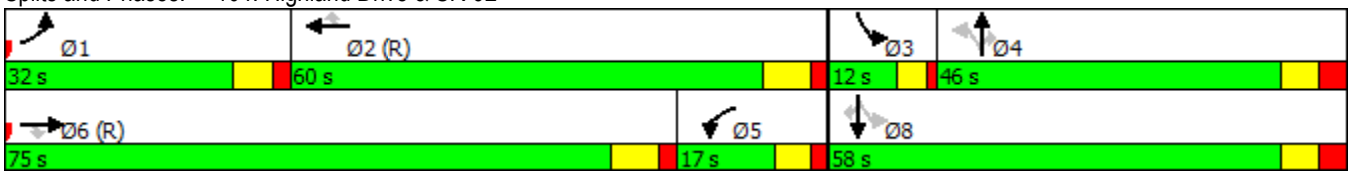


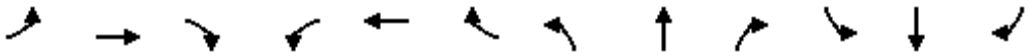
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	2420	20	260	650	180	40	210	390	320	260	320
Future Volume (vph)	380	2420	20	260	650	180	40	210	390	320	260	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	435		450	260		280	100		170	280		180
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	280			125			80			100		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.950			0.950			0.578			0.369		
Satd. Flow (perm)	3433	5085	1583	3433	3539	1583	1077	1863	1583	687	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			119			196			164			348
Link Speed (mph)		50			50			25			25	
Link Distance (ft)		1343			952			1887			477	
Travel Time (s)		18.3			13.0			51.5			13.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	413	2630	22	283	707	196	43	228	424	348	283	348
Shared Lane Traffic (%)												
Lane Group Flow (vph)	413	2630	22	283	707	196	43	228	424	348	283	348
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2			4		3	8	
Permitted Phases			6			2	4		4	8		8
Detector Phase	1	6	6	5	2	2	4	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	29.3	29.3	11.1	22.3	22.3	43.6	43.6	43.6	9.5	12.6	12.6
Total Split (s)	32.0	75.0	75.0	17.0	60.0	60.0	46.0	46.0	46.0	12.0	58.0	58.0
Total Split (%)	21.3%	50.0%	50.0%	11.3%	40.0%	40.0%	30.7%	30.7%	30.7%	8.0%	38.7%	38.7%
Yellow Time (s)	4.3	5.2	5.2	4.0	5.2	5.2	4.2	4.2	4.2	3.5	4.2	4.2
All-Red Time (s)	2.2	2.1	2.1	2.1	2.1	2.1	3.4	3.4	3.4	1.0	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	7.3	7.3	6.1	7.3	7.3	7.6	7.6	7.6	4.5	7.6	7.6
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	21.7	75.3	75.3	10.9	64.1	64.1	30.8	30.8	30.8	45.9	42.8	42.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.14	0.50	0.50	0.07	0.43	0.43	0.21	0.21	0.21	0.31	0.29	0.29
v/c Ratio	0.83	1.03	0.03	1.14	0.47	0.25	0.20	0.60	0.93	1.32	0.53	0.50
Control Delay	69.3	37.1	0.0	143.0	24.9	6.8	48.3	59.5	63.2	205.7	48.0	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.3	37.1	0.0	143.0	24.9	6.8	48.3	59.5	63.2	205.7	48.0	5.9
LOS	E	D	A	F	C	A	D	E	E	F	D	A
Approach Delay		41.2			50.1			61.1			89.1	
Approach LOS		D			D			E			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 110 (73%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.32			
Intersection Signal Delay: 53.2		Intersection LOS: D	
Intersection Capacity Utilization 104.8%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 104: Highland Drive & SR-92





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	413	2630	22	283	707	196	43	228	424	348	283	348
v/c Ratio	0.83	1.03	0.03	1.14	0.47	0.25	0.20	0.60	0.93	1.32	0.53	0.50
Control Delay	69.3	37.1	0.0	143.0	24.9	6.8	48.3	59.5	63.2	205.7	48.0	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.3	37.1	0.0	143.0	24.9	6.8	48.3	59.5	63.2	205.7	48.0	5.9
Queue Length 50th (ft)	188	~1032	0	~160	188	26	35	201	265	~381	230	0
Queue Length 95th (ft)	m188	m#1148	m0	#260	316	67	69	278	#401	#572	307	71
Internal Link Dist (ft)		1263			872			1807			397	
Turn Bay Length (ft)	435		450	260		280	100		170	280		180
Base Capacity (vph)	583	2554	854	249	1512	789	275	476	527	264	625	762
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	1.03	0.03	1.14	0.47	0.25	0.16	0.48	0.80	1.32	0.45	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

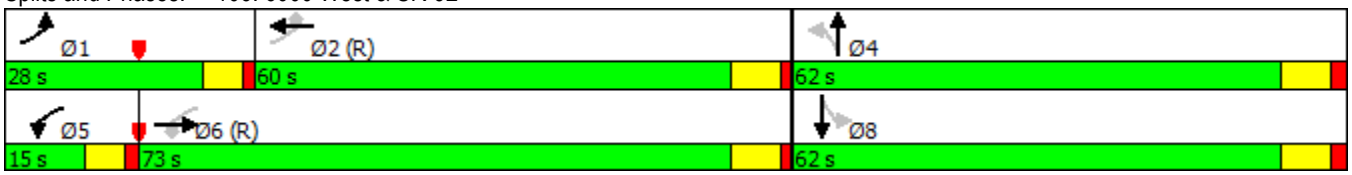
m Volume for 95th percentile queue is metered by upstream signal.

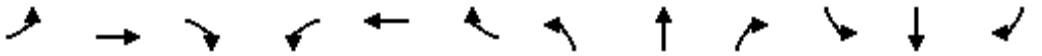
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	2120	170	60	1510	330	120	170	70	410	180	330
Future Volume (vph)	420	2120	170	60	1510	330	120	170	70	410	180	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	300		175	275		150	125		0	150		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	50			75			75			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.956			0.903	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1781	0	1770	1682	0
Flt Permitted	0.075			0.058			0.163			0.503		
Satd. Flow (perm)	140	3539	1583	108	3539	1583	304	1781	0	937	1682	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			76			119		15			69	
Link Speed (mph)		50			50			30			35	
Link Distance (ft)		2677			2693			1450			1432	
Travel Time (s)		36.5			36.7			33.0			27.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	457	2304	185	65	1641	359	130	185	76	446	196	359
Shared Lane Traffic (%)												
Lane Group Flow (vph)	457	2304	185	65	1641	359	130	261	0	446	555	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	2		6	6		2	4			8		
Detector Phase	1	6	6	5	2	2	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.8	22.9	22.9	11.0	22.9	22.9	32.5	32.5		32.5	32.5	
Total Split (s)	28.0	73.0	73.0	15.0	60.0	60.0	62.0	62.0		62.0	62.0	
Total Split (%)	18.7%	48.7%	48.7%	10.0%	40.0%	40.0%	41.3%	41.3%		41.3%	41.3%	
Yellow Time (s)	4.3	5.4	5.4	4.5	5.4	5.4	5.6	5.6		5.6	5.6	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.8	6.9	6.9	6.0	6.9	6.9	7.5	7.5		7.5	7.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	76.4	70.4	70.4	77.2	53.1	53.1	54.5	54.5		54.5	54.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.51	0.47	0.47	0.51	0.35	0.35	0.36	0.36		0.36	0.36	
v/c Ratio	1.46	1.39	0.24	0.49	1.31	0.56	1.18	0.40		1.31	0.85	
Control Delay	252.7	208.0	21.6	35.0	173.8	20.7	184.6	35.6		198.3	51.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	252.7	208.0	21.6	35.0	173.8	20.7	184.6	35.6		198.3	51.6	
LOS	F	F	C	C	F	C	F	D		F	D	
Approach Delay		203.2			142.8			85.1			117.0	
Approach LOS		F			F			F			F	

Intersection Summary	
Area Type:	Other
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.46	
Intersection Signal Delay: 163.0	Intersection LOS: F
Intersection Capacity Utilization 124.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 106: 6000 West & SR-92





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	460	2080	200	50	1460	250	150	160	60	300	160	370
Future Volume (vph)	460	2080	200	50	1460	250	150	160	60	300	160	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	300		175	275		150	125		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	50			75			75			50		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987			0.978				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5019	0	1770	4973	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.950			0.045			0.561			0.561		
Satd. Flow (perm)	1770	5019	0	84	4973	0	1045	1863	1583	1045	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			26				114			388
Link Speed (mph)		50			50			30			35	
Link Distance (ft)		2677			2693			1450			1432	
Travel Time (s)		36.5			36.7			33.0			27.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	500	2261	217	54	1587	272	163	174	65	326	174	402
Shared Lane Traffic (%)												
Lane Group Flow (vph)	500	2478	0	54	1859	0	163	174	65	326	174	402
Turn Type	Prot	NA		D.P+P	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases				6			4		4	8		8
Detector Phase	1	6		5	2		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.8	22.9		11.0	22.9		32.5	32.5	32.5	43.5	43.5	43.5
Total Split (s)	43.0	92.0		15.0	64.0		43.0	43.0	43.0	43.0	43.0	43.0
Total Split (%)	28.7%	61.3%		10.0%	42.7%		28.7%	28.7%	28.7%	28.7%	28.7%	28.7%
Yellow Time (s)	4.3	5.4		4.5	5.4		5.6	5.6	5.6	5.6	5.6	5.6
All-Red Time (s)	1.5	1.5		1.5	1.5		1.9	1.9	1.9	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	6.9		6.0	6.9		7.5	7.5	7.5	7.5	7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Act Effct Green (s)	37.2	90.1		96.2	57.1		35.5	35.5	35.5	35.5	35.5	35.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.25	0.60		0.64	0.38		0.24	0.24	0.24	0.24	0.24	0.24
v/c Ratio	1.14	0.82		0.44	0.97		0.66	0.40	0.14	1.32	0.40	0.60
Control Delay	138.5	19.6		37.8	40.3		66.1	51.4	0.9	213.1	51.4	9.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	138.5	19.6		37.8	40.3		66.1	51.4	0.9	213.1	51.4	9.2
LOS	F	B		D	D		E	D	A	F	D	A
Approach Delay		39.5			40.2			49.2			91.1	
Approach LOS		D			D			D			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 5 (3%), Referenced to phase 2:WBT and 6:EBWB, Start of 1st Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.32			
Intersection Signal Delay: 47.9		Intersection LOS: D	
Intersection Capacity Utilization 107.4%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 106: 6000 West & SR-92

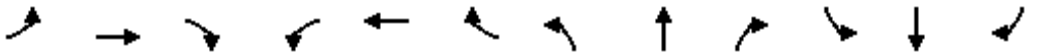
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	500	2478	54	1859	163	174	65	326	174	402
v/c Ratio	1.14	0.82	0.44	0.97	0.66	0.40	0.14	1.32	0.40	0.60
Control Delay	138.5	19.6	37.8	40.3	66.1	51.4	0.9	213.1	51.4	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	138.5	19.6	37.8	40.3	66.1	51.4	0.9	213.1	51.4	9.2
Queue Length 50th (ft)	~567	324	22	669	146	145	0	~410	145	11
Queue Length 95th (ft)	m#629	m418	m63	#775	233	220	2	#611	220	109
Internal Link Dist (ft)		2597		2613		1370			1352	
Turn Bay Length (ft)	300		275		125		150	150		150
Base Capacity (vph)	438	3022	156	1909	247	440	461	247	440	670
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.82	0.35	0.97	0.66	0.40	0.14	1.32	0.40	0.60

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

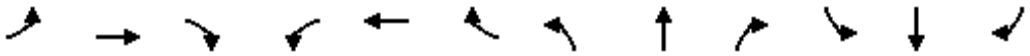


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	460	2080	200	50	1460	250	150	160	60	300	160	370
Future Volume (vph)	460	2080	200	50	1460	250	150	160	60	300	160	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	300		175	275		150	125		150	150		150
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	50			75			75			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.950			0.047			0.647			0.950		
Satd. Flow (perm)	3433	3539	1583	88	3539	1583	1205	1863	1583	3433	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			151			147			210
Link Speed (mph)		50			50			30			35	
Link Distance (ft)		2677			2693			1450			1432	
Travel Time (s)		36.5			36.7			33.0			27.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	500	2261	217	54	1587	272	163	174	65	326	174	402
Shared Lane Traffic (%)												
Lane Group Flow (vph)	500	2261	217	54	1587	272	163	174	65	326	174	402
Turn Type	Prot	NA	Perm	D.P+P	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2			4		3	8	
Permitted Phases			6	6		2	4		4			8
Detector Phase	1	6	6	5	2	2	4	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.8	22.9	22.9	11.0	22.9	22.9	32.5	32.5	32.5	9.5	43.5	43.5
Total Split (s)	27.0	85.0	85.0	15.0	73.0	73.0	33.0	33.0	33.0	17.0	50.0	50.0
Total Split (%)	18.0%	56.7%	56.7%	10.0%	48.7%	48.7%	22.0%	22.0%	22.0%	11.3%	33.3%	33.3%
Yellow Time (s)	4.3	5.4	5.4	4.5	5.4	5.4	5.6	5.6	5.6	3.5	5.6	5.6
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.9	1.9	1.9	1.0	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	6.9	6.9	6.0	6.9	6.9	7.5	7.5	7.5	4.5	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	23.5	85.8	85.8	92.0	66.6	66.6	22.7	22.7	22.7	12.5	39.7	39.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.16	0.57	0.57	0.61	0.44	0.44	0.15	0.15	0.15	0.08	0.26	0.26
v/c Ratio	0.93	1.12	0.23	0.44	1.01	0.35	0.90	0.62	0.18	1.14	0.35	0.70
Control Delay	83.7	83.1	13.1	39.0	44.8	6.6	106.0	69.1	1.1	155.2	46.3	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.7	83.1	13.1	39.0	44.8	6.6	106.0	69.1	1.1	155.2	46.3	29.7
LOS	F	F	B	D	D	A	F	E	A	F	D	C
Approach Delay		78.1			39.2			73.0			78.3	
Approach LOS		E			D			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 5 (3%), Referenced to phase 2:WBT and 6:EBWB, Start of 1st Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.14			
Intersection Signal Delay: 65.8		Intersection LOS: E	
Intersection Capacity Utilization 101.6%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 106: 6000 West & SR-92



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	500	2261	217	54	1587	272	163	174	65	326	174	402
v/c Ratio	0.93	1.12	0.23	0.44	1.01	0.35	0.90	0.62	0.18	1.14	0.35	0.70
Control Delay	83.7	83.1	13.1	39.0	44.8	6.6	106.0	69.1	1.1	155.2	46.3	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.7	83.1	13.1	39.0	44.8	6.6	106.0	69.1	1.1	155.2	46.3	29.7
Queue Length 50th (ft)	~275	~1381	58	25	~857	35	155	158	0	~191	135	170
Queue Length 95th (ft)	m#299	m#1505	m80	m66	#974	67	#277	240	0	#294	206	297
Internal Link Dist (ft)		2597			2613			1370			1352	
Turn Bay Length (ft)	300		175	275		150	125		150	150		150
Base Capacity (vph)	537	2025	952	155	1572	787	204	316	391	286	527	599
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	1.12	0.23	0.35	1.01	0.35	0.80	0.55	0.17	1.14	0.33	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

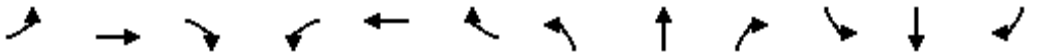
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	2640	390	70	1880	10	130	10	60	10	20	20
Future Volume (vph)	60	2640	390	70	1880	10	130	10	60	10	20	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		150	100		0	125		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.872			0.925	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1624	0	1770	1723	0
Flt Permitted	0.070			0.038			0.728			0.708		
Satd. Flow (perm)	130	3539	1583	71	3539	1583	1356	1624	0	1319	1723	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			202			33		65			22	
Link Speed (mph)		50			50			35			15	
Link Distance (ft)		1837			2677			1555			1208	
Travel Time (s)		25.1			36.5			30.3			54.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	65	2870	424	76	2043	11	141	11	65	11	22	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	2870	424	76	2043	11	141	76	0	11	44	0
Turn Type	Perm	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6		6	6		2	4			8		
Detector Phase	6	6	6	5	2	2	4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	5.0	15.0	15.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0	24.0	10.0	22.0	22.0	31.5	31.5		33.5	33.5	
Total Split (s)	102.0	102.0	102.0	15.0	117.0	117.0	33.0	33.0		33.0	33.0	
Total Split (%)	68.0%	68.0%	68.0%	10.0%	78.0%	78.0%	22.0%	22.0%		22.0%	22.0%	
Yellow Time (s)	5.0	5.0	5.0	3.0	5.0	5.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0	7.0	5.0	7.0	7.0	7.5	7.5		7.5	7.5	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	104.6	104.6	104.6	113.5	116.5	116.5	19.0	19.0		19.0	19.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.70	0.70	0.70	0.76	0.78	0.78	0.13	0.13		0.13	0.13	
v/c Ratio	0.72	1.16	0.36	0.58	0.74	0.01	0.82	0.29		0.07	0.19	
Control Delay	31.0	101.1	2.7	28.2	24.7	1.8	97.5	18.6		55.2	34.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	31.0	101.1	2.7	28.2	24.7	1.8	97.5	18.6		55.2	34.2	
LOS	C	F	A	C	C	A	F	B		E	C	
Approach Delay		87.3			24.7			69.9			38.4	
Approach LOS		F			C			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 125 (83%), Referenced to phase 2:WBT and 6:EBWB, Start of 1st Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 63.1		Intersection LOS: E	
Intersection Capacity Utilization 98.9%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 105: 6400 West & SR-92

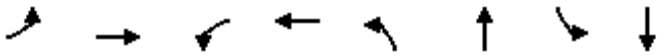


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	2670	400	70	1900	10	130	10	60	10	20	20
Future Volume (vph)	60	2670	400	70	1900	10	130	10	60	10	20	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		150	100		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.980			0.999			0.872			0.925	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4984	0	1770	5080	0	1770	1624	0	1770	1723	0
Flt Permitted	0.082			0.038			0.728			0.708		
Satd. Flow (perm)	153	4984	0	71	5080	0	1356	1624	0	1319	1723	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			1			65			21	
Link Speed (mph)		50			50			35			15	
Link Distance (ft)		1837			2677			1555			1208	
Travel Time (s)		25.1			36.5			30.3			54.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	65	2902	435	76	2065	11	141	11	65	11	22	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	3337	0	76	2076	0	141	76	0	11	44	0
Turn Type	Perm	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			6			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		5.0	15.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		10.0	22.0		35.5	35.5		35.5	35.5	
Total Split (s)	99.0	99.0		15.0	114.0		36.0	36.0		36.0	36.0	
Total Split (%)	66.0%	66.0%		10.0%	76.0%		24.0%	24.0%		24.0%	24.0%	
Yellow Time (s)	5.0	5.0		3.0	5.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		5.0	7.0		7.5	7.5		7.5	7.5	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	104.0	104.0		113.1	116.1		19.4	19.4		19.4	19.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.69	0.69		0.75	0.77		0.13	0.13		0.13	0.13	
v/c Ratio	0.62	0.96		0.57	0.53		0.81	0.29		0.06	0.18	
Control Delay	20.0	23.1		28.3	17.7		94.0	18.2		54.3	34.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.0	23.1		28.3	17.7		94.0	18.2		54.3	34.7	
LOS	B	C		C	B		F	B		D	C	
Approach Delay		23.1			18.1			67.4			38.6	
Approach LOS		C			B			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 135 (90%), Referenced to phase 2:WBT and 6:EBWB, Start of 1st Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 23.0		Intersection LOS: C	
Intersection Capacity Utilization 86.5%		ICU Level of Service E	
Analysis Period (min) 15			

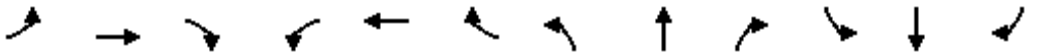
Splits and Phases: 105: 6400 West & SR-92



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	3337	76	2076	141	76	11	44
v/c Ratio	0.62	0.96	0.57	0.53	0.81	0.29	0.06	0.18
Control Delay	20.0	23.1	28.3	17.7	94.0	18.2	54.3	34.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	23.1	28.3	17.7	94.0	18.2	54.3	34.7
Queue Length 50th (ft)	15	1254	50	466	136	10	10	20
Queue Length 95th (ft)	m37	m#1249	m63	m525	204	56	28	56
Internal Link Dist (ft)		1757		2597		1475		1128
Turn Bay Length (ft)	150		150		100		125	
Base Capacity (vph)	105	3466	170	3933	257	361	250	344
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.96	0.45	0.53	0.55	0.21	0.04	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	520	1640	330	130	1060	70	260	370	210	120	350	500
Future Volume (vph)	520	1640	330	130	1060	70	260	370	210	120	350	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		215	150		250	175		180	275		175
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			65			50			75		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.074			0.084			0.129			0.154		
Satd. Flow (perm)	138	3539	1583	156	3539	1583	240	1863	1583	287	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			176			162			164			332
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2055			3245			1172			1187	
Travel Time (s)		31.1			49.2			17.8			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	565	1783	359	141	1152	76	283	402	228	130	380	543
Shared Lane Traffic (%)												
Lane Group Flow (vph)	565	1783	359	141	1152	76	283	402	228	130	380	543
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.9	27.2	27.2	11.3	31.2	31.2	11.0	30.0	30.0	11.1	33.0	33.0
Total Split (s)	42.0	82.0	82.0	15.0	55.0	55.0	20.0	38.0	38.0	15.0	33.0	33.0
Total Split (%)	28.0%	54.7%	54.7%	10.0%	36.7%	36.7%	13.3%	25.3%	25.3%	10.0%	22.0%	22.0%
Yellow Time (s)	3.8	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9
All-Red Time (s)	2.1	2.3	2.3	2.3	2.3	2.3	2.0	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	7.2	7.2	6.3	7.2	7.2	6.0	7.0	7.0	6.1	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effct Green (s)	91.1	74.8	74.8	57.4	47.8	47.8	46.0	31.0	31.0	35.8	26.0	26.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.61	0.50	0.50	0.38	0.32	0.32	0.31	0.21	0.21	0.24	0.17	0.17
v/c Ratio	1.19	1.01	0.41	0.92	1.02	0.12	1.31	1.04	0.50	0.83	1.18	0.99
Control Delay	127.6	34.5	1.8	81.8	69.3	1.7	203.5	114.1	19.7	79.9	160.3	59.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.6	34.5	1.8	81.8	69.3	1.7	203.5	114.1	19.7	79.9	160.3	59.8
LOS	F	C	A	F	E	A	F	F	B	E	F	E
Approach Delay		49.6			66.8			118.2			98.6	
Approach LOS		D			E			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 82 (55%), Referenced to phase 2:WBTL and 6:EBTL, Start of 1st Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.31			
Intersection Signal Delay: 72.4		Intersection LOS: E	
Intersection Capacity Utilization 112.7%		ICU Level of Service H	
Analysis Period (min) 15			

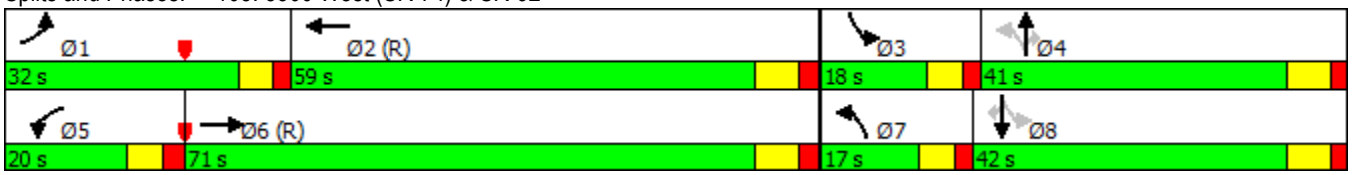
Splits and Phases: 108: 5300 West (SR-74) & SR-92

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	1670	240	190	1080	100	180	380	280	190	400	440
Future Volume (vph)	420	1670	240	190	1080	100	180	380	280	190	400	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		215	150		250	175		180	275		175
Storage Lanes	2		0	1		0	1		1	1		1
Taper Length (ft)	60			65			50			75		
Lane Util. Factor	0.97	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.987				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	4989	0	1770	5019	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.950			0.950			0.118			0.114		
Satd. Flow (perm)	3433	4989	0	1770	5019	0	220	1863	1583	212	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			11				187			275
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2055			3245			1172			1187	
Travel Time (s)		31.1			49.2			17.8			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	457	1815	261	207	1174	109	196	413	304	207	435	478
Shared Lane Traffic (%)												
Lane Group Flow (vph)	457	2076	0	207	1283	0	196	413	304	207	435	478
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases							4		4	8		8
Detector Phase	1	6		5	2		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.9	34.2		11.3	34.2		11.0	31.0	31.0	11.1	37.0	37.0
Total Split (s)	32.0	71.0		20.0	59.0		17.0	41.0	41.0	18.0	42.0	42.0
Total Split (%)	21.3%	47.3%		13.3%	39.3%		11.3%	27.3%	27.3%	12.0%	28.0%	28.0%
Yellow Time (s)	3.8	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
All-Red Time (s)	2.1	2.3		2.3	2.3		2.0	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	7.2		6.3	7.2		6.0	7.0	7.0	6.1	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Act Effct Green (s)	23.2	63.8		13.7	54.7		46.0	34.0	34.0	47.8	35.0	35.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.15	0.43		0.09	0.36		0.31	0.23	0.23	0.32	0.23	0.23
v/c Ratio	0.86	0.97		1.29	0.70		1.08	0.98	0.60	1.08	1.00	0.82
Control Delay	87.4	32.9		213.7	21.3		127.4	95.8	24.9	126.3	100.3	35.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.4	32.9		213.7	21.3		127.4	95.8	24.9	126.3	100.3	35.5
LOS	F	C		F	C		F	F	C	F	F	D
Approach Delay		42.7			48.0			79.0			77.4	
Approach LOS		D			D			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 90 (60%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 55.9		Intersection LOS: E	
Intersection Capacity Utilization 101.2%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 108: 5300 West (SR-74) & SR-92



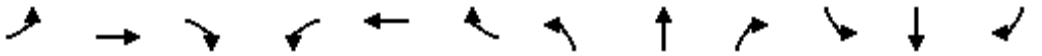
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	457	2076	207	1283	196	413	304	207	435	478
v/c Ratio	0.86	0.97	1.29	0.70	1.08	0.98	0.60	1.08	1.00	0.82
Control Delay	87.4	32.9	213.7	21.3	127.4	95.8	24.9	126.3	100.3	35.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.4	32.9	213.7	21.3	127.4	95.8	24.9	126.3	100.3	35.5
Queue Length 50th (ft)	244	270	~259	204	~160	405	101	~173	~430	204
Queue Length 95th (ft)	303	#822	m#339	m239	#329	#624	209	#346	#661	#387
Internal Link Dist (ft)		1975		3165		1092			1107	
Turn Bay Length (ft)	250		150		175		180	275		175
Base Capacity (vph)	597	2134	161	1835	181	422	503	191	434	580
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.97	1.29	0.70	1.08	0.98	0.60	1.08	1.00	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

