VOLUME 1

CHAPTERS 1-4, APPENDIX A

STATE
ENVIRONMENTAL STUDY

MARCH 2017

I-15; SR-201
TO 12300 SOUTH

SALT LAKE COUNTY, UTAH

SOUTH INTERSTATE 15 BOUND

UDOT PROJECT NUMBER: S-I15-7(324)297
PIN: 12587

UDOT
Keeping Utah Moving

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List of Acronyms

ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
ADT	average daily traffic
AOI	Area of Interest
APA	Agricultural Protection Areas
APE	Area of Potential Effects
BFE	Base Flood Elevation
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	Best Management Practices
CAAA	Clean Air Act Amendments
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CH_4	Methane
CLOMR	Conditional Letter of Map Revision
CO	Carbon Monoxide
CO_2	Carbon Dioxide
dBA	A-weighted decibels
DERR	Division of Environmental Response and Remediation
DOEFOE	Determination of Eligibility and Finding of Effect
EA	Environmental Assessment
EIA	Environmental Impact Assessement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FDP	Floodplain Development Permit
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FPPA	Farmland Protection Policy Act
FTA	Federal Transit Authority
GHG	Green House Gases
HCFs	Hydroflourocarbons
HEI	Health Effects Institute
HHS	Health and Human Services
HOV	High Occupancy Vehicle
HUD	United States Department of Housing and Urban Development
IPaC	Information Planning and Conservation System
IRIS	Integrated Risk Information System
LDV	Light Duty Vehicles
LOMR	Letter of Map Revision
LOS	Level-of-Service
LUST	Leaking Underground Storage Tank
LRTP	Long Range Transportation Plan
MAG	Mountainland Association of Governors
mg/m^3	milligrams per cubic meter
mpg	miles per gallon

MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MSAT	Mobile Source Air Toxic
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NATA	National Air Toxics Assessment
NCA	National Climate Assessment
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Services
NO_2	Nitrogen Dioxide
NOX	Nitrogen Oxide
NRHP	National Register of Historic Places
NPS	National Park Service
O_3	Ozone
Pb	Lead
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter with a diameter of 2.5 micrometers or less
PM_{10}	Particulate Matter with a diameter of 10 micrometers or less
POAQC	Project of Air Quality Concern
ppb	Parts per billion
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act
RTP	Regional Transportation Plan
SES	State Environmental Study
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SPUI	Single Point Urban Interchange
SO_2	Sulfur Dioxide
SWPPP	Storm Water Pollution Prevention Plan
TCP	Traditional Cultural Properties
TDS	Total Dissolved Solids
TNM	Traffic Noise Model
TSS	Total Suspended Solids
UDAQ	Utah Division of Air Quality
UDEQ	Utah Division of Environmental Quality
UDOT	Utah Department of Transportation
UDWQ	Utah Division of Water Quality
UDWR	Utah Division of Wildlife Resources
UGS	Utah Geological Survey
ULT	Ute ladies'-tresses
UNHP	Utah Natural Heritage Program
UPDES	Utah Pollutant Discharge Elimination System
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank

UTA	Utah Transit Authority
UTP	Unified Transportation Plan
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
VPD	Vehicles per Day
WFCCS	Wasatch Front Central Corridor Study
WFRC	Wasatch Front Regional Council
$\mu g/m^3$	micrograms per cubic meter
°F	Fahrenheit

Chapter One: Purpose and Need

1.1 INTRODUCTION

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15) between SR-201 and 12300 South in Salt Lake County and on 7200 South between I-15 and Bingham Junction Boulevard in Midvale.

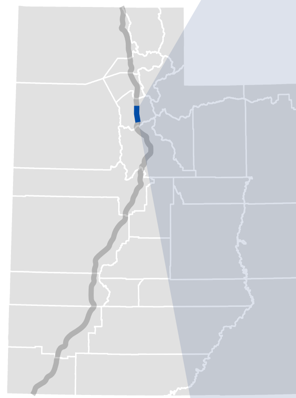
This SES identifies existing and future needs for transportation improvements to southbound I-15 and 7200 South, assesses the potential impacts of alternatives, and identifies a preferred alternative. This SES has been prepared to assist local and state decision makers in identifying the best course of action, or actions, to improve current and future traffic needs related to southbound I-15 and 7200 South.

1.2 EXISTING CONDITIONS

I-15 is a major transportation corridor in the western United States that begins near the border of the United States and Mexico in San Diego County and continues north to Alberta Canada, passing through the states of California, Nevada, Arizona, Utah, Idaho, and Montana. I-15 is the primary north-south transportation corridor in Utah, with the majority of the Utah population living along its corridor. I-15 serves north/south travel in Salt Lake County and provides access to Davis County to the north and Utah County to the south. The I-15 corridor is an important transportation artery, facilitating access to commercial developments, restaurants, grocery stores, automobile sale and service, trucking operations, and residential areas. Traffic data analyzed in 2016 by UDOT determined that the annual average daily traffic in the proposed study area ranged between 160,000 and 250,000 vehicles per day (vpd). Throughout the study area, southbound I-15 varies from three to six lanes with one high-occupancy vehicle (HOV)/express lane.

1.3 STUDY AREA

The study area is approximately 14 miles long. It begins at SR-201 and extends south to 12300 South (see Figure 1-1). For I-15, the logical termini for this SES are just south of the SR-201 interchange to the north and 12300 South to the south.



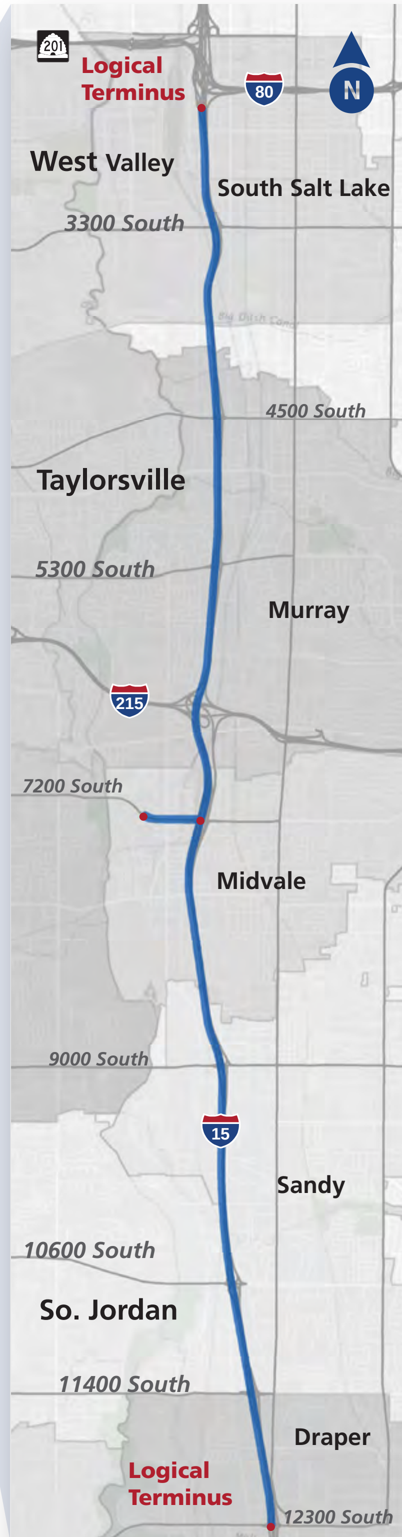


Figure 1-1. Study Area

These termini were selected since SR-201 is an east-west freeway, and south of 12300 South, I-15 widens to five lanes and an auxiliary lane. On 7200 South the logical termini are I-15 to the east and Bingham Junction Boulevard to the west. These termini are an adequate distance apart to assess the environmental impacts on a broad scope and are located at rational end points for proposed transportation improvements. The proposed project has independent utility since the proposed improvements would be usable and be a reasonable expenditure, even if no additional transportation improvements in the area are made. The identified study area is sufficiently broad and does not restrict the consideration of a reasonable range of alternatives that could meet the identified needs of the project.

What are logical termini?

Logical termini are the beginning and end points of a project. For roadway projects logical termini are usually interchanges or intersections where travel demand changes.

1.4 SUMMARY OF PURPOSE AND NEED

The **purpose** of this project is to address current and future travel demand on southbound I-15 between SR-201 and 12300 South and on 7200 South between I-15 and Bingham Junction Boulevard.

The **need** for the project is to address current and future traffic congestion and travel demand on southbound I-15 and 7200 South.

- Current conditions indicate that various stretches of southbound I-15 are highly congested and are inadequate in meeting the needs of travel. By 2040, traffic on I-15 is projected to substantially grow and congestion on existing and additional stretches of southbound I-15 will increase (see Section 1.6.1 for more information).
- By 2040, all intersections on 7200 South within the study area will experience substantial delay (over 100 seconds) and operate at failing conditions (see Section 1.6.1 for more information).

1.5 TRANSPORTATION PLANNING EFFORTS

Transportation planning is an important, on-going process to identify projects to maintain an adequate transportation system. The Wasatch Front Regional Council (WFRC), UDOT, and surrounding municipalities are responsible for transportation planning in the study area.

1.5.1 METROPOLITAN PLANNING

Wasatch Front Regional Council

Planning for the project began as part of WFRC's regional planning efforts. Consistent with federal law, WFRC is responsible for developing a 30-year financially-constrained regional transportation plan based on a comprehensive, region-wide transportation systems analysis. This analysis addresses all modes of transportation, including highways, transit, trucking, pedestrian, and bicycle.

In the Wasatch Front Urban Area Regional Transportation Plan (RTP): 2015-2040, WFRC has identified several transportation needs in and near the study area, including the addition of a southbound lane on I-15 between SR-201 and 12300 South, and the widening of 7200 South from four to six lanes. These proposed projects are included in

What is the WFRC?

WFRC has been the designated metropolitan planning organization (MPO) for the Wasatch Front Urban Area since 1969 and is responsible for developing and maintaining a region-wide, long-range transportation plan for Salt Lake, Davis, western Weber, and southern Box Elder counties. WFRC works in close cooperation with UDOT, the Utah Transit Authority (UTA), the Utah Division of Air Quality (UDAQ), and the cities and counties located within its region to develop regional plans that include new transportation facilities and upgrades to the existing transportation systems and infrastructure.

Phase One (2015 to 2024) of WFRC's RTP 2015-2040 and are part of WFRC's overall plan to address congestion and provide for an adequate transportation system. All projects on the 2040 RTP in or near the study area are available for review in Appendix A.

Unified Transportation Plan

UDOT, the WFRC, and other metropolitan planning organizations in Utah have created Utah's Unified Transportation Plan (UTP) 2015-2040. The Unified Plan is an executive summary of five individual agency plans, including WFRC's RTP, and contains a comprehensive project list including all major capacity projects anticipated through 2040. Therefore, any projects that are listed on the WFRC RTP (including the projects within the study area) are also listed on the Unified Plan, and are officially recognized as planned projects by UDOT.

Wasatch Front Central Corridor Study

The Wasatch Front Central Corridor Study (WFCCS) is a collaborative effort among UDOT, UTA, WFRC, and Mountainland Association of Governments (MAG) to create a set of solutions along I-15 that is more comprehensive than could be created separately. The four agencies, in collaboration with area stakeholders, will recommend solutions for now through 2050 that incorporate multiple modes of transportation and are compatible with emerging technology. Solutions will include improved connectivity between modes and a variety of choices and strategies for mobility. These solutions will be integrated into the WFRC and MAG 2019-2050 Regional Transportation Plans that will be part of Utah's Unified Transportation Plan. The WFCCS identified the projects within the study area as short-term solutions.

1.6 DESCRIPTION OF TRANSPORTATION NEEDS

The "needs" for the project are the transportation deficiencies the project is intended to address. The needs for this project are discussed in the following sections.

1.6.1 CURRENT AND FUTURE TRAFFIC CONGESTION

Level-of-Service

Transportation agencies use a qualitative measurement known as "level-of-service" (LOS) to measure the quality of the traffic flow rate. LOS characterizes the traffic operations of a facility in factors such as speed, average travel delay, travel times, and freedom to maneuver. LOS ranges from A to F, with LOS A representing the best operating conditions (little or no congestion or delay) and LOS F representing the worst operating conditions (extreme congestion and delay with long traffic queues and stop-and-go traffic). If a roadway exhibits LOS E or F conditions, it is considered failing.

Other factors that influence congestion on roadways include spacing between traffic signals, number of street access points (business and residential driveways), design deficiencies, traffic crashes, and amount of queuing storage space at intersections. Existing congestion and delay measurements are based upon field observations, data collection from traffic counters, and data obtained from the UDOT Traffic Operations Center.

Level of Service (LOS)	
A	FREE FLOW. Low volumes and no delays
B	STABLE FLOW. Speeds restricted by travel conditions, minor delays
C	STABLE FLOW. Speeds and maneuverability closely controlled because of higher volumes
D	STABLE FLOW. Speeds considerably affected by change in operation conditions. High density traffic restricts maneuverability, volume near capacity
E	UNSTABLE FLOW. Low speeds, considerable delay, volume at or slightly over capacity
F	FORCED FLOW. Very low speeds, volumes exceed capacity, long delays with stop-and-go traffic

Travel Demand Model

Future traffic (2040) was estimated using the WFRC travel demand model. The No Action condition assumes that all planned projects included in the 2040 RTP would be completed by 2040, except for improvements to I-15 between SR-201 and 12300 South and improvements to 7200 South. Additionally, the No Action condition includes short-term minor restoration types of activities (safety and maintenance improvements, etc.) that maintain continuing operations of the existing roadways. These improvements include activities such as adding or lengthening left-turn pockets, signal phasing changes, and adding dual left-turn lanes if receiving lanes already exist.

Existing (2016) and Future No Action (2040) Conditions

I-15 and I-215 Collector/Distributor System

Freeway Level-of-Service

For freeways, such as I-15, the Highway Capacity Manual calculates LOS based on density. Density is defined as the average number of vehicles that occupy one mile of road space and is expressed in passenger cars per mile per lane (pc/mi/ln).

Table 1-1 on the subsequent page shows freeway segments defined for the purposes of traffic analysis including basic freeway segments, and merge, diverge, and weave areas (see Figure 1-2).

LOS and Corresponding Densities

The table below describes the LOS for freeway segments and the corresponding densities for basic freeway segments and merge/diverge/weave segments.

LOS for Freeway Segments	Density (pc/mi/ln*)	
	Basic	Merge/ Diverge/ Weave
A	≤11	≤10
B	>11-18	>10-20
C	>18-26	>20-28
D	>26-35	>28-35
E	>34-45	>35
F	Demand Exceeds Capacity	

*passenger cars per mile per lane

What is the Highway Capacity Manual?

The Highway Capacity Manual is a publication of the Transportation Research Board of the National Academies of Science in the U.S. It contains concepts, guidelines, and procedures for computing the capacity and LOS of various highway facilities, including freeways, highways, arterial roads, roundabouts, signalized and unsignalized intersections, rural highways.

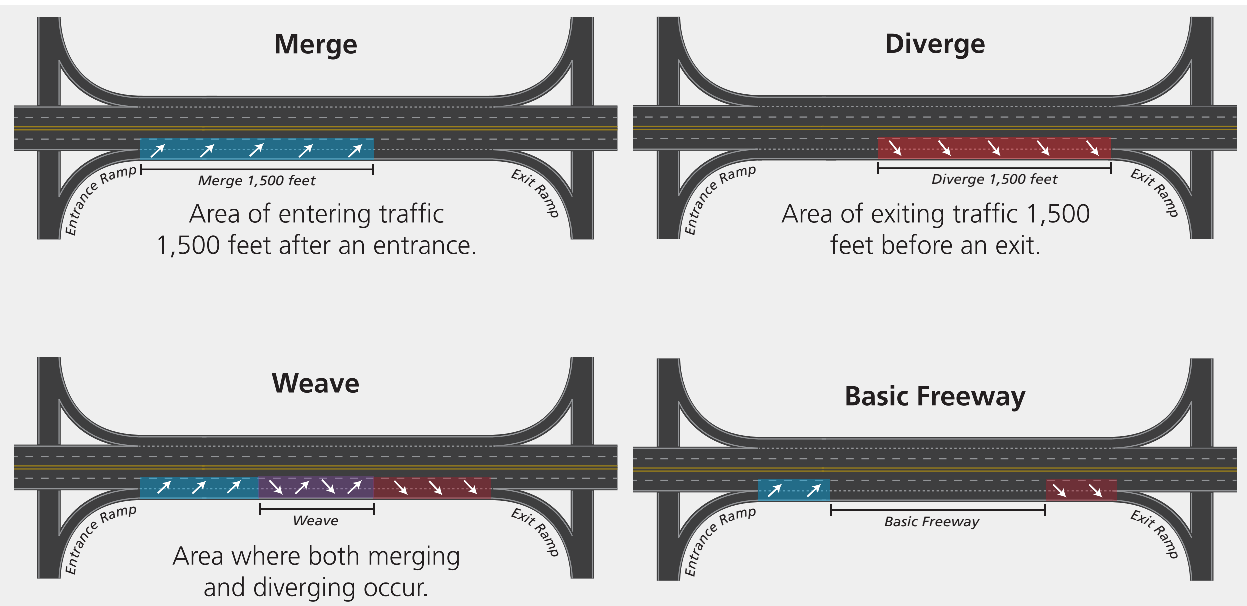
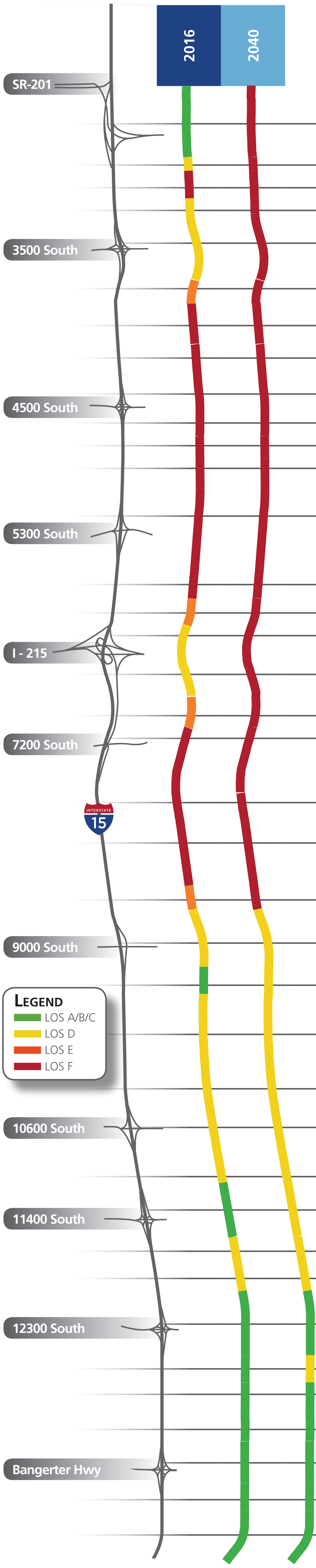


Figure 1-2. Merge, Diverge, Weave, and Basic Freeway Segments of a Freeway

Table 1-1. Existing and 2040 No Action LOS on Southbound I-15 (PM Peak Period)



Roadway Segment	Type	2016 No Action		2040 No Action	
		Average Density	LOS	Average Density	LOS
I-15	Basic Freeway	22	C	72.3	F
2100 South CD Entrance Ramp	Merge	30.3	D	125.8	F
I-80 CD Entrance Ramp	Merge	45.3	F	99.7	F
3300 South Exit Ramp	Diverge	34	D	97.4	F
I-15	Basic Freeway	33.2	D	106	F
3300 South Entrance Ramp	Merge	41.3	E	98	F
I-15	Basic Freeway	49.6	F	90.2	F
4500 South Exit Ramp	Diverge	54.5	F	87.7	F
I-15	Basic Freeway	61	F	107.5	F
4500 South Entrance Ramp	Merge	57.5	F	87.5	F
I-15	Basic Freeway	58.8	F	78.3	F
5300 South Exit Ramp	Diverge	57.7	F	75.1	F
I-15	Basic Freeway	63.2	F	92.8	F
5300 South Entrance Ramp	Merge	40.4	E	66.8	F
I-215 Exit Ramp	Diverge	33.7	D	62.9	F
I-15	Basic Freeway	30.2	D	75.7	F
7200 South Exit Ramp	Diverge	28.2	D	85.9	F
I-15	Basic Freeway	44.6	E	109.2	F
I-215 CD Entrance-Ramp	Merge	82.9	F	104.9	F
7200 South Entrance Ramp	Merge	74.6	F	79.5	F
I-15	Basic Freeway	58.2	F	58.9	F
9000 South Exit Ramp	Diverge	44.8	E	48	F
I-15	Basic Freeway	31.1	D	29.5	D
9000 South Entrance Ramp	Merge	26.9	C	33	D
I-15	Basic Freeway	30.6	D	32	D
10600 South Exit Ramp	Diverge	31.5	D	31.8	D
I-15	Basic Freeway	27.7	D	27.8	D
10600 South to 11400 South	Weave	28.8	D	29.5	D
I-15	Basic Freeway	25.6	C	26.3	D
11400 South Entrance Ramp	Merge	29.5	D	30.5	D
12300 South Exit Ramp	Diverge	29.6	D	31.3	D
I-15	Basic Freeway	24.2	C	25.8	C
12300 South Entrance Ramp	Merge	24.9	C	29.1	D
I-15	Basic Freeway	23	C	24.4	C
Bangerter Exit Ramp	Diverge	22.4	C	24.3	C
I-15	Basic Freeway	14.6	B	15.9	B
Bangerter Entrance Ramp	Merge	17.7	B	19.6	B
I-15	Basic Freeway	19.3	C	20.6	C

Table 1-1 illustrates the LOS for each freeway segment in the study area for the p.m. peak period both in 2016 (existing condition) and 2040 (No Action condition). The traffic analysis evaluated the p.m. peak period because it has higher traffic volumes than the a.m. peak period. As shown in Table 1-1, in 2016, 23 of the 38 freeway segments within the study area currently exhibit acceptable LOS (LOS D or better). A total of 15 freeway segments in the study area currently operate at LOS E or LOS F (failing conditions). These areas are failing due to high volumes of traffic (an average of 55.6 pc/mi/ln). In 2040, 22 of the 38 freeway segments in the study area are projected to operate at LOS E or LOS F (failing conditions) with an average of 86.8 pc/mi/ln.

Speed

The traffic analysis evaluated existing and projected (2040) freeway speeds along I-15 between SR-201 and 14600 South between the hours of 3:00 pm and 7:00 pm. The traffic analysis evaluated the p.m. peak period because it has higher traffic volumes than the a.m. peak period. Under existing conditions highway speeds fluctuate between less than 25 mph and 55 mph between the hours of 3:00 pm and 5:30 pm. Segments of I-15 between 7200 South and 9000 South (see Figure 1-3 on page 1-7) are particularly congested during peak p.m. times with speeds dropping to less than 45 mph between 3:00 and 5:30 pm. By 2040, if no action is taken, slowdowns and stop-and-go traffic will increase between SR-201 and 9000 South and speeds will drop to less than 35 mph between 3:00 and 6:45 pm. Additionally, traffic on I-15 ramps will back up onto the SR-201 and I-80 mainlines (see Figure 1-3).

Speeds observed on the I-215 to I-15 southbound collector/distributor system noted that the existing speeds during peak p.m. traffic begin to see slowdowns and stop-and-go traffic developing between 3:15 and 6:00 pm (see Figure 1-4 on page 1-8), with speeds less than 25 mph until 5:45 p.m. If no action is taken, the road speeds for the I-215 collector/distributor system are projected to substantially diminish. Slowdowns and stop-and-go traffic will increase between 3:00 and 7:00 p.m. with an average speed of less than 25 mph. Additionally, traffic on the I-215 collector/distributor system will back up onto the eastbound and westbound I-215 mainline (see Figure 1-4).

7200 South

Intersection Level-of-Service

Intersection LOS is determined by the amount of extra time it takes, or delay, to pass through an intersection as a result of starts and stops associated with the intersection control, such as stop signs and signals. LOS E or F describes very congested driving conditions where the number of vehicles arriving at an

Why was 2016 evaluated as the existing condition?

2016 is considered the existing condition because the project team collected traffic data in 2016.

Why did the traffic analysis evaluate to 14600 South?

Making improvements to southbound I-15 between SR-201 and 12300 South has the potential to add traffic south of 12300 South. The traffic analysis evaluated to 14600 South to ensure proposed improvements would not cause additional problems south of 12300 South.

Intersection LOS

LOS*	Average Control Delay (sec/veh)
A	0-10
B	>10-20
C	>20-35
D	>35-55
E*	>55-80
F*	>80

*LOS E and F indicate failing conditions.
Source: Highway Capacity Manual (HCM), 2010, Exhibit 18-4

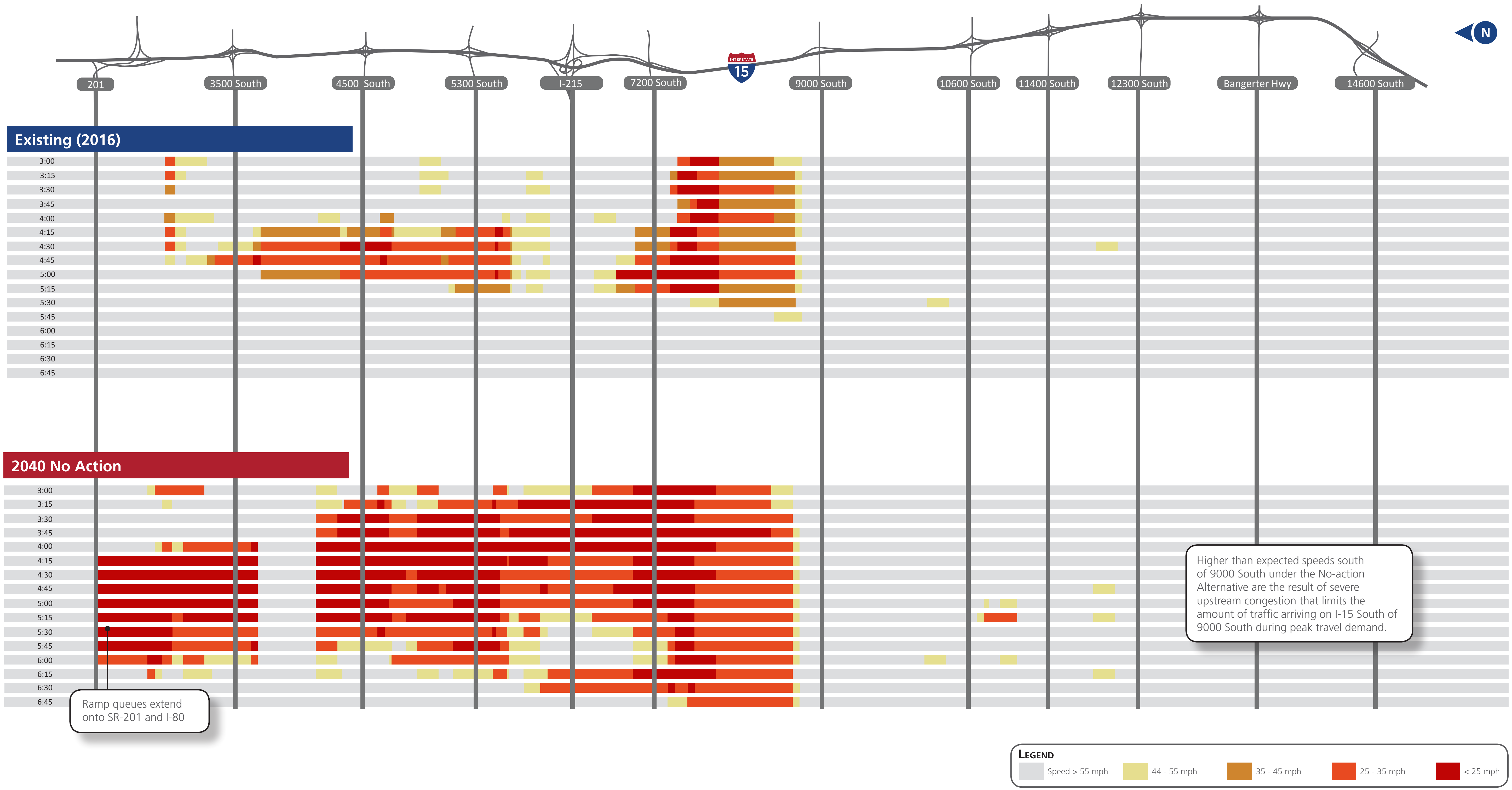


Figure 1-3. Existing and 2040 Speeds on Southbound I-15

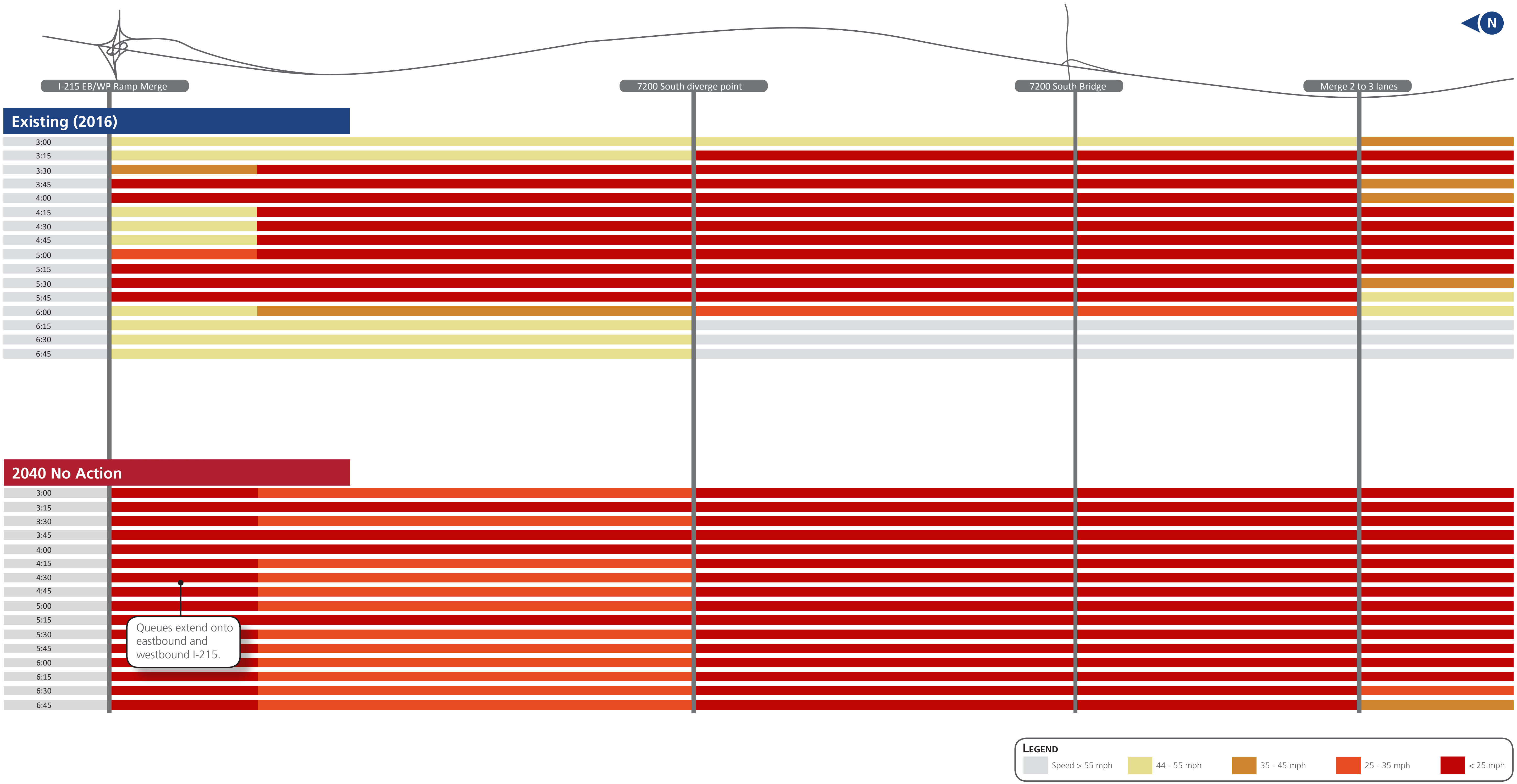


Figure 1-4. Existing and 2040 Speeds on I-215 Collector/Distributor System

intersection exceeds the capacity of the intersection. Most drivers have to wait for multiple signal cycles before they get through the intersection. Long queues of left-turning vehicles stack out of the left turn pockets and block adjacent through lanes. The 7200 South intersection analysis evaluated west of Bingham Junction Boulevard to ensure proposed improvements would not cause additional problems west of the study area. Existing (2016) traffic conditions for 7200 South demonstrate that the intersections within the study area are operating at acceptable LOS. However, by 2040, if no improvements are made all of the intersections within the study area will experience substantial delay and operate at LOS F (see Table 1-2 and Figure 1-5 below).

Table 1-2. Existing and 2040 No Action Intersection LOS on 7200 South

Intersection	Existing (2016)		2040 No Action Condition	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
I-15 Single Point Urban Interchange (SPUI)	42	D	> 100	F
700 West	45	D	> 100	F
Bingham Junction Boulevard	20	B	> 100	F
River Gate Drive/Fl Smidth Drive	10	A	> 100	F

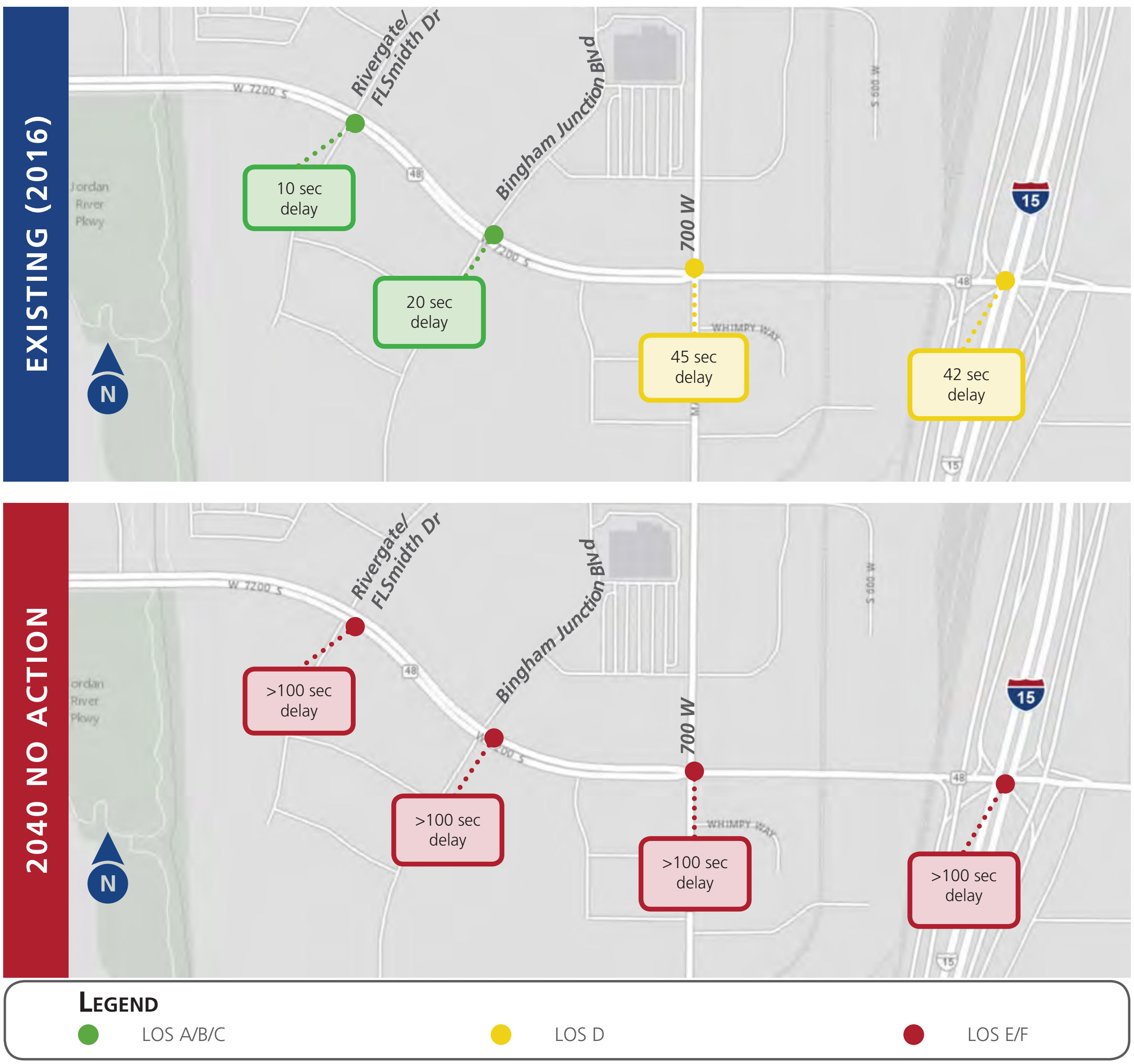


Figure 1-5. Existing and 2040 No Action Intersection LOS on 7200 South

1.7 CONCLUSION

1.7.1 PURPOSE OF AND NEED FOR THE PROJECT

The **purpose** of this project is to address current and future travel demand on southbound I-15 between SR-201 and 12300 South and on 7200 South between I-15 and Bingham Junction Boulevard.

The **need** for the project is to address current and future traffic congestion and travel demand on southbound I-15 and 7200 South.

- Current conditions indicate that various stretches of southbound I-15 are highly congested and inadequately meeting travel needs. By 2040, traffic on I-15 is projected to substantially grow and congestion on existing and additional stretches of southbound I-15 will increase (see Section 1.6.1 for more information).
- By 2040, all intersections on 7200 South within the study area will experience substantial delay (over 100 seconds) and will operate at failing conditions (see Section 1.6.1 for more information).

Chapter Two: Alternatives

2.1 INTRODUCTION

In accordance with the Utah Department of Transportation's (UDOT) Environmental Process Manual of Instruction, this State Environmental Study (SES) describes the alternatives considered and provides details on those alternatives that were studied but eliminated.

What is the Project Purpose?

The purpose of the project is to:

- Address current and future travel demand on southbound I-15 between SR-201 and 12300 South
- Address current and future travel demand on 7200 South between I-15 and Bingham Junction Boulevard

2.2 DEVELOPMENT OF ALTERNATIVES

The alternatives development process includes identifying potential solutions that meet the project purpose. The purpose of this project is to address current and future travel demand on southbound I-15 between SR-201 and 12300 South and on 7200 South between I-15 and Bingham Junction Boulevard.

All alternatives assume that all other planned improvements included in approved regional and local plans would be completed by 2040. These include all improvements, regardless of transportation mode, in the Wasatch Front Urban Area Regional Transportation Plan (RTP): 2015-2040.

This SES evaluates the No-action Alternative, I-15 Alternative 1, and I-15 Alternative 2.

2.2.1 NO-ACTION ALTERNATIVE

The No-action Alternative would maintain the current roadway configurations of I-15, I-215, 7200 South and their associated interchanges. It also assumes that all other planned improvements would be completed by 2040.

The No-action condition includes short-term minor restoration types of activities (safety and maintenance improvements, etc.) that maintain continuing operations of the existing roadways. These improvements include activities such as adding or lengthening left-turn pockets, signal phasing changes, and adding dual left-turn lanes if receiving lanes already exist.

2.2.1 BUILD ALTERNATIVES

Southbound I-15

The project team developed two build alternatives to address current and future travel demand on southbound I-15 between SR-201 and 12300 South.

I-15 Alternative 1

I-15 Alternative 1 (see Figure 2-2) includes constructing:

- An additional lane on southbound I-15 between SR-201 and 12300 South
- An additional southbound to eastbound left-turn lane at the 3300 South interchange (for a total of three lanes)

I-15 Alternative 2

I-15 Alternative 2 is similar to I-15 Alternative 1. It incudes all the elements of I-15 Alternative 1 plus improvements to the I-215 interchange with I-15 (see Figure 2-3).

7200 South

The project team developed one build alternative to address current and future travel demand on 7200 South between I-15 and Bingham Junction Boulevard. The 7200 South Alternative includes constructing an additional lane in both directions on 7200 South between southbound I-15 and Bingham Junction Boulevard (see Figure 2-1).

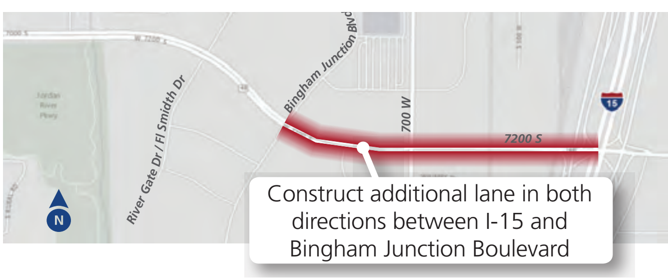


Figure 2-1. 7200 South Alternative

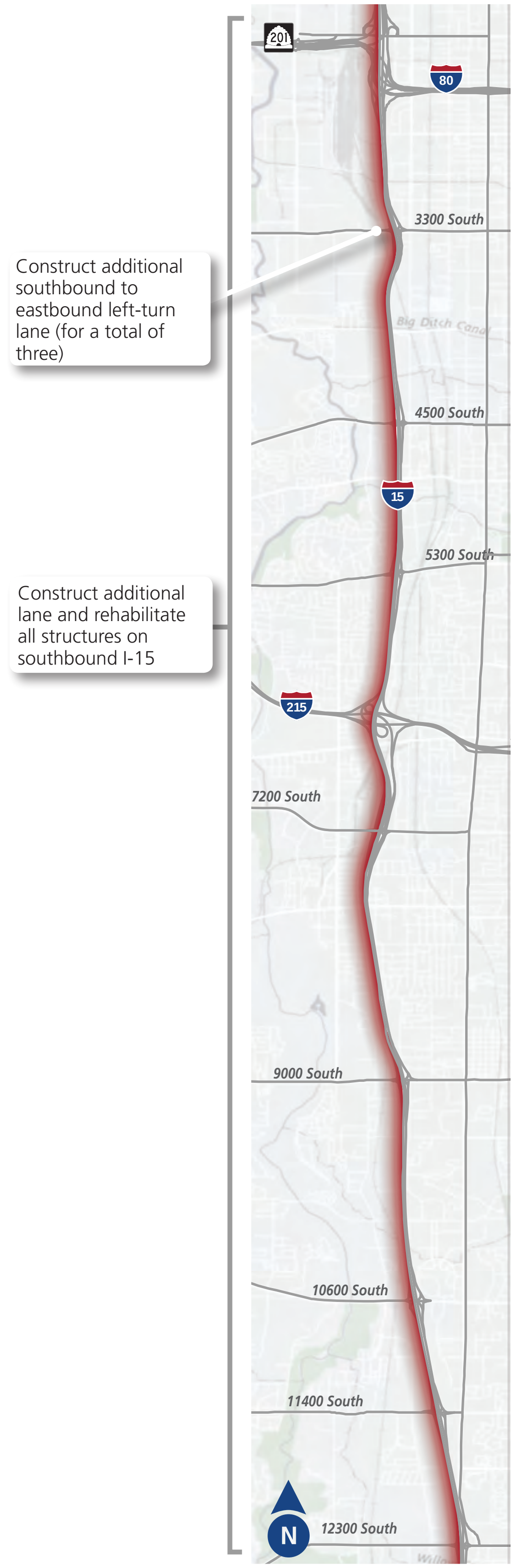


Figure 2-2. I-15 Alternative 1

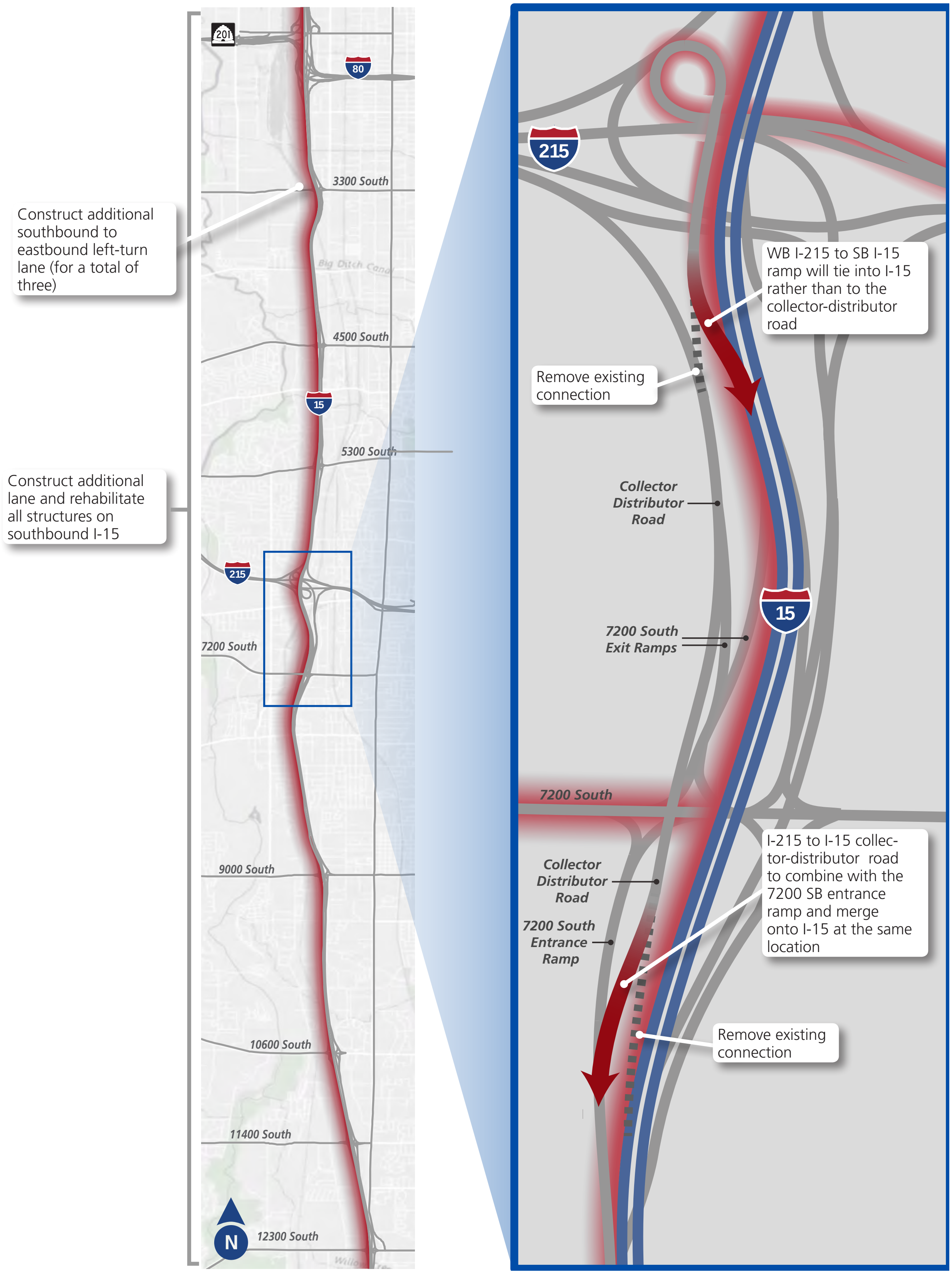


Figure 2-3. I-15 Alternative 2

2.3 ALTERNATIVES PURPOSE AND NEED SCREENING

The alternatives screening process evaluated alternatives based on their ability to meet the purpose and need.

2.3.1 MEASURES OF EFFECTIVENESS

Measures of effectiveness are tools used to measure the achievement of desired results, or in this case, whether or not an alternative meets the purpose of the project. The alternatives were evaluated against the following measures of effectiveness (see Table 2-1).

Table 2-1. Purpose and Need Measures of Effectiveness

Purpose	Measures of Effectiveness
Address current and future travel demand on **southbound I-15**	**Southbound I-15**; SR-201 to 12300 South during PM Peak Hour for 2016, 2024, and 2040: a. Provides Level-of-Service (LOS) D or better **OR** b. Improves average density, speeds, and delays **AND** c. Does not cause back-ups from I-15 to SR-201, I-80, or I-215
Address current and future travel demand on **7200 South**	**7200 South**; I-15 to Bingham Junction Boulevard during PM Peak Hour for 2016, 2024, and 2040: a. Provides LOS D or better **OR** b. Improves intersection delay

2.3.2 SOUTHBOUND I-15 ALTERNATIVES

Tables 2-2, 2-3, and 2-4 on the subsequent pages show freeway segments defined for the purposes of traffic analysis. These tables illustrate the average density and LOS for each freeway segment in the study area for the No-action Alternative and I-15 Alternatives 1 and 2 in 2016, 2024, and 2040. The traffic analysis evaluated the p.m. peak period because it has higher traffic volumes than the a.m. peak period.

LOS and Corresponding Densities

The table below describes the LOS for freeway segments and the corresponding densities for basic freeway segments and merge/diverge/weave segments.

LOS for Freeway Segments	Density (pc/mi/ln*)	
	Basic	Merge/ Diverge/ Weave
A	≤11	≤10
B	>11-18	>10-20
C	>18-26	>20-28
D	>26-35	>28-35
E	>34-45	>35
F	Demand Exceeds Capacity	

*passenger cars per mile per lane

I-15 LOS and Densities

<u>No-action Alternative</u>

The No-action Alternative fails to meet the "provide LOS D or improve density" element of the purpose and need (see Tables 2-2, 2-3, and 2-4). However, it will move forward for detailed study because it provides a baseline to compare impacts of build alternatives.

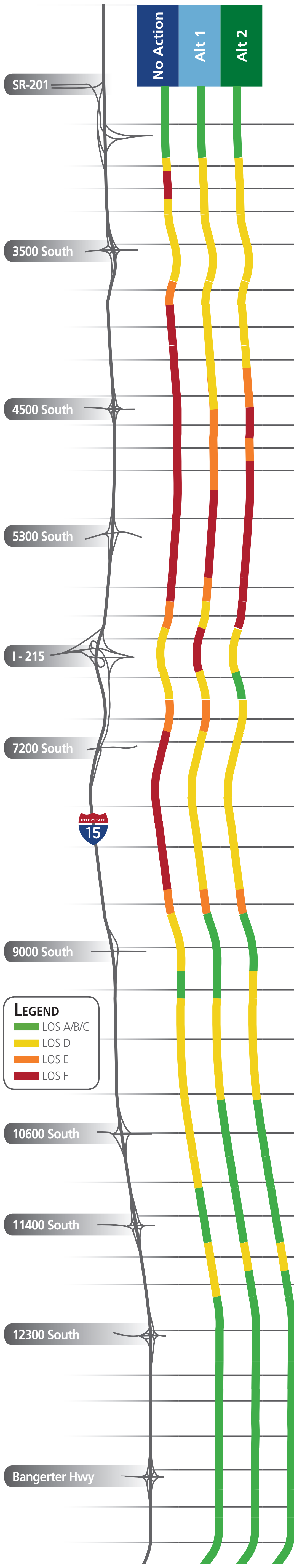
<u>I-15 Alternative 1</u>

In 2016, I-15 Alternative 1 provides LOS D or better or improves density in 36 of 38 sections of southbound I-15 compared to the No-Action Alternative. In 2024, 36 out of 38 sections are predicted to operate at LOS D or better or improve density compared to the No-Action Alternative. By 2040, all 38 sections will operate at LOS D or better or improve density compared to the No-Action Alternative.

<u>I-15 Alternative 2</u>

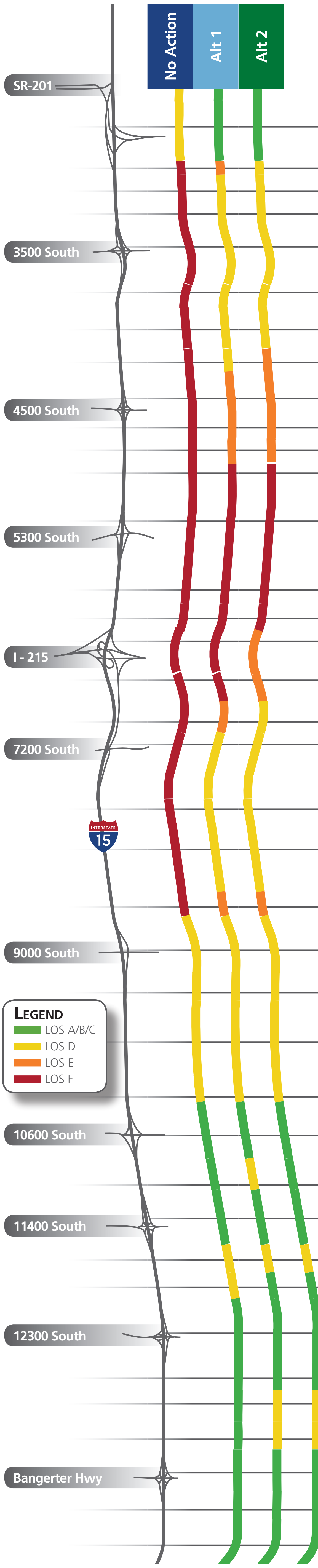
Similar to I-15 Alternative 1, I-15 Alternative 2 provides LOS D or improves density in 36 of 38 sections of southbound I-15 in 2016 compared to the No-Action Alternative. In 2024, 36 out of 38 sections will operate at LOS D or better or improve density compared to the No-Action Alternative. By 2040, all 38 sections will operate at LOS D or better or improve density compared to the No-Action Alternative. As shown in Tables 2-2, 2-3, and 2-4, I-15 Alternatives 1 and 2 generally provide LOS D or better or improve density on southbound I-15 between SR-201 and 12300 South for all study years (2016, 2024, and 2040).