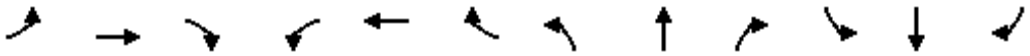


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	1670	240	190	1080	100	180	380	280	190	400	440
Future Volume (vph)	420	1670	240	190	1080	100	180	380	280	190	400	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		215	150		250	175		180	275		175
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	60			65			50			75		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.287			0.313		
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	535	3539	1583	583	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124			162			181			255
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2055			3245			1172			1187	
Travel Time (s)		31.1			49.2			17.8			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	457	1815	261	207	1174	109	196	413	304	207	435	478
Shared Lane Traffic (%)												
Lane Group Flow (vph)	457	1815	261	207	1174	109	196	413	304	207	435	478
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.9	34.2	34.2	11.3	34.2	34.2	11.0	31.0	31.0	11.1	37.0	37.0
Total Split (s)	31.0	81.0	81.0	20.0	70.0	70.0	15.0	34.0	34.0	15.0	34.0	34.0
Total Split (%)	20.7%	54.0%	54.0%	13.3%	46.7%	46.7%	10.0%	22.7%	22.7%	10.0%	22.7%	22.7%
Yellow Time (s)	3.8	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9
All-Red Time (s)	2.1	2.3	2.3	2.3	2.3	2.3	2.0	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	7.2	7.2	6.3	7.2	7.2	6.0	7.0	7.0	6.1	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	22.9	73.8	73.8	14.7	66.0	66.0	36.0	26.0	26.0	35.8	26.0	26.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.15	0.49	0.49	0.10	0.44	0.44	0.24	0.17	0.17	0.24	0.17	0.17
v/c Ratio	0.87	1.04	0.31	1.20	0.75	0.14	0.97	0.67	0.72	0.99	0.71	0.99
Control Delay	81.1	51.5	9.4	179.6	18.7	1.7	103.7	63.9	33.3	108.4	65.3	65.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.1	51.5	9.4	179.6	18.7	1.7	103.7	63.9	33.3	108.4	65.3	65.6
LOS	F	D	A	F	B	A	F	E	C	F	E	E
Approach Delay		52.5			39.8			62.2			73.4	
Approach LOS		D			D			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 83 (55%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 54.7		Intersection LOS: D	
Intersection Capacity Utilization 99.9%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 108: 5300 West (SR-74) & SR-92



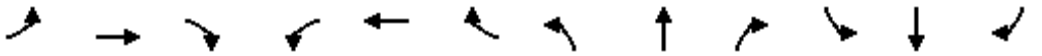
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	457	1815	261	207	1174	109	196	413	304	207	435	478
v/c Ratio	0.87	1.04	0.31	1.20	0.75	0.14	0.97	0.67	0.72	0.99	0.71	0.99
Control Delay	81.1	51.5	9.4	179.6	18.7	1.7	103.7	63.9	33.3	108.4	65.3	65.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.1	51.5	9.4	179.6	18.7	1.7	103.7	63.9	33.3	108.4	65.3	65.6
Queue Length 50th (ft)	238	~1024	51	~261	257	5	155	200	114	165	212	244
Queue Length 95th (ft)	303	#1166	m116	m#339	m281	m9	#252	260	229	#336	274	#479
Internal Link Dist (ft)		1975			3165			1092			1107	
Turn Bay Length (ft)	250		215	150		250	175		180	275		175
Base Capacity (vph)	574	1741	841	173	1556	786	202	637	433	209	637	494
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	1.04	0.31	1.20	0.75	0.14	0.97	0.65	0.70	0.99	0.68	0.97

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

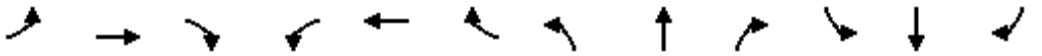


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	1670	240	190	1080	100	180	380	280	190	400	440
Future Volume (vph)	420	1670	240	190	1080	100	180	380	280	190	400	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		215	150		250	175		180	275		175
Storage Lanes	2		0	1		0	1		1	1		1
Taper Length (ft)	60			65			50			75		
Lane Util. Factor	0.97	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.981			0.987				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	4989	0	1770	5019	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.065			0.379			0.245		
Satd. Flow (perm)	3433	4989	0	121	5019	0	706	3539	1583	456	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			12				225			305
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2055			3245			1172			1187	
Travel Time (s)		31.1			49.2			17.8			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	457	1815	261	207	1174	109	196	413	304	207	435	478
Shared Lane Traffic (%)												
Lane Group Flow (vph)	457	2076	0	207	1283	0	196	413	304	207	435	478
Turn Type	Prot	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases				2			4		4	8		8
Detector Phase	1	6		5	2		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.9	27.2		11.3	31.2		11.0	30.0	30.0	11.1	33.0	33.0
Total Split (s)	35.0	76.0		23.0	64.0		15.0	31.0	31.0	20.0	36.0	36.0
Total Split (%)	23.3%	50.7%		15.3%	42.7%		10.0%	20.7%	20.7%	13.3%	24.0%	24.0%
Yellow Time (s)	3.8	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
All-Red Time (s)	2.1	2.3		2.3	2.3		2.0	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	7.2		6.3	7.2		6.0	7.0	7.0	6.1	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	Max
Act Effct Green (s)	23.9	70.4		78.0	62.0		34.2	24.2	24.2	43.6	29.0	29.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.16	0.47		0.52	0.41		0.23	0.16	0.16	0.29	0.19	0.19
v/c Ratio	0.84	0.88		0.91	0.62		0.88	0.72	0.68	0.82	0.64	0.87
Control Delay	52.0	29.2		91.6	33.3		81.8	67.9	24.8	68.9	60.5	37.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	29.2		91.6	33.3		81.8	67.9	24.8	68.9	60.5	37.5
LOS	D	C		F	C		F	E	C	E	E	D
Approach Delay		33.3			41.4			56.5			52.2	
Approach LOS		C			D			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 110 (73%), Referenced to phase 2:WBTL and 6:EBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 42.3		Intersection LOS: D	
Intersection Capacity Utilization 91.3%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 108: 5300 West (SR-74) & SR-92

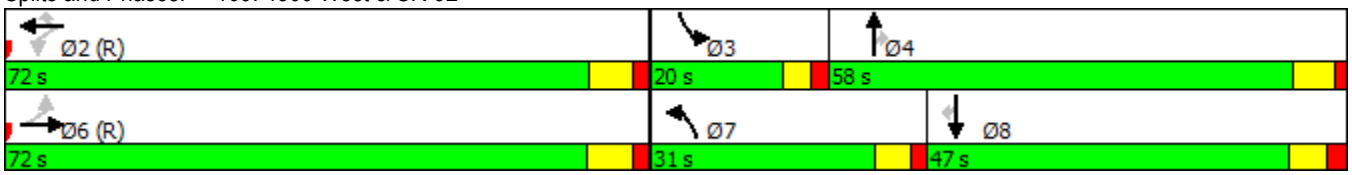


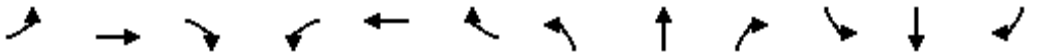
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	620	1080	40	390	220	690	520	50	150	560	180
Future Volume (vph)	270	620	1080	40	390	220	690	520	50	150	560	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		250	150		130	250		275	150		530
Storage Lanes	1		1	1		2	1		1	1		1
Taper Length (ft)	75			75			75			30		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.464			0.311			0.950			0.950		
Satd. Flow (perm)	864	3539	1583	579	3539	1583	3433	1863	1583	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			690			239			67			196
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		3245			900			1430			1106	
Travel Time (s)		49.2			13.6			21.7			21.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	293	674	1174	43	424	239	750	565	54	163	609	196
Shared Lane Traffic (%)												
Lane Group Flow (vph)	293	674	1174	43	424	239	750	565	54	163	609	196
Turn Type	Perm	NA	Free	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		Free	2		2			4			8
Detector Phase	6	6		2	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	25.0	25.0		24.8	24.8	24.8	10.8	24.3	24.3	10.2	24.6	24.6
Total Split (s)	72.0	72.0		72.0	72.0	72.0	31.0	58.0	58.0	20.0	47.0	47.0
Total Split (%)	48.0%	48.0%		48.0%	48.0%	48.0%	20.7%	38.7%	38.7%	13.3%	31.3%	31.3%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	4.8	4.8	3.2	4.1	4.1
All-Red Time (s)	2.0	2.0		1.8	1.8	1.8	1.8	1.5	1.5	2.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		6.8	6.8	6.8	5.8	6.3	6.3	5.2	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	65.0	65.0	150.0	65.2	65.2	65.2	25.2	52.0	52.0	14.5	40.4	40.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.43	0.43	1.00	0.43	0.43	0.43	0.17	0.35	0.35	0.10	0.27	0.27
v/c Ratio	0.78	0.44	0.74	0.17	0.28	0.29	1.30	0.88	0.09	0.95	1.22	0.34
Control Delay	25.8	16.3	13.5	33.2	33.3	10.0	195.8	61.9	5.0	123.6	159.9	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	16.3	13.5	33.2	33.3	10.0	195.8	61.9	5.0	123.6	159.9	7.0
LOS	C	B	B	C	C	A	F	E	A	F	F	A
Approach Delay		16.1			25.4			133.0			122.8	
Approach LOS		B			C			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 130 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of 1st Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.30			
Intersection Signal Delay: 68.2		Intersection LOS: E	
Intersection Capacity Utilization 96.7%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 109: 4800 West & SR-92



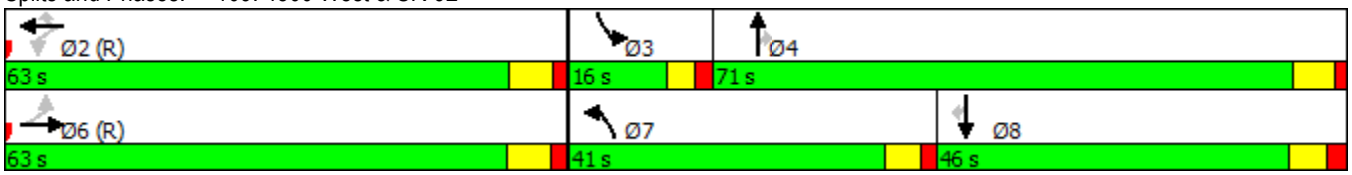


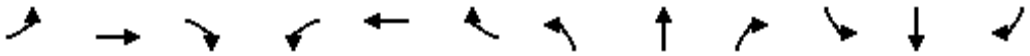
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	700	1190	40	450	190	750	430	50	120	460	170
Future Volume (vph)	250	700	1190	40	450	190	750	430	50	120	460	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		250	150		500	250		275	150		530
Storage Lanes	1		0	1		1	2		1	2		1
Taper Length (ft)	75			75			75			30		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	3433	1863	1583
Flt Permitted	0.399			0.234			0.950			0.950		
Satd. Flow (perm)	743	3539	1583	436	3539	1583	3433	1863	1583	3433	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			709			207			67			132
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		3245			900			1430			1106	
Travel Time (s)		49.2			13.6			21.7			21.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	272	761	1293	43	489	207	815	467	54	130	500	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	272	761	1293	43	489	207	815	467	54	130	500	185
Turn Type	Perm	NA	Free	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		Free	2		2			4			8
Detector Phase	6	6		2	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	38.0	38.0		33.8	33.8	33.8	10.8	33.3	33.3	10.2	33.6	33.6
Total Split (s)	63.0	63.0		63.0	63.0	63.0	41.0	71.0	71.0	16.0	46.0	46.0
Total Split (%)	42.0%	42.0%		42.0%	42.0%	42.0%	27.3%	47.3%	47.3%	10.7%	30.7%	30.7%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	4.8	4.8	3.2	4.1	4.1
All-Red Time (s)	2.0	2.0		1.8	1.8	1.8	1.8	1.5	1.5	2.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		6.8	6.8	6.8	5.8	6.3	6.3	5.2	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	56.0	56.0	150.0	56.2	56.2	56.2	35.2	67.0	67.0	8.5	39.4	39.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.37	0.37	1.00	0.37	0.37	0.37	0.23	0.45	0.45	0.06	0.26	0.26
v/c Ratio	0.98	0.58	0.82	0.26	0.37	0.29	1.01	0.56	0.07	0.67	1.02	0.36
Control Delay	53.8	17.2	21.6	31.9	28.5	7.3	90.9	34.3	3.7	85.8	100.0	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	17.2	21.6	31.9	28.5	7.3	90.9	34.3	3.7	85.8	100.0	16.0
LOS	D	B	C	C	C	A	F	C	A	F	F	B
Approach Delay		23.9			22.8			67.6			78.7	
Approach LOS		C			C			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of 1st Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 43.5		Intersection LOS: D	
Intersection Capacity Utilization 95.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 109: 4800 West & SR-92





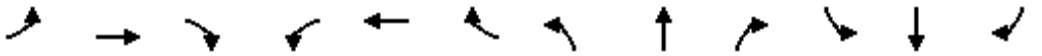
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	761	1293	43	489	207	815	467	54	130	500	185
v/c Ratio	0.98	0.58	0.82	0.26	0.37	0.29	1.01	0.56	0.07	0.67	1.02	0.36
Control Delay	53.8	17.2	21.6	31.9	28.5	7.3	90.9	34.3	3.7	85.8	100.0	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	17.2	21.6	31.9	28.5	7.3	90.9	34.3	3.7	85.8	100.0	16.0
Queue Length 50th (ft)	250	181	1212	26	156	43	~422	334	0	65	~518	40
Queue Length 95th (ft)	m#307	m193	m1265	60	208	71	#562	460	20	101	#745	110
Internal Link Dist (ft)		3165			820			1350			1026	
Turn Bay Length (ft)	150		250	150		500	250		275	150		530
Base Capacity (vph)	277	1321	1583	163	1325	722	805	831	743	247	489	513
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.58	0.82	0.26	0.37	0.29	1.01	0.56	0.07	0.53	1.02	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

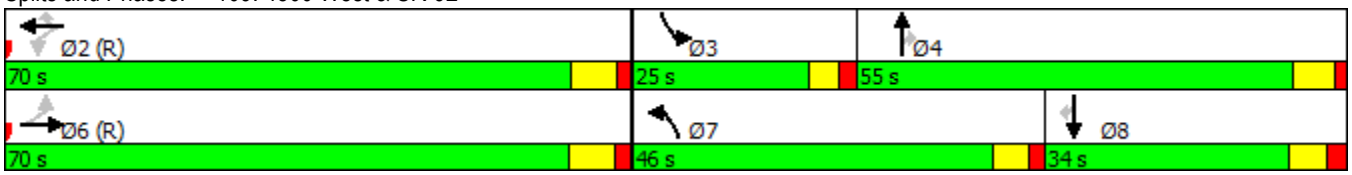


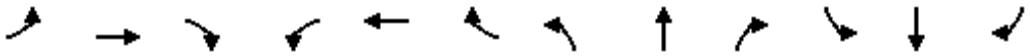
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	700	1190	40	450	190	750	430	50	120	460	170
Future Volume (vph)	250	700	1190	40	450	190	750	430	50	120	460	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		250	150		500	250		275	150		530
Storage Lanes	1		0	1		1	2		1	1		1
Taper Length (ft)	75			75			75			30		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	3539	1583	1770	3539	1583
Flt Permitted	0.425			0.275			0.950			0.950		
Satd. Flow (perm)	792	3539	1583	512	3539	1583	3433	3539	1583	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			792			207			67			160
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		3245			900			1430			1106	
Travel Time (s)		49.2			13.6			21.7			21.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	272	761	1293	43	489	207	815	467	54	130	500	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	272	761	1293	43	489	207	815	467	54	130	500	185
Turn Type	Perm	NA	Free	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		Free	2		2			4			8
Detector Phase	6	6		2	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	38.0	38.0		33.8	33.8	33.8	10.8	33.3	33.3	10.2	33.6	33.6
Total Split (s)	70.0	70.0		70.0	70.0	70.0	46.0	55.0	55.0	25.0	34.0	34.0
Total Split (%)	46.7%	46.7%		46.7%	46.7%	46.7%	30.7%	36.7%	36.7%	16.7%	22.7%	22.7%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	4.8	4.8	3.2	4.1	4.1
All-Red Time (s)	2.0	2.0		1.8	1.8	1.8	1.8	1.5	1.5	2.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		6.8	6.8	6.8	5.8	6.3	6.3	5.2	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	67.8	67.8	150.0	68.0	68.0	68.0	37.7	49.7	49.7	14.0	25.2	25.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.45	0.45	1.00	0.45	0.45	0.45	0.25	0.33	0.33	0.09	0.17	0.17
v/c Ratio	0.76	0.48	0.82	0.19	0.31	0.25	0.95	0.40	0.09	0.79	0.84	0.46
Control Delay	22.5	14.1	17.0	23.3	21.7	6.7	74.9	39.7	5.3	96.7	74.0	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	14.1	17.0	23.3	21.7	6.7	74.9	39.7	5.3	96.7	74.0	15.1
LOS	C	B	B	C	C	A	E	D	A	F	E	B
Approach Delay		16.7			17.6			59.8			64.2	
Approach LOS		B			B			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of 1st Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 35.3		Intersection LOS: D	
Intersection Capacity Utilization 83.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 109: 4800 West & SR-92





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	761	1293	43	489	207	815	467	54	130	500	185
v/c Ratio	0.76	0.48	0.82	0.19	0.31	0.25	0.95	0.40	0.09	0.79	0.84	0.46
Control Delay	22.5	14.1	17.0	23.3	21.7	6.7	74.9	39.7	5.3	96.7	74.0	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	14.1	17.0	23.3	21.7	6.7	74.9	39.7	5.3	96.7	74.0	15.1
Queue Length 50th (ft)	193	180	1148	24	148	43	400	178	0	127	249	21
Queue Length 95th (ft)	m186	m175	m935	49	180	71	#503	240	24	194	315	95
Internal Link Dist (ft)		3165			820			1350			1026	
Turn Bay Length (ft)	150		250	150		500	250		275	150		530
Base Capacity (vph)	357	1598	1583	231	1603	830	920	1190	577	233	646	419
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.48	0.82	0.19	0.31	0.25	0.89	0.39	0.09	0.56	0.77	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Appendix D

4800 West/Canyon Crest Road Concept Design

PRELIMINARY
NOT FOR CONSTRUCTION
1/7/2022

REVISIONS				
NO.	DATE	APPROVED BY	REMARKS	

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AVENUE CONSULTANTS

APPROVED

PROFESSIONAL ENGINEER

PROJECT: SR-92 ACCESS AND CIRCULATION STUDY

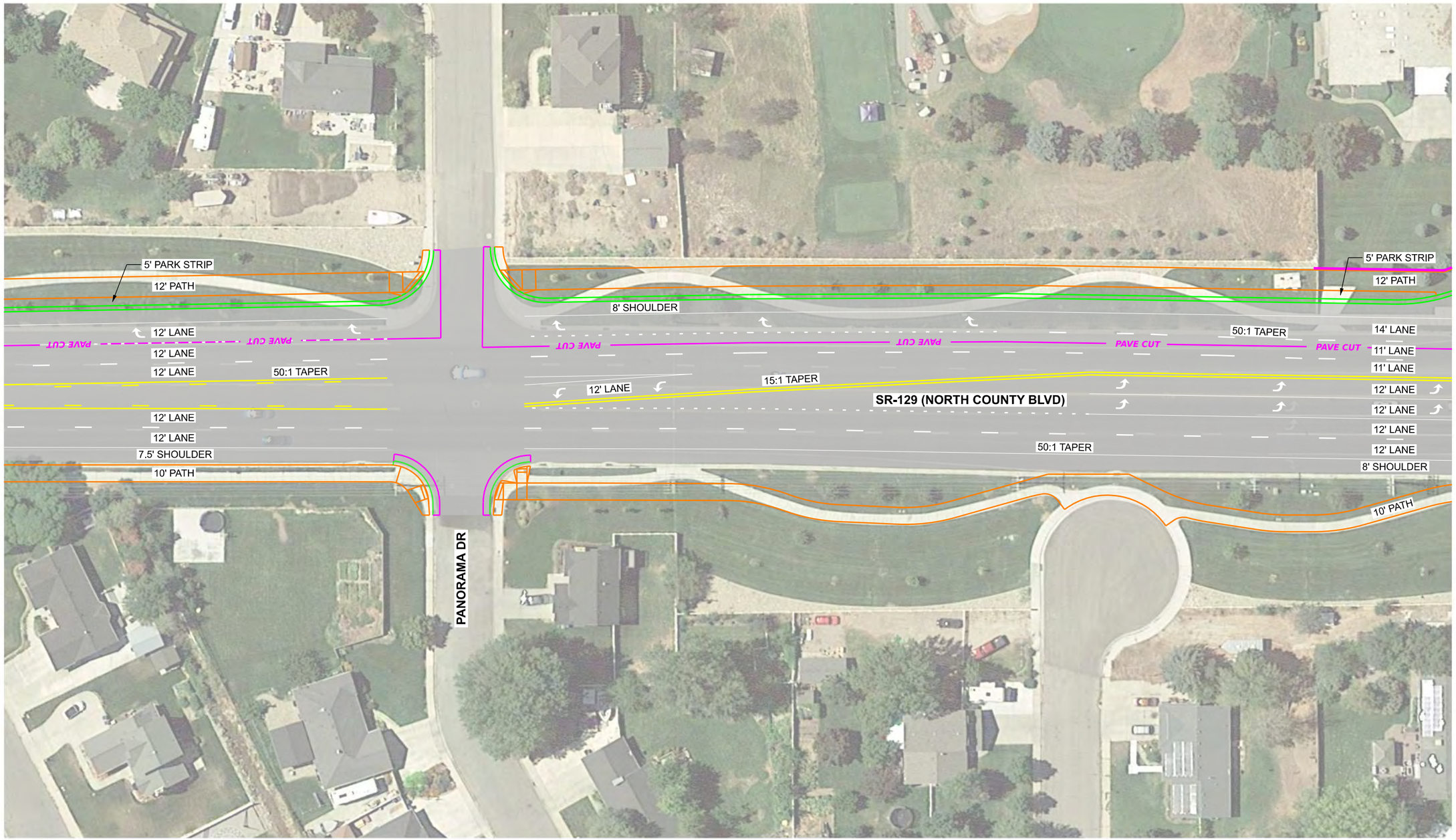
PIN: 16992

PROJECT NUMBER: S-0092(39)1

ROADWAY - PHASE 1

SHEET NO. RD-01

28-645_RD-01.dgn
1/7/2022



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28-045.RD-02.dgn
1/7/2022

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PROFESSIONAL ENGINEER

PROJECT: SR-92 ACCESS AND CIRCULATION STUDY

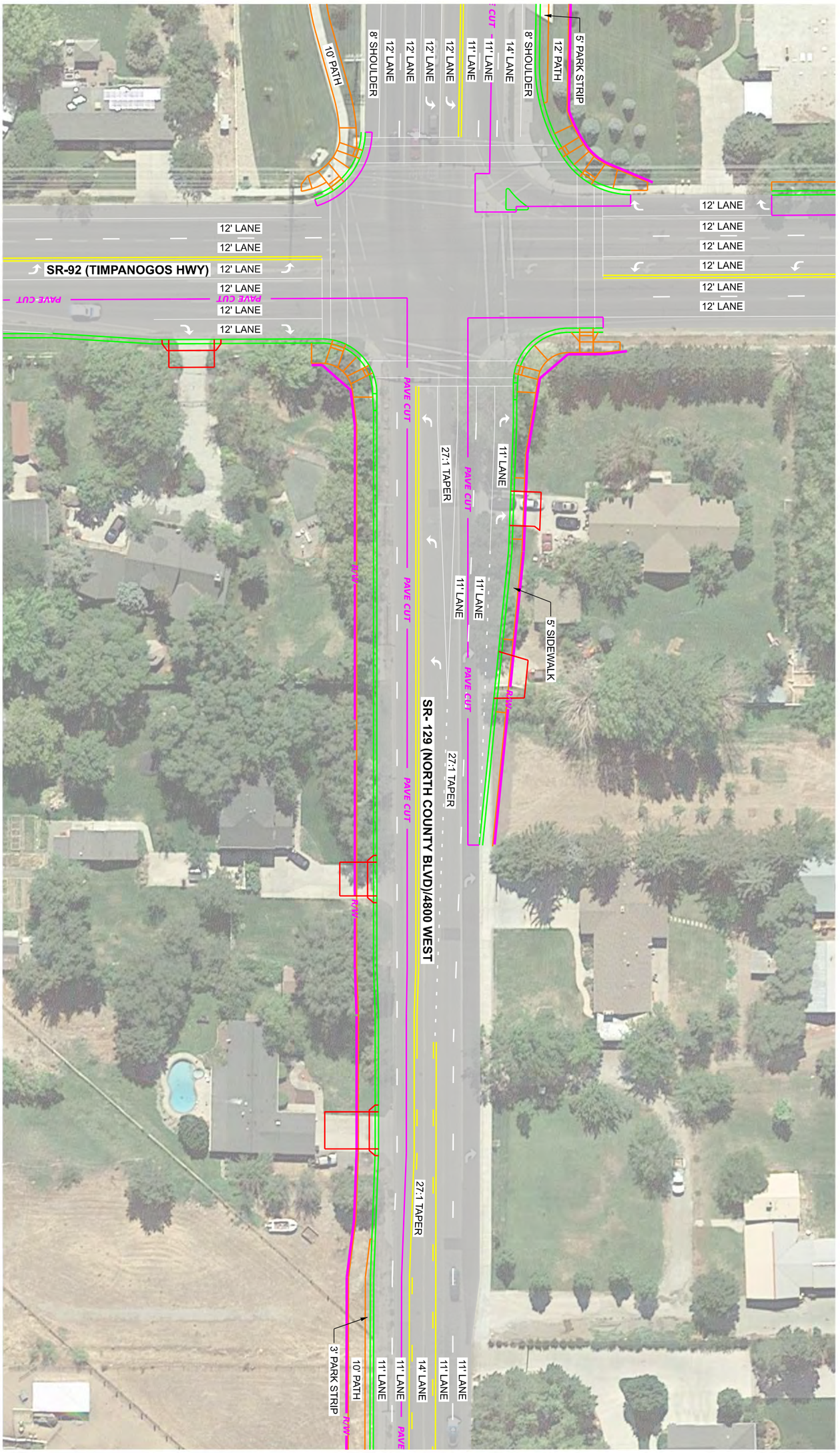
PROJECT NUMBER: S-0092(39)1 PIN 16992

ROADWAY - PHASE 1

SHEET NO. RD-02

1/7/2022 20-845_RD-03.dgn

PRELIMINARY
NOT FOR CONSTRUCTION
1/7/2022



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		ROADWAY - PHASE 1	PROFESSIONAL ENGINEER DATE	QC CHECKED BY	

PRELIMINARY
NOT FOR CONSTRUCTION
1/7/2022

20-845_RD-04.dgn
1/7/2022

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PROFESSIONAL ENGINEER

PROJECT: SR-92 ACCESS AND CIRCULATION STUDY

PIN: 16992

PROJECT NUMBER: S-0092(39)1

ROADWAY - PHASE 1

SHEET NO. RD-04

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1/7/2022

28-045.RD-05.dgn
1/7/2022

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PROJECT: SR-92 ACCESS AND CIRCULATION STUDY

PIN: 16992

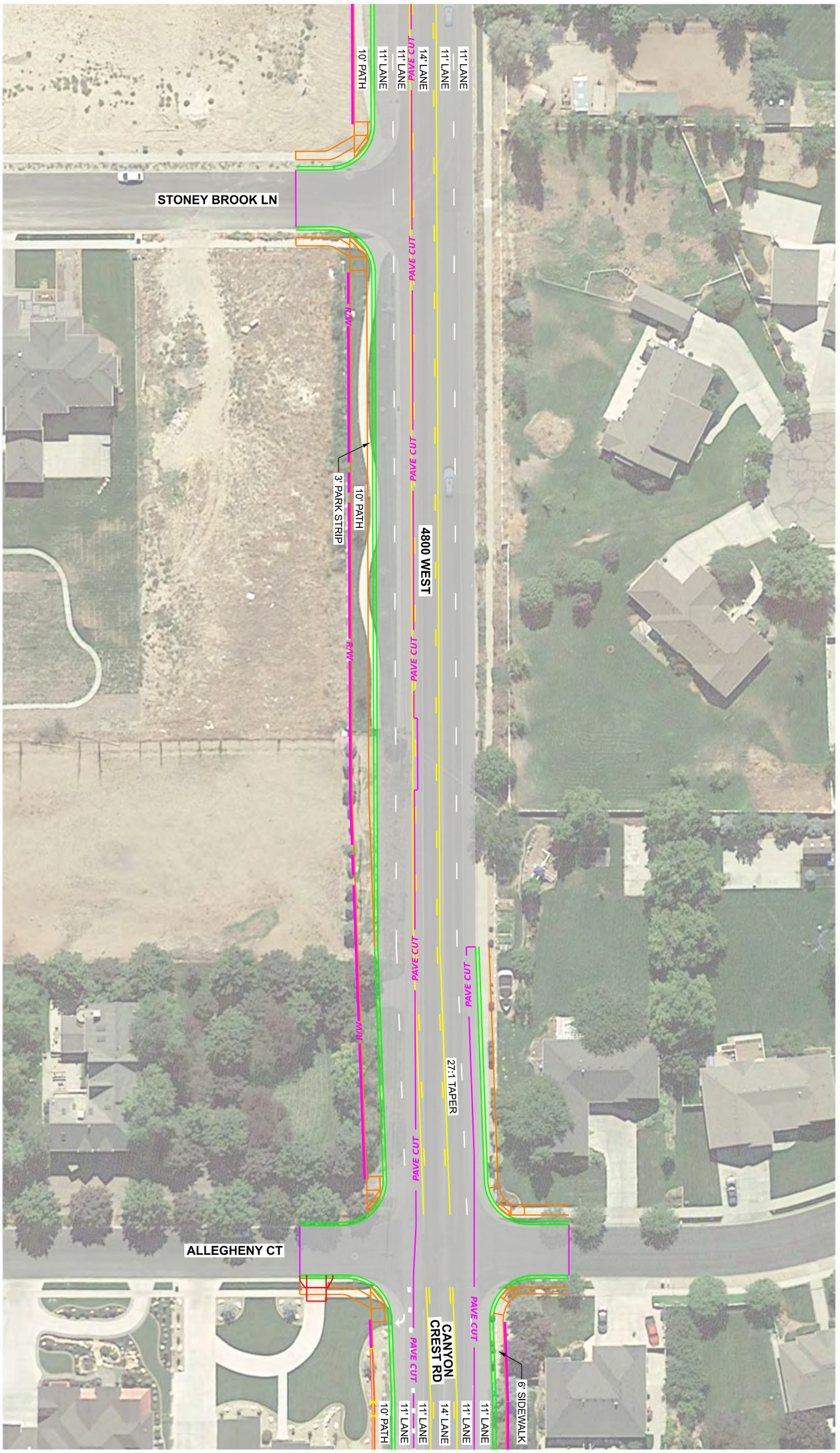
PROJECT NUMBER: S-0092(39)1

ROADWAY - PHASE 1

SHEET NO. RD-05

1/7/2022 20-845_RD-06.dgn

PRELIMINARY
NOT FOR CONSTRUCTION
1/7/2022



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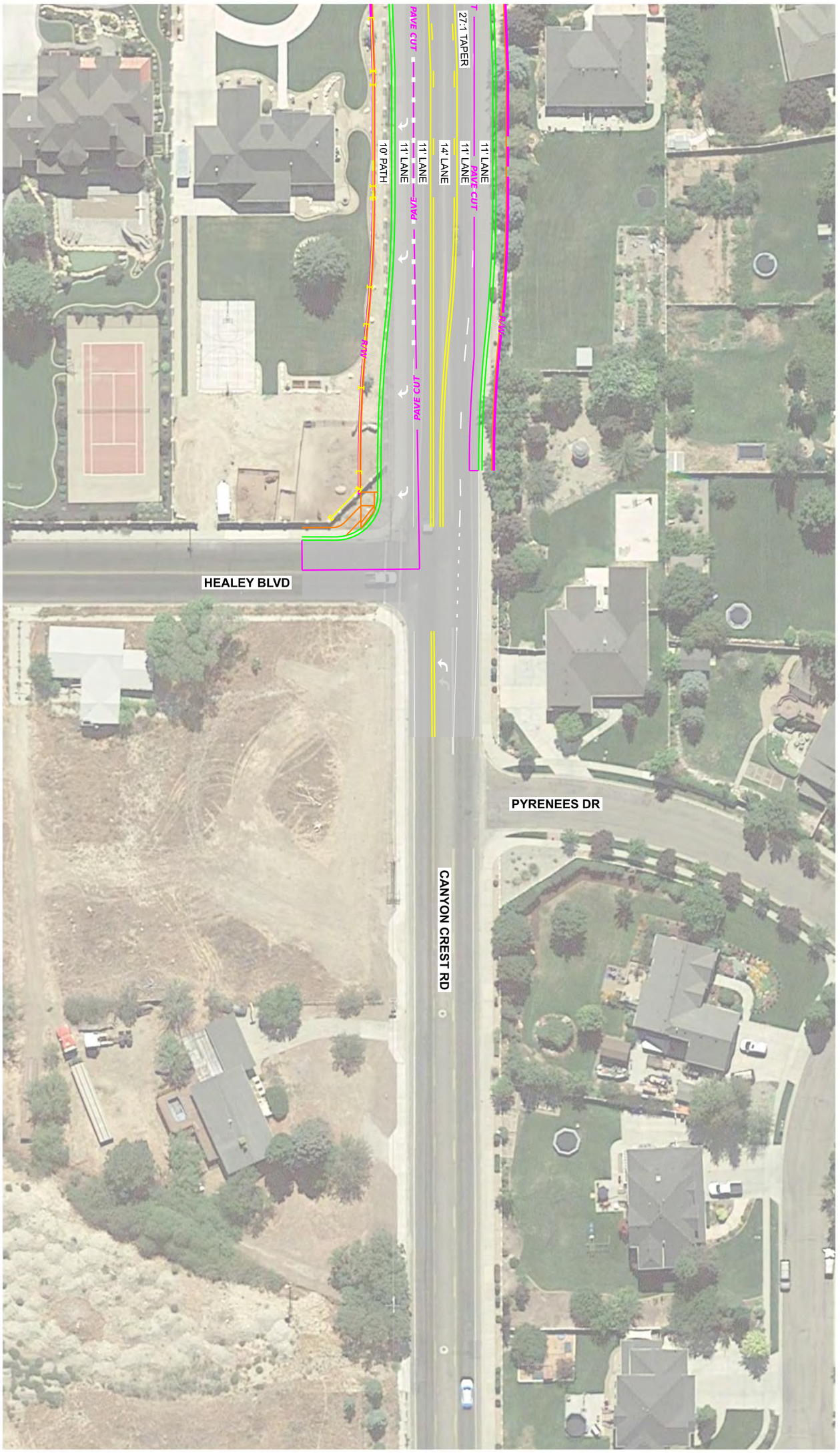
		ROADWAY - PHASE 1	PROFESSIONAL ENGINEER DATE	QC CHECKED BY	

1/7/2022 20-045_RD-07 - Phase 1.dgn

PRELIMINARY
NOT FOR CONSTRUCTION
1/7/2022



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		ROADWAY - PHASE 1	PROFESSIONAL ENGINEER DATE	QC CHECKED BY	

1/7/2022 20-845_RD-07 - Phase 2.dgn

PRELIMINARY
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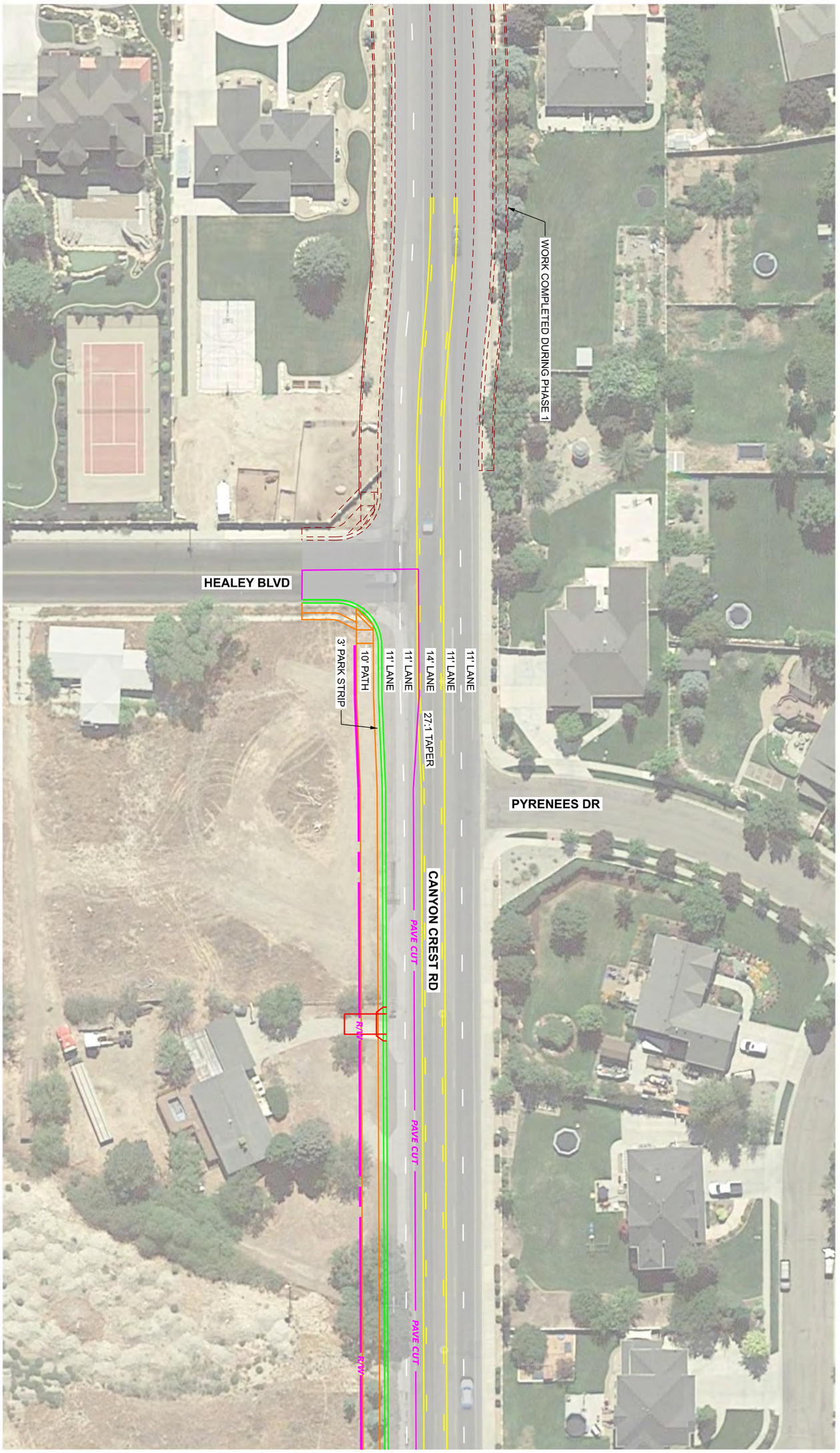
1/7/2022



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		ROADWAY - PHASE 2	PROFESSIONAL ENGINEER DATE	QC CHECKED BY	

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1/7/2022

20-645_RD-08.dgn
1/7/2022

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UTAH DEPARTMENT OF TRANSPORTATION
AVENUE CONSULTANTS

APPROVED

PROFESSIONAL ENGINEER

PROJECT: SR-92 ACCESS AND CIRCULATION STUDY

PIN: 16992

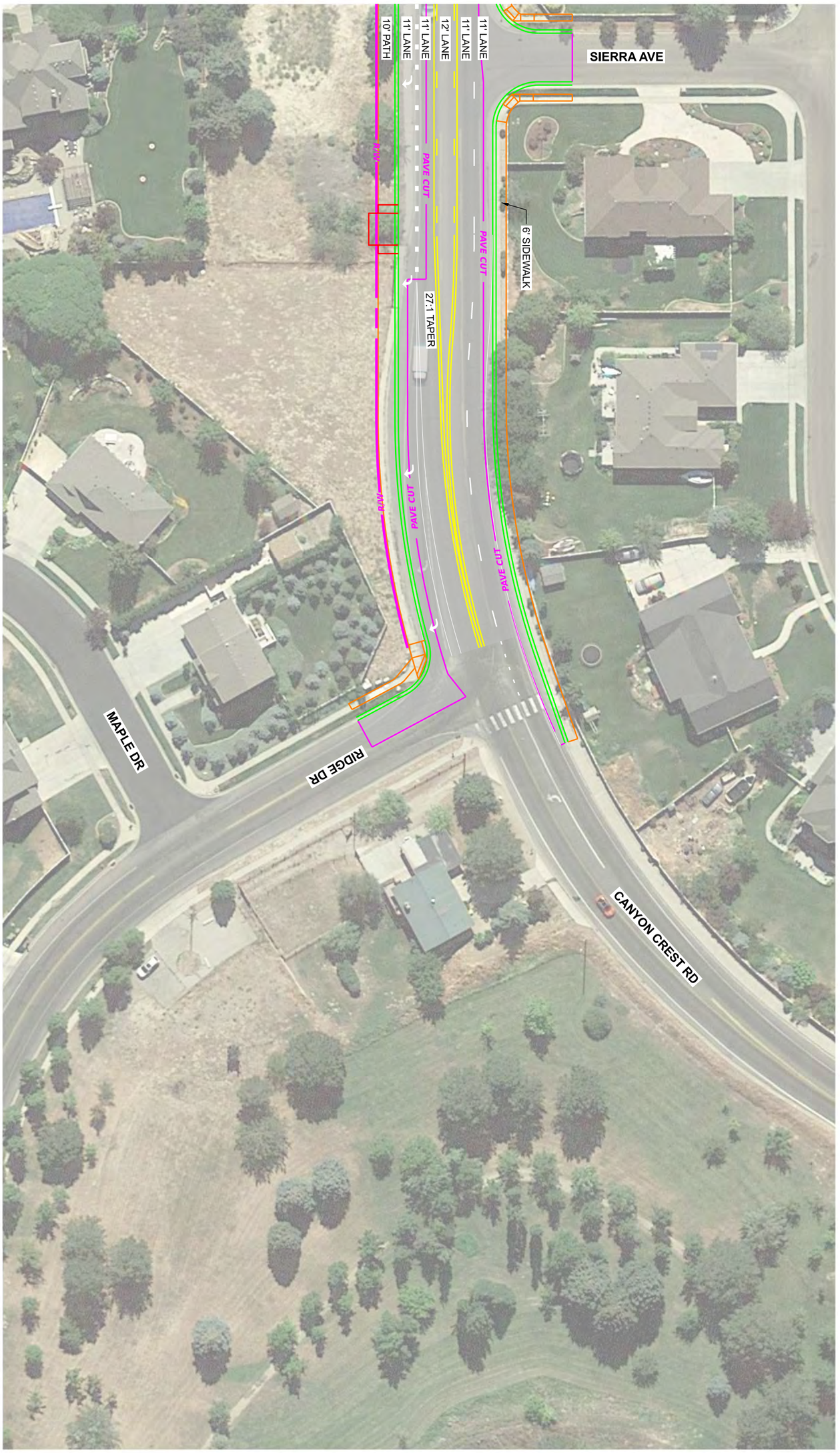
PROJECT NUMBER: S-0092(39)1

ROADWAY - PHASE 2

SHEET NO. RD-08

1/7/2022 20-845_RD-09 - Phase 2.dgn

PRELIMINARY
NOT FOR CONSTRUCTION
1/7/2022



SHEET NO. RD-09	PROJECT	SR-92 ACCESS AND CIRCULATION STUDY	UTAH DEPARTMENT OF TRANSPORTATION AVENUE CONSULTANTS		REVISIONS
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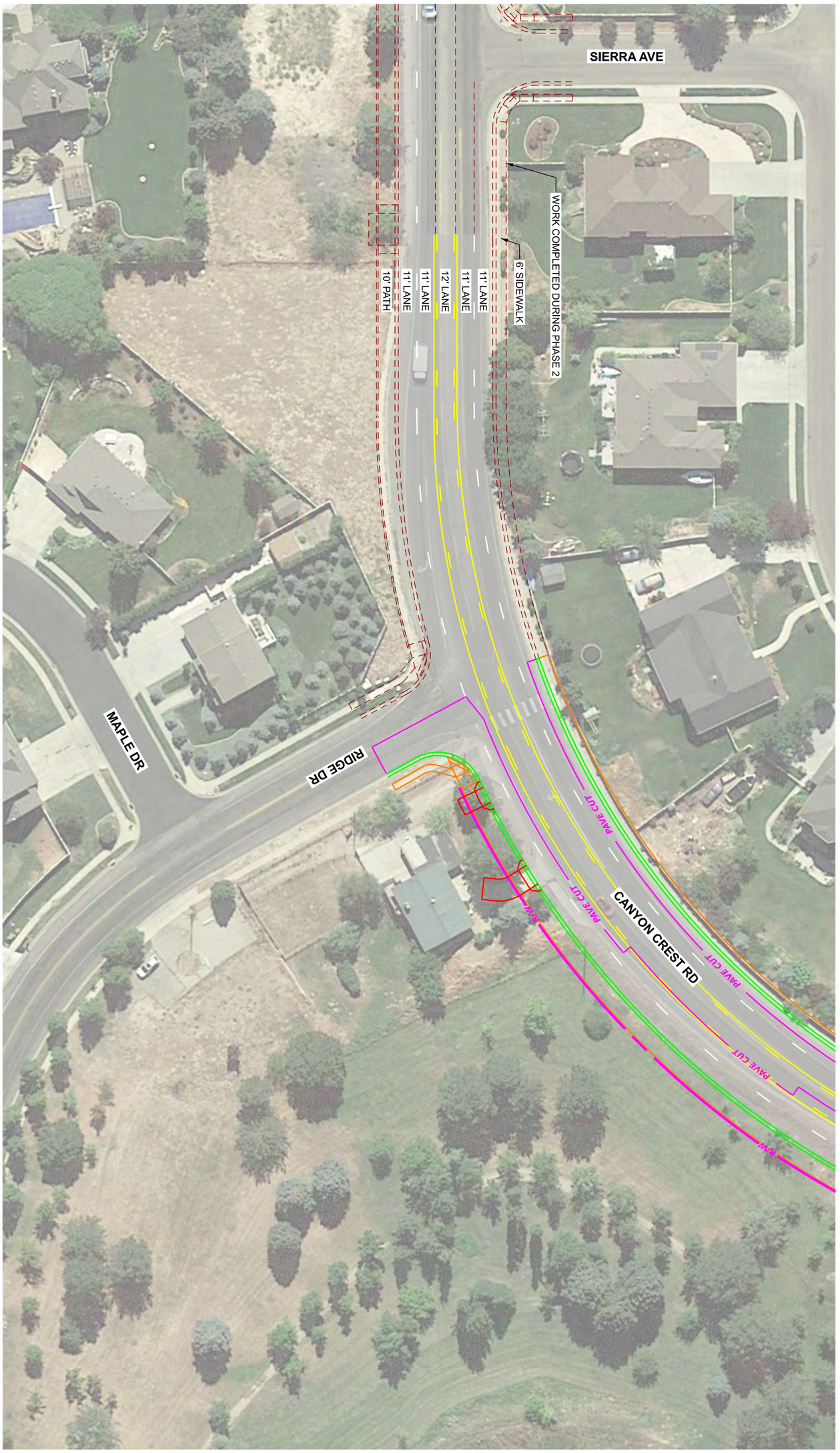
		ROADWAY - PHASE 2	PROFESSIONAL ENGINEER DATE	QC CHECKED BY	

1/7/2022 20-845_RD-09 - Phase 3.dgn

PRELIMINARY
NOT FOR CONSTRUCTION
1/7/2022



SHEET NO. RD-09	PROJECT	SR-92 ACCESS AND CIRCULATION STUDY	UTAH DEPARTMENT OF TRANSPORTATION AVENUE CONSULTANTS		REVISIONS
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		ROADWAY - PHASE 3	PROFESSIONAL ENGINEER DATE	QC CHECKED BY	

PRELIMINARY
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1/7/2022

28-045-RD-10.dgn
1/7/2022

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REVISIONS

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APPROVED

PROFESSIONAL ENGINEER

PROJECT: SR-92 ACCESS AND CIRCULATION STUDY

PROJECT NUMBER: S-0092(39)1

PIN: 16992

ROADWAY - PHASE 3

SHEET NO. RD-10

PRELIMINARY
NOT FOR CONSTRUCTION
1/7/2022

20-045_RD-11.dgn
1/7/2022

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UTAH DEPARTMENT OF TRANSPORTATION
AVENUE CONSULTANTS

APPROVED

PROFESSIONAL ENGINEER

DRAWN BY

QC CHECKED BY

DATE

PROJECT: SR-92 ACCESS AND CIRCULATION STUDY

PIN: 16992

PROJECT NUMBER: S-0092(39)1

ROADWAY - PHASE 3

SHEET NO. RD-11

Appendix E

Cost Estimates

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 North Regional Traffic Study
SR-92 & 6000 West
Cost Estimate - Concept Level

Prepared By: David Webb **Date** 4/26/2021

Proposed Project Scope: **Improve signal LOS by adding a third EB/WB lane and adding NB/SB right turn pockets.**

Approximate Route Reference Mile Post (BEGIN) =		(END) =	
Project Length =	0.000	miles	ft
Current FY Year (July-June) =	2021		
Assumed Construction FY Year =	2025		
Construction Items Inflation Factor =	1.18	4 yrs for inflation	
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	3.25%		
Assumed Yearly Inflation for Right of Way (%/yr) =	4.0%		
Items not Estimated (% of Construction) =	30.0%		
Preliminary Engineering (% of Construction + Incentives) =	12.0%		
Construction Engineering (% of Construction + Incentives) =	10.0%		

Construction Items		Cost	Remarks
Public Information Services		$10,000	
Roadway and Drainage		$2,557,782	
Traffic and Safety		$513,082	
Structures		$0	
Environmental Mitigation		$20,000	
ITS		$0	
	Subtotal	$3,100,864	
	Items not Estimated (30%)	$930,259	
	Construction Subtotal	**$4,031,123**	
P.E. Cost	**P.E. Subtotal**	**$493,455**	12%
C.E. Cost	**C.E. Subtotal**	**$411,212**	10%
Right of Way	**Right of Way Subtotal**	$694,943	
Utilities	**Utilities Subtotal**	$96,000	
Incentives	**Incentives Subtotal**	$81,000	
Miscellaneous	**Miscellaneous Subtotal**	**$0**	

Cost Estimate (ePM screen 505)			2021		2025
	P.E.		**$493,000**		**$560,000**
	Right of Way		**$695,000**		**$813,000**
	Utilities		**$96,000**		**$114,000**
	Construction		**$4,031,000**		**$4,775,000**
	C.E.		**$411,000**		**$467,000**
	Incentives		**$81,000**		**$96,000**
	Aesthetics	**0.75%**	**$30,000**		**$36,000**
	Change Order Contingency	**9.00%**	**$365,000**		**$432,000**
	UDOT Oversight		**$0**		**$0**
	Miscellaneous		**$0**		**$0**
		TOTAL	**$6,202,000**	**TOTAL**	**$7,293,000**

PROPOSED COMMISSION REQUEST	**TOTAL**	**$6,202,000**	**TOTAL**	**$7,293,000**

Project Assumptions/Risks

1 Pavement design: 8" HMA, 6" UTBC, 12" GB
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Roadway and Drainage

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 North Regional Traffic Study
SR-92 & 6000 West

Item #	Item	Quantity	Units	Price	Cost	Remarks
Roadway						
015017010	Mobilization	1	lump	$282,000.00	$282,000.00	Usually 7-10% of construction
015547005	Traffic Control	1	lump	$121,000.00	$121,000.00	Usually 3-5% of construction
01557001*	Maintenance of Traffic	1	lump	$40,000.00	$40,000.00	Usually 1% of construction
020567015	Granular Borrow (Plan Quantity)	4,913	cubic yard	$40.00	$196,520.00	
022217125	Remove Concrete Curb and Gutter	7,232	foot	$5.00	$36,159.03	
022217115	Remove Concrete Driveway	458	square yard	$15.00	$6,872.69	
022217110	Remove Concrete Sidewalk	3,818	square yard	$10.00	$38,180.85	
	Remove Sound Wall	338	foot	$50.00	$16,901.25	
	Remove Fence	162	foot	$5.00	$808.93	
022317010	Clearing and Grubbing	1	lump	$50,000.00	$50,000.00	
023167020	Roadway Excavation (Plan Quantity)	10,675	cubic yard	$25.00	$266,875.00	
027217020	Untreated Base Course (Plan Quantity)	2,488	cubic yard	$55.00	$136,840.00	
027357010	Micro-Surfacing	42,800	square yard	$3.00	$128,400.00	
027417050	HMA - 1/2 Inch	6,765	ton	$85.00	$575,025.00	
027487040	Emulsified Asphalt CSS-1	13	ton	$800.00	$10,400.00	Tack Coat
027767025	Concrete Curb and Gutter Type B1	7,116	foot	$25.00	$177,904.10	
027767038	Concrete Driveway Flared, 6 inch Thick	5,755	square foot	$10.00	$57,545.97	
027767010	Concrete Sidewalk	29,154	square foot	$5.50	$160,348.89	
027717059	Perpendicular/Parallel Pedestrian Access Ramp	17	each	$3,000.00	$51,000.00	
Roadway Subtotal					**$2,352,782**	
Drainage						
026107386	Drainage Pipe - 18 inch, Smooth, Leak-Resistant	300	foot	$150.00	$45,000.00	
026337130	Concrete Drainage Structure 5 ft to 7 ft deep - CB 9	25	each	$4,000.00	$100,000.00	
	Drainage (1.5% of Construction)	1	lump	$60,000.00	$60,000.00	
Drainage Subtotal					**$205,000**	
PI						
015407010	Public Information Services	1	lump	$10,000.00	**$10,000**	Usually 0.25% of construction

Traffic, Safety & ITS

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 North Regional Traffic Study
SR-92 & 6000 West

Item #	Item	Quantity	Units	Price	Cost	Remarks
Traffic						
027657050	Pavement Marking Paint	288	gallon	$1,000.00	$288,000.00	
027687105	Pavement Message (Preformed Thermoplastic)	26	each	$200.00	$5,200.00	
027687115	Pavement Message (Preformed Thermoplastic Stop Line, Crosswalks - 12 inch)	823	foot	$12.00	$9,881.87	
	Signs (0.25% of Construction)	1	Lump	$10,000.00	$10,000.00	
Signals						
02892701D	Traffic Signal System	1	lump	$200,000.00	$200,000.00	
Lighting						
Traffic and Safety Subtotal					**$513,082**	
ITS						
	ATMS (0% of Construction)	1	Lump	$0.00	$0.00	
ITS Subtotal					**$0**	

Environmental and Landscaping

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 North Regional Traffic Study
SR-92 & 6000 West

Item #	Item	Quantity	Units	Price	Cost	Remarks
Environmental						
Temporary Erosion Control						
Landscaping						
	Erosion Control and Landscaping (0.5% of Construction	1	Lump	$20,000.00	$20,000.00	
Environmental Mitigation Subtotal					**$20,000**	

Utilities, Right of Way, and Incentives

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 North Regional Traffic Study
SR-92 & 6000 West

Item #	Item	Quantity	Units	Price	Cost	Remarks
Utilities						
	Reconstruct Irrigation Box	3	Each	$5,000.00	$15,000.00	
	Utility (2% of Construction)	1	Lump	$81,000.00	$81,000.00	
Utilities Subtotal					**$96,000**	
Right-of-way						
	Urban/Suburban Residential	23,648	sq ft	$20.00	$472,952.74	
	Cost to Cure (Stone Wall)	2,704	sq ft	$80.00	$216,320.00	
	Cost to Cure (Ornamental Fence)	162	ft	$35.00	$5,670.00	
Right-of-Way Subtotal					**$694,943**	
Incentives						
	Incentive (2% of Construction)	1	Lump	$81,000.00	$81,000.00	
Incentives Subtotal					**$81,000**	