Table 2-2. 2016 PM Peak Hour Density and LOS



Roadway Segment	2016 No-action Average Density	2016 No-action LOS	2016 Alternative 1 Average Density	2016 Alternative 1 LOS	Provides LOS D or Improves Density	2016 Alternative 2 Average Density	2016 Alternative 2 LOS	Provides LOS D or Improves Density
I-15	22	C	23.2	C	Yes	23.3	C	Yes
2100 South CD Entrance Ramp	30.3	D	34.9	D	Yes	34.7	D	Yes
I-80 CD Entrance Ramp	45.3	F	31.5	D	Yes	34.1	D	Yes
3300 South Exit Ramp	34	D	29.3	D	Yes	29.4	D	Yes
I-15	33.2	D	27.3	D	Yes	27.3	D	Yes
3300 South Entrance Ramp	41.3	E	30.4	D	Yes	30.2	D	Yes
I-15	49.6	F	30.9	D	Yes	31.5	D	Yes
4500 South Exit Ramp	54.5	F	33.5	D	Yes	33.7	D	Yes
I-15	61	F	33.6	D	Yes	36.7	E	Yes
4500 South Entrance Ramp	57.5	F	40.9	E	Yes	48	F	Yes
I-15	58.8	F	38.5	E	Yes	47.8	F	Yes
5300 South Exit Ramp	57.7	F	43.2	E	Yes	53.7	F	Yes
I-15	63.2	F	49.3	F	Yes	52.1	F	Yes
5300 South Entrance Ramp	40.4	E	43.9	E	No	50.4	F	No
I-215 Exit Ramp	33.7	D	34.6	D	Yes	48.6	F	No
I-15	30.2	D	39.4	E	No	30.2	D	Yes
7200 South Exit Ramp	28.2	D	34.4	D	Yes	25.6	C	Yes
I-15	44.6	E	39	E	Yes	29.4	D	Yes
I-215 CD Entrance-Ramp	82.9	F	29.5	D	Yes	32.1	D	Yes
7200 South Entrance Ramp	74.6	F	33.2	D	Yes	n/a	n/a	n/a
I-15	58.2	F	31.1	D	Yes	31.8	D	Yes
9000 South Exit Ramp	44.8	E	38.6	E	Yes	39.2	E	Yes
I-15	31.1	D	25.4	C	Yes	26	C	Yes
9000 South Entrance Ramp	26.9	C	25.6	C	Yes	26.4	D	Yes
I-15	30.6	D	27.6	D	Yes	28.1	D	Yes
10600 South Exit Ramp	31.5	D	30.1	D	Yes	30.2	D	Yes
I-15	27.7	D	24.4	C	Yes	24.8	C	Yes
10600 South to 11400 South	28.8	D	26.8	C	Yes	27.3	C	Yes
I-15	25.6	C	22	C	Yes	22.5	C	Yes
11400 South Entrance Ramp	29.5	D	28.1	D	Yes	28.1	D	Yes
12300 South Exit Ramp	29.6	D	23.2	C	Yes	24.1	C	Yes
I-15	24.2	C	20	C	Yes	20.3	C	Yes
12300 South Entrance Ramp	24.9	C	23	C	Yes	23.9	C	Yes
I-15	23	C	22.7	C	Yes	23.3	C	Yes
Bangerter Exit Ramp	22.4	C	24.6	C	Yes	25	C	Yes
I-15	14.6	B	17.3	B	Yes	17.7	B	Yes
Bangerter Entrance Ramp	17.7	B	19	B	Yes	25	C	Yes
I-15	19.3	C	19.3	C	Yes	19.7	C	Yes

Table 2-3. 2024 PM Peak Hour Density and LOSAverage Density and LOS



Roadway Segment	2024 No-action Average Density	2024 No-action LOS	2024 Alternative 1 Average Density	2024 Alternative 1 LOS	Provides LOS D or Improves Density	2024 Alternative 2 Average Density	2024 Alternative 2 LOS	Provides LOS D or Improves Density
I-15	28.7	D	24	C	Yes	23.9	C	Yes
2100 South CD Entrance Ramp	51.8	F	35.2	E	Yes	34.5	D	Yes
I-80 CD Entrance Ramp	63.4	F	31.3	D	Yes	31.4	D	Yes
3300 South Exit Ramp	52.2	F	30.9	D	Yes	31.1	D	Yes
I-15	59.1	F	28	D	Yes	27.8	D	Yes
3300 South Entrance Ramp	66.4	F	31.8	D	Yes	31.6	D	Yes
I-15	64.3	F	33.3	D	Yes	32.2	D	Yes
4500 South Exit Ramp	59.7	F	34.4	D	Yes	35.1	E	Yes
I-15	66.5	F	41.4	E	Yes	36.9	E	Yes
4500 South Entrance Ramp	64.7	F	52	F	Yes	52.4	F	Yes
I-15	65.5	F	50.6	F	Yes	51.4	F	Yes
5300 South Exit Ramp	62.6	F	56.5	F	Yes	55.9	F	Yes
I-15	64.8	F	57.2	F	Yes	56.8	F	Yes
5300 South Entrance Ramp	50	F	51.1	F	No	53	F	No
I-215 Exit Ramp	48.7	F	50.1	F	No	51.9	F	No
I-15	58.3	F	41.6	E	Yes	39.6	E	Yes
7200 South Exit Ramp	72.1	F	39.3	E	Yes	41.4	E	Yes
I-15	92.8	F	38.4	E	Yes	32.2	D	Yes
I-215 CD Entrance-Ramp	100	F	32.4	D	Yes	33.3	D	Yes
7200 South Entrance Ramp	76.8	F	33.2	D	Yes	n/a	n/a	n/a
I-15	61.4	F	32.1	D	Yes	34.9	D	Yes
9000 South Exit Ramp	40.7	F	41.2	E	Yes	44.4	E	Yes
I-15	27.7	D	27.4	D	Yes	27.5	D	Yes
9000 South Entrance Ramp	29.2	D	32.3	D	Yes	30.3	D	Yes
I-15	29.2	D	29.8	D	Yes	30	D	Yes
10600 South Exit Ramp	28.9	D	31.6	D	Yes	31.4	D	Yes
I-15	25.6	C	25.9	C	Yes	25.7	C	Yes
10600 South to 11400 South	26.3	C	28.1	D	Yes	27.9	C	Yes
I-15	24.3	C	24.2	C	Yes	24.8	C	Yes
11400 South Entrance Ramp	29	D	30.3	D	Yes	30.1	D	Yes
12300 South Exit Ramp	29.8	D	26.1	C	Yes	26.6	C	Yes
I-15	24	C	23.7	C	Yes	24.4	C	Yes
12300 South Entrance Ramp	26.9	C	27.1	C	Yes	27.6	C	Yes
I-15	23	C	29.5	D	Yes	27.4	D	Yes
Bangerter Exit Ramp	23.1	C	29.8	D	Yes	30.7	D	Yes
I-15	16	B	21.5	C	Yes	22.2	C	Yes
Bangerter Entrance Ramp	21.2	C	23.6	C	Yes	24.2	C	Yes
I-15	21.7	C	23.8	C	Yes	24.4	C	Yes

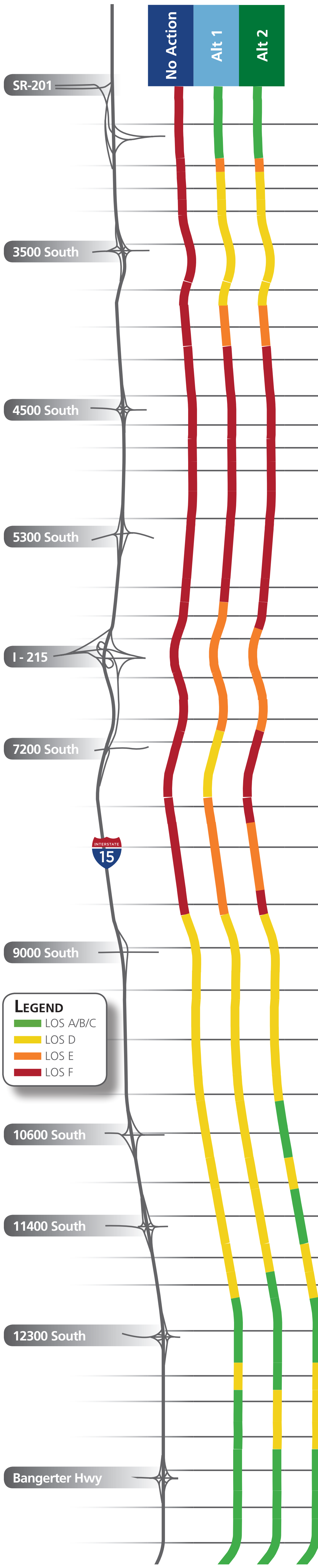


Table 2-4. 2040 PM Peak Hour Density and LOS

Roadway Segment	2040 No-action Average Density	2040 No-action LOS	2040 Alternative 1 Average Density	2040 Alternative 1 LOS	Provides LOS D or Improves Density	2040 Alternative 2 Average Density	2040 Alternative 2 LOS	Provides LOS D or Improves Density
I-15	72.3	F	23.4	C	Yes	23.4	C	Yes
2100 South CD Entrance Ramp	125.8	F	36.7	E	Yes	37.1	E	Yes
I-80 CD Entrance Ramp	99.7	F	31.4	D	Yes	31.5	D	Yes
3300 South Exit Ramp	97.4	F	29	D	Yes	28.7	D	Yes
I-15	106	F	27.7	D	Yes	27.7	D	Yes
3300 South Entrance Ramp	98	F	32.2	D	Yes	34.8	D	Yes
I-15	90.2	F	36.3	E	Yes	44.2	E	Yes
4500 South Exit Ramp	87.7	F	45.8	F	Yes	53.9	F	Yes
I-15	107.5	F	62.4	F	Yes	70.5	F	Yes
4500 South Entrance Ramp	87.5	F	63.9	F	Yes	64.5	F	Yes
I-15	78.3	F	51.7	F	Yes	50.2	F	Yes
5300 South Exit Ramp	75.1	F	57.4	F	Yes	52.2	F	Yes
I-15	92.8	F	57.6	F	Yes	57.5	F	Yes
5300 South Entrance Ramp	66.8	F	50.7	F	Yes	54.1	F	Yes
I-215 Exit Ramp	62.9	F	44	E	Yes	48.8	F	Yes
I-15	75.7	F	41.4	E	Yes	40.4	E	Yes
7200 South Exit Ramp	85.9	F	38.3	E	Yes	39.9	E	Yes
I-15	109.2	F	39.7	E	Yes	37.5	E	Yes
I-215 CD Entrance-Ramp	104.9	F	34.6	D	Yes	50.6	F	Yes
7200 South Entrance Ramp	79.5	F	35.9	E	Yes	n/a	n/a	n/a
I-15	58.9	F	37	E	Yes	44.9	E	Yes
9000 South Exit Ramp	48	F	45	E	Yes	46.7	F	Yes
I-15	29.5	D	28.8	D	Yes	28.2	D	Yes
9000 South Entrance Ramp	33	D	33.8	D	Yes	32	D	Yes
I-15	32	D	31.5	D	Yes	30.8	D	Yes
10600 South Exit Ramp	31.8	D	33.4	D	Yes	31.4	D	Yes
I-15	27.8	D	27.2	D	Yes	26.6	C	Yes
10600 South to 11400 South	29.5	D	29.5	D	Yes	28.8	D	Yes
I-15	26.3	D	26.3	D	Yes	27.6	C	Yes
11400 South Entrance Ramp	30.5	D	32	D	Yes	32.8	D	Yes
12300 South Exit Ramp	31.3	D	27.2	C	Yes	28	D	Yes
I-15	25.8	C	24.2	C	Yes	25.2	C	Yes
12300 South Entrance Ramp	29.1	D	28	C	Yes	28.9	D	Yes
I-15	24.4	C	30.3	D	Yes	28.5	D	Yes
Bangerter Exit Ramp	24.3	C	30.5	D	Yes	31.6	D	Yes
I-15	15.9	B	21.6	C	Yes	22.4	C	Yes
Bangerter Entrance Ramp	19.6	B	21.9	C	Yes	23.1	C	Yes
I-15	20.6	C	23.1	C	Yes	23.6	C	Yes

I-15 Freeway Speeds

The traffic analysis evaluated 2016, 2024, and 2040 freeway speeds for the No-action Alternative, I-15 Alternative 1, and I-15 Alternative 2 along southbound I-15 between SR-201 and 14600 South and on the I-215 collector/distributor system between the hours of 3:00 pm and 7:00 pm. The traffic analysis evaluated the p.m. peak period because it has higher traffic volumes than the a.m. peak period. The traffic volumes on I-15 for the two build alternatives are approximately 5% higher than the No-action Alternative due to the additional capacity allowing additional traffic volume. Speeds south of 9000 South under the No-action Alternative are generally higher than would be expected because severe upstream congestion limits the amount of traffic arriving on I-15 South of 9000 South during peak travel demand.

Why did the traffic analysis evaluate to 14600 South?

Making improvements to southbound I-15 between SR-201 and 12300 South has the potential to add traffic south of 12300 South. The traffic analysis evaluated to 14600 South to ensure alternatives would not cause additional problems south of 12300 South.

I-15

For both I-15 Alternatives 1 and 2, speeds on southbound I-15 in 2016, 2024, and 2040 improve substantially when compared to the No-action Alternative. Slowdowns are generally limited to approximately one hour. In comparison, the No-action Alternative will see slow-downs and congestion for longer periods of time, with stop-and-go conditions between 3:00 pm and 7:00 pm in 2040. I-15 Alteratives 1 and 2 meet nearly all of the projected traffic demand on I-15, resulting in fewer stop-and-go conditions (see Figures 2-4, 2-5, and 2-6).

Table 2-5 displays average speeds for the No-action Alternative, I-15 Alternative 1, and I-15 Alternative 2. Both I-15 Alternative 1 and I-15 Alternative 2 show substantial improvements in speed when compared to the No-action Alternative.

Table 2-5. Average speeds on southbound I-15 during P.M. Peak Periods

Alternative	Average Speed (mph)	Improves I-15 Speed?
2016		
No-Action Alternative	54	No (Baseline)
I-15 Alternative 1	63	**Yes**
I-15 Alternative 2	63	**Yes**
2024		
No-Action Alternative	38	No (Baseline)
I-15 Alternative 1	61	**Yes**
I-15 Alternative 2	62	**Yes**
2040		
No-Action Alternative	38	No (Baseline)
I-15 Alternative 1	58	**Yes**
I-15 Alternative 2	60	**Yes**

I-215 Collector/Distributor System

Under I-15 Alternative 1, speeds improve when compared to the No-action Alternative, but slow-downs and congestion are present between 3:00 pm and 5:00 pm in 2024, and between 3:00 pm and 6:00 pm in 2040 Under I-15 Alternative 2, speeds on the I-215 collector/distributor system improve in 2016, 2024, and 2040 with no slow-downs or congestion (see Figures 2-7, 2-8, and 2-9).

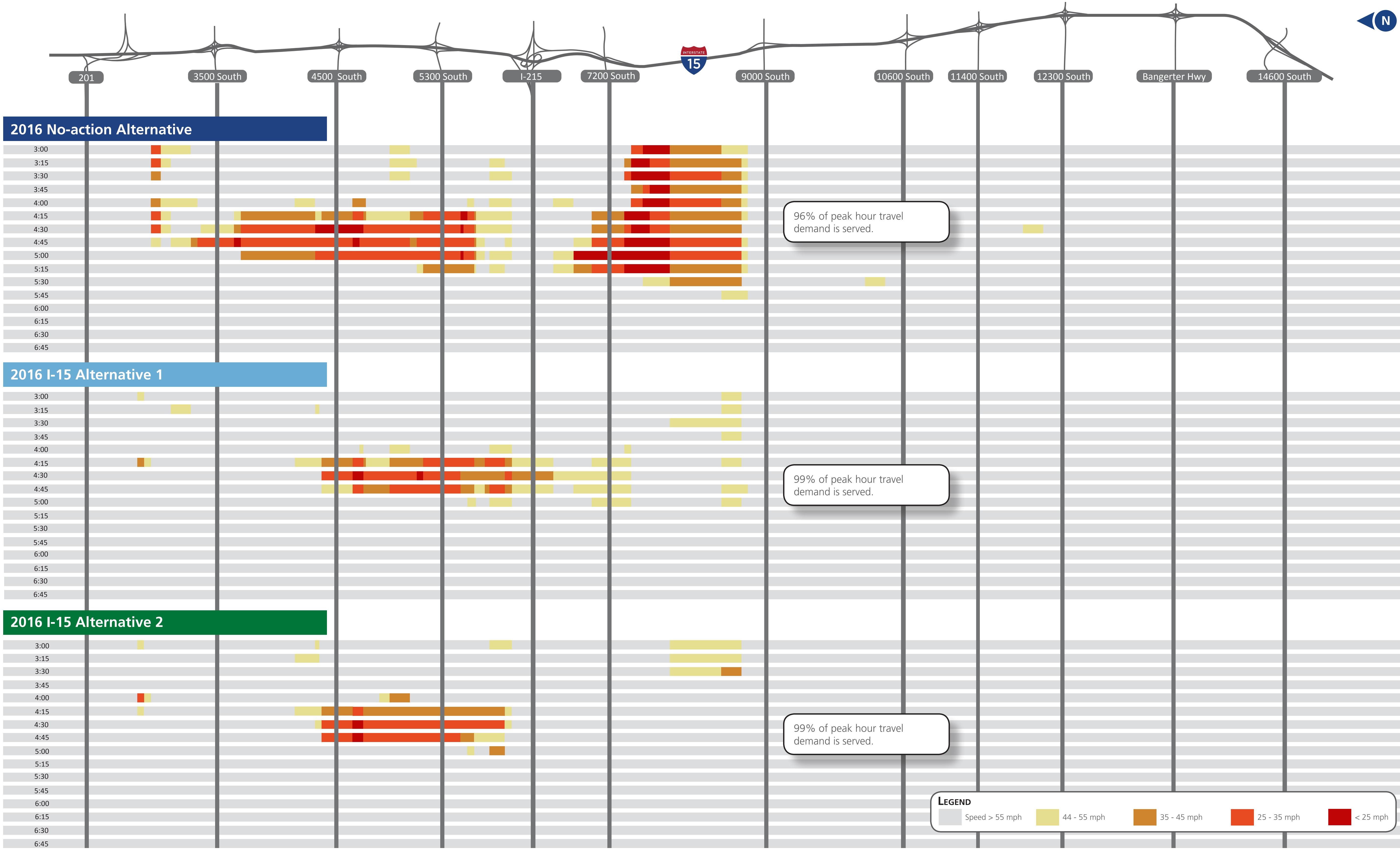


Figure 2-4. 2016 Speeds on Southbound I-15

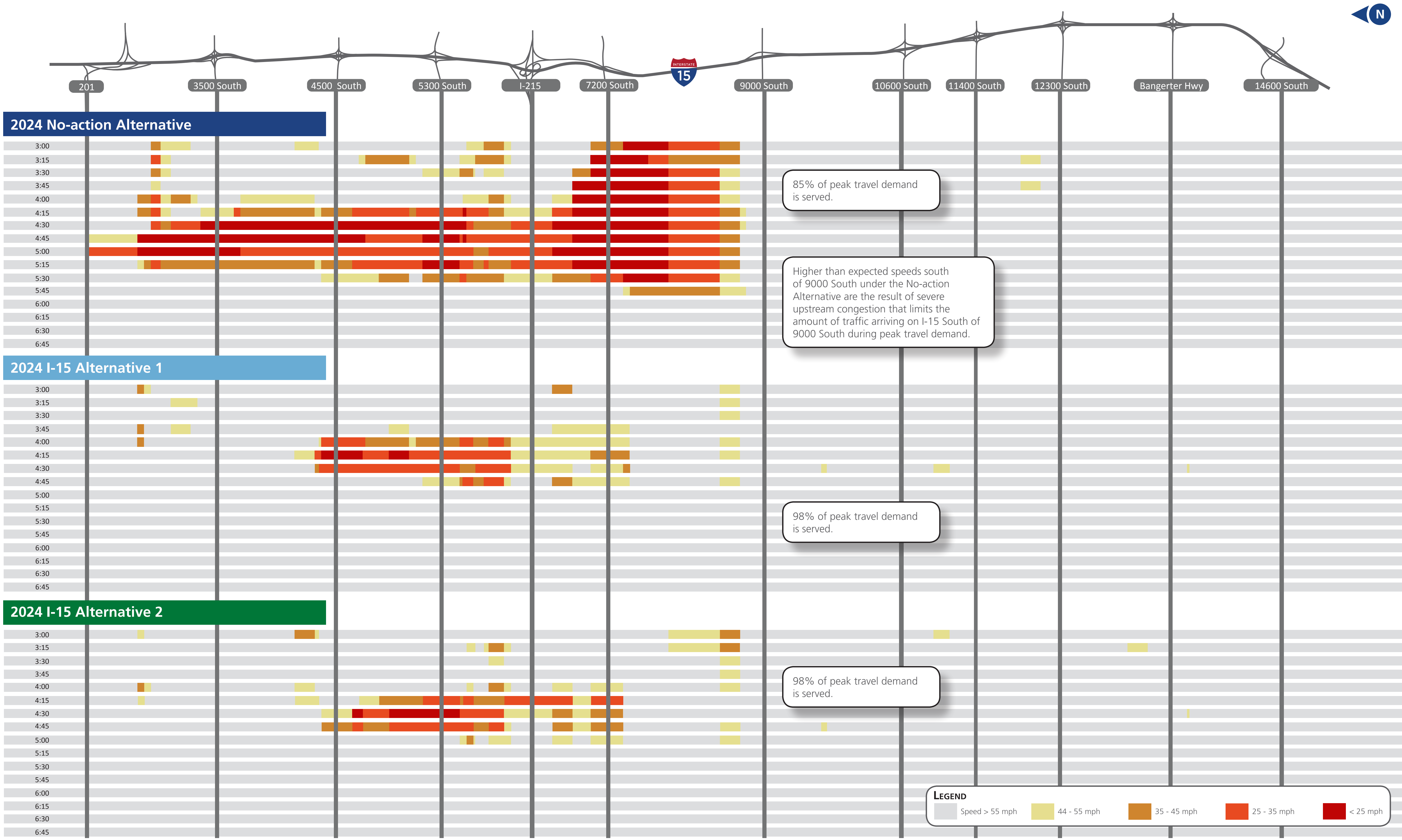


Figure 2-5. 2024 Speeds on Southbound I-15

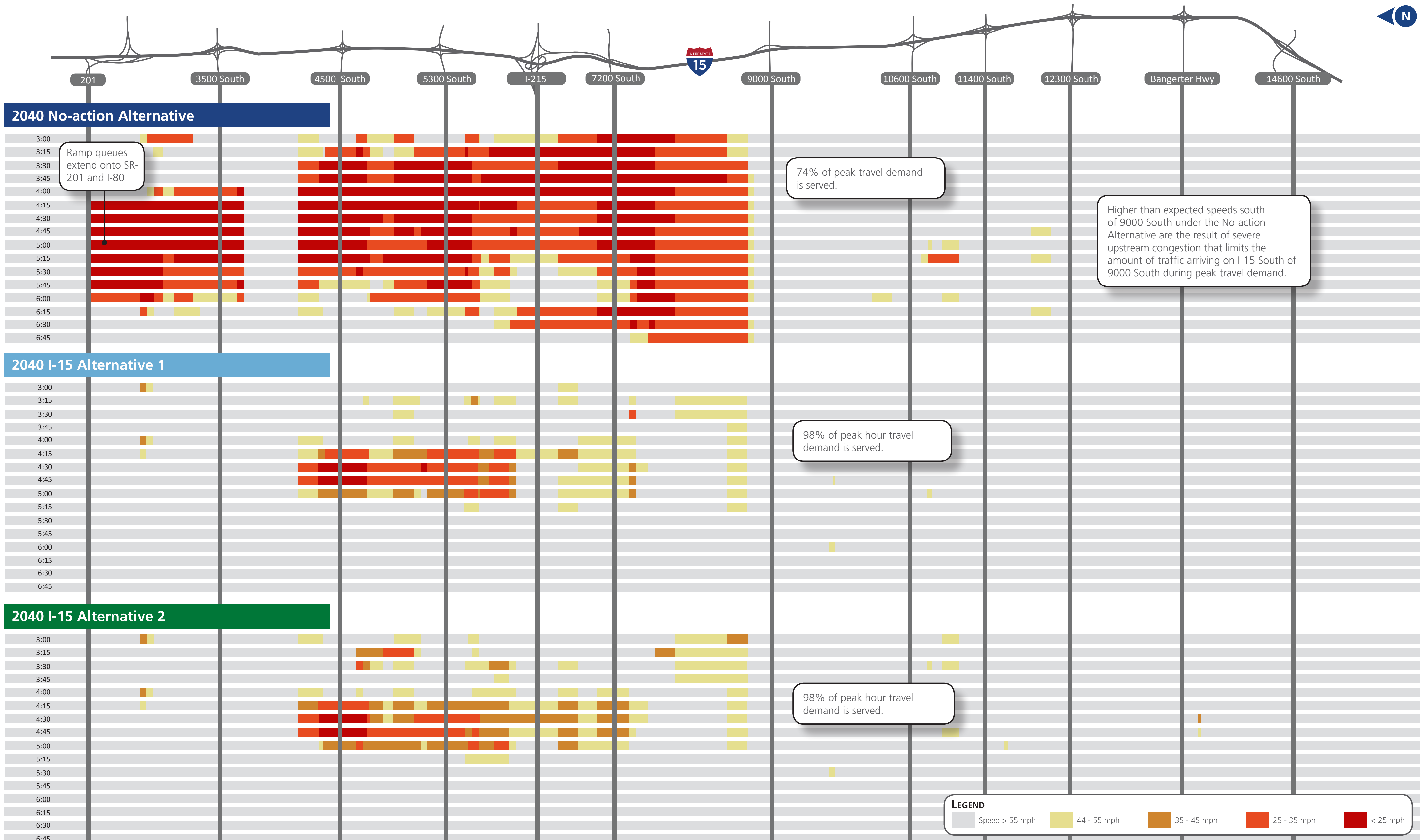


Figure 2-6. 2040 Speeds on Southbound I-15

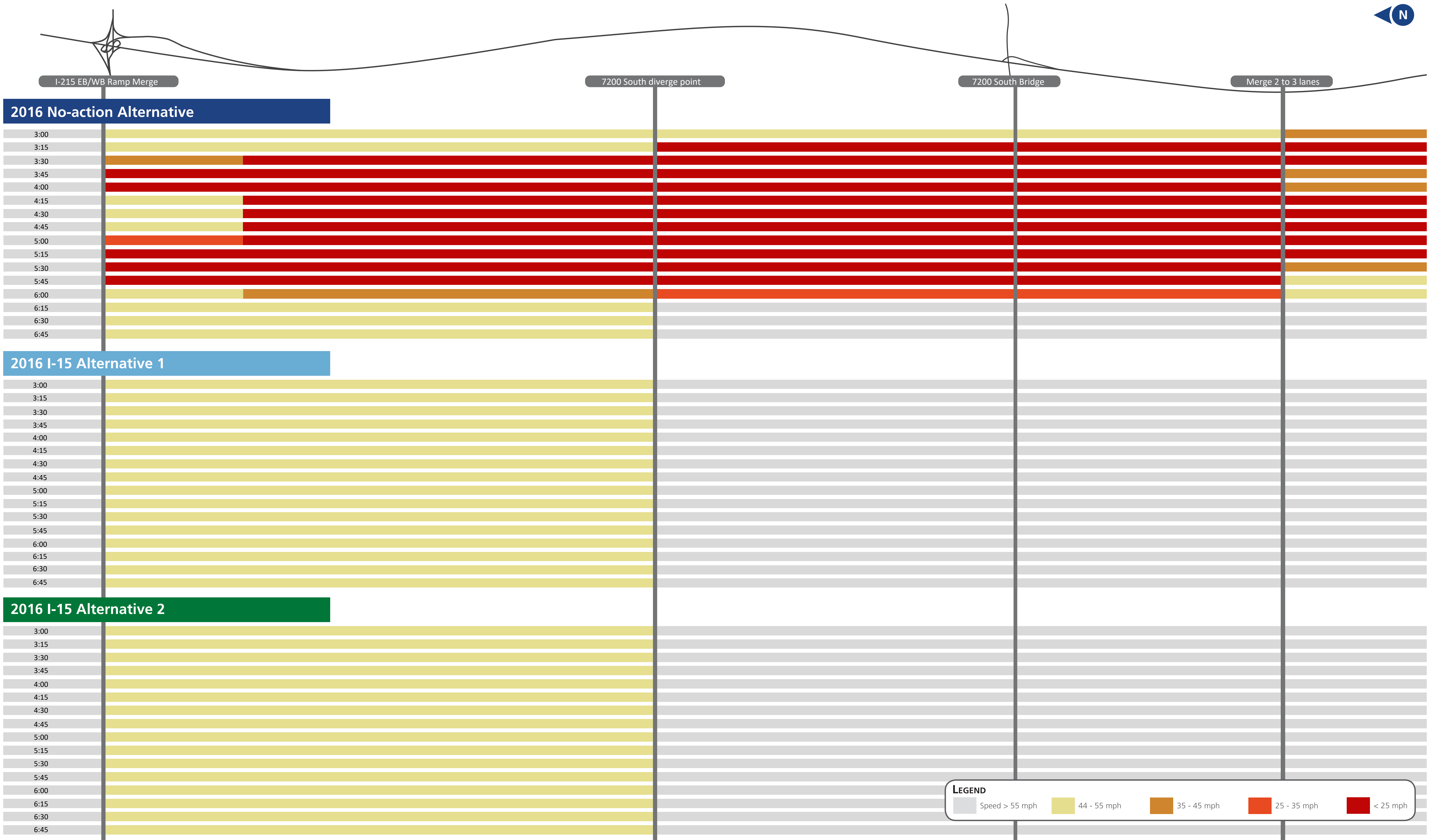


Figure 2-7. 2016 Speeds on I-215 C/D Road Speeds

Figure 2-8. 2024 Speeds on I-215 C/D Road Speeds

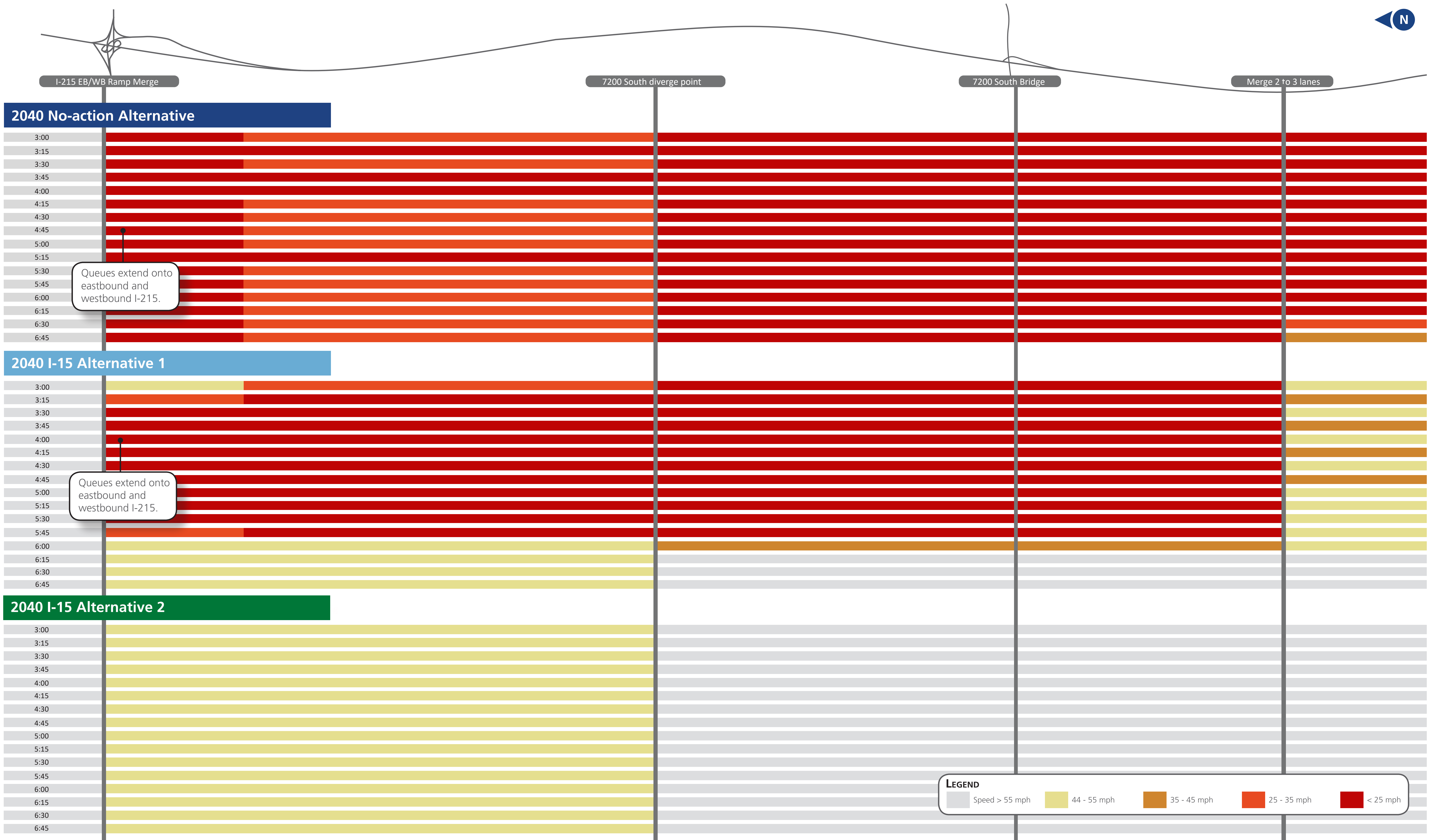


Figure 2-9. 2040 Speeds on I-215 C/D Road Speeds

I-15 Delay

Traffic delays on I-15 are measured in minutes and seconds. Both I-15 Alternatives 1 and 2 substantially reduce the average delay on southbound I-15 between SR-201 and 12300 South for 2016, 2024, and 2040 (see Table 2-6).

What is Average Delay?

Delay occurs when travel speeds are less than an arbitrary "free flow" threshold. The delay is measured in terms of flow and travel time in excess of the free flow value. Delay is expressed in minutes and seconds.

Table 2-6. Summary of Average Delays on Southbound I-15

Alternative	Average Delay (seconds)	Improves I-15 Delay?
2016		
No-Action Alternative	1 minute and 8 seconds	No (Baseline)
I-15 Alternative 1	31 seconds	**Yes**
I-15 Alternative 2	33 Seconds	**Yes**
2024		
No-Action Alternative	5 minutes and 4 seconds	No (Baseline)
I-15 Alternative 1	47 seconds	**Yes**
I-15 Alternative 2	40 Seconds	**Yes**
2040		
No-Action Alternative	7 minutes and 2 seconds	No (Baseline)
I-15 Alternative 1	1 minute and 25 seconds	**Yes**
I-15 Alternative 2	59 Seconds	**Yes**

Backups onto Adjacent Facilities

<u>No-action Alternative</u>

Under the No-action Alternative, congestion on I-15 and the I-215 collector-distributor system will cause traffic to back-up onto SR-201, I-80, and I-215 mainlines for 2024 and 2040 (see Figures 2-6, 2-8, and 2-9).

<u>I-15 Alternative 1</u>

Because I-15 Alternative 1 does not include any modifications to the I-215 interchange with I-15, congestion on the I-215 collector-distributor system will cause traffic to backup onto the eastbound I-215 mainline in 2024 and on both the eastbound and westbound I-215 mainline in 2040 (see Figures 2-8 and 2-9).

<u>I-15 Alternative 2</u>

I-15 Alternative 2 will not cause any backups onto SR-201, I-80, or I-215 for any study years.

I-15 System Summary

Table 2-7 displays a summary for southbound I-15 between SR-201 and 12300 South for the No-action Alternative and Alternatives 1 and 2.

Table 2-7. Network Summary of Average Delays, Stops, Speeds, and Total Travel Times

Alternative	Average Delay (seconds)	Average Stops	Average Speed (mph)	Percent Served	Total Travel Time (Hour)
2016					
No-Action Alternative	1 minute and 8 seconds	3.4	53.9	96%	12,324
I-15 Alternative 1	31 seconds	0.2	62.9	99%	11,081
I-15 Alternative 2	33 Seconds	0.3	63.1	99%	11,156
2024					
No-Action Alternative	5 minutes and 4 seconds	10.7	37.7	85%	18,483
I-15 Alternative 1	47 seconds	0.8	60.9	98%	12,480
I-15 Alternative 2	40 Seconds	0.4	61.9	98%	12,375
2040					
No-Action Alternative	7 minutes and 2 seconds	38.1	34.4	74%	24,853
I-15 Alternative 1	1 minute and 25 seconds	1.8	58.0	98%	15,544
I-15 Alternative 2	59 Seconds	0.6	59.9	98%	15,183

Key Traffic Terms

Average Stops
The count of full stops divided by the number of vehicles served.

Average Speed
The length of the highway segment divided by the average travel time of all vehicles traversing the segment, including all stopped delay times.

Total Travel Time
The average time spent by vehicles traversing a highway segment, including control delay.

Percent Served
The amount of travel demand that is able to enter and exit the system during peak travel hours.

Southbound I-15 Alternatives Purpose and Need Screening Summary

The screening process evaluated the compatibility of the Southbound I-15 alternatives with the purpose and need. Alternatives that could not meet specific objectives to measure an alternative's ability to meet the purpose of the project (see Table 2-1) were eliminated from further consideration and will not move forward for further study. Table 2-8 provides a summary of the screening process for the Southbound I-15 alternatives.

Table 2-8. Summary of Purpose and Need Screening

Alternative	Purpose and Need Measures of Effectiveness				Move Forward for Further Study?
	Provides LOS D or Improves I-15 Density	Improves I-15 Speeds	Improves I-15 Delays	Does not Cause Backups on Adjacent Freeway Facilities	
No-Action Alternative	No	No	No	No	**Yes**
I-15 Alternative 1	Yes	Yes	Yes	No	No
I-15 Alternative 2	Yes	Yes	Yes	Yes	**Yes**

<u>No-Action Alternative</u>

The No-Action Alternative fails to meet the purpose for the project because it does not improve average density, speeds, and delays along southbound I-15. However, the No-action Alternative will move forward for further study to establish a baseline for comparing alternatives.

<u>I-15 Alternative 1</u>

I-15 Alternative 1 would improve average density, speeds, and delays along southbound I-15. This alternative will, however, cause backups onto I-215. Therefore, this alternative was eliminated from further study.

<u>I-15 Alternative 2</u>

I-15 Alternative 2 would improve average density, speeds, and delays along southbound I-15. It would also eliminate backups on to I-215 due to the modification of the I-215 interchange with I-15. I-15 Alternative 2 will move forward for further study.

2.3.3 7200 SOUTH ALTERNATIVE

7200 South Intersection Delay

The 7200 South Alternative includes constructing an additional lane in both directions on 7200 South between I-15 and Bingham Junction Boulevard. The 7200 South intersection analysis evaluated west of Bingham Junction Boulevard to ensure proposed improvements would not cause additional problems west of the study area. The proposed lane will improve intersection delays on 7200 South (see Table 2-9 and Figure 2-10). If no action is taken, delays in 2024 and 2040 will substantially increase on intersections along 7200 South.

Intersection LOS

LOS*	Average Control Delay (sec/veh)
A	0-10
B	>10-20
C	>20-35
D	>35-55
E*	>55-80
F*	>80

*LOS E and F indicate failing conditions.

Source: Highway Capacity Manual (HCM), 2010, Exhibit 18-4

Table 2-9. Intersection Delay and LOS on 7200 South

Intersection	2016 No Action		2016 7200 S Alt		2024 No Action		2024 7200 S Alt		2040 No Action		2040 7200 S Alt	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
I-15 SPUI	42	D	34	C	>100	F	66	E	>100	F	88	F
700 West	45	D	31	C	>100	F	39	D	>100	F	49	D
Bingham Junction Boulevard	20	B	16	B	>100	F	16	B	>100	F	25	C
River Gate Drive/Fl Smidth Drive	10	A	7	A	>100	F	10	A	>100	F	19	B

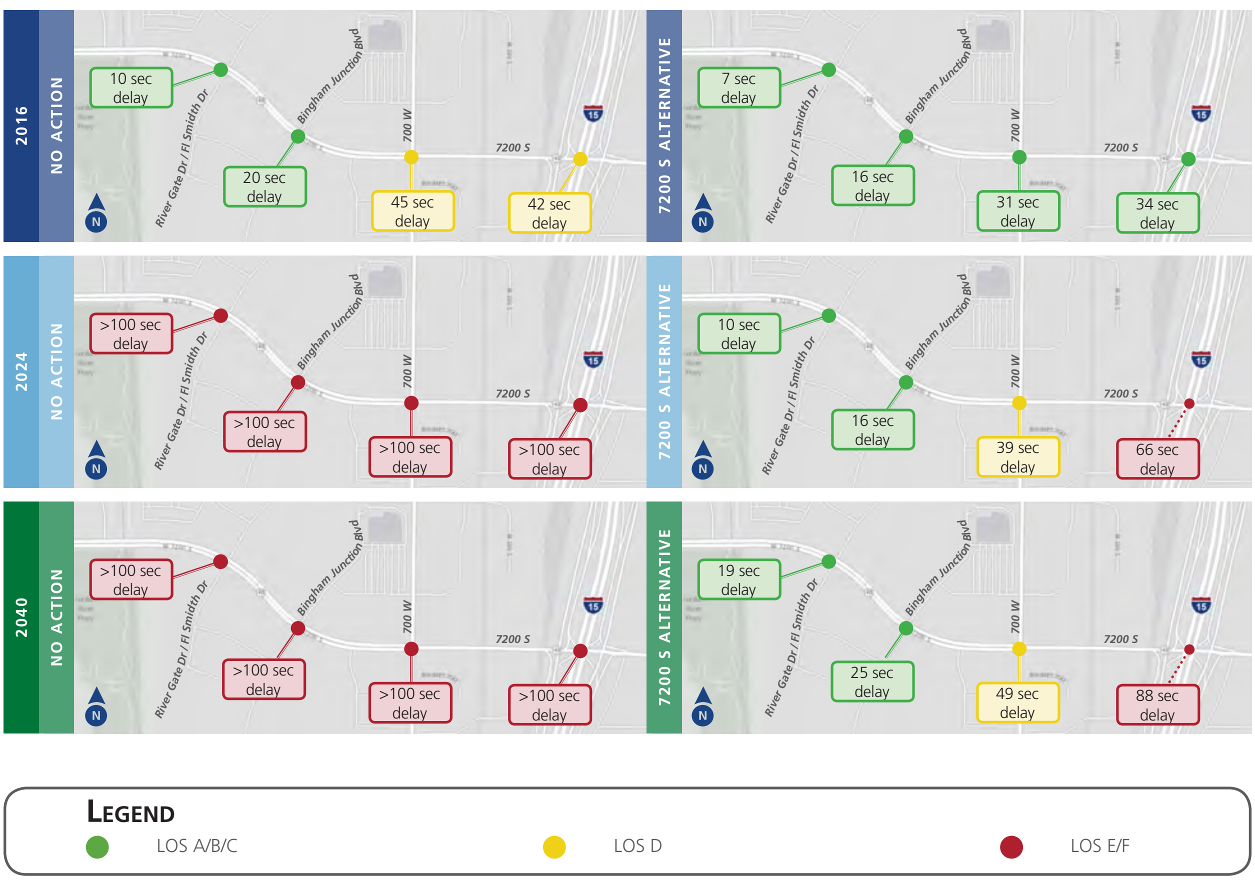


Figure 2-10. Intersection Delay and LOS on 7200 South

7200 South Alternatives Purpose and Need Screening

The screening process evaluated the compatibility of the 7200 South alternatives with the purpose and need. Alternatives that could not meet specific objectives to measure an alternative's ability to meet the purpose of the project (see Table 2-1) were eliminated from further consideration and will not move forward for further study. Table 2-10 provides a summary of the 7200 South screening process.

Table 2-10. Summary of Purpose and Need Screening

Alternative	Purpose and Need Measures of Effectiveness	Move Forward for Further Study?
	Improves Delay on 7200 South	
No-Action Alternative	No	**Yes**
7200 South Alternative	Yes	**Yes**

No-Action Alternative

The No-Action Alternative fails to meet the purpose for the project because it does not improve intersection delay on 7200 South. However, the No-action Alternative will move forward for further study to establish a baseline for comparing alternatives.

7200 South Alternative

The 7200 South Alternative would improve delay on 7200 South; therefore, the 7200 South Alternative will move forward for further study.

2.4 ALTERNATIVES SELECTED FOR DETAILED STUDY

2.4.1 NO-ACTION ALTERNATIVE

The No-action Alternative would maintain the current roadway configurations of I-15, I-215, 7200 South and their associated interchanges.

The No-action condition includes short-term minor restoration types of activities (safety and maintenance improvements, etc.) that maintain continuing operations of the existing roadways. These improvements include activities such as adding or lengthening left-turn pockets, signal phasing changes, and adding dual left-turn lanes if receiving lanes already exist.

2.4.2 I-15 ALTERNATIVE 2

I-15 Alternative 2 include the following:

- An additional lane on southbound I-15 between SR-201 and 12300 South
- An additional southbound to eastbound left-turn lane at the 3300 South interchange (for a total of three lanes)
- An additional lane in both directions on 7200 South between southbound I-15 and Bingham Junction Boulevard
- Modification of the I-215 interchange with I-15

2.4.3 7200 SOUTH ALTERNATIVE

The 7200 South Alternative includes constructing an additional lane in both directions on 7200 South between southbound I-15 and Bingham Junction Boulevard.

2.5 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

UDOT has identified I-15 Alternative 2 with the 7200 South Alternative as the alternative which best meets the project's purpose and need; this includes measures to minimize impacts to environmental resources (see Figure 2-11 and Preferred Alternative maps in Volume 2). Therefore, UDOT has identified I-15 Alternative 2 with the 7200 South Alternative as the Preferred Alternative.

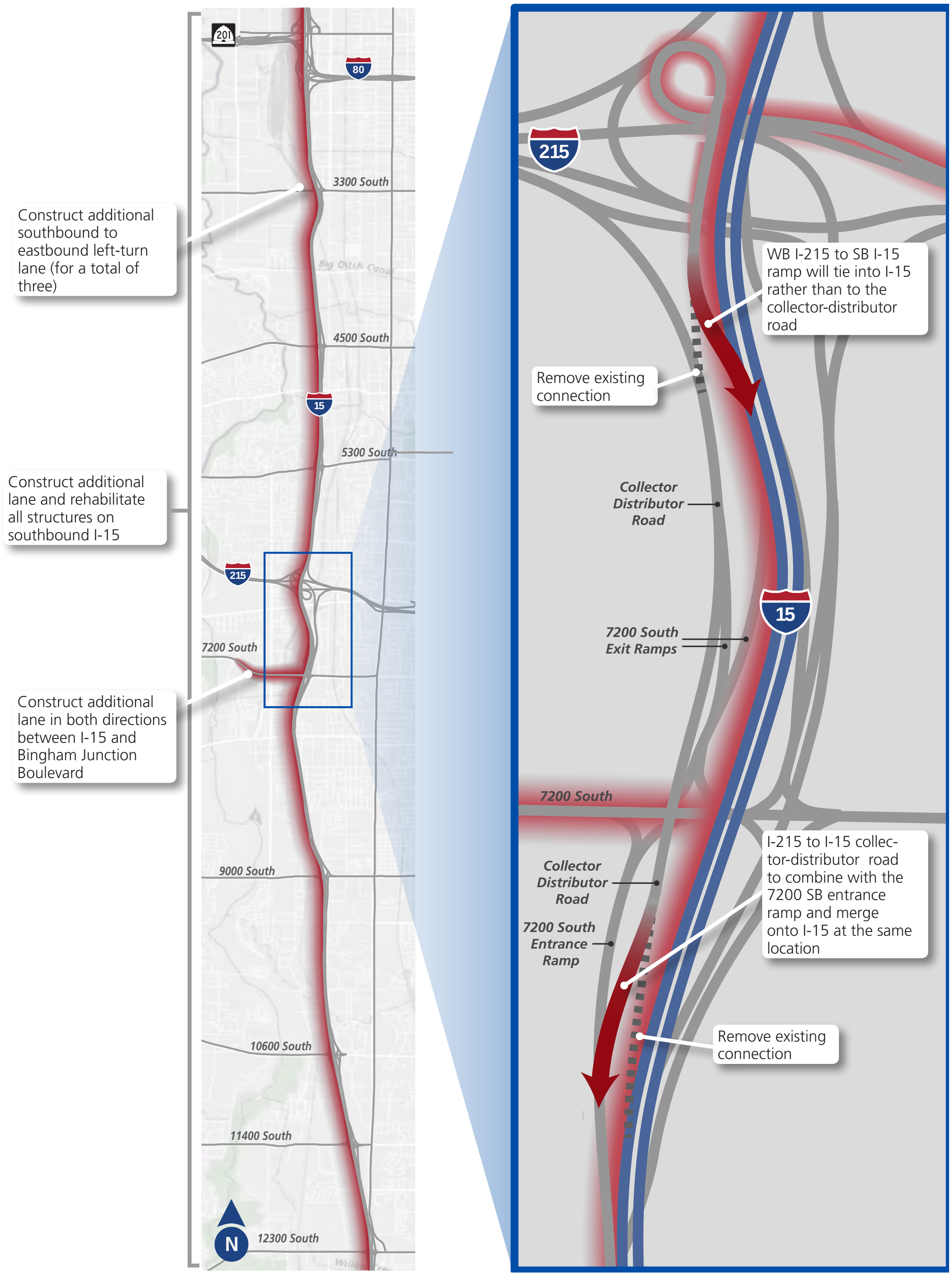


Figure 2-11. Preferred Alternative

Chapter Three: Affected Environment and Environmental Consequences

This chapter describes the existing environmental, social, and economic conditions within the study area and how these conditions would be affected by the No-action Alternative and the Preferred Alternative. Existing conditions were identified based on literature and data file searches; coordination with federal, state, and local agencies; and field investigations. Additional details relating to technical research performed in the preparation of this State Environmental Study (SES) that are not discussed in this document are included in the project records.

Each environmental resource was evaluated for direct, indirect, and cumulative impacts, including appropriate avoidance, minimization and mitigation measures. Types of impacts are explained in the following definitions and illustrated in Figure 3-1:

- **Direct impacts** are caused by the project and occur at the same time and place (40 CFR §1508.8). These impacts are discussed in each resource area subsection.
- **Indirect impacts** are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR §1508.8). Indirect impacts are generally not quantifiable but can be reasonably predicted to occur. These impacts are discussed in each resource area subsection.
- **Cumulative impacts** are the impacts to the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR §1508.7). These impacts are discussed in Section 3.24 of this Chapter.

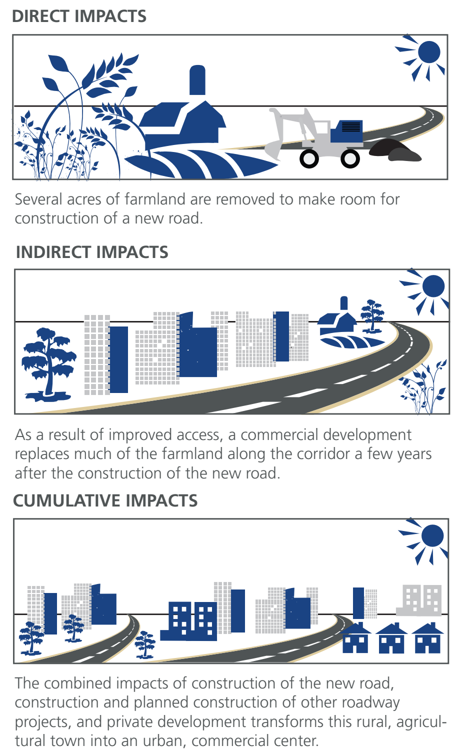


Figure 3-1. Types of Impacts

The study area is defined in Chapter 1 (see Figure 1-1). The study area may vary for individual resources, depending on the characteristics of the individual resource. Unless otherwise noted, the study area for each resource is the study area defined in Figure 1-1.

3.1 LAND USE

The Utah State Legislature has delegated responsibility for land use planning to local governments (Utah Code 17-27a-102). Zoning maps and general plans show the current and planned uses within the cities of South Salt Lake, Millcreek, Murray, Midvale, South Jordan, Sandy, and Draper. These maps and plans are used, in conjunction with other documents, to identify community goals and priorities and to assist in decision making processes.

3.1.1 AFFECTED ENVIRONMENT

Current land uses adjacent to the I-15 corridor and 7200 South vary. The majority of the land uses are commercial or industrial, as would be expected next to a major freeway; however, there are also some residential neighborhoods. Residential uses are located on the west side of I-15 close to the I-215 interchange and also in Midvale from 7200 South to approximately 9000 South. Schools in the area include Grant Elementary School, Midvale Middle School, the Salt Lake Community College near 9800 South (Miller Campus), and the AmeriTech

College near 12300 South. Recreational facilities in the study area include the Living Planet Aquarium (see map 23 in Volume 2) and Top Golf (see map 25 in Volume 2). The zoning and land use plans for the study area are described below.

I-15 Southbound Current and Planned Zoning

Table 3-1. Current Zoning in the Study Area

I-15 Mainline Segment	Current Zoning
2100 South to 3300 South	Light industrial zoning.
Redfield Avenue to 3300 South	Business and commercial zoning.
3300 South to Archard Avenue	Commercial zoning.
Archard Avenue to 3900 South	Light industrial zoning.
3900 South to 4055 South	Light industrial zoning.
4055 South to 4800 South	General manufacturing zoning.
4800 South to 5100 South	Mixed use development zoning.
5100 South to 5300 South	General office and commercial office zoning.
5300 South to I-215	Commercial development, general office zoning, and residential (low density, single family).
I-2215 to 6800 South	Low and medium density single-family residential zoning.
6800 South to 7200 South	Clean industrial zoning.
7200 South to 7th Avenue	Clean industrial zoning.
7th Avenue to 1st Avenue	Single-family, residential zoning.
1st Avenue to Center Street/7800 South	Regional commercial zoning.
Center Street/7800 South to Wasatch Street	Regional commercial zoning and multi-family residential zoning.
Wasatch Street to 8360 South	Single-family and multi-family residential zoning and clean industrial zoning.
8360 South to 8600 South	Single-family residential zoning.
8600 South to 9120 South	Commercial zoning.
9120 South to 9800 South	Industrial and research development zoning.
9800 South to 10200 South	Office and mixed use zoning.
10200 South to 11400 South	Commercial zoning.
11400 South to 12300 South	Commercial and business park zoning.

Table 3-2. Planned Land Use in the Study Area

I-15 Mainline Segment	Planned Land Uses from General Plans
2100 South to 3300 South	Planned for continued light industrial zoning.
3300 South to Archard Avenue	Industrial zoning.
Archard Avenue to 3900 South	Planned for continued light industrial zoning.
3900 South to 4055 South	Continued light industrial.
4055 South to 4800 South	Continued industrial and commercial retail.
4800 South to 5100 South	Mixed use, then commercial retail, and office development.
5100 South to 5300 South	General office development.
5300 South to I-215	General office and commercial retail, then residential single family, low-density housing.
I-2215 to 6800 South	Continued residential single family low-density housing.

I-15 Mainline Segment	Planned Land Uses from General Plans
6800 South to 7200 South	Planned for government use.
7200 South to 7th Avenue	Continued planned clean industrial.
7th Avenue to 1st Avenue	Planned government use.
1st Avenue to Center Street/7800 South	Planned government use.
Center Street/7800 South to Wasatch Street	Planned clean industrial and multi and single family housing.
Wasatch Street to 8360 South	Planned multi and single family housing and clean industrial.
8360 South to 8600 South	Planned commercial development.
8600 South to 9120 South	Planned regional commercial district.
9120 South to 9800 South	Planned industrial and research and development.
9800 South to 10200 South	Planned central business district and office subdistrict.
10200 South to 11400 South	Commercial zoning.
11400 South to 12300 South	Planned growth area, industrial manufacturing, and community commercial zoning.

7200 South Current and Planned Zoning

Existing land use along the north side of 7200 South includes commercial and single-family residential housing. The south side of 7200 South is zoned for commercial purposes.

Planned land use along 7200 South is not expected to change from the existing land use designations and will remain commercial and single-family residential housing on the north side of 7200 South and commercial zoning on the south side of 7200 South.

3.1.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

<u>Direct Impacts</u>

The No-action Alternative would not directly impact land uses within the study area.

<u>Indirect Impacts</u>

The No-action Alternative would not have any indirect impacts on land use.

Preferred Alternative

<u>Direct Impacts</u>

The Preferred Alternative is consistent with the zoning and future land use plans for South Salt Lake, Millcreek, Murray, Midvale, South Jordan, Sandy, and Draper and would not directly impact existing or planned land uses.

The Preferred Alternative would not impact the Living Planet Aquarium or Top Golf (see maps 23 and 25 in Volume 2).

<u>Indirect Impacts</u>

The Preferred Alternative would not have any indirect impacts on land use.

3.1.3 MITIGATION

No mitigation required.

3.2 FARMLAND

The Farmland Protection Policy Act (FPPA)(7 CFR §658.2a) requires federal agencies to identify and account for adverse effects of their programs and policies on the preservation of farmlands, including identifying alternatives to lessen potential adverse impacts. Under the FPPA, the definition of prime, unique, or statewide important farmland excludes land already in or committed to urban development or water storage. Farmland already in urban development also includes lands identified as an "urbanized area" on the Census Bureau Map, an urban area on the US Geological Survey (USGS) topographical maps, or as "urban-built-up" on US department of Agriculture (USDA) Important Farmland Maps. Farmland "committed to urban development or water storage" also includes all such land that received a combined score of 160 points or less from the land evaluation and site assessment criteria.

Federal programs are also required to comply with State, local and private programs aimed at preserving farmland. In Utah Code Annotated, Title 17, Chapter 41, the State of Utah allows for the formation of Agricultural Protection Areas (APAs). Areas so designated are protected for the production of commercial crops, livestock, and livestock products.

3.2.1 AFFECTED ENVIRONMENT

The study area is located within the Salt Lake City-West Valley City, Utah Urbanized Area, as per the 2010 Census maps. Therefore, there is no prime or unique farmland, or farmland of statewide importance within the study area. In addition, a review of the study area found no APAs or actively farmed land.

3.2.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

Direct Impacts

The No-action Alternative would not impact farmland.

Indirect Impacts

The No-action Alternative would have no indirect impacts to farmland.

Preferred Alternative

Direct Impacts

The Preferred Alternative would not impact farmland.

Indirect Impacts

The Preferred Alternative would have no indirect impacts to farmland.

3.2.3 MITIGATION

No mitigation required.

3.3 SOCIAL IMPACTS AND ENVIRONMENTAL JUSTICE

Existing social and demographic characteristics of the population in the study area were analyzed for potential impacts to community cohesion and to identify the presence of populations that may experience heightened susceptibility to disturbance from the proposed project.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs federal agencies to take appropriate and necessary steps to identify and address disproportionately high and adverse effects from federal projects on the health or environment of minority and low-income populations to the greatest extent possible and permitted by law.

Fundamental Environmental Justice principles include the following:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- To prevent the denial of, reduction in, or substantial delay in the receipt of benefits by minority and low-income populations

Environmental Justice Populations are defined by FHWA Guidelines as any of the following groups:

- **Black** – A person having origins in any of the black racial groups of Africa
- **Hispanic** – A person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race
- **American Indian and Alaskan Native** – A person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognitions
- **Asian** – A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent
- **Native Hawaiian or Other Pacific Islander** – A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands
- **Low-Income** – A person whose household income (or in the case of a community or group, whose median household income) is at or below the Health and Human Services (HHS) poverty guidelines

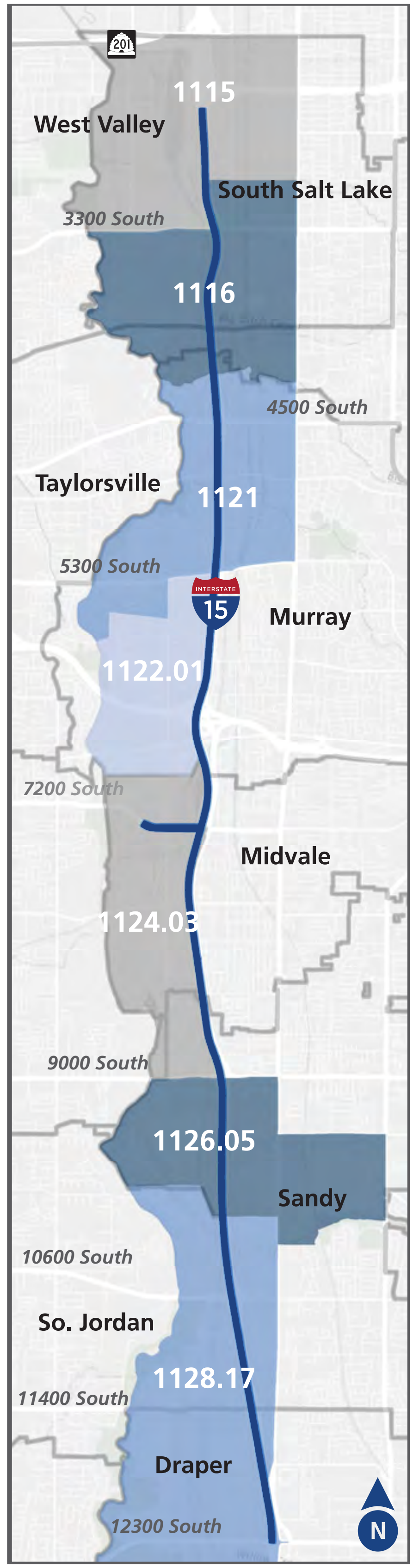


Figure 3-2. Census Tracts in Study Area

3.3.1 AFFECTED ENVIRONMENT

Census-Based Data Relating to Environmental Justice

Minority and Hispanic/Latino Populations

According to the 2010 Census data, the combined population of the cities adjacent to this study area totals 531,695. The US Census Bureau establishes geographies for conducting census studies. At the local level, these geographies are defined by state, county, city, census tract, block group, and block. For this analysis, the study area includes Census Tracts 1128.17, 1126.05, 1124.03, 1122.01, 1121, 1116, and 1115 (see Figure 3-2). These census tracts were compared to the overall census data in Salt Lake County. Selected social and demographic characteristics of the population are summarized in Table 3-3. Five of the census tracts in the study area (1128.17,1124.03, 1122.01, 1121, 1116, and 1115) are characterized by higher concentrations of Black or African American persons than the Salt Lake County average of 1.6%. Two census tracts (1128.17 and 1116) have a higher average of Asian persons than the Salt Lake County average of 3.3%.