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 North Regional Traffic Study
SR-92 & 5300 West
Cost Estimate - Concept Level

Prepared By: Heather Hamilton **Date** 4/26/2021

Proposed Project Scope: **Improve signal LOS by adding additional thru lanes in all directions and making the EB left turn a dual left turn.**

Approximate Route Reference Mile Post (BEGIN) =		(END) =	
Project Length =	0.000	miles	ft
Current FY Year (July-June) =	2021		
Assumed Construction FY Year =	2025		
Construction Items Inflation Factor =	1.18	4 yrs for inflation	
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	3.25%		
Assumed Yearly Inflation for Right of Way (%/yr) =	4.0%		
Items not Estimated (% of Construction) =	30.0%		
Preliminary Engineering (% of Construction + Incentives) =	12.0%		
Construction Engineering (% of Construction + Incentives) =	10.0%		

Construction Items		Cost	Remarks
Public Information Services		$11,000	
Roadway and Drainage		$3,726,672	
Traffic and Safety		$334,340	
Structures		$0	
Environmental Mitigation		$27,000	
ITS		$0	
	Subtotal	$4,099,012	
	Items not Estimated (30%)	$1,229,704	
	Construction Subtotal	**$5,328,716**	
P.E. Cost	**P.E. Subtotal**	**$652,286**	12%
C.E. Cost	**C.E. Subtotal**	**$543,572**	10%
Right of Way	**Right of Way Subtotal**	$3,663,720	
Utilities	**Utilities Subtotal**	$543,000	
Incentives	**Incentives Subtotal**	$107,000	
Miscellaneous	**Miscellaneous Subtotal**	**$0**	

Cost Estimate (ePM screen 505)			2021		2025
	P.E.		**$652,000**		**$741,000**
	Right of Way		**$3,664,000**		**$4,286,000**
	Utilities		**$543,000**		**$643,000**
	Construction		**$5,329,000**		**$6,312,000**
	C.E.		**$544,000**		**$618,000**
	Incentives		**$107,000**		**$127,000**
	Aesthetics	**0.75%**	**$40,000**		**$47,000**
	Change Order Contingency	**9.00%**	**$483,000**		**$572,000**
	UDOT Oversight		**$0**		**$0**
	Miscellaneous		**$0**		**$0**
		TOTAL	**$11,362,000**	**TOTAL**	**$13,346,000**

PROPOSED COMMISSION REQUEST	**TOTAL**	**#########**	**TOTAL**	**$13,346,000**

Project Assumptions/Risks

1 Pavement design: 8" HMA, 6" UTBC, 12" GB
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Roadway and Drainage

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 North Regional Traffic Study
SR-92 & 5300 West

Item #	Item	Quantity	Units	Price	Cost	Remarks
Roadway						
015017010	Mobilization	1	lump	$373,000.00	$373,000.00	Usually 7-10% of construction
015547005	Traffic Control	1	lump	$160,000.00	$160,000.00	Usually 3-5% of construction
01557001*	Maintenance of Traffic	1	lump	$53,000.00	$53,000.00	Usually 1% of construction
020567015	Granular Borrow (Plan Quantity)	7,299	cubic yard	$40.00	$291,960.00	
022217110	Remove Concrete Sidewalk	4,486	square yard	$10.00	$44,858.93	
022217120	Remove Concrete Curb	1,921	foot	$5.00	$9,603.40	
022217125	Remove Concrete Curb and Gutter	10,220	foot	$5.00	$51,101.39	
022217115	Remove Concrete Driveway	1,416	square yard	$15.00	$21,246.93	
022317010	Clearing and Grubbing	1	lump	$50,000.00	$50,000.00	
023167020	Roadway Excavation (Plan Quantity)	15,813	cubic yard	$25.00	$395,325.00	
027217020	Untreated Base Course (Plan Quantity)	3,650	cubic yard	$55.00	$200,750.00	
027357010	Micro-Surfacing	75,569	square yard	$3.00	$226,707.00	
027417050	HMA - 1/2 Inch	10,050	ton	$85.00	$854,250.00	
027487040	Emulsified Asphalt CSS-1	20	ton	$800.00	$16,000.00	Tack Coat
027717059	Perpendicular/Parallel Pedestrian Access Ramp	41	each	$3,000.00	$123,000.00	
027767018	Concrete Curb Type M2	4,785	foot	$25.00	$119,614.40	
027767025	Concrete Curb and Gutter Type B1	9,764	foot	$25.00	$244,100.10	
027767010	Concrete Sidewalk	40,272	square foot	$5.50	$221,495.98	
027767038	Concrete Driveway Flared, 6 inch Thick	7,174	square foot	$10.00	$71,737.48	
Roadway Subtotal					**$3,527,751**	
Drainage						
026107386	Drainage Pipe - 18 inch, Smooth, Leak-Resistant	233	foot	$150.00	$34,920.90	
026337130	Concrete Drainage Structure 5 ft to 7 ft deep - CB 9	21	each	$4,000.00	$84,000.00	
	Drainage (1.5% of Construction)	1	lump	$80,000.00	$80,000.00	
Drainage Subtotal					**$198,921**	
PI						
015407010	Public Information Services	1	lump	$11,000.00	**$11,000**	Usually 0.25% of construction

Traffic, Safety & ITS

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 North Regional Traffic Study
SR-92 & 5300 West

Item #	Item	Quantity	Units	Price	Cost	Remarks
Traffic						
027657050	Pavement Marking Paint	422	gallon	$100.00	$42,200.00	
027687105	Pavement Message (Preformed Thermoplastic)	79	each	$200.00	$15,800.00	
027687115	Pavement Message (Preformed Thermoplastic Stop Line, Crosswalks - 12 inch)	1,278	foot	$12.00	$15,340.18	
	Signs (0.25% of Construction)	1	Lump	$11,000.00	$11,000.00	
Signals						
02892701D	Traffic Signal System	1	lump	$250,000.00	$250,000.00	
Lighting						
Traffic and Safety Subtotal					**$334,340**	
ITS						
ITS Subtotal					**$0**	

Environmental and Landscaping

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 North Regional Traffic Study
SR-92 & 5300 West

Item #	Item	Quantity	Units	Price	Cost	Remarks
Environmental						
Temporary Erosion Control						
Landscaping						
	Erosion Control and Landscaping (0.5% of Construction	1	Lump	$27,000.00	$27,000.00	
Environmental Mitigation Subtotal					**$27,000**	

Utilities, Right of Way, and Incentives

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 North Regional Traffic Study
SR-92 & 5300 West

Item #	Item	Quantity	Units	Price	Cost	Remarks
Utilities						
	Relocate Power Pole (Transmission)	6	Lump	$50,000.00	$300,000.00	
	Relocate Power Pole (Distribution)	3	Lump	$10,000.00	$30,000.00	
	Utility (4% of Construction)	1	Lump	$213,000.00	$213,000.00	
Utilities Subtotal					**$543,000**	
Right-of-way						
	Urban/Suburban Residential	44,772	sq ft	$20.00	$895,446.64	
	Urban/Suburban Commercial	55,365	sq ft	$50.00	$2,768,273.55	
Right-of-Way Subtotal					**$3,663,720**	
Incentives						
	Incentive (2% of Construction)	1	Lump	$107,000.00	$107,000.00	
Incentives Subtotal					**$107,000**	

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 1)
COST ESTIMATE - CONCEPT LEVEL

PREPARED BY: DAVID WEBB **DATE** 10/15/2021

PROPOSED PROJECT SCOPE: **WIDEN CANYON CREST TO A 5-LANE SECTION FROM SR-92 TO MAIN STREET.**

APPROXIMATE ROUTE REFERENCE MILE POST (BEGIN) =	N/A	(END) =	N/A
PROJECT LENGTH =	1.207	MILES	6,373 FT
CURRENT FY YEAR (JULY-JUNE) =	2021		
ASSUMED CONSTRUCTION FY YEAR =	2025		
CONSTRUCTION ITEMS INFLATION FACTOR =	1.18	4 YRS FOR INFLATION	
ASSUMED YEARLY INFLATION FOR ENGINEERING SERVICES (PE AND CE) (%/YR) =	3.25%		
ASSUMED YEARLY INFLATION FOR RIGHT OF WAY (%/YR) =	4.0%		
ITEMS NOT ESTIMATED (% OF CONSTRUCTION) =	30.0%		
PRELIMINARY ENGINEERING (% OF CONSTRUCTION + INCENTIVES) =	14.0%		
CONSTRUCTION ENGINEERING (% OF CONSTRUCTION + INCENTIVES) =	10.0%		

CONSTRUCTION ITEMS		COST	REMARKS
PUBLIC INFORMATION SERVICES		$10,000	
ROADWAY AND DRAINAGE		$2,902,111	
TRAFFIC AND SAFETY		$79,678	
STRUCTURES		$0	
ENVIRONMENTAL MITIGATION		$59,000	
ITS		$0	
	SUBTOTAL	$3,050,789	
	ITEMS NOT ESTIMATED (30%)	$915,237	
	CONSTRUCTION SUBTOTAL	**$3,966,026**	
P.E. COST	**P.E. SUBTOTAL**	**$566,304**	14%
C.E. COST	**C.E. SUBTOTAL**	**$404,503**	10%
RIGHT OF WAY	**RIGHT OF WAY SUBTOTAL**	$1,166,747	
UTILITIES	**UTILITIES SUBTOTAL**	$1,032,100	
INCENTIVES	**INCENTIVES SUBTOTAL**	$79,000	
MISCELLANEOUS	**MISCELLANEOUS SUBTOTAL**	**$0**	

COST ESTIMATE (EPM SCREEN 505)		2021	2025
P.E.		$566,000	$643,000
RIGHT OF WAY		$1,167,000	$1,365,000
UTILITIES		$1,032,000	$1,222,000
CONSTRUCTION		$3,966,000	$4,698,000
C.E.		$405,000	$460,000
INCENTIVES		$79,000	$94,000
AESTHETICS	0.75%	$30,000	$36,000
CHANGE ORDER CONTINGENCY	9.00%	$360,000	$426,000
UDOT OVERSIGHT		$0	$0
MISCELLANEOUS		$0	$0
	TOTAL	$7,605,000	TOTAL $8,944,000

PROPOSED COMMISSION REQUEST	**TOTAL**	**$7,605,000**	**TOTAL**	**$8,944,000**

PROJECT ASSUMPTIONS/RISKS

1 PAVEMENT DESIGN: 8" HMA, 6" UTBC, 12" GB

2 ROADWAY EXCAVATION INCLUDES ASPHALT REMOVAL

3 TYPICAL SECTION: (2)11-FT LANES, 14-FT TWLT LANE, (2)11-FT LANES, NO SHOULDER, 2-FT CURB AND GUTTER, 3-FT PARKSTRIP, 10-FT PATH

4 3-FT PARKSTRIP REMOVED AS NEEDED TO REDUCE ROW IMPACTS

5 MOST WIDENING COMPLETED TO EAST MAINTAING EXISTING EDGE OF PAVEMENT ON THE WEST

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ROADWAY AND DRAINAGE

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 1)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
ROADWAY						
015017010	MOBILIZATION	1	LUMP	$278,000.00	$278,000.00	USUALLY 5-7% OF CONSTRUCTION
015547005	TRAFFIC CONTROL	1	LUMP	$79,000.00	$79,000.00	USUALLY 1-2% OF CONSTRUCTION
01557001*	MAINTENANCE OF TRAFFIC	1	LUMP	$40,000.00	$40,000.00	USUALLY 1% OF CONSTRUCTION
020567015	GRANULAR BORROW (PLAN QUANTITY)	4,667	CUBIC YARD	$40.00	$186,680.00	
022217125	REMOVE CONCRETE CURB AND GUTTER	5,845	FOOT	$5.00	$29,226.94	
022217110	REMOVE CONCRETE SIDEWALK	3,837	SQUARE YARD	$10.00	$38,366.26	
022217110	REMOVE CONCRETE DRIVEWAY	544	SQUARE YARD	$15.00	$8,160.63	
022217080	REMOVE FENCE	1,422	FOOT	$5.00	$7,111.54	VINYL, WOOD, OR CHAIN LINK
	REMOVE RETAINING WALL		FOOT	$15.00		
	REMOVE PRIVACY WALL	544	FOOT	$12.50	$6,801.94	
022317010	CLEARING AND GRUBBING	1	LUMP	$235,000.00	$235,000.00	INCLUDES APPROXIMATELY: 45 TREES < 4" 31 TRESS 4" TO 12" 16 TREES > 12"
023167020	ROADWAY EXCAVATION (PLAN QUANTITY)	10,110	CUBIC YARD	$25.00	$252,750.00	
027217020	UNTREATED BASE COURSE (PLAN QUANTITY)	2,334	CUBIC YARD	$55.00	$128,370.00	
027357010	MICRO-SURFACING	44,305	SQUARE YARD	$3.00	$132,915.00	
027417050	HMA - 1/2 INCH	6,511	TON	$85.00	$553,435.00	
027487040	EMULSIFIED ASPHALT CSS-1	13	TON	$800.00	$10,400.00	TACK COAT
	CONCRETE CURB AND GUTTER APWA TYPE E	6,505	FT	$25.00	$162,615.53	
027767010	CONCRETE SIDEWALK	58,606	SQUARE FOOT	$5.50	$322,330.99	
027767022P	CONCRETE DRIVEWAY	3,986	SQUARE FOOT	$7.00	$27,898.50	
027717059	PERPENDICULAR/PARALLEL PEDESTRIAN ACCESS RAMP	30	EACH	$3,000.00	$90,000.00	
	FENCE	1,322	FT	$30.00	$39,657.78	VINYL, WOOD, OR CHAIN LINK
	FENCE - PRIVACY	507	FT	$350.00	$177,339.05	
ROADWAY SUBTOTAL					**$2,806,059**	
DRAINAGE						
026107386	DRAINAGE PIPE-18 INCH SMOOTH LEAK RESISTANT	150	FT	$120.00	$18,051.60	
018927010	RECONSTRUCT CATCH BASIN	15	EACH	$2,500.00	$37,500.00	
	CONCRETE DRAINAGE STRUCTURE	9	EACH	$4,500.00	$40,500.00	
DRAINAGE SUBTOTAL					**$96,052**	
PI						
015407010	PUBLIC INFORMATION SERVICES	1	LUMP	$10,000.00	**$10,000**	USUALLY 0.25% OF CONSTRUCTION

TRAFFIC, SAFETY & ITS

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 1)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
TRAFFIC						
027657050	PAVEMENT MARKING PAINT	254	GALLON	$40.00	$10,160.00	
027687105	PAVEMENT MESSAGE (PREFORMED THERMOPLASTIC)	118	EACH	$250.00	$29,518.33	
	SIGNS LUMP SUM	1	LUMP	$40,000.00	$40,000.00	1% OF CONSTRUCTION
TRAFFIC AND SAFETY SUBTOTAL					**$79,678**	
ITS SUBTOTAL					**$0**	

ENVIRONMENTAL AND LANDSCAPING

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 1)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
TEMPORARY	**EROSION CONTROL & LANDSCAPING**					
	EROSION CONTROL AND LANDSCAPING	1	LUMP	$59,000.00	$59,000.00	1.5% OF CONSTRUCTION
ENVIRONMENTAL MITIGATION SUBTOTAL					**$59,000**	

UTILITIES, RIGHT OF WAY, AND INCENTIVES

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 1)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
UTILITIES						
	RELOCATE POWER POLE (METAL)	2	EACH	$200,000.00	$400,000.00	
	RELOCATE POWER POLE (WOOD)	10	EACH	$15,000.00	$150,000.00	
	UNDERGROUNDING POWER LINES	2,176	FT	$80.00	$174,080.00	4 LINES TO MOVE UNDERGROUND
	UNDERGROUNDING POWER LINES	1,154	FT	$130.00	$150,020.00	7 LINES TO MOVE UNDERGROUND
	UTILITY (2% OF CONSTRUCTION)	1	LUMP	$79,000.00	$79,000.00	
UTILITIES SUBTOTAL					**$1,032,100**	
RIGHT-OF-WAY						
	URBAN/SUBURBAN RESIDENTIAL	46,670	SQ FT	$25.00	$1,166,746.50	
RIGHT-OF-WAY SUBTOTAL					**$1,166,747**	
INCENTIVES						
	INCENTIVE	1	LUMP	$79,000.00	$79,000.00	2% OF CONSTRUCTION
INCENTIVES SUBTOTAL					**$79,000**	

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 2)
COST ESTIMATE - CONCEPT LEVEL

PREPARED BY: DAVID WEBB **DATE** 10/15/2021

PROPOSED PROJECT SCOPE: **WIDEN CANYON CREST TO A 5-LANE SECTION FROM SR-92 TO MAIN STREET.**

APPROXIMATE ROUTE REFERENCE MILE POST (BEGIN) =	N/A	(END) =	N/A	
PROJECT LENGTH =	1.207	MILES	6,373 FT	
CURRENT FY YEAR (JULY-JUNE) =	2021			
ASSUMED CONSTRUCTION FY YEAR =	2025			
CONSTRUCTION ITEMS INFLATION FACTOR =	1.18	4 YRS FOR INFLATION		
ASSUMED YEARLY INFLATION FOR ENGINEERING SERVICES (PE AND CE) (%/YR) =	3.25%			
ASSUMED YEARLY INFLATION FOR RIGHT OF WAY (%/YR) =	4.0%			
ITEMS NOT ESTIMATED (% OF CONSTRUCTION) =	30.0%			
PRELIMINARY ENGINEERING (% OF CONSTRUCTION + INCENTIVES) =	14.0%			
CONSTRUCTION ENGINEERING (% OF CONSTRUCTION + INCENTIVES) =	10.0%			

CONSTRUCTION ITEMS		COST	REMARKS
PUBLIC INFORMATION SERVICES		$5,000	
ROADWAY AND DRAINAGE		$1,288,312	
TRAFFIC AND SAFETY		$24,040	
STRUCTURES		$295,460	
ENVIRONMENTAL MITIGATION		$32,000	
ITS		$0	
	SUBTOTAL	$1,644,812	
	ITEMS NOT ESTIMATED (30%)	$493,444	
	CONSTRUCTION SUBTOTAL	**$2,138,256**	
P.E. COST	**P.E. SUBTOTAL**	**$305,376**	14%
C.E. COST	**C.E. SUBTOTAL**	**$218,126**	10%
RIGHT OF WAY	**RIGHT OF WAY SUBTOTAL**	$519,374	
UTILITIES	**UTILITIES SUBTOTAL**	$188,640	
INCENTIVES	**INCENTIVES SUBTOTAL**	$43,000	
MISCELLANEOUS	**MISCELLANEOUS SUBTOTAL**	**$0**	

COST ESTIMATE (EPM SCREEN 505)		2021	2025
P.E.		$305,000	$347,000
RIGHT OF WAY		$519,000	$608,000
UTILITIES		$189,000	$224,000
CONSTRUCTION		$2,138,000	$2,532,000
C.E.		$218,000	$248,000
INCENTIVES		$43,000	$51,000
AESTHETICS	0.75%	$16,000	$19,000
CHANGE ORDER CONTINGENCY	9.00%	$194,000	$230,000
UDOT OVERSIGHT		$0	$0
MISCELLANEOUS		$0	$0
	TOTAL	$3,622,000	TOTAL $4,259,000

PROPOSED COMMISSION REQUEST	TOTAL	$3,622,000	TOTAL	$4,259,000

PROJECT ASSUMPTIONS/RISKS

1 PAVEMENT DESIGN: 8" HMA, 6" UTBC, 12" GB

2 ROADWAY EXCAVATION INCLUDES ASPHALT REMOVAL

3 TYPICAL SECTION: (2)11-FT LANES, 12-FT TWLT LANE, (2)11-FT LANES, NO SHOULDER, 2-FT CURB AND GUTTER, 3-FT PARKSTRIP, 10-FT PATH

4 3-FT PARKSTRIP REMOVED AS NEEDED TO REDUCE ROW IMPACTS

5 MOST WIDENING COMPLETED TO EAST/NORTH MAINTAING EXISTING EDGE OF PAVEMENT ON THE WEST/SOUTH

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ROADWAY AND DRAINAGE

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 2)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
ROADWAY						
015017010	MOBILIZATION	1	LUMP	$150,000.00	$150,000.00	USUALLY 5-7% OF CONSTRUCTION
015547005	TRAFFIC CONTROL	1	LUMP	$43,000.00	$43,000.00	USUALLY 1-2% OF CONSTRUCTION
01557001*	MAINTENANCE OF TRAFFIC	1	LUMP	$21,000.00	$21,000.00	USUALLY 1% OF CONSTRUCTION
020567015	GRANULAR BORROW (PLAN QUANTITY)	1,480	CUBIC YARD	$45.00	$66,600.00	
022217125	REMOVE CONCRETE CURB AND GUTTER	3,014	FOOT	$5.00	$15,072.40	
022217110	REMOVE CONCRETE SIDEWALK	1,669	SQUARE YARD	$10.00	$16,686.05	
022217110	REMOVE CONCRETE DRIVEWAY	185	SQUARE YARD	$15.00	$2,773.09	
022217080	REMOVE FENCE	563	FOOT	$5.00	$2,815.00	VINYL, WOOD, OR CHAIN LINK
	REMOVE RETAINING WALL	342	FOOT	$15.00	$5,135.91	
	REMOVE PRIVACY WALL	418	FOOT	$12.50	$5,225.00	
022317010	CLEARING AND GRUBBING	1	LUMP	$205,000.00	$205,000.00	INCLUDES APPROXIMATELY: 28 TREES < 4" 31 TRESS 4" TO 12" 16 TREES > 12"
023167020	ROADWAY EXCAVATION (PLAN QUANTITY)	3,207	CUBIC YARD	$30.00	$96,210.00	
027217020	UNTREATED BASE COURSE (PLAN QUANTITY)	740	CUBIC YARD	$60.00	$44,400.00	
027357010	MICRO-SURFACING	12,724	SQUARE YARD	$3.00	$38,172.00	
027417050	HMA - 1/2 INCH	2,038	TON	$90.00	$183,420.00	
027487040	EMULSIFIED ASPHALT CSS-1	4	TON	$800.00	$3,200.00	TACK COAT
	CONCRETE CURB AND GUTTER APWA TYPE E	3,002	FT	$25.00	$75,041.45	
027767010	CONCRETE SIDEWALK	20,958	SQUARE FOOT	$5.50	$115,269.05	
027767022P	CONCRETE DRIVEWAY	749	SQUARE FOOT	$7.00	$5,242.34	
027717059	PERPENDICULAR/PARALLEL PEDESTRIAN ACCESS RAMP	8	EACH	$3,000.00	$24,000.00	
	FENCE	625	FT	$30.00	$18,750.00	VINYL, WOOD, OR CHAIN LINK
	FENCE - PRIVACY	418	FT	$350.00	$146,300.00	
ROADWAY SUBTOTAL					**$1,283,312**	
DRAINAGE						
018927010	RECONSTRUCT CATCH BASIN	2	EACH	$2,500.00	$5,000.00	
DRAINAGE SUBTOTAL					**$5,000**	
PI						
015407010	PUBLIC INFORMATION SERVICES	1	LUMP	$5,000.00	**$5,000**	USUALLY 0.25% OF CONSTRUCTION

TRAFFIC, SAFETY & ITS

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 2)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
TRAFFIC						
027657050	PAVEMENT MARKING PAINT	76	GALLON	$40.00	$3,040.00	
	SIGNS LUMP SUM	1	LUMP	$21,000.00	$21,000.00	1% OF CONSTRUCTION
TRAFFIC AND SAFETY SUBTOTAL					$24,040	
ITS SUBTOTAL					$0	

STRUCTURES

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 2)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
WALLS						
	RETAINING WALL	1,676	SQ FT	$85.00	$142,460.00	ASSUMED 419X4 (WALL AREA)
	RETAINING WALL	1,800	SQ FT	$85.00	$153,000.00	ASSUMED 200X9 (WALL AREA)
STRUCTURES SUBTOTAL					**$295,460**	

ENVIRONMENTAL AND LANDSCAPING

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 2)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
TEMPORARY	**EROSION CONTROL & LANDSCAPING**					
	EROSION CONTROL AND LANDSCAPING	1	LUMP	$32,000.00	$32,000.00	1.5% OF CONSTRUCTION
ENVIRONMENTAL MITIGATION SUBTOTAL					**$32,000**	

UTILITIES, RIGHT OF WAY, AND INCENTIVES

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 2)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
UTILITIES						
	RELOCATE POWER POLE (DISTRIBUTION)	4	EACH	$15,000.00	$60,000.00	
	UNDERGROUNDING POWER LINES	1,066	FT	$40.00	$42,640.00	2 LINES TO MOVE UNDERGROUND
	UTILITY (2 % OF CONSTRUCTION)	1	LUMP	$43,000.00	$43,000.00	
UTILITIES SUBTOTAL					**$188,640**	
RIGHT-OF-WAY						
	URBAN/SUBURBAN RESIDENTIAL	20,775	SQ FT	$25.00	$519,374.08	
RIGHT-OF-WAY SUBTOTAL					**$519,374**	
INCENTIVES						
	INCENTIVE	1	LUMP	$43,000.00	$43,000.00	2% OF CONSTRUCTION
INCENTIVES SUBTOTAL					**$43,000**	

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 3)
COST ESTIMATE - CONCEPT LEVEL

PREPARED BY: DAVID WEBB **DATE** 10/15/2021

PROPOSED PROJECT SCOPE: **WIDEN CANYON CREST TO A 5-LANE SECTION FROM SR-92 TO MAIN STREET.**

APPROXIMATE ROUTE REFERENCE MILE POST (BEGIN) =	N/A	(END) =	N/A
PROJECT LENGTH =	1.207	MILES	6,373 FT
CURRENT FY YEAR (JULY-JUNE) =	2021		
ASSUMED CONSTRUCTION FY YEAR =	2025		
CONSTRUCTION ITEMS INFLATION FACTOR =	1.18	4 YRS FOR INFLATION	
ASSUMED YEARLY INFLATION FOR ENGINEERING SERVICES (PE AND CE) (%/YR) =	3.25%		
ASSUMED YEARLY INFLATION FOR RIGHT OF WAY (%/YR) =	4.0%		
ITEMS NOT ESTIMATED (% OF CONSTRUCTION) =	30.0%		
PRELIMINARY ENGINEERING (% OF CONSTRUCTION + INCENTIVES) =	14.0%		
CONSTRUCTION ENGINEERING (% OF CONSTRUCTION + INCENTIVES) =	10.0%		

CONSTRUCTION ITEMS		COST	REMARKS
PUBLIC INFORMATION SERVICES		$4,000	
ROADWAY AND DRAINAGE		$1,238,323	
TRAFFIC AND SAFETY		$27,120	
STRUCTURES		$0	
ENVIRONMENTAL MITIGATION		$25,000	
ITS		$0	
	SUBTOTAL	$1,294,443	
	ITEMS NOT ESTIMATED (30%)	$388,333	
	CONSTRUCTION SUBTOTAL	**$1,682,776**	
P.E. COST	**P.E. SUBTOTAL**	**$240,349**	14%
C.E. COST	**C.E. SUBTOTAL**	**$171,678**	10%
RIGHT OF WAY	**RIGHT OF WAY SUBTOTAL**	$329,988	
UTILITIES	**UTILITIES SUBTOTAL**	$128,000	
INCENTIVES	**INCENTIVES SUBTOTAL**	$34,000	
MISCELLANEOUS	**MISCELLANEOUS SUBTOTAL**	**$0**	

COST ESTIMATE (EPM SCREEN 505)		2021	2025
	P.E.	**$240,000**	**$273,000**
	RIGHT OF WAY	**$330,000**	**$386,000**
	UTILITIES	**$128,000**	**$152,000**
	CONSTRUCTION	**$1,683,000**	**$1,994,000**
	C.E.	**$172,000**	**$195,000**
	INCENTIVES	**$34,000**	**$40,000**
	AESTHETICS 0.75%	**$13,000**	**$15,000**
	CHANGE ORDER CONTINGENCY 9.00%	**$153,000**	**$181,000**
	UDOT OVERSIGHT	**$0**	**$0**
	MISCELLANEOUS	**$0**	**$0**
	TOTAL	**$2,753,000**	**TOTAL** **$3,236,000**

PROPOSED COMMISSION REQUEST	**TOTAL**	**$2,753,000**	**TOTAL**	**$3,236,000**

PROJECT ASSUMPTIONS/RISKS

1 PAVEMENT DESIGN: 8" HMA, 6" UTBC, 12" GB

2 ROADWAY EXCAVATION INCLUDES ASPHALT REMOVAL

3 TYPICAL SECTION: (2)11-FT LANES, 12-FT TWLT LANE, (2)11-FT LANES, NO SHOULDER, 2-FT CURB AND GUTTER, 10-FT PATH

4 MOST WIDENING COMPLETED TO EAST MAINTAING EXISTING EDGE OF PAVEMENT ON THE WEST

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ROADWAY AND DRAINAGE

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 3)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
ROADWAY						
015017010	MOBILIZATION	1	LUMP	$118,000.00	$118,000.00	USUALLY 5-7% OF CONSTRUCTION
015547005	TRAFFIC CONTROL	1	LUMP	$34,000.00	$34,000.00	USUALLY 1-2% OF CONSTRUCTION
01557001*	MAINTENANCE OF TRAFFIC	1	LUMP	$17,000.00	$17,000.00	USUALLY 1% OF CONSTRUCTION
020567015	GRANULAR BORROW (PLAN QUANTITY)	1,970	CUBIC YARD	$45.00	$88,650.00	
022217125	REMOVE CONCRETE CURB AND GUTTER	3,582	FOOT	$5.00	$17,908.00	
022217110	REMOVE CONCRETE SIDEWALK	1,302	SQUARE YARD	$10.00	$13,015.21	
022217140	REMOVE RAISED ISLAND	523	SQUARE YARD	$10.00	$5,232.56	
	REMOVE BRICK WALL	292	FOOT	$20.00	$5,840.00	
022217110	REMOVE CONCRETE DRIVEWAY	353	SQUARE YARD	$15.00	$5,298.53	
	REMOVE PRIVACY WALL	140	FOOT	$12.50	$1,750.00	
022317010	CLEARING AND GRUBBING	1	LUMP	$110,000.00	$110,000.00	INCLUDES APPROXIMATELY: 8 TREES < 4" 39 TRESS 4" TO 12" 4 TREES > 12"
023167020	ROADWAY EXCAVATION (PLAN QUANTITY)	4,267	CUBIC YARD	$30.00	$128,010.00	
027217020	UNTREATED BASE COURSE (PLAN QUANTITY)	985	CUBIC YARD	$60.00	$59,100.00	
027357010	MICRO-SURFACING	14,610	SQUARE YARD	$3.00	$43,830.00	
027417050	HMA - 1/2 INCH	2,712	TON	$90.00	$244,080.00	
027487040	EMULSIFIED ASPHALT CSS-1	6	TON	$800.00	$4,800.00	TACK COAT
	CONCRETE CURB APWA TYPE R	161	FT	$15.00	$2,415.00	
	CONCRETE CURB APWA TYPE S	395	FT	$15.00	$5,925.00	
	CONCRETE CURB AND GUTTER APWA TYPE E	3,162	FT	$25.00	$79,059.08	
027767060	CONCRETE FLATWORK, 8 INCH THICK	3,706	SQUARE FOOT	$7.00	$25,942.26	
027767010	CONCRETE SIDEWALK	18,513	SQUARE FOOT	$5.50	$101,818.75	
027767022P	CONCRETE DRIVEWAY	1,894	SQUARE FOOT	$7.00	$13,256.45	
027717059	PERPENDICULAR/PARALLEL PEDESTRIAN ACCESS RAMP	9	EACH	$3,000.00	$27,000.00	
027717086	DETECTABLE WARNING SURFACE	4	EACH	$1,000.00	$4,000.00	
027767100	PLOWABLE END SECTION	8	EACH	$600.00	$4,800.00	
	CHAIN LINK FENCE - 12 FT	127	FT	$30.00	$3,810.00	VINYL, WOOD, OR CHAIN LINK
	CHAIN LINK FENCE - 4 FT	216	FT	$15.00	$3,240.00	
	LANDSCAPE WALL	163	FT	$20.00	$3,267.26	
	FENCE - PRIVACY	132	FT	$350.00	$46,095.00	
ROADWAY SUBTOTAL					**$1,217,143**	
DRAINAGE						
026107386	DRAINAGE PIPE-18 INCH SMOOTH LEAK RESISTANT	39	FT	$120.00	$4,680.00	
018927010	RECONSTRUCT CATCH BASIN	3	EACH	$2,500.00	$7,500.00	
	CONCRETE DRAINAGE STRUCTURE	2	EACH	$4,500.00	$9,000.00	
DRAINAGE SUBTOTAL					**$21,180**	
PI						
015407010	PUBLIC INFORMATION SERVICES	1	LUMP	$4,000.00	**$4,000**	USUALLY 0.25% OF CONSTRUCTION

TRAFFIC, SAFETY & ITS

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 3)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
TRAFFIC						
027657050	PAVEMENT MARKING PAINT	68	GALLON	$40.00	$2,720.00	
027687105	PAVEMENT MESSAGE (PREFORMED THERMOPLASTIC)	37	EACH	$200.00	$7,400.00	
	SIGNS LUMP SUM	1	LUMP	$17,000.00	$17,000.00	1% OF CONSTRUCTION
TRAFFIC AND SAFETY SUBTOTAL					**$27,120**	
ITS SUBTOTAL					**$0**	

ENVIRONMENTAL AND LANDSCAPING

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 3)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
TEMPORARY	**EROSION CONTROL & LANDSCAPING**					
	EROSION CONTROL AND LANDSCAPING	1	LUMP	$25,000.00	$25,000.00	1.5% OF CONSTRUCTION
ENVIRONMENTAL MITIGATION SUBTOTAL					**$25,000**	

UTILITIES, RIGHT OF WAY, AND INCENTIVES

PIN: 16992 PROJECT # S-0092(39)1 PROJECT NAME: SR-92 NORTH REGIONAL TRAFFIC STUDY
CANYON CREST; SR-92 TO MAIN STREET (PHASE 3)

ITEM #	ITEM	QUANTITY	UNITS	PRICE	COST	REMARKS
UTILITIES						
	RELOCATE POWER POLE (DISTRIBUTION)	4	EACH	$15,000.00	$60,000.00	
	UTILITY (2% OF CONSTRUCTION)	1	LUMP	$34,000.00	$34,000.00	
UTILITIES SUBTOTAL					**$128,000**	
RIGHT-OF-WAY						
	URBAN/SUBURBAN COMMERCIAL	3,261	SQ FT	$25.00	$81,519.50	
	URBAN/SUBURBAN RESIDENTIAL	9,939	SQ FT	$25.00	$248,468.75	
RIGHT-OF-WAY SUBTOTAL					**$329,988**	
INCENTIVES						
	INCENTIVE	1	LUMP	$34,000.00	$34,000.00	2% OF CONSTRUCTION
INCENTIVES SUBTOTAL					**$34,000**	

APPENDIX E
Items Required for Approval by City Council

- Updated Alpine City Transportation Master Plan Map
- New Standard Detail, Street Cross-sections (Major Arterial)
- Ordinance Changes in sections 4.03.010 & 4.07.040

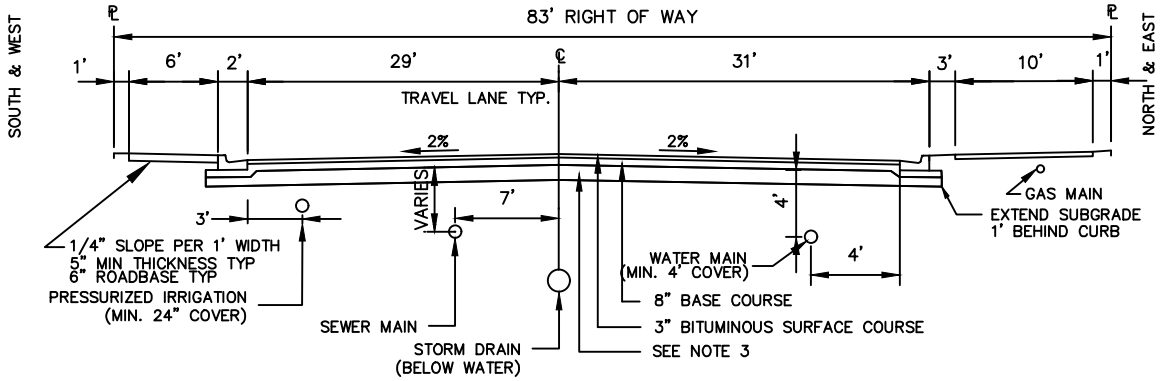
City Boundary

Street Classifications

- Existing Minor Arterial
- Future Major Arterial
- Existing Collector
- Existing Minor (Local)
- Existing Secondary Access
- Planned Collector
- Planned Minor (Local)
- Planned Secondary Access
- Planned Intermunicipal Connection

Alpine City Transportation Master Plan Map

Proposed 2022



NOTES:

1. WATER VALVES AND 5-INCH VALVE OPENING MUELLER FIRE HYDRANTS SHALL BE LOCATED AS APPROVED.
2. NO WATER LINE SMALLER THAN 8-INCH DIA. SHALL BE INSTALLED WITHOUT APPROVAL OF CITY COUNCIL.
3. SUBGRADE DEPTHS VARY DEPENDING ON CBR VALUE OF THE AREA, SEE ALPINE CITY STANDARD SPECIFICATIONS
4. CULINARY WATER MAINS SHALL BE ON THE NORTH AND EAST SIDES OF THE STREET. PRESSURIZED IRRIGATION AND SEWER LINES SHALL BE ON THE SOUTH AND WEST SIDES OF THE STREET.

STREET CROSS-SECTIONS & UTILITY LOCATIONS

N.T.S.

REVISION

NO.		BY	APRL	DATE

ALPINE CITY
ESTABLISHED 1850

CAD FILE: G:\ENGINEERING\CODES & STANDARD SPECS\STANDARD SPECIFICATIONS AND DRAWINGS\2021 CITY SPEC AND DETAILS\CITY DETAILS\1C STREET CROSS SECTION 83FT ROW

STREET CROSS-SECTIONS (MAJOR ARTERIAL)

ALPINE CITY
20 NORTH MAIN
ALPINE, UT 84004

STANDARD DRAWING NUMBER:	1c
PLOT SCALE:	N.T.S.
DRAWN BY:	B.D.B.
DESIGN BY:	
CHECKED BY:	
ADOPTED DATE:	10/13/05

ALPINE CITY
ORDINANCE 2022-04

AN ORDINANCE ADOPTING AMENDMENTS TO ARTICLE 4.03.010 AND 4.07.040 OF THE ALPINE CITY DEVELOPMENT CODE PERTAINING TO THE MAJOR STREET PLAN AND MAJOR ARTERIAL STREETS.

WHEREAS, The Planning Commission held a public hearing on February 15, 2022, regarding proposed amendments to Article 4.03.010 and 4.07.040 of the Development Code; and

WHEREAS, on February 22, 2022, the Alpine City Council has deemed it in the best interest of Alpine City to amend the Development Code; and

WHEREAS, the Alpine City Planning Commission has reviewed the proposed Amendments to the Development Code, held a public hearing, and has forwarded a recommendation to the City Council; and

WHEREAS, the Alpine City Council has reviewed the proposed Amendments to the Development Code:

NOW THEREFORE, be it ordained by the Council of the Alpine City, in the State of Utah, as follows: The amendments to Article 4.03.010 and 4.07.040 will supersede Article 4.03.010 and 4.07.040 as previously adopted. This ordinance shall take effect upon posting.

SECTION 1: **AMENDMENT** "4.03.010 Definitions" of the Alpine City Development Code is hereby *amended* as follows:

A M E N D M E N T

4.03.010 Definitions

Unless the context requires otherwise, the following definitions shall be used in the interpretation and construction of this Ordinance. Words used in the present tense include the future; the singular number shall include the plural, and the plural the singular; the word "building" shall include the word "structure;" the words "used" and "occupied" shall include arranged, designed, constructed, altered, converted, rented, leased, or intended to be used or occupied; the word "shall" is mandatory and not directory; and the word "may" is permissive; the word" person" includes a firm, association, organization, partnership, trust, company, or corporation as well as an individual; the word "lot" includes the words plot, or parcel. Words used in this Ordinance but not defined herein shall have the meaning as defined in any other Ordinance adopted by the City of Alpine.

Average Slope. The definition shall conform with that in the Alpine Zoning Ordinance, DCA 3.01.110 Part 4.

Block. The land surrounded by streets or other rights-or-way, other than an alley, or land which is designated as a block or any recorded subdivision plat.

Building Official. Building official is the official, or his duly authorized deputy, charged with the administration and enforcement of this ordinance.

Condominium. The ownership of a single unit in a multi-unit project together with an undivided interest in common in the common areas and facilities of the property as provided by state law.

Crosswalk or Walkway or Pedestrian Way. A right-of-way designed for use by pedestrians and not intended for use by motor vehicles of any kind; a cross-walk or walkway or pedestrian-way may be located within or without a street right-of-way, at grade, or grade- separated from vehicular traffic.

Designated Buildable Area. A lot or portion thereof possessing all of the following physical characteristics: (Added by Ord. 2004-13, 9/28/05)

1. The area contains no territory having a natural slope of twenty (20) percent or greater;
2. The area contains no territory which is located in any identified flood plain or within any recognized inundation zone, mud flow zone or zone of deformation, or lands subject to earth slippage, landslide or rockfall;
3. The engineering properties of the soil provide adequate structural support for the intended use;
4. The area does not possess any other recognized natural condition, which renders it unsafe for building purposes;
5. The area is within the building setback envelope as determined in accordance with the setback provisions of the zone; and
6. The area is readily capable of vehicular access from the adjacent public street over a driveway having a slope of not more than twelve (12) percent with no cut or fill greater than five feet as measured at the finished grade of the centerline alignment .

Driveway. A private roadway, the use of which is limited to persons residing, employed, or otherwise using or visiting the lot on which the roadway is located.

Dwelling. Any building or portion thereof designed or used exclusively as the more or less permanent residence or sleeping place of one of more persons or families.

Easement. That portion of a lot or lots reserved for present or future use by a person or agency other than the legal owner(s) of said properties. The easement may be for use on, under, or above said lot or lots.

Environmental Impact Study. A study which is described by means of written narrative as well as maps, a geographical area in terms of existing: (1) slope, (2) soils, (3) water courses, (4) water table, (5) flood hazard areas, (6) geologic hazards, (7) vegetative types, (8) wildlife, (9) wildlife habitat, and (10) available urban services, i.e., electricity, gas, roads, schools, culinary water, sewage facilities, police and fire protection, (11) air quality and movement, (12) noise, (13) aesthetics and cultural, (14) land use, (15) open space and trails, (16) recreational facilities.

The study recommends measures which, if undertaken, will mitigate or obviate acts resulting from development of the proposed subdivision, and discusses the benefits to be gained from such subdivision.

The study also evaluates the potential area-wide economic impact of the subdivision on both private and public economic sectors and the potential impact on school systems.

Essential Facilities. Utilities, sanitary and public safety facilities provided by a public utility or other governmental agency for overhead or surface or underground services, excluding any building, electrical substation or transmission line of fifty (50) KV or greater capacity, except by conditional use permit.

Final Plat. A subdivision map prepared in accordance with the provisions of this Ordinance, which is designed to be placed on record in the office of the County Recorder.

Fire Protection. Such water supply, water lines, fire hydrants, and other protective devices as may be required in accordance with the provisions of this Ordinance.

Flood Hazard. A hazard to land or improvements due to inundation or overflow water having sufficient velocity to transport or deposit debris, scour the surface soil, dislodge or damage buildings, or erode the banks of water courses.

Frontage. The width of the lot or parcel of land measured at the required front setback lines.

Geological Hazard. A hazard inherent in the crust of the earth, or artificially created, which is dangerous or potentially dangerous to life, property, or improvements, due to the movements, failure or shifting of the earth.

Improvement. Work, objects, devices, facilities, or utilities required to be constructed or installed in a subdivision. Such improvements may include, but are not limited to, street construction to required standards water facilities, sewer facilities, sidewalks, curbs and gutters, drainage facilities, street trees, street signs, street lights, traffic control or safety devices, fire hydrants, and such other facilities or construction required by the Subdivision Ordinance, Subdivision Regulations, or by the Planning Commission and/or City Council for the necessary proper development of the proposed subdivision.

Land, Agricultural. Land whose primary use is determined to be agricultural in the Land Use Element of the Alpine City General Plan, or which is included in an agricultural district in the Alpine Zoning Ordinance.

Land, Commercial. Land whose optimum use is determined to be commercial in the Land Use Element of the Alpine City General Plan, or which is included in a commercial district in the Alpine Zoning Ordinance.

Land, Industrial. Land whose optimum use is determined to be industrial in the Land Use Element of the Alpine City General Plan, or which is included in an industrial or manufacturing district in the Alpine Zoning Ordinance.

Land Use Element of the General Plan. A coordinated plan which has been prepared and adopted for the purpose of guiding development of land use.

Lot.

1. An independently described parcel of land as shown on the records of the County Recorder; or
2. Two or more contiguous parcels each of which qualify under (1) above and for which a Declaration of Zoning Lot has been approved and filed in the office of the County Recorder.

Lot, Corner. A lot abutting upon two (2) or more streets at their intersection or upon two parts of the same street, such streets or parts of the same street forming an interior angle of less than one hundred thirty-five (135) degrees.

Major Street Plan. ~~A map of the City of Alpine~~The most recently adopted "Alpine City Transportation Master Plan Map" which shows existing public streets and which has been officially adopted by the Planning Commission and City Council as the Major Street Plan.

Off-street Parking Space. An area adjoining a building providing for the parking of automobiles which does not include a public street but has convenient access to it.

Off-site. Of or pertaining to land, area or facilities not located within the boundaries of a final plat of a subdivision.

On-site. Of or pertaining to land, area or facilities located within the boundaries of a final plat of a subdivision.

Permanent Monument. Any structure of concrete, masonry and/or metal permanently placed on or in the ground, including those expressly placed for surveying reference, which meets the requirements of the local jurisdiction for permanent monuments.

Site Plan. A plot of a lot, drawn to scale, showing its actual measurements, the size and location of any existing buildings or buildings to be erected, the location of the lot in relation to abutting streets, north point, scale, utility easements, vehicle access, and such other information as may be required by the Planning Commission.

Streets, Roads, and Highways.

1. Street, Arterial. A street, existing or proposed, which serves or is intended to serve as a major traffic way, and is designated an arterial street on the Major Street Plan.
2. Street, Collector. A street, existing or proposed, of considerable continuity, which is the main means of access to arterial streets, and is designated a collector street on the Major Street Plan.
3. Street, Cul-de-sac. A street which is designed to remain permanently closed at one end with the closed end terminated by a vehicular turnaround. For purposes of these regulations, the length of a cul-de-sac street shall be measured from center of turn-around to the point of connection to the next intersection street. (DCA 4.07.040 Part 9, Subdivision Ordinance)
4. Street, Frontage, or Frontage Road. A minor street or road which is parallel to and adjacent to a limited access major street and which provides access to abutting properties and protection from through traffic.
5. Street, Minor. A street, existing or proposed, which is supplementary to a collector street and of limited continuity, which serves or is intended to serve the local needs of a neighborhood and to give access to abutting properties.
6. Street, Partial, Width. A street parallel and contiguous to a property line and of lesser right-of-way width than will eventually be required; the additional needed right-of-way width to be obtained in the future from the abutting property owner prior to development as frontage.
7. Street, Public. A thoroughfare which has been dedicated or abandoned to the public and accepted by proper public authority.
8. Street Right-of-Way. That portion of land dedicated to public use for street and utility purposes.
9. Street, Stub. A street or road extending from within a subdivision boundary and terminating there; with no permanent vehicular turnaround. Stub streets are provided to permit adjacent undeveloped parcels of land to be developed later by continuing the stub street to the extended connecting street system.

Structure. Anything constructed, the use of which requires fixed location on the ground, or attachment to something having a fixed location upon the ground, includes "building."

Subdivider. Any person, firm, corporation, partnership or association who causes land to be divided into two or more parcels of land for himself or others.

Subdivision. Subdivision means any land that is divided, re-subdivided, or proposed to be divided into two (2) or more lots, parcels, sites, units, plots or other division of land for the purpose, whether immediate or future, for offer, sale, lease or development either on the installment plan or upon any and all other plans, terms and conditions. The term "Subdivision includes:

1. The division or development of land whether by deed, metes and bounds description, devise and testacy, lease map, plat or other recorded instrument; and
2. Divisions of land for all residential and nonresidential uses, including land used or to be used for commercial, agricultural and industrial purposes.

Vicinity Map (Location Map). A map or drawing showing where a subdivision, or proposed subdivision is located.

(Ord. 98-19 amending Ord. 78-03)

SECTION 2: **AMENDMENT** "4.07.040 Streets And Street Requirements" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

4.07.040 Streets And Street Requirements

1. Subdivision plans shall be consistent with the Major Street Plan, which has been adopted as part of the Transportation and Circulation element of the General Plan of the City.
    a. Collector Streets (feeder). Where the area of a proposed subdivision includes any Collector class streets, as shown on the Major Street Plan, the subdivision plan shall incorporate such streets in the location shown on the Major Street Plan, and the approval of the Final Plat shall include the dedication of the right- of-way and its improvement in accordance with the applicable City standards.
    b. Minor Streets (local service). Where the area of a proposed subdivision includes any Minor class streets, as shown on the Major Street Plan, the subdivision plan shall provide for such street in the approximate location shown on the Major Street Plan, and the approval of the Final Plat shall include the dedication of the right-of-way and its improvement in accordance with the applicable City standards.
    c. Arterial Streets. Where the area of a proposed subdivision includes any arterial class streets, as shown on the Major Street Plan, the subdivision plan shall incorporate such streets in the location shown on the Major Street Plan, and the approval of the Final Plat shall include the dedication of the right-of-way and its improvement in accordance with the applicable City standards.
2. **Through Traffi**c. Minor streets shall be laid out to encourage circulation but discourage through traffic. Subdivisions with 20 or more lots shall provide two working accesses to the development.
3. **Stub Streets** (Amended by Ord. 96-08, 5/28/96; Amended by Ord. 2013-01, 1/15/13). Shall be required to provide adequate circulation – Temporary turnaround required in certain instances--Subsequent development of adjacent property to incorporate.
    a. In order to facilitate the development of an adequate and convenient circulation system within the City, and to provide access for the logical development of adjacent vacant properties, the City shall, as a condition of approval, require the subdivision plan to include one or more temporary dead

end streets (stub streets) which extend to the boundary of the parcel, and dedicate the right-of-way to the property line to the City to insure that adjacent properties are not landlocked.

b. All such stub streets shall be fully developed with full City street and utility improvements to the boundary of the subdivision unless it can be shown by the applicant for the subdivision that the need for a fully improved street does not have an essential link to a legitimate government interest or that the requirement to fully improve the stub street is not roughly proportionate, both in nature and extent to the impact of the proposed subdivision on the City.

c. Factors to be considered in determining whether or not the requirement to install a fully improved street is considered proportionate may include but not be limited to:

    i. The estimated cost to improve the stub street;
    ii. Whether or not the stub street will be essential to provide reasonable access to the undeveloped parcel;
    iii. The number of lots in the proposed subdivision that will be accessed from the improved stub street;
    iv. The estimated number of lots that can be developed in the future on the adjacent undeveloped parcel through use of the stub street.

    After receiving a recommendation by the Planning Commission, if the City Council determines that the stub street need not be fully developed either because it does not further a legitimate government interest or that the requirement is disproportionate to the impact of the proposed subdivision on the City, then only the right-of-way for the stub street shall be dedicated to the City and the requirement to improve the stub street shall be placed on the undeveloped adjacent parcel as a condition of the development if the adjacent property is ever developed.

d. Any such stub street having a length of more than 150 feet or providing primary vehicular access to one or more lots shall be terminated by an improved temporary turn-around designed and constructed in accordance with the City Standards. Where any portion of the temporary turn-around is to be located on private property, use of the portion located on private property by the public shall be secured through the conveyance of an easement for that purpose.

e. Any plan for the subsequent development of the adjacent property shall provide for the continuation of any such stub street and shall bear the burden of designing such stub street or streets in accordance with City standards.

4. **Intersections**. Intersections of minor streets with major streets shall be kept to the minimum.

5. **Right-of-Way Width**. Minimum right-of-way widths for local streets shall be the following:

    a. Major arterial street: 83 feet
    b. Minor arterial street: 66 feet

c. Collector street: 60 feet
d. Minor street, rural road, secondary access, or frontage road: 54 feet

6. **Roadway Width**. Local streets shall have roadway widths and classifications as follows (add four feet [4'] for curb where required):
    a. Major arterial street: 58 feet, paved
    b. Minor arterial street: 42 feet, paved
    c. Collector street: 36 feet, paved
    d. Minor street or frontage road: 30 feet, paved
    e. (Rural roads: 26 feet, paved) - Requires a recommendation by the Planning Commission and approval by the City Council through the Subdivision exception procedure.
    f. Secondary Access: At least the minimum width and improvements required by the Utah State Fire Code, or its successor code, for emergency access along with such other improvements such as surface type, curb and gutter, and gating at the discretion of the City Council and upon recommendation of the Planning Commission and City Engineer approval.
7. **Road Shoulders**. Where curbs are not required to be installed, a minimum of ten foot shoulders shall be provided on each side of the street unless parking is prohibited.
8. **Partial-Width Streets**. All streets within and adjacent to a subdivision shall either have been previously conveyed to the City by deed or dedication or shall be shown on the final plat for dedication to the City for street purposes.

    All streets shown on the final plat for dedication to the City shall conform to the minimum standards for street width and improvements for the entire width of the street, except that the City Council may accept the dedication and improvement of partial width streets provided:
    a. That the proposed partial width street is located at the border of the subdivision and the land abutting the proposed uncompleted side of the street is not owned by the subdivider.
    b. The width of the right-of-way of the partial width street shall be not less than thirty- nine (39) feet in the instance of a minor class street and forty-two (42) feet in the instance of a collector class street.
    c. Upon approval of the City Council the improvements constructed on the partial width street may include: (a) the curb, gutter and sidewalk improvements adjacent to all abutting lots in the subdivision, (b) the water and sewer line, (c) a hard surfaced travelway portion having a width not less than one/half that required for the specified street class plus an additional twelve (12) feet of width, (d) all utility systems in the partial width street shall be located and constructed as set forth in City standards, and (e) storm drains.
    d. That there are no existing conditions which would have the effect of preventing the subsequent development of the remaining portion of the street.
    e. That construction of the partial width street at the proposed location will not create an unsafe or hazardous condition.

        No final plat shall be approved where access to a proposed or existing street

from adjacent property is proposed to be prohibited or is impaired by an access retainer strip ("nuisance" or "protective" strip).