Hispanic or Latino persons make up 10.8% of the overall population in Salt Lake County, but they represent much higher population levels in three tracts within the study area (1124.03,1116, and 1115). Percentages of Hispanic or Latino persons are particularly high in Tract 1124.03 (51.82%) and Tract 1115 (40.30%).

Low-Income Populations

The average percentage of persons below the poverty level in Salt Lake County is 10.8%. The percentage of individuals below the poverty level in the study area ranges between 4.1% and 32.6%. Census Tracts 1124.03 and 1116 have average percentages of 17.7% and 32.6% respectively and are the tracts with the highest percentage of individuals living below the poverty level.

Table 3-3. Selected Population Characteristics for South Salt Lake, Millcreek, Murray, Midvale, Sandy, Draper, and Salt Lake County

Characteristics	Tract 1 1128.17	Tract 2 1126.05	Tract 3 1124.03	Tract 4 1122.01	Tract 5 1121	Tract 6 1116	Tract 7 1115	Salt Lake County
Population (2010)	6347	6975	4473	5249	7264	7472	1749	1,029,581
Race (2010)								
White	89.02%	86.27%	60.30%	91.41%	84.47%	71.75%	66.28%	81.20%
Black or African American	1.32%	0.78%	2.41%	1.16%	2.89%	6.65%	3.29%	1.6%
Asian	3.66%	2.43%	1.27%	1.89%	2.42%	4.46%	3.01%	3.3%
Native Hawaiian or Other Pacific Islander	0.74%	1.40%	0.63%	0.23%	0.99%	1.42%	1.39%	1.5%
Hispanic or Latino (2010)	7.75%	11.94%	51.82%	7.37%	11.94%	26.53%	40.30%	17.1%
Persons below poverty level (percent in 2014)	8.6%	7.2%	17.7%	4.1%	17.8%	32.6%	13.6%	10.8%

The analysis of census tracts and the consideration of social impacts and environmental justice indicate that there is not a concentration of any environmental justice populations along the corridor in which direct impacts would occur.

3.3.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

Direct Impacts

The No-action Alternative would not impact social conditions and trends, nor would it have a disproportionately high and adverse effect on minority or low-income populations.

Indirect Impacts

The No-action Alternative would not result in any indirect impacts.

Preferred Alternative

Direct Impacts

Social Conditions

The Preferred Alternative would generally remain within the existing I-15 corridor right-of-way and there would be no removal of residential units, substantial encroachment into residential properties, or alteration of the general character of existing residential neighborhoods. As such, there appears to be no meaningful potential for disruptive social effects. No individuals or families would be confronted by either financial or social adjustment difficulties that can occur when relocations are necessary. In the absence of such relocation effects and with no alteration to roadway infrastructure within localized residential neighborhoods, there is no reason to anticipate changes to existing patterns of social interaction in neighborhoods located in proximity to the study corridor, or in the larger surrounding community. Levels of social integration and cohesion at the level of individual neighborhoods and in the broader local community would consequently not be altered as a result of changes to the I-15 corridor associated with the Preferred Alternative.

The addition of one southbound travel lane along the study corridor would in some locations reduce the distance between nearby residential units and neighborhoods and I-15 traffic. As a result, some homes located in close proximity to I-15 would experience increased exposure to traffic noise following the completion of construction activities (see Section 3.8 Noise). The potential for disturbance and increased dissatisfaction with traffic noise would be greatest in neighborhoods where housing units are already situated very close to I-15. The Preferred Alternative would replace existing noise walls in-kind, which would help mitigate noise effects in some areas.

Environmental Justice

Impacts from the Preferred Alternative, such as increases in noise levels and construction impacts, would be comparable for all residents in the study area. Homeless individuals or families using the Midvale location of The Road Home (a non-profit organization and shelter) has been identified as an environmental justice population within the study area (see map 26 in Volume 2). The Preferred Alternative would not require any right-of-way from The Road Home and would provide new pedestrian access in the form of stairs and a walkway to The Road Home from 7200 South. Stakeholder meetings with The Road Home have indicated that existing access to the facility must be maintained and that the creation of stairs and a walkway from 7200 South would facilitate pedestrian access and reduce trespassing onto railroad facilities and nearby businesses. Key personnel from The Road Home have requested to be added to the contact list and for coordination to continue throughout the process. They have specifically requested notification regarding any activity along 9th Avenue.

The Preferred Alternative would not result in the denial of, reduction in, or substantial delay in the receipt of the benefits of any federal programs, policies, or activities to Environmental Justice populations. Based on the above considerations, the Preferred Alternative would not have disproportionately high and adverse effects on minority and low-income populations.

<u>Indirect Impacts</u>

The Preferred Alternative would not result in any indirect impacts.

3.3.3 MITIGATION

No mitigation required.

3.4 RELOCATIONS AND RIGHT-OF-WAY ACQUISITION

Where property acquisition is necessary and state and/or federal funds are used, land owners are compensated under the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. If an individual is required to move as a result of a federal or federally assisted program, assistance will be provided. Relocation resources will be available to each relocated residence without regard to race, color, national origin, or sex in compliance with Title IV of the Civil Rights Act (42 USC §2000d, et seq.).

This relocations and right-of-way section will use the following definitions to analyze the impacts of relocations (see Figure 3-3):

- **Relocation:** This occurs when an existing structure would be within the right-of-way of the Preferred Alternative, the entire property needs to be acquired, and the residents or business would need to relocate.
- **Potential Relocation:** A situation in which a property would be directly affected by the project and an existing structure (excluding porches and garages) would be (1) close to the proposed right-of-way, or (2) would impair driveway access, but it is not clear whether the entire property needs to be acquired. By the end of the right-of-way acquisition phase, it will be determined whether each potential relocation is a full relocation or a partial acquisition. This determination depends on an independent evaluation of the property that includes any project related damage to buildings.
- **Partial Acquisition:** A process that generally occurs when a property is located within the proposed right-of-way, but the right-of-way is further away from an existing structure. For this type of impact, only a strip of land would need to be acquired. As with potential relocations, partial acquisitions could be refined during the right-of-way acquisition phase.

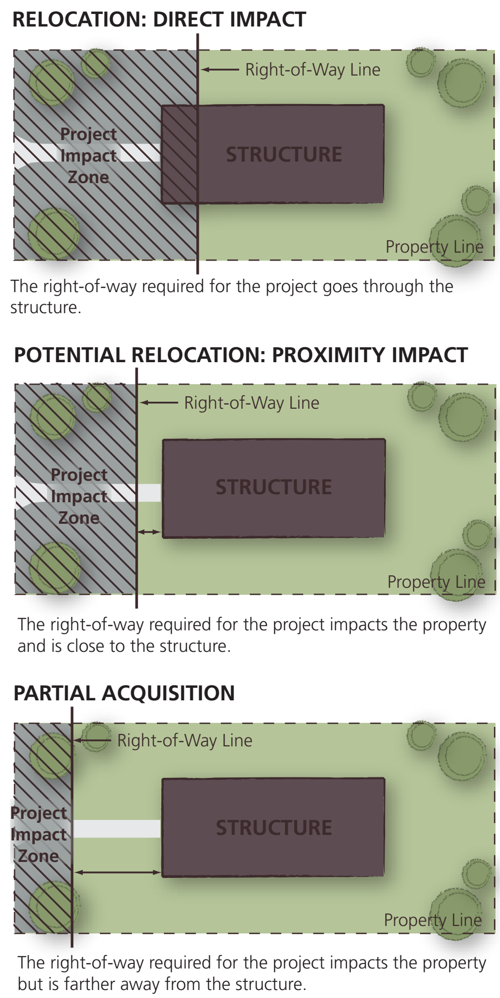


Figure 3-3. Relocation Definitions

3.4.1 AFFECTED ENVIRONMENT

The study area and the areas adjacent to the study area are mostly characterized by industrial, commercial, and residential land uses. See Section 3.1 Land Use for more detail.

3.4.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

Direct Impacts

The No-action Alternative would not require the acquisition of additional right-of-way or any relocations.

Indirect Impacts

There would be no indirect impacts as a result of the No-action Alternative.

Preferred Alternative

Direct Impacts

Under the Preferred Alternative, no relocations would be required. The roadway improvements would be mostly confined to within the existing roadway right-of-way, but some minor right-of-way acquisition may be required, as described below:

- *3645 South 500 West:* Acquire up to 15 feet of property to build retaining wall (see map 3 in Volume 2)
- *6063 South Sanford Drive*: Acquire up to 15 feet of property to build retaining wall (see map 10 in Volume 2)
- *City-owned property on the northwest corner of 7200 South and Bingham Junction Boulevard (Located adjacent to Top Golf and Maverik):* Acquire small amount of right-of-way (see map 25 in Volume 2)
- *Riverwalk Land Investment, 7141 Bingham Junction Boulevard and 7157 Bingham Junction Boulevard*: Acquire a small amount of right-of-way from both parcels (see map 25 in Volume 2)
- *Popeyes Louisiana Kitchen, 7149 Bingham Junction Boulevard*: Acquire small amount of right-of-way (see map 25 in Volume 2)
- *Sinclair/Holiday Oil, 7173 South 700 West*: Acquire small amount of right-of-way and reconfigure parking stalls (see map 26 in Volume 2)
- *Southeast corner of 700 West and 7200 South:* Acquire small amount of right-of-way (see map 26 in Volume 2)
- Potential minor right-of-way acquisitions may occur at all parcels adjacent to intersections on 7200 South due to radii and ramp improvements.

In addition to the minor right-of-way acquisition described above, properties adjacent to the Preferred Alternative may require temporary acquisition for construction activities.

Indirect Impacts

There would be no indirect impacts as a result of the Preferred Alternative.

3.4.3 MITIGATION

No mitigation required.

3.5 ECONOMICS

3.5.1 AFFECTED ENVIRONMENT

Local Economic Conditions

Salt Lake County has historically emphasized residential and agricultural land uses and focused commercial and business development in specified corridors and centers. According to the *United States Census Bureau 2014*, there are approximately 30,279 businesses in the County (excluding home occupation businesses).

Property tax and sales tax are the County's main sources of revenue. When combined, they represent over half of the County's total general fund revenue. The County continues to seek to reduce sales tax leakage to other counties and create local job opportunities through business development.

The majority of land within the study area is currently composed of industrial, commercial retail, and office developments. Salt Lake County's General Land Use Plan shows varied future land uses along the I-15/I-215 corridor. These land uses include general commercial office space, recreation areas, high density residential areas, and heavy and light industry uses.

3.5.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

Direct Impacts

Under the No-action Alternative, existing commercial activities and trends would continue to influence the local economy. Increased congestion on I-15 could hamper access to local businesses from the I-15 corridor; however, I-15 is a major thoroughfare through Salt Lake County and impacts to local businesses would be low. On 7200 South, traffic congestion may result in traffic shifting to other, less congested roadways.

Indirect Impacts

On 7200 South, increased congestion could make the corridor less attractive for certain types of businesses. However, any effect is likely to be small and ongoing development trends are expected to continue.

Preferred Alternative

Direct Impacts

The Preferred Alternative would not displace commercial and industrial businesses, would not acquire any parking stalls, nor would it change existing access locations. Current market forces and trends would continue to influence the local economy. The improvements to I-15 would improve traffic flow and mobility through the study area, which would make access to local businesses from the I-15 corridor easier for both the local and traveling commuter. On 7200 South, the additional capacity would reduce congestion and provide better access to businesses. The Preferred Alternative may have a slight benefit to the local economy in the long term by reducing congestion and making businesses more accessible.

Indirect Impacts

There would be no indirect impacts to economic conditions as a result of the Preferred Alternative.

3.5.3 MITIGATION

No mitigation required.

3.6 PEDESTRIAN AND BICYCLIST CONSIDERATIONS

Pedestrian and bicyclist considerations were analyzed in accordance with 23 USC §217 – Bicycle and Pedestrian Walkways, which states that transportation projects shall provide consideration for safety and contiguous routes for bicyclists and pedestrians. Pedestrian facilities are required to comply with the Americans with Disabilities Act (ADA) of 1990.

3.6.1 AFFECTED ENVIRONMENT

Information on existing and planned trails and pedestrian facilities within the study area was obtained from the WFRC Priority Bicycle Plan and the Midvale City General Plan. Pedestrian and bicyclist access is not allowed on I-15; therefore, pedestrian and bicyclist facilities were considered only on 7200 South. Pedestrian facilities, primarily sidewalks, exist at every interchange along I-15, allowing pedestrians and bicyclists to cross the interstate corridor.

Existing Trails & Pedestrian Access Within or Nearby the Study Area

Jordan River Parkway Trail

The Jordan River Parkway Trail is a regional, multi-use trail (Class I) that is planned along or nearby the Jordan River from the Great Salt Lake to Utah Lake. Development and maintenance is divided among Salt Lake County and local municipalities. Near the study area in Midvale, the trail is a 10 ft asphalt trail primarily on the west side of the Jordan River (see map 25 in Volume 2).

Bicycle Facilities

Aside from the Jordan River Parkway Trail, 7200 South has periodic shoulders wide enough for bicycles, but these are not continuous.

Sidewalks

Sidewalks are present on 7200 South and all other roadways in the study area.

Planned Trails & Pedestrian Access Within or Nearby the Study Area

No pedestrian facilities are currently shown on local or regional plans. The Midvale General Plan shows a potential bikeway along the TRAX light-rail line, but no facilities on 7200 South.

3.6.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

Direct Impacts

Under the No-action Alternative no change would be made to existing or planned trails and pedestrian access within the study area.

Indirect Impacts

No indirect impacts to pedestrian or bicycle facilities are anticipated as a result of the No-action Alternative.

Preferred Alternative

Direct Impacts

The Preferred Alternative would maintain or relocate sidewalks along 7200 South. Pedestrian facilities would be maintained at all interchanges affected by the project. No other existing or planned pedestrian facilities would be affected by the project.

Indirect Impacts

No indirect impacts to pedestrian or bicycle facilities are anticipated as a result of the Preferred Alternative.

3.6.3 MITIGATION

No mitigation required.

3.7 AIR QUALITY

Air quality is assessed on both the regional and project levels. The regional level analysis for this SES includes Salt Lake County, Utah. The project level analysis encompasses the project study area.

3.7.1 REGULATORY BACKGROUND

National Ambient Air Quality Standards

The Clean Air Act Amendments (CAAA) of 1990 (42 USC 7401 et seq.) established the National Ambient Air Quality Standards (NAAQS) for airborne pollutants. The six criteria pollutants addressed in the NAAQS are carbon monoxide (CO), particulate matter (PM), ozone (O_3), nitrogen dioxide (NO_2), lead (Pb), and sulfur dioxide (SO_2). Particulate matter is broken into two categories: particulate matter with a diameter of 10 micrometers or less (PM_{10}) and particulate matter with a diameter of 2.5 micrometers or less ($PM_{2.5}$). Current NAAQS are shown in Table 3-4.

Table 3-4. National Ambient Air Quality Standards

Pollutant	Primary/ Secondary	Level	Averaging Time	Violation Determination
Carbon Monoxide (CO)	Primary	9 ppm	8 hours	Not to be exceeded more than once per year
		35 ppm	1 hour	
Lead (Pb)	Primary/ Secondary	0.15 µg/m³	Rolling 3-Month Average	Not to be exceeded
Nitrogen Dioxide (NO_2)	Primary/ Secondary	53 ppb	Annual	Annual mean
	Primary	100 ppb	1 hour	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
Particulate Matter (PM_{10})	Primary/ Secondary	150 µg/m³	24 hours	Not to be exceeded more than once per year on average over 3 years
Particulate Matter ($PM_{2.5}$)	Primary/ Secondary	35 µg/m³	24 hours	98th percentile, averaged over 3 years
	Primary	12.0 µg/m³	Annual	Annual mean, averaged over 3 years
	Secondary	15.0 µg/m³	1 year	Annual mean, averaged over 3 years
Ozone (O_3)	Primary/ Secondary	0.070 ppm	8 hours	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Sulfur Dioxide (SO_2)	Primary	75 ppb	1 hour	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	0.5 ppm	3 hours	Not to be exceeded more than once per year

Source: EPA (as of January 30, 2017 (https://www.epa.gov/criteria-air-pollutants/naaqs-table)

*Final rule signed October 1, 2016, and effective December 28, 2016.

Note: Units of measure for the standards are parts per million (ppm) and parts per billion (ppb) by volume, milligrams per cubic meter of air (mg/m³), and micrograms per cubic meter of air (µg/m3). Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

If the levels of the criteria air pollutants exceed the NAAQS, then the area is designated a non-attainment area and the development of a State Implementation Plan (SIP) is required. The SIP sets allowable emissions levels to be met and identifies control strategies to meet the NAAQS for those specific criteria pollutants that experienced exceedances. All proposed transportation projects must conform to the SIP. The Transportation Conformity Rule (40 C.F.R. parts 51 and 93) sets forth the standards and guidelines for determining conformity of a proposed transportation project with the SIP. Air quality analysis occurs at both the regional and project level.

Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary source (e.g., factories or refineries). Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. The seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) are:

- Acrolein
- Benzene
- 1.3-butadiene
- Diesel exhaust particulate matter plus diesel exhaust organic gases (diesel PM)
- Formaldehyde
- Naphthalene
- Polycyclic organic matter

Greenhouse Gases

The issue of global climate change is an important national and global concern that is being addressed in several ways by the federal government. The transportation sector is the second-largest source of total greenhouse gases (GHGs) in the United States and the largest source of carbon dioxide (CO_2) emissions, the predominant greenhouse gas. In 2004, the transportation sector was responsible for 31% of all CO_2 emissions produced in the United States. The principal anthropogenic (human-made) source of carbon emissions is the combustion of fossil fuels, which account for about 80% of anthropogenic emissions of carbon worldwide. Almost all (98%) of transportation-related greenhouse gas emissions result from the consumption of petroleum products such as gasoline, diesel fuel, jet fuel, and other residual fuels.

3.7.2 AFFECTED ENVIRONMENT

Climate

The study area is located in the southern portion of Salt Lake County between the Oquirrh and the Wasatch Mountains and is at an elevation of approximately 4400 feet above mean sea level. The climate is characterized as subhumid, with dry summers and wet winters. The Wasatch Range of the Rocky Mountains to the east and northeast helps block cold waves from polar highs. The Great Salt Lake, located to the west of Salt Lake City, contributes to precipitation and lake-effect snow. Salt Lake County experiences large variation in temperatures between the seasons. Summers are hot, frequently reaching above 100 degrees Fahrenheit (38 degrees Celsius) while winters are cold and snowy, but rarely frigid. Salt Lake County and the study area frequently experience severe inversion events during the winter months. The surrounding mountain ranges trap cold air and pollution from inversion conditions within the Salt Lake Valley and decrease air quality.

Attainment Status

For this project, the study area for air quality analysis was limited to the I-15 corridor from between SR-201 and 12300 South in Salt Lake County and 7200 South between I-15 and Bingham Junction Boulevard in Midvale, as this is the area where transportation improvements would be implemented. According to the WFRC Air Quality Memorandum #35 dated January 26, 2017 (see Appendix A), the study area is located in a nonattainment area for particulate matter (PM_{10} and $PM_{2.5}$) and for sulfur, and in a maintenance area for ozone. It is not in a nonattainment or maintenance area for carbon monoxide.

Existing Air Quality Data

The Utah Division of Air Quality (UDAQ) maintains a network of air quality monitoring stations throughout the area. In general, these monitoring stations are located where there are known air quality problems, usually in or near urban areas or close to specific emission sources. Other stations are located in remote areas to provide an indication of regional air pollution levels. Data from Salt Lake City Monitoring Hawthorne Station # 49-035-3006 (located at 1675 South 600 East, Salt Lake City) was used to compile air quality data for the years of 2010-2015 (see Table 3-5). See also the *Utah Air Quality Monitoring Network Five-year Network Assessment,* issued by UDAQ in June 2016.

Table 3-5. Pollutant Data from Salt Lake City Monitoring Hawthorne Station #49-035-3006

Pollutants		2010	2011	2012	2013	2014	2015
CO	8-hour (ppm)	2.2	1.7	2.7	1.9	1.9	1.8
	1-hour (ppm)	4.5	3.1	12.46	3.13	3.14	3.44
NO_2	1-hour (ppb)	57	57.0	54.0	62.0	48	52.0
O_3	8-hour (ppm)	.065	.075	.078	.077	.072	.081
PM_{10}	24-hr (μg/m3)	278	86	78	110	110	80
PM_{25}	24-hr (μg/m3)	49.9	38.5	26	58.8	43.3	29.3

3.7.3 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

Vehicle emission rates would continue to improve due to increasingly tougher EPA regulations regarding vehicle emissions, which would help to improve air quality in the study area. There would be no construction activities, so no temporary increase in particulate matter related to such activities would occur. The No-action Alternative would have a slight increase in per vehicle emissions due to continuing congestion and delays in the study area; however, the increase from the congestion would be more than offset by the improved vehicle emission rates.

Transportation Conformity

A regional level analysis looks at the Long-Range Transportation Plan (LRTP) to see that all of the projects included in the LRTP, including the proposed project, conform to the control strategies and emissions levels set in the SIP. An individual project is said to conform to the SIP if, both by itself and in combination with the other planned transportation projects in the plan, it would not result in any of the following conditions (see 40 CFR 93.116):

- New violations of the NAAQS
- Increases in the frequency or severity of existing violations of the NAAQS
- Delays in attaining the NAAQS

Utah does not currently have an approved SIP for PM2.5. Because Utah does not currently have an approved SIP for PM2.5, interim conformity requirements apply, which require that future NOx emissions (a precursor to PM2.5) and primary particulate emissions not exceed 2008 levels. NOx is a generic term for the mono-nitrogen oxides NO and NO2 (nitric oxide and nitrogen dioxide) and are produced from the reaction among nitrogen, oxygen and even hydrocarbons (during combustion), especially at high temperatures.

Based on the air quality conformity analysis conducted by the WFRC for the 2040 Regional Transportation Plan and the Air Quality Memorandum #35 dated January 26, 2017 (see Appendix A for Air Quality Memorandum), all the transportation projects in the 2016-2040 RTP conform to the SIP or the EPA interim conformity guidelines. This project is identified in Phase 1 of WFRC's 2016-2040 Regional Transportation Plan (RTP) (a financially-constrained long-range plan).

For PM_{10}, the Air Quality Memorandum #35 demonstrates that projected mobile source emissions are within the emissions budget defined in the SIP for Salt Lake County. For $PM_{2.5}$, Air Quality Memorandum #35 demonstrates projected mobile source emissions of NOx in the five-county $PM_{2.5}$ non-attainment area are less than 2008 NOx. Additionally, direct particle emissions of $PM_{2.5}$ are less than 2008 $PM_{2.5}$ emissions.These standards are required under the interim conformity requirements that are currently applicable to this area. Further, with support from WFRC, the Utah Division of Air Quality has been developing a new plan (or a new section of the SIP) to reduce $PM_{2.5}$ related emissions to the point that the Wasatch Front Region will once again be in compliance with national $PM_{2.5}$ standards. The improved vehicle emission technology and national standards enacted in 2004 and 2007 respectively will be instrumental in the DAQ plan to achieve the new $PM_{2.5}$ standard.

Project Level Analysis

Project level analysis is performed when a project is located in a non-attainment area for CO or PM_{10} /$PM_{2.5}$ or in an area that was previously designated as non-attainment but has been subsequently redesignated as attainment, otherwise known as a maintenance area. Project level analysis may consist of either a qualitative or quantitative analysis or both.

Carbon Monoxide

A project level (“hot-spot”) analysis is required for CO if:

- A location is currently in a non-attainment or maintenance area and the project is experiencing LOS D or worse, or
- A location is currently in a non-attainment or maintenance area and the project is expected to result in LOS D or worse in the design year

The study area is not located in a non-attainment area for CO; therefore, no project level analysis is required under transportation conformity rules.

Particulate Matter

A quantitative analysis for PM_{10} and $PM_{2.5}$ is only required for a “project of air quality concern” (see 40 CFR Section 93.123(b)(1)). Projects of air quality concern are certain highway and transit projects that involve a significant level of diesel vehicle traffic or any other project that is identified in the $PM_{2.5}$ or PM_{10} SIP as a localized air quality concern. Examples of projects of air quality concern include the following:

- new or expanded highway projects that have a significant number of or significant increase in diesel vehicles;
- projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
- new bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location) expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location;
- projects in or affecting locations, areas, or categories of sites which are identified in the $PM_{2.5}$ or PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The FHWA provided examples of projects that would not be considered projects of air quality concern. See the Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM10 and PM2.5 Nonattainment and Maintenance Areas, issued March 2006. These examples included:

- Any new or expanded highway project that primarily services gasoline vehicle traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles), including such projects involving congested intersections operating at Level-of-Service D, E, or F;
- An intersection channelization project or interchange configuration project that involves either turn lanes or slots, or lanes or movements that are physically separated. These kinds of projects improve freeway operations by smoothing traffic flow and vehicle speeds by improving weave and merge operations, which would not be expected to create or worsen $PM_{2.5}$ or PM_{10} violations; and,
- Intersection channelization projects, traffic circles or roundabouts, intersection signalization projects at individual intersections, and interchange reconfiguration projects that are designed to improve traffic flow and vehicle speeds, and do not involve any increases in idling. Thus, they would be expected to have a neutral or positive influence on $PM_{2.5}$ or PM_{10} emissions.

This project is not exempt under either 40 CFR 93.126 or 40 CFR 93.128. Further, this project does not qualify as a project of air quality concern since it would not result in a significant increase in diesel traffic in the study area. See the Project of Air Quality Concern (POAQC) Memo in Appendix A. The project is not expected to influence the vehicle mix in the study area nor attract a significant number of new diesel vehicles to the area. The project involves improvements to the I-15 corridor from SR-201 to 12300 South and 7200 South from Bingham Junction Boulevard to I-15 to address current and future traffic congestion and travel demand. The project is intended to improve traffic flow and vehicle speeds and reduce delays along the I-15 corridor and 7200 South in the study area, including delays at the intersections on 7200 South. This project is not a project of air quality concern. Since the project has been determined to not be a project of air quality concern, no project level analysis is required for conformity purposes.

Construction-Related Fugitive Dust

Construction-related dust is not identified in the Utah SIP as a Contributor to the PM_{10} non-attainment area. Therefore, there is no conformity requirement for construction dust. Section 93.122(d) (1) of 40 CFR reads as follows:

> "For areas in which the implementation plan does not identify construction-related fugitive PM_{10} as a contributor to the non-attainment problem, the fugitive PM_{10} emissions associated with highway and transit project construction are not required to be considered in the regional emissions analysis."

In the Utah PM_{10} SIP, construction-related PM_{10} is not included in the inventory, nor is it included in the attainment demonstration or control strategies.

Control of construction-related PM_{10} emissions are mentioned in qualitative terms in Section IX.A.7 of the SIP as a maintenance measure to preserve attainment of the PM_{10} standard achieved by application of the control strategies identified in the SIP. Section IX.A.7.d of the SIP requires UDOT and local planning agencies to cooperate and review all proposed construction projects for impacts on the PM10 standard. This SIP requirement is satisfied through the Utah State Air Quality Rules. R307-309-4 requires that sponsors of any construction activity file a dust control plan with the State Division of Air Quality.

Mobile Source Air Toxics (MSAT)

MSAT analysis is based upon the Interim Guidance Update on MSAT in NEPA (December 6, 2012). FHWA developed a three-tiered approach for analyzing MSAT in NEPA documents, depending on specific project circumstances.

Tier 1 – No potential for meaningful MSAT effects or exempt projects: No analysis is required, only documentation that the project qualifies as a categorical exclusion or an exempt project

- Projects that qualify as a CE under 23 CFR 771.117(c)
- Projects exempt under the CAA conformity rule (40 CFR 93.126)
- Projects with no meaningful impacts on traffic volumes or vehicle mix

Tier 2 – Low potential for meaningful MSAT effects: A qualitative analysis is required

- Defined as any project not meeting Tier 1 or Tier 3 standards types of projects and are those that serve to improve operations of highway, transit or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions
- Examples include the following:
  - Minor widening
  - New interchanges
  - Projects where design-year traffic projected to be less than 140,000 to 150,000 AADT

Tier 3 – Higher potential for meaningful MSAT effects: A quantitative analysis is required, analyzing all seven priority MSATs

- Potential for meaningful differences in MSAT emissions among project alternatives, including:
  - New or additional roadway capacity with traffic volumes of 140,000 to 150,000 AADT or greater in the design year, and
  - Located in proximity to populated areas or, in rural areas, in proximity to vulnerable populations (near schools, nursing homes, hospitals, etc.)

The improvements included in the project are intended to improve speed and reduce delays in the study area and to improve the operation of I-15 and 7200 South without adding substantial new capacity or otherwise having a meaningful impact on MSAT emissions. One additional southbound lane would be added to I-15 in the study area, one additional southbound to eastbound turning lane would be added to the 3300 South Interchange, and one additional travel lane would be added on 7200 South in both directions between I-15 and Bingham Junction, as well as improvements to the I-215 Interchange. I-15 in the study area already consists of five travel lanes plus an HOV, lane so the additional travel lane would not qualify as substantial. On 7200 South, the additional travel lanes would improve the operation of the intersections for 2040 travel demand traffic and would not constitute a substantial improvement; therefore, a qualitative MSAT analysis under Tier 2 was performed.

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled "A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives," found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm.

For the proposed project under all of the alternatives, including the No-action Alternative, the amount of MSATs emitted would be proportional to the vehicle miles traveled (VMT), assuming that other variables such as fleet mix are the same for each alternative. No appreciable difference was identified in VMT between the No-action and the Preferred Alternative; however, it is likely that the proposed improvements would increase the efficiency of the roadway and therefore attract rerouted trips from elsewhere in the transportation network. Because the estimated VMT under each of the Alternatives are approximately the same, it is expected there would be no appreciable difference in overall MSAT emissions among the alternatives (see Table 3-6).

Table 3-6. Difference in VMT and VHT

Scenario	VMT (Daily)	Difference	Percent Change
Existing (2016)	3,808,000	NA	NA
2040 No-action	4,754,000	946,000	24.8%
2040 Preferred	4,829,500	1,021,500	26.8%

Also, regardless of the build alternative chosen, emissions would likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

The transportation improvements contemplated as part of the Interchange Alternatives would have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT could be higher under certain Build Alternatives than the No-action Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections along the I-15 corridor and in conjunction with 7200 South under all of the build alternatives. However, the magnitude and the duration of these potential increases compared to the No-action Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No-action Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, would over time cause substantial reductions that, in almost all cases, would cause region-wide MSAT levels to be substantially lower than today.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis
In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings, cancer in animals, and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/

view.php?id=282), or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts, each step in the process builds on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame since such information is unavailable.

Given that some of the information needed unavailable, it is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways, to determine the portion of time that people are actually exposed at a specific location, and to establish the extent attributable to a proposed action.

There are many uncertainties in existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, as expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response which are better suited for quantitative analysis.

Climate Change

Climate change is a critical national and global concern. Human activity is changing the earth's climate by causing the buildup of heat-trapping greenhouse gas emissions through the burning of fossil fuels and other human activities. Carbon dioxide (CO_2) is the largest component of human produced emissions; other prominent emissions include methane (CH_4), nitrous oxide (N_2O), and hydrofluorocarbons (HFCs). These emissions are different from criteria air pollutants since their effects in the atmosphere are global rather than localized, and also since they remain in the atmosphere for decades to centuries, depending on the species.

The National Climate Assessment (NCA), released by the U.S. Global Change Resource Program, contains scenarios for regions and sectors, including energy and transportation. These scenarios discuss potential impacts that may result from climate change, broken down into nationwide sectors or by region of the county. The NCA includes Utah in the Southwest region. The scenario for this region states that this is the hottest and driest region with limited water resources. Climate change is anticipated to increase the heat in this region, affecting precipitation and snowpack. Therefore limiting the availability of water for agriculture, energy producers, and other consumers. The NCA scenario states that the decade of 2001-2010 was the warmest in the 110-year instrumental record, with temperatures almost 2 degrees F higher than historic averages and fewer cold air outbreaks. Regional annual average temperatures are projected to rise by 2.5 degrees F to 5.5 degrees F by 2041-2070 (so long as there is continued growth in global emissions) and 2.5 degrees F to 4.5 degrees F in the same period if global emissions are substantially reduced.

For the sector-based scenarios, the nationwide focus means that some of the identified potential impacts are not applicable to the study area (i.e., coastal impacts). Others are somewhat speculative at this point, as there are variations in the scenarios put forward. However, as stated in Chapter 5; Transportation of the NCA, "[c]limate change will affect transportation systems directly, through infrastructure damage [such as accelerated asphalt deterioration, increased stress on expansion joints on bridges and highways, etc.], and indirectly, through changes in trade flows, agriculture, energy use, and settlement patterns." There may also be changes to snow removal needs and construction schedules.

Due to the location of the project in an urbanized area with minimal chances of flooding, hurricanes, or other major weather disruptions, there would be no appreciable climate-change related effects to this project versus the No-action Alternative. As for the resiliency of the infrastructure, the roadway structure will be designed to withstand adverse conditions for the anticipated lifespan of the infrastructure.

<u>Greenhouse Gases</u>

Greenhouse gas emissions have accumulated rapidly as the world has industrialized, with concentration of atmospheric CO_2 increasing from roughly 300 parts per million in 1900 to over 400 parts per million today. Over this timeframe, global average temperatures have increased by roughly 1.5 degrees Fahrenheit (1 degree Celsius), and the most rapid increases have occurred over the past 50 years.

Scientists have warned that significant and potentially dangerous shifts in climate and weather are possible without substantial reductions in greenhouse gas emissions. They commonly have cited 2 degrees Celsius (1 degree Celsius beyond warming that has already occurred) as the total amount of warming the earth can tolerate without serious and potentially irreversible climate effects. For warming to be limited to this level, atmospheric concentrations of CO2 would need to stabilize at a maximum of 450 ppm, requiring annual global emissions to be reduced 40-70% below 2010 levels by 2050 (see IPCC, 2014: Climate Change 2014: Synthesis Report Summary for Policymakers. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change).

State and national governments in many developed countries have set GHG emissions reduction targets of 80 percent below current levels by 2050, recognizing that post-industrial economies are primarily responsible for GHGs already in the atmosphere. As part of a 2014 bilateral agreement with China, the U.S. pledged to reduce GHG emissions 26-28 percent below 2005 levels by 2025; this emissions reduction pathway is intended to support economy-wide reductions of 80 percent or more by 2050 (see "U.S.-China Joint Announcement on Climate Change," White House, Office of the Press Secretary, November 11, 2014, on the White House website, https://www.whitehouse.gov/the-press-office/2014/11/11/us-china-joint-announcement-climate-change, accessed December 22, 2016). Further, as reported in the New York Times (http://mobile.nytimes.com/2016/12/13/world/europe/climate-change-accord-paris.html?_r), the representatives of 195 nations reached a landmark accord on December 12, 2016 that commits nearly every country to lowering GHG emissions in order to stave off an increase in atmospheric temperatures of 2 degrees Celsius or 3.6 degrees Fahrenheit.

GHG emissions from vehicles using roadways are a function of distance travelled (expressed as vehicle miles travelled, or VMT), vehicle speed, and road grade. GHG emissions are also generated during roadway construction and maintenance activities. An estimate of GHG emissions in the study area is contained in Table 3-7, which shows that GHG emissions are expected to decrease from existing (2016) conditions to the design year of 2040 by approximately 28.18%.

Table 3-7. Comparison of 2016 and 2040 GHG Emission Estimates

Scenario	Daily VMT	Change in Daily VMT	Percent Change in Daily VMT	GHG Emissions (lbs/day)*	Percent Change in GHG Emissions
2016 Travel Demand	3,808,000	NA	NA	3,662,915.1	NA
2040 Travel Demand (No-action Alternative)	4,754,000	946,000	24.8%	2,595,427.1	-29.14%
2040 Travel Demand (Preferred Alternative)	4,829,500	1,021,500	26.8%	2,636,651.5	-28.18%

**GHG Emissions Factor of 20.2 lbs/gallon*

This project involves minor widening intended to improve traffic flow in the study area and would not result in any meaningful changes to VMT, traffic speeds or to the road grade between alternatives. Further, EPA's GHG emissions standards, implemented in concert with national fuel economy standards, would also help minimize GHG emissions. The Energy Information Administration (EIA) projects that vehicle energy efficiency (and thus, GHG emissions) on a per-mile basis will improve by 28% between 2012 and 2040. Thus, the study area will see a net reduction in GHG emissions under any of the alternatives.

Construction and subsequent maintenance of the project will generate GHG emissions. Preparation of the roadway corridor (e.g., earth-moving activities) involves a considerable amount of energy consumption and resulting GHG emissions; manufacture of the materials used in construction and fuel used by construction equipment also contribute GHG emissions. Typically, construction emissions associated with a new roadway account for approximately 5% of the total 20-year lifetime emissions from the roadway, although this can vary widely with the extent of construction activity and the number of vehicles that use the roadway.

Conclusion

The proposed project would not result in new violations of the NAAQS, increases in the frequency or severity of existing violations of the NAAQS, or delays in attaining the NAAQS.

Indirect Impacts

The Preferred Alternative would have a small positive impact on air quality by reducing congestion on southbound I-15 and other major roadways. Additional capacity could decrease emissions from stop-and-go traffic, vehicle idling, and reduced speeds during periods of heavy traffic on adjacent roadways.

3.7.4 MITIGATION

No mitigation is required.

3.8 NOISE

A preliminary noise analysis was completed in accordance with 23 CFR §772 and UDOT Noise Abatement Policy, last revised March 2017. The preliminary noise analysis is summarized below.

3.8.1 AFFECTED ENVIRONMENT

Traffic noise is measured in A-weighted sound levels in decibels (dBA), which most closely approximates the way the human ear hears sounds at different frequencies (see Figure 3-4). Since traffic noise varies over time, the sound levels for this noise analysis are expressed as "equivalent levels" or Leq, representing the average sound level over a one hour period of time. Unless noted otherwise, all sound levels in this noise analysis are expressed in the hourly equivalent noise level.

UDOT has established Noise Abatement Criteria for several categories of land use activities (see Table 3-8). UDOT's noise criteria is based on sound levels that are considered to be an impact to nearby property owners, also known as receptors. Primary consideration is to be given for exterior areas where frequent human use occurs.

UDOT has developed a Noise Abatement Policy for transportation projects, which conforms to FHWA noise abatement requirements outlined in 23 CFR §772. UDOT's Noise Abatement Policy states that a traffic noise impact occurs when either 1) the future worst case noise level is equal to or greater than the UDOT Noise Abatement Criteria for specified land use categories or, 2) the future worst case noise level is greater than or equal to an increase of 10 dBA over the existing noise level (see Table 3-8).

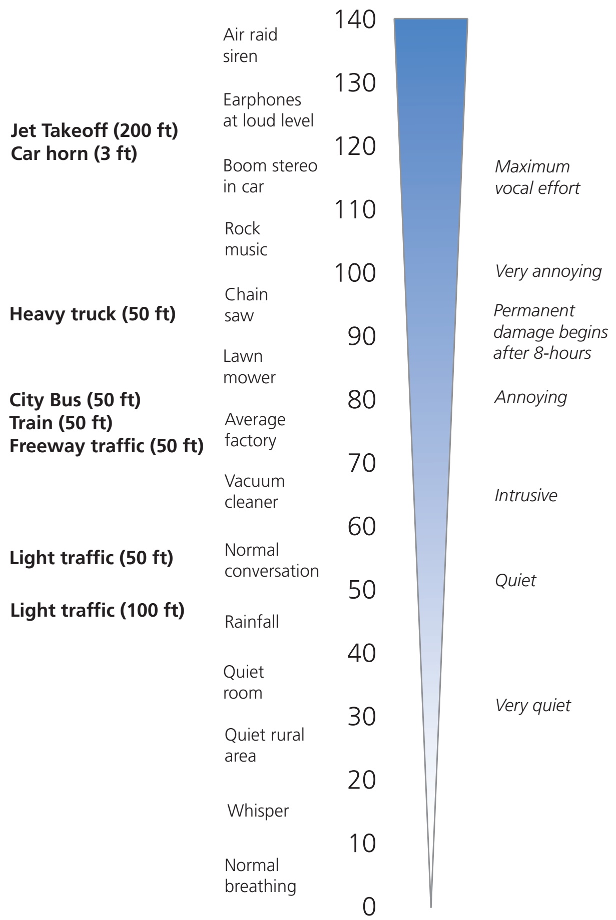


Figure 3-4. Sound Levels (in dBA) of Common Sounds (Compiled from Federal Transit Administration and Environmental Protection Agency Data)

Table 3-8. Noise Abatement Criteria

Activity Category	FHWA Criteria Leq(h)	UDOT Criteria Leq(h)	Evaluation Location	Activity Description
A	57	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67	66	Exterior	Residential

Activity Category	FHWA Criteria Leq(h)	UDOT Criteria Leq(h)	Evaluation Location	Activity Description
C	67	66	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios trails and trail crossings.
D	52	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in Categories A-D or F
F	--	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	--	Undeveloped lands that are not permitted.

Noise impact and abatement analyses are required within Land Use Activity Categories A, B, C, D, and E (see Table 3-8) only when development exists or has been permitted (formal building permit issued prior to the date the final environmental decision document is approved). Activity Categories F and G include lands that are not sensitive to traffic noise. There are no impact criteria for these land use types and an analysis of noise impacts is not required.

There are no Activity Category A land uses within the study area. Activity Category B land uses include all residences. Activity Category C land uses within the study area include churches (multiple meetinghouses for the Church of Jesus Christ of Latter-day Saints, Calvary Church of Salt Lake, K2 Church), schools (American International School of Utah, Realms of Inquiry (private school), Stevens-Henager College, Columbia College, Oquirrh Mountain Phlebotomy School, Eagle Gate College, Grant Elementary School, Midvale Elementary School, MIdvale Middle School, Salt Lake Community College Miller Campus, Challenger School), parks (Hidden Village Park, Copperview Recreation Center Park, Midvale City Park), non-profit institutional structures (Humane Society, Alano Club, Utah Foster Care, The Road Home shelter), the Midvale City Cemetery, and Lone Peak Hospital. The interior of the churches, schools, hospital, and non-profit institutional structures would be considered Activity Category D. Activity Category E land uses include all other businesses, offices, restaurants, and hotels/motels located within the study area. The UDOT Noise Policy states that a noise impact analysis will not be required for Activity Categories F and G.

Existing Noise Levels

The primary source of noise in the study area is automobile and truck traffic on I-15, I-215, and other roadways in the area. Existing traffic sound levels for each receptor in the study area were calculated using the Traffic Noise Model (TNM) 2.5 software using existing conditions (travel lane configurations and the posted speed limit). Existing noise levels were determined using the greatest hourly traffic noise conditions likely to occur on a regular basis, or Level-of-Service (LOS) C traffic volumes.

On-site measurements were made to verify the accuracy of the model and are shown in Table 3-9. To verify that the model represents real-life conditions, the noise measurements must be within 3 dBA of the model's predicted noise level, using the traffic volumes and speeds actually present when the noise measurements were taken. For existing noise levels and figures see the Noise Report in Appendix A.

Table 3-9. Field Noise Measurements

Site #	Location	Field Noise Level (dBA)	TNM Output (dBA)	Difference
1	Econolodge, 8955 S. 255 W., Sandy, UT	63.3	63.0	0.3
2	Challenger School #2, 9424 S. 300 W., Sandy, UT	68.3	69.2	0.9
3	Private residence, 253 W. 9400 S., Sandy, UT	67.7	68.0	0.3
4	Windmill Cove Apts, 9551 S. Brandy Spring Lane, Sandy, UT	65.3	66.1	0.8
5	Private residence, 385 Gregson Ave., South Salt Lake, UT	67.6	70.3	2.7
6	Denny's restaurant, 420 W. 4500 S., Murray, UT	66.9	67.1	0.2
7	4700 S. Commerce Drive, Murray, UT	68.3	70.7	2.4
8	American International School, 4998 S. 360 W., Murray, UT	63.0	64.9	1.9
9	English Manor Apts., 532 Wasatch Avenue, Midvale, UT	68.8	70.3	1.5
10	The Road Home, 7200 South	64.5	67.3	2.8

3.8.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

<u>Direct Impacts</u>

Noise levels for the No-action Alternative would generally be the same as existing conditions.

<u>Indirect Impacts</u>

There would be no indirect impacts to noise levels in the study area as a result of the No-action Alternative.

Preferred Alternative

<u>Direct Impacts</u>

The Preferred Alternative would generally result in a slight noise level increase throughout the study area. The average increase in noise would be 0.4 dBA, with no receptor having an increase of more than 1.3 dBA (see the Noise Report in Appendix A). The number of receptors that would be impacted by traffic noise is 252 (see maps in Volume 2).

<u>Indirect Impacts</u>

There would be no indirect impacts to noise levels in the study area as a result of the Preferred Alternative.

<u>Noise Abatement</u>

According to the UDOT Noise Abatement Policy, specific conditions must be met before traffic noise abatement is implemented as part of the Preferred Alternative. Noise mitigation must be considered feasible and reasonable.

Some of the factors considered when determining if mitigation is feasible and reasonable include, but are not limited to, the following:

- **Engineering Considerations:** Engineering considerations such as safety, presence of cross streets, sight distance, access to adjacent properties, barrier height, topography, drainage, utilities, maintenance access and maintenance of the abatement measure must be taken into account as part of establishing feasibility.
- **Safety on Urban Non-Access Controlled Roadways:** To avoid a damaged wall from becoming a safety hazard in the event of a failure, wall height shall be no greater than the distance from the back of curb to the face of proposed wall.
- **Acoustic Feasibility:** Noise abatement must be considered "acoustically feasible". This is defined as achieving at least a 5 dBA highway traffic noise reduction for at least 50% of front-row receptors.
- **Noise Abatement Design Goal:** Every reasonable effort should be made to obtain substantial noise reductions. UDOT defines the minimum noise reduction (design goal) from proposed abatement measures to be 7 dBA or greater for at least 35% of front-row receptors.
- **Cost Effectiveness:** The cost used to determine reasonable mitigation for Activity Category B is $30,000 per benefited receptor. (A benefited receptor is a noise-sensitive receptor that is predicted to receive a minimum of 5 dBA of noise reduction as a result of noise abatement.) The cost used to determine reasonable mitigation for Activity Categories A, C, D, or E is $360 per linear foot.
- **Viewpoints of Property Owners and Residents:** As part of the final design phase, public balloting would take place if noise abatement measures appear to meet the criteria outlined in UDOT's Noise Abatement Policy.

Under UDOT's Noise Abatement Policy, only Type I projects are eligible for noise abatement measures. Type I projects are projects that include any of the following: the construction of a highway at a new location, the physical alteration of an existing highway that substantially alters its alignment, the addition of a through traffic lane, the addition of an auxiliary lane, or the addition or relocation of interchange lanes or ramps. The Preferred Alternative is a Type I project so noise abatement was considered.

3.8.3 MITIGATION

Traffic Management Measures

Traffic management measures include reducing speed or signing for the restriction of compression brakes. According to the Highway Traffic Noise Analysis and Abatement Policy and Guidance report produced by FHWA, a reduction in speed of more than 20 mph is necessary for a noticeable decrease in noise levels. Therefore, speed reduction is not a reasonable abatement measure for this project because it is not consistent with the roadway classification.

Noise Barriers

For a sound wall to be effective, it must be high enough and long enough to block the view of the noise source from the receptor's perspective. The *Highway Traffic Noise Analysis and Abatement Policy and Guidance* states that a good rule of thumb is that the noise barrier should extend four times as far in each direction as the distance from the receptor to the barrier. For instance, if the receptor is 50 feet from the proposed noise barrier, the barrier needs to extend at least 200 feet on either side of the receptor in order to shield the receptor from noise traveling past the ends of the barrier.

Noise walls were analyzed for more than 20 different locations along I-15 where noise impacts occur. The majority of these walls were not found to be reasonable or feasible. The farther away a receptor is from I-15, the less likely the 7 dBA reduction for at least 35% of front-row receptors criteria can be met. This is because a noise wall creates a noise "shadow zone" behind it. The shadow zone is where the noise benefits are the greatest. When a receptor is farther from a potential wall at the edge of I-15, the benefits are decreased. Additionally, solitary receptors or receptors that are widely spaced are also less likely to receive a noise wall because it takes a longer wall to create a noise reduction benefit and the cost effectiveness criteria cannot be met.

See below for a summary of the two recommended noise walls. A more detailed noise wall analysis is in the Noise Report in Appendix A.

Noise Wall 1

Noise Wall 1 would be located on the west side of I-15 near the 7200 South interchange. The noise wall would be constructed on the west side of the I-215 to I-15 Southbound Collector Ramp (see map 12 in Volume 2) and would extend from the approach to the bridge across 7200 South and continue for 1,100 feet. The wall would block noise from I-15 to The Road Home shelter for the homeless on the southwest corner of I-15 and 7200 South. A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for any of the front row receptors. A 16-foot wall would meet the acoustic feasibility requirements, reduce noise levels by 7 dBA for 50% of front row receptors, and would be cost-effective. This wall is found to be reasonable and feasible. A noise wall was also analyzed on the west side of the I-15 mainline, but it was found that a wall at this location would reduce noise at The Road Home receptors by less than 2 dBA. It is recommended that a 16-foot noise wall be constructed along the west side of the I-215 to I-15 Southbound Collector Ramp, pending the results of balloting by affected property owners and tenants.

A consideration for the property owners and tenants in their decision is that the proposed noise wall would be constructed on the east side of the UPRR/UTA tracks. It is possible that train noise might become more annoying as it reflects off the concrete sound wall toward the residences. This effect is impossible to model and it is unknown whether the increase in noise would be perceptible.

Noise Wall 2

Noise Wall 2 would be located on the west side of I-15 near the Wasatch Street bridge. The noise wall would extend approximately 1,200 feet as shown on map 14 in Volume 2. The wall would block noise from I-15 to the English Manor Apartments and three single-family homes on Wasatch Street and Allen Street. A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for any of the front row receptors. A 16-foot wall would meet the acoustic feasibility requirements, reduce noise levels by 7 dBA for 92% of front row receptors, and would be cost-effective. This wall is found to be reasonable and feasible. It is recommended that a 16-foot noise wall be constructed at this location, pending the results of balloting by affected property owners and tenants.

A consideration for the property owners and tenants in their decision is that the proposed noise wall would be constructed on the east side of the UPRR/UTA tracks. It is possible that train noise might become more annoying as it reflects off the concrete sound wall toward the residences. This effect is impossible to model and it is unknown whether the increase in noise would be perceptible.

All other existing noise walls impacted by the construction of the Preferred Alternative would be replaced "in-kind" consistent with the UDOT Noise Abatement Policy.

3.9 WETLANDS AND WATERS OF THE U.S.

The U.S. Army Corps of Engineers (USACE) administers and enforces Section 404 of the Clean Water Act (33 U.S.C. 1251). Under the Clean Water Act, waters of the U.S. (WOUS) are defined as waters currently or previously used for interstate or foreign commerce, all interstate waters, any waters in which the destruction could affect interstate or foreign commerce, all impoundments and tributaries of the previously mentioned waters, the territorial seas, and wetlands adjacent to WOUS. Wetlands are considered a subset of WOUS and, for the purposes of regulatory guidance, are considered special aquatic sites.

Under Section 404 of the Clean Water Act, no discharge of dredged or fill material is permitted in WOUS, if there is a less environmentally damaging practicable alternative. Executive Order 11990 (May 24, 1977) requires federal agencies to not undertake or provide assistance to activities that impact wetlands. If a project does impact wetlands, it must be determined by the head of the agency (1) that there is no practicable alternative to such construction, and (2) that the proposed action includes all practicable measures to minimize harm to wetlands, which may result from such use.

3.9.1 AFFECTED ENVIRONMENT

In compliance with Section 404 of the Clean Water Act and USACE policy, a wetland and waters of the U.S. inventory of the study area was conducted by Horrocks Engineers on May 17, 2016. The purpose of the inventory was to identify and map potential wetlands and non-wetland waters of the U.S. within the study area. A full wetland delineation was not conducted and a jurisdictional determination from the USACE was not issued.

Wetlands and Waters of the U.S.

Wetlands

One potential wetland (Wetland 5), totaling approximately 0.22 acre, was identified within the study area (see Map 25 in Volume 2). This wetland runs along the south side of 7200 South in an open storm drainage ditch, and will not be impacted by the proposed project. Four other potential wetlands were identified adjacent to the study area. Wetland 5 is the only wetland anticipated to be considered jurisdictional as any surface water would eventually flow to the Jordan River.

Detention Ponds

Along the western portion of I-15 and throughout the study area, there are ten large stormwater detention ponds which contain standing water and wetland vegetation around the edges. Five of the ten detention ponds, totaling approximately 2.9 acres, were identified within the study area (see maps in Volume 2). Standing water within the ponds is a direct result of stormwater run-off from adjacent roadways. This is supported by historic aerial imagery which shows that the ponds were excavated in upland areas. Furthermore, the detention ponds are isolated from, and lack any surface water connection to, waters of the U.S. Given these conditions, the detention ponds within the study area do not meet the USACE's definition of a wetland or a WOUS and are not considered jurisdictional. Five of the identified detention ponds were adjacent to the study area. As part of the proposed project, all ten of the detention ponds identified are going to be dredged to remove trash, sediment, and invasive vegetation to allow for greater storage capacity

Waters of the U.S.

Three perennial streams, Mill Creek, Big Cottonwood Creek, and Dry Creek (See Maps 1, 5, and 18 in Volume 2), were identified in the study area all which should be considered WOUS. Little Cottonwood Creek and the Jordan and Salt Lake Canal (See Maps 6 and 21 in Volume 2) are located just outside the study area, but are close enough to be worth noting as they are also likely jurisdictional waters.

3.9.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

Direct Impacts

The No-action Alternative would not impact wetlands or waters of the U.S.

Indirect Impacts

The No-action Alternative would not result in any indirect impacts to wetlands or waters of the U.S.

Preferred Alternative

Direct Impacts

Wetlands

The Preferred Alternative would involve roadway improvements in areas adjacent to identified wetlands, but would not require construction activities in the wetlands. Given these conditions, the Preferred Alternative would not impact wetlands.

Waters of the U.S.

The Preferred Alternative is estimated to impact approximately 230 linear feet (0.092 acres) of the identified WOUS. The culverts currently used to carry water under I-15 would need to be extended to allow for construction on the roadway. Impacts from the preferred Alternative are approximately 15 feet (0.01 acres) of Mill Creek, 15 feet (0.01 acres) of Big Cottonwood Creek, and 200 linear feet (0.08 acres) of Dry Creek.

Indirect Impacts

The Preferred Alternative would not result in any indirect impacts to wetlands or waters of the U.S.

3.9.3 MITIGATION

Permitting

Based on our understanding, impacts to WOUS will be approximately 0.09 acres, and no wetlands will be impacted by the Preferred Alternative. If it is determined that impacts to WOUS are greater than 0.10 acre, or that any wetlands are impacted, a joint Section 404 and Stream Alteration Permit will be completed for submittal to the Utah Division of Water Rights (UDWR) and the USACE. Compensatory mitigation will be required for any impacts to WOUS.

3.10 FLOODPLAINS

A floodplain is defined as a normally dry area surrounding a natural lake or river that is occasionally inundated by water and subject to periodic flooding. Floodplain impacts occur when a project encroaches on a 100-year floodplain (the area susceptible to 100-year floods), which in the case of roadways and other linear features, can be parallel or perpendicular crossings. Development in floodplains can reduce flood-carrying capacity and extend the flooding hazard beyond the developed area.

Federal Emergency Management

In response to escalating taxpayer costs for flood disaster relief, Congress established the National Flood Insurance Program (NFIP) as a voluntary mitigation program administered by the Federal Emergency Management Agency (FEMA). Under this program, the federal government makes flood insurance available in those communities that practice sound floodplain management. This incentive encourages state and local governments to develop and implement floodplain management programs.

Participating communities are required to review proposed development projects to determine if they are in identified FEMA floodplains. If a project is located in a mapped Special Flood Hazard Area, the project must obtain a Floodplain Development Permit (FDP) from the community before any proposed construction or development begins to ensure that the project meets the requirements of the NFIP.

If a project will cause changes to the FEMA floodplain, one or more FEMA documents must be updated. A Letter of Map Revision (LOMR) officially revises these documents. A LOMR is generally done after the completion of the project causing the changes. In certain situations, a Conditional Letter of Map Revision (CLOMR) must be obtained from FEMA. A CLOMR is FEMA's comment on a proposed project and how it would affect the existing floodplain.

A CLOMR does not have to be done as part of a FDP, but a community may require it before the permit is issued to show anticipated impacts. Further, a CLOMR is required if a proposed project changes the base flood elevations (BFEs) more than a predetermined amount (based on FEMA's minimum standards or more stringent community-adopted standards). FEMA has set a 1 foot increase in the 100-year-flood elevation as the upper limit of the allowable encroachment caused by a project.

Executive Order 11988, Floodplain Management

Executive Order 11988 and 23 CFR §650, Subpart A, provide guidance to federal agencies on projects with floodplains.

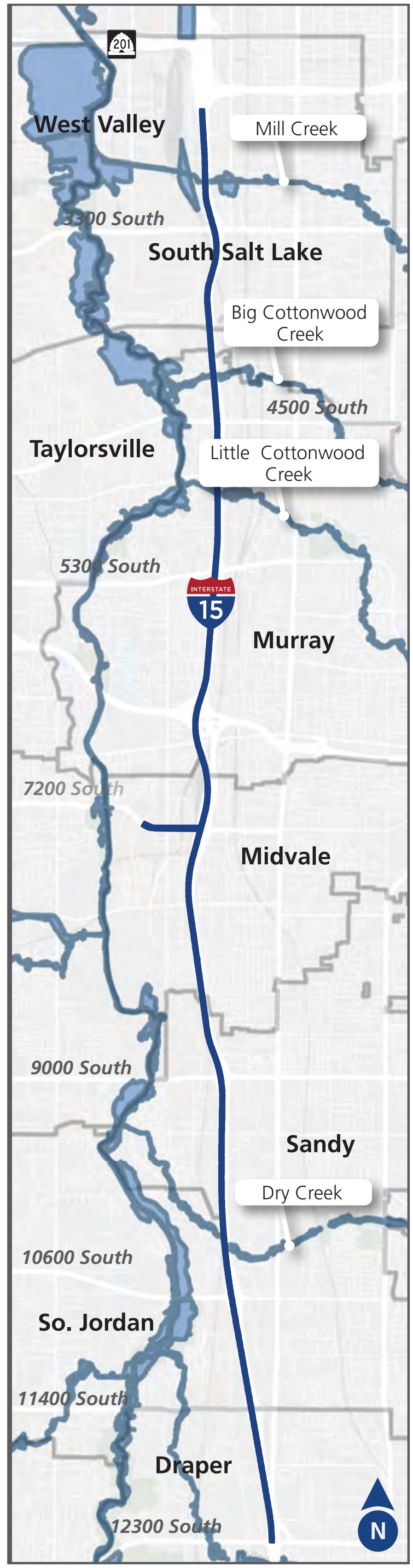


Figure 3-5. Floodplains in Study Area

Executive Order 11988 requires the avoidance, to the extent possible, of long and short term adverse impacts associated with the occupancy and modification of floodplains. 23 CFR §650, Subpart A, outlines FHWA policies and procedures for floodplain encroachment. FHWA must avoid longitudinal and significant encroachments, where practicable, and avoid support of incompatible floodplain development. Under FHWA's regulations, a significant encroachment can arise from any of the following situations:

- Significant potential for interfering with a transportation facility that is needed for emergency vehicles or that provides a community's only evacuation route
- Significant risk of upstream flooding
- Significant adverse impact on natural and beneficial floodplain values

3.10.1 AFFECTED ENVIRONMENT

South Salt Lake, Murray, and Sandy are FEMA Flood Insurance Program participating communities (community identification numbers 49035C0284G, 49035C0292G, and 490035C0434G, respectively). According to FEMA Flood Rate Insurance Maps, the study area contains four regulatory 100-year floodplains that are associated with Mill Creek, Big Cottonwood Creek, Little Cottonwood Creek, and Dry Creek (See Maps 1, 5, and 18 in Volume 2). A regulatory floodplain is a floodplain that is recognized by FEMA and adopted by the local community (that is, the community agrees to abide by FEMA regulations associated with the floodplain). No other floodplains were identified within the study area.

3.10.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

Direct Impacts

The No-action Alternative would not impact floodplains.

Indirect Impacts

The No-action Alternative would not impact floodplains.

Preferred Alternative

Direct Impacts

The Preferred Alternative would extend the culverts already in place under I-15 at Mill Creek, Big Cottonwood Creek, and Dry Creek and would involve construction activities within the 100-year floodplain. Because the majority of the floodplains are confined to channels, impacts would be minor. Permanent impacts would be avoided and minimized to the maximum extent practicable. Exact quantities of permanent impacts will be determined during final design. It is anticipated that approximately 0.3 acres and 435 linear feet of the 100-year floodplains could be temporarily impacted.

Indirect Impacts

The Preferred Alternative would not result in any indirect impacts to floodplains.

3.10.3 MITIGATION

Hydraulic analyses will be performed to determine if there would be a rise in the BFE. If the rise in the BFE is greater than one foot, proper steps will be taken with Salt Lake County and FEMA to obtain a LOMR. These steps include:

- Coordination with Salt Lake County Floodplain Manager during final design
- Salt Lake County approval of CLOMR documentation
- Obtain a CLOMR from FEMA
- Obtain an FDP from Salt Lake County
- Following project completion, obtain an LOMR from FEMA

3.11 WATER QUALITY

Water quality in Utah is regulated by the U.S. Environmental Protection Agency (EPA) through the Federal Clean Water Act and by the regulations of the Utah Department of Environmental Quality (UDEQ), Division of Water Quality (UDWQ) and Division of Drinking Water as described in the Utah Administrative Code, Rules 317 and 309 (UAC R317 and R309). This section describes water resources and current water quality conditions within the study area.

3.11.1 AFFECTED ENVIRONMENT

Storm Water

In general, areas with storm drain systems capture storm water runoff from roads and convey it to a discharge point through catch basins, pipes, and/or detention ponds. These systems can be effective at reducing total suspended solids (TSS) if storm water is conveyed to a detention pond with discharge control devices prior to storm water entering surface waters. Discharge control devices regulate the flow exiting a detention pond, thus slowing storm water and allowing sufficient time for suspended solids to fall from the flow. Paved areas without storm drain systems allow storm water to sheet flow into nearby surface waters or to nearby pervious surfaces. Pervious areas allow for storm water to infiltrate into the ground.

If not managed properly, roadway runoff can negatively impact water quality by increasing total dissolved solids (TDS) and TSS entering nearby streams and lakes. Highway surfaces collect automobile related pollutants (mainly lead, copper, zinc, oil, grease, and rust) and de-icing chemicals (salt and salt solutions), which are then washed off highway surfaces from rain or snow melt. Unmanaged runoff can become concentrated, gather sediment through erosion, and enter streams and lakes unless measures are taken to reduce pollutants.

Most of the study area is dominated by impervious surfaces (roadways, sidewalks, parking lots, etc.). The area is urbanized and mostly confined to the roadway prism for I-15 and 7200 South.

Groundwater/Aquifers

The study area is located within both a discharge zone and a secondary recharge zone of an aquifer (see Figure 3-6). The outflow of groundwater discharge may occur naturally or as the result of human activity, notably well pumping. Springs or seeps may be found in areas where ground water discharge from the table surface intersects with the land surface. Runoff may flow into fresh water bodies such as lakes or streams or may flow into saltwater bodies.

Primary and secondary aquifers are located to the east and west of the study area (see Figure 3-6). Primary aquifers are located within two miles of the study area. A primary aquifer provides a high level of water storage and may support water supplies and/or river base flows. In most cases, principal aquifers are aquifers previously designated as major aquifers. Aquifers supplying minor amounts of water are considered secondary aquifers.

Wells

According to the Utah Division of Water Rights (UDWR), 25 underground water wells are located within the study area and are owned by both municipal and private land owners. All of these wells are located within the I-15 right-of-way and are considered inactive.

3.11.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

Direct Impacts

Under the No-action Alternative, drainage conditions in the study area would remain the same. Storm water

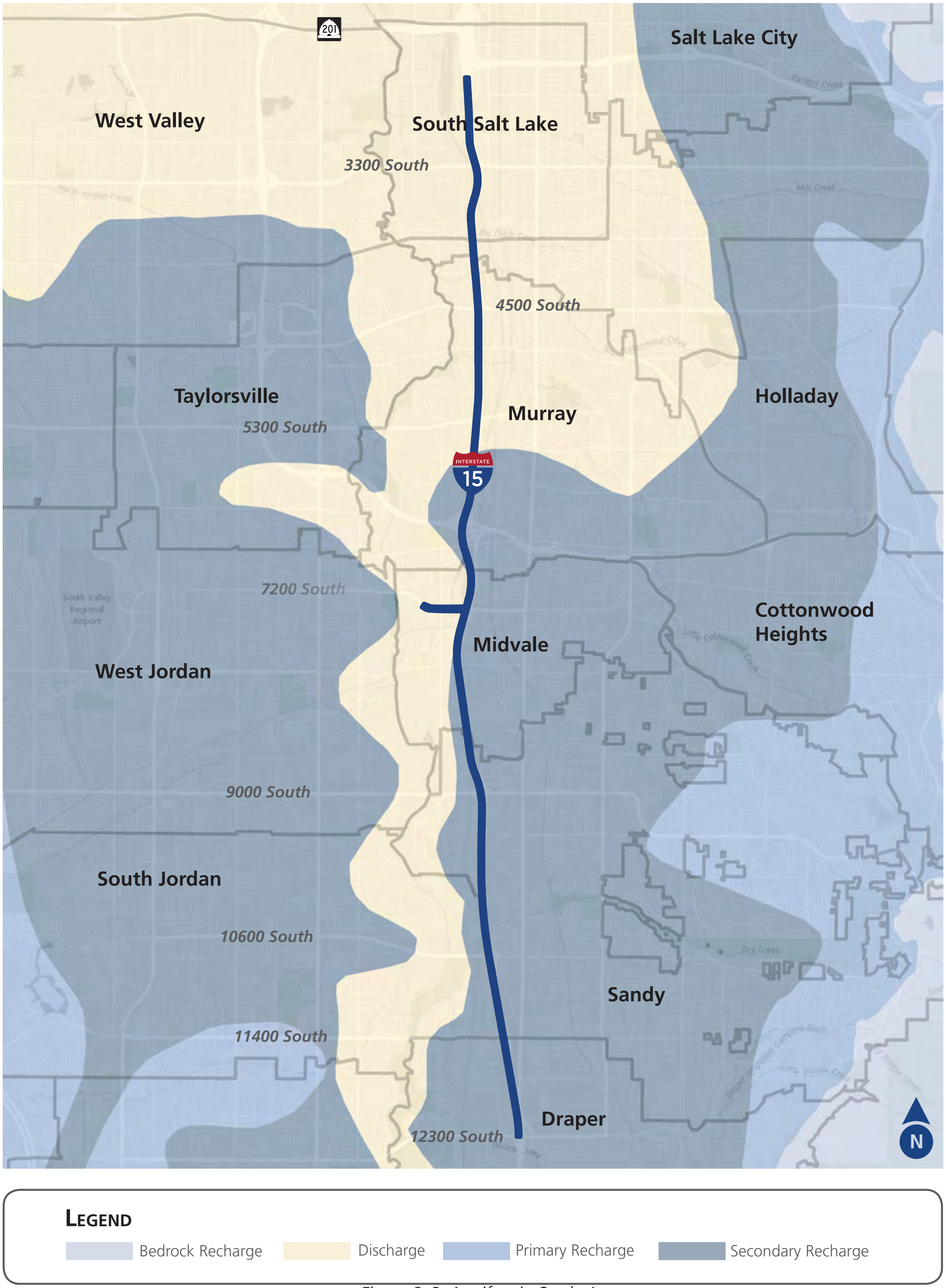


Figure 3-6. Aquifers in Study Area

would continue to flow through existing storm drain systems. There would be no impacts to groundwater or underground wells.

Storm Water

Under the No-action Alternative, there would be no increase in impervious surfaces and therefore, no increase in storm water runoff.

Groundwater

The No-action Alternative would have no impacts on groundwater recharge areas.

Surface Water

The No-action Alternative would have no impacts on surface water quality in the area.

Indirect Impacts

There would be no indirect impacts to water quality as a result of the No-action Alternative.

Preferred Alternative

Direct Impacts

Storm Water

The Proposed Alternative would increase the impervious surface area in the study area and would result in an increase of storm water runoff volumes. Storm water would be collected and enter improved or new storm drain systems via catch basins. A system of inlets and pipes would convey the storm water to discharge points and detention facilities that would aid in lowering peak flows to near existing conditions.

The storm drain system would be designed and managed according to the requirements of UDWQ, including flow management controls, oil skimmers, grease traps, etc., as required in order to minimize negative impacts to water quality. Storm drain systems minimize negative impacts associated with storm water through capturing and conveying its flow. By capturing and conveying storm water flow, flooding and erosion to adjacent properties can be minimized. Storm drain systems also have the capability of incorporating features that help to minimize trash and debris (under low or regular flow conditions) from being carried further down the storm drain system through the use of hoods or snouts in the catch basins. However, trash and debris held in the catch basins would need to be removed periodically for the benefit to be maintained.

Groundwater

The study area is located in a both a discharge zone and a secondary recharge zone (see Figure 3-6); therefore, no impacts to groundwater are expected as a result of the Preferred Alternative.

Indirect Impacts

There would be no indirect impacts to water quality as a result of the Preferred Alternative.

3.11.3 MITIGATION

- Storm drain modifications will be constructed in compliance with current UDEQ and UDWQ standards as well as local discharge rates and regulations.
- Impacted water rights will be handled through UDOT's Right-of-Way acquisition process.
- Existing detention ponds within the study area will be dredged to remove sediment, trash, and plant material that has infiltrated them over time. This will allow more storage for storm water runoff.

3.12 WILDLIFE AND THREATENED AND ENDANGERED SPECIES

Wildlife and plant life, as well as their associated habitats, are protected and regulated by law at both the federal and state levels. At the federal level, the United States Fish and Wildlife Service (USFWS) manages and regulates threatened and endangered species under the Endangered Species Act (ESA). At the state level, state sensitive species, game animals, and general wildlife are managed by the Utah Division of Wildlife Resources (UDWR). This section describes plant and animal species and their associated habitats that are known to, or may potentially occur in the study area.

Impacts of the proposed project on threatened and endangered species were assessed in accordance with the Endangered Species Act (ESA). The ESA provides protection to federally-listed threatened and endangered species and their designated critical habitats. It requires that all federal agencies considering a project or action to consult with USFWS or National Marine Fisheries Service (NMFS) to ensure that the proposed activity is "not likely to jeopardize the continued existence" of any listed species or will not "result in adverse modification" of its critical habitat.

3.12.1 AFFECTED ENVIRONMENT

Threatened and Endangered Species

The Endangered Species Act protects threatened and endangered species and their designated critical habitats which fall under the jurisdiction of USFWS. USFWS's Information Planning and Conservation System (IPaC) website provides information regarding the occurrence of ESA species in an area based on a specific area of interest (AOI) (i.e. the study area). Table 3-10 identifies the federally listed species from an IPaC Official Species List which are known to occur in Salt Lake County and could occur in the study area. Suitable habitat for these species does not exist within the study area.

Table 3-10. Threatened and Endangered Species Potentially Occurring Within the Study Area

Name	Status	Habitat Requirements	Critical Habitat
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	Dense, deciduous, lowland riparian forests with tall cottonwoods and willows	No
June Sucker (*Chasmistes liorus*)	Endangered	Endemic to Utah Lake and the Provo River	No
Ute ladies'-tresses (*Spiranthes diluvialis*)	Threatened	Wetlands associated with floodplains, wet meadows, streams, abandoned stream meanders, and near lake shores and spring seeps	No
Canada Lynx (*Lynx canadensis*)	Threatened	Boreal/coniferous forests in areas with deep snow and an abundance of snowshoe hare	No

Source: USFWS' IPaC system (http://ecos.fws.gov/ipac/) accessed on 02/14/2017; Habitat Requirements - UDWR (http://dwrcdc.nr.utah.gov/ucdc/) accessed on 02/14/2017

Yellow-billed Cuckoo

Riparian habitat for migratory birds is found near the Jordan River, which is just west of the study area project. However, yellow-billed cuckoo require dense cottonwood canopy cover for breeding, nesting, and foraging. Habitat of this nature is not present near the study area and it is unlikely that yellow-billed cuckoo are present in the study area. No critical habitat has been identified by USFWS within the study area.

June Sucker

Due to the Jordan River's connectivity with Utah Lake, the main body of water to which June sucker are endemic, it is possible for the species to occur near the study area. However, June sucker rarely leave Utah Lake except to swim upstream in the Provo River (the Jordan River is downstream) to spawn. No critical habitat for June sucker has been identified by USFWS within the study area. In addition, there are major barriers in the form of diversion dams between the study area and Utah Lake. It is unlikely that the June sucker is found within the study area.

Ute ladies'-tresses

Suitable habitat for Ute ladies'-tresses (ULT) may be present in the riparian habitat adjacent to the Jordan River. However, most existing populations of ULT are relic in nature and there are no known ULT populations occurring within the study area. It is unlikely that Ute ladies'-tresses are found in the study area.

Canada Lynx

There is no habitat meeting the requirements of suitability for the Canada lynx in the study area. No critical habitat has been identified by USFWS in the study area, and it is unlikely that the Canada lynx is found in the study area.

3.12.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

Direct Impacts

The No-action Alternative would have No Effect on threatened or endangered species, designated critical habitat, or state sensitive species. The No-action Alternative would have no direct impacts to general wildlife.

Indirect Impacts

The No-action Alternative would have no indirect impacts on threatened or endangered species, critical habitat, state-sensitive species, or other wildlife.

Preferred Alternative

Direct Impacts

UDOT's wildlife biologist evaluated the study area with regard to potential issues related to federally listed species. A review of the Utah Division of Wildlife Resources, Natural Heritage Program (UDWR/UNHP) 2016 database indicated that no federally listed, threatened, endangered, or candidate species, or any critical habitat would be affected by the proposed project. The Preferred Alternative would have no effect on federally-listed threatened and endangered species or designated critical habitat protected under the ESA because there is no suitable habitat for these species within or near the study area (see correspondence in Chapter 4). In accordance with the U.S. Fish and Wildlife Service (USFWS) memo dated January 27, 2006, USFWS is no longer required to concur on "no-effect" determinations. A no effect determination was made because there is no suitable habitat in the study area, there is no Critical Habitat in the study area, the species are not known to occur in the study area, and the species are not expected to be present in the study area.

Indirect Impacts

The Preferred Alternative would have no indirect impacts on threatened or endangered species, critical habitat, state-sensitive species, or other wildlife.

3.12.3 MITIGATION

No mitigation required.

3.13 WILD AND SCENIC RIVERS

As defined by the Wild and Scenic River Act, a wild and scenic river is a river which qualifies for inclusion on the Nationwide Rivers Inventory maintained by the National Park Service (NPS) and must be free-flowing (i.e. "existing or flowing in a natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway") and possess "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or similar values." The Bureau of Land Management (BLM) also maintains a list of wild and scenic rivers on BLM-administered lands, as well as those that are under consideration for designation.

3.13.1 AFFECTED ENVIRONMENT

According to the Nationwide Rivers Inventory and the BLM, there are no designated wild and scenic rivers in the study area.

3.13.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

The No-action Alternative would have no impacts to wild and scenic rivers.

Preferred Alternative

The Preferred Alternative would have no impacts to wild and scenic rivers.

3.13.3 MITIGATION

No mitigation required.

3.14 CULTURAL RESOURCES

Cultural resources include archaeological resources (both prehistoric and historic), architectural or historic resources (buildings and structures), and traditional cultural properties (TCPs). The Advisory Council on Historic Preservation (ACHP) defines a historic resource as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) (i.e., historic properties built 50 years ago or later)." The term includes artifacts, records, and remains related to and located within such properties and includes properties of traditional religious and cultural importance to a Native American tribe that also meets the National Register criteria. The term "eligible for inclusion" in the NRHP includes all properties that meet the National Register criteria, whether or not formally determined as such.

The National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations (36 CFR 800) establish the national policy and procedures regarding cultural resources. Section 106 of the NHPA requires consideration of the effects of federal projects and policies on cultural resources. The Utah Antiquities Act (Utah Code Annotated 9-8-102 et seq (404)) also provides protection of "all antiquities, historic and prehistoric ruins, and historic sites, buildings, and objects which, when neglected, desecrated, destroyed, or diminished in aesthetic value, result in an irreplaceable loss to the people of this state."

The Section 106 review process requires cultural resources to be evaluated for eligibility for listing on the NRHP based upon whether "the quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association" and whether or not they meet one or more of the criteria in Table 3-11.

Table 3-11. National Register of Historic Places (NRHP) Criteria

NRHP Criterion	Characteristics
A	Associated with events that have made a significant contribution to the broad patterns of our history
B	Associated with the lives of persons significant in our past
C	Embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction
D	Yielded, or may likely yield, information important in prehistory or history

The Utah State Historic Preservation Office (SHPO) has developed a rating system for buildings that allows for a distinction to be made between those buildings individually eligible under the National Register Criterion A or C and those that have been altered, but that may be eligible as part of a historic district or for historical reasons. The rating system also allows for a distinction to be made between those buildings that are ineligible due to loss of integrity and those that are ineligible because they are out-of-period (see Table 3-12).

Table 3-12. Utah State Historic Preservation Office (SHPO) Rating Definitions for Historic Structures

SHPO Rating	Characteristics
ES	**Eligible/Significant:** Built within the historic period and retains integrity; excellent example of a style or type; unaltered or only minor alterations or additions; individually eligible for NRHP under Criterion C; also, buildings of known historical significance
EC	**Eligible/Contributing:** Built within a historic period and retains integrity; good example of a style or type, but not as well-preserved or well-executed as "ES" buildings; more substantial alterations or additions than "ES" buildings, though overall integrity is retained; eligible for NRHP as part of a potential historic district or primarily for historical rather than architectural reasons (which cannot be determined at this point)

SHPO Rating	Characteristics
NC	**Ineligible/Noncontributing:** Built during the historic period but has had major alterations or additions; no longer retains integrity
OP	**Ineligible/Out-of-Period:** Built during the modern era

3.14.1 AFFECTED ENVIRONMENT

Area of Potential Effects (APE)

The Area of Potential Effects (APE) is the same as the SES study area.

Determination of Eligibility

UDOT prepared a Determination of Eligibility and Finding of Effect (DOEFOE), which outlines the eligibility determinations for each architectural and archaeological resource. SHPO concurred with the DOEFOE. A copy of the DOEFOE is found in Chapter 4: Comments and Coordination.

Archaeological Resources

A Class III inventory of the APE was conducted on November 1st and 2nd 2016 by Horrocks Engineers. Previously recorded sites were also revisited within the study area. These inventories were conducted according to the 2010 "UDOT Guidelines for Identifying, Recording, and Evaluating Archaeological and Paleontological Resources" using 15-meter survey transects in undeveloped areas. Five archaeological sites were recorded or revisited within the APE and, of those, four sites have been determined eligible for inclusion on the NRHP (see Table 3-13).

Table 3-13. Archaeological Resources

Site Number	Description	Previously Recorded	NRHP Eligibility
42SL104	Historic Trash Dump	Yes	Not Eligible
42SL214	Jordan and Salt Lake City Canal	Yes	Eligible
42SL293	Denver & Rio Grande Western Railroad	Yes	Eligible
42SL335	Bingham Branch- D&RGW	Yes	Eligible
42SL383	Big Ditch Canal	Yes	Eligible

Architectural Resources

A survey of the APE for architectural resources was conducted by Horrocks Engineers in March 2016. Sixty-three historic properties (45 years or older) were identified within the APE (see Table 3–14 and maps in Appendix A). Thirty six of these properties were determined to be eligible for the NRHP (see DOEFOE in Chapter 4: Comments and Coordination).

Table 3-14. Historic Architectural Resources

Address	Date of Construction	Description	NRHP Eligibility
2250 S. 600 West	1965	South Salt Lake Water Tank	Eligible/Contributing under Criterion A
2975 S. 460 West	1970	South Salt Lake Water Tank	Eligible/Contributing under Criterion A
3645 S. 500 West	1957	Concrete Block Commercial Building	Eligible/Contributing under Criterion A
416 W. 3900 South	1886	Victorian Eclectic Crosswing residence constructed of brick and shingle siding.	Eligible/Contributing under Criterion A

Address	Date of Construction	Description	NRHP Eligibility
4343 S. Century Dr.	1970	Concrete Block Warehouse with multiple additions on façade.	Inelig./Non-contributing
4595 S. Cherry St.	1939	Twentieth Century residential structure clad in aluminum siding and imitation stone.	Inelig./Non-contributing
4621 S. Cherry St.	1925	Unclear style residence clad in drop siding, narrow clapboard and wood sheet. Windows and siding altered on primary façade.	Inelig./Non-contributing
4717 S. Plum St.	1926	Bungalow residence clad in aluminum siding with original windows.	Eligible/Contributing under Criterion A
4727 S. Plum St.	1905/1960	Residential crosswing altered in 1960 with a garage addition and altered materials.	Inelig./Non-contributing
4755 S. Plum St.	1905	Victorian Eclectic half-crosswing residence clad with drop siding.	Eligible/Contributing under Criterion A
4757 S. Plum St.	1935	Vacant residential Bungalow clad with drop siding and narrow clapboard.	Eligible/Contributing under Criterion A
392 W. 4800 South	1948	Early Ranch residence constructed of striated brick.	Eligible/Contributing under Criterion A
396 W. 4800 South	1937	English Cottage residence clad in aluminum siding.	Eligible/Contributing under Criterion A
380 W. 4850 South	1954	Striated brick Early Ranch-type residence.	Eligible/Contributing under Criterion A
368 W. Vine St.	1901	Originally constructed as a Hall/ Parlor residence, altered to Minimal Traditional, now clad in vinyl siding.	Inelig./Non-contributing
370 W. Vine St.	1941	World War II-Era Cottage clad in vinyl siding.	Inelig./Non-contributing
481 W. Anderson Ave.	1959	Split Level residence with carport constructed of concrete brick.	Eligible/Contributing under Criterion A
5739 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick. Alterations to the primary façade.	Inelig./Non-contributing
5749 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick. The roof has been altered.	Inelig./Non-contributing
5759 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick. The carport has been enclosed.	Inelig./Non-contributing
5769 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick.	Inelig./Non-contributing
5779 S. Golden Dr.	1959	Split Level residence constructed of concrete brick with a large rear addition and the roof has been altered.	Inelig./Non-contributing
5791 S. Golden Dr.	1959	Originally constructed as a Split Level residence, it has been altered to uniform levels and clad in vinyl siding.	Inelig./Non-contributing

Address	Date of Construction	Description	NRHP Eligibility
5801 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick.	Eligible/Contributing under Criterion A
5809 S. Golden Dr.	1970	Split Level residence with carport constructed of concrete brick. It has a large addition on the south.	Inelig./Non-contributing
5817 S. Golden Dr.	1970	Split Level residence with carport constructed of concrete brick. The carport has been enclosed with vinyl siding.	Inelig./Non-contributing
5825 S. Golden Dr.	1970	Split Level residence with carport constructed of concrete brick.	Eligible/Contributing under Criterion A
5833 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick.	Eligible/Contributing under Criterion A
5841 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick. The carport has been enclosed with vinyl siding.	Inelig./Non-contributing
6023 S. Sanford Dr.	1960	Split Level residence with garage clad with brick and aluminum siding.	Eligible/Contributing under Criterion A
6031 S. Sanford Dr.	1960	Brick Ranch style residence with a carport addition on the south which is not visually invasive.	Eligible/Contributing under Criterion A
6039 S. Sanford Dr.	1960	Split Level residence with garage constructed of striated brick. There is a carport addition on the north which does not impact the integrity of the house.	Eligible/Contributing under Criterion A
6047 S. Sanford Dr.	1960	Brick Ranch style residence	Eligible/Contributing under Criterion A
6059 S. Sanford Dr.	1961	Brick Ranch style residence	Eligible/Contributing under Criterion A
6063 S. Sanford Dr.	1960	Brick Ranch style residence	Eligible/Contributing under Criterion A
6073 S. Sanford Dr.	1960	Split Level residence with garage constructed of regular brick.	Eligible/Contributing under Criterion A
540 W. 6300 South	1898/ 1983	The primary façade of this residence has additions and alterations. Originally constructed as a Hall/Parlor it is clad in aluminum siding.	Inelig./Non-contributing
499 W. Winchester St.	1920/ 1945	Asbestos siding covers this Bungalow with in-period additions and alterations to Minimal Traditional style.	Eligible/Contributing under Criterion A
550 W. 7200 South	1965	Steel continuous stringer/multi-girder bridge.	Inelig./Non-contributing as per UDOT Bridge Programmatic Agreement with SHPO.
600 W. 7200 South	1965	Steel continuous stringer/multi-girder bridge.	Inelig./Non-contributing as per UDOT Bridge Programmatic Agreement with SHPO.

Address	Date of Construction	Description	NRHP Eligibility
560 W. Center St.	1965	Steel continuous stringer/multi-girder bridge.	Inelig./Non-contributing as per UDOT Bridge Programmatic Agreement with SHPO.
7825 S. Allen St.	1901	Victorian Crosswing residence clad in vinyl siding and imitation stone.	Inelig./Non-contributing
7831 S. Allen St.	1915	Box Bungalow clad in aluminum siding has altered fenestration and a rear addition.	Inelig./Non-contributing
7953 S. Allen St.	1971	Two story stucco apartment building with altered fenestration.	Inelig./Non-contributing
7971 S. Allen St.	1954	Ranch-type residence clad in asbestos siding.	Eligible/Contributing under Criterion A
500 W. Wasatch St.	1965	Steel continuous stringer/multi-girder bridge.	Inelig./Non-contributing as per UDOT Bridge Programmatic Agreement with SHPO.
554 W. Wasatch St.	1898	Victorian style Bungalow clad with drop and shingle siding.	Eligible/Contributing under Criterion A
582 W. Wasatch St.	1891	Original Greek Revival half-crosswing covered with stucco has a Victorian Eclectic crosswing addition constructed of brick.	Eligible/Contributing under Criterion A
8085 S. Fern Cr.	1959	Ranch type duplex clad with aluminum siding.	Eligible/Contributing under Criterion A
515 W. Fern Dr.	1960	A Ranch-style fourplex of brick and aluminum siding.	Eligible/Contributing under Criterion A
522 W. Ivy Dr.	1970	A Ranch-type residence constructed with oversized brick.	Eligible/Contributing under Criterion A
528 W. Ivy Dr.	1970	A Split Entry residence constructed of brick.	Eligible/Contributing under Criterion A
8151 S. Ivy Dr.	1970	A Split Entry residence constructed of oversized brick and a recent addition of imitation stone.	Inelig./Non-contributing
8157 S. Ivy Dr.	1970	A Split Entry residence constructed of oversized brick.	Eligible/Contributing under Criterion A
8163 S. Ivy Dr.	1970	A Ranch-type residence constructed with oversized brick.	Inelig./Non-contributing
8169 S. Ivy Dr.	1970	A Ranch-type residence with a carport constructed of brick, cladding altered to vinyl siding.	Inelig./Non-contributing
8175 S. Ivy Dr.	1970	A Ranch-type residence with a carport constructed of brick.	Eligible/Contributing under Criterion A
8179 S. Ivy Dr.	1970	A Ranch-type residence with a carport constructed of brick.	Eligible/Contributing under Criterion A
8183 S. Ivy Dr.	1970	A Split Entry residence constructed of oversized brick with a wood sheet addition on the north.	Inelig./Non-contributing

Address	Date of Construction	Description	NRHP Eligibility
8189 S. Ivy Dr.	1970	A Split Entry residence constructed of oversized brick. It has a rear addition and alterations to the primary façade.	Inelig./Non-contributing
8195 S. Ivy Dr.	1971	A Split Entry residence with altered siding of board and batten and shingle siding.	Inelig./Non-contributing
8205 S. Ivy Dr.	1971	A Split Entry residence clad with vinyl siding.	Inelig./Non-contributing
8217 S. Ivy Dr.	1971	A Split Level residence with Vinyl Siding, Board and Batten and Imitation stone.	Inelig./Non-contributing

Consultation

As part of Section 106 regulations, coordination included correspondence between UDOT and Native American tribes that may have cultural and historical interest within the study area. UDOT sent consultation letters dated February 21st, 2017 to the following tribes: The Eastern Shoshone Tribe of the Wind River Reservation, the Shoshone-Bannock Tribes of Fort Hall, The Paiute Indian Tribe of Utah, The Northwestern Band of the Shoshone Nation, The Ute Indian tribe of the Uintah and Ouray Utah Indian Reservation, The Skull Valley Band of the Goshute Indians, The Cedar Band of Paiutes, The Shivwits Band of Paiute Indian Tribe of Utah, and the Confederated Tribes of the Goshute Reservation.

3.14.2 ENVIRONMENTAL CONSEQUENCES

Effects are defined as "alteration[s] to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register" (36 CFR §800.16(i)). Impacts to historic properties are categorized as No Historic Properties Affected, No Adverse Effect, and Adverse Effect.

A finding of ***No Historic Properties Affected*** is made when "[e]ither there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them as defined in §800.16(i)" (See 36 CFR §800.4(d)(1)).

A finding of ***No Adverse Effect*** is made "[w]hen the undertaking's effects do not meet the criteria of paragraph (a)(1) of this section [see Adverse Effect definition] or the undertaking is modified or conditions are imposed... to ensure consistency with the Secretary's standards for the treatment of historic properties (36 CFR §68) to avoid adverse effects" (See 36 CFR §800.5(b)).

A finding of ***Adverse Effect*** is made "[w]hen an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, and association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative" (See 36 CFR §800.5(a)(1)).

Finding of Effect

UDOT prepared a DOEFOE, which outlines the effect determinations for each architectural and archaeological resource. SHPO concurred with the DOEFOE. A copy of the DOEFOE is found in Chapter 4: Comments and Coordination.

No-action Alternative

The No-action Alternative would result in a finding of No Historic Properties Affected.

Indirect Impacts

There would be no indirect impacts from the No-action Alternative.

Preferred Alternative

The Preferred Alternative will result in a finding of no adverse effect for two architectural properties, and a finding of no historic properties affected for all remaining architectural properties and archaeological sites (see Table 3-15).

Table 3-15. FInding of Effect for Cultural Resources

Address/ Site Number	Nature of Impact	Finding
42SL214	No Impact	No Historic Properties Affected
42SL293	Non-contributing bridge over 7200 South demolished and replaced	No Historic Properties Affected
42SL335	Non-contributing bridge over 7200 South demolished and replaced	No Historic Properties Affected
42SL383	No Impact	No Historic Properties Affected
2250 S. 600 West	No Impact	No Historic Properties Affected
2975 S. 460 West	No Impact	No Historic Properties Affected
3645 S. 500 West	Acquire 15 feet of property to build retaining wall	No Adverse Effect
416 W. 3900 South	No Impact	No Historic Properties Affected
4717 S. Plum St.	Temporary Construction Easement	No Historic Properties Affected
4755 S. Plum St.	Temporary Construction Easement	No Historic Properties Affected
4757 S. Plum St.	Temporary Construction Easement	No Historic Properties Affected
392 W. 4800 South	No Impact	No Historic Properties Affected
396 W. 4800 South	No Impact	No Historic Properties Affected
380 W. 4850 South	No Impact	No Historic Properties Affected
481 W. Anderson Ave.	Temporary Construction Easement	No Historic Properties Affected
5801 S. Golden Dr.	Temporary Construction Easement	No Historic Properties Affected
5825 S. Golden Dr.	Temporary Construction Easement	No Historic Properties Affected

Address/ Site Number	Nature of Impact	Finding
5833 S. Golden Dr.	Temporary Construction Easement	No Historic Properties Affected
6023 S. Sanford Dr.	No Impact	No Historic Properties Affected
6031 S. Sanford Dr.	No Impact	No Historic Properties Affected
6039 S. Sanford Dr.	No Impact	No Historic Properties Affected
6047 S. Sanford Dr.	Temporary Construction Easement	No Historic Properties Affected
6059 S. Sanford Dr.	Temporary Construction Easement	No Historic Properties Affected
6063 S. Sanford Dr.	Acquire 15 feet of property (1080 square feet)	No Adverse Effect
6073 S. Sanford Dr.	Temporary Construction Easement	No Historic Properties Affected
499 W. Winchester St.	No Impact	No Historic Properties Affected
7971 S. Allen St.	No Impact	No Historic Properties Affected
554 W. Wasatch St.	No Impact	No Historic Properties Affected
582 W. Wasatch St.	No Impact	No Historic Properties Affected
8085 S. Fern Cr.	No Impact	No Historic Properties Affected
515 W. Fern Dr.	No Impact	No Historic Properties Affected
522 W. Ivy Dr.	No Impact	No Historic Properties Affected
528 W. Ivy Dr.	No Impact	No Historic Properties Affected
8157 S. Ivy Dr.	No Impact	No Historic Properties Affected
8175 S. Ivy Dr.	No Impact	No Historic Properties Affected
8179 S. Ivy Dr.	No Impact	No Historic Properties Affected

Indirect Impacts

There would be no indirect impacts from the Preferred Alternative.

3.14.3 MITIGATION

As the project would not have any adverse effects, no mitigation is required.

3.15 PALEONTOLOGICAL RESOURCES

Paleontology is the scientific study of life in the geologic past, especially through the study of animal and plant fossils. Before expending state funds or approving an undertaking, a state agency is required to take into account the effect of the undertaking on a specimen that is included in or eligible for inclusion in the State Paleontological Register (U.C.A. 63-73-19). The Memorandum of Understanding (MOU) between the Utah Geological Survey (UGS) and UDOT outlines the process for implementing Utah Code Annotated §63-73-19.

3.15.1 AFFECTED ENVIRONMENT

Horrocks Engineers contacted UGS for information regarding paleontological resources in the study area. The UGS stated that the deposits in the study area have a low potential to yield significant fossil localities, and that the project should have no effect on paleontological resources (see correspondence in Chapter 4 - Comments and Coordination).

3.15.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

The No-action Alternative would have no impact to paleontological resources.

Preferred Alternative

The Preferred Alternative would have no impact to paleontological resources.

3.15.3 MITIGATION

No mitigation required.

3.16 HAZARDOUS WASTE

Hazardous waste includes any solid, liquid, or gaseous waste materials that, if improperly managed or disposed of, may pose substantial hazards to human health and the environment. A waste is considered hazardous if it exhibits one or more of the following characteristics: ignitability, corrosivity, reactivity, and toxicity.

The Resource Conservation and Recovery Act (RCRA) was enacted in 1976 to regulate the management of solid waste (i.e., garbage), hazardous waste, and underground storage tanks (UST) that hold petroleum products or certain chemicals—including leaking underground storage tanks (LUST). Under RCRA, hazardous wastes are tracked from the time they are generated until the time they are ultimately disposed of or recycled. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) was enacted in 1980. CERCLA provided for the clean-up and remediation of closed and abandoned hazardous waste sites where hazardous waste has been abandoned, accidentally spilled, or illegally dumped and created a "Superfund" to help pay for clean-up costs.

3.16.1 AFFECTED ENVIRONMENT

The study area for hazardous waste sites is the area within 0.5 miles of the proposed project improvements. The project team reviewed databases from state and federal regulatory agencies to identify generators and facilities that use hazardous waste, accidental releases of hazardous wastes, sites contaminated with hazardous waste, and sites that have the potential for contamination in the proposed study area. These regulatory agency databases include the Utah Division of Environmental Response and Remediation's (DERR) interactive maps and the EPA's EnviroMapper and EnviroFacts resources. Once potential sites were identified, sites with no or little contamination and no proximity to the project were eliminated from further consideration. Table 3–16 lists the hazardous waste sites of potential concern in the study area (see also Figure 3-7 and maps in Volume 2).

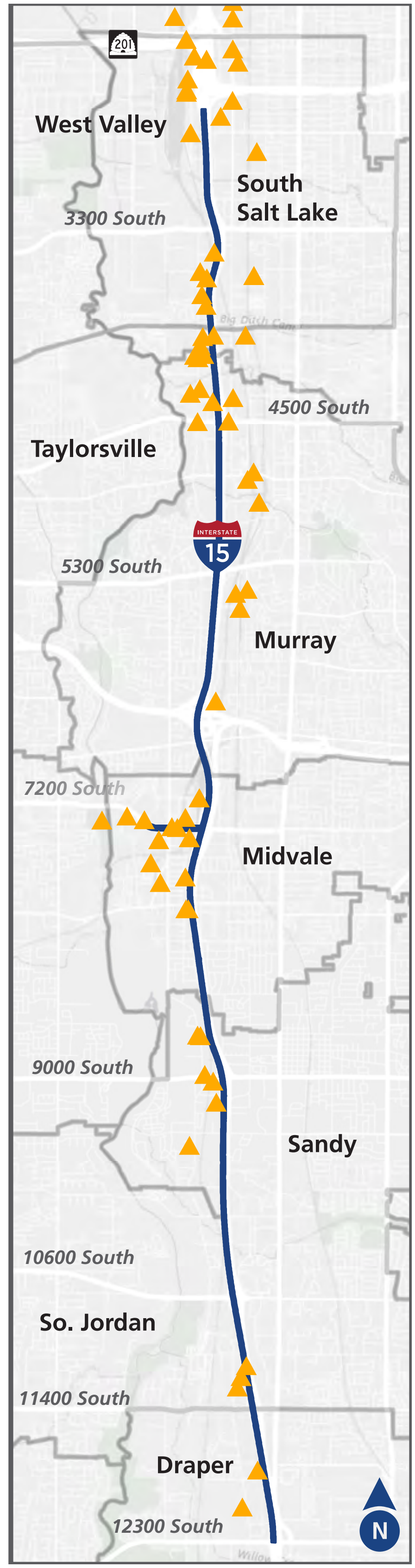


Figure 3-7. Hazardous Waste in Study Area

Table 3-16. Hazardous Waste Sites in the Study Area

Name	Address	Type
Midvale Brownfields Pilot Project	Central Midvale	Brownfields
4500 South 300 West Plume	4500 South 300 West	CERCLIS
4500 South 500 West Plume	4500 South 500 West	CERCLIS
Bennett Paint–Karpowitz Coal	2131 South 300 West	CERCLIS
Bingham Gold and Copper Company	7300 South 100 West	CERCLIS
Denver & Rio Grande RR–Roper Yard	2300 South 600 West	CERCLIS/LUST
Denver & Rio Grande RR–South Roper Yard	2400 South 600 West	CERCLIS
Franklin or Horn Silver Smelter	4600 South West Temple	CERCLIS
Geneva Rock Products	350 West 3900 South	CERCLIS
Germania Smelting and Refining Company	4900 South West Temple	CERCLIS
Midvale Lagoons	7030 South and Jordan River	CERCLIS
Midvale Main Street PCE Plume	Main Street and 4th Avenue	CERCLIS
Midvale Railyard	6400 to 7200 South, just west of I-15	CERCLIS
Midvale Roundhouse	150 9th Avenue	CERCLIS
Pallas Yard	300 West 5300-5900 South	CERCLIS/Voluntary Cleanup
Printer and Cassette Services	6211 South 380 West	CERCLIS
Riley Lane Residences	5390 South Riley Lane	CERCLIS
Safety-Kleen South	394 West Ironwood Drive	CERCLIS
Sheridan Hill Smelter	7500 South 200 West	CERCLIS
Utah Ore Sampling	5510 South 300 West	CERCLIS
Wasatch Chemical Co. (Lot 6)	1979 South 700 West	CERCLIS
Proposed Commuter Rail Murray Station	149-151 West Vine Street	Enforceable Written Assurances
Midvale Diesel Spill	7200 South 650 West	Environmental Incidents
SLC–Diesel Fuel Spill/Salt Lake Co. Diesel	I-15 Southbound between SR-201 and I-80 Eastbound	Environmental Incidents
Swift Transportation	I-15 MP 293	Environmental Incidents
Salt Lake Valley SWMF–Transfer Station	502 West 3300 South	Solid Waste Facilities
Tire Me Out LLC–Tire Transporter	4530 South 300 West	Solid Waste Facilities
Arden Realty, Wasatch Corporate Park	170 West Election Road	Tier 2
Daily's Premium Meats	3535 South 500 West	Tier 2
Abra Auto Body and Glass	2300 South 600 West	Used Oil Facility
American West Analytical Lab	463 West 3600 South	Used Oil Facility
CarMax 7167	11213 South Jordan Gateway	Used Oil Facility/UST
FLSmidth USA Inc.	7068 South FLSmidth Drive	Used Oil Facility
Litho Flexo Grafics Inc.	2400 South 600 West	Used Oil Facility
Midvale Rail Yard	7367 Rio Grande Street	Used Oil Facility
Denver & Rio Grande Western RR	7750 South Allen Street	UST
Former Magic Topper	591 West 7800 South	UST
Holiday Oil #49	7173 South 700 West	UST
John Harland Co.	2400 South 600 West	UST

Name	Address	Type
Maverik #541	9000 South Sandy Parkway	UST
Maverik #556	6962 South Bingham Junction Road	UST
Summerhays Music	8695 South Sandy Parkway	UST
Alder Construction	3937 South 500 West	LUST
Blue Ribbon Enterprises	3997 South 500 West	LUST
Century Equipment Co.	4343 Century Drive	LUST
Diesel Service	4235 South 500 West	LUST
Economy Builders Supply	9150 South 300 West	LUST
Midvale Fueling Complex	7125 South 600 West	LUST
Mountain States Fence, Inc.	3737 South 500 West	LUST
Piro Texaco	365 West 9000 South	LUST
Scott Machinery Company	4055 South 500 West	LUST
Superior Roofing Company	3405 South 500 West	LUST
Wasatch Service and Supply, Inc.	3685 South 500 West	LUST
Inverness Square	242 West 4800 South	Voluntary Cleanup
Simpson Steel	120 West Fireclay Avenue	Voluntary Cleanup

3.16.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

The No-action Alternative would not impact any site identified with having possible environmental degradation.

Preferred Alternative

The Preferred Alternative has the potential to affect three sites where past or current concerns with hazardous waste exist. These are the 4500 South 300 West Plume, Geneva Rock Products, and Midvale Railyard, all CERCLIS sites. If contaminated soil or groundwater is encountered, the contractor will follow UDOT Standard Specification 01355 to ensure proper handling and disposal of the hazardous materials.

3.16.3 MITIGATION

No mitigation required.

3.17 VISUAL QUALITY

The visual resources of a community or area include the physical features that make up the landscape and include both natural (landforms, waterways, etc.) and other elements (buildings, roads, structures, etc.). The following visual analysis discusses the visual qualities and resources within and nearby the study area and how the No-action and Preferred Alternatives impact those visual resources.

3.17.1 AFFECTED ENVIRONMENT

Existing Visual Environment

Interstate 15 is a large 12 lane roadway strewn with overpasses, interchanges, overhead signs, billboards, and noise walls. The study area is located along the I-15 corridor beginning at SR-201 and continuing to 12300 South in Riverton, Utah. The southbound portion of this corridor will be mostly expanded within the roadway right-of-way to include one additional travel lane and 7200 South will be widened between I-15 and Bingham Junction Boulevard to include one additional travel lane in each direction. Change in grade, and the addition of jersey barriers and/or noise walls, visually separates I-15 from the neighborhoods along the majority of the corridor.

Figure 3-8. Looking south along I-15 from 2700 South

The visual character of the study area is consistent with the overall look and feel of this part of Salt Lake County. Almost all of the land within the study area is developed. Industrial parks, rail yards, and residential and commercial developments line the I-15 corridor's west side. Current views from the roadway include views of the developed residential, commercial, and industrial land adjacent to the roadway; views of the Wasatch Mountain range to the east; and views of the Oquirrh Mountains range to the west. In general, drivers along I-15 are visually disconnected from the neighborhoods to the west of I-15.

Figure 3-9. Looking east at I-15 from industrial park on Cherry Street

3.17.2 AFFECTED ENVIRONMENT

No-action Alternative

Direct Impacts

The No-action Alternative would not make any alterations to the viewshed in the study area.

<u>Indirect Impacts</u>

The No-action Alternative would not have any indirect impacts to visual conditions in the study area.

Figure 3-10. Looking east at noise wall adjacent to residential neighborhood on Golden Drive

Preferred Alternative

<u>Direct Impacts</u>

Under the Preferred Alternative, there are primarily two viewer groups in the study area that would be impacted: viewers of the roadway and viewers using the roadway.

<u>Viewers of the Roadway</u>

The western portion of I-15 includes residential and commercial developments which face and back the roadway. I-15 is not seen in most locations due to walls, barriers, and the elevation change. The only impact to these viewers would be in the locations where new retaining walls or bridges would be constructed. These would only replace existing structures, thus the visual impacts of this project to the viewers of the roadway would be minimal, and views would essentially remain the same.

Figure 3-11. Looking north along I-15 from 3900 South

Visual impact to the viewers of the roadway would also occur near 7200 South. Improvements to 7200 South include widening 7200 South, relocating sidewalks and existing landscaping, and replacing two of the railroad bridges that cross the roadway. Views in this area will essentially remain the same.

<u>Indirect Impacts</u>

The Preferred Alternative would not have any indirect impacts to visual conditions in the study area.

Figure 3-12. Looking north at grade change from Anderson Avenue to I-15

Figure 3-13. Looking north at retaining wall and difference in elevation near Jensen Lane

Figure 3-14. Looking north at noise wall near residential neighborhood on 4800 South

Figure 3-15. Looking east at UTA railroad bridge over 7200 South

3.17.3 MITIGATION

During the design phase, a plan will be developed that is consistent with the existing aesthetics of the I-15 corridor and UDOT's Aesthetics Policy. Impacts to any landscaping, sidewalks, signage, and lighting will be restored.

3.18 ENERGY

3.18.1 AFFECTED ENVIRONMENT

In the context of transportation projects, energy is consumed during both the construction and the operational phases of the project. For construction, it is used to manufacture and transport materials and to operate construction machinery. During operation of the facility, energy is primarily related to vehicle fuel consumption, which is dependent upon vehicle miles traveled and travel conditions, i.e. vehicle type, speed, weather conditions, and roadway conditions such as vertical grade, roadway geometry, and the type and condition of the pavement.

Construction energy requirements were analyzed on a qualitative basis as to what types of construction activities (if any) would be required. Operational energy requirements were analyzed on a quantitative basis, as well as a qualitative basis.

This analysis consisted of dividing the average daily vehicle miles traveled (VMT) in the study area under each proposed alternative (including the No-action Alternative) by an average vehicle fuel efficiency estimate obtained from the Annual Energy Outlook 2016 with projections to 2040, (U.S. Energy Information Administration, April 2016). The report includes average fuel economy for light duty vehicles (LDV), which includes passenger cars, light-duty trucks and commercial light-duty trucks. For existing conditions, an average vehicle fuel efficiency of 21.9 miles per gallon (mpg) (as of 2013) was used. For 2040 conditions, an average vehicle fuel efficiency of 37.0 mpg was used (Table 3-17).

Table 3-17. Comparison of 2016 and 2040 Operational Energy Consumption

Scenario	Daily VMT	Change in Daily VMT	Percent Change in Daily VMT	Fuel Consumption (gallons)	Percent Changes in Fuel Consumption
2016 Travel Demand	3,808,000	NA	NA	181,332.43	NA
2040 Travel Demand: No-action Alternative	4,754,000	946,000	24.8%	128,486.49	-29.14%
2040 Travel Demand: Preferred Alternative	4,829,500	1,021,500	26.8%	130,527.03	-28.02%

3.18.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

Under the No-action Alternative, there would be no construction activities and therefore, the No-action Alternative would not have energy requirements for construction. In terms of operational energy requirements, the 2040 travel demand did not substantially vary between the No-action and the Preferred Alternative. The No-action Alternative would not include the additional travel lane on I-15 and delays would continue to occur. As discussed in Chapter 2, the additional travel lane is needed to improve LOS along the corridor; therefore, the No-action Alternative would result in a lower LOS, which would reduce vehicle efficiency and increase fuel consumption slightly more than under the Preferred Alternative.

Preferred Alternative

The Preferred Alternative would involve construction activities and therefore would require the consumption of energy for construction activities. In terms of operational energy requirements, the 2040 travel demand did not substantially vary between the No-action and the Preferred Alternative. Fuel consumption under the Preferred Alternative would be slightly higher than under the No-action Alternative. However, the Preferred Alternative would provide additional capacity along I-15 which would in turn reduce congestion and allow traffic to flow more smoothly. The reduction in traffic congestion would enable vehicles to maintain a more optimum speed, thereby improving vehicle efficiency and reducing fuel consumption in comparison with the No-action Alternative.

3.18.3 MITIGATION

No mitigation is required.

3.19 INVASIVE SPECIES

Executive Order 13112 directs federal agencies to expand and coordinate their efforts to combat the introduction and spread of plants and animals not native to the United States. Non-native flora and fauna can cause substantial changes to ecosystems, upset the ecological balance, and cause economic harm to our nation's agricultural and recreational sectors. Since roadway corridors provide opportunities for the movement of invasive species through the landscape, it is important that roadway projects include measures to combat the introduction and spread of invasive species. The State of Utah Department of Agriculture and Food maintains a Utah Noxious Weeds list with which designates three classes of noxious weeds: Class A, Class B, and Class C.

- **Class A** – Early Detection Rapid Response: Declared noxious weeds not native to the sate of Utah that pose a serious threat to the state and should be considered as a very high priority.

Blackhenbane	*Hyseyamus niger*
Diffuse Knapweed	*Centaurea diffusa*
Johnsongrass	*Sorghum halepense*
Leafy Spurge	*Euphorbia esula*
Medusahead	*Taeniatherum caput-medusae*
Oxeye daisy	*Chrysanthemum leucanthemum*
Perennial Sorgum	including but not limited to Johnson Grass (*Sorghum zhalepense*) and Sorghum Almum (*Sorghum almum,parodi*)
Purple Loosestrife	*Lythrum salicaria*
Spotted Knapweed	*Centaurea maculosa*
Squarrose Knapweed	*Centaurea Squarrosa*
St. Johns Wort	*Hypericum perforatum*
Sulfur Cinquefoil	*Potentilla recta*
Yellow Starthistle	*Centaurea solstitialis*
Yellow Toadflax	*Linaria vulgaris*

- **Class B –** Control: Declared noxious weeds not native to the state of Utah that pose a threat to the state and should be considered a high priority for control.

Bermudagrass	*Cynodon dactylon*
Broad-leaved Peppergrass	*Lepidium latifolium*
Dalmation Toadflax	*Linaria dalmatica*
Dyers Woad	*Isatis tinctoria*
Hoary Cress	*Cardaria spp.*
Musk Thistle	*Carduus nutans*
Perenial Pepperweed	*Lepidium latifolium*

Poison Hemlock	*Conium maculatum*
Russian Knapweed	*Centaurea repens*
Scotch Thistle	*Onopordium acanthium*
Squarrose Knapweed	*Centaurea virgata ssp*

- **Class C –** Containment: Declared noxious weeds not native to the state of Utah that are widely spread but pose a threat to the agricultural industry and agricultural products with a focus on stopping expansion.

Field Bindweed	Convolvulus spp.
Canada Thistle	*Cirsium arvense*
Houndstongue	*Cynoglossum officianale*
Salt Cedar	*Tamarix ramosissima*
Quack Grass	*Agropyron repens*

Like the Utah Department of Agriculture and Food, the Salt Lake County Noxious Weed List is comprised of the same 30 weeds listed above. The Salt Lake County Weed Board has identified three additional weeds not appearing on the state noxious weed list: Mytle Spurge (*Euphorbia myrsinites*), Garlic Mustard (*Alliaria petiolata*), and Puncturevine (*Tribulus terrestris*). Additionally, the Common Reed (*Phragmites australis)* while not on the Utah Noxious Weeds List, is considered an aggressive and problematic weed that clogs stormwater detention ponds and other bodies of water.

3.19.1 AFFECTED ENVIRONMENT

Land uses and degrees of development are relatively consistent throughout the study area. The majority of the study area is developed; however, vacant fields and strips of poorly maintained lands are found in multiple locations.

3.19.2 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

The No-action Alternative would not provide opportunities for movement of invasive species.

The Preferred Alternative

Direct Impacts

The Preferred Alternative would include roadway construction and would provide opportunities for the movement of invasive species. Based on the location, the construction of the Preferred Alternative has the potential to introduce or spread invasive species included on the noxious weeds lists of the State of Utah, Salt Lake County, and *Phragmites australis*. To minimize the movement of invasive species, the Contractor will be required to comply with UDOT's Special Provision 02924S - Invasive Weed Control.

Indirect Impacts

No indirect impacts are anticipated.

Mitigation

No mitigation required.

3.20 CONSTRUCTION IMPACTS

3.20.1 ENVIRONMENTAL CONSEQUENCES

No-action Alternative

There would be no construction impacts under the No-action Alternative.

Preferred Alternative

Social Conditions

Local residents as well as those traveling through the study area would experience traffic congestion, delays, and detours during the construction period. In addition, some residents who live or work in close proximity to the study corridor may experience disturbance effects from noise and dust generated by construction activities. Access to all properties will be maintained; however, there may be some temporary construction impacts.

Economic Conditions

Commuters who work in the study area would experience traffic congestion, delays, and detours during the construction period, as well as disturbance effects from noise and dust generated by construction activities. Access to all businesses will be maintained; however, there may be some temporary construction impacts.