9. **Cul-de-sac Streets**.(Ord 96-08 amended 5/28/96) Cul-de-sacs (dead end streets) shall be used only where unusual conditions exist which make other designs undesirable. Each cul-de-sac street shall have a minimum right-of-way width of fifty-four (54) feet and must be terminated by a turn-around having a radius of not less than sixty (60) feet to the property line. The maximum length of a cul-de-sac shall be four hundred and fifty (450) feet as measured from the center of the turn-around to the point of connection to the next intersecting street. Surface water must drain away from the turn-around, except where surface water cannot be drained away from the turn-around along the street, due to grade, necessary catch basins and drainage easements shall be provided.
10. **Number of Streets at Intersection**. No more than four streets shall enter an intersection.
11. **Angle of Street Intersections**. Streets shall intersect at ninety degrees, except where otherwise recommended as necessary by the Planning Commission and approved by the City Council. The minimum radius of property lines and back of curb at intersections shall be fifteen (15) feet and twenty-five (25) feet respectively
12. **Centerline of Intersecting Streets**. The centerline of two subordinate streets meeting a through street from opposite sides shall extend as a continuous line, or the centerline shall be offset at least one hundred fifty (150') feet. An exception may be given to the off-set requirement of up to 15 feet as recommended by the City Engineer and Planning Commission and approved by the City Council. (Amended by Ord. 2004-13, 9/28/04)
13. **Curved Streets Preferred**. In the design of subdivisions, curving streets shall be preferred to straight streets or rigid ninety degree grid systems.
14. **Frontage on Arterial Streets**. Driveways or other vehicular accesses to an individual lot that open onto any public street designated by the official City Street Plan as an arterial street may be used as an access if it is recommended by the City Engineer and Planning Commission and approved by the City Council. Turn-arounds, hammerhead or side-entry driveways must be incorporated to ensure that vehicles will not back out on arterial streets. (Amended by Ord. 2004-13, 9/28/04)
15. **Wildland Urban Interface**.
    a. Access. All developments in the Wildland Urban Interface area shall have more than one access route which provides simultaneous access for emergency equipment and civilian evacuation. The design of access routes shall take into consideration traffic circulation and provide for looping of roads as required to ensure at least two access points. Looped roads with a single access are not allowed.
    b. Exceptions. Where terrain features or other physical obstacles make provision of a second access impractical, a single access may be approved by the City Council after obtaining the recommendation of the Fire Chief and the Planning Commission.
    c. Specifications. All secondary access roads shall have a minimum all weather

surface width of not less than 20 feet and an unobstructed vertical clearance of not less than 13 feet 6 inches to permit two-way traffic. These provisions will apply in lieu of those provided in Section 503 of the International Fire Code.

16. **Intermunicipal Street Connections.** There shall be no new street connections to municipalities outside of Alpine City unless the connection is existing or planned as shown on the Transportation Master Plan.

(Ord. 98-19 amending Ord. 78-03)
(Amended by Ord. 2014-12, 7/08/14; Ord. 2016-03, 02/23/16)

PASSED AND ADOPTED BY THE ALPINE CITY COUNCIL
_____.

	AYE	**NAY**	**ABSENT**	**ABSTAIN**
Lon Lott	_____	_____	_____	_____
Gregory Gordon	_____	_____	_____	_____
Jason Thelin	_____	_____	_____	_____
Jessica Smuin	_____	_____	_____	_____
Kelli Law	_____	_____	_____	_____

Presiding Officer

Attest

_____
Carla Merrill, Mayor, Alpine City

_____
Bonnie Cooper, City Recorder Alpine City

ALPINE PLANNING COMMISSION AGENDA

SUBJECT: **Public Hearing – Ordinance 2022-03 Accessory Structures and Swimming Pools**

FOR CONSIDERATION ON: **15 February 2022**

PETITIONER: **Staff**

ACTION REQUESTED BY PETITIONER: **Approve amendments to the language regarding setbacks for accessory structures and swimming pools.**

BACKGROUND INFORMATION:
The City's setbacks standards are divided into two separate categories, main buildings, and accessory buildings. Main buildings include homes, office buildings and barns. Accessory buildings include all other structures and building types. However, the code is not clear on how setbacks apply to structures that might not be defined as a building. For example, swimming pools, water slides, diving platforms, waterfalls, pergolas, etc. do not necessarily meet the definition of a building but they should still be regulated by setback standards.

Staff is recommending changes to the Development Code to make it more clear how setbacks apply to swimming pools and accessory structures. Please see attached proposed ordinance for recommended changes.

STAFF RECOMMENDATION:
Hold a public hearing and make a recommendation to the City Council.

SAMPLE MOTION TO APPROVE:
I move to recommend that Ordinance 2022-03 be adopted as proposed.

SAMPLE MOTION TO APPROVE WITH CONDITIONS:
I move to recommend that Ordinance 2022-03 be adopted with the following conditions:

- ***Insert Finding***

SAMPLE MOTION TO TABLE/DENY:
I move to recommend that Ordinance 2022-03 be tabled (or denied) based on the following:

- ***Insert Finding***

ALPINE CITY
ORDINANCE 2022-03

AN ORDINANCE ADOPTING AMENDMENTS TO ARTICLE 3.02.050, 3.03.050, 3.04.050, 3.05.050, AND 3.06.040 OF THE ALPINE CITY DEVELOPMENT CODE PERTAINING TO SETBACK REQUIREMENTS FOR ACCESSORY STRUCTURES AND SWIMMING POOLS.

WHEREAS, The Planning Commission held a public hearing on February 15, 2022, regarding proposed amendments to Article 3.02.050, 3.03.050, 3.04.050, 3.05.050, AND 3.06.040 of the Development Code; and

WHEREAS, on February 22, 2022, the Alpine City Council has deemed it in the best interest of Alpine City to amend the Development Code; and

WHEREAS, the Alpine City Planning Commission has reviewed the proposed Amendments to the Development Code, held a public hearing, and has forwarded a recommendation to the City Council; and

WHEREAS, the Alpine City Council has reviewed the proposed Amendments to the Development Code:

NOW THEREFORE, be it ordained by the Council of the Alpine City, in the State of Utah, as follows: The amendments to Article 3.02.050, 3.03.050, 3.04.050, 3.05.050, AND 3.06.040 will supersede Article 3.02.050, 3.03.050, 3.04.050, 3.05.050, AND 3.06.040 as previously adopted. This ordinance shall take effect upon posting.

SECTION 1: **AMENDMENT** "3.02.050 Setback Requirements (See Appendix For Drawing)" of the Alpine City Development Code is hereby *amended* as follows:

A M E N D M E N T

3.02.050 Setback Requirements (See Appendix For Drawing)

1. **Dwellings and Other Main Buildings**
    a. Front Yard. The minimum front yard for all main dwelling structures shall be thirty (30) feet (measured from the front property line).
    b. Side Yard Interior Lots. All dwellings shall be situated on the lot to allow for a side yard on each side of the main building the aggregate widths of which shall be at least twenty-two (22) feet. Neither side yard shall be less than ten (10) feet wide.
    c. Side Yard Corner Lots. On corner lots, the front and side yard requirements shall be the same as above, except that the side set back from the street for all

buildings shall not be less than thirty (30) feet.

d. Rear Yard Interior Lots. All main dwelling structures shall be set back from the rear property line a distance not less than twenty (20) feet.
e. Rear Yard Corner Lots. All main dwelling structures shall be set back from the rear property line a distance of twenty (20) feet.

2. ~~**Accessory Buildings**. All accessory buildings require a building permit and shall be located in accordance with the following:~~ **Customary Residential Accessory Structures**. All Customary Residential Accessory Structures (henceforth referred to as Accessory Structures) shall be located in accordance with the setbacks and regulations outlined below. Accessory Structures that also meet the classification of Accessory Building shall require a building permit. Swimming pools have separate location requirements (see item 3).
(Amended by Ord. No. 2006-14, 9/12/06; Ord. No. 2010-03, 8/24/10)
   a. Setback from main building. Accessory ~~buildings~~ Structures shall be set back not less than five (5) feet from the main building. Additionally, ~~a~~Accessory ~~b~~Buildings which are located twelve (12) feet or closer to a main building and are attached to the main building by a common roof or wall shall be considered as part of the main building and shall meet the same setbacks as the main building.
   b. Side Setback - Corner Lot, Side Abutting a Street. Accessory ~~buildings~~ Structures shall be set back not less than forty (40) feet from the side lot line which abuts on a street.
   c. Front Setback. Accessory ~~buildings~~ Structures shall be set back not less than forty (40) feet from the front property line.
   d. Side and Rear Setback - Interior Lot Line. Accessory ~~buildings~~ Structures shall be set back no less than ten (10) feet from the rear lot line and five (5) feet from the side lot line, except that a two (2) foot minimum rear or side setback shall be required when all the following conditions are met:
      i. The ~~a~~Accessory ~~building~~ Structure is located more than twelve (12) feet from an existing dwelling on the same or adjacent lot;
      ii. If ~~T~~the ~~a~~Accessory ~~building~~ Structure is an Accessory Building. it shall contain~~s~~ no openings on the side contiguous to the lot line;
      iii. No drainage from the roof will be discharged onto an adjacent lot;
      iv. The ~~a~~Accessory ~~building~~ Structure shall be constructed of non-combustive materials or have fire resistive walls rated at one (1) hour or more;
      v. The ~~building~~ Accessory Structure will not be placed on land designated as a recorded easement, such as a utility or trail easement, unless the owner(s) of said easement agree(s) to allow the encroachment. Documentation of the agreement shall be provided to the City
      ;
         (1) When utilities are present in an easement, the ~~building~~ Accessory Structure shall not be permanently attached to the

ground and can be moved or relocated within 24 hours. Fines shall be issued for buildings that cannot be moved within 24 hours.

(2) The owner acknowledges that they bear all costs of moving ~~a~~the ~~building~~Accessory Structure, including damage to the property, in the event an easement needs to be accessed.

vi. The ~~building~~ Accessory Structure will not be taller than twelve (12) feet six (6) inches to the top of the roof line;

vii. If the Accessory Structure is an Accessory Building, it ~~The building~~ will not exceed 200 square feet in size;

viii. The City Council may grant additional exceptions to the above conditions if the ~~a~~Accessory ~~building~~ Structure will be located adjacent to a non-residential property; and

ix. No minimum rear or side setback shall be required if the building will not be taller than ten (10) feet to the top of the roof line.

3. **Swimming Pools**. All swimming pools require a building permit and shall be located in accordance with the setbacks outlined below. Swimming pools shall not be permitted in a recorded easement. Setbacks are measured from the wall of the pool to the property line.
    a. Front Setback. Swimming pools shall be set back not less than forty (40) feet from the front property line.
    b. Side Setback – Corner Lot, Side Abutting a Street. Accessory buildings shall be set back not less than ten (10) feet from the side lot line which abuts on a street.
    c. Side and Rear Setback - Interior Lot Line. Swimming pools shall be set back not less than ten (10) feet from a side or rear lot line.

(Ord. 2015-02, 02/10/15)

SECTION 2: **AMENDMENT** "3.03.050 Setback Requirements (See Appendix For Drawing)" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.03.050 Setback Requirements (See Appendix For Drawing)

1. **Dwellings and other Main Buildings**. All dwellings and other main buildings shall be setback from the lot boundary lines as follows:
    a. Front Yard. The minimum front yard for all main dwelling structures shall be thirty (30) feet (measured from the front property line).

b. Side Yard - Interior Lots. For single-unit detached dwellings, main buildings shall be situated on the lot to allow for a side yard on each side of the main building the aggregate width of which shall be at least thirty (30) feet. Neither side yard shall be less than twelve (12) feet.
c. Side Yard - Corner Lots. On corner lots, the front, rear and side yard requirements shall be the same as above, except that the set back on any side that faces onto a public street shall be not less than thirty (30) feet.
d. Rear Yard - Interior Lots. All main dwelling structures shall be set back from the rear property line a distance of not less than thirty (30) feet.
e. Rear Yard - Corner Lots. Rear yard set back for dwellings on corner lots shall be the same as that required for interior lots.

2. ~~**Accessory Buildings**. All accessory buildings require a building permit and shall be located in accordance with the following:~~**Customary Residential Accessory Structures**. All Customary Residential Accessory Structures (henceforth referred to as Accessory Structures) shall be located in accordance with the setbacks and regulations outlined below. Accessory Structures that also meet the classification of Accessory Building shall require a building permit. Swimming pools have separate location requirements (see item 3).
(Amended by Ord. No. 2006-14, 9/12/06; Ord. No. 2010-03, 8/24/10)
   a. Setback from Main Building. Accessory ~~buildings~~ Structures shall be set back not less than five (5) feet from the main building.
   Additionally, ~~a~~Accessory ~~b~~Buildings which are located twelve (12) feet or closer to a main building and are attached to the main building by a common roof or wall shall be considered as part of the main building and shall meet the same setbacks as the main building.
   b. Side Setback - Corner Lot, Side Abutting a Street. Accessory ~~buildings~~ Structures shall be set back not less than forty (40) feet from the side lot line which abuts on a street.
   c. Front Setback. Accessory ~~buildings~~ Structures shall be set back not less than forty (40) feet from the front property line.
   d. Side and Rear Setback - Interior Lot Line. Accessory ~~buildings~~Structures shall be set back not less than fifteen (15) feet from the rear lot line and ten (10) feet from the side lot line, except that a two (2) foot minimum rear or side setback shall be required when all the following conditions are met:
      i. The ~~a~~Accessory building is located more than twelve (12) feet from an existing dwelling on the same or adjacent lot;
      ii. ~~T~~If the ~~a~~Accessory ~~building~~ Structure is an Accessory Building, it shall contain~~s~~ no openings on the side contiguous to the lot line;
      iii. No drainage from the roof will be discharged onto an adjacent lot;
      iv. The ~~a~~Accessory ~~building~~ Structure shall be constructed of non-combustive materials or have fire resistive walls rated at one (1) hour or more;
      v. The ~~building~~ Accessory Structure will not be placed on land designated as a recorded easement, such as a utility or trail easement, unless the owner(s) of said easement agree(s) to allow the

encroachment. Documentation of the agreement shall be provided to the City
;

(1) When utilities are present in an easement, the ~~building~~ Accessory Structure shall not be permanently attached to the ground and can be moved or relocated within 24 hours. Fines shall be issued for buildings that cannot be moved within 24 hours.

(2) The owner acknowledges that they bear all costs of moving ~~a~~the~~building~~Accessory Structure, including damage to the property, in the event an easement needs to be accessed.

vi. The ~~building~~ Accessory Structure will not be taller than twelve (12) feet six (6) inches to the top of the roof line;

vii. If the Accessory Structure is an Accessory Building, it~~The building~~ will not exceed 200 square feet in size;

viii. The City Council may grant additional exceptions to the above conditions if the ~~a~~Accessory ~~building~~ Structure will be located adjacent to a non-residential property; and

ix. No minimum rear or side setback shall be required if the building will not be taller than ten (10) feet to the top of the roof line.

3. **Swimming Pools**. All swimming pools require a building permit and shall be located in accordance with the setbacks outlined below. Swimming pools shall not be permitted in a recorded easement. Setbacks are measured from the wall of the pool to the property line.

a. Front Setback. Swimming pools shall be set back not less than forty (40) feet from the front property line.

b. Side Setback – Corner Lot, Side Abutting a Street. Accessory buildings shall be set back not less than ten (10) feet from the side lot line which abuts on a street.

c. Side and Rear Setback - Interior Lot Line. Swimming pools shall be set back not less than ten (10) feet from a side or rear lot line.

(Ord. 95-24, 11/14/95; Ord. 2014-11, 6/24/14)

SECTION 3: **AMENDMENT** "3.04.050 Setback Requirements (See Appendix For Drawing)" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.04.050 Setback Requirements (See Appendix For Drawing)

1. **Dwellings and other Main Buildings** (Ord. 97-02, 2/25/97). All dwellings and other main buildings shall be setback from the lot boundary lines as follows:
    a. Front Yard. The minimum front yard for all main dwelling structures shall be thirty (30) feet (measured from the front property line).
    b. Side Yard - Interior Lots. For single-unit detached dwellings, main buildings shall be situated on the lot to allow for a side yard on each side of the main building the aggregate width of which shall be at least thirty (30) feet. Neither side yard shall be less that twelve (12) feet.
    c. Side Yard - Corner Lots. On corner lots, the front, rear and side yard requirements shall be the same as above, except that the set back on any side that faces onto a public street shall be not less than thirty (30) feet.
    d. Rear Yard - Interior Lots. All main dwelling structures shall be set back from the rear property line a distance of not less than thirty (30) feet.
    e. Rear Yard - Corner Lots. Rear yard set back for dwellings on corner lots shall be the same as that required for interior lots.
2. ~~**Accessory Buildings**. All accessory buildings require a building permit and shall be located in accordance with the following:~~**Customary Residential Accessory Structures**. All Customary Residential Accessory Structures (henceforth referred to as Accessory Structures) shall be located in accordance with the setbacks and regulations outlined below. Accessory Structures that also meet the classification of Accessory Building shall require a building permit. Swimming pools have separate location requirements (see item 3).
   (Amended by Ord. 2006-14, 9/12/06; Ord. No. 2010-03, 8/24/10)
    a. Setback from Main Building. Accessory ~~buildings~~ Structures shall be set back not less than five (5) feet from the main building.
    Additionally, ~~a~~Accessory ~~b~~Buildings which are located twelve (12) feet or closer to a main building and are attached to the main building by a common roof or wall shall be considered as part of the main building and shall meet the same setbacks as the main building.
    b. Side Setback - Corner Lot, Side Abutting a Street. Accessory ~~buildings~~ Structures shall be set back not less than forty (40) feet from the side lot line which abuts on a street.
    c. Front Setback. Accessory ~~buildings~~ Structures shall be set back not less than forty (40) feet from the front property line.
    d. Side and Rear Setback - Interior Lot Line. Accessory ~~buildings~~ Structures shall be set back not less than fifteen (15) feet from the rear lot line and ten (10) feet from the side lot line, except that a two (2) foot minimum rear or side setback shall be required when all the following conditions are met:
        i. The ~~a~~Accessory ~~building~~ Structure is located more than twelve (12) feet from an existing dwelling on the same or adjacent lot;
        ii. If ~~T~~the ~~a~~Accessory ~~building~~ Structure is an Accessory Building, it shall contain~~s~~ no openings on the side contiguous to the lot line;
        iii. No drainage from the roof will be discharged onto an adjacent lot;
        iv. The ~~a~~Accessory ~~building~~ Structure shall be constructed of non-combustive materials or have fire resistive walls rated at one (1) hour

or more;

v. The ~~building~~ Accessory Structure will not be placed on land designated as a recorded easement, such as a utility or trail easement , unless the owner(s) of said easement agree(s) to allow the encroachment. Documentation of the agreement shall be provided to the City;
   (1) When utilities are present in an ~~easement~~Accessory Structure, the building shall not be permanently attached to the ground and can be moved or relocated within 24 hours. Fines shall be issued for buildings that cannot be moved within 24 hours.
   (2) The owner acknowledges that they bear all costs of moving ~~a~~the~~building~~ Accessory Structure, including damage to the property, in the event an easement needs to be accessed.

vi. The ~~building~~ Accessory Structure will not be taller than twelve (12) feet six (6) inches to the top of the roof line;

vii. ~~The building~~If the Accessory Structure is an Accessory Building, it will not exceed 200 square feet in size;

viii. The City Council may grant additional exceptions to the above conditions if the ~~a~~Accessory ~~building~~ Structure will be located adjacent to a non-residential property; and

ix. No minimum rear or side setback shall be required if the building will not be taller than ten (10) feet to the top of the roof line.

3. **Swimming Pools**. All swimming pools require a building permit and shall be located in accordance with the setbacks outlined below. Swimming pools shall not be permitted in a recorded easement. Setbacks are measured from the wall of the pool to the property line.
   a. Front Setback. Swimming pools shall be set back not less than forty (40) feet from the front property line.
   b. Side Setback – Corner Lot, Side Abutting a Street. Accessory buildings shall be set back not less than ten (10) feet from the side lot line which abuts on a street.
   c. Side and Rear Setback - Interior Lot Line. Swimming pools shall be set back not less than ten (10) feet from a side or rear lot line.

(CR-1 Created by Ord. 91-01, 4/9/91 and amended by Ord. 95-04, 2/3/95; Ord. 2014-11, 6/24/14)

SECTION 4: **AMENDMENT** "3.05.050 Setback Requirements (See Appendix For Drawing)" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.05.050 Setback Requirements (See Appendix For Drawing)

Same as required within the CR-40,000 Country Residential Zone or as set forth on the final plat of the Planned Residential development, as applicable.

1. **Dwellings and other Main Buildings** (Ord. 97-02, 2/25/97). All dwellings and other main buildings shall be setback from the lot boundary lines as follows:
    a. Front Yard. The minimum front yard for all main dwelling structures shall be thirty (30) feet (measured from the front property line).
    b. Side Yard - Interior Lots. For single-unit detached dwellings, main buildings shall be situated on the lot to allow for a side yard on each side of the main building the aggregate width of which shall be at least thirty (30) feet. Neither side yard shall be less that twelve (12) feet.
    c. Side Yard - Corner Lots. On corner lots, the front, rear and side yard requirements shall be the same as above, except that the set back on any side that faces onto a public street shall be not less than thirty (30) feet.
    d. Rear Yard - Interior Lots. All main dwelling structures shall be set back from the rear property line a distance of not less than thirty (30) feet.
    e. Rear Yard - Corner Lots. Rear yard set back for dwellings on corner lots shall be the same as that required for interior lots.
2. ~~**Accessory Buildings**~~**Customary Residential Accessory Structures.** All Customary Residential Accessory Structures (henceforth referred to as Accessory Structures) shall be located in accordance with the setbacks and regulations outlined below. Accessory Structures that also meet the classification of Accessory Building shall require a building permit. Swimming pools have separate location requirements (see item 3). (Amended by Ord. 2006-14, 9/12/06; Ord. No. 2010-03, 8/24/10) ~~All accessory buildings require a buildng permit and shall be located in accordance with the following:~~
    a. Setback from Main Building. Accessory ~~buildings~~ Structures shall be set back not less than five (5) feet from the main building.
    Additionally, ~~a~~Accessory ~~b~~Buildings which are located twelve (12) feet or closer to a main building and are attached to the main building by a common roof or wall shall be considered as part of the main building and shall meet the same setbacks as the main building.
    b. Side Setback- Corner Lot, Side Abutting a Street. Accessory ~~buildings~~ Structures shall be set back not less than forty (40) feet from the side lot line which abuts on a street.
    c. Front Setback. Accessory ~~buildings~~ Structures shall not be set back less than forty (40) feet from the front property line.
    d. Side and Rear Setback - Interior Lot Line. Accessory ~~buildings~~ Structures shall be set back not less than fifteen (15) feet from the rear lot line and ten (10) feet from the side lot line, except that a two (2) foot minimum rear or side setback shall be required when all the following conditions are met:

i. The ~~a~~Accessory ~~building~~ Structure is located more than twelve (12) feet from an existing dwelling on the same or adjacent lot;
ii. The ~~a~~Accessory ~~building~~ Structure contains no openings on the side contiguous to the lot line;
iii. No drainage from the roof will be discharged onto an adjacent lot;
iv. The ~~a~~Accessory ~~building~~ Structure shall be constructed of non-combustive materials or have fire resistive walls rated at one (1) hour or more;
v. The ~~building~~ Accessory Structure will not be placed on land designated as a recorded easement, such as a utility or trail easement, unless the owner(s) of said easement agree(s) to allow the encroachment. Documentation of the agreement shall be provided to the City;
    (1) When utilities are present in an easement, the ~~building~~ Accessory Structure shall not be permanently attached to the ground and can be moved or relocated within 24 hours. Fines shall be issued for buildings that cannot be moved within 24 hours.
    (2) The owner acknowledges that they bear all costs of moving ~~a~~the~~building~~Accessory Structure, including damage to the property, in the event an easement needs to be accessed.
vi. The ~~building~~ Accessory Structure will not be taller than twelve (12) feet six (6) inches to the top of the roof line;
vii. If the Accessory Structure is an Accessory Building, it ~~The building~~ will not exceed 200 square feet in size;
viii. The City Council may grant additional exceptions to the above conditions if the ~~a~~Accessory ~~building~~ Structure will be located adjacent to a non-residential property; and
ix. No minimum rear or side setback shall be required if the building will not be taller than ten (10) feet to the top of the roof line.

3. **Swimming Pools**. All swimming pools require a building permit and shall be located in accordance with the setbacks outlined below. Swimming pools shall not be permitted in a recorded easement. Setbacks are measured from the wall of the pool to the property line.
    a. Front Setback. Swimming pools shall be set back not less than forty (40) feet from the front property line.
    b. Side Setback – Corner Lot, Side Abutting a Street. Accessory buildings shall be set back not less than ten (10) feet from the side lot line which abuts on a street.
    c. Side and Rear Setback - Interior Lot Line. Swimming pools shall be set back not less than ten (10) feet from a side or rear lot line.

(Ord. 95-28, 11/28/95)

SECTION 5: **AMENDMENT** "3.06.040 Setback Requirements (See Appendix For Drawing)" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.06.040 Setback Requirements (See Appendix For Drawing)

1. **Dwellings and other Main Buildings** (Ord. 97-02, 2/25/97). All dwellings and other main buildings shall be setback from the lot boundary lines as follows:
    a. Front Yard. The minimum front yard for all main dwelling structures shall be thirty (30) feet (measured from the front property line).
    b. Side Yard - Interior Lots. For single-unit detached dwellings, main buildings shall be situated on the lot to allow for a side yard on each side of the main building the aggregate width of which shall be at least thirty (30) feet. Neither side yard shall be less than twelve (12) feet.
    c. Side Yard - Corner Lots. On corner lots, the front, rear and side yard requirements shall be the same as above, except that the set back on any side that faces onto a public street shall be not less than thirty (30) feet.
    d. Rear Yard - Interior Lots. All main dwelling structures shall be set back from the rear property line a distance of not less than thirty (30) feet.
    e. Rear Yard - Corner Lots. Rear yard set back for dwellings on corner lots shall be the same as that required for interior lots.
2. ~~**Accessory Buildings**~~**Customary Residential Accessory Structures.** (Amended by Ord. 2006-14, 9/12/06; Ord. No. 2010-03, 8/24/10). ~~All accessory buildings require a building permit and shall be located in accordance with the following:~~All Customary Residential Accessory Structures (henceforth referred to as Accessory Structures) shall be located in accordance with the setbacks and regulations outlined below. Accessory Structures that also meet the classification of Accessory Building shall require a building permit. Swimming pools have separate location requirements (see item 3).
    a. Setback from Main Building. Accessory ~~buildings~~ Structures shall be set back not less than five (5) feet from the main building.
    Additionally, ~~a~~Accessory ~~b~~Buildings which are located twelve (12) feet or closer to a main building and are attached to the main building by a common roof or wall shall be considered as part of the main building and shall meet the same setbacks as the main building.
    b. Side Setback - Corner Lot, Side Abutting a Street. Accessory ~~buildings~~ Structures shall be set back not less than forty (40) feet from the side lot line which abuts on a street.
    c. Front Setback. Accessory ~~buildings~~ Structures shall be set back not less than forty (40) feet from the front property line.
    d. Side and Rear Setback - Interior Lot Line. Accessory ~~buildings~~ Structures shall be set back not less than fifteen (15) feet from the rear lot line and ten

(10) feet from the side lot line, except that a two (2) foot minimum rear or side setback shall be required when all the following conditions are met:

i. The ~~a~~Accessory ~~building~~ Structure is located more than twelve (12) feet from an existing dwelling on the same or adjacent lot;

ii. The ~~a~~Accessory ~~building~~ Structure contains no openings on the side contiguous to the lot line;

iii. No drainage from the roof will be discharged onto an adjacent lot;

iv. The ~~a~~Accessory ~~building~~ Structure shall be constructed of non-combustive materials or have fire resistive walls rated at one (1) hour or more;

v. The ~~building~~ Accessory Structure will not be placed on land designated as a recorded easement, such as a utility or trail easement, unless the owner(s) of said easement agree(s) to allow the encroachment. Documentation of the agreement shall be provided to the City;

(1) When utilities are present in an easement, the ~~building~~ Accessory Structure shall not be permanently attached to the ground and can be moved or relocated within 24 hours. Fines shall be issued for buildings that cannot be moved within 24 hours.