Pedestrian and Bicyclist

The Preferred Alternative could require the temporary closure of bike and pedestrian facilities. A detour route will be provided for any facilities closed temporarily.

Air Quality

Construction of the Preferred Alternative would result in temporary negative effects to air quality in the study area due to increased dust and particulates. PM_{10} emissions from construction activities are usually local and short-term and last only for the duration of the construction period. Construction activity may also generate a temporary increase in MSAT emissions, especially for long-term construction projects. A permit for air quality impacts during construction would be obtained from the Utah Department of Air Quality (UDAQ) by the contractor.

Fugitive dust during construction would be mitigated and controlled in accordance with a fugitive dust control plan to be developed in coordination with UDAQ. This plan would include measures to minimize the extent of disturbed surface areas and restrict construction activities during high-wind periods.

Noise

Area residents would experience temporary inconvenience due to construction noise. Extended disruption of normal activities is not anticipated, since no one receptor is expected to be exposed to construction noise of long duration. Construction noise impacts would be minimized through adherence to UDOT Standard Specification 01355, Section 3.6 – Noise Control. The contractor would also be required to abide by any and all local noise ordinances, including Salt Lake County's Community Noise Pollution Control Regulation which requires a permit to conduct construction or demolition activities between the hours of 10 p.m. and 7 a.m.

Wetlands and Waters of the U.S.

There would be no construction impacts to wetlands or waters of the U.S.

Water Quality

During construction, there is the potential for temporary soil erosion and sediment/siltation impacts. Construction-related erosion and sedimentation would be managed through obtaining a Utah Pollution

Discharge Elimination System (UPDES) permit from the Utah Department of Environmental Quality (UDEQ). This permit requires a Storm Water Pollution Prevention Plan (SWPPP) and for Best Management Practices (BMPs) to be followed during construction. Short-term impacts to water quality would be minimized through implementation of UDOT's BMPs from the Temporary Erosion and Sediment Control Manual.

Cultural and Paleontological Resources

It is not expected than any previously unidentified cultural or paleontological resources would be encountered during construction. However, in the event that any such resources are discovered, the contractor would be required to abide by UDOT Standard Specification 01355 – Environmental Protection, Part 1.13, in relation to the discovery of any historical, archaeological, or paleontological objects, features, sites, and human remains.

Hazardous Waste

It is not expected that any hazardous materials would be encountered during construction activities. However, if hazardous waste material is encountered during construction, mitigation would be coordinated in accordance with UDOT Standard Specification 03155, which directs the contractor to stop work and notify the project engineer of any discovery of hazardous material. Disposition of any hazardous material would take place under the guidelines set by the UDEQ.

Visual Conditions

There would be some temporary visual impacts to the study area with the addition of construction signs, barricades, exposed earth, and construction equipment during construction.

Invasive Species

The Interchange Alternatives involve construction activities, including soil disruption, and therefore would provide opportunities for the movement of invasive species. The contractor will abide by UDOT's Special Provision 02926S – Invasive Weed Control to minimize the spread and introduction of invasive species. Some of the measures in the Special Provision include:

- Cleaning all earth-moving equipment before entering the project
- Treating existing noxious weeds at least ten days before starting earthwork operations
- Controlling invasive weeds using pre-emergent, selective and non-selective herbicides, as appropriate

Energy

The Preferred Alternative would involve construction activities and would therefore directly consume energy in the form of energy used to operate machinery, provide construction lighting, and produce and transport materials used in the construction of the project, such as asphalt.

Mitigation

No mitigation is required for construction impacts, as such impacts are temporary in nature.

3.21 THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

All roadway projects require the investment or commitment of some resources found in the existing environment. Short-term refers to the immediate consequences of the project; long-term relates to its direct or secondary effects on future generations.

3.21.1 NO-ACTION ALTERNATIVE

In the short-term, no construction activities would occur and there would be no need for the conversion of raw materials, funding sources, and labor for any improvements in the study area. The short-term consequences of the No-action Alternative would be continued traffic congestion on the I-15 corridor. The existing and future increase in traffic congestion would increase fuel consumption and decrease localized air quality in the area due to longer idling times at the intersections in the study area.

3.21.2 PREFERRED ALTERNATIVE

Under the Preferred Alternative, finite resources would be required, such as land and materials for the reconstruction of the roadway, as well as the expenditure of funds and labor. Short-term impacts would occur primarily during and immediately after the construction of the project.

With the Preferred Alternative comes greater traffic mobility in the study area due to the additional travel lane, reduced energy usage and vehicle emissions from less traffic delay and idling at the intersections, and improved safety. Thus, the short-term impacts of and the use of resources under the Preferred Alternative (e.g., lane closures, traffic delays, consumption of raw materials and funding resources) are consistent with the maintenance of and enhancement of long-term productivity at both a local and state level.

3.22 ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ALTERNATIVE

3.22.1 NO-ACTION ALTERNATIVE

For the No-action Alternative, there would be no construction activities and no commitment of either natural, physical, human, or fiscal resources. There would be no irreversible or irretrievable commitments of resources.

3.22.2 PREFERRED ALTERNATIVE

Implementation of the Preferred Alternative would involve construction activities and would therefore require a commitment of natural, physical, human and fiscal resources. Land used in the construction of the facilities included in the Preferred Alternative is considered an irreversible commitment during the time period that the land is used for a roadway facility. However, if a greater need arises for the use of the land or if the roadway facility is no longer needed, the land could be converted to another use. At present, there is no reason to believe that such a conversion would be necessary or desirable.

Considerable amounts of fossil fuels, labor and roadway construction materials (such as cement, aggregate, and bituminous material) would be expended in the construction of the new and/or improved roadway facilities. Additionally, large amounts of labor and natural resources would be used in the fabrication of construction materials. These materials are generally not retrievable. However, they are currently not in short supply and their use would not have an adverse effect on continued availability of these resources for other projects. Any construction would also require a substantial one-time expenditure of both state and federal funds for construction, which are not retrievable.

The commitment of these resources is based on the concept that residents in the immediate area, commuters through the area, and the state and the region would benefit by the improved quality of the transportation system. These benefits include improved accessibility and safety, time savings, and greater availability of quality services, which are anticipated to outweigh the commitment of these resources.

3.23 CUMULATIVE IMPACTS

3.23.1 INTRODUCTION

Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time "(40 CFR §1508.7). Cumulative impacts include the direct and indirect impacts of a project, together with the reasonably foreseeable future actions of other projects

Cumulative impact analysis is focused on the sustainability of the environmental resource in light of all the forces acting upon it and can result from individually minor but collectively significant actions taking place over time. For a project to have a cumulative effect, however, it must first have a direct or indirect effect on the resource in question. In accordance with the CEQ cumulative effects guidelines, cumulative effects analysis should be limited to those issues of a regional, national, or global concern.

3.23.2 METHODOLOGY AND TIME FRAME FOR DETERMINING CUMULATIVE IMPACTS

The methodology for determining cumulative impacts is based on Considering Cumulative Effects under NEPA (CEQ 1997). The geographic scope of the cumulative impacts analysis was determined to be Salt Lake County. The time frame for the cumulative impacts analysis includes past action and extends to the 2040 design year. The only cumulative impact issue to be analyzed, based on the concerns expressed during scoping and the project impact analysis, is air quality.

The potential cumulative impacts on the resources under study depend upon future changes in land use in the study area and the direct impacts from the project. The geographic scope of the cumulative impacts analysis was determined to be the Wasatch Front airshed. The time frame for the cumulative impacts analysis includes past action and extends to the 2040 design year.

3.23.3 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

This section provides a brief overview of the past, present, and reasonably foreseeable actions that either have contributed or will likely contribute to cumulative impacts on the previously mentioned resources.

Past Actions
Past actions that have impacted the development of Salt Lake County Include the following:

- *Population growth and residential development*
- *Construction of I-15 and associated interchanges:* Construction of I-15 began in the 1960s and influenced development along its corridor through Salt Lake County.
- *Construction of UTA's FrontRunner commute*r rail system: A commuter rail line operated by UTA, FrontRunner runs between Salt Lake City and Ogden. It began operation in April 2008.

Present and Reasonably Foreseeable Future Actions
The study area is located in a highly urbanized, built-out area so there is less likelihood that there would be major changes in the land use and social composition of the area in the foreseeable future. Present and reasonably foreseeable future plans for transportation in the study area include the following roadway and transit projects (Table 3-18):

Table 3-18. Present and Reasonably Foreseeable Transportation Projects in the Study Area

Street/Project Name	Project Limits	Existing No. of Lanes	Future No. of Lanes	Type
East-West Facilities				
I-15 HOT with Ramps	600 North to Bangerter Highway	8+2 HOT	8+4 HOT	Widening
I-15	Davis County Line to Utah County Line	--	--	Operational
North-South Facilities				
12300 South / 12600 South	I-15 to 700 East	4	6	Widening
10600 South / 10400 South	Redwood Road to I-15	4	6	Widening
9000 South	Redwood Road to I-15	4	6	Widening
7000 South / 7200 South	Bingham Junction to I-15	4	6	Widening
4500 South / 4700 South	Redwood Road to I-15	4	6	Widening
Spot Facilities				
I-15	@ 7200 South	- -	- -	Upgrade
I-15	@ 9400South	--	--	Upgrade
Transit				
3300 South / 3500 South Corridor	Millcreek TRAX Station to 2700 West/#500 South	--	--	BRT
3900 South / 4100 South Corridor	I-215 (Eastside) Ramp/3900 South to Meadowbrook TRAX station	--	--	EB
4500 South / 4700 South Corridor (Murray-Taylorsville Segment)	Murray Central TRAX Station to 4530 South/Riverboat Road	--	--	EB
Cottonwood/Kearns Corridor	State Street/Fort Union Blvd. to the Red Line (Bingham Junction) TRAX Station	--	--	BRT
Redwood Road Corridor	South Jordan FrontRunner Station to Sandy Civic Center TRAX Station	--	--	BRT

3.23.4 CUMULATIVE IMPACT ANALYSIS

Air Quality

Air Quality Standard Status

In the 1990s, Davis, Salt Lake, and Utah Counties failed to attain the NAAQS for ozone, particles, carbon monoxide, and sulfur dioxide. However, Salt Lake and Davis Counties were officially re-designated to attainment status for ozone by the EPA in 1997; Salt Lake, Ogden, and Provo Cities were re-designated to attainment for carbon monoxide in 1999, 2001, and 2006 respectively. Requests to re-designate Salt Lake County and part of Tooele County to attainment for sulfur dioxide, and to re-designate Salt Lake and Utah Counties and Ogden City to attainment for PM_{10} were submitted to the EPA in 2005.

On September 21, 2006, the EPA issued revisions to the NAAQS for particle pollution. The EPA strengthened the 24-hour $PM_{2.5}$ standard from the 1997 level of 65 µg/m3 to 35 µg/m3, and retained the current annual fine particle standard at 15 µg/m3.

In October 2008, the EPA strengthened the NAAQS for lead to increase protection of public health and the environment. The ambient air lead standards—both the primary (health-based) and secondary (environment-based) standards—have been revised to 0.15µg/m3 (micrograms per cubic meter of air). The previous NAAQS issued by the EPA in 1978 were ten times higher (1.5µg/m3).

In October 2016 (effective December 28, 2016), the EPA issued its Final Rule on ozone, which lowered the primary and secondary 8-hour ozone standards to 0.070 ppm. Areas of non-attainment for the new ozone standards have not yet been designated by EPA.

In September 2006, the EPA implemented a more stringent national standard for $PM_{2.5}$ of 35 µg/m3, replacing the former 65 µg/m3 standard. The range of PM2.5 measurements for urbanized counties, including Weber, Davis and Salt Lake, is 32-53 µg/m3.

$PM_{2.5}$

EPA designated Salt Lake and other counties in Utah as $PM_{2.5}$ Nonattainment Areas, effective April 2009. With support from WFRC, the Utah Division of Air Quality (UDAQ) has been developing a new plan to reduce $PM_{2.5}$ related emissions to the point that the Wasatch Front region will once again be in compliance with national $PM_{2.5}$ standards, which includes improved vehicle emission technology and national standards enacted in 2004 and 2007, respectively.

According to the WFRC, $PM_{2.5}$ emissions from transportation sources are projected to decline by 52% from 2008 to 2019, due to improvements in auto technology, transit utilization, and other travel choices. This project involves widening along one side of the I-15 Corridor and minor improvements to 7200 South intended to improve traffic flow in the study area and is intended to address congestion and delays from existing and anticipated future travel demand in the study area. It would not have a meaningful difference in VMT and would therefore would have a negligible impact on $PM_{2.5}$ trends along the Wasatch Front.

Ozone

Salt Lake County is in attainment for the 8-hour standard, so the original SIP for Salt Lake County has been replaced by a plan to maintain ozone related emissions at or below current levels to maintain compliance with the new standard. This project involves widening along one side of the I-15 Corridor and minor improvements to 7200 South intended to improve traffic flow in the study area and is intended to address congestion and delays from existing and anticipated future travel demand in the study area. It would not have a meaningful difference in VMT and would therefore have a negligible impact on ozone trends along the Wasatch Front.

MSAT

Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (such as airplanes), area sources (such as dry cleaners), and stationary sources (such as factories or refineries). MSAT's, which are compounds emitted from highway vehicles and non-road equipment, are a subset of the 188 air toxics defined by the Clean Air Act. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead federal agency for administering the Clean Air Act and has specific responsibilities for determining the health effects of MSATs. On April 29, 2014, the EPA published a final rule adopting new emission standards and fuel requirements for motor vehicles and for motor vehicle fuels (79 FR 23414). The final rule included Tier 3 emission standards to reduce exhaust and evaporative emissions from light-duty vehicles, light-duty trucks, and heavy duty vehicles up to 14,000 pounds GVWR.

The Tier 3 program is part of a comprehensive approach to reducing the impacts of motor vehicles on air quality and public health. The program considers the vehicle and its fuel as an integrated system, setting new vehicle emissions standards, and lowering the sulfur content of gasoline beginning in 2017. The new vehicle standards will reduce both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles. The gasoline sulfur standard will enable more stringent vehicle emissions standards and will make emissions control systems more effective. According to the EPA, the new Tier 3 vehicle emissions standards, combined with the reduction of gasoline sulfur content, will significantly reduce motor vehicle emissions, including nitrogen oxides (NOX) volatile organic compounds (VOC), direct particulate matter (PM2.5), carbon monoxide (CO), and air toxics (see Table 3-19).

Table 3-19. Estimated Emission Reductions from the Final Tier 3 Standards (Annual U.S. Short Tons)

Pollutant	2018		2030	
	Tons	Percent of On-road Inventory	Tons	Percent of On-road Inventory
NO_2	264,369	10%	328,509	25%
VOC	47,504	3%	157,591	16%
CO	278,879	2%	3,458,041	24%
Direct $PM_{2.5}$	130	0.1%	2,892	10%
Benzene	1,916	6%	4,762	26%
SO_2	14,813	56%	12,399	56%
1, 3-Butadiene	257	5%	677	29%
Formaldehyde	513	2%	1,277	10%
Acetaldehyde	600	3%	2,067	21%
Acrolein	40	3%	127	15%
Ethanol	2,704	2%	19,950	16%

Source: EPA, Office of Transportation and Air Quality Regulatory Announcement. EPA-420-F-14-009. March 2014

Due to the new Tier 3 standards, overall emissions from motor vehicles would be reduced in the design year. Further, this project involves widening along one side of the I-15 corridor and minor improvements to 7200 South. These measures are intended to improve traffic flow in the study area and address congestion and delays from existing and anticipated future travel demand in the study area. The measures would not have a meaningful difference in VMT and would therefore would have a negligible impact on MSAT trends along the Wasatch Front.

Future residential growth could also affect future ozone levels. Based upon the population growth anticipated in the region, there would be an increase in non-road sources, such as lawn mowers, paints, and consumer products, which emit pollutants such as NO_2 and/or VOCs.

GHG Emissions

As discussed in the Air Quality Section, greenhouse gas emissions have accumulated rapidly as the world has industrialized, with concentration of atmospheric CO2 increasing form roughly 300 parts per million in 1900 to over 400 parts per million today. State and national governments in many developed countries have set GHG emissions reduction targets of 80 percent below current levels by 2050, recognizing that post-industrial economies are primarily responsible for GHGs already in the atmosphere. As part of a 2014 bilateral agreement with China, the U.S. pledged to reduce GHG emissions 26-28 percent below 2005 levels by 2025; this emissions reduction pathway is intended to support economy-wide reductions of 80 percent or more by 2050. Further, the representatives of 195 nations reached a landmark accord on December 12, 2016 that commits nearly every country to lowering GHG emissions in order to stave off an increase in atmospheric temperatures of 2 degrees Celsius or 3.6 degrees Fahrenheit.

An estimate of GHG emissions in the study area is contained in Table 3-7 in the Air Quality Section, which shows that GHG emissions are expected to decrease from existing (2016) conditions to the design year of 2040 by approximately 28.18%. This project involves the addition of a travel lane in one direction from 12300 South to SR-201. This is intended to improve traffic flow in the study area and would not result in any meaningful changes to VMT, traffic speeds, or to the road grade. Further, EPA's GHG emissions standards, implemented in concert with national fuel economy standards, would also help minimize GHG emissions.

Conclusion

With ongoing improvements to vehicle emissions, including Tier 3 standards, and more stringent air quality controls, it is expected that air quality will continue to improve along the Wasatch Front through the 2040 planning period, even with anticipated increases in vehicle miles traveled. Due to the new Tier 3 standards, overall emissions from motor vehicles would be reduced in the design year. This project involves widening along one side of the I-15 corridor with minor improvements to 7200 South. These measures are intended to improve traffic flow in the study area and address congestion and delays from existing and anticipated future travel demand in the study area. These improvements would not have a meaningful difference in VMT and would therefore would have a negligible impact on MSAT trends along the Wasatch Front.

Vehicle emissions have continued to decrease substantially over time as the EPA has imposed a series of tighter emission-control requirements on engine emissions. As the region's vehicle fleet becomes newer and the older, higher-emitting vehicles are gradually replaced, it is expected that the tighter emission standards will more than offset the regional growth and the anticipated increase in vehicle miles traveled.

Based on the air quality conformity analysis conducted by the WFRC for the 2040 Regional Transportation Plan and the Air Quality Memorandum dated January 28, 2016, all the transportation projects in the 2016-2040 RTP conform to the SIP or the EPA interim conformity guidelines. With support from WFRC, the Utah Division of Air Quality has been developing a new plan (or a new section of the SIP) to reduce $PM_{2.5}$ related emissions to the point that the Wasatch Front Region will once again be in compliance with national $PM_{2.5}$ standards. The improved vehicle emission technology and national standards enacted in 2004 and 2007 respectively will be instrumental in the DAQ plan to achieve the new $PM_{2.5}$ standard. The WFRC Regional Transportation Plan will also aid in the emission reduction effort by reducing pollution that comes from traffic congestion and by improving transit service (bus, light rail, and commuter rail) to reduce dependence on private automobiles. According to the WFRC, $PM_{2.5}$ emissions from transportation sources are projected to decline by 52% from 2008 – 2019, due to improvements in auto technology, transit utilization, and other travel choices.

Climate Change

The National Climate Assessment (NCA), released by the U.S. Global Change Resource Program, contains scenarios for regions and sectors, including energy and transportation. These scenarios discuss potential impacts that may result from climate change, broken down into nationwide sectors or by region of the county. The NCA includes Utah in the Southwest region. The scenario for this region states that this is the hottest and driest region with limited water resources. Climate change is anticipated to increase the heat in this region, affecting precipitation and snowpack and therefore the availability of water for agriculture, energy producers, and other consumers. The NCA scenario states that the decade of 2001-2010 was the warmest in the 110-year instrumental record, with temperatures almost 2 degrees F higher than historic averages and fewer cold air outbreaks. Regional annual average temperatures are projected to rise by 2.5 degrees F to 5.5 degrees F by

2041-2070 (so long as there is continued growth in global emissions) and 2.5 degrees F to 4.5 degrees F in the same period if global emissions are substantially reduced.

For the sector-based scenarios, the nationwide focus means that some of the identified potential impacts are not applicable to the study area (i.e., coastal impacts). Others are somewhat speculative at this point, as there are variations in the scenarios put forward. However, as stated in Chapter 5 – Transportation, "[c]limate change will affect transportation systems directly, through infrastructure damage [such as accelerated asphalt deterioration, increased stress on expansion joints on bridges and highways, etc.], and indirectly, through changes in trade flows, agriculture, energy use, and settlement patterns." There may also be changes to snow removal needs and construction schedules.

Due to the location of the project in an urbanized area with minimal chances of flooding, hurricanes, or other major weather disruptions, there would be no appreciable climate-change related effects to this project versus the No-action Alternative.

Preferred Alternative

Regional modeling conducted by the WRFC for the 2015-2040 transportation conformity analysis demonstrated that all regionally significant transportation projects included in the RTP would be in compliance with the NAAQS. Further, vehicle emissions have continued to decrease substantially over time as the EPA has imposed tighter emission-control requirements on engine emissions. As the region's vehicle fleet becomes newer and the older, higher-emitting engines are gradually replaced, it is expected that the tighter emission standards will substantially offset the expected growth in vehicle miles traveled in the area that would occur under either scenario but which would be greater under the Preferred Alternative.

3.24 MITIGATION AND PROJECT COMMITMENTS SUMMARY

All UDOT Standard Specifications and BMPs will be followed.

3.24.1 LAND USE

No mitigation required.

3.24.2 FARMLANDS

No mitigation required.

3.24.3 SOCIAL CONDITIONS AND ENVIRONMENTAL JUSTICE

No mitigation required.

3.24.4 RELOCATIONS AND RIGHT-OF-WAY ACQUISITION

No mitigation required.

3.24.5 ECONOMICS

No mitigation required.

3.24.6 PEDESTRIAN AND BICYCLIST

No mitigation required.

3.24.7 AIR QUALITY

No mitigation required.

3.24.8 NOISE

Noise Wall 1

Noise Wall 1 would be located on the west side of I-15 near the 7200 South interchange. The noise wall would be constructed on the west side of the I-215 to I-15 Southbound Collector Ramp (see map 12 in Volume 2) and would extend from the approach to the bridge across 7200 South and continue for 1,100 feet. The wall would block noise from I-15 to The Road Home shelter for the homeless on the southwest corner of I-15 and 7200 South. A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for any of the front row receptors. A 16-foot wall would reduce noise levels by 7 dBA for 50% of front row receptors and is reasonable and feasible. A noise wall was also analyzed on the west side of the I-15 mainline, but it was found that a wall at this location would reduce noise at The Road Home receptors by less than 2 dBA. It is recommended that a 16-foot noise wall be constructed along the west side of the I-215 to I-15 Southbound Collector Ramp, pending the results of balloting by affected property owners and tenants.

A consideration for the property owners and tenants in their decision is that the proposed noise wall would be constructed on the east side of the UPRR/UTA tracks. It is possible that train noise might become more annoying as it reflects off the concrete sound wall toward the residences. This effect is impossible to model and it is unknown whether the increase in noise would be perceptible.

Noise Wall 2

Noise Wall 2 would be located on the west side of I-15 near the Wasatch Street bridge. The noise wall would extend approximately 1,200 feet as shown on map 14 in Volume 2. The wall would block noise from I-15 to the English Manor Apartments and three single-family homes on Wasatch Street and Allen Street. A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for any of the front row receptors. A 16-foot wall would reduce noise levels by 7 dBA for 92% of front row receptors and would meet the cost-effectiveness criteria. It is recommended that a 16-foot noise wall be constructed at this location, pending the results of balloting by affected property owners and tenants.

A consideration for the property owners and tenants in their decision is that the proposed noise wall would be constructed on the east side of the UPRR/UTA tracks. It is possible that train noise might become more annoying as it reflects off the concrete sound wall toward the residences. This effect is impossible to model and it is unknown whether the increase in noise would be perceptible.

All other existing noise walls impacted by the construction of the project would be replaced "in-kind" consistent with the UDOT Noise Abatement Policy.

3.24.9 WETLANDS AND WATERS OF THE U.S.

Permitting

Based on our understanding, impacts to WOUS will be approximately 0.09 acres, and no wetlands will be impacted by the Preferred Alternative. If it is determined that impacts to WOUS are greater than 0.10 acre, or that any wetlands are impacted, a joint Section 404 and Stream Alteration Permit will be completed for submittal to the Utah Division of Water Rights (UDWR) and the USACE. Compensatory mitigation will be required for any impacts to WOUS.

3.24.10 FLOODPLAINS

Hydraulic analyses will be performed to determine if there would be a rise in the BFE. If the rise in the BFE is greater than one foot, proper steps will be taken with Salt Lake County and FEMA to obtain a LOMR. These steps include:

- Coordination with Salt Lake County Floodplain Manager during final design
- Salt Lake County approval of CLOMR documentation
- Obtain a CLOMR from FEMA
- Obtain an FDP from Salt Lake County
- Following project completion, obtain an LOMR from FEMA

3.24.11 WATER QUALITY

- A new storm drain system will be constructed that will comply with current UDEQ and UDWQ standards as well with local discharge rates and regulations.
- Impacted water rights will be handled through UDOT's Right-of-Way acquisition process.
- Existing detention ponds within the study area will be dredged to remove sediment, trash, and plant material that has infiltrated them over time. This will allow more storage for storm water runoff.

3.24.12 WILDLIFE AND THREATENED AND ENDANGERED SPECIES

No mitigation required.

3.24.13 WILD AND SCENIC RIVERS

No mitigation required.

3.24.14 CULTURAL RESOURCES

No mitigation required.

3.24.15 PALEONTOLOGY

No mitigation required.

3.24.16 HAZARDOUS WASTE

No mitigation required.

3.24.17 VISUAL QUALITY

During the design phase, a plan will be developed that is consistent with the existing aesthetics of the I-15 corridor and UDOT's Aesthetics Policy. Impacts to any landscaping, sidewalks, signage, and lighting will be restored.

3.24.18 ENERGY

No mitigation required.

3.24.19 INVASIVE SPECIES

No mitigation required.

3.24.20 CONSTRUCTION

No mitigation required for construction impacts, as such impacts are temporary in nature.

Chapter Four: Comments and Coordination

This chapter describes the early and ongoing coordination activities, summarizes key issues and pertinent information received from the public and agencies, and lists those agencies and persons that were consulted. Chapter 4 is organized as follows:

- **4.1 Public and Agency Coordination**: This section includes descriptions of key meetings with agencies and with the public in general.
- **4.2 Agency Correspondence**: This section details the correspondence letters and e-mails from agencies.

4.1 PUBLIC AND AGENCY COORDINATION

Public involvement activities included the following:

- Newsletters, flyers, and other public notices
- Agency and public meetings

The following is a list of meetings held as part of the coordination process for this State Environmental Study (SES), including a brief summary of the minutes. The minutes themselves are contained in the Administrative Record for the project. In addition, regular project team meetings were held approximately every week.

- Project Kickoff Meeting
- November 8, 2016: Stakeholder Meeting with UTA
- November 30, 2016: Agency and Public Scoping Meeting
- December 12, 2016: Monthly Coordination Meeting with Midvale City
- January 9, 2017: Stakeholder Meeting with Midvale City
- January 17, 2017: Stakeholder Meeting with South Salt Lake, UDOT
- February 1, 2017: Stakeholder Meeting with The Road Home (Midvale Location)

October 18th, 2016: Project Kickoff Meeting

In this initial meeting, the project team members met to discuss the following items:

- Project Roles
- Scheduling
- Scoping Activities
- Agency Coordination

November 8th, 2016: Stakeholder Meeting

Representatives from Horrocks Engineers met with Midvale City, the Utah Department of Transportation's (UDOT) Project Manager and The Langdon Group (public involvement team). Those in attendance discussed the following:

- Identification of Key Stake Holders
- Design Aspects: 7200 South
- Transportation Alternatives
    - Priority addressed: Ease of access to transit
- Consideration of the UTA Ski Bus
- Arrangement of Public Involvement Team and Economic Development Director Meetings

November 30th, 2016: Agency and Public Scoping Meeting

The Utah Transit Authority (UTA), representatives from Midvale City, Salt Lake County, Murray City, and South Jordan City attended this meeting, which was held at the Midvale Senior Center. The UDOT Project Manager, representatives from Horrocks Engineers, The Langdon Group and the public were also in attendance. Notices were mailed to 2,584 residents and businesses within the study area. Additionally, notices were posted through UDOT's public meeting portal as well as via social media announcements. A total of 40 people attended the public scoping meeting. Items discussed in the meeting included the following:

- Project Team Introductions
- Presentation of Project Information
- Transportation Alternatives
    - Project Area
    - Schedule
    - Design Elements
    - Traffic Elements
    - Environmental Resources: Air Quality, Noise, Traffic Congestion, Intrusive Highway Lighting
- Invitation for Public Input

December 12th, 2016: Monthly Coordination Meeting with Midvale City

Midvale City Economic Development Director Chris Butte, representatives from Horrocks Engineers, and The Langdon Group met at the Midvale City Community Development Office, and discussed the following items:

- Outreach to Local Businesses
- City Coordination
- Project Time Frames
- Construction Impacts
- Development Follow-up with Local Businesses

January 9th, 2017: Monthly Coordination Meeting with Midvale City

Representatives from Horrocks Engineers, The Langdon Group, and Chris Butte, the director of Midvale City Development Office personnel met at the Midvale City Community Development Office to discuss the following topics:

- Outreach to Local Businesses
- City Coordination
- Local Business Coordination
- Communication Gaps
- Determination of Coordination with Key Businesses
    - Priority Businesses: Winco & Top Golf

January 17th, 2017: Stakeholder Meeting with South Salt Lake City

The UDOT Project Manager, representatives from Horrocks Engineers, the City of South Salt Lake, and The Langdon Group met at the South Salt Lake City offices and discussed the following items:

- Identification of Key Stakeholders
- Beautification Project of 3300 South
- Existing Utilities
- Transportation Maintenance
- Local Road Coordination
- Drainage Issues
    - Priority Issue: Detention basins at 3300 South
- Ongoing Coordination and Outreach with Stakeholders

February 1st, 2017: Stakeholder Meeting with The Road Home

This meeting, held at the Midvale location of The Road Home, included representatives from Horrocks Engineers, UDOT, The Road Home, and The Langdon Group. Items discussed included the following:

- Project Overview
- Ongoing Coordination with The Road Home
- Long-term Plans for The Road Home
    - Priority Issues: needs of the facility, access to the facility, and incorporation of project design elements
    - Temporary Construction Easement
- Contractor Schedule

4.2 AGENCY CORRESPONDENCE

Correspondence letters (both sent and received) are shown in Table 4-1 and are included in the following pages, in order by date.

Table 4-1. Correspondence

Date	To	From	Subject
12/02/2016	Jason Gipson US Army Corps of Engineers	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Andrew Gruber Wasatch Front Regional Council	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Brad Westwood State Historic Preservation Office	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Lance Kippen Union Pacific Railroad	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2105	Larry Crist US Fish and Wildlife Service	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Ed Buchanan Utah Transit Authority	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Kathleen Clarke Utah Resource Development Coordinating Committee	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Mayor Ben McAdams Salt Lake County	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Mayor Cherie Wood South Salt Lake	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Mayor David Eyre Murray City	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Mayor David L. Alvord South Jordan	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Mayor JoAnn Seghini Midvale	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Mayor Tom Dolan Sandy	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Mayor Troy Walker Draper	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting
12/02/2016	Mayor-Elect Jeff Silvestrini Millcreek	Lisa Zundel UDOT Project Manager	Invitation to Attend Agency Scoping Meeting

Date	To	From	Subject
12/7/2016	Peter Steele Horrocks Engineers	Martha Hayden Department of Natural Resources	Paleontological Clearance
12/28/2016	Nicole Tolley Horrocks Engineers	Paul W. West UDOT Wildlife Program Manager	Threatened & Endangered Species/ Wildlife
02/21/2017	Darwin St. Clair Jr., Chairman Eastern Shoshone Tribe of the Wind River Reservation	Jonathan Dugmore UDOT Archaeologist Regions 1 and 2	Native American Consultation
02/21/2017	Blaine Edmo, Chair Shoshone-Bannock Tribes of Fort Hall	Jonathan Dugmore UDOT Archaeologist Regions 1 and 2	
02/21/2017	Corrina Bow, Tribal Chairperson Paiute Indian Tribe of Utah	Jonathan Dugmore UDOT Archaeologist Regions 1 and 2	Native American Consultation
02/21/2017	Shane Warner, Chairman Northwest-ern Band of Shoshone Nation	Jonathan Dugmore UDOT Archaeologist Regions 1 and 2	Native American Consultation
02/21/2017	Shaun Chapoose, Chairperson Ute Indian Tribe of the Uintah and Ouray Ute Indian Reservation	Jonathan Dugmore UDOT Archaeologist Regions 1 and 2	Native American Consultation
02/21/2017	Candace Bear, Chairwoman Skull Val-ley Band of Goshute Indians	Jonathan Dugmore UDOT Archaeologist Regions 1 and 2	Native American Consultation
02/21/2017	Lora Tom, Band Chairwoman Cedar Band of Paiutes	Jonathan Dugmore UDOT Archaeologist Regions 1 and 2	Native American Consultation
02/21/2017	Jetta Wood, Band Chairwoman Shivwits Band of Paiute Indian Tribe of Utah	Jonathan Dugmore UDOT Archaeologist Regions 1 and 2	Native American Consultation
02/21/2017	Virgil Johnson, Chairman Confederat-ed Tribes of the Goshute Reservation	Jonathan Dugmore UDOT Archaeologist Regions 1 and 2	Native American Consultation
02/23/2017	Cory Jensen SHPO	Liz Robinson Cultural Resource Program Manager UDOT Environmental Services	Determination of Eligibility and Finding of Effect (DOEFOE)
03/27/2017	Liz Robinson UDOT Cultural Resources Manager	Cory Jensen SHPO	DOEFOE Concurrence

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Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Jason Gipson
US Army Corps of Engineers
533 West 2600 South, Ste. 150
Bountiful, UT 84010

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Jason Gipson,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

At this time, we request your assistance in identifying potential resources, concerns, requirements, or recommendations you may have relating to the proposed project. You are invited to attend a scoping meeting that will be held at the Midvale Senior Center (7550 South Main Street, Midvale), on November 30, 2016 at 4:00 p.m., prior to a public scoping open house from 5:00 p.m. to 7:00 p.m. If you plan to attend the scoping meeting, please RSVP to Nicole Tolley at Horrocks Engineers, 2162 West Grove Parkway, Suite 400; Pleasant Grove, Utah 84062 or by e-mail at nicolet@horrocks.com. Please respond to Nicole Tolley with scoping comments no later than December 14, 2016 at the above address/email.

We appreciate your participation on this project and look forward to the opportunity to work with you.

Sincerely,

Lisa Zundel
UDOT Project Manager

Region Two Headquarters, 2010 South 2760 West, Salt Lake City, Utah 84104-4592
telephone 801-975-4900 • facsimile 801-975-4841 • www.udot.utah.gov

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DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Andrew Gruber
Wasatch Front Regional Council
295 N. Jimmy Doolittle Road
Salt Lake City, UT 84116

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Andrew Gruber,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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We appreciate your participation on this project and look forward to the opportunity to work with you.

Sincerely,

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CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Brad Westwood
State Historic Preservation Office
300 S. Rio Grande Street
Salt Lake City, UT 84101

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Brad Westwood,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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We appreciate your participation on this project and look forward to the opportunity to work with you.

Sincerely,

Lisa Zundel
UDOT Project Manager

Region Two Headquarters, 2010 South 2760 West, Salt Lake City, Utah 84104-4592
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DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Lance Kippen
Union Pacific Railroad
1400 West 52nd Ave.
Denver, CO 80221

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Lance Kippen,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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We appreciate your participation on this project and look forward to the opportunity to work with you.

Sincerely,

Lisa Zundel

Lisa Zundel
UDOT Project Manager

Region Two Headquarters, 2010 South 2760 West, Salt Lake City, Utah 84104-4592
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DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Larry Crist
US Fish and Wildlife Service
2369 West Orton Circle, Ste.50
West Valley City, UT 84119-7603

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Larry Crist,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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Sincerely,

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Lisa Zundel
UDOT Project Manager

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DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Ed Buchanan
Utah Transit Authority
P.O. Box 30810
Salt Lake City, UT 84130

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Ed Buchanan,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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We appreciate your participation on this project and look forward to the opportunity to work with you.

Sincerely,

Lisa Zundel
UDOT Project Manager

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CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Kathleen Clarke
Utah Resource Development Coordinating Committee
E-210 State Capitol Complex
Salt Lake City, UT 84114

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Kathleen Clarke,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

At this time, we request your assistance in identifying potential resources, concerns, requirements, or recommendations you may have relating to the proposed project. You are invited to attend a scoping meeting that will be held at the Midvale Senior Center (7550 South Main Street, Midvale), on November 30, 2016 at 4:00 p.m., prior to a public scoping open house from 5:00 p.m. to 7:00 p.m. If you plan to attend the scoping meeting, please RSVP to Nicole Tolley at Horrocks Engineers, 2162 West Grove Parkway, Suite 400; Pleasant Grove, Utah 84062 or by e-mail at nicolet@horrocks.com. Please respond to Nicole Tolley with scoping comments no later than December 14, 2016 at the above address/email.

We appreciate your participation on this project and look forward to the opportunity to work with you.

Sincerely,

Lisa Zundel
UDOT Project Manager

Region Two Headquarters, 2010 South 2760 West, Salt Lake City, Utah 84104-4592
telephone 801-975-4900 • facsimile 801-975-4841 • www.udot.utah.gov

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Mayor Ben McAdams
2001 State St N 2100
Salt Lake City, UT 84190

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Mayor Ben McAdams,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Mayor Cherie Wood
220 E. Morris Avenue
South Salt Lake, UT 84115

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Mayor Cherie Wood,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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We appreciate your participation on this project and look forward to the opportunity to work with you.

Sincerely,

Lisa Zundel

Lisa Zundel
UDOT Project Manager

Region Two Headquarters, 2010 South 2760 West, Salt Lake City, Utah 84104-4592
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DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Mayor David Eyre
5025 State St
Murray, UT 84107

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Mayor David Eyre,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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Sincerely,

Lisa Zundel

Lisa Zundel
UDOT Project Manager

Region Two Headquarters, 2010 South 2760 West, Salt Lake City, Utah 84104-4592
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DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Mayor David L. Alvord
4316 Opencrest Drive
South Jordan, UT 84095

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Mayor David L. Alvord,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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We appreciate your participation on this project and look forward to the opportunity to work with you.

Sincerely,

Lisa Zundel
UDOT Project Manager

Region Two Headquarters, 2010 South 2760 West, Salt Lake City, Utah 84104-4592
telephone 801-975-4900 • facsimile 801-975-4841 • www.udot.utah.gov

State of Utah

GARY R. HERBERT
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SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Mayor JoAnn B. Seghini
655 West Center Street
Midvale, UT 84047

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Mayor JoAnn B. Seghini,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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We appreciate your participation on this project and look forward to the opportunity to work with you.

Sincerely,

Lisa Zundel

Lisa Zundel
UDOT Project Manager

Region Two Headquarters, 2010 South 2760 West, Salt Lake City, Utah 84104-4592
telephone 801-975-4900 • facsimile 801-975-4841 • www.udot.utah.gov

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DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Mayor Tom Dolan
10000 Centennial Parkway
Sandy, UT 84070

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Mayor Tom Dolan,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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We appreciate your participation on this project and look forward to the opportunity to work with you.

Sincerely,

Lisa Zundel

Lisa Zundel
UDOT Project Manager

Region Two Headquarters, 2010 South 2760 West, Salt Lake City, Utah 84104-4592
telephone 801-975-4900 • facsimile 801-975-4841 • www.udot.utah.gov

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DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Mayor Troy Walker
1020 E. Pioneer Road
Draper, UT 84020

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Mayor Troy Walker,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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We appreciate your participation on this project and look forward to the opportunity to work with you.

Sincerely,

Lisa Zundel

Lisa Zundel
UDOT Project Manager

Region Two Headquarters, 2010 South 2760 West, Salt Lake City, Utah 84104-4592
telephone 801-975-4900 • facsimile 801-975-4841 • www.udot.utah.gov

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DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Mayor-Elect Jeff Silvestrini
Jeff4Millcreek@gmail.com

Re: Invitation to Scoping Meeting for the I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah
UDOT Project No. S-I15-7(324)297; PIN 12587

Dear Mayor-Elect Jeff Silvestrini,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes (see enclosed Project Location Maps).

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We appreciate your participation on this project and look forward to the opportunity to work with you.

Sincerely,

Lisa Zundel

Lisa Zundel
UDOT Project Manager

Region Two Headquarters, 2010 South 2760 West, Salt Lake City, Utah 84104-4592
telephone 801-975-4900 • facsimile 801-975-4841 • www.udot.utah.gov

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director

Utah Geological Survey
RICHARD G. ALLIS
State Geologist/Division Director

December 7, 2016

Peter Steele
Horrocks Engineers
2162 West Grove Parkway, Suite 400
Pleasant Grove UT 84062

RE: Paleontological File Search and Recommendations for the US-6 and US-191 Helper to Blanding ATMS Project, Carbon, Emery, Grand, and San Juan Counties, Utah
U.C.A. 79-3-508 (Paleontological) Compliance; Request for Confirmation of Literature Search according to the UDOT/UGS Memorandum of Understanding.

Dear Peter:

I have conducted a paleontological file search for the US-6 and US-191 ATMS Project in response to your email of December 7, 2016. This project qualifies for treatment under the UDOT/UGS executed Memorandum of Understanding.

There are no paleontological localities recorded in our files for this project area. Quaternary and Recent alluvial deposits and Mancos Shale deposits that are exposed at these project locations have a low potential for yielding significant fossil localities (PFYC 2). In two of the project locations (6. US-191 MP80.7 and 9. US-191 MP62.0 and 61.2), there is a slight potential to encounter Morrison and Cedar Mountain Formation deposits (PFYC 4-5), so please be aware of potential impacts to paleontological resources if there is disturbance outside of the existing UDOT ROW. Otherwise, unless fossils are discovered as a result of construction activities, this project should have no impact on paleontological resources.

If you have any questions, please call me at (801) 537-3311.

Sincerely,

Martha Hayden

Martha Hayden
Paleontological Assistant

1594 West North Temple, Suite 3110, PO Box 146100, Salt Lake City, UT 84114-6100
telephone (801) 537-3300 • facsimile (801) 537-3400 • TTY (801) 538-7458 • *geology.utah.gov*

Memorandum

To: Nicole Tolley, P.E.
Horrocks Engineers

From: Paul W. West, Wildlife Program Manager
UDOT, Environmental Services

P.W.W.

Date: December 28, 2016

Re: S-I15-7(324)297 – I-15, 12300 S to SR-201, Salt Lake County (PIN 12587)

CC: Craig Bown – UDOT, Region 2
Ashley Green – UDWR, Headquarters
Mark Farmer – UDWR, Central Region
Matt Howard – UDWR, Central Region
Lloyd Neeley – UDOT, Maintenance
File

Encls:

I understand the Utah Department of Transportation (UDOT) UDOT is proposing to make transportation improvements on southbound Interstate 15 (I-15) in Salt Lake County (see Project Location Maps). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and is proposing to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes

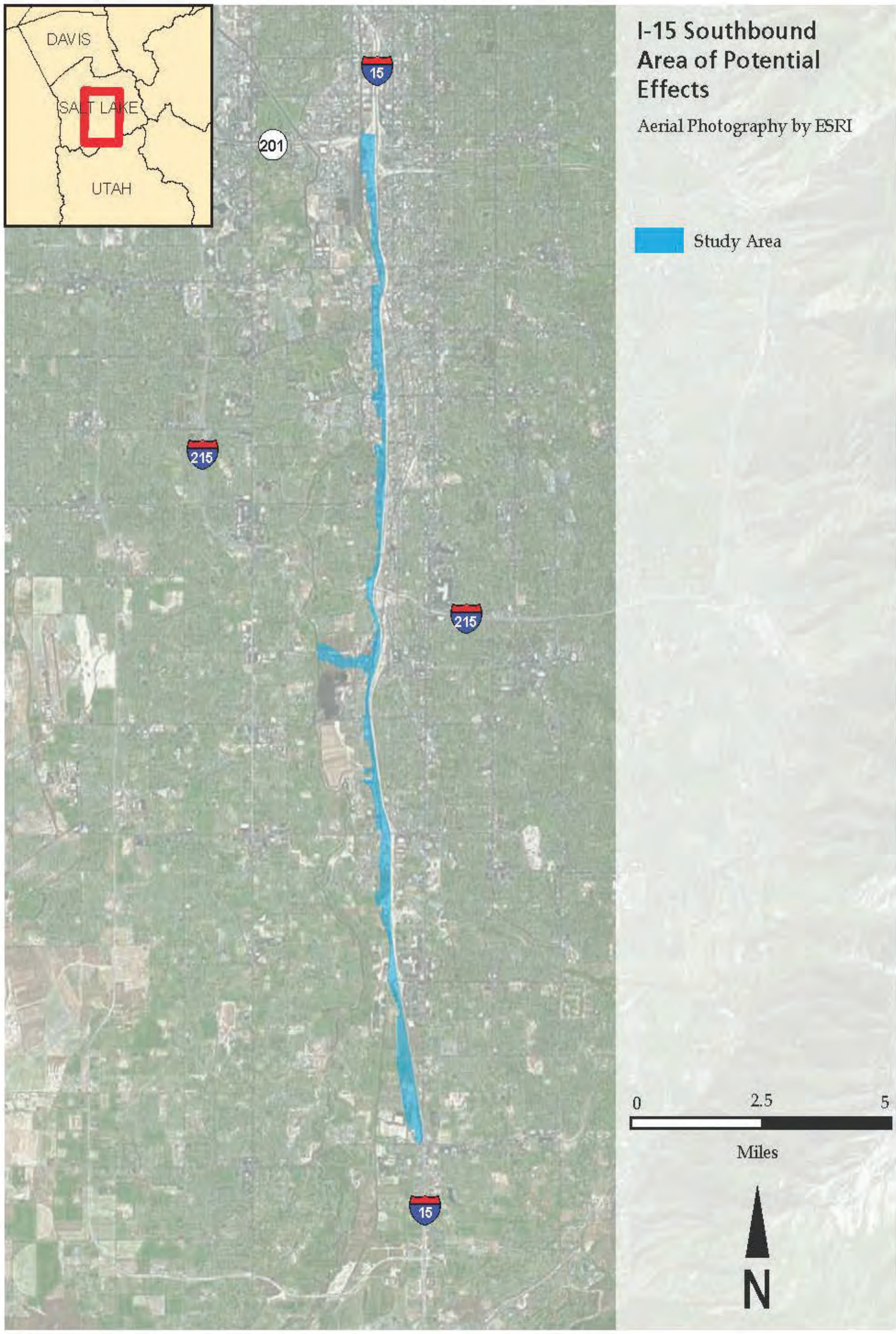
A review of the Utah Division of Wildlife Resources, Utah Natural Heritage Program (UDWR/UNHP) 2015 database indicates that no federally listed, threatened, endangered or candidate species, or any critical habitat would be affected by this project.

Inasmuch as this is a state funded project with no federal nexus of which I am aware, we are not required to obtain concurrence letters from the U.S. Fish and Wildlife Service. Therefore, I am issuing this memo in-lieu of their concurrence for your environmental documentation.

In addition, I have evaluated the above-referenced project with regard to Greater Sage Grouse (*Centrocercus urophasianus*) and migratory birds as required in the UDOT Environmental Manual of Instruction and by the Conservation plan for Greater Sage-grouse MOU between UDWR and UDOT.

Based on the "UDWR/UNHP 2015 database and Greater Sage Grouse 2015 mapping," it is my opinion that his project should not negatively affect Greater Sage Grouse or migratory birds.

If you have any questions, please call me at (801) 633-8747, or email me at paulwest@utah.gov.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Aerial Photography by ESRI
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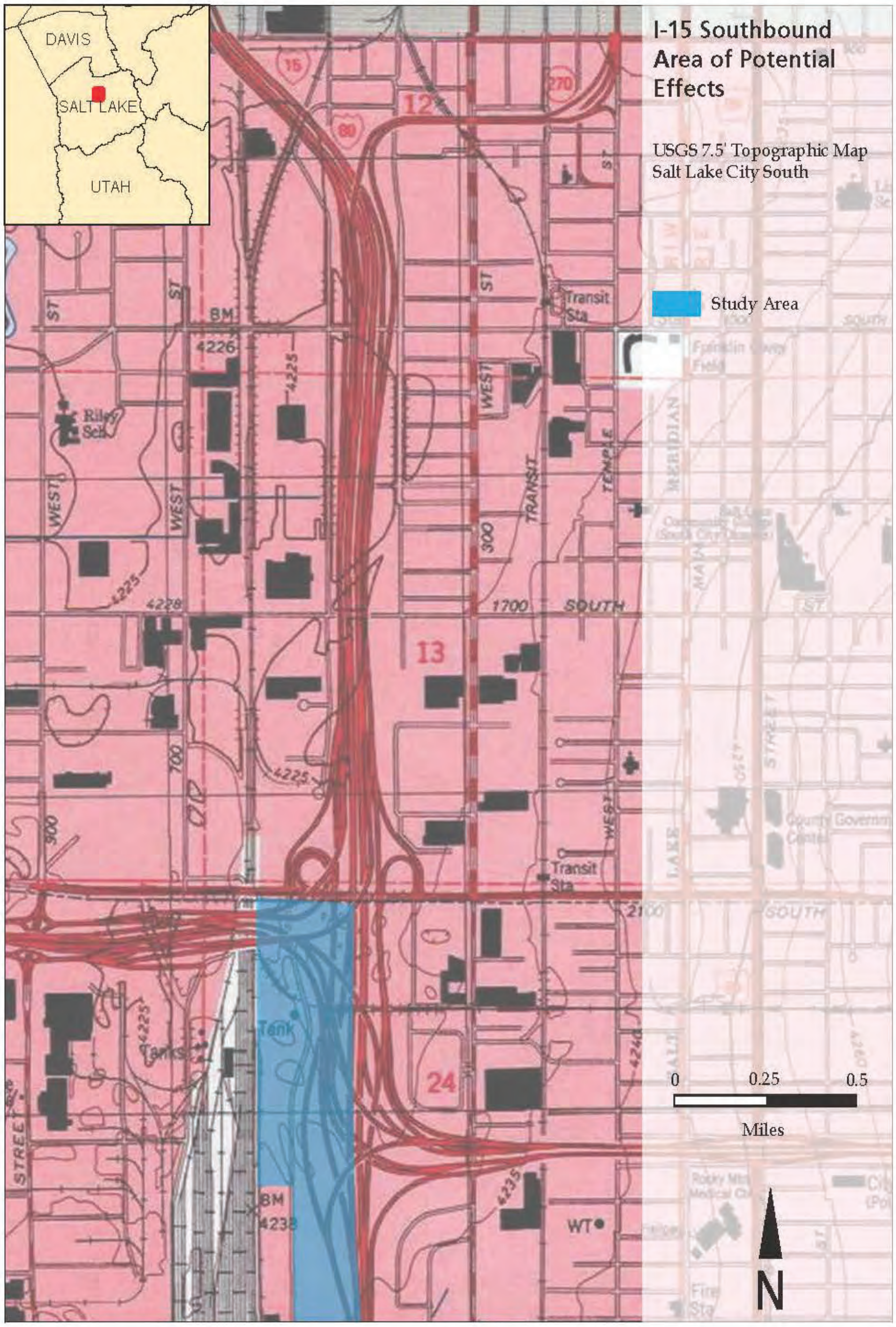
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USGS 7.5' Topographic Map
Salt Lake City South
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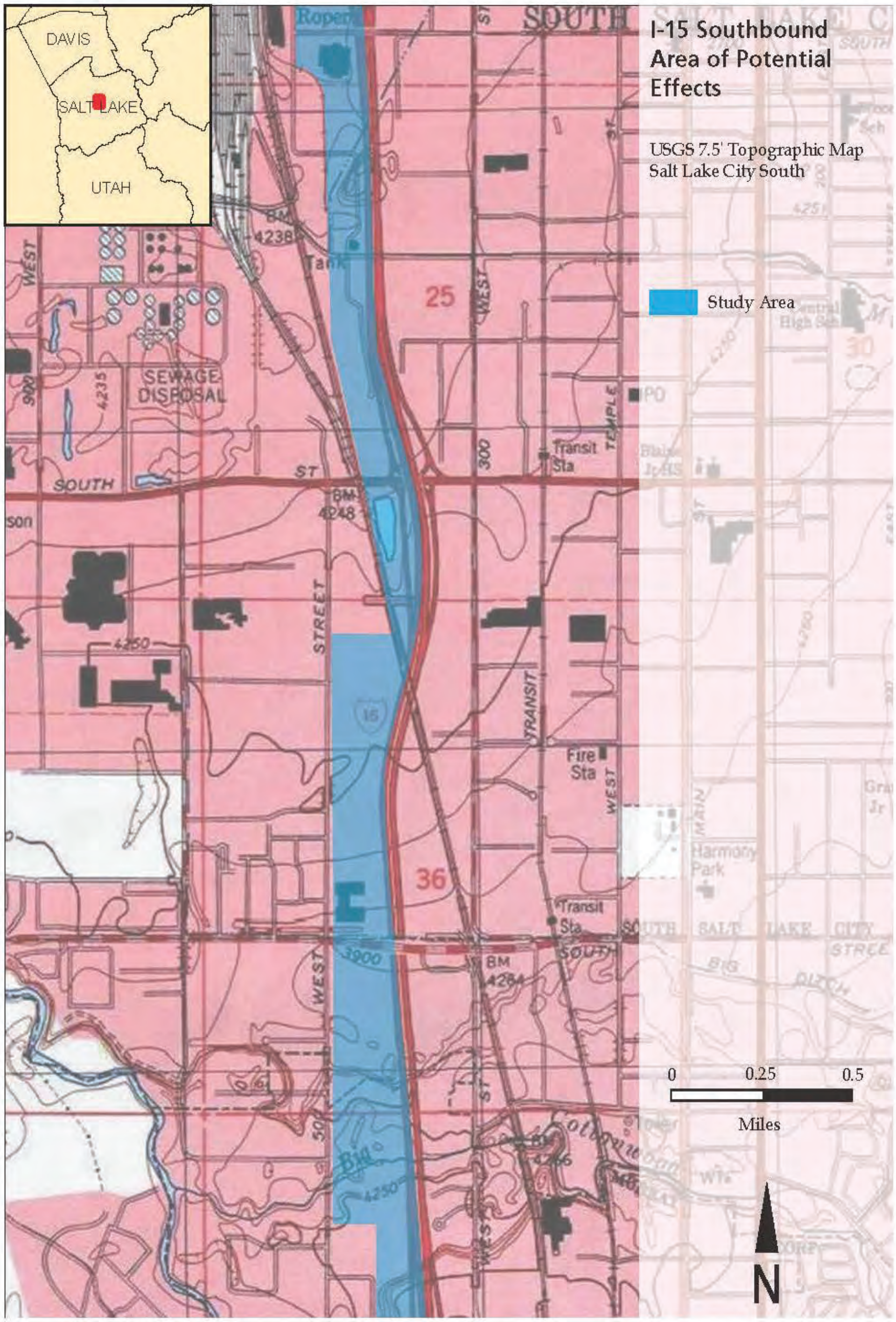
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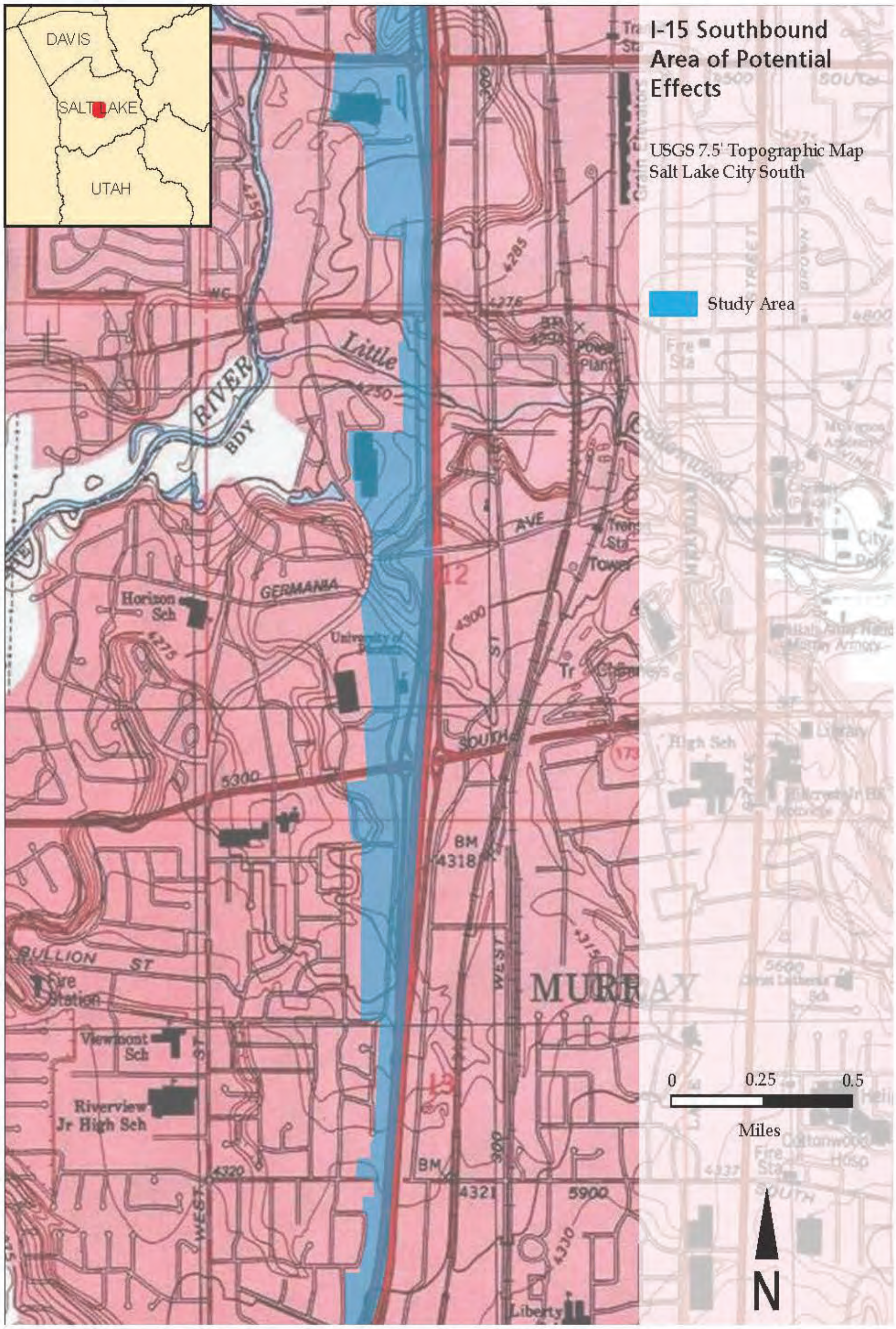
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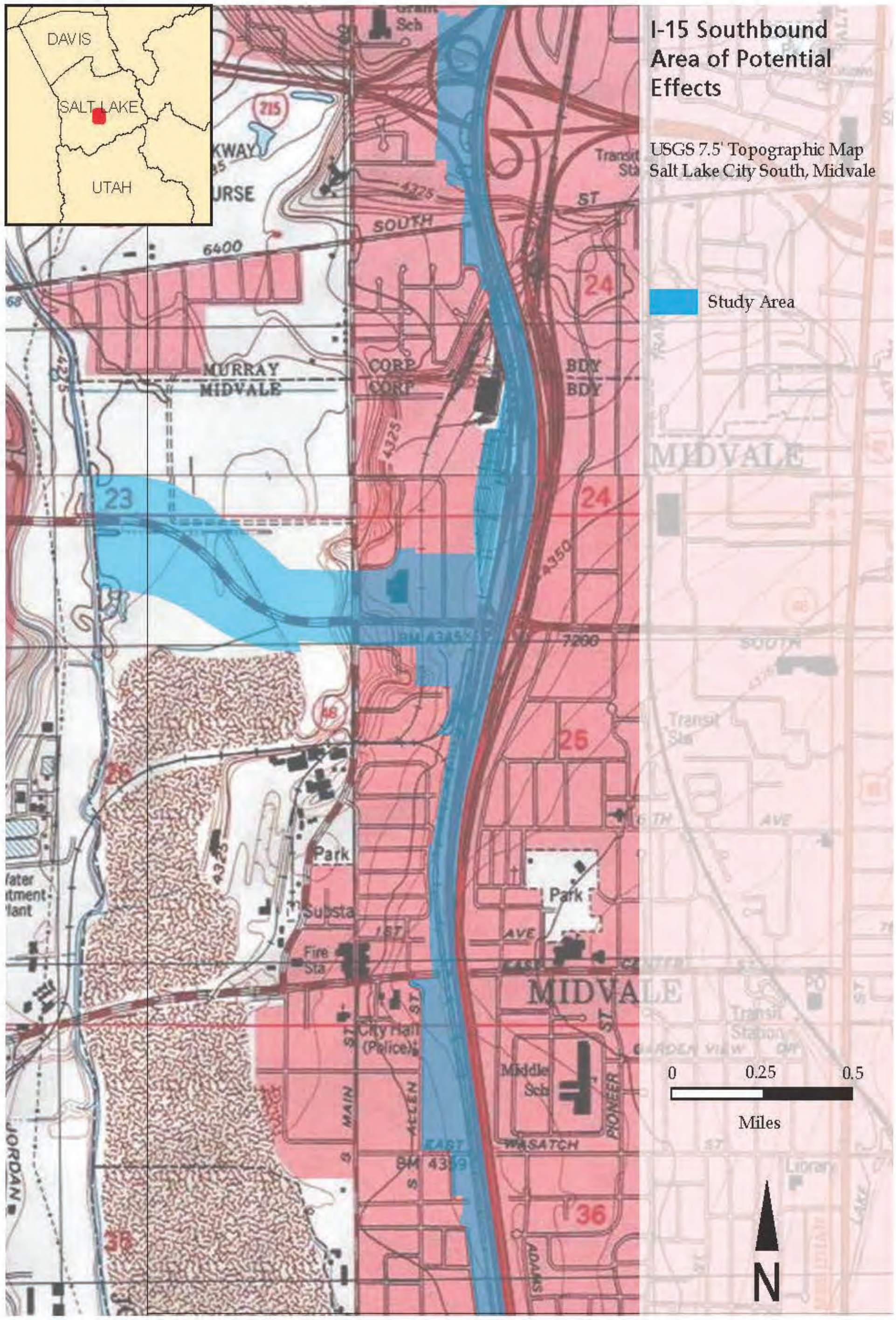
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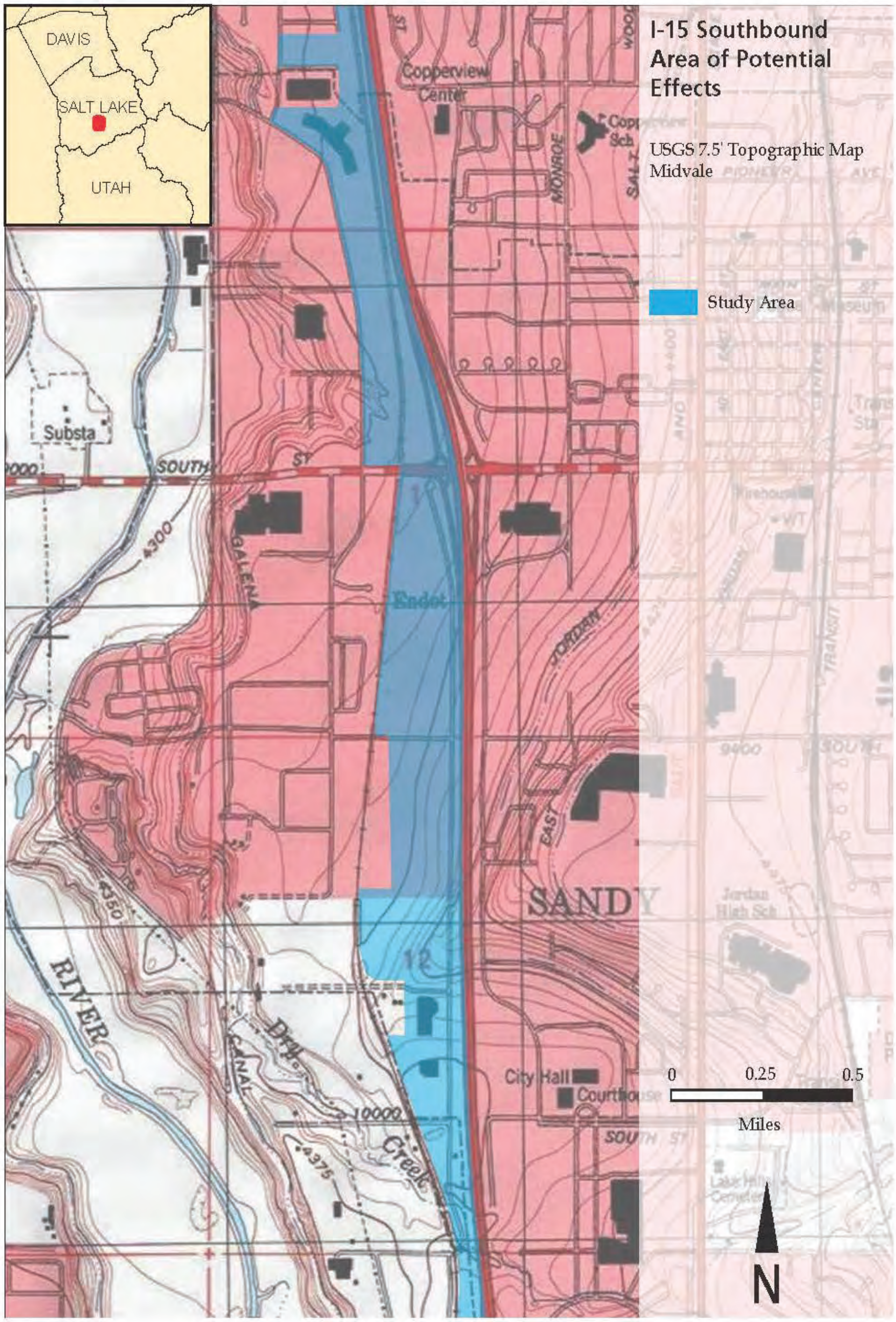
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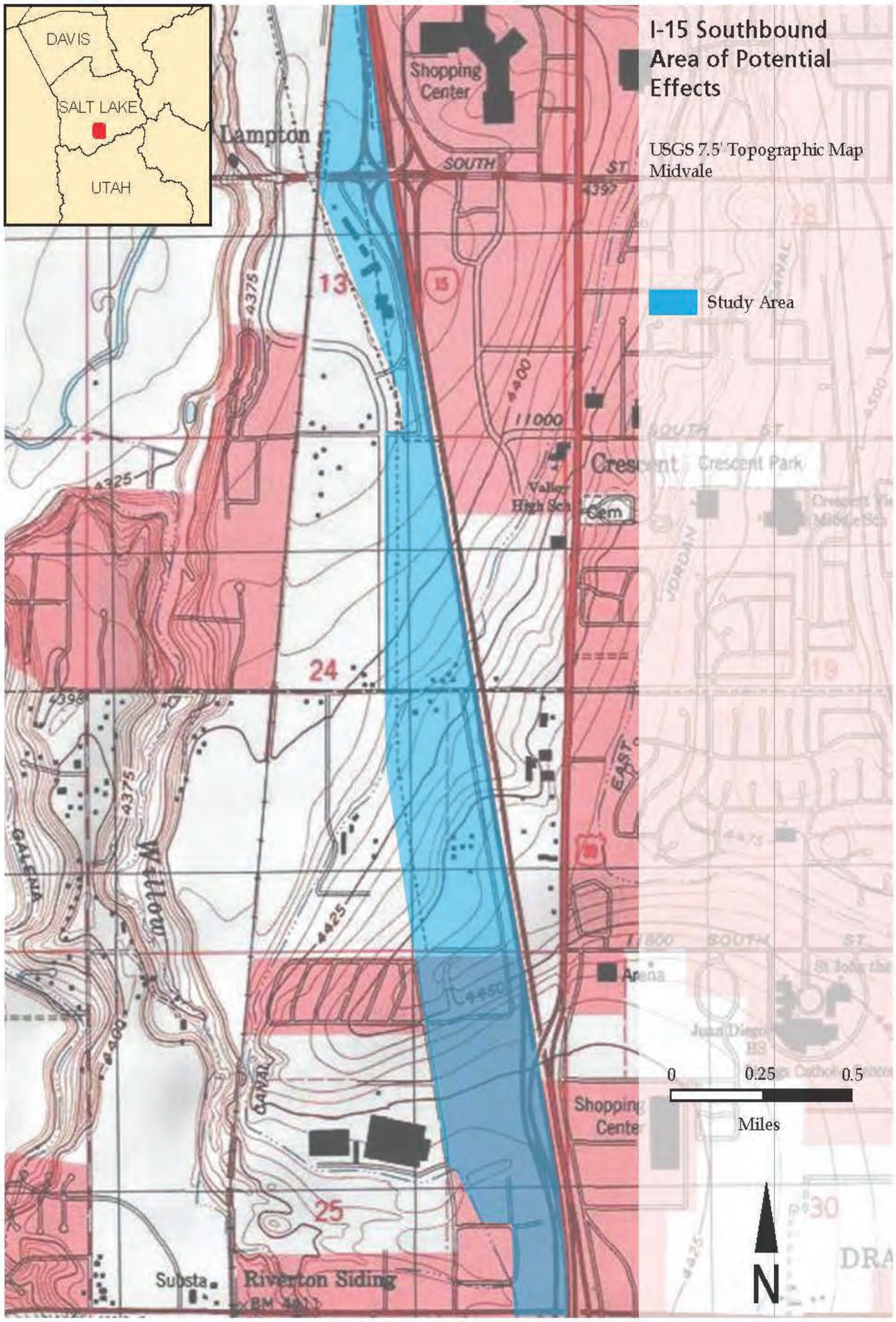
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Juan Diego HS
Riverton Siding
Substa
Willow
GALENA
CANAL
JORDAN
EAST
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State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Tribal Notification Form, Section 106 Consultation

Federally funded projects classified as delegated categorical exclusions are processed in accordance with Stipulation II, Part A and Appendix B of the *Memorandum of Understanding, State Assumption of Responsibility for Categorical Exclusions (23 USC §326)*, by which the UDOT assumes responsibility, assigned by the FHWA, for ensuring compliance with Section 106 of the NHPA and with Section 4(f). This form is submitted on behalf of the FHWA. Direct government-to-government consultation can be conducted upon request.

This project is being conducted pursuant to the *Second Amended Programmatic Agreement among the FHWA, the Utah SHPO, the ACHP, the USACE Sacramento District, and the UDOT Regarding Section 106 Implementation for Federal-Aid Transportation Projects in the State of Utah*, and the *Programmatic Agreement between the UDOT and the Utah SHPO Regarding Implementation of U.C.A. 9-8-404 for State Funded Transportation Projects in Utah.*

UDOT Project: S-I15-7(324)297, I-15; 12300 South to SR-201, Salt Lake County, Utah (PIN 12587).
Contact Name: Jonathan Dugmore Date: February 21, 2017
Address: 2010 South 2760 West, Salt Lake City, Utah 84104
Telephone: 385-414-2066 Email: jdugmore@utah.gov

Project Description: This project proposes constructing an additional lane on southbound I-15 between SR-201 and 12300 South; adding an additional southbound to eastbound left-turn lane at the 3300 South interchange; adding an additional lane in both directions on 7200 South between southbound I-15 and Bingham Junction Boulevard; and a modification of the I-215 interchange with I-15.

Archaeological Potential (Prehistoric or Historic Sites):

☐ Known prehistoric sites in the project area	☒ Unlikely to find prehistoric sites in the project area
☒ Known historic sites in the project area	☐ Unlikely to find historic sites in the project area
☐ Likely to find prehistoric sites in the project area	☐ No expected ground disturbance
☐ Likely to find historic sites in the project area	☐ Other:

Additional Information/Comments: Five historic archaeological sites were identified within the project area: 42SL104, a historic trash dump; 42SL214, the Jordan and Salt Lake City Canal; 42SL293, the Denver and Rio Grande Western Railroad; 42SL335, the Bingham Branch of the Denver and Rio Grande Western Railroad; and 42SL383, the Big Ditch Canal. Sites 42SL214, 42SL293, 42SL335, and 42SL383 are all NRHP-eligible.

Tribal Information
«AddressBlock»

Copies to:

Comments:

1. Do you wish to be a Section106 consulting party on this project? ☐ Yes ☐ No ☐ Not Sure
2. If you do not wish to be a Section 106 consulting party, do you wish to continue to be involved in the development of this project? ☐ Yes ☐ No ☐ Not Sure
   Note: If your answer is "Not Sure," UDOT will continue to provide information.
3. Are you aware of any traditional religious or culturally important places in or near the project area? ☐ Yes ☐ No ☐ Not Sure

1

4. If yes, can you share details about the place (e.g., location and other characteristics) and any concerns you may have? ☐Yes ☐No
5. Is this information sensitive? ☐Yes ☐No

Additional Comments:

Name of person completing this form, if different from above:
Signature: Date:

2

Identical copies of the Project Notification Form sent to the following recipients:

Original to:	CC to:
Mr. Darwin St. Clair Jr., Chairman Eastern Shoshone Tribe of the Wind River Reservation P.O. Box 538/15 North Fork Rd Fort Washakie, WY 82514	Ms. Glenda Trosper, Director, Cultural Center Eastern Shoshone Tribe of the Wind River Reservation P.O. Box 538/15 North Fork Rd Fort Washakie, WY 82514
	Mr. Wilfred Ferris, THPO Eastern Shoshone Tribe of the Wind River Reservation P.O. Box 538/15 North Fork Rd Fort Washakie, WY 82514
Mr. Blaine Edmo, Chair Shoshone-Bannock Tribes of Fort Hall P.O. Box 306 Pima Drive Fort Hall, ID 83203	Ms. Carolyn Smith, Cultural Resource Director Shoshone-Bannock Tribes of Fort Hall P.O. Box 306 Pima Drive Fort Hall, ID 83203
Ms. Corrina Bow, Tribal Chairperson Paiute Indian Tribe of Utah 440 North Paiute Drive Cedar City, UT 84721	Ms. Dorena Martineau, Cultural Resources Manager Paiute Indian Tribe of Utah 440 North Paiute Drive Cedar City, UT 84721
Mr. Shane Warner, Chairman Northwestern Band of Shoshone Nation 707 North Main Street Brigham City, UT 84302	Ms. Patty Timbimboo-Madsen, Cultural Specialist Northwestern Band of Shoshone Nation 707 North Main Street Brigham City, UT 84302
Mr. Shaun Chapoose, Chairperson Ute Indian Tribe of the Uintah and Ouray Ute Indian Reservation P.O. Box 190 Fort Duchesne, UT 84026	Ms. Betsy Chapoose, Director, Cultural Rights and Protection Ute Indian Tribe of the Uintah and Ouray Ute Indian Reservation P.O. Box 190 Fort Duchesne, UT 84026
Ms. Candace Bear, Chairwoman Skull Valley Band of Goshute Indians P.O. Box 448 Grantsville, UT 84029	None

Original to:	CC to:	Email to:
Ms. Lora Tom, Band Chairwoman Cedar Band of Paiutes 4655 North Utah Trail Enoch, UT 84720	Ms. Vala Parashonts, Cultural Resources Representative Cedar Band of Paiutes 533 South 640 West Cedar City, UT 84721	lora.tom@ihs.gov (Lora Tom)
Ms. Jetta Wood, Band Chairwoman Shivwits Band of Paiute Indian Tribe of Utah 6060 West 3650 North Ivins, UT 84738	Ms. Shanan Anderson, Cultural Resource Director Shivwits Band of Paiute Indian Tribe of Utah 6060 West 3650 North Ivins, UT 84738	lomeli20034@aol.com martineau@shivwits.org
Mr. Virgil Johnson, Chairman Confederated Tribes of the Goshute Reservation P.O. BOX 6104 195 Tribal Center Rd. Ibapah, UT 84034	Ms. Mary Pete-Freeman, Cultural Resources Coordinator Confederated Tribes of the Goshute Reservation P.O. BOX 6104 195 Tribal Center Rd. Ibapah, UT 84034	virgilwjohnson@yahoo.com marypete@goshutetribe.com

State of Utah

GARY R HERBERT
Governor

SPENCER J COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M BRACERAS, P.E
Executive Director

SHANE M MARSHALL, P.E
Deputy Director

February 23, 2017

Mr. Cory Jensen
Senior Historic Preservation Specialist
Utah Division of State History
300 Rio Grande
Salt Lake City, UT 84101-1182

RE: UDOT Project No. S-I15-7(324)297, I-15; 12300 South to SR-201, Salt Lake County, Utah (PIN 12587).
Determination of Eligibility and Finding of No Adverse Effect.

Dear Mr. Jensen:

The Utah Department of Transportation (UDOT) is preparing to undertake the subject state-aid project. In accordance with the *Programmatic Agreement between the UDOT and the Utah State Historic Preservation Officer Regarding Implementation of U.C.A. 9-8-404 for State Funded Transportation Projects in Utah* (executed March 19, 2008), the UDOT has taken into account the effects of this undertaking on historic properties and is affording the Utah State Historic Preservation Officer (SHPO) an opportunity to comment on the undertaking.

PROJECT DESCRIPTION

This project proposes constructing an additional lane on southbound I-15 between SR-201 and 12300 South; adding an additional southbound to eastbound left-turn lane at the 3300 South interchange; adding an additional lane in both directions on 7200 South between southbound I-15 and Bingham Junction Boulevard; and a modification of the I-215 interchange with I-15. The area of potential affects (APE) has been defined as the west side of the I-15 corridor between 12300 South and SR-201.

The APE has been surveyed for archaeology by Peter Steele with Horrocks Engineers, under State Antiquities Project Number U160808ps, and the results are reported in *An Archaeological Investigation for the I-15; 12300 South to SR-201 Project, February 16, 2017* (see enclosed report). The majority of the archaeological survey was conducted by windshield due the amount of urban development within the project area. An intensive level pedestrian survey was conducted using 15 meter transects to identify archaeological resources in specific undeveloped areas along the corridor. A reconnaissance level survey was conducted to record architectural properties, and the results are reported in *Reconnaissance Survey – State Environmental Study: I-15, SB 12300 South to SR-201, December 2016* (see enclosed report).

The survey has resulted in the identification of 5 archaeological sites and 63 architectural properties. Of these, 4 archaeological sites and 33 architectural properties are eligible to the National Register of Historic Places (NRHP). No known traditional cultural properties or paleontological resources are located in the APE. The Determinations of Eligibility and Findings of Effects are provided in Table 1 for archaeological resources and in Table 2 for architectural properties.

Environmental Services Division • Telephone (801) 965-4173 • Facsimile (801) 965-4796 • www.udot utah.gov
Calvin Rampton Complex • 4501 South 2700 West • Mailing Address P.O. Box 148450 • Salt Lake City, Utah 84114-8450

ARCHAEOLOGICAL RESOURCES

Table 1. Determinations of Eligibility and Findings of Effect for Archaeological Resources

Site	Name or Description	NRHP Eligibility	Finding of Effect
42SL104	Historic Trash Dump	Not Eligible	No Historic Properties Affected
42SL214	Jordan and Salt Lake City Canal	Eligible (Criterion A)	No Historic Properties Affected
42SL293	Denver and Rio Grande Western Railroad	Eligible (Criterion A)	No Historic Properties Affected
42SL335	Bingham Branch – D&RGW RR	Eligible (Criterion A)	No Historic Properties Affected
42SL383	Big Ditch Canal	Eligible (Criterion A)	No Historic Properties Affected

Description of Effects: Sites 42SL214, 42SL293, 42SL335 and 42SL383 all either avoid the construction area, or pass underneath the highway structure. The project will not substantially impact or alter any contributing elements of the sites or any of the character-defining features for which it was determined eligible for the NRHP. Thus, the proposed project will result in a finding of No Historic Properties Affected for each property.

ARCHITECTURAL PROPERTIES

Table 2. Determinations of Eligibility and Findings of Effect for Architectural Properties

Address	Date	Style	NRHP Eligibility/ SHPO Rating	Finding of Effect
2250 S. 600 West	1965	South Salt Lake Water Tank	Eligible/EC	No Historic Properties Affected
2975 S. 460 West	1970	South Salt Lake Water Tank	Eligible/EC	No Historic Properties Affected
3645 S. 500 West	1957	Concrete Block Commercial Building	Eligible/EC	No Adverse Effect
416 W. 3900 South	1886	Victorian Eclectic Crosswing residence constructed of brick and shingle siding.	Eligible/EC	No Historic Properties Affected
4343 S. Century Dr.	1970	Concrete Block Warehouse with multiple additions on façade.	Not Eligible/NC	No Historic Properties Affected
4595 S. Cherry St.	1939	Twentieth Century residential structure clad in aluminum siding and imitation stone.	Not Eligible/NC	No Historic Properties Affected
4621 S. Cherry St.	1925	Unclear style residence clad in drop siding, narrow clapboard and wood sheet. Windows and siding altered on primary façade.	Not Eligible/NC	No Historic Properties Affected
4717 S. Plum St.	1926	Bungalow residence clad in aluminum siding with original windows.	Eligible/EC	No Historic Properties Affected
4727 S. Plum St.	1905/1960	Residential crosswing altered in 1960 with a garage addition and altered materials.	Eligible/EC	No Historic Properties Affected
4755 S. Plum St.	1905	Victorian Eclectic half-crosswing residence clad with drop siding.	Eligible/EC	No Historic Properties Affected

I-15; 12300 South to SR-201, 2

4757 S. Plum St.	1935	Vacant residential Bungalow clad with drop siding and narrow clapboard.	Eligible/EC	No Historic Properties Affected
392 W. 4800 South	1948	Early Ranch residence constructed of striated brick.	Eligible/EC	No Historic Properties Affected
396 W. 4800 South	1937	English Cottage residence clad in aluminum siding.	Eligible/EC	No Historic Properties Affected
380 W. 4850 South	1954	Striated brick Early Ranch-type residence.	Eligible/EC	No Historic Properties Affected
368 W. Vine St.	1901	Originally constructed as a Hall/Parlor residence, altered to Minimal Traditional, now clad in vinyl siding.	Not Eligible/NC	No Historic Properties Affected
370 W. Vine St.	1941	World War II-Era Cottage clad in vinyl siding.	Not Eligible/NC	No Historic Properties Affected
481 W. Anderson Ave.	1959	Split Level residence with carport constructed of concrete brick.	Eligible/EC	No Historic Properties Affected
5739 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick. Alterations to the primary façade.	Not Eligible/NC	No Historic Properties Affected
5749 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick. The roof has been altered.	Not Eligible/NC	No Historic Properties Affected
5759 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick. The carport has been enclosed.	Not Eligible/NC	No Historic Properties Affected
5769 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick.	Not Eligible/NC	No Historic Properties Affected
5779 S. Golden Dr.	1959	Split Level residence constructed of concrete brick with a large rear addition and the roof has been altered.	Not Eligible/NC	No Historic Properties Affected
5791 S. Golden Dr.	1959	Originally constructed as a Split Level residence, it has been altered to uniform levels and clad in vinyl siding.	Not Eligible/NC	No Historic Properties Affected
5801 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick.	Eligible/EC	No Adverse Effect
5809 S. Golden Dr.	1970	Split Level residence with carport constructed of concrete brick. It has a large addition on the south.	Not Eligible/NC	No Historic Properties Affected
5817 S. Golden Dr.	1970	Split Level residence with carport constructed of concrete brick. The carport has been enclosed with vinyl siding.	Not Eligible/NC	No Historic Properties Affected
5825 S. Golden Dr.	1970	Split Level residence with carport constructed of	Eligible/EC	No Historic Properties Affected

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		concrete brick.		
5833 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick.	Eligible/EC	No Historic Properties Affected
5841 S. Golden Dr.	1959	Split Level residence with carport constructed of concrete brick. The carport has been enclosed with vinyl siding.	Not Eligible/NC	No Historic Properties Affected
6023 S. Sanford Dr.	1960	Split Level residence with garage clad with brick and aluminum siding.	Eligible/EC	No Historic Properties Affected
6031 S. Sanford Dr.	1960	Brick Ranch style residence with a carport addition on the south which is not visually invasive.	Eligible/EC	No Historic Properties Affected
6039 S. Sanford Dr.	1960	Split Level residence with garage constructed of striated brick. There is a carport addition on the north which does not impact the integrity of the house.	Eligible/EC	No Historic Properties Affected
6047 S. Sanford Dr.	1960	Brick Ranch style residence	Eligible/EC	No Historic Properties Affected
6059 S. Sanford Dr.	1961	Brick Ranch style residence	Eligible/EC	No Historic Properties Affected
6063 S. Sanford Dr.	1960	Brick Ranch style residence	Eligible/EC	No Adverse Effect
6073 S. Sanford Dr.	1960	Split Level residence with garage constructed of regular brick.	Eligible/EC	No Historic Properties Affected
540 W. 6300 South	1898/ 1983	The primary façade of this residence has additions and alterations. Originally constructed as a Hall/Parlor it is clad in aluminum siding.	Not Eligible/NC	No Historic Properties Affected
499 W. Winchester St.	1920/ 1945	Asbestos siding covers this Bungalow with in-period additions and alterations to Minimal Traditional style.	Eligible/EC	No Historic Properties Affected
550 W. 7200 South (OC441)	1965	Steel continuous stringer/multi-girder bridge.	Not Eligible/NC	No Historic Properties Affected
600 W. 7200 South (OC497)	1965	Steel continuous stringer/multi-girder bridge.	Not Eligible/NC	No Historic Properties Affected
560 W. Center St.	1965	Steel continuous stringer/multi-girder bridge.	Not Eligible/NC	No Historic Properties Affected
7825 S. Allen St.	1901	Victorian Crosswing residence clad in vinyl siding and imitation stone.	Not Eligible/NC	No Historic Properties Affected
7831 S. Allen St.	1915	Box Bungalow clad in aluminum siding has altered fenestration and a rear addition.	Not Eligible/NC	No Historic Properties Affected

7953 S. Allen St.	1971	Two story stucco apartment building with altered fenestration.	Not Eligible/NC	No Historic Properties Affected
7971 S. Allen St.	1954	Ranch-type residence clad in asbestos siding.	Eligible/EC	No Historic Properties Affected
500 W. Wasatch St.	1965	Steel continuous stringer/multi-girder bridge.	Not Eligible/NC	No Historic Properties Affected
554 W. Wasatch St.	1898	Victorian style Bungalow clad with drop and shingle siding.	Eligible/EC	No Historic Properties Affected
582 W. Wasatch St.	1891	Original Greek Revival half-crosswing covered with stucco has a Victorian Eclectic crosswing addition constructed of brick.	Eligible/EC	No Historic Properties Affected
8085 S. Fern Cr.	1959	Ranch type duplex clad with aluminum siding.	Eligible/EC	No Historic Properties Affected
515 W. Fern Dr.	1960	A Ranch-style fourplex of brick and aluminum siding.	Eligible/EC	No Historic Properties Affected
522 W. Ivy Dr.	1970	A Ranch-type residence constructed with oversized brick.	Eligible/EC	No Historic Properties Affected
528 W. Ivy Dr.	1970	A Split Entry residence constructed of brick.	Eligible/EC	No Historic Properties Affected
8151 S. Ivy Dr.	1970	A Split Entry residence constructed of oversized brick and a recent addition of imitation stone.	Not Eligible/NC	No Historic Properties Affected
8157 S. Ivy Dr.	1970	A Split Entry residence constructed of oversized brick.	Eligible/EC	No Historic Properties Affected
8163 S. Ivy Dr.	1970	A Ranch-type residence constructed with oversized brick.	Not Eligible/NC	No Historic Properties Affected
8169 S. Ivy Dr.	1970	A Ranch-type residence with a carport constructed of brick, cladding altered to vinyl siding.	Not Eligible/NC	No Historic Properties Affected
8175 S. Ivy Dr.	1970	A Ranch-type residence with a carport constructed of brick.	Eligible/EC	No Historic Properties Affected
8179 S. Ivy Dr.	1970	A Ranch-type residence with a carport constructed of brick.	Eligible/EC	No Historic Properties Affected
8183 S. Ivy Dr.	1970	A Split Entry residence constructed of oversized brick with a wood sheet addition on the north.	Not Eligible/NC	No Historic Properties Affected
8189 S. Ivy Dr.	1970	A Split Entry residence constructed of oversized brick. It has a rear addition and alterations to the primary façade.	Not Eligible/NC	No Historic Properties Affected
8195 S. Ivy Dr.	1971	A Split Entry residence with altered siding of board and batten and shingle siding.	Not Eligible/NC	No Historic Properties Affected
8205 S. Ivy Dr.	1971	A Split Entry residence clad with vinyl siding.	Not Eligible/NC	No Historic Properties Affected

8217 S. Ivy Dr.	1971	A Split Level residence with Vinyl Siding, Board and Batten and Imitation stone.	Not Eligible/NC	No Historic Properties Affected

Description of Effects: This proposed project requires right of way acquisitions of approximately 8020 square feet from 2 properties eligible to the NRHP in order to construct a retaining wall. The acquisitions and associated construction affect a relatively small portion of each property and will not substantially impact or alter any contributing elements of the properties or any of the character-defining features for which each were determined eligible for the NRHP.

CONSULTATION EFFORTS

Native American consultation was initiated through letters sent to the Eastern Shoshone Tribe of the Wind River Reservation, Shoshone-Bannock Tribes, Paiute Indian Tribe of Utah, Northwestern Band of Shoshone Nation, Uintah and Ouray Ute Tribes, and the Skull Valley Band of Goshute Indians (sent February 21, 2017). In addition, notification was also sent to those tribes with whom UDOT has Section 106 Programmatic Agreements: Cedar Band of Paiutes, Shivwits Band of Paiute Indian Tribe, and the Confederated Tribes of the Goshute Reservation (sent February 21, 2017). To date, none of the tribes have responded to these notifications.

SUMMARY

To summarize, the project will result in a finding of **No Adverse Effect** for 2 architectural properties, and a finding of **No Historic Properties Affected** for all remaining architectural properties and archaeological sites. Therefore, the Finding of Effect for the proposed UDOT Project No. S-I15-7(324)297, I-15; 12300 South to SR-201, Salt Lake County, Utah, is **No Adverse Effect**.

Please review this document and, providing you agree with the findings contained herein, sign and date the signature line at the end of this letter. Should you have any questions or need additional information, please feel free to contact Liz Robinson at 801-910-2035 or lizrobinson@utah.gov; or Elizabeth Giraud at 801-965-4917 or egiraud@utah.gov.

Sincerely,

Elizabeth Giraud

Liz Robinson, M.A., RPA
Cultural Resources Program Manager
UDOT Environmental Services

Elizabeth Giraud, AICP
Architectural Historian
UDOT Environmental Services

Enclosures

cc: Lisa Zundel, Project Manager
Craig Bown, Environmental Manager

____

Regarding UDOT Project No. S-I15-7(324)297, I-15; 12300 South to SR-201, Salt Lake County, Utah, I concur with the Determination of Eligibility and Finding of Effect, submitted to the Utah State Historic Preservation Office in accordance with the *Programmatic Agreement* and U.C.A. 9-8-404, which states that the UDOT has determined that the finding is **No Adverse Effect.**

Cory Jensen
Senior Historic Preservation Specialist

3/27/2017
Date

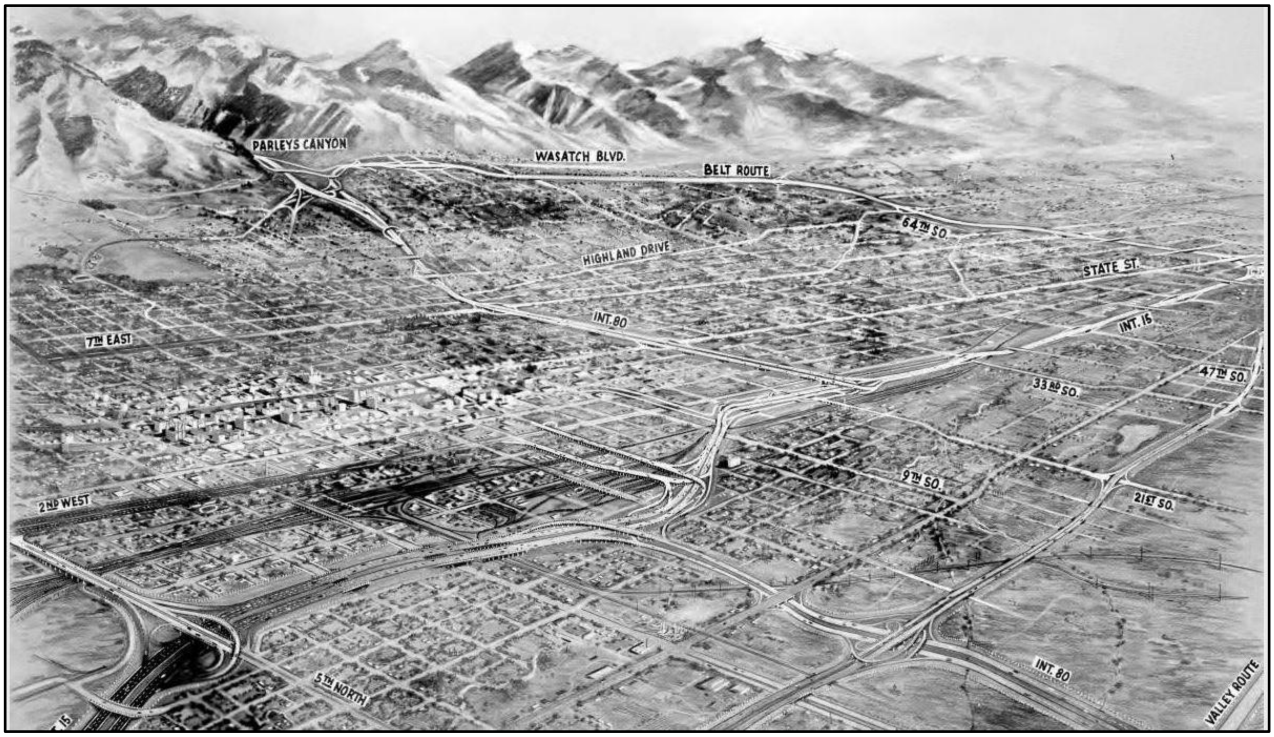
I-15; 12300 South to SR-201, 7

APPENDIX A: TECHNICAL REPORTS

Technical Report Title	Prepared by:	Contact
Selective Reconnaissance Level Survey SB I-15 between SR-201 and 12300 South	Horrocks Engineers Nancy Calkins Historic Preservation Specialist	Nicole Tolley Horrocks Engineers 2162 W. Grove Parkway, Suite 400 Pleasant Grove, Utah 8460
Wetland Inventory for I-15; 12300 South to SR-201 State Environmental Study	Ryan Pitts and Nathan Clarke	Ryan Pitts Horrocks Engineers 2162 W. Grove Parkway, Suite 400 Pleasant Grove, Utah 8460
Wasatch Front Regional Council's Regional Transportation Plan 2015-2040	Wasatch Front Regional Council	Nicole Tolley Horrocks Engineers 2162 W. Grove Parkway, Suite 400 Pleasant Grove, Utah 8460
I-15 SES; 12300 South to SR-201 Project of Air Quality Concern (POAQC) Memorandum	Judy Imlay	Judy Horrocks Engineers 2162 W. Grove Parkway, Suite 400 Pleasant Grove, Utah 84602
Wasatch Front Regional Council's Air Quality Memorandum 33	Wasatch Front Regional Council	Nicole Tolley Horrocks Engineers 2162 W. Grove Parkway, Suite 400 Pleasant Grove, Utah 84602
Noise Report	Stephanee Eastman	Stephanee Eastman Horrocks Engineers 2162 W. Grove Parkway, Suite 400 Pleasant Grove, Utah 84602

RECONNAISSANCE LEVEL SURVEY

State Environmental Study: I-15, SB 12300 South to SR-201
South Salt Lake, Millcreek, Murray, Midvale, Sandy, South Jordan, and Draper
Salt Lake County
PIN 12587, Project No. S-I15-7 (324) 297



"**Salt Lake City** Interstate Network" *Courtesy of Utah State Historical Society*

Prepared by Nancy Calkins and Peter Steele of Horrocks Engineers
For Utah Department of Transportation

December 2016

ABSTRACT

This report contains the results of Reconnaissance Level Survey of properties bordering the west side of Interstate 15 in South Salt Lake, Millcreek, Murray, Midvale, Sandy, South Jordan, and Draper in Salt Lake County, Utah. This survey was conducted at the request of Utah Department of Transportation. Nancy Calkins, of Horrocks Engineers conducted the historic research, fieldwork, and analysis of data collected during fieldwork. At the request of the Utah Department of Transportation a Selective Reconnaissance Level Survey was conducted as the area is predominantly non-historic buildings. To extend the life of the survey all buildings constructed within the past 45 years were surveyed. A total of 65 properties were surveyed, 34 of which were determined eligible for inclusion on the National Register of Historic Places. The results of this survey are provided herein to assist the Utah Department of Transportation in decisions to be made regarding historic properties within the current project Area of Potential Effect.

TABLE OF CONTENTS

Reconnaissance Level Survey

State Environmental Study: I-15, SB 12300 South to SR-201

South Salt Lake, Millcreek, Murray, Midvale, Sandy, South Jordan, and Draper in Salt Lake County

December 2016

Objective: To survey all buildings within the Area of Potential Effect which were constructed during the historic period, which may be affected by the proposed widening of Interstate 15. This survey is to identify those buildings within the Area of Potential Effect, which may be eligible for inclusion in the National Register of Historic Places and those that may be of historic importance to the seven communities within the survey boundaries.

An archaeological survey conducted by Peter Steele and Aaron Woods of Horrocks Engineers entitled "An Archaeological Investigation for the I-15: 12300 South to SR-201 Project" will be submitted in conjunction with this report.

Project Description: The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on south-bound Interstate 15 (I-15). These improvements include the addition of a south-bound auxiliary lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from 5 lanes to 7 lanes.

Survey Boundaries: The Survey Boundary coincides with the project Area of Potential Effect (APE) and includes roughly those properties immediately adjacent to Interstate 15 from the south side of 2100 South to the south side of 12300 South. The APE also includes an east-west section (one property deep) of 7200 West from Interstate 15 west to the Jordan River. As the APE is irregularly shaped, please see the figure in Appendix B for the exact location of the APE. At the request of the Utah Department of Transportation, a Selective Reconnaissance Level survey was conducted as the APE has a large number of non-historic structures. All buildings constructed within the last 45 years (in or before 1971) were surveyed. The historic boundary for each property surveyed is the current legal parcel boundary.

Physical Environment: The survey area is located three miles south of downtown Salt Lake City and extends approximately 14 miles south along Interstate 15 running through South Salt Lake, unincorporated Millcreek, Murray, Midvale, Sandy, South Jordan, and Draper. This area adjacent to the freeway is commercial/industrial with the exception of residential neighborhoods in Murray near I-215 and in Midvale surrounding historic downtown Midvale. The Union Pacific Railroad right-of-way is within the survey area from 6500 South to 9000 South

Historic Context: Due to the linear nature of the survey area and the large number of cities within the survey boundaries, this historic context will focus on the history of transportation in the Salt Lake Valley and its effect on the development of the local communities.

Early Transportation and development in the Salt Lake Valley 1847-1915

The earliest transportation through the Salt Lake Valley was along a well-established wagon road through the valley. Eventually known as the Territorial Road and even later as State Street, this road ran the full north-south length of the valley with outlying farming communities like Murray, Crescent, and Sandy building up around this road.

In 1871 the Utah Southern Railway was constructed in the Salt Lake Valley to connect to the trans-continental railroad lines that crossed the territory near Ogden. The Denver Rio Grande was completed through the Salt Lake Valley in 1881 very near the Utah Southern Railway route. Both rail lines ran parallel to and west of the Territorial Road.

The railroad brought dramatic changes to several towns south of Salt Lake City as they shifted from small farming communities to industrial centers. The mining industry in the mountains surrounding the valley prompted the construction of smelters in Murray, Midvale and Sandy. The town of Midvale developed west of the railroad lines near a large smelter. A spur of the Denver Rio Grande ran west past the smelter to the Bingham mine west of the valley and the spur was appropriately called the Bingham Junction. Midvale was known by the name of Bingham Junction for many years and the smelter supported much of the town. Murray and Sandy, both with several smelters, had previously established town sites along the Territorial Road so smelters were constructed along the rail lines west of each of these communities. Like Midvale, much of the population was employed locally at the smelter. The result of this local industry in both Midvale and Murray during this time period is that residential buildings were clustered in neighborhoods rather than spread out on farmsteads as they were further south in the valley.

Changes in transportation 1916-1955

In the late Nineteenth and early Twentieth Century, street car lines were built throughout Salt Lake City and into areas outside the city limits. With the ability to more easily move in and out of the city, the population expanded south and east of the city. The first of many residential suburbs were developed in areas of South Salt Lake, Millcreek, and Murray. Although street car lines extended as far south as Sandy, the south end of the Salt Lake Valley remained predominantly rural through the late Twentieth Century.

The increased popularity of the private automobile in the early Twentieth Century brought an increased need for better roads. The United States Federal Government took steps in 1916 and 1921 to promote and financially support the development of public roads in a US Highway program. Previous to this time interstate roads, such as the Lincoln Highway were constructed by clubs or groups interested in promoting tourism. These roads often linked existing roads within an individual state with those of another. The chaotic network created by this method was organized by the Federal Government in the early 1920s. With this organization, Utah's former Territorial Road, State Street, became part of US Highway 89. Funding for improving this existing road helped to pave State Street from downtown Salt Lake City to Murray in 1916, but the majority of improvements were not completed until the WPA projects of the depression.

Interstate Highways 1956-1971

At the close of World War II, the nation was acutely aware of the vulnerability created by poor transportation across the nation. In July 1954, then Vice President Richard Nixon presented the Eisenhower Administration's proposal, billed as a highway system for national defense to the National Conference of Governors. The proposal was a welcome relief to the Utah State Road Commission which had been studying the options for a north-south freeway in the Salt Lake Valley. Having chosen the corridor of this much-needed freeway, the Commission had gone so far as to purchase some right of way and freeze land development on the remainder of the corridor in October 1951. However, just as the debate over funding of the Eisenhower proposal heated up in congress, the Utah State Road Commission made the decision in April 1955 to abandon plans for the freeway due to the fifty million-dollar cost of land purchase and construction. Their decision alarmed proponents of the National Interstate bill in Washington D.C. as the north-south freeway through Salt Lake City was an important part of the Interstate system to be constructed through Utah. The Commission quickly reversed their decision, counting on aid from the Federal Government to bring the project to fruition. The "National Interstate and Defense Highways Act" finally passed in June 1956.

The act called for the construction of 41,000 miles of highway over a ten-year period at the cost of twenty-five billion dollars. Because Utah was a sparsely-populated, public-land state, the 965 miles of highway proposed for construction in the state would be paid 95% by the Federal Government and only 5% by the state. The State Road Commission pointed out, however, that with the millions of dollars sent to the Federal Government in the form of fuel and automobile taxes, which the Federal Government returned in the form of aid, the "true aid" of funds not originating in Utah only amounted to 10-15% of the total expenditures on Interstate construction.

The National Highway Act also brought about "a new concept in road design" to the National Highway system. What was different about these highways was that the funding was not to improve existing roadways as previous assistance from the Federal government had. Instead, new freeways, independent of existing streets (except at interchanges) were to be constructed throughout the country. In Utah, the remaining right-of-way designated by the previous State Road Commission north-south freeway plan, was purchased through farms and neighborhoods at approximately 600 West in Salt Lake. The official route was published in the legal notices of local papers on December 30, 1957.

Although some communities objected to the location of the freeway, the majority of protests were regarding the earth embankment construction rather than the elevated freeway on pillars that many had envisioned. Addressing these objections with a cost comparison between the two methods, the State Road Commission satisfied the objectors and broke ground for Interstate 15 on January 28, 1959.

Although construction of Interstate 15 began in early 1959, the roadway and structures from 800 South to 4500 South were not constructed until 1965 and with areas south of 4500 South were constructed in 1966. But even long before construction, Interstate 15 had an impact on the development of communities in the Salt Lake Valley. Just two weeks following the publication of the route, the City of South Salt Lake announced the development of an Industrial Center adjacent to the interchange to be built at 2100 South "on the new Interstate freeway". Developers noted that a clover-leaf interchange was proposed making the location "ideally suited for the center," which would be enhanced by required "setbacks, lawns, shrubs, and off-street parking." Others advertised property in various valley locations adjacent to the freeway as “the most wanted commercial and industrial area,” often stating the distance from the nearest future interchange.

While the City of South Salt Lake had only industrial land to develop near the freeway, Murray and Midvale both had large areas of open land used for residential development during the late 1950s through the 1960s. One particularly forward-thinking developer, Benjamin LaSalle Farnsworth was the first to cross the “invisible barrier” of the land development freeze imposed by the Utah Road Commission in 1951. Farnsworth’s LaSalle Acres was platted in 1955 between 500 and 600 West, south of 5900 South. Only four of the properties in his 88 parcel development were affected by the eventual construction of the Interstate. The properties on Sanford Drive in this survey are part of LaSalle Acres. The only other subdivision platted on the west side of the future Interstate in Murray was Auburn Gardens in 1958 (Golden Drive properties are part of this subdivision.) The Midvale developers proved a little more cautious as development of Midvale Meadows was in 1969, after construction of I-15.

Although it appears that the construction of Interstate 15 divided communities such as South Salt Lake, Murray and Midvale in two, the communities had for over 80 years been divided by the railroad with only particular streets having at-grade crossings. The construction of the Interstate freeway was just an extension of this existing circumstance. With the construction of railroad bridges and lowered grades beneath the freeway and railroad at 7200 South, Midvale Center Street, and Wasatch Street, the crossing at those locations became far less dangerous. Growth in Midvale proceeded east past the freeway and growth in Murray proceeded west to the Jordan River. Because the streets were lowered beneath the overpasses, the freeway was not as high as it was in other locations.

Recent Development along Interstate 15; Post-1971

As stated previously, the south end of the Salt Lake Valley south of Midvale remained very rural through the latter part of the Twentieth Century. Since that time, explosive growth in the communities of Sandy, South Jordan, and Draper have lined Interstate 15 with commercial development. As this area was rural, much of the historic rural architecture has been demolished to make way for this commercial development.

Summary of Properties within the Historic Context:

Of the 65 properties surveyed 34 were determined eligible for the National Register of Historic Places. The following is an assessment of all surveyed properties, whether determined eligible or ineligible, to give better context to those which are eligible.

Although the vast majority of properties within the survey boundaries are non-historic commercial or industrial property, the majority of historic buildings were residential buildings.

Early Transportation and development in the Salt Lake Valley 1847-1915

There are nine residences from this time period, three of which were constructed on farms. Only one of these, a brick Victorian Eclectic style house retains architectural integrity. The other six houses were constructed in a neighborhood setting during the industrial period of Murray and Midvale. Four are Victorian styles and two are Bungalow styles, with four of the six retaining architectural integrity.

Changes in transportation 1916-1955

The nine residences from this time period include Bungalow, Period Cottage, World War II-Era Cottage, and Early Ranch type buildings. Eight of these houses were all constructed as infill in existing historic neighborhoods, the other as a small farmstead. Six of the nine residences from this period retain architectural integrity.

Interstate Highways 1956-1971

Thirty-five of the surveyed historic structures were within these subdivisions: LaSalle Acres and Auburn Gardens in Murray and Midvale Meadows and Heather Subdivisions in Midvale. Of these thirty-five Ranch, Split Level, Split Entry, and Multiple Dwelling residences, sixteen retained architectural integrity. Most of the residences were constructed of brick or concrete brick so alterations were most often in secondary materials altered to vinyl in fenestration and eaves/gable ends. The most significant alterations were to the roofs of houses built with low-pitched roofs in 1959.

Other residences from this time period include a ranch house and a large apartment building constructed as in-fill in an historic neighborhood.

Additionally two commercial buildings were surveyed from this time period, both of concrete block- one was found eligible/contributing. There are four railroad bridges constructed in conjunction with Interstate 15, as none of the four bridges meet the criterion for eligibility as continuous stringer/multi-girder bridges (exceptional skew greater than 54 degrees; early use of high tensile bolts; exceptional main span length over 120', early examples constructed prior to 1923) they were determined ineligible. Two water tanks constructed by the City of South Salt Lake in 1965 and 1970 surveyed were eligible and indicative of the emphasis on industry promoted by South Salt Lake during I-15 construction.

Explanation of Fieldwork Techniques:

Prior to conducting the survey a search of Preservation Pro was conducted online to find any previously recorded sites. There were 47 previously recorded properties found in Preservation Pro within the survey boundaries, 29 of which have been demolished. Of the eighteen remaining properties, fourteen are located in Murray and four in Midvale. The information from these previously recorded sites was taken into the field to determine any changes that had been made to the property and all 47 sites updated in Preservation Pro.

The Salt Lake County Interactive Property Maps were also consulted online to determine construction dates of all buildings within the survey boundaries. Any historic photographs contained with property information were copied for reference in the field. In addition, historic aerial photographs and historic subdivision plats were studied to determine settlement patterns prior to the survey. All pertinent information was input into our Historic Preservation Survey App for reference in the field. There were no historic properties located within the

The survey was conducted on November 11, 2016 by Nancy Calkins and Peter Steele of Horrocks Engineers. Each site was evaluated using the current evaluating system set forth by the Utah State Historic Preservation Office. The following is a brief explanation of those evaluations.

Eligible/Significant (ES) Property meets the age requirement of 45 years and has significant architectural features or known association with a significant person or historical event and is eligible for inclusion on the National Register of Historic Places.

Eligible/Contributing (EC) Property meets the age requirement of 45 years but has some alterations or lacks architectural/historic significance. It may be considered as a contributing structure to a broader historic district or pattern in the community and therefore eligible for inclusion on the National Register of Historic Places.

Ineligible/Non-contributing (NC) Property meets the age requirement of 45 years but has been altered after the historic period and no longer retains historic architectural integrity, rendering it ineligible for inclusion on the National Register of Historic Places.

Out-of-Period (OP) Property does not meet the age requirement of 45 years and therefore not eligible for inclusion on the National Register of Historic Places.

As this was a selective survey, there were no Out-of-Period properties surveyed and the historic properties all fell within the Eligible/Contributing or Ineligible/Non-contributing categories. However, further research could possibly demonstrate local significance of several residential buildings in Murray and Midvale.

Bibliography

"44 Interstate Miles Slated for Completion in Utah," The Salt Lake Tribune, August 9, 1965.

"Auto Injuries Fatal to 2 Utah Women," The Salt Lake Tribune, June 8, 1960.

"Business Opportunities," The Salt Lake Tribune, October 6, 1960.

Calkins, Nancy. *Reconnaissance Level Survey: Environmental Impact Statement for I-80; State Street Interchange, Salt Lake County, Utah, 2015.*

Calkins, Nancy. *Selective Reconnaissance Level Survey: State Street, 6400 South to 9000 South, Salt Lake County, 2010.*

"Clyde to Launch Freeway Work," The Salt Lake Tribune, January 28, 1959.

"Commercial-Industrial Development Opport.," The Salt Lake Tribune, May 12, 1959.

"Congress OK Expected on Highway Bill," The Ogden Standard Examiner, April 28, 1956.

"Freeway Gets Firm's Okeh," The Salt Lake Tribune, December 13, 1957.

"Industrial Center to Sprout in South S.L., Firm Says," The Salt Lake Tribune, February 15, 1959.

"Interstate System Plan Wins Board Approval," The Salt Lake Tribune, August 6, 1960.

Knowlton, Ezra C. The History of Highway Development in Utah, [Salt Lake City: Utah State Department of Highways, 1967.]

Miller, Clyde L., compiler, State of Utah Compiled Digest of Administrative Reports, 1965-1966.

"Murray Leaders Sign Letter in Protest of Move," The Salt Lake Tribune, January 7, 1958.

"Notice to the Public [from the State Road Commission]," The Salt Lake Tribune, December 30, 1957.

Salt Lake County Tax Photographs, http://recorder.slco.org

Salt Lake County Subdivision Plats, http://recorder.slco.org

Sillitoe, Linda. A History of Salt Lake County, [Salt Lake City: Utah State Historical Society, 1996.]

"Speak Up for Good Roads, Ike Urges Auto Drivers," The Ogden Standard Examiner, September 20, 1955.

"Staten Envisions Roads for Tomorrow," The Salt Lake Tribune, January 30, 1958.

"The Utah Freeway Puzzle," The Daily Herald, April 13, 1955.