(2) The owner acknowledges that they bear all costs of moving ~~a building~~the Accessory Structure, including damage to the property, in the event an easement needs to be accessed.

vi. The ~~building~~ Accessory Structure will not be taller than twelve (12) feet six (6) inches to the top of the roof line;

vii. The ~~building~~ Accessory Structure will not exceed 200 square feet in size;

viii. The City Council may grant additional exceptions to the above conditions if the ~~a~~Accessory ~~building~~ Structure will be located adjacent to a non-residential property; and

ix. No minimum rear or side setback shall be required if the building will not be taller than ten (10) feet to the top of the roof line.

3. **Swimming Pools**. All swimming pools require a building permit and shall be located in accordance with the setbacks outlined below. Swimming pools shall not be permitted in a recorded easement. Setbacks are measured from the wall of the pool to the property line.

a. Front Setback. Swimming pools shall be set back not less than forty (40) feet from the front property line.

b. Side Setback – Corner Lot, Side Abutting a Street. Accessory buildings shall be set back not less than ten (10) feet from the side lot line which abuts on a street.

c. Side and Rear Setback - Interior Lot Line. Swimming pools shall be set back not less than ten (10) feet from a side or rear lot line.

(Ord. 98-23,11-24-98)

PASSED AND ADOPTED BY THE ALPINE CITY COUNCIL
_____.

	AYE	**NAY**	**ABSENT**	**ABSTAIN**
Lon Lott	_____	_____	_____	_____
Gregory Gordon	_____	_____	_____	_____
Jason Thelin	_____	_____	_____	_____
Jessica Smuin	_____	_____	_____	_____
Kelli Law	_____	_____	_____	_____

Presiding Officer

_____
Carla Merrill, Mayor, Alpine City

Attest

_____
Bonnie Cooper, City Recorder Alpine City

ALPINE CITY
ORDINANCE 2022-03

AN ORDINANCE ADOPTING AMENDMENTS TO ARTICLE 3.02.050, 3.03.050, 3.04.050, 3.05.050, AND 3.06.040 OF THE ALPINE CITY DEVELOPMENT CODE PERTAINING TO SETBACK REQUIREMENTS FOR ACCESSORY STRUCTURES AND SWIMMING POOLS.

WHEREAS, The Planning Commission held a public hearing on February 15, 2022, regarding proposed amendments to Article 3.02.050, 3.03.050, 3.04.050, 3.05.050, AND 3.06.040 of the Development Code; and

WHEREAS, on February 22, 2022, the Alpine City Council has deemed it in the best interest of Alpine City to amend the Development Code; and

WHEREAS, the Alpine City Planning Commission has reviewed the proposed Amendments to the Development Code, held a public hearing, and has forwarded a recommendation to the City Council; and

WHEREAS, the Alpine City Council has reviewed the proposed Amendments to the Development Code:

NOW THEREFORE, be it ordained by the Council of the Alpine City, in the State of Utah, as follows: The amendments to Article 3.02.050, 3.03.050, 3.04.050, 3.05.050, AND 3.06.040 will supersede Article 3.02.050, 3.03.050, 3.04.050, 3.05.050, AND 3.06.040 as previously adopted. This ordinance shall take effect upon posting.

SECTION 1: **AMENDMENT** "3.02.050 Setback Requirements (See Appendix For Drawing)" of the Alpine City Development Code is hereby *amended* as follows:

A M E N D M E N T

3.02.050 Setback Requirements (See Appendix For Drawing)

1. **Dwellings and Other Main Buildings**
    a. Front Yard. The minimum front yard for all main dwelling structures shall be thirty (30) feet (measured from the front property line).
    b. Side Yard Interior Lots. All dwellings shall be situated on the lot to allow for a side yard on each side of the main building the aggregate widths of which shall be at least twenty-two (22) feet. Neither side yard shall be less than ten (10) feet wide.
    c. Side Yard Corner Lots. On corner lots, the front and side yard requirements

shall be the same as above, except that the side set back from the street for all buildings shall not be less than thirty (30) feet.

d. Rear Yard Interior Lots. All main dwelling structures shall be set back from the rear property line a distance not less than twenty (20) feet.
e. Rear Yard Corner Lots. All main dwelling structures shall be set back from the rear property line a distance of twenty (20) feet.

2. **Customary Residential Accessory Structures**. All Customary Residential Accessory Structures (henceforth referred to as Accessory Structures) shall be located in accordance with the setbacks and regulations outlined below. Accessory Structures that also meet the classification of Accessory Building shall require a building permit. Swimming pools have separate location requirements (see item 3).
(Amended by Ord. No. 2006-14, 9/12/06; Ord. No. 2010-03, 8/24/10)
    a. Setback from main building. Accessory Structures shall be set back not less than five (5) feet from the main building. Additionally, Accessory Buildings which are located twelve (12) feet or closer to a main building and are attached to the main building by a common roof or wall shall be considered as part of the main building and shall meet the same setbacks as the main building.
    b. Side Setback - Corner Lot, Side Abutting a Street. Accessory Structures shall be set back not less than forty (40) feet from the side lot line which abuts on a street.
    c. Front Setback. Accessory Structures shall be set back not less than forty (40) feet from the front property line.
    d. Side and Rear Setback - Interior Lot Line. Accessory Structures shall be set back no less than ten (10) feet from the rear lot line and five (5) feet from the side lot line, except that a two (2) foot minimum rear or side setback shall be required when all the following conditions are met:
        i. The Accessory Structure is located more than twelve (12) feet from an existing dwelling on the same or adjacent lot;
        ii. If the Accessory Structure is an Accessory Building. it shall contain no openings on the side contiguous to the lot line;
        iii. No drainage from the roof will be discharged onto an adjacent lot;
        iv. The Accessory Structure shall be constructed of non-combustive materials or have fire resistive walls rated at one (1) hour or more;
        v. The Accessory Structure will not be placed on land designated as a recorded easement, such as a utility or trail easement, unless the owner(s) of said easement agree(s) to allow the encroachment. Documentation of the agreement shall be provided to the City ;
            (1) When utilities are present in an easement, the Accessory Structure shall not be permanently attached to the ground and can be moved or relocated within 24 hours. Fines shall be issued for buildings that cannot be moved within 24 hours.

(2) The owner acknowledges that they bear all costs of moving the Accessory buildingStructure including damage to the property, in the event an easement needs to be accessed.

vi. The Accessory Structure will not be taller than twelve (12) feet six (6) inches to the top of the roof line;
vii. If the Accessory Structure is an Accessory Building, it will not exceed 200 square feet in size;
viii. The City Council may grant additional exceptions to the above conditions if the Accessory Structure will be located adjacent to a non-residential property; and
ix. No minimum rear or side setback shall be required if the building will not be taller than ten (10) feet to the top of the roof line.

3. **Swimming Pools**. All swimming pools require a building permit and shall be located in accordance with the setbacks outlined below. Swimming pools shall not be permitted in a recorded easement. Setbacks are measured from the wall of the pool to the property line.
    a. Front Setback. Swimming pools shall be set back not less than forty (40) feet from the front property line.
    b. Side Setback – Corner Lot, Side Abutting a Street. Accessory buildings shall be set back not less than ten (10) feet from the side lot line which abuts on a street.
    c. Side and Rear Setback - Interior Lot Line. Swimming pools shall be set back not less than ten (10) feet from a side or rear lot line.

(Ord. 2015-02, 02/10/15)

SECTION 2: **AMENDMENT** "3.03.050 Setback Requirements (See Appendix For Drawing)" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.03.050 Setback Requirements (See Appendix For Drawing)

1. **Dwellings and other Main Buildings**. All dwellings and other main buildings shall be setback from the lot boundary lines as follows:
    a. Front Yard. The minimum front yard for all main dwelling structures shall be thirty (30) feet (measured from the front property line).
    b. Side Yard - Interior Lots. For single-unit detached dwellings, main buildings

shall be situated on the lot to allow for a side yard on each side of the main building the aggregate width of which shall be at least thirty (30) feet. Neither side yard shall be less than twelve (12) feet.

c. Side Yard - Corner Lots. On corner lots, the front, rear and side yard requirements shall be the same as above, except that the set back on any side that faces onto a public street shall be not less than thirty (30) feet.
d. Rear Yard - Interior Lots. All main dwelling structures shall be set back from the rear property line a distance of not less than thirty (30) feet.
e. Rear Yard - Corner Lots. Rear yard set back for dwellings on corner lots shall be the same as that required for interior lots.

2. **Customary Residential Accessory Structures**. All Customary Residential Accessory Structures (henceforth referred to as Accessory Structures) shall be located in accordance with the setbacks and regulations outlined below. Accessory Structures that also meet the classification of Accessory Building shall require a building permit. Swimming pools have separate location requirements (see item 3).
(Amended by Ord. No. 2006-14, 9/12/06; Ord. No. 2010-03, 8/24/10)
    a. Setback from Main Building. Accessory Structures shall be set back not less than five (5) feet from the main building.
    Additionally, Accessory Buildings which are located twelve (12) feet or closer to a main building and are attached to the main building by a common roof or wall shall be considered as part of the main building and shall meet the same setbacks as the main building.
    b. Side Setback - Corner Lot, Side Abutting a Street. Accessory Structures shall be set back not less than forty (40) feet from the side lot line which abuts on a street.
    c. Front Setback. Accessory Structures shall be set back not less than forty (40) feet from the front property line.
    d. Side and Rear Setback - Interior Lot Line. Accessory Structures shall be set back not less than fifteen (15) feet from the rear lot line and ten (10) feet from the side lot line, except that a two (2) foot minimum rear or side setback shall be required when all the following conditions are met:
        i. The Accessory building is located more than twelve (12) feet from an existing dwelling on the same or adjacent lot;
        ii. If the Accessory Structure is an Accessory Building, it shall contain no openings on the side contiguous to the lot line;
        iii. No drainage from the roof will be discharged onto an adjacent lot;
        iv. The Accessory Structure shall be constructed of non-combustive materials or have fire resistive walls rated at one (1) hour or more;
        v. The Accessory Structure will not be placed on land designated as a recorded easement, such as a utility or trail easement, unless the owner(s) of said easement agree(s) to allow the encroachment. Documentation of the agreement shall be provided to the City
        ;

(1) When utilities are present in an easement, the Accessory Structure shall not be permanently attached to the ground and can be moved or relocated within 24 hours. Fines shall be issued for buildings that cannot be moved within 24 hours.
(2) The owner acknowledges that they bear all costs of moving the Accessory Structure, including damage to the property, in the event an easement needs to be accessed.

vi. The Accessory Structure will not be taller than twelve (12) feet six (6) inches to the top of the roof line;
vii. If the Accessory Structure is an Accessory Building, it will not exceed 200 square feet in size;
viii. The City Council may grant additional exceptions to the above conditions if the Accessory Structure will be located adjacent to a non-residential property; and
ix. No minimum rear or side setback shall be required if the building will not be taller than ten (10) feet to the top of the roof line.

3. **Swimming** Pools. All swimming pools require a building permit and shall be located in accordance with the setbacks outlined below. Swimming pools shall not be permitted in a recorded easement. Setbacks are measured from the wall of the pool to the property line.
    a. Front Setback. Swimming pools shall be set back not less than forty (40) feet from the front property line.
    b. Side Setback – Corner Lot, Side Abutting a Street. Accessory buildings shall be set back not less than ten (10) feet from the side lot line which abuts on a street.
    c. Side and Rear Setback - Interior Lot Line. Swimming pools shall be set back not less than ten (10) feet from a side or rear lot line.

(Ord. 95-24, 11/14/95; Ord. 2014-11, 6/24/14)

SECTION 3: **<u>AMENDMENT</u>** "3.04.050 Setback Requirements (See Appendix For Drawing)" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.04.050 Setback Requirements (See Appendix For Drawing)

1. **Dwellings and other Main Buildings** (Ord. 97-02, 2/25/97). All dwellings and other main buildings shall be setback from the lot boundary lines as follows:

a. Front Yard. The minimum front yard for all main dwelling structures shall be thirty (30) feet (measured from the front property line).
b. Side Yard - Interior Lots. For single-unit detached dwellings, main buildings shall be situated on the lot to allow for a side yard on each side of the main building the aggregate width of which shall be at least thirty (30) feet. Neither side yard shall be less that twelve (12) feet.
c. Side Yard - Corner Lots. On corner lots, the front, rear and side yard requirements shall be the same as above, except that the set back on any side that faces onto a public street shall be not less than thirty (30) feet.
d. Rear Yard - Interior Lots. All main dwelling structures shall be set back from the rear property line a distance of not less than thirty (30) feet.
e. Rear Yard - Corner Lots. Rear yard set back for dwellings on corner lots shall be the same as that required for interior lots.

2. **Customary Residential Accessory Structures**. All Customary Residential Accessory Structures (henceforth referred to as Accessory Structures) shall be located in accordance with the setbacks and regulations outlined below. Accessory Structures that also meet the classification of Accessory Building shall require a building permit. Swimming pools have separate location requirements (see item 3).
(Amended by Ord. 2006-14, 9/12/06; Ord. No. 2010-03, 8/24/10)
    a. Setback from Main Building. Accessory Structures shall be set back not less than five (5) feet from the main building.
    Additionally, Accessory Buildings which are located twelve (12) feet or closer to a main building and are attached to the main building by a common roof or wall shall be considered as part of the main building and shall meet the same setbacks as the main building.
    b. Side Setback - Corner Lot, Side Abutting a Street. Accessory Structures shall be set back not less than forty (40) feet from the side lot line which abuts on a street.
    c. Front Setback. Accessory Structures shall be set back not less than forty (40) feet from the front property line.
    d. Side and Rear Setback - Interior Lot Line. Accessory Structures shall be set back not less than fifteen (15) feet from the rear lot line and ten (10) feet from the side lot line, except that a two (2) foot minimum rear or side setback shall be required when all the following conditions are met:
        i. The Accessory Structure is located more than twelve (12) feet from an existing dwelling on the same or adjacent lot;
        ii. If the Accessory Structure is an Accessory Building, it shall contain no openings on the side contiguous to the lot line;
        iii. No drainage from the roof will be discharged onto an adjacent lot;
        iv. The Accessory Structure shall be constructed of non-combustive materials or have fire resistive walls rated at one (1) hour or more;
        v. The Accessory Structure will not be placed on land designated as a recorded easement, such as a utility or trail easement , unless the

owner(s) of said easement agree(s) to allow the encroachment. Documentation of the agreement shall be provided to the City;

(1) When utilities are present in an Accessory Structure, the building shall not be permanently attached to the ground and can be moved or relocated within 24 hours. Fines shall be issued for buildings that cannot be moved within 24 hours.

(2) The owner acknowledges that they bear all costs of moving the Accessory Structurebuilding, including damage to the property, in the event an easement needs to be accessed.

vi. The Accessory Structure will not be taller than twelve (12) feet six (6) inches to the top of the roof line;

vii. If the Accessory Structure is an Accessory Building, it will not exceed 200 square feet in size;

viii. The City Council may grant additional exceptions to the above conditions if the Accessory Structure will be located adjacent to a non-residential property; and

ix. No minimum rear or side setback shall be required if the building will not be taller than ten (10) feet to the top of the roof line.

3. **Swimming Pools**. All swimming pools require a building permit and shall be located in accordance with the setbacks outlined below. Swimming pools shall not be permitted in a recorded easement. Setbacks are measured from the wall of the pool to the property line.

   a. Front Setback. Swimming pools shall be set back not less than forty (40) feet from the front property line.

   b. Side Setback – Corner Lot, Side Abutting a Street. Accessory buildings shall be set back not less than ten (10) feet from the side lot line which abuts on a street.

   c. Side and Rear Setback - Interior Lot Line. Swimming pools shall be set back not less than ten (10) feet from a side or rear lot line.

(CR-1 Created by Ord. 91-01, 4/9/91 and amended by Ord. 95-04, 2/3/95; Ord. 2014-11, 6/24/14)

SECTION 4: **<u>AMENDMENT</u>** "3.05.050 Setback Requirements (See Appendix For Drawing)" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.05.050 Setback Requirements (See Appendix For Drawing)

Same as required within the CR-40,000 Country Residential Zone or as set forth on the final plat of the Planned Residential development, as applicable.

1. **Dwellings and other Main Buildings** (Ord. 97-02, 2/25/97). All dwellings and other main buildings shall be setback from the lot boundary lines as follows:
    a. Front Yard. The minimum front yard for all main dwelling structures shall be thirty (30) feet (measured from the front property line).
    b. Side Yard - Interior Lots. For single-unit detached dwellings, main buildings shall be situated on the lot to allow for a side yard on each side of the main building the aggregate width of which shall be at least thirty (30) feet. Neither side yard shall be less that twelve (12) feet.
    c. Side Yard - Corner Lots. On corner lots, the front, rear and side yard requirements shall be the same as above, except that the set back on any side that faces onto a public street shall be not less than thirty (30) feet.
    d. Rear Yard - Interior Lots. All main dwelling structures shall be set back from the rear property line a distance of not less than thirty (30) feet.
    e. Rear Yard - Corner Lots. Rear yard set back for dwellings on corner lots shall be the same as that required for interior lots.
2. **Customary Residential Accessory Structures.** All Customary Residential Accessory Structures (henceforth referred to as Accessory Structures) shall be located in accordance with the setbacks and regulations outlined below. Accessory Structures that also meet the classification of Accessory Building shall require a building permit. Swimming pools have separate location requirements (see item 3).
   (Amended by Ord. 2006-14, 9/12/06; Ord. No. 2010-03, 8/24/10)
    a. Setback from Main Building. Accessory Structures shall be set back not less than five (5) feet from the main building.
       Additionally, Accessory Buildings which are located twelve (12) feet or closer to a main building and are attached to the main building by a common roof or wall shall be considered as part of the main building and shall meet the same setbacks as the main building.
    b. Side Setback- Corner Lot, Side Abutting a Street. Accessory Structures shall be set back not less than forty (40) feet from the side lot line which abuts on a street.
    c. Front Setback. Accessory Structures shall not be set back less than forty (40) feet from the front property line.
    d. Side and Rear Setback - Interior Lot Line. Accessory Structures shall be set back not less than fifteen (15) feet from the rear lot line and ten (10) feet from the side lot line, except that a two (2) foot minimum rear or side setback shall be required when all the following conditions are met:
        i. The Accessory Structure is located more than twelve (12) feet from an existing dwelling on the same or adjacent lot;

ii. The Accessory Structure contains no openings on the side contiguous to the lot line;
iii. No drainage from the roof will be discharged onto an adjacent lot;
iv. The Accessory Structure shall be constructed of non-combustive materials or have fire resistive walls rated at one (1) hour or more;
v. The Accessory Structure will not be placed on land designated as a recorded easement, such as a utility or trail easement, unless the owner(s) of said easement agree(s) to allow the encroachment. Documentation of the agreement shall be provided to the City;
    (1) When utilities are present in an easement, the Accessory Structure shall not be permanently attached to the ground and can be moved or relocated within 24 hours. Fines shall be issued for buildings that cannot be moved within 24 hours.
    (2) The owner acknowledges that they bear all costs of moving the Accessory Structure, including damage to the property, in the event an easement needs to be accessed.
vi. The Accessory Structure will not be taller than twelve (12) feet six (6) inches to the top of the roof line;
vii. If the Accessory Structure is an Accessory Building, it will not exceed 200 square feet in size;
viii. The City Council may grant additional exceptions to the above conditions if the Accessory Structure will be located adjacent to a non-residential property; and
ix. No minimum rear or side setback shall be required if the building will not be taller than ten (10) feet to the top of the roof line.

3. **Swimming Pools**. All swimming pools require a building permit and shall be located in accordance with the setbacks outlined below. Swimming pools shall not be permitted in a recorded easement. Setbacks are measured from the wall of the pool to the property line.
    a. Front Setback. Swimming pools shall be set back not less than forty (40) feet from the front property line.
    b. Side Setback – Corner Lot, Side Abutting a Street. Accessory buildings shall be set back not less than ten (10) feet from the side lot line which abuts on a street.
    c. Side and Rear Setback - Interior Lot Line. Swimming pools shall be set back not less than ten (10) feet from a side or rear lot line.

(Ord. 95-28, 11/28/95)

SECTION 5: **AMENDMENT** "3.06.040 Setback Requirements (See Appendix For Drawing)" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.06.040 Setback Requirements (See Appendix For Drawing)

1. **Dwellings and other Main Buildings** (Ord. 97-02, 2/25/97). All dwellings and other main buildings shall be setback from the lot boundary lines as follows:
    a. Front Yard. The minimum front yard for all main dwelling structures shall be thirty (30) feet (measured from the front property line).
    b. Side Yard - Interior Lots. For single-unit detached dwellings, main buildings shall be situated on the lot to allow for a side yard on each side of the main building the aggregate width of which shall be at least thirty (30) feet. Neither side yard shall be less than twelve (12) feet.
    c. Side Yard - Corner Lots. On corner lots, the front, rear and side yard requirements shall be the same as above, except that the set back on any side that faces onto a public street shall be not less than thirty (30) feet.
    d. Rear Yard - Interior Lots. All main dwelling structures shall be set back from the rear property line a distance of not less than thirty (30) feet.
    e. Rear Yard - Corner Lots. Rear yard set back for dwellings on corner lots shall be the same as that required for interior lots.
2. **Customary Residential Accessory Structures.** (Amended by Ord. 2006-14, 9/12/06; Ord. No. 2010-03, 8/24/10). All Customary Residential Accessory Structures (henceforth referred to as Accessory Structures) shall be located in accordance with the setbacks and regulations outlined below. Accessory Structures that also meet the classification of Accessory Building shall require a building permit. Swimming pools have separate location requirements (see item 3).
    a. Setback from Main Building. Accessory Structures shall be set back not less than five (5) feet from the main building.
    Additionally, Accessory Buildings which are located twelve (12) feet or closer to a main building and are attached to the main building by a common roof or wall shall be considered as part of the main building and shall meet the same setbacks as the main building.
    b. Side Setback - Corner Lot, Side Abutting a Street. Accessory Structures shall be set back not less than forty (40) feet from the side lot line which abuts on a street.
    c. Front Setback. Accessory Structures shall be set back not less than forty (40) feet from the front property line.
    d. Side and Rear Setback - Interior Lot Line. Accessory Structures shall be set back not less than fifteen (15) feet from the rear lot line and ten (10) feet from

the side lot line, except that a two (2) foot minimum rear or side setback shall be required when all the following conditions are met:

i. The Accessory Structure is located more than twelve (12) feet from an existing dwelling on the same or adjacent lot;

ii. The Accessory Structure contains no openings on the side contiguous to the lot line;

iii. No drainage from the roof will be discharged onto an adjacent lot;

iv. The Accessory Structure shall be constructed of non-combustive materials or have fire resistive walls rated at one (1) hour or more;

v. The Accessory Structure will not be placed on land designated as a recorded easement, such as a utility or trail easement, unless the owner(s) of said easement agree(s) to allow the encroachment. Documentation of the agreement shall be provided to the City;

(1) When utilities are present in an easement, the Accessory Structure shall not be permanently attached to the ground and can be moved or relocated within 24 hours. Fines shall be issued for buildings that cannot be moved within 24 hours.

(2) The owner acknowledges that they bear all costs of moving the AccessoryStructure building, including damage to the property, in the event an easement needs to be accessed.

vi. The Accessory Structure will not be taller than twelve (12) feet six (6) inches to the top of the roof line;

vii. The Accessory Structure will not exceed 200 square feet in size;

viii. City Council may grant additional exceptions to the above conditions if the Accessory Structure will be located adjacent to a non-residential property; and

ix. No minimum rear or side setback shall be required if the building will not be taller than ten (10) feet to the top of the roof line.

3. **Swimming Pools**. All swimming pools require a building permit and shall be located in accordance with the setbacks outlined below. Swimming pools shall not be permitted in a recorded easement. Setbacks are measured from the wall of the pool to the property line.

a. Front Setback. Swimming pools shall be set back not less than forty (40) feet from the front property line.

b. Side Setback – Corner Lot, Side Abutting a Street. Accessory buildings shall be set back not less than ten (10) feet from the side lot line which abuts on a street.

c. Side and Rear Setback - Interior Lot Line. Swimming pools shall be set back not less than ten (10) feet from a side or rear lot line.

(Ord. 98-23,11-24-98)

PASSED AND ADOPTED BY THE ALPINE CITY COUNCIL
_____.

	AYE	**NAY**	**ABSENT**	**ABSTAIN**
Lon Lott	_____	_____	_____	_____
Gregory Gordon	_____	_____	_____	_____
Jason Thelin	_____	_____	_____	_____
Jessica Smuin	_____	_____	_____	_____
Kelli Law	_____	_____	_____	_____

Presiding Officer

_____
Carla Merrill, Mayor, Alpine City

Attest

_____
Bonnie Cooper, City Recorder Alpine City

ALPINE PLANNING COMMISSION AGENDA

SUBJECT: **Public Hearing – Ordinance 2022-05 Accessory Dwelling Unit Requirements**

FOR CONSIDERATION ON: **15 February 2022**

PETITIONER: **Staff**

ACTION REQUESTED BY PETITIONER: **Approve amendments to the requirements for Accessory Dwelling Units.**

BACKGROUND INFORMATION:
In 2021 the Utah State Legislature updated the requirements for Accessory Dwelling Units (ADU's). Alpine City code needs to be updated to meet the new requirements from the state. Specifically, a municipality cannot limit the square footage of an ADU.

Staff recommends updating the code to be in compliance with State requirements.

STAFF RECOMMENDATION:
Hold a public hearing and make a recommendation to the City Council.

SAMPLE MOTION TO APPROVE:
I move to recommend that Ordinance 2022-05 be adopted as proposed.

SAMPLE MOTION TO APPROVE WITH CONDITIONS:
I move to recommend that Ordinance 2022-05 be adopted with the following conditions:

- ***Insert Finding***

SAMPLE MOTION TO TABLE/DENY:
I move to recommend that Ordinance 2022-05 be tabled (or denied) based on the following:

- ***Insert Finding***

ALPINE CITY
ORDINANCE 2022-05

AN ORDINANCE ADOPTING AMENDMENTS TO ARTICLE 3.23.070 OF THE ALPINE CITY DEVELOPMENT CODE PERTAINING TO REQUIREMENTS FOR ACCESSORY APARTMENTS.

WHEREAS, The Planning Commission held a public hearing on February 15, 2022, regarding proposed amendments to Article 3.23.070 of the Development Code; and

WHEREAS, on February 22, 2022, the Alpine City Council has deemed it in the best interest of Alpine City to amend the Development Code; and

WHEREAS, the Alpine City Planning Commission has reviewed the proposed Amendments to the Development Code, held a public hearing, and has forwarded a recommendation to the City Council; and

WHEREAS, the Alpine City Council has reviewed the proposed Amendments to the Development Code:

NOW THEREFORE, be it ordained by the Council of the Alpine City, in the State of Utah, as follows: The amendments to Article 3.23.070 will supersede Article 3.23.070 as previously adopted. This ordinance shall take effect upon posting.