Toronto, Lamont F., compiler, State of Utah Compiled Digest of Administrative Reports, 1957-1964

USDA Aerial Photographs, 1958: AAL 12V 41, AAL 12V 76
1966: AAL 1FF 71, AAL 1FF 112
1971: AAL 1MM 18, AAL 1MM 100

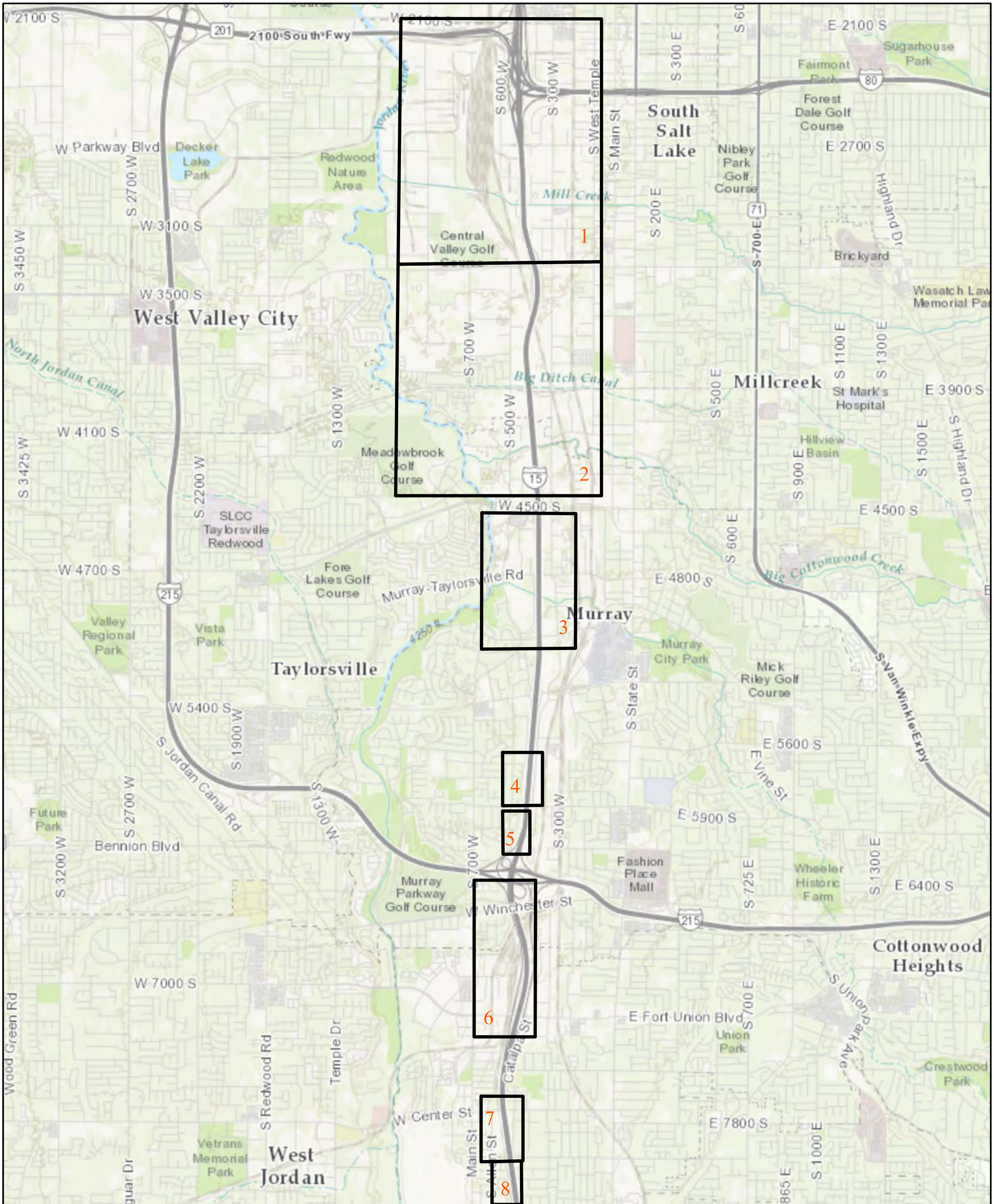
Appendix

Survey Maps, Data Sheets, and Photographic Contact Sheets

Survey Boundary

0 2.5 5 Miles

Reconnaissance Level Survey
1-15, SB 12300 South to SR-201



DATE	December 2016
	Index Map

Reconnaissance Level Survey
1-15, SB 12300 South to SR-201

Page boundary

0 0.375 0.75 1.5 Miles

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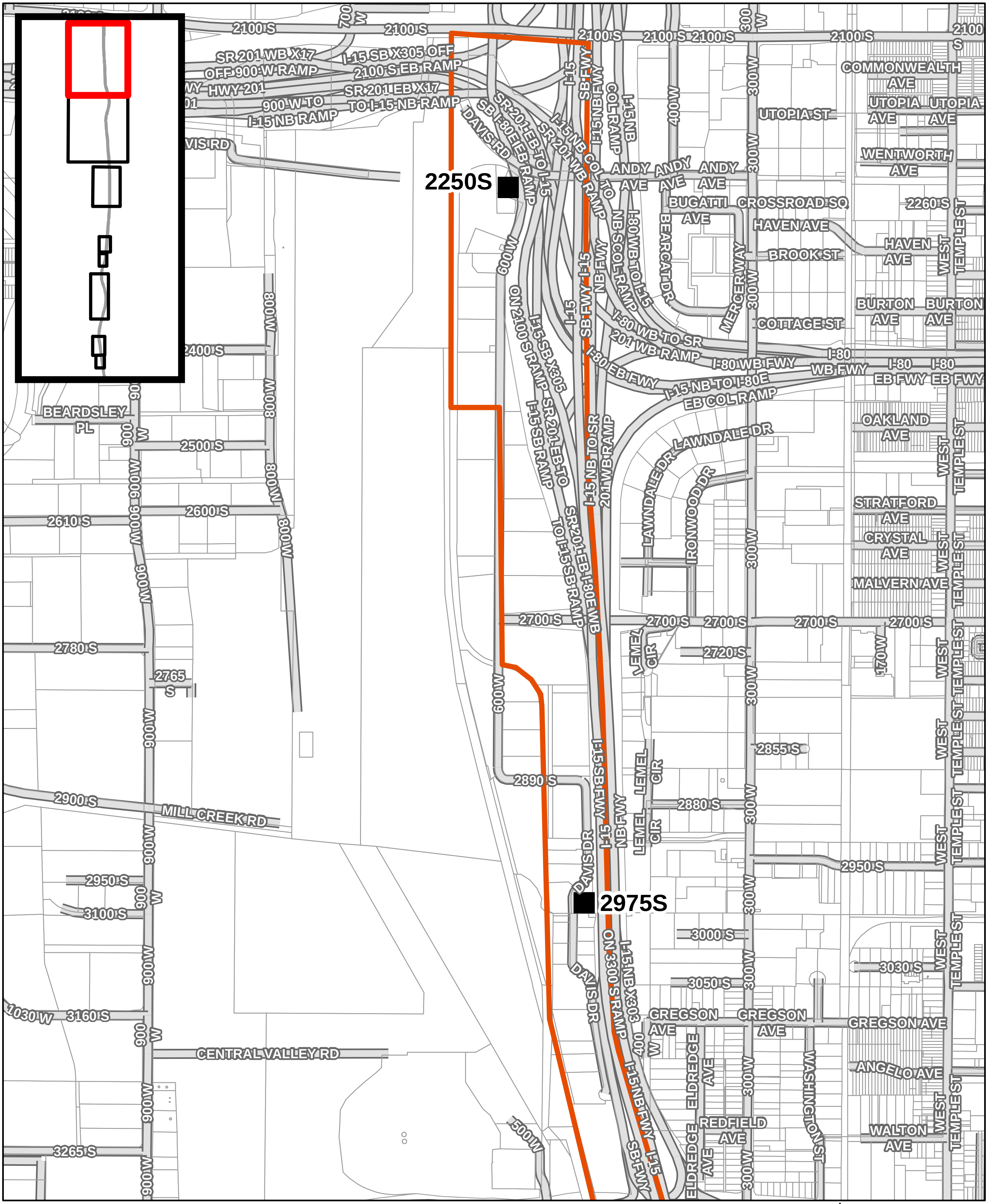


0 300 600 1,200 Feet

N

Eligible/Contributing

Inelig./Non-contributing

Reconnaissance Level Survey
1-15, SB 12300 South to SR-201
Survey Boundary

DATE 12/21/2016
DRAWN

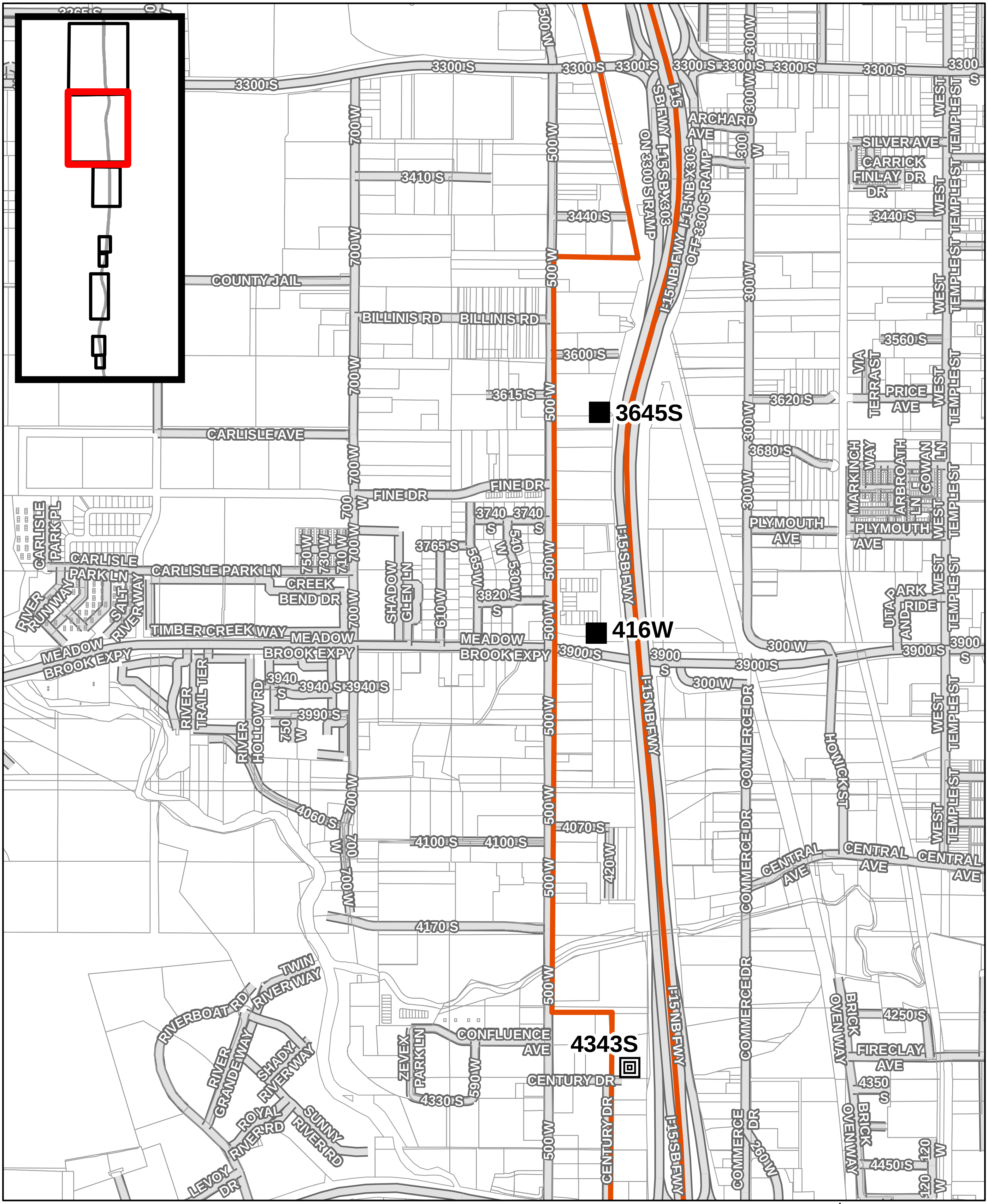
Map 1

2250 S 600 WEST
Eligible/Contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
600 West	2250	S	EC	Water Works			0	2	1965	Metal: Undef./Othe		

2975 S 460 WEST
Eligible/Contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
460 West	2975	S	EC	Water Works			0	3	1970	Metal: Undef./Othe		



0 305 610 1,220 Feet

N

■ Eligible/Contributing

▣ Inelig./Non-contributing

Reconnaissance Level Survey
1-15, SB 12300 South to SR-201

Survey Boundary

DATE 12/21/2016

DRAWN

Map 2

3645 S 500 WEST
Eligible/Contributing

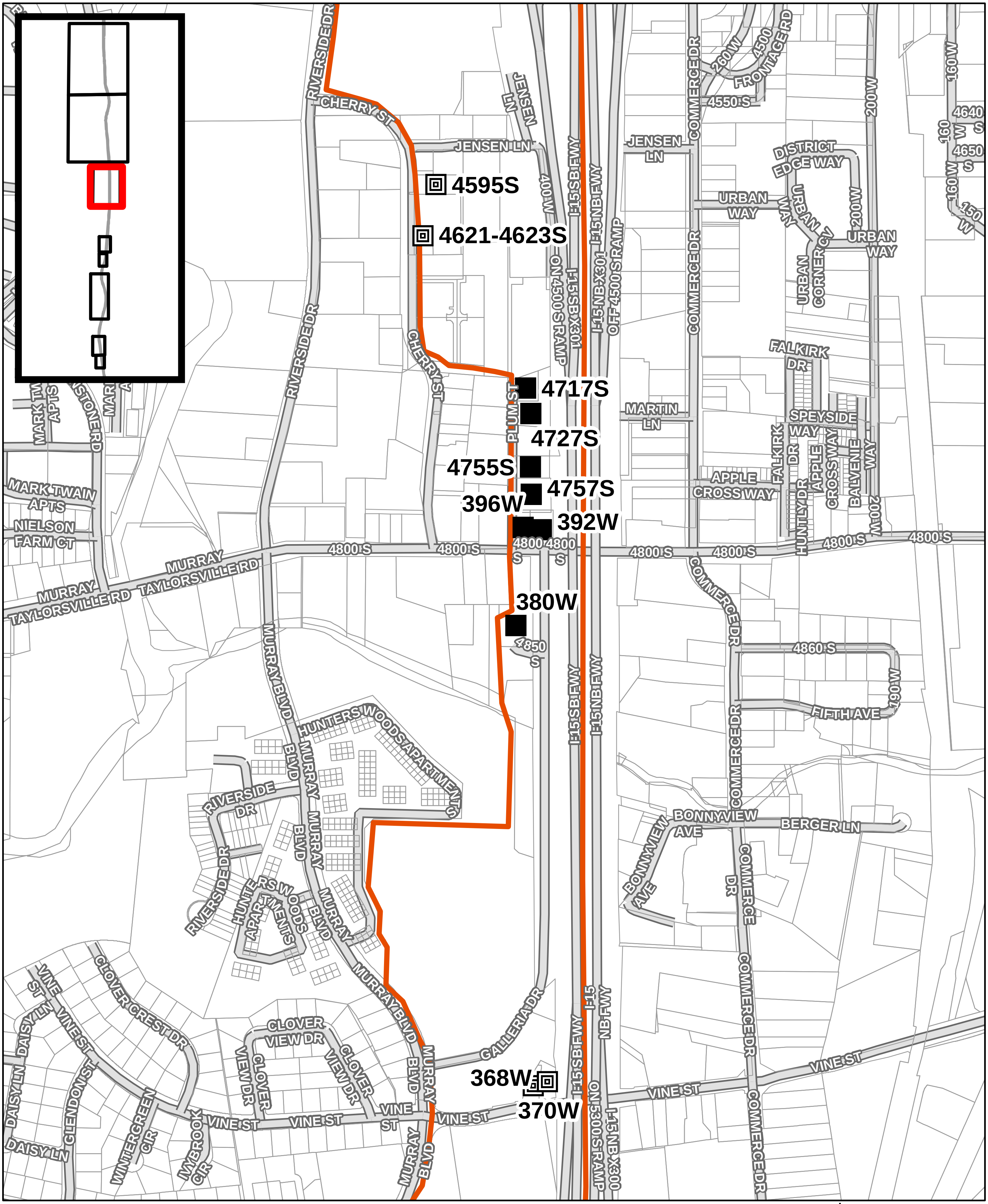
Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
500 West	3645	S	EC	Commercial (Gen.)	1	Other Late 20th C. Type	0	0	1957	Concrete Block	Post WWII.: Other	Original casement windows

416 W 3900 SOUTH
Eligible/Contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
3900 South	416	W	EC	Residential (Gen.)	1	Crosswing	0	3	1886	Regular Brick, Shingle siding	Victorian Eclectic	Rear addition connects house to summer kitchen and two trailers.

4343 S Century Dr.
Ineligible/non-contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Century Drive	4343	S	NC	Commercial (Gen.)	1	Warehouse	0	0	1970	Concrete Block	20th C. Commercial	Multiple additions, primary facade altered with additions, original portion of the building is in the rear.



Feet

0 165 330 660

N

Eligible/Contributing

Inelig./Non-contributing

Reconnaissance Level Survey
1-15, SB 12300 South to SR-201
Survey Boundary

DATE 12/21/2016

DRAWN

Map 3

4595 S Cherry Street
Inelig./Non-contributing

4621 S Cherry Street
Inelig./Non-contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Cherry Street	4595	S	NC	Residential (Gen.)	1	Other Residential Type	0	1	1939	Aliminum Siding, Imitation Stone	20th C.: Other	Some original windows, others replaced in new openings. Front door is odd. In-filled porch?
Cherry Street	4621	S	NC	Residential (Gen.)	2	Other Residential Type	0	0	1925	Narrow Clapboard, Drop siding, Wood sheet	Other/Unclear style, Arts & Crafts	Has original rafter tails. Windows altered on primary elevation, wood sheet added. Drop siding visible on the north elevation.

4717 S Plum Street
Eligible/Contributing

4727 S Plum Street
Eligible/Contributing

4755 S Plum Street
Eligible/Contributing

4757 S Plum Street
Eligible/Contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Plum Street	4717	S	EC	Residential (Gen.)	1	Bungalow	1	0	1926	Aluminum Siding	Bungalow	Has original wood windows. Was recorded as 4721 on previous survey.
Plum Street	4727	S	EC	Residential (Gen.)	1.5	Crosswing	1	2	1905/ 1960	Asbestos Siding, vinyl siding	20th C.: Other	Additions and alterations in 1960 include garage addition on south, front door moved and chimney added over original front door.
Plum Street	4755	S	EC	Residential (Gen.)	1	Crosswing- half	0	1	1905	Drop/Novelty Siding, Shingle siding	Victorian Eclectic	In-period additions on north. Difficult to photograph due to fence and vegetation.
Plum Street	4757	S	EC	Residential (Gen.)	1	Bungalow	0	2	1930	Drop/Novelty Siding, Narrow Clapboard	Bungalow	Multiple additions during historic period. Currently unoccupied on commercial lot.

392 W 4800 South
Eligible/Contributing

396 W 4800 South
Eligible/Contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
4800 South	392	W	EC	Residential (Gen.)	1	Early Ranch/Rambler	0	3	1948	Striated Brick	Early Ranch (Gen.)	Has original windows.
4800 South	396	W	EC	Residential (Gen.)	1	Period Cottage	1	0	1937	Aluminum Siding	English Cottage	Vinyl windows. Property is possible location of boarding house (corner of Plum and 4800 South) where Joe Hill was arrested in 1914.

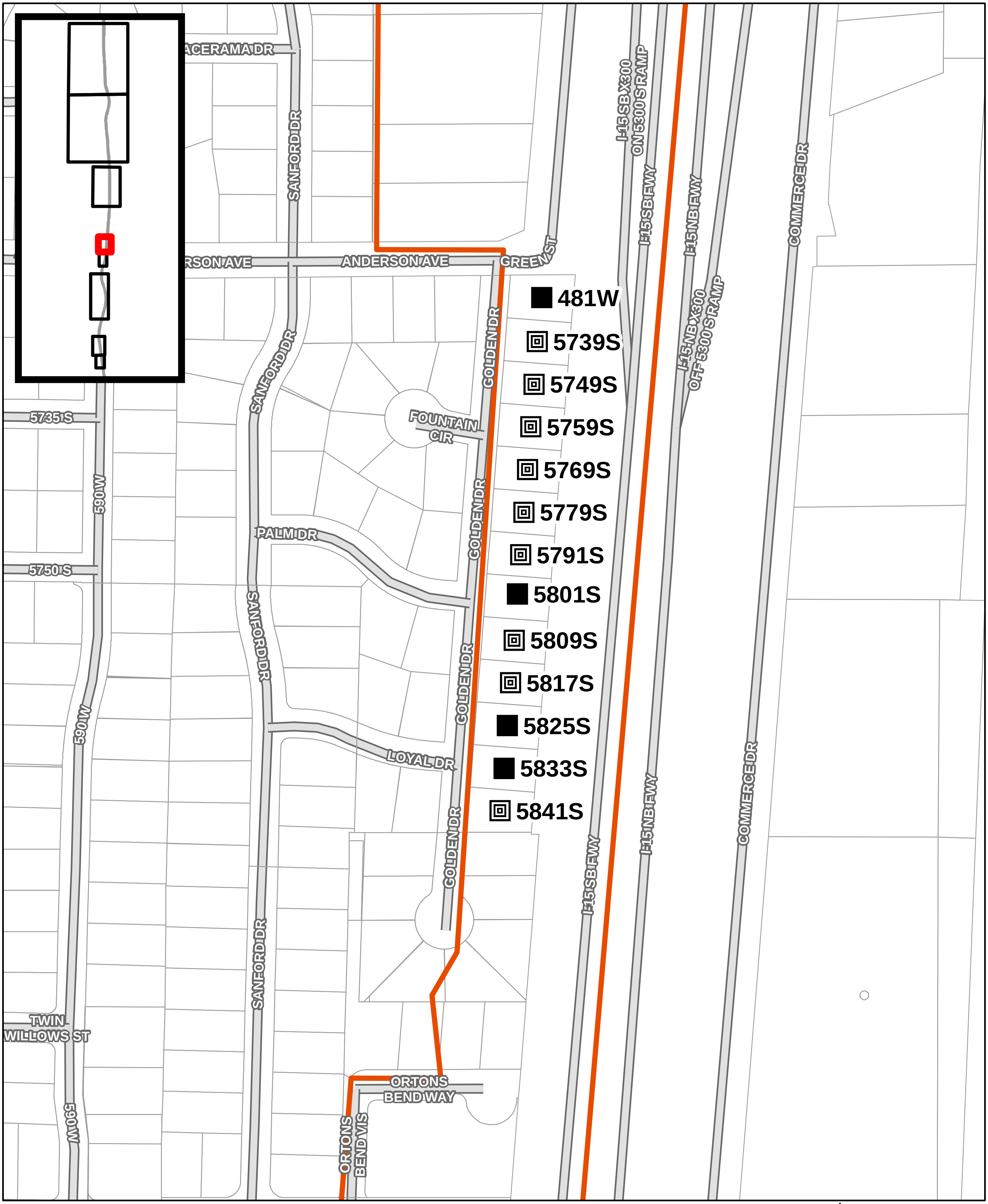
380 W 4850 South
Eligible/Contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
4850 South	380	W	EC	Residential (Gen.)	1	Early Ranch/ Rambler	0	1	1954/ 1965	Striated Brick, Vinyl Siding	Early Ranch (Gen.)	House moved to this location possibly due to 1-15 construction. Large rear addition possibly added at that time as is has aluminum sliders.

368 W Vine Street
Inelig./Non-contributing

370 W Vine Street
Inelig./Non-contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Vine Street	368	W	NC	Residential (Gen.)	1	Hall-Parlor	0	0	1901	Vinyl Siding	Minimal Traditional	Altered to Minimal Traditional during historic period. Recent Vinyl cladding.
Vine Street	370	W	NC	Residential (Gen.)	1	Central Blk w/ Proj Bays	0	1	1941	Vinyl siding	Minimal Traditional	Siding altered, windows replaced.



Feet

0 65 130 260

N

Eligible/Contributing

Inelig./Non-contributing

Reconnaissance Level Survey
1-15, SB 12300 South to SR-201

Survey Boundary

DATE 12/21/2016

DRAWN

Map 4

481 W Anderson Avenue
Eligible/Contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Anderson Avenue	481	W	EC	Residential (Gen.)	1.5	Split Level with carport	0	2	1959	Concrete Brick	Split Level (Gen.)	Vinyl Windows. Tax photo shows carport enclosed as a garage which must have been removed.

5739 S Golden Drive
Inelig./Non-contributing

5749 S Golden Drive
Inelig./Non-contributing

5759 S Golden Drive
Inelig./Non-contributing

5769 S Golden Drive
Inelig./Non-contributing

5779 S Golden Drive
Inelig./Non-contributing

5791 S Golden Drive
Inelig./Non-contributing

5801 S Golden Drive
Eligible/Contributing

5809 S Golden Drive
Inelig./Non-contributing

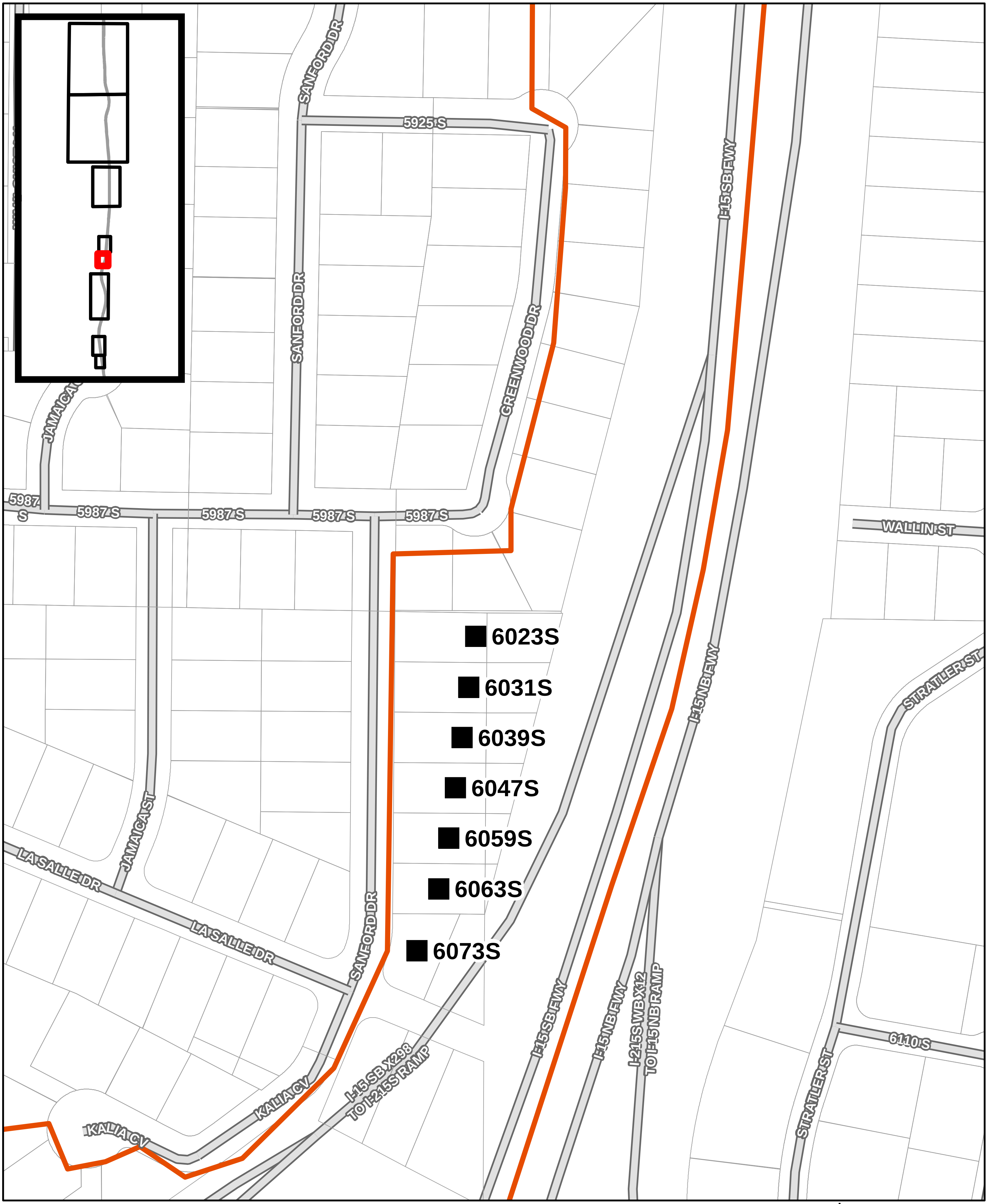
5817 S Golden Drive
Inelig./Non-contributing

5825 S Golden Drive
Eligible/Contributing

5833 S Golden Drive
Eligible/Contributing

5841 S Golden Drive.
Inelig./Non-contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Golden Drive	5739	S	NC	Residential (Gen.)	1.5	Split Level with carport	0	1	1959	Concrete Brick	Split Level (Gen.)	Roof pitch altered on back Split level in back (see 5801 S Golden Dr.), vinyl windows, front door altered. Difficult to photograph due to vegetation.
Golden Drive	5749	S	NC	Residential (Gen.)	1	Split Level with carport	0	1	1959	Concrete Brick, Vinyl Siding	Split Level (Gen.)	Split level in back, roof altered (see 5801 S Golden Dr.), vinyl windows, window enclosed left of front door.
Golden Drive	5759	S	NC	Residential (Gen.)	1.5	Split Level with carport	0	1	1959	Concrete Brick, Vinyl Siding	Split Level (Gen.)	Split level in back portion of the house. Original roof altered (see tax photo), carport enclosed, vinyl windows
Golden Drive	5769	S	NC	Residential (Gen.)	1	Split Level with carport	0	1	1959	Concrete Brick, Vinyl Siding	Split Level (Gen.)	Original Roof replaced with gabled roof, garage enclosed very early (see tax photo)
Golden Drive	5779	S	NC	Residential (Gen.)	1.5	Split Level with carport	0	1	1959	Concrete Brick, Vinyl Siding	Other/Unclear Style	Altered primary facade, enclosed carport, altered roof pitch, vinyl siding and windows.
Golden Drive	5791	S	NC	Residential (Gen.)	1.5	Other Residential Type	0	1	1959	Concrete Brick, Vinyl Siding	Split Level (Gen.)	Addition of half level, altered roof, enclosed carport, altered materials, vinyl windows.
Golden Drive	5801	S	EC	Residential (Gen.)	1.5	Split Level with carport	0	1	1959	Concrete Brick	Split Level (Gen.)	Maintains original style and character with Split Level in rear. Windows replaced with vinyl
Golden Drive	5809	S	NC	Residential (Gen.)	1.5	Split Level with carport	0	1	1970	Concrete Brick, Aluminum Siding	Split Level (Gen.)	Roof overhang is odd. Altered roof? Later constr. date could account for roof. Vinyl windows. Carport addition connects house to outbuilding.
Golden Drive	5817	S	NC	Residential (Gen.)	1.5	Split Level with carport	0	01	1970	Concrete Brick, Vinyl Siding Siding	Split Level (Gen.)	Hipped roof possibly due to later constr. date. Enclosed carport, vinyl siding, vinyl windows.
Golden Drive	5825	S	EC	Residential (Gen.)	1.5	Split Level with carport	0	0	1970	Concrete Brick, Vinyl Siding Brick	Split Level (Gen.)	Altered roof? Difference may be due to later constr. date. Aluminum windows.
Golden Drive	5833	S	EC	Residential (Gen.)	1.5	Split Level with carport	0	1	1959	Concrete Brick	Split Level (Gen.)	Maintains original style and character with Split Level in rear. Windows replaced with vinyl.
Golden Drive	5841	S	NC	Residential (Gen.)	1.5	Split Level with carport	0	1	1959	Concrete Brick, Vinyl Siding Siding	Split Level (Gen.)	Original aluminum windows. Possible roof alteration, carport enclosed with vinyl.



Feet
0 50 100 200

N

Eligible/Contributing

Inelig./Non-contributing

Reconnaissance Level Survey
1-15, SB 12300 South to SR-201

DATE 2/17/2017

DRAWN

Map 5

6023 S Sanford Drive
Eligible/Contributing

6031 S Sanford Drive
Eligible/Contributing

6039 S Sanford Drive
Eligible/Contributing

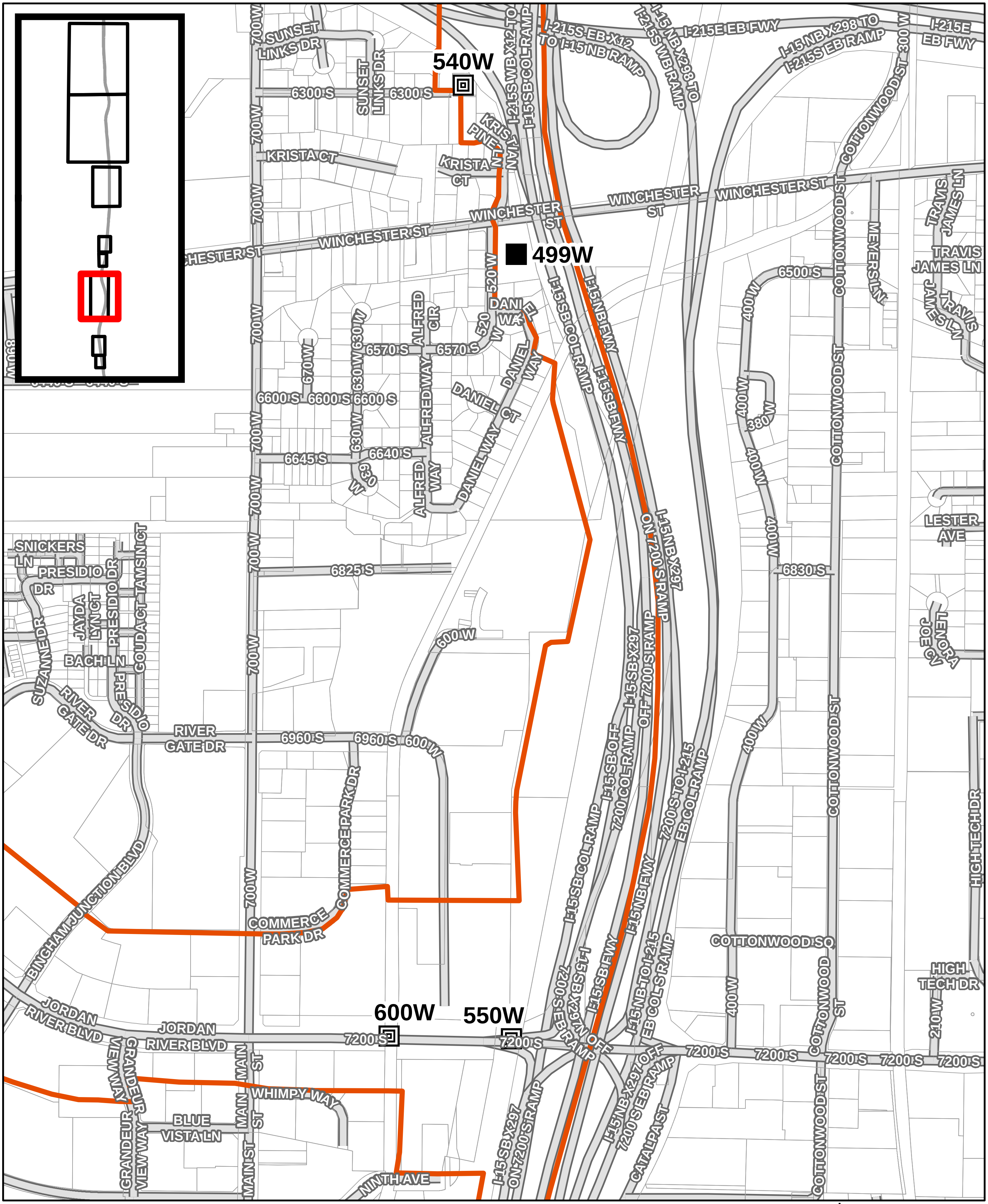
6047 S Sanford Drive
Eligible/Contributing

6059 S Sanford Drive
Eligible/Contributing

6063 S Sanford Drive
Eligible/Contributing

6073 S Sanford Drive
Eligible/Contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Sanford Drive	6023	S	EC	Residential (Gen.)	1.5	Split Level with Garage	0	1	1960	Regular Brick, Aluminum Siding	Split Level (Gen.)	Difficult to photograph due to evergreens.
Sanford Drive	6031	S	EC	Residential (Gen.)	1	Ranch	0	1	1960	Regular Brick	Ranch/Rambler (Gen.)	Carport addition on south, vinyl windows
Sanford Drive	6039	S	EC	Residential (Gen.)	1.5	Split Level with Garage	0	1	1960	Striated Brick	Split Level (Gen.)	Vinyl windows, 1.5 story carport on the north
Sanford Drive	6047	S	EC	Residential (Gen.)	1	Ranch	0	1	1960	Regular Brick	Ranch/Rambler (Gen.)	Windows replaced with vinyl.
Sanford Drive	6059	S	EC	Residential (Gen.)	1	Ranch	1	0	1961	Striated Brick	Ranch/Rambler (Gen.)	Retains original windows
Sanford Drive	6063	S	EC	Residential (Gen.)	1	Ranch	1	1	1960	Regular Brick	Ranch/Rambler (Gen.)	Vinyl windows
Sanford Drive	6073	S	EC	Residential (Gen.)	1.5	Split Level with Garage	0	1	1960	Regular Brick, Vinyl Siding	Split Level (Gen.)	Vinyl windows. Vinyl siding on gable ends but brick is dominant material.



Feet

0 190 380 760

N

Eligible/Contributing

Inelig./Non-contributing

Reconnaissance Level Survey

1-15, SB 12300 South to SR-201

DATE 2/17/2017

DRAWN

Map 6

540 W 6300 South
Inelig./Non-contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
6300 South	540	W	NC	Residential (Gen.)	1	Hall/Parlor	0	1	1898/ 1983	Aluminum siding	Other/Unclear Style	Addition on the north, windows altered for aluminum. Difficult to photograph due to lot shape and vegetation.

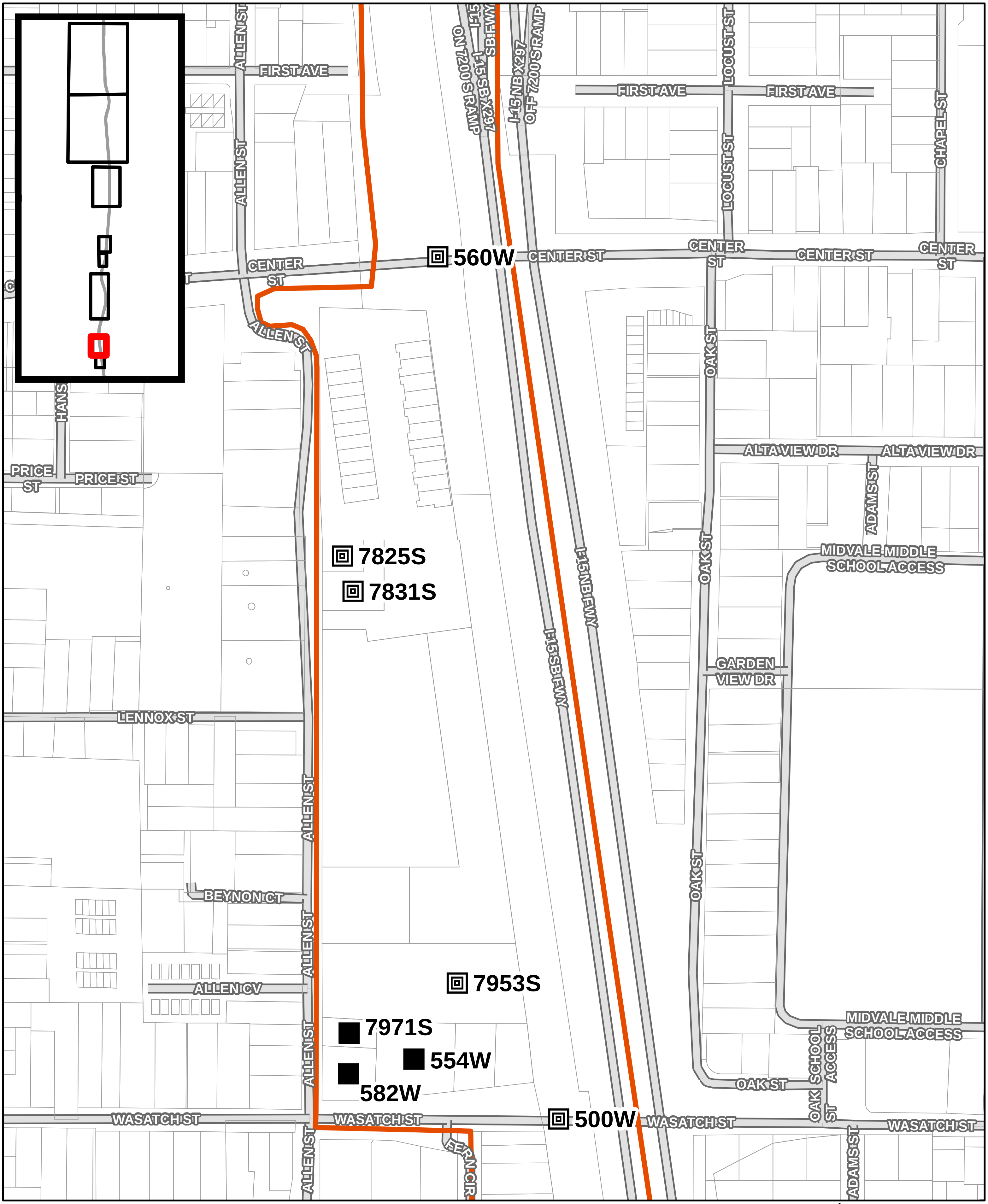
499 W. Winchester Street
Eligible/Contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Winchester Street	499	W	EC	Residential (Gen.)	1	Bungalow	2	1	1920/ 1945	Asbestos siding	Minimal Traditional	Multiple in-period additions (prior to 1964 aerial), style altered during historic period, seamed metal roof.

550 W. 7200 South
Inelig./Non-contributing

600 W. 7200 South
Inelig./Non-contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
7200 South	550	W	NC	Commercial (Gen.)	1	Continuous stringer/ multi-girder bridge	0	0	1966	Steel, Cast Concrete		DRG&W bridge constructed in conjunction with I-15 when 7200 South was lowered below grade.
7200 South	600	W	NC	Commercial (Gen.)	1	Continuous stringer/ multi-girder bridge	0	0	1966	Steel, Cast Concrete		Bingham Junction Spur of DRG&W. Constructed in conjunction with I-15 when 7200 South was lowered below grade.



Feet

0 75 150 300

Eligible/Contributing

Inelig./Non-contributing

Reconnaissance Level Survey
1-15, SB 12300 South to SR-201

DATE 2/17/2017

DRAWN

Map 7

560 W. Center Street
Inelig./Non-contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Center Street	560	W	NC	Rail Transp. Related		Continuous stringer/ multi-girder bridge	0	0	1965	Steel, Cast Concrete		DRG&W bridge constructed in conjunction with I-15 when Center Street was lowered below grade.

7825 S. Allen Street
Inelig./Non-contributing

7831 S. Allen Street
Inelig./Non-contributing

7953 S. Allen Street
Inelig./Non-contributing

7971 S. Allen Street
Eligible/Contributing

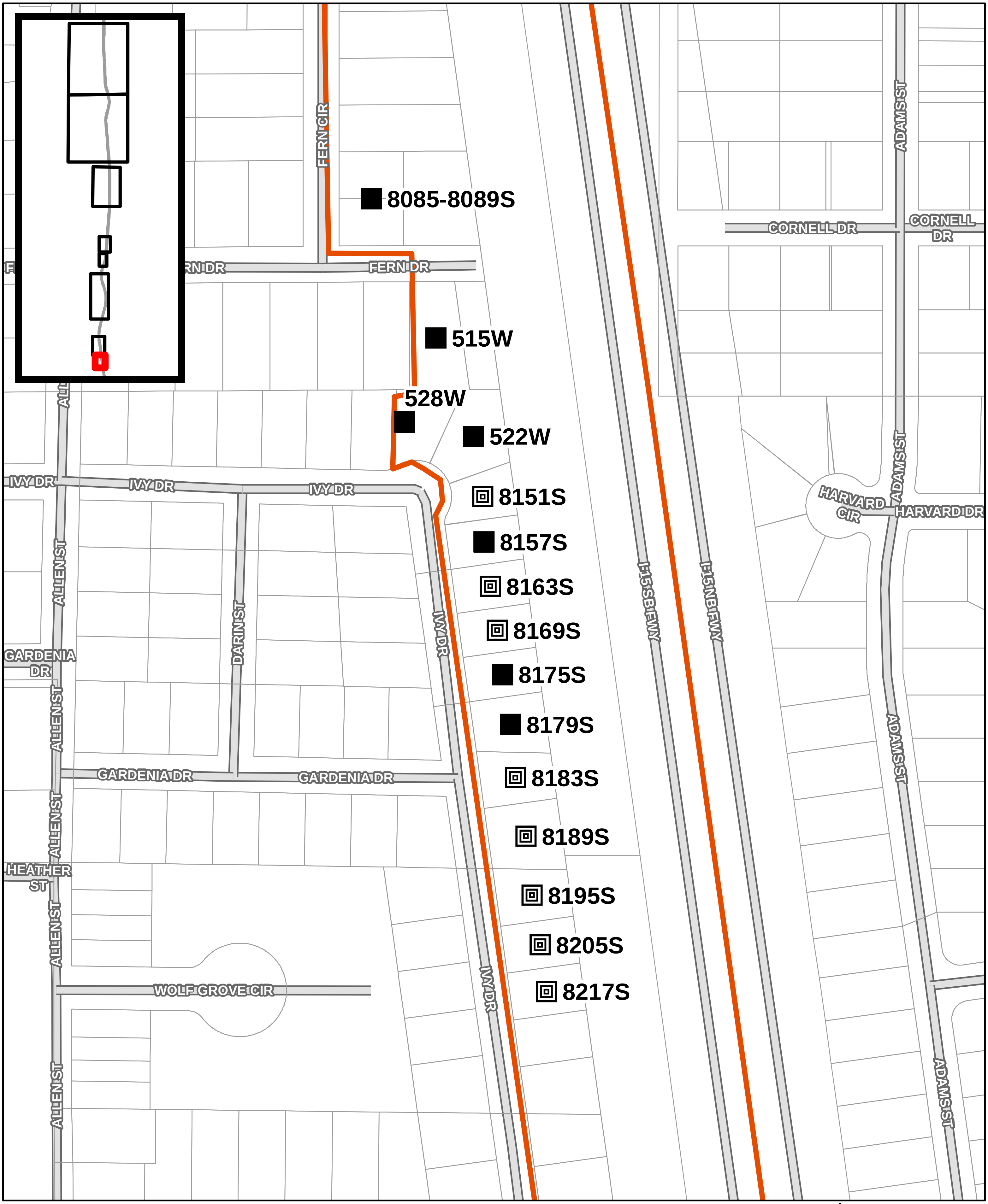
Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Allen Street	7825	S	NC	Residential (Gen.)	1	Crosswing	1	0	1901	Vinyl Siding, Imitation Stone	Victorian:Other, Other/ Unclear Style	Large rear addition, altered materials, windows replaced with aluminum.
Allen Street	7831	S	NC	Residential (Gen.)	1	Box Bungalow	0	2	1915	Aluminum Siding	Bungalow	Aluminum windows, altered openings, rear addition.
Allen Street	7953	S	NC	Multiple Dwelling	1.5	Other Apt./Hotel Plan	0	2	1971	Stucco	Mansard, Other/Unclear Style	Recent stucco, some vinyl windows, some altered openings. Other two buildings constructed in 1973.
Allen Street	7971	S	EC	Residential (Gen.)	1	Ranch	0	1	1954	Asbestos siding	Ranch/Rambler (Gen.)	Vinyl windows. Carport on the north elevation.

500 W. Wasatch Street
Inelig./Non-contributing

554 W. Wasatch Street
Eligible/Contributing

582 W. Wasatch Street
Eligible/Contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Wasatch Street	500	W	NC	Rail Transp. Related	0	Continuous stringer/ multi-girder bridge	0	0	1966	Steel, Cast Concrete		DRG&W bridge constructed in conjunction with I-15 when Wasatch St. was lowered below grade.
Wasatch Street	554	W	EC	Residential (Gen.)	1	Bungalow	0	0	1898	Drop/Novelty Siding, Shingle siding	Victorian Eclectic	Cross between Victorian and Early Bungalow, has original windows
Wasatch Street	582	W	EC	Residential (Gen.)	1	Crosswing	1	0	1891	Stucco, Regular Brick, Shingle Siding	Greek Revival, Victorian Eclectic	Vinyl windows. Original wing on west may be stucco over adobe, has Greek Rev. pediments. East brick crosswing addition is Vict. Eclec.



Feet
0 50 100 200

N

Eligible/Contributing

Inelig./Non-contributing

Reconnaissance Level Survey
1-15, SB 12300 South to SR-201
Survey Boundary

DATE 12/21/2016

DRAWN

Map 8

8085 S. Fern Circle
Eligible/Contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Fern Circle	8085	S	EC	Multiple Dwelling	1	Duplex (Apt.)	0	0	1959	Aluminum siding	Ranch/Rambler (Gen.)	windows replaced with vinyl

515 W. Fern Drive
Eligible/Contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Fern Drive	515	W	EC	Multiple Dwelling	1	Duplex (apt.)	0	2	1960	Regular Brick, Aluminum siding	Ranch/Rambler (Gen.)	Four apartments

522 W Ivy Drive
Eligible/Contributing

528 W Ivy Drive
Eligible/Contributing

8151 S Ivy Drive
Inelig./Non-contributing

8157 S Ivy Drive
Eligible/Contributing

8163 S Ivy Drive
Inelig./Non-contributing

8169 S Ivy Drive
Inelig./Non-contributing

8175 S Ivy Drive
Eligible/Contributing

8179 S Ivy Drive
Eligible/Contributing

8183 S Ivy Drive
Inelig./Non-contributing

8189 S Ivy Drive
Inelig./Non-contributing

8195 S Ivy Drive
Inelig./Non-contributing

8205 S Ivy Drive
Inelig./Non-contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Ivy Drive	522	W	EC	Residential (Gen.)	1	Ranch with carport	0	1	1970	Oversized Brick	Ranch/Rambler (Gen.)	Windows replaced with vinyl.
Ivy Drive	528	W	EC	Residential (Gen.)	1.5	Split Entry	0	0	1970	Oversized Brick, vinyl siding	Split Entry (Gen.)	Vinyl windows, vinyl siding, retains original look as brick is dominant material and siding imitates original.
Ivy Drive	8151	S	NC	Residential (Gen.)	1.5	Split Entry	0	0	1970	Oversized Brick, imitation stone	Split Entry (Gen.)	Recent Application of Imitation Stone alters facade. Difficult to photograph due to evergreens.
Ivy Drive	8157	S	EC	Residential (Gen.)	1.5	Split Entry	0	0	1970	Oversized Brick, vinyl siding	Split Entry (Gen.)	Vinyl siding, Vinyl windows, retains original look as brick is the dominant material and siding imitates original siding.
Ivy Drive	8163	S	NC	Residential (Gen.)	1	Ranch	0	2	1970	Oversized Brick, vinyl siding	Ranch/Rambler (Gen.)	Roof altered, Carport removed, vinyl windows.
Ivy Drive	8169	S	NC	Residential (Gen.)	1	Ranch with Carport	0	2	1970	Oversized Brick, imitation stone, vinyl siding	Ranch/Rambler (Gen.)	Imitation stone alters facade, vinyl windows
Ivy Drive	8175	S	EC	Residential (Gen.)	1	Ranch with Carport	0	0	1970	Oversized Brick, vinyl siding	Ranch/Rambler (Gen.)	Vinyl windows.
Ivy Drive	8179	S	EC	Residential (Gen.)	1	Ranch with Carport	0	0	1970	Regular Brick, Wood: Other/Undef	Ranch/Rambler (Gen.)	Windows replaced with vinyl.
Ivy Drive	8183	S	NC	Residential (Gen.)	1.5	Split Entry	0	2	1970	Oversized Brick, vinyl siding	Split Entry (Gen.)	added porch awning, altered siding, windows replaced, addition on the north.
Ivy Drive	8189	S	NC	Residential (Gen.)	1.5	Split Entry	0	1	1970	Oversized Brick, vinyl siding	Split Entry (Gen.)	rear addition, seamed metal roof, porch awning added, windows and siding replaced.
Ivy Drive	8195	S	NC	Residential (Gen.)	1.5	Split Entry	0	1	1971	Shingle siding, Board & Batten Siding	Split Entry (Gen.)	altered materials, vinyl windows
Ivy Drive	8205	S	NC	Residential (Gen.)	1.5	Split Entry	0	2	1971	Vinyl Siding	Split Entry (Gen.)	vinyl siding and vinyl windows

8217 S. Ivy Drive
Inelig./Non-contributing

Street Name	House #	Dir.	Eval.	Original Use	Ht.	Plan Type	OB Con	OB Non	C. Date	Materials	Building Style	Comments
Ivy Drive	8217	S	NC	Residential (Gen.)	1.5	Split Level	0	1	1971	Vinyl Siding, Imitation Stone, Board Batten Siding.	Split Level (Gen.)	Altered Windows and Siding

HORROCKS ENGINEERS

To: Ryan Halverson,
Landscape Architect
UDOT, Region 1

From: Ryan Pitts and Nathan Clarke

Date: February 15, 2017

Memorandum

Subject: Wetland Inventory for I-15; SB 12300 South to SR-201 State Environmental Study, Salt Lake County, Utah. UDOT Project No. S-I15-7(324)297; PIN 12587

Introduction

Horrocks Engineers has prepared a waters of the U.S. and wetland inventory for the Utah Department of Transportation (UDOT) in support of their State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15). These improvements include the addition of a southbound general purpose lane on I-15 between State Highway 201 (SR-201) and 12300 South and are proposed to address current and projected traffic demands. Improvements also include widening 7200 South between I-15 and Bingham Junction Boulevard from five lanes to seven lanes.

The proposed project area stretches from Salt Lake City to Draper, Utah in Sections 24, 25, and 36 of Township 1 South, Range 1 West, Sections 1, 12, 13, 24, 25, and 36 of Township 2 South, Range 1 West, and Sections 1, 12, 13, 24, and 25 of Township 3 South, Range 1 West. The proposed roadway improvements are planned to occur along approximately 14 miles of I-15.

This memo summarizes the findings from the inventory work done by Horrocks Engineers and addresses potential project impacts to wetlands and waters of the U.S. (WOUS).

Inventory

The inventory field work was conducted by Ryan Pitts and Nathan Clarke on November 16th, 2016. Prior to visiting the project location, National Wetlands Inventory (NWI) maps were studied to help identify potential waters and wetlands. The project area was driven and possible waters of the U.S. and wetlands were identified and mapped based on vegetation type and hydrology. A wetland delineation was not conducted, no sample pits were dug to identify wetland boundaries, and a jurisdiction determination from the Utah Army Corp of Engineers (USACE) was not obtained.

Results

Five possible wetlands, ten detention basins/ponds, and five waters of the U.S. (WOUS) were identified during the inventory within, or near, the project area (see attached figures). Some features, including wetlands, detention ponds, and the Jordan and Salt Lake Canal, are located just outside the study area, but within close enough proximity that they are worth noting. Many of the open water areas identified consist of stormwater detention ponds near interchanges, while the other areas documented are associated with natural water features that transect the area. The natural water features that can clearly be defined as waters of the U.S. include Mill Creek, Big Cottonwood Creek, Little Cottonwood Creek, Dry Creek, and the Jordan and Salt Lake City Canal. Wetlands within the study area are either riparian fringes adjacent to a WOUS, like those associated with Mill Creek, or are ditch-type wetlands that are dominated by Common Reed (*Phragmites australis),* and whose water source is likely ponded stormwater runoff.

Below are further details on the WOUS and wetlands inventoried.

Detention Ponds

Along the western portion of I-15 and throughout the study area, there are ten large storm water detention ponds which contain standing water and wetland vegetation around the edges. Five of the ten detention ponds, totaling approximately 2.9 acres, were identified within the study area (see attached figures). Standing water within the ponds is a direct result of stormwater run-off from adjacent roadways. This is supported by historic aerial imagery which shows that the ponds were excavated in upland areas. Furthermore, the detention ponds are isolated from, and lack any surface water connection to waters of the U.S. Given these conditions, the detention ponds within the study area do not meet the USACE's definition of a wetland or a WOUS and are not considered jurisdictional. Five of the identified detention ponds were adjacent to the study area. As part of the proposed project, all ten of the detention ponds identified are going to be dredged to remove trash, sediment, and invasive vegetation to allow for greater storage capacity.

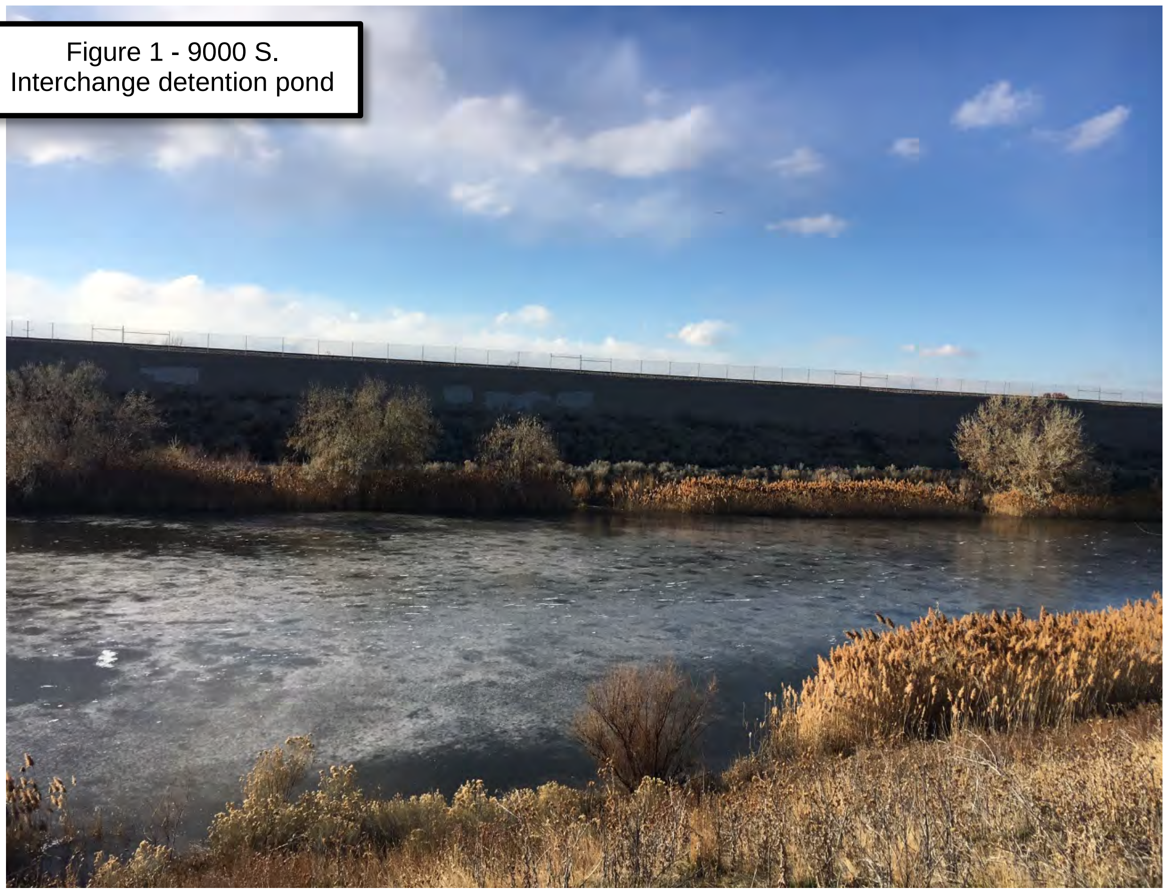


Figure 1 - 9000 S. Interchange detention pond

Wetlands

One potential wetland, totaling approximately 0.22 acre, was identified within the study area (Wetland 5, see attached figures). This wetland will not be impacted by the proposed project. Four other potential wetlands were identified adjacent to the study area.