SECTION 1: **AMENDMENT** "3.23.070 Review Conditions And Criteria For Certain Conditional Uses" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.23.070 Review Conditions And Criteria For Certain Conditional Uses

1. **Accessory Apartments** (Amended by Ord. 95-04, 02/28/95; 2004-13, 09/28/04; 2009-12, 07/14/09). An accessory apartment shall be considered a subordinate dwelling unit within and part of a principle dwelling and which has its own cooking, sleeping, and sanitation facilities. Accessory apartments may be permitted as a conditional use, upon approval of the City Planner and Building Official. Approval shall be subject to the following:
    a. Accessory apartments are listed as a conditional use within the zone.
    b. Accessory apartments shall be permitted only in owner-occupied single-unit detached dwellings.
        i. Owner occupancy shall not be required when the owner has submitted a temporary absence application prior to beginning the temporary absence and meets the following criteria:

(1) The owner has a bona fide, temporary absence of three (3) years or less for activities such as temporary job assignments, sabbaticals, military service, or voluntary service (indefinite periods of absence from the dwelling shall not qualify for this exception); or
(2) The owner is placed in a hospital, nursing home, assisted living facility or other similar facility.
(3) Owner occupancy shall have the meaning set forth in Article 3.01.110, Alpine City Development Code.
(4) The owner has resided in the residence for at least one (1) year prior to beginning the temporary absence.

c. A maximum of one (1) accessory apartment shall be permitted in each owner occupied single-unit detached dwelling.
d. ~~Accessory apartments shall be permitted only in a basement, above an attached garage, or on the main floor limiting it to twenty-five percent (25%) of the main floor.~~
e. A single-unit detached dwelling with an accessory apartment shall provide not less than four (4) off-street parking spaces. Parking spaces may include garage and driveway space. At least one (1) space shall be designated for the accessory apartment.
f. The accessory apartment shall ~~contain no less than 300 square feet of living area and shall~~ comply with all size and access specifications of the International Residential and Building Codes.
g. Accessory apartments shall have at least one (1) separate entrance from the main dwelling accessible from outside. The entrance shall be located on the side or rear of the main dwelling.
h. A single-unit detached dwelling containing an accessory apartment shall have not more than one (1) meter for each water, gas and electric utility service, and the meter shall be in the name of the owner.
i. All construction and remodeling to accommodate the accessory apartment shall be in accordance with the International Residential and Building Codes in effect at the time of construction or remodeling.
j. Any person constructing or causing the construction of a residence that has an accessory apartment or any person remodeling or causing the remodeling of a residence for an accessory apartment, or any person desiring to provide an accessory apartment within a single-unit detached dwelling, shall obtain an Accessory Apartment Permit from the Building Department. Such permit shall be in addition to any building permits that may be necessary.

2. **Guest Houses** (Ord. 94-06, 5/24/94). Guest houses may be permitted as a conditional use, upon approval of the City Council and subject to compliance with the following:
   a. Guest Houses are listed as a conditional use within the zone.
   b. The lot or parcel upon which the guesthouse is proposed to be placed shall have a lot area of not less than five (5) acres.
   c. The guesthouse shall be located not less than 30 ft. to the rear of the primary

dwelling and not closer than twelve (12) ft. to any side or rear property line.

d. The water and sewer service shall be the same as for the principle dwelling.
e. The hookup fees for a single-unit dwelling with a guest house shall be one and one- half (1 and 1/2) times the rate for a single family dwelling.
f. The guesthouse shall be an integral part of the site plan for the principle dwelling and attendant lot area. Vehicular access to the guest house shall be over the same driveway as for the primary dwelling, unless a secondary driveway can be accessed from another public right of way.
g. Prior to approval, a site plan showing the proposed location of the guesthouse and provision for utilities, vehicular access and other standards and conditions shall be submitted and approved by the Planning Commission.
h. Any person desiring to construct a guest house shall convey to the City water rights in the amount of 1/2 acre foot.

3. **Home Occupations** (Ord. 95-04, 2/28/95. Amended Ord. 08-18, 12/16/08; Ord. 2009- 14, 9/22/09; Ord. 2010-07, 5/11/10; Ord. 2010-11, 10/12/10; Ord. 2013-04, 3/12/13; Ord. 2014-06, 3/25/14; Ord. 2016-23, 11/09/16). Home occupations may be permitted as a conditional use, upon review of Staff and approval by the City Planner. If the City Planner determines that the home occupation may create significant impacts, approval from the Planning Commission may be required. All home occupations will be subject to compliance with the following:
    a. Terms and Conditions.
        i. Home occupations are listed as a conditional use in the zone.
        ii. The home occupation is conducted entirely within the livable area of a dwelling or attached garage. Business outdoor activities such as swimming lessons, tennis lessons, horseback riding lessons or other similar activities as determined by the Planning Commission may be considered as a home occupation.
        iii. The business activity of the Home Occupation carried out on the premises shall be conducted only by members of the residing family, except that not more than one person, not a member of the residing family, may be engaged in the conduct of the home occupation if such person is utilized in the capacity of a support function.
        iv. The home occupation does not involve the use of any accessory buildings or yard space for storage outside of the dwelling or attached garage.
        v. The home occupation shall contain no facilities for the display of goods. Any sale of goods and services shall constitute a clearly incidental part of the operation of the home occupation.
        vi. No commercial vehicles shall be stored at the premises except one delivery truck which does not exceed 12,000 gvw rated capacity.
        vii. The home occupation is clearly incidental and secondary to the use of the dwelling for dwelling purposes and does not change the character of the building from that of a dwelling.
        viii. Home occupation signs shall be limited to one (1) identification nameplate, not larger in area than two (2) square feet fastened to the

home, and one (1) sign, not larger in area than one (1) square foot, fastened to the side of the mailbox structure at or below the level of the mail box. No off-site advertising signs shall be permitted.

ix. The home occupation shall not occupy an area not more than the equivalent of twenty-five percent (25%) of the livable area of the dwelling or 1000 square feet, whichever is less. The livable area does not include the garage.
x. The home occupation shall obtain a business license from the City.
xi. The activities of the home occupation shall not involve the use of hazardous materials or chemicals in amounts that will increase the hazard of fire or explosion. Activities of the home occupation shall not decrease safety to the structure or occupants of the dwelling or adjacent dwellings.
xii. The operation of the home occupation shall not produce any noise, smoke, glare, light, fumes, dust, electronic interference or similar condition which is discernible outside the dwelling.
xiii. The physical appearance, traffic, and other activities in connection with the home occupation will not be contrary to the intent of the zone in which the home occupation is located and, in the opinion of the Planning Commission, the activities of the home occupation will not depreciate surrounding property values or the quality of the area for residential purposes as determined by the Planning Commission.
xiv. A sexually-oriented business shall not be a home occupation.
xv. An automotive repair business shall not be a home occupation.
xvi. If the home occupation will have customers/clients coming to the home as part of the business, an inspection(s) of the business portion of the home is required to determine compliance with zoning, building, and life safety requirements. When no customers/clients will be coming to the home as part of the business, the applicant shall be required to submit the home business self fire inspection form.

b. Commission May Attach Conditions. In order to achieve the objectives of this Code and to protect the health, safety and quality of life in the community the Planning Commission or City Planner may attach conditions to the granting of a home occupation consistent with the standards hereinabove stated.
c. Continuing Obligation - Business License Required. All home occupations shall be operated in compliance with the conditions herein above set forth and any conditions which may be attached as part of the approval. Upon approval of a home occupation the applicant shall be eligible to acquire a business license to operate. Issuance of the Business License shall be conditioned upon continued performance of the conditions of approval and said license shall be refused or revoked upon failure of the owner and/or operator to maintain or operate the home occupation in accordance therewith.

The approval shall be valid for the remainder of the year in which it is first

granted. Thereafter the approval will be extended for successive one year periods, commencing on January 1 of the calendar year, or such other date as the Council or City Planner may from time to time establish as the effective date for business licenses, provided (1) that the home occupation remains substantially the same as initially approved and (2) that the home occupation has remained active as evidenced by the acquisition of a valid business license for the previous year.

4. **Produce Stands** (Ord 96-05, 4/10/96). Incidental Produce stands may be permitted as a conditional use, upon approval by the Planning Commission and subject to compliance with the following:
    a. Intent. The Intent and purpose of this Part is to allow the operation of incidental produce stands which supply the local market with needed food and farm products produced on the premises.
    b. Terms and Conditions.
        i. Incidental Produce Stands are listed as a conditional use in the zone.
        ii. Only plants, animals, or parts thereof which are products of the subject lot shall be offered for sale.
        iii. The Produce stand shall provide sufficient off-street parking space to safely accommodate the anticipated level of patrons. The required off-street parking shall be in addition to the spaces required to meet the parking requirements of the primary use.
        iv. Each produce stand shall be entitled to one sign. Said sign shall have not more than thirty-two (32) sq. ft. of sign area and shall advertise only products of the lot. The sign shall not extend into the road right-of-way.
        v. An annual business license to operate the produce stand shall be obtained from the City.
        vi. The application shall include a detailed site plan showing the location of all dwellings and other buildings on the site and also all facilities and areas intended for use in the production, processing, storage and sales of the products intended to be offered for sale on the premises.

(Ord. 94-06, 5/24/94; Amended by Ord. 2004-13, 9/28/04)
(Amended by Ordinance 2005-21 on 12/20/05)

PASSED AND ADOPTED BY THE ALPINE CITY COUNCIL
_____.

	AYE	**NAY**	**ABSENT**	**ABSTAIN**
Lon Lott	_____	_____	_____	_____
Gregory Gordon	_____	_____	_____	_____
Jason Thelin	_____	_____	_____	_____
Jessica Smuin	_____	_____	_____	_____
Kelli Law	_____	_____	_____	_____

Presiding Officer

_____
Carla Merrill, Mayor, Alpine City

Attest

_____
Bonnie Cooper, City Recorder Alpine City

ALPINE CITY
ORDINANCE 2022-05

AN ORDINANCE ADOPTING AMENDMENTS TO ARTICLE 3.23.070 OF THE ALPINE CITY DEVELOPMENT CODE PERTAINING TO REQUIREMENTS FOR ACCESSORY APARTMENTS.

WHEREAS, The Planning Commission held a public hearing on February 15, 2022, regarding proposed amendments to Article 3.23.070 of the Development Code; and

WHEREAS, on February 22, 2022, the Alpine City Council has deemed it in the best interest of Alpine City to amend the Development Code; and

WHEREAS, the Alpine City Planning Commission has reviewed the proposed Amendments to the Development Code, held a public hearing, and has forwarded a recommendation to the City Council; and

WHEREAS, the Alpine City Council has reviewed the proposed Amendments to the Development Code:

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SECTION 1: **AMENDMENT** "3.23.070 Review Conditions And Criteria For Certain Conditional Uses" of the Alpine City Development Code is hereby *amended* as follows:

A M E N D M E N T

3.23.070 Review Conditions And Criteria For Certain Conditional Uses

1. **Accessory Apartments** (Amended by Ord. 95-04, 02/28/95; 2004-13, 09/28/04; 2009-12, 07/14/09). An accessory apartment shall be considered a subordinate dwelling unit within and part of a principle dwelling and which has its own cooking, sleeping, and sanitation facilities. Accessory apartments may be permitted as a conditional use, upon approval of the City Planner and Building Official. Approval shall be subject to the following:
    a. Accessory apartments are listed as a conditional use within the zone.
    b. Accessory apartments shall be permitted only in owner-occupied single-unit detached dwellings.
        i. Owner occupancy shall not be required when the owner has submitted a temporary absence application prior to beginning the

temporary absence and meets the following criteria:

(1) The owner has a bona fide, temporary absence of three (3) years or less for activities such as temporary job assignments, sabbaticals, military service, or voluntary service (indefinite periods of absence from the dwelling shall not qualify for this exception); or

(2) The owner is placed in a hospital, nursing home, assisted living facility or other similar facility.

(3) Owner occupancy shall have the meaning set forth in Article 3.01.110, Alpine City Development Code.

(4) The owner has resided in the residence for at least one (1) year prior to beginning the temporary absence.

c. A maximum of one (1) accessory apartment shall be permitted in each owner occupied single-unit detached dwelling.

d.

e. A single-unit detached dwelling with an accessory apartment shall provide not less than four (4) off-street parking spaces. Parking spaces may include garage and driveway space. At least one (1) space shall be designated for the accessory apartment.

f. The accessory apartment shall comply with all size and access specifications of the International Residential and Building Codes.

g. Accessory apartments shall have at least one (1) separate entrance from the main dwelling accessible from outside. The entrance shall be located on the side or rear of the main dwelling.

h. A single-unit detached dwelling containing an accessory apartment shall have not more than one (1) meter for each water, gas and electric utility service, and the meter shall be in the name of the owner.

i. All construction and remodeling to accommodate the accessory apartment shall be in accordance with the International Residential and Building Codes in effect at the time of construction or remodeling.

j. Any person constructing or causing the construction of a residence that has an accessory apartment or any person remodeling or causing the remodeling of a residence for an accessory apartment, or any person desiring to provide an accessory apartment within a single-unit detached dwelling, shall obtain an Accessory Apartment Permit from the Building Department. Such permit shall be in addition to any building permits that may be necessary.

2. **Guest Houses** (Ord. 94-06, 5/24/94). Guest houses may be permitted as a conditional use, upon approval of the City Council and subject to compliance with the following:

a. Guest Houses are listed as a conditional use within the zone.

b. The lot or parcel upon which the guesthouse is proposed to be placed shall have a lot area of not less than five (5) acres.

c. The guesthouse shall be located not less than 30 ft. to the rear of the primary dwelling and not closer than twelve (12) ft. to any side or rear property line.

d. The water and sewer service shall be the same as for the principle dwelling.

e. The hookup fees for a single-unit dwelling with a guest house shall be one and one- half (1 and 1/2) times the rate for a single family dwelling.

f. The guesthouse shall be an integral part of the site plan for the principle dwelling and attendant lot area. Vehicular access to the guest house shall be over the same driveway as for the primary dwelling, unless a secondary driveway can be accessed from another public right of way.

g. Prior to approval, a site plan showing the proposed location of the guesthouse and provision for utilities, vehicular access and other standards and conditions shall be submitted and approved by the Planning Commission.

h. Any person desiring to construct a guest house shall convey to the City water rights in the amount of 1/2 acre foot.

3. **Home Occupations** (Ord. 95-04, 2/28/95. Amended Ord. 08-18, 12/16/08; Ord. 2009- 14, 9/22/09; Ord. 2010-07, 5/11/10; Ord. 2010-11, 10/12/10; Ord. 2013-04, 3/12/13; Ord. 2014-06, 3/25/14; Ord. 2016-23, 11/09/16). Home occupations may be permitted as a conditional use, upon review of Staff and approval by the City Planner. If the City Planner determines that the home occupation may create significant impacts, approval from the Planning Commission may be required. All home occupations will be subject to compliance with the following:

    a. Terms and Conditions.

        i. Home occupations are listed as a conditional use in the zone.

        ii. The home occupation is conducted entirely within the livable area of a dwelling or attached garage. Business outdoor activities such as swimming lessons, tennis lessons, horseback riding lessons or other similar activities as determined by the Planning Commission may be considered as a home occupation.

        iii. The business activity of the Home Occupation carried out on the premises shall be conducted only by members of the residing family, except that not more than one person, not a member of the residing family, may be engaged in the conduct of the home occupation if such person is utilized in the capacity of a support function.

        iv. The home occupation does not involve the use of any accessory buildings or yard space for storage outside of the dwelling or attached garage.

        v. The home occupation shall contain no facilities for the display of goods. Any sale of goods and services shall constitute a clearly incidental part of the operation of the home occupation.

        vi. No commercial vehicles shall be stored at the premises except one delivery truck which does not exceed 12,000 gvw rated capacity.

        vii. The home occupation is clearly incidental and secondary to the use of the dwelling for dwelling purposes and does not change the character of the building from that of a dwelling.

viii. Home occupation signs shall be limited to one (1) identification nameplate, not larger in area than two (2) square feet fastened to the home, and one (1) sign, not larger in area than one (1) square foot, fastened to the side of the mailbox structure at or below the level of the mail box. No off-site advertising signs shall be permitted.

ix. The home occupation shall not occupy an area not more than the equivalent of twenty-five percent (25%) of the livable area of the dwelling or 1000 square feet, whichever is less. The livable area does not include the garage.

x. The home occupation shall obtain a business license from the City.

xi. The activities of the home occupation shall not involve the use of hazardous materials or chemicals in amounts that will increase the hazard of fire or explosion. Activities of the home occupation shall not decrease safety to the structure or occupants of the dwelling or adjacent dwellings.

xii. The operation of the home occupation shall not produce any noise, smoke, glare, light, fumes, dust, electronic interference or similar condition which is discernible outside the dwelling.

xiii. The physical appearance, traffic, and other activities in connection with the home occupation will not be contrary to the intent of the zone in which the home occupation is located and, in the opinion of the Planning Commission, the activities of the home occupation will not depreciate surrounding property values or the quality of the area for residential purposes as determined by the Planning Commission.

xiv. A sexually-oriented business shall not be a home occupation.

xv. An automotive repair business shall not be a home occupation.

xvi. If the home occupation will have customers/clients coming to the home as part of the business, an inspection(s) of the business portion of the home is required to determine compliance with zoning, building, and life safety requirements. When no customers/clients will be coming to the home as part of the business, the applicant shall be required to submit the home business self fire inspection form.

b. Commission May Attach Conditions. In order to achieve the objectives of this Code and to protect the health, safety and quality of life in the community the Planning Commission or City Planner may attach conditions to the granting of a home occupation consistent with the standards hereinabove stated.

c. Continuing Obligation - Business License Required. All home occupations shall be operated in compliance with the conditions herein above set forth and any conditions which may be attached as part of the approval. Upon approval of a home occupation the applicant shall be eligible to acquire a business license to operate. Issuance of the Business License shall be conditioned upon continued performance of the conditions of approval and said license shall be

refused or revoked upon failure of the owner and/or operator to maintain or operate the home occupation in accordance therewith.

The approval shall be valid for the remainder of the year in which it is first granted. Thereafter the approval will be extended for successive one year periods, commencing on January 1 of the calendar year, or such other date as the Council or City Planner may from time to time establish as the effective date for business licenses, provided (1) that the home occupation remains substantially the same as initially approved and (2) that the home occupation has remained active as evidenced by the acquisition of a valid business license for the previous year.

4. **Produce Stands** (Ord 96-05, 4/10/96). Incidental Produce stands may be permitted as a conditional use, upon approval by the Planning Commission and subject to compliance with the following:
    a. Intent. The Intent and purpose of this Part is to allow the operation of incidental produce stands which supply the local market with needed food and farm products produced on the premises.
    b. Terms and Conditions.
        i. Incidental Produce Stands are listed as a conditional use in the zone.
        ii. Only plants, animals, or parts thereof which are products of the subject lot shall be offered for sale.
        iii. The Produce stand shall provide sufficient off-street parking space to safely accommodate the anticipated level of patrons. The required off-street parking shall be in addition to the spaces required to meet the parking requirements of the primary use.
        iv. Each produce stand shall be entitled to one sign. Said sign shall have not more than thirty-two (32) sq. ft. of sign area and shall advertise only products of the lot. The sign shall not extend into the road right-of-way.
        v. An annual business license to operate the produce stand shall be obtained from the City.
        vi. The application shall include a detailed site plan showing the location of all dwellings and other buildings on the site and also all facilities and areas intended for use in the production, processing, storage and sales of the products intended to be offered for sale on the premises.

(Ord. 94-06, 5/24/94; Amended by Ord. 2004-13, 9/28/04)
(Amended by Ordinance 2005-21 on 12/20/05)

PASSED AND ADOPTED BY THE ALPINE CITY COUNCIL
_____.

	AYE	**NAY**	**ABSENT**	**ABSTAIN**
Lon Lott	_____	_____	_____	_____
Gregory Gordon	_____	_____	_____	_____
Jason Thelin	_____	_____	_____	_____
Jessica Smuin	_____	_____	_____	_____
Kelli Law	_____	_____	_____	_____

Presiding Officer

_____
Carla Merrill, Mayor, Alpine City

Attest

_____
Bonnie Cooper, City Recorder Alpine City

ALPINE PLANNING COMMISSION AGENDA

SUBJECT: Planning Commission Minutes January 18, 2022

FOR CONSIDERATION ON: 15 February 2022

PETITIONER: Staff

ACTION REQUESTED BY PETITIONER: Approve Minutes

BACKGROUND INFORMATION:

Minutes from the January 18, 2022 Planning Commission Meeting.

STAFF RECOMMENDATION:

Review and approve the Planning Commission Minutes.

ALPINE CITY PLANNING COMMISSION MEETING
Alpine City Hall, 20 North Main, Alpine, UT
January 18, 2021

I. GENERAL BUSINESS

A. Welcome and Roll Call: The meeting was called to order at 7:00 p.m. by Chair Jane Griener. The following were present and constituted a quorum:

Chair: Jane Griener
Commission Members: John MacKay, Ethan Allen, Troy Slade, Jeff Davis
Excused: Alan MacDonald
Staff: Jed Muhlestein, Austin Roy, Marla Fox

B. Prayer/Opening Comments: John MacKay
C. Pledge of Allegiance: Jane Griener

II. PUBLIC COMMENT

No Public Comment

III. ACTION ITEMS

A. Height and Grading Requirements Continued

Austin Roy explained that in 2021 the Mayor asked the City look at the current height and grading regulations and investigate other options. Following the September fieldtrip, the Planning Commission should make a formal recommendation to City Council. Below is a timeline for the discussion on this item.

On August 3, 2021, the Planning Commission held a discussion on height of buildings in Alpine. The Planning Commission asked that staff research how building height is regulated in other cities.

On August 17, 2021, the Planning Commission continued the discussion on height and information on how other City's measure height. The Planning Commission also discussed "natural grade" and how it is difficult to define. A proposed amendment to the ordinance, measuring height of a building from natural grade, was tabled to a later date.

On August 24, 2021, the City Council held a discussion on height, grading, and setback requirements. The City Council decided it would be helpful to have a work session with the Planning Commission to work through ideas.

On September 28, 2021, a joint field trip was held with the City Council and Planning, they visited several sites around the city to see and discuss examples of height and grading.

On October 5, 2021, staff asked for feedback from the Planning Commission regarding their impressions of the field trip. Some of the thoughts from Planning Commission included: leaving the ordinance as is, limiting the size of accessory buildings, and writing separate ordinances for lots that slope down, lots that slope up, and lots that slope to the side.

On December 7, 2021, the Planning Commission reviewed and discussed this item. After some discussion, the Planning Commission made the motion to table the item until further information regarding Bountiful City's hillside ordinances could be obtained.

<u>Austin Roy researched Bountiful City's ordinances, and this is what he found:</u>

Minimum Buildable Area – Any lot or parcel designated or zoned for residential development shall have a rectangular buildable area with a length to width ratio between 2:1 and 1:2, that is located entirely on ground of less than thirty percent (30%) slope, that does not encroach into required setbacks or easements, and that meets the following criteria:

R-4	2,000 sq ft
R-3	3,000 sq ft
RF	6,000 sq ft
All other zones	5,000 sq ft

Driveway slopes shall have a minimum slope of two percent (2%), and a maximum slope of fifteen percent (15%), as measured along the centerline of the driveway.

The maximum grade of the driveway shall be seven percent (7%).

Exposed unstable surfaces of an excavation or fill shall not be steeper than one (1) vertical or two (2) horizontal.

The top or bottom edges of slopes caused by an excavation or fill up to ten (10) vertical feet shall be at least three (3) horizontal feet from the property line and/or street right-of-way lines. Cut and/or fills greater than ten (10) feet shall be setback an appropriate distance as determined by the City Engineer.

The maximum vertical height of any cut or fill shall be ten (10) feet, except for existing, naturally occurring, and/or man-made site anomalies.

No Cut, fill, or other area of disturbance may have a finished grade exceeding two (2) horizontal feet for every one (1) vertical (a 2:1 slope). Retaining walls shall be required in any area of disturbance where the grade exceeds a 2:1 slope.

No retaining wall shall exceed ten (10) feet in height.

Retaining Walls 4-5-109

No retaining wall which is four feet tall or taller shall be constructed without a permit issued by the city.

Jed Muhlestein said if this was in our ordinance, he would want the proposal backed up by a Geotech study, retaining wall studies, basically anything that proves that what they are proposing is going to be safe and not cause any kind of hardship to their neighbors.

Jed Muhlestein said our ordinance states you can have a retaining wall nine (9) feet tall and you can tier and have another retaining wall. We allow you to have a set of two nine foot walls, and then go back nine feet and add another set if you needed to.

Jane Griener asked if a developer can come in and raise the road up. Austin Roy said we have ordinances about grade. Ethan Allen said the Planning Commission would be able to review that when the plans came in.

Jane Griener said the three situations are a lot that slopes from the front to the back, a lot that slopes from the back to the front, and a lot that slopes from side to side. She wanted to know if Bountiful' s ordinances would apply to these three situations.

Austin Roy said if they lot is on the down slope, they could fill or have a walkout basement, if the lot is on an uphill slope, they could fill ten (10) feet.

Jane Griener said she doesn't think we should require anyone to build their home below street grade because we would be asking someone to set their house up for a flood. She said it is different in Fort Canyon where the road winds down to the home. Jed Muhlestein said our ordinance doesn't require homeowners to build anywhere, it's based off of finished grade, so they have the option to build low if they choose to.

John MacKay asked if lots have to have designated buildable areas. Jed Muhlestein said only lots that have some kind of a natural hazard. All other lots will go by the setbacks.

Jane Griener asked if we could make our ordinance better. Would adding a fill restriction do us any good?

John MacKay asked if we were okay with measuring from the average grade. Jed Muhlestein said this is what most cities do, and it covers the broadest situations possible where you can keep a standard ordinance without having to write a whole bunch of individual ordinances.

The Planning Commission talked about slope and asked if we should follow the 2:1 slope. Jed Muhlestein said a 3:1 slope would be better. It will not help the height situation because that is determined by the driveway and the natural topography but would help with vegetation and drainage.

Ethan Allen asked if we have had issues with people building up their lots other than the two examples given. Jed Muhlestein said no, we haven't had any complaints.

Jane Griener said we could say you have to go out six feet before you could build up your slope. Jed Muhlestein said that has not been a problem and would be more work for builders and staff to try and regulate it. He said we have a good ordinance and doesn't think it needs to be changed.

Jane Griener said she has changed her mind on this issue and doesn't think we need to change the ordinance. She said the control of the driveway slope, the water retention, and the retaining wall ordinance will are all good.

MOTION: Commission Member John MacKay moved to recommend that the city continue with the existing height and grading ordinances as currently written and find that no changes are recommended at this time.

Jeff Davis seconded the motion. There were 5 Ayes and 0 Nays (recorded below). The motion passed.

Ayes:	**Nays:**
Ethan Allen	
John MacKay	
Jane Griener	
Troy Slade	
Jeff Davis	

IV. COMMUNICATIONS

Austin Roy said the City Attorney is trying to set up a meeting with the State Ombudsman for a training. He said it will most likely be in March. He will discuss Robert's Rules of Order and the Public Meetings Act.

The next meeting will be on February 1, 2022.

The Planning Commission asked for a re-cap of the City Council meeting.

Austin Roy said the Legislation Session is starting now so we might see some stuff come out of that.

V. APPROVAL OF PLANNING COMMISSION MINUTES: November 16, 2021, and January 4, 2022

MOTION: Commission Member John MacKay moved to approve the minutes for November 16, 2021, and January 4, 2022.

Ethan Allen seconded the motion. There were 5 Ayes and 0 Nays (recorded below). The motion passed unanimously.

Ayes:	**Nays:**
Jane Griener	
Ethan Allen	
Troy Slade	
John MacKay	

Jeff Davis

MOTION: Commission Member Ethan Allen moved to adjourn the meeting.

John MacKay seconded the motion. There were 5 Ayes and 0 Nays (recorded below). The motion passed unanimously.

Ayes:	**Nays:**
Jane Griener	
Ethan Allen	
Troy Slade	
John MacKay	
Jeff Davis	

The meeting was adjourned at 8:14 p.m.