Wetland 1 (Not within study area)

Wetland 1 is approximately 0.3 acre in size, runs parallel to 2700 South, and is associated with a ditch north of the roadway. Water is likely runoff from the roadway or the adjacent nursery. The wetland is full of common reed (*Phragmites australlis)*, and does not have a connection to any WOUS (see figure 5).

Wetland 2 (Not within study area)

Wetland 2a and 2b are approximately 0.021 acre in size and are small riparian areas on the north and south side of Mill Creek dominated by coyote willow (*Salix exigua)* (see Figure 2). These wetlands will not be impacted by the proposed project.

Wetland 2
Figure 2 – Riparian area adjacent to Mill Creek

Wetland 3 (Not within study area)

Wetland 3 is a small patch of common reed (*Phragmites australlis)* along the hillslope north of the 3300 South roadway and is approximately 0.038 acre in size. The wetland has no connection to any WOUS, and will not be impacted by the proposed project.

Wetland 4 (Not within study area)

Wetland 4 is approximately 0.07 acre in size and is located at the bottom of the fill slope along the north side of 3900 South, (see Figure 3).The wetland has no connection to any WOUS, and will not be impacted by the proposed project.

Wetland 5

Wetland 5 is 0.22 acres in size and runs along the south side of 7200 South in an open storm drainage ditch. This is the only wetland anticipated to be considered jurisdictional as any surface was would eventually flow to the Jordan River. This wetland will not be impacted by the proposed project

Wetland 4
Figure 3 - Wetland area north of 3900 South

Waters of the U.S.

Three perennial streams, Mill Creek, Big Cottonwood Creek, and Dry Creek, were identified in the study area (see attached figures), all which should be considered WOUS. Little Cottonwood Creek and the Jordan and Salt Lake Canal are located just outside the study area, but are close enough to be worth noting as they are also likely jurisdictional waters. The proposed project is estimated to impact approximately 230 linear feet (0.092 acres) of the identified WOUS.

Mill Creek

Mill Creek is a perennial stream that flows for 18.5 miles from its' headwaters in Mill Creek Canyon to its confulence with the Jordan River. The proposed alternative would extend the culvert currently used to carry water under I-15 and would impact about 15 linear feet (0.006 acres) of the stream (see attached figures).

Big Cottonwood Creek

Big Cottonwood Creek is a perennial stream that flows for 20.4 miles from its' headwaters in Big Cottonwood Canyon to its confulence with the Jordan River in the Murray area. The proposed alternative would extend the culvert currently used to carry water under I-15 and would impact about 15 linear feet (0.006 acres) of the stream (see Figure 4).

Figure 4 – Looking east at Big Cottonwood Creek from 500 West

Dry Creek

Dry Creek is an innermitent stream that flows from the Lower Bell Canyon Reservoir to the Jordan River. The proposed alternative would pipe a portion of the creek between I-15 and 300 West, impacting approximately 200 linear feet (0.08 acres) (see attached figures).

Little Cottonwood Creek (Not within study area)

Little Cottonwood Creek is a perennial stream that flows for 27.7 miles from its' headwaters in Little Cottonwood Canyon to its confulence with the Jordan River. The creek will not be impacted by the proposed project.

Jordan and Salt Lake City Canal (Not within study area)

The Jordan and Salt Lake City Canal was orignially contrsucted in 1864 to transport stone from the quarry in the Wasatch Mountains to the site of the Salt Lake City Temple. The canal is 28 miles long, running from the Jordan River to 8th South in Salt Lake City, and is still in use today (see Figure 7 and 8). The proposed alternative would not impact the canal.

Conclusion

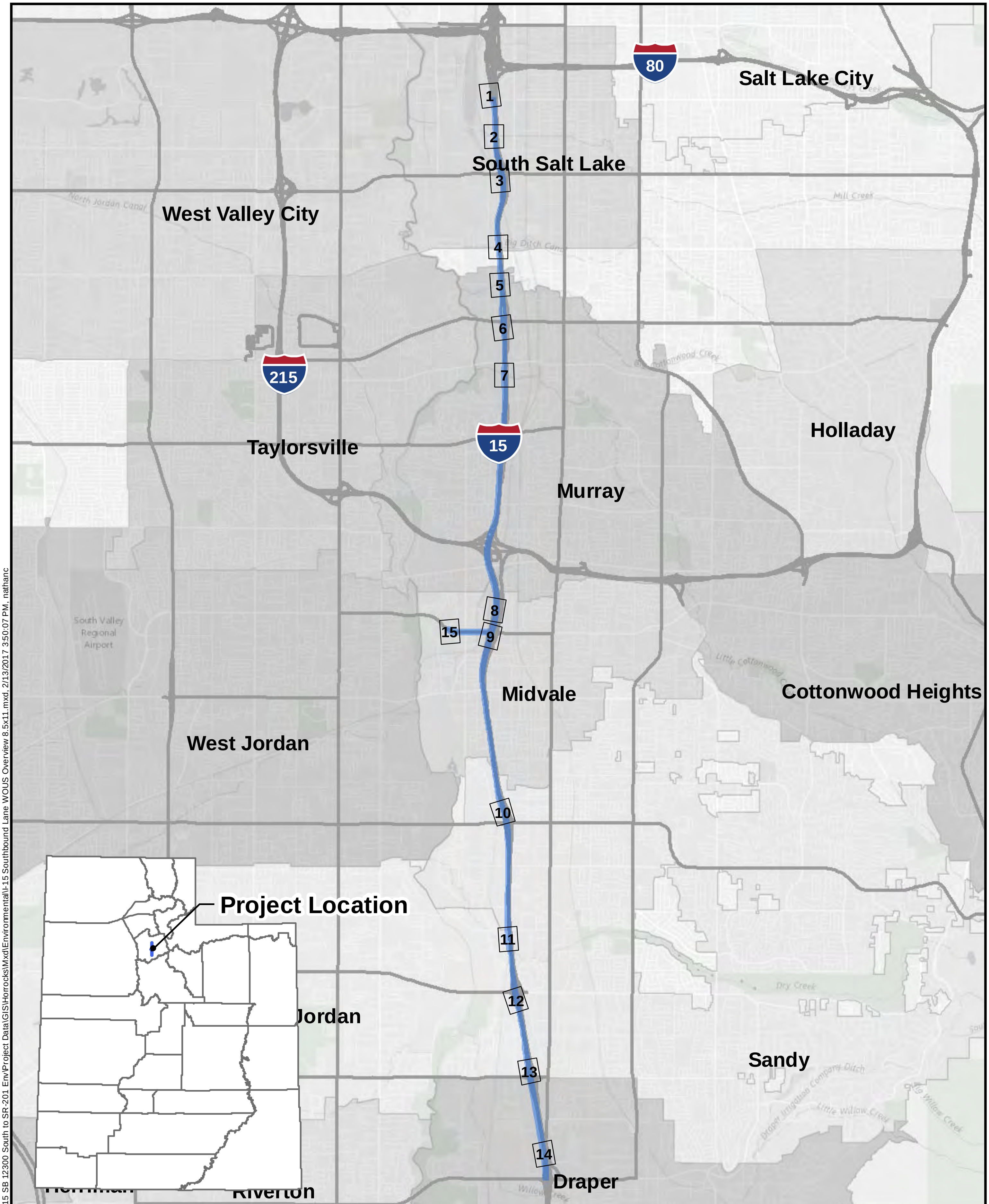
Based on our understanding, impacts to WOUS will be approximately 0.09 acres, and no wetlands will be impacted by the proposed project. If it is determined that impacts to WOUS are greater than 0.10 acre, or that any wetlands are impacted, a joint Section 404 and Stream Alteration Permit will be completed for submittal to the Utah Division of Water Rights and the Army Corps of Engineers.

Figure 5- Possible wetland on north side of 2700 South

Figure 6- Looking West at Little Cottonwood Creek

Figure 7- Looking West at Jordan and Salt Lake City Canal

Figure 8- Looking East at Jordan and Salt Lake City Canal



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I-15; SB 12300 South to SR-201 State Environmental Study

Wetland Inventory Overview Map

Detention Pond
Study Area
UDOT 1/10 MP
Waters of the U.S. (WOUS)
Possible Wetland

N

0 100 200 Feet

I-15; SB 12300 South to
Wetland Inventory Mapbook
Map 1 of 15

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Detention Pond

Study Area

UDOT 1/10 MP

Waters of the U.S. (WOUS)

Possible Wetland

0 100 200 Feet

I-15; SB 12300 South to
Wetland Inventory Mapbook
Map 2 of 15

Detention Pond
Study Area
UDOT 1/10 MP
Waters of the U.S. (WOUS)
Possible Wetland

0 100 200
Feet

I-15; SB 12300 South to
Wetland Inventory Mapbook
Map 3 of 15

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Detention Pond
Study Area
UDOT 1/10 MP
Waters of the U.S. (WOUS)
Possible Wetland

0 100 200 Feet

I-15; SB 12300 South to
Wetland Inventory Mapbook
Map 4 of 15

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Detention Pond
Study Area
UDOT 1/10 MP
Waters of the U.S. (WOUS)
Possible Wetland

0 100 200 Feet

I-15; SB 12300 South to
Wetland Inventory Mapbook
Map 5 of 15

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Detention Pond

Study Area

UDOT 1/10 MP

Waters of the U.S. (WOUS)

Possible Wetland

0 100 200 Feet

I-15; SB 12300 South to
Wetland Inventory Mapbook

Map 6 of 15

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Detention Pond
Study Area
UDOT 1/10 MP
Waters of the U.S. (WOUS)
Possible Wetland

0 100 200 Feet

I-15; SB 12300 South to Wetland Inventory Mapbook
Map 7 of 15

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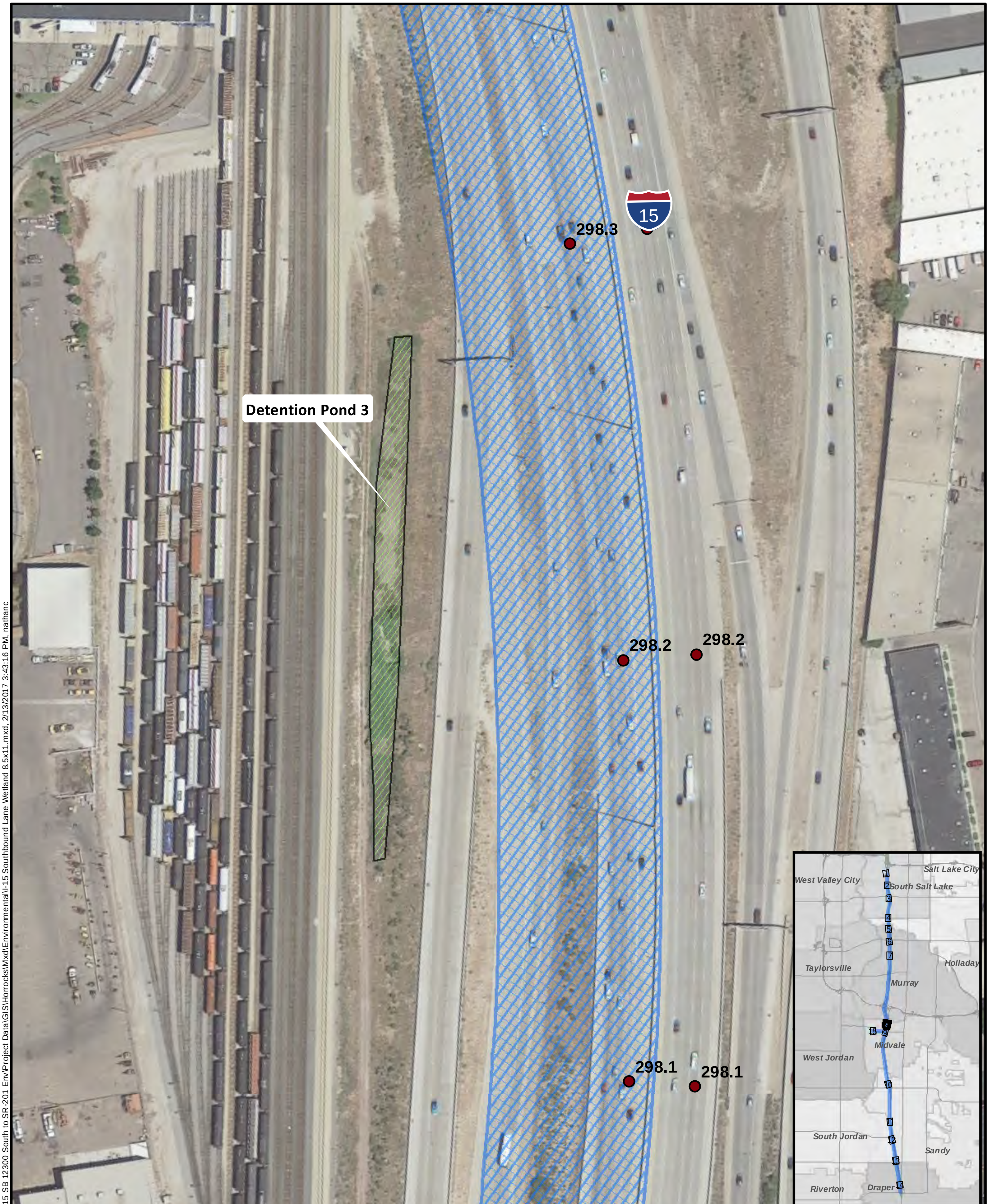

Detention Pond

Study Area

UDOT 1/10 MP

Waters of the U.S. (WOUS)

Possible Wetland

0 100 200 Feet

I-15; SB 12300 South to Wetland Inventory Mapbook

Map 8 of 15

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Detention Pond

Study Area

UDOT 1/10 MP

Waters of the U.S. (WOUS)

Possible Wetland

0 100 200 Feet

I-15; SB 12300 South to Wetland Inventory Mapbook

Map 9 of 15

Detention Pond

Study Area

UDOT 1/10 MP

Waters of the U.S. (WOUS)

Possible Wetland

0 100 200 Feet

I-15; SB 12300 South to Wetland Inventory Mapbook

Map 10 of 15

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Detention Pond

Study Area

UDOT 1/10 MP

Waters of the U.S. (WOUS)

Possible Wetland

0 100 200 Feet

I-15; SB 12300 South to Wetland Inventory Mapbook

Map 11 of 15

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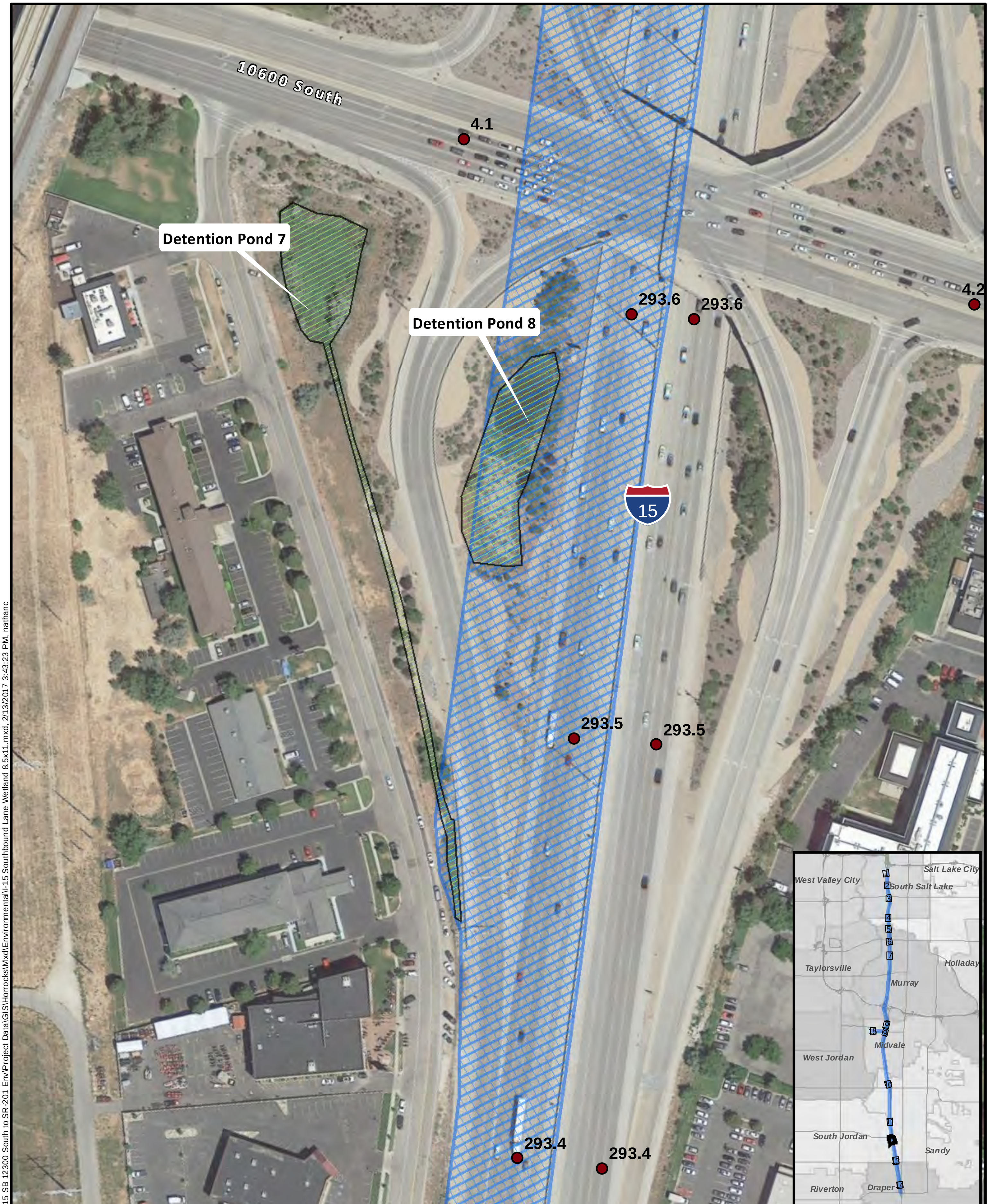

Detention Pond
Study Area
UDOT 1/10 MP
Waters of the U.S. (WOUS)
Possible Wetland

0 100 200 Feet

I-15; SB 12300 South to Wetland Inventory Mapbook
Map 12 of 15

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Detention Pond

Study Area

UDOT 1/10 MP

Waters of the U.S. (WOUS)

Possible Wetland

N

0 100 200 Feet

I-15; SB 12300 South to Wetland Inventory Mapbook

Map 13 of 15

O:\2016\PG-882-1607 I-15 SB 12300 South to SR-201 Env\Project Data\GIS\Horrocks\Mxd\Environmental\I-15 Southbound Lane Wetland 8.5x11.mxd, 2/13/2017 3:43:24 PM, nathanc

Detention Pond
Study Area
UDOT 1/10 MP
Waters of the U.S. (WOUS)
Possible Wetland

0 100 200 Feet

I-15; SB 12300 South to
Wetland Inventory Mapbook
Map 14 of 15

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Detention Pond
Study Area
UDOT 1/10 MP
Waters of the U.S. (WOUS)
Possible Wetland

I-15; SB 12300 South to Wetland Inventory Mapbook
Map 15 of 15

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Functional Classification," shown as **Map 7-6**, graphically illustrates the Wasatch Front Region's (1) freeways, (2) principal arterials, (3) minor arterials, and (4) collector streets. Freeway systems are the largest traffic facilities built with complete control of access and high design speeds and provide the greatest mobility for regional traffic. Principal arterial streets serve the major centers of activity of a metropolitan area and the longest projected trips. Minor arterials interconnect with and augment the urban principal arterial system and provide for trips of moderate length at a somewhat lower level of travel mobility than principal arterials. These facilities place more emphasis on land access to adjoining or nearby properties than freeways or major arterials, and offer movement within communities. However, ideally they should not penetrate identifiable neighborhoods. Finally, collector streets provide for both land access service and movement for local traffic within residential, commercial, and industrial areas. This particular road classification may penetrate neighborhoods distributing trips form arterial streets through developed areas to ultimate destinations. Conversely, collector roads can also be expected to collect traffic from local streets and channel it onto the arterial system. Appendix L entitled, "Street Functional Classification" provides a more complete description of various highway and street classification types.

TABLE 7 - 4 2015-2040 RTP HIGHWAY PROJECT LIST

ID#	PROJECT	DESCRIPTION		PHASE 1: 2015-2024 PHASE 2: 2025-2034 PHASE 3: 2035-2040 Unfunded (U))	COST
SALT LAKE COUNTY, EAST-WEST FACILITIES					
S-1	**Sports Complex Boulevard (2400 North)** I-215 East Frontage Road to Redwood Road	New Construction: 0 to 2 lanes ROW:2015 - 0 ft./2040 - 66 ft.	Collector / 0.5 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $4,400,000 Phased - $5,300,000
S-3	**California Avenue** Mountain View Corridor to 4800 West	Widening: 2 to 4 lanes ROW:2015 - 110 ft./2040 - 110 ft.	Minor Arterial / 1.3 miles / Local Bike Routes: Priority	Needed Phase - 3 Funded Phase - 3	2015 - $10,000,000 Phased - $24,700,000
S-4	**I-80** 1300 East to I-215 (East)	Widening: 6 to 8 lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 3.3 miles / I-80 Bike Routes: None	Needed Phase - 2 Funded Phase - 2	2015 - $181,500,000 Phased - $326,900,000
S-5	**I-80** I-215 (East) to Lambs Canyon	Widening: 3 EB to 4 EB lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 8.0 miles / I-80 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $36,900,000 Phased - $44,900,000
S-6	**2100 South** I-15 to 1300 East	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Minor Arterial / 2.6 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 2	2015 - $6,500,000 Phased - $11,700,000
S-7	**SR-201** I-80 (West) to SR-111 Bypass	Widening: 4 to 6 lanes ROW:2015 - 300 ft. / 2040 - 300 ft.	Freeway / 9.0 miles / SR-201 Bike Routes: None/Priority	Needed Phase - 2 Funded Phase - 2	2015 - $198,000,000 Phased - $356,600,000
S-8	**SR-201** SR-111 Bypass to Mountain View Corridor	Widening: 4 to 6 lanes ROW:2015 - 300 ft. / 2040 - 300 ft.	Freeway / 4.6 miles / SR-201 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $101,200,000 Phased - $182,300,000
S-9	**SR-201** Mountain View Corridor to I-15	Widening: 6 to 6+HOT lanes ROW:2015 - 300 ft. / 2040 - 300 ft.	Freeway / 6.0 miles / SR-201 Bike Routes: None	Needed Phase - 1 Funded Phase - 2	2015 - $132,000,000 Phased - $237,700,000
S-164	**2400 South** 7200 West to 6750 West	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 0.5 miles / Local Bike Routes: Base	Needed Phase - 2 Funded Phase - 2	2015 - $6,100,000 Phased - $11,000,000
S-165	**2400 South** 6400 West to 5600 West	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 1.3 miles / Local Bike Routes: None/Base/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $15,900,000 Phased - $19,400,000
S-166	**2400 South** 3200 West to 2700 West	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 0.5 miles / Local Bike Routes: None	Needed Phase - 2 Funded Phase - 2	2015 - $6,100,000 Phased - $11,000,000
S-10	**Parkway Boulevard (2700 South)** 7200 West to 5600 West	Widening: 2 to 4 lanes ROW:2015 - 86 ft. / 2040 - 86 ft.	Collector / 2.0 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $15,400,000 Phased - $18,700,000
S-11	**3300 South/ 3500 South** I-215 (West) to Highland Drive	Operational ROW:2015 - 126 ft. / 2040 - 126 ft.	Principal Arterial / 5.2 miles / SR-171 Bike Routes: None/Base/Priority	Needed Phase - 1 Funded Phase - 2	2015 - $13,000,000 Phased - $23,400,000
S-12	**3500 South** SR-111 Bypass to 7200 West	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 100 ft.	Principal Arterial / 2.2 miles / SR-171 Bike Routes: Base/Priority	Needed Phase - 3 Funded Phase - U	2015 - $20,900,000 Phased - $51,500,000
S-13	**3500 South** 7200 West to Mountain View Corridor	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 100 ft.	Principal Arterial / 1.8 miles / SR-171 Bike Routes: None	Needed Phase - 2 Funded Phase - 2	2015 - $17,100,000 Phased - $30,800,000

S-14	**3500 South** Mountain View Corridor to 4000 West	Widening: 2/4 to 6 lanes ROW:2015 - 80 ft. / 2040 - 100 ft.	Principal Arterial / 2.2 miles / SR-171 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $19,300,000 Phased - $23,400,000
S-15	**4100 South** 7200 West to 5600 West	Widening: 2 to 4 lanes ROW:2015 - 76 ft. / 2040 - 99 ft.	Minor Arterial / 2.0 miles / Local Bike Routes: Priority	Needed Phase - 3 Funded Phase - 3	2015 - $37,800,000 Phased - $93,200,000
S-16	**4700 South** 5600 West to 4000 West	Widening: 2 to 4 lanes ROW:2015 - 80 ft. / 2040 - 110 ft.	Principal Arterial / 2 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $38,600,000 Phased - $69,500,000
S-17	**4700 South** 4000 West to I-215	Widening / Operational: 4 to 6 lanes ROW:2015 - 110 ft. / 2040 - 110 ft.	Principal Arterial / 1.8 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $12,300,000 Phased - $15,000,000
S-18	**4500 South / 4700 South** Redwood Road to I-15	Widening: 4 to 6 lanes ROW:2015 - 150 ft. / 2040 - 150 ft.	Principal Arterial / 2.0 miles / SR-266 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $29,600,000 Phased - $53,300,000
S-19	**4500 South** 900 East to Highland Drive	Widening: 2 to 4 lanes ROW:2015 - 80 ft. / 2040 - 110 ft.	Principal Arterial / 1.3 miles / SR-266 Bike Routes: Base	Needed Phase - 2 Funded Phase - 3	2015 - $12,100,000 Phased - $29,700,000
S-20	**5400 South** SR-111 to Mountain View Corridor	Widening: 2 to 4 lanes ROW:2015 - 70 ft. / 2040 - 100 ft.	Minor Arterial / 1.6 miles / SR-173 Bike Routes: Base	Needed Phase - 2 Funded Phase - 2	2015 - $14,900,000 Phased - $26,800,000
S-21	**5400 South** SR-111 to Mountain View Corridor	Widening: 4 to 6 lanes ROW:2015 - 70 ft. / 2040 - 100 ft.	Minor Arterial / 1.6 miles / SR-173 Bike Routes: Base	Needed Phase - 3 Funded Phase - U	2015 - $14,900,000 Phased - $36,600,000
S-22	**5400 South** Mountain View Corridor to 4800 West	Widening: 4 to 6 lanes ROW:2015 - 65 ft. / 2040 - 100 ft.	Minor Arterial / 2.0 miles / SR-173 Bike Routes: Base	Needed Phase - 2 Funded Phase - 2	2015 - $39,100,000 Phased - $70,400,000
S-24	**5400 South** Redwood Road to State Street	Operational ROW:2015 - 100 ft. / 2040 - 100 ft.	Minor Arterial / 2.7 miles / SR-173 Bike Routes: None/Base/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $6,800,000 Phased - $8,200,000
S-25	**6200 South** SR-111 to Mountain View Corridor	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 110 ft.	Minor Arterial / 0.7 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $9,500,000 Phased - $11,500,000
S-26	**6200 South** SR-111 to Mountain View Corridor	Widening: 4 to 6 lanes ROW:2015 - 0 ft. / 2040 - 110 ft.	Minor Arterial / 0.7 miles / Local Bike Routes: Priority	Needed Phase - 3 Funded Phase - 3	2015 - $9,500,000 Phased - $23,300,000
S-167	**6200 South** Mountain View Corridor to Redwood Road	Widening: 4 to 6 lanes ROW:2015 - 86 ft. / 2040 - 110 ft.	Minor Arterial / 5.6 miles / Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $50,200,000 Phased - $90,400,000
S-168	**Winchester Street** 1300 West to State Street	Widening: 2 to 4 lanes ROW:2015 - 68 ft. / 2040 - 86 ft.	Collector / 2.1 miles / Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $50,200,000 Phased - $90,300,000
S-169	**6200 South** 3000 East to Wasatch Boulevard	Widening : 4 to 6 lanes ROW:2015 - 125 ft. / 2040 - 125 ft.	Principal Arterial / 0.5 miles / SR-190 Bike Routes: None	Needed Phase - 3 Funded Phase - U	2015 - $3,900,000 Phased - $9,500,000
S-28	**7000 South** Bangerter Highway to Redwood Road	Widening: 3 to 4 lanes ROW:2015 - 80 ft. / 2040 - 99 ft.	Minor Arterial / 2.0 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $17,400,000 Phased - $21,200,000
S-29	**7000 South / 7200 South** Redwood Road to Bingham Junction Boulevard	Widening: 4 to 6 lanes ROW:2015 - 100 ft. / 2040 - 123 ft.	Principal Arterial / 1.3 miles / SR-48 Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $25,000,000 Phased - $30,400,000
S-30	**7000 South / 7200 South** Bingham Junction Boulevard to I-15	Widening: 4 to 6 lanes ROW:2015 - 123 ft. / 2040 - 123 ft.	Principal Arterial / 0.5 miles / SR-48 Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $44,400,000 Phased - $54,000,000
S-31	**Fort Union Boulevard** Union Park Boulevard to 3000 East	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Minor Arterial / 2.8 miles / Local Bike Routes: Base/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $7,000,000 Phased - $8,500,000
S-32	**7800 South** SR-111 to New Bingham Highway	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 120 ft.	Minor Arterial / 3.5 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $40,800,000 Phased - $49,600,000
S-33	**New Bingham Highway** 10200 South to 9000 South	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 110 ft.	Principal Arterial / 3.0 miles / SR-48 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $30,100,000 Phased - $74,100,000
S-34	**9000 South** SR-111 to New Bingham Highway	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 110 ft.	Principal Arterial / 1.2 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $16,200,000 Phased - $29,200,000
S-35	**9000 South** 5600 West to Bangerter Highway	Widening: 4 to 6 lanes ROW:2015 - 100 ft. / 2040 - 123 ft.	Principal Arterial / 2.5 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $25,000,000 Phased - $45,100,000
S-36	**9000 South** Bangerter Highway to Redwood Road	Widening: 4 to 6 lanes ROW:2015 - 100 ft. / 2040 - 123 ft.	Principal Arterial / 1.9 miles / SR-209 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $31,100,000 Phased - $55,900,000
S-198	**9000 South** Redwood Road to I-15	Widening: 4 to 6 lanes ROW:2015 - 100 ft. / 2040 - 123 ft.	Principal Arterial / 2.0 miles / SR-209 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $23,200,000 Phased - $28,300,000
S-170	**9000 South** I-15 to 700 East	Operational ROW:2015 - 110 ft. / 2040 - 110 ft.	Principal Arterial / 1.6 miles / SR-209 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $4,000,000 Phased - $4,900,000

S-171	**9400 South** Monroe Street to State Street	Widening: 2 to 4 lanes ROW:2015 - 76 ft. / 2040 - 110 ft.	Collector / 0.4 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $4,200,000 Phased - $5,200,000
S-172	**9400 South** State Street to Ski Connection Road	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Minor Arterial / 1.5 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $3,800,000 Phased - $4,600,000
S-173	**Little Cottonwood Road** Eastdale Drive to Wasatch Boulevard	Operational ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 1.6 miles / SR-209 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $4,000,000 Phased - $7,200,000
S-37	**10200 South** SR-111 to Mountain View Corridor	Widening: 2 to 4 lanes ROW:2015 - 82 ft. / 2040 - 110 ft.	Collector / 1.6 miles / Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 3	2015 - $14,700,000 Phased - $36,200,000
S-38	**South Jordan Parkway (11000 South)** SR-111 to Mountain View Corridor	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 110 ft.	Minor Arterial / 1.8 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $24,300,000 Phased - $43,800,000
S-39	**South Jordan Parkway (11000 South)** Mountain View Corridor to 5600 West	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 110 ft.	Minor Arterial / 0.3 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $4,100,000 Phased - $4,900,000
S-40	**10600 South / 10400 South** Bangerter Highway to Redwood Road	Widening: 4 to 6 lanes ROW:2015 - 110 ft. / 2040 - 110 ft.	Principal Arterial / 2.0 miles / SR-151 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $27,400,000 Phased - $49,300,000
S-199	**10600 South / 10400 South** Redwood Road to I-15	Widening: 4 to 6 lanes ROW:2015 - 110 ft. / 2040 - 110 ft.	Principal Arterial / 2.1 miles / SR-151 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $18,500,000 Phased - $22,500,000
S-41	**10600 South** 1700 East to Highland Drive	Widening: 2 to 4 lanes ROW:2015 - 86 ft. / 2040 - 86 ft.	Minor Arterial / 0.5 miles / Local Bike Routes: Base	Needed Phase - 2 Funded Phase - 2	2015 - $3,900,000 Phased - $6,900,000
S-42	**11800 South** Bacchus Highway to 6000 West	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 99 ft.	Minor Arterial / 1.9 miles / Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $17,900,000 Phased - $32,300,000
S-45	**11400 South** 1300 East to Highland Drive	Widening: 2 to 4 lanes ROW:2015 - 80 ft. / 2040 - 99 ft.	Minor Arterial / 1.1 miles / Local Bike Routes: None/Priority	Needed Phase - 3 Funded Phase - 3	2015 - $9,600,000 Phased - $23,600,000
S-46	**Herriman Parkway (12600 South)** 7300 West to 6000 West	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 110 ft.	Principal Arterial / 1.7 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $23,000,000 Phased - $27,900,000
S-47	**12600 South** Mountain View Corridor to Bangerter Highway	Widening: 4 to 6 lanes ROW:2015 - 123 ft. / 2040 - 123 ft.	Principal Arterial / 1.1 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $1,400,000 Phased - $1,700,000
S-174	**12600 South** Bangerter Highway to Redwood Road	Operational ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 2.4 miles / SR-71 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $6,000,000 Phased - $10,800,000
S-48	**12300 South / 12600 South** Redwood Road to I-15	Widening: 4 to 6 lanes ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 2.6 miles / SR-71 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $52,000,000 Phased - $93,700,000
S-197	**12300 South / 12600 South** I-15 to 700 East	Widening: 4 to 6 lanes ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 1.0 miles / SR-71 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $7,700,000 Phased - $9,400,000
S-175	**Herriman Main Street** 7300 West to 6200 West	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Minor Arterial / 1.4 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $3,500,000 Phased - $6,300,000
S-49	**Riverton Boulevard** 4570 West to 13400 South	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 89 ft.	Collector / 0.9 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $11,200,000 Phased - $13,600,000
S-177	**14600 South** 1000 West to Porter Rockwell Road	Widening: 2 to 4 lanes ROW:2015 - 76 ft. / 2040 - 110 ft.	Minor Arterial / 1.0 miles / SR-140 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $9,500,000 Phased - $23,400,000
S-54	**Traverse Ridge Road** Highland Drive to Mike Weir Drive	Widening: 2 to 4 lanes ROW:2015 - 89 ft. / 2040 - 99 ft.	Minor Arterial / 1.3 miles / Local Bike Routes: Base	Needed Phase - 3 Funded Phase - 3	2015 - $10,700,000 Phased - $26,400,000
S-55	**Porter Rockwell Road** Mountain View Corridor to 14600 South / 1-15	New Construction/Widening: 0/2 to 6 lanes ROW:2015 - 0 ft. / 2040 - 167 ft.	Principal Arterial / 2.9 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $75,700,000 Phased - $92,100,000

SALT LAKE COUNTY, NORTH-SOUTH FACILITIES					
S-56	**SR-111 Magna Bypass** SR-201 to SR-111	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 113 ft.	Principal Arterial / 2.6 miles / SR-111 Bike Routes: None/Priority	Needed Phase - 3 Funded Phase - U	2015 - $38,400,000 Phased - $94,600,000
S-57	**SR-111 / Bacchus Highway** 5400 South to South Jordan Parkway (11000 South)	Widening: 2 to 4 lanes ROW:2015 - 106 ft. / 2040 - 113 ft.	Principal Arterial / 7.4 miles / SR-111/ Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $67,900,000 Phased - $122,200,000
S-58	**7300 West** South Jordan Parkway (11000 South) to 13100 South	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 113 ft.	Collector / 2.9 miles / Local Bike Routes: None	Needed Phase - 3 Funded Phase - 3	2015 - $42,800,000 Phased - $105,500,000
S-178	**SR-111 / 8400 West** SR-201 to 2700 South	Widening: 2 to 3 lanes ROW:2015 - 72 ft. / 2040 - 113 ft.	Principal Arterial / 0.5 miles / SR-111 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $5,500,000 Phased - $9,900,000
S-179	**Prosperity Road** Crimson View Drive (10400 South) to 11800 South	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 1.8 miles / Local Bike Routes: None	Needed Phase - 2 Funded Phase - 2	2015 - $22,000,000 Phased - $39,700,000
S-180	**6400 West** 11800 South to Herriman Main Street	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 1.6 miles / Local Bike Routes: None/Base	Needed Phase - 1 Funded Phase - 1	2015 - $19,600,000 Phased - $23,800,000
S-60	**Mountain View Corridor** I-80 to SR-201	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 328 ft.	Principal Arterial / 3.2 miles / SR-85 Bike Routes: None	Needed Phase - 2 Funded Phase - 3	2015 - $660,000,000 Phased- $1,626,700,000
S-61	**Mountain View Corridor** SR-201 to 4100 South	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 328 ft.	Principal Arterial / 3.1 miles / SR-85 Bike Routes: None/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $410,000,000 Phased - $498,800,000
S-64	**Mountain View Corridor** Porter Rockwell Road to Utah County Line	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 328 ft.	Principal Arterial / 2.4 miles / SR-85 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $105,000,000 Phased - $127,700,000
S-65	**Mountain View Corridor** I-80 to SR-201	Widening and Interchanges: 4 to 6 lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 3.2 miles / SR-85 Bike Routes: None	Needed Phase - 3 Funded Phase - U	2015 - $195,000,000 Phased - $480,600,000
S-66	**Mountain View Corridor** SR-201 to 4100 South	Widening and Interchanges: 4 to 6 lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 3.1 miles / SR-85 Bike Routes: None/Priority	Needed Phase - 2 Funded Phase - 2	2015 - $215,000,000 Phased - $387,200,000
S-67	**Mountain View Corridor** 4100 South to 5400 South	Widening and Interchanges: 4 to 6 lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 2.2 miles / SR-85 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $70,000,000 Phased - $126,100,000
S-68	**Mountain View Corridor** 5400 South to 9000 South	Widening and Interchanges: 4 to 6 lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 4.7 miles / SR-85 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $193,300,000 Phased - $348,000,000
S-69	**Mountain View Corridor** 9000 South to 10200 South	Widening and Interchanges: 4 to 6 lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 1.6 miles / SR-85 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 3	2015 - $65,800,000 Phased - $162,200,000
S-70	**Mountain View Corridor** 10200 South to Porter Rockwell Road	Widening and Interchanges: 4 to 6 lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 8.9 miles / SR-85 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 3	2015 - $366,000,000 Phased - $902,000,000
S-71	**Mountain View Corridor** Porter Rockwell Road to Utah County Line	Widening and Interchanges: 4 to 6 lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 2.4 miles / SR-85 Bike Routes: None	Needed Phase - 2 Funded Phase - 2	2015 - $41,300,000 Phased - $74,400,000
S-72	**Mountain View Corridor** SR-201 to Utah County Line	Widening: 6 to 6+HOT lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 26 miles / SR-85 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $86,700,000 Phased - $213,600,000
S-73	**5600 West** I-80 to SR-201	Widening: 2 to 4 lanes ROW:2015 - 86 ft. / 2040 - 150 ft.	Principal Arterial / 2.8 miles / SR-172 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $34,100,000 Phased - $41,500,000
S-74	**5600 West** SR-201 to 6200 South	Operational ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 6.0 miles / SR-172 Bike Routes: Base	Needed Phase - 1 Funded Phase - 2	2015 - $15,000,000 Phased - $27,000,000
S-76	**5600 West** 6200 South to New Bingham Highway	Operational ROW:2015 - 100 ft. / 2040 - 100 ft.	Minor Arterial / 3.1 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 2	2015 - $7,800,000 Phased - $14,000,000

S-75	**5600 West** 7800 South to New Bingham Highway	Widening: 2 to 4 lanes ROW:2015 - 80 ft. / 2040 - 100 ft.	Minor Arterial / 1.1 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $9,600,000 Phased - $11,700,000
S-77	**5600 West** New Bingham Highway to Old Bingham Highway	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 100 ft.	Minor Arterial / 1.4 miles / Local Bike Routes: Base/Priority	Needed Phase - 1 Funded Phase – 2	2015 - $13,300,000 Phased - $23,900,000
S-78	**5600 West** Old Bingham Highway to South Jordan Parkway	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 1.2 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $14,700,000 Phased - $17,900,000
S-80	**5600 West Connection** 5600 West to 11800 South	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 66 ft.	Collector / 0.7 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $6,100,000 Phased - $7,500,000
S-181	**Fort Herriman Parkway** Herriman Main Street to 13400 South	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 0.8 miles / Local Bike Routes: Base	Needed Phase - 2 Funded Phase - 2	2015 - $9,500,000 Phased - $17,200,000
S-81	**4800 West** SR-201 Frontage Road to Lake Park Boulevard	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 1.0 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $12,200,000 Phased - $14,900,000
S-82	**4800 West** Kestrel Rise Drive (10900 S.) to Mountain View Corridor	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 66 ft.	Collector / 0.9 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $10,100,000 Phased - $12,200,000
S-83	**4570 West** 12600 South to 13400 South	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 89 ft.	Collector / 1.0 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $12,400,000 Phased - $15,100,000
S-84	**4570 West** 13400 South to Juniper Crest	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 89 ft.	Collector / 1.5 miles / Local Bike Routes: None	Needed Phase - 2 Funded Phase - 2	2015 - $18,600,000 Phased - $33,500,000
S-85	**4150 West** 12600 South to Riverton Boulevard	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 89 ft.	Collector / 0.5 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $6,200,000 Phased - $7,500,000
S-200	**4000 West / 4150 West** 12600 South to Riverton Boulevard	New Construction/Widening: 2/0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 89 ft.	Collector / 1.0 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $12,400,000 Phased - $15,100,000
S-86	**3600 West** 13400 South to 14400 South	Widening: 2 to 4 lanes ROW:2015 - 73 ft. / 2040 - 86 ft.	Collector / 1.3 miles / Local Bike Routes: Priority	Needed Phase - 3 Funded Phase - 3	2015 - $10,900,000 Phased - $26,900,000
S-182	**2700 West** 5400 South to 6200 South	Widening: 2 to 4 lanes ROW:2015 - 86 ft. / 2040 - 86 ft.	Minor Arterial / 1.0 miles / Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $7,700,000 Phased - $13,900,000
S-89	**I-215** Redwood Road to I-80	Widening / Operational: 6 to 8 lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 4.8 miles / I-215 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $76,400,000 Phased - $92,900,000
S-183	**I-215** SR-201 to 4700 South	Operational ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 3.1 miles / I-215 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $15,500,000 Phased - $18,900,000
S-90	**I-215 Frontage Road** SR-201 to 4700 South	New Construction: 0 to 1 lanes ROW:2015 - 0 ft. / 2040 - 66 ft.	Collector / 7.4 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 2	2015 - $65,000,000 Phased - $117,100,000
S-91	**Redwood Road** Davis County Line to 1000 North	Widening: 2 to 4 lanes ROW:2015 - 110 ft. / 2040 - 110 ft.	Principal Arterial / 2.3 miles / SR-68 Bike Routes: Base	Needed Phase - 2 Funded Phase - 2	2015 - $29,700,000 Phased - $53,500,000
S-92	**Redwood Road** 1000 North to 6200 South	Operational ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 10.5 miles / SR-68 Bike Routes: None/Base/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $26,200,000 Phased - $31,900,000
S-93	**Redwood Road** 9000 South to Bangerter Highway	Widening: 4 to 6 lanes ROW:2015 - 66 ft. / 2040 - 100 ft.	Principal Arterial / 6.0 miles / SR-68 Bike Routes: None/Base/Priority	Needed Phase - 2 Funded Phase - 3	2015 - $57,000,000 Phased - $140,400,000
S-94	**Redwood Road** 9000 South to 11400 South	Operational ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 3.0 miles / SR-68 Bike Routes: None/Base/Priority	Needed Phase - 1 Funded Phase - 2	2015 - $7,500,000 Phased - $13,500,000
S-95	**Redwood Road** 12600 South to Bangerter Highway	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 123 ft.	Principal Arterial / 1.5 miles / SR-68 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $17,700,000 Phased - $21,600,000
S-96	**Redwood Road** Bangerter Highway to Porter Rockwell Road	Widening: 4 to 6 lanes ROW:2015 - 100 ft. / 2040 - 123 ft.	Principal Arterial / 2.7 miles / SR-68 Bike Routes: Priority	Needed Phase - 3 Funded Phase - Unfunded	2015 - $27,000,000 Phased - $66,600,000
S-184	**1300 West** 5400 South to 9400 South	Widening: 2 to 4 lanes ROW:2015 - 60 ft. / 2040 - 86 ft.	Collector / 5.0 miles / Local Bike Routes: Priority	Needed Phase - 3 Funded Phase - 3	2015 - $45,400,000 Phased - $111,800,000

S-98	**Bingham Junction Boulevard** 7800 South to 8400 South	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 1.0 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $12,200,000 Phased - $14,900,000
S-99	**Galena Park Boulevard** 12300 South to 13490 South	Widening: 2 to 4 lanes ROW:2015 - 70 ft. / 2040 - 89 ft.	Collector / 1.6 miles / Local Bike Routes: Base/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $13,900,000 Phased - $16,900,000
S-100	**Lone Peak Parkway** 11400 South to 12650 South	Widening: 2 to 4 lanes ROW:2015 - 65 ft. / 2040 - 99 ft.	Minor Arterial / 1.2 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $11,400,000 Phased - $20,500,000
S-101	**Lone Peak Parkway** 12650 South to Bangerter Highway	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 99 ft.	Minor Arterial / 1.9 miles / Local Bike Routes: None/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $24,600,000 Phased - $29,900,000
S-102	**600 West** Bangerter Highway to 14600 South	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 70 ft.	Minor Arterial / 1.4 miles / Local Bike Routes: None	Needed Phase - 3 Funded Phase - 3	2015 - $14,000,000 Phased - $34,500,000
S-103	**I-15 Collectors and Distributors** 7800 South to 10600 South	New Construction: 0 to 1 lanes ROW:2015 - 0 ft. / 2040 - 70 ft.	Collector / 7.3 miles / Local Bike Routes: None	Needed Phase - 2 Funded Phase - 2	2015 - $73,000,000 Phased - $131,400,000
S-186	**I-15** Davis County Line to Utah County Line	Operational ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 26.5 miles / I-15 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $66,300,000 Phased - $80,600,000
S-187	**I-15 HOT with Ramps** 600 North to Bangerter Highway	Widening: 8+2 HOT to 8+4 HOT lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 19.8 miles / I-15 Bike Routes: None	Needed Phase - 2 Funded Phase - 3	2015 - $356,400,000 Phased - $878,400,000
S-202	**Monroe Street** 9000 South to 10000 South	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 70 ft.	Collector / 1.0 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $11,000,000 Phased - $13,400,000
S-107	**Cottonwood Street** 4500 South to Vine Street	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 0.9 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $10,000,000 Phased - $12,200,000
S-188	**Cottonwood Street** Vine Street to Winchester Street	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Collector / 2.4 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $6,000,000 Phased - $10,800,000
S-108	**State Street** 600 South to I-215	Operational ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 8.6 miles / SR-89 Bike Routes: None/Base	Needed Phase - 1 Funded Phase - 2	2015 - $21,500,000 Phased - $38,700,000
S-109	**State Street** I-215 to 12300 South	Operational ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 7.3 miles / SR-89 Bike Routes: None	Needed Phase - 1 Funded Phase - 2	2015 - $18,300,000 Phased - $32,900,000
S-110	**State Street** 8000 South to 9000 South	Widening: 4 to 6 lanes ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 1.2 miles / SR-89 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $9,200,000 Phased - $11,200,000
S-189	**State Street** 10600 South to 11400 South	Widening: 4 to 6 lanes ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 1.0 miles / SR-89 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $7,700,000 Phased - $9,400,000
S-111	**900 East** 3300 South to 4500 South	Operational ROW:2015 - 66 ft. / 2040 - 66 ft.	Collector / 1.8 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $4,500,000 Phased - $5,500,000
S-112	**900 East / 700 East** Fort Union Boulevard to 9400 South	Widening: 4 to 6 lanes ROW:2015 - 106 ft. / 2040 - 123 ft.	Principal Arterial / 3.0 miles / SR-71 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 3	2015 - $29,100,000 Phased - $71,700,000
S-113	**700 East** 11400 South to 12300 South	Widening: 2 to 4 lanes ROW:2015 - 80 ft. / 2040 - 110 ft.	Principal Arterial / 1.2 miles / SR-71 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $11,100,000 Phased - $20,100,000
S-190	**1300 East** 1300 South to Van Winkle Expressway	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Minor Arterial / 5.7 miles / Local Bike Routes: Base/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $14,300,000 Phased - $17,300,000
S-114	**Union Park Boulevard / 1300 East** Fort Union Boulevard to 7800 South	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Minor Arterial / 1.2 miles / Local Bike Routes: None/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $3,000,000 Phased - $3,600,000
S-115	**Highland Drive** 3900 South to Van Winkle Expressway	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Minor Arterial / 3.4 miles / Local Bike Routes: None/Base	Needed Phase - 1 Funded Phase - 2	2015 - $8,500,000 Phased - $15,300,000
S-116	**2000 East** Fort Union Boulevard to 9400 South	Widening: 4 to 6 lanes ROW:2015 - 114 ft. / 2040 - 114 ft.	Principal Arterial / 3.1 miles / Local Bike Routes: Priority	Needed Phase - 3 Funded Phase - 3	2015 - $27,300,000 Phased - $67,200,000
S-117	**Highland Drive** 9400 South to 9800 South	Widening: 2 to 4 lanes ROW:2015 - 114 ft. / 2040 - 114 ft.	Principal Arterial / 0.6 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $5,300,000 Phased - $6,400,000
S-118	**Highland Drive** 9800 South to Draper City Limit	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 114 ft.	Principal Arterial / 2.9 miles / Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $6,3000,000 Phased - $113,400,000
S-119	**Highland Drive** Draper City Limit to 14600 South	Widening: 2 to 4 lanes ROW:2015 - 106 ft. / 2040 - 114 ft.	Principal Arterial / 5.6 miles / Local Bike Routes: Priority	Needed Phase - 3 Funded Phase - 3	2015 - $51,600,000 Phased - $127,300,000
S-120	**Highland Drive Connection** Traverse Ridge Road to 13800 South	Widening: 2 to 4 lanes ROW:2015 - 106 ft. / 2040 - 110 ft.	Principal Arterial / 1.3 miles / Local Bike Routes: Base	Needed Phase - 3 Funded Phase - 3	2015 - $10,300,000 Phased - $25,300,000

S-191	**3000 East** 6200 South to 7000 South	Widening: 2 to 4 lanes ROW:2015 - 100 ft. / 2040 - 100 ft.	Collector / 0.8 miles / Local Bike Routes: None/Priority	Needed Phase - 3 Funded Phase - 3	2015 - $6,200,000 Phased - $15,200,000
S-121	**500 South / Foothill Boulevard** 1300 East to 2300 East	Operational ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 2.4 miles / SR-186 Bike Routes: None/Base	Needed Phase - 1 Funded Phase - 1	2015 - $6,000,000 Phased - $7,300,000
S-122	**Foothill Boulevard** 2300 East to I-80	Widening: 4 to 6 lanes ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 1.5 miles / SR-186 Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $11,600,000 Phased - $14,100,000
S-192	**Wasatch Boulevard** 4500 South to 6200 South	Widening: 2 to 4 lanes ROW:2015 - 86 ft. / 2040 - 86 ft.	Minor Arterial / 3.2 miles / Local Bike Routes: Priority	Needed Phase - 3 Funded Phase - 3	2015 - $24,600,000 Phased - $60,700,000
S-193	**Wasatch Boulevard** Bengal Boulevard to Little Cottonwood Canyon	Widening: 2 to 4 lanes ROW:2015 - 150 ft. / 2040 - 150 ft.	Principal Arterial / 2.7 miles / Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $23,800,000 Phased - $42,800,000
SALT LAKE COUNTY, SPOT FACILITIES					
S-123	**SR-201 Interchange** @ I-80	Upgrade	Freeway / SR-201 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $15,000,000 Phased - $27,000,000
S-124	**SR-201 Interchange** @ SR-111 Bypass	New Construction	Freeway / SR-201 Bike Routes: Priority	Needed Phase - 3 Funded Phase - Unfunded	2015 - $38,000,000 Phased - $93,700,000
S-125	**SR-201 Interchange** @ 8400 West	New Construction	Freeway / SR-201 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $38,000,000 Phased - $93,700,000
S-126	**SR-201 Interchange** @ 7200 West	New Construction	Freeway / SR-201 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $38,000,000 Phased - $68,400,000
S-127	**SR-201 Interchange** @ I-215	Upgrade	Freeway / SR-201 Bike Routes: None	Needed Phase - 1 Funded Phase - 2	2015 - $107,000,000 Phased - $192,700,000
S-129	**I-80 Interchange** @ 5600 West	Upgrade	Freeway / I-80 Bike Routes: None	Needed Phase - 3 Funded Phase - U	2015 - $15,000,000 Phased - $37,000,000
S-130	**5600 West Railroad Crossing** @ 750 South	New Construction: 2 to 4 lanes	Minor Arterial / SR-172 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $20,000,000 Phased - $24,300,000
S-132	**Bangerter Highway Interchange** @ California Avenue	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $38,000,000 Phased - $93,700,000
S-133	**Bangerter Highway Interchange** @ SR-201	Upgrade	Freeway / SR-154 Bike Routes: None	Needed Phase - 1 Funded Phase - 2	2015 - $107,000,000 Phased - $192,700,000
S-134	**Bangerter Highway Interchange** @ Lake Park Boulevard (2700 South)	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $38,000,000 Phased - $93,700,000
S-135	**Bangerter Highway Overpass** @ 3100 South	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $20,000,000 Phased - $49,300,000
S-136	**Bangerter Highway Interchange** @ 3500 South	New Construction	Freeway / SR-154 Bike Routes: None	Needed Phase - 3 Funded Phase - U	2015 - $38,000,000 Phased - $93,700,000
S-137	**Bangerter Highway Interchange** @ 4100 South	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $38,000,000 Phased - $93,700,000
S-138	**Bangerter Highway Interchange** @ 4700 South	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $38,000,000 Phased - $93,700,000
S-139	**Bangerter Highway Interchange** @ 5400 South	New Construction	Freeway / SR-154 Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $38,000,000 Phased - $46,200,000
S-140	**Bangerter Highway Interchange** @ 6200 South	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 3	2015 - $38,000,000 Phased - $93,700,000
S-141	**Bangerter Highway Interchange** @ 7000 South	New Construction	Freeway / SR-154 Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $38,000,000 Phased - $46,200,000
S-143	**Bangerter Highway Interchange** @ 9000 South	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $38,000,000 Phased - $46,200,000
S-144	**Bangerter Highway Interchange** @ 9800 South	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $38,000,000 Phased - $68,400,000
S-145	**Bangerter Highway Interchange** @ 10400 South	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $38,000,000 Phased - $46,200,000

S-146	**Bangerter Highway Interchange** @ 11400 South	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $38,000,000 Phased - $46,200,000
S-147	**Bangerter Highway Interchange** @ 12600 South	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $38,000,000 Phased - $68,400,000
S-148	**Bangerter Highway Interchange** @ 13400 South	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $38,000,000 Phased - $68,400,000
S-149	**Bangerter Highway Interchange** @ 2700 West	New Construction	Freeway / SR-154 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $38,000,000 Phased - $68,400,000
S-151	**Bangerter Highway Interchange** @ 600 West	New Construction	Freeway / SR-154 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $38,000,000 Phased - $46,200,000
S-152	**Bangerter Highway Interchange** @ I-15	Upgrade	Freeway / SR-154 Bike Routes: None	Needed Phase - 2 Funded Phase - U	2015 - $107,000,000 Phased - $263,700,000
S-154	**I-215 Interchange** @ 5400 South	New Construction	Freeway / I-215 Bike Routes: Base	Needed Phase - 3 Funded Phase - U	2015 - $45,000,000 Phased - $110,900,000
S-155	**I-215 Interchange** @ Redwood Road (South)	Upgrade	Freeway / I-215 Bike Routes: None	Needed Phase - 1 Funded Phase - 2	2015 - $15,000,000 Phased - $27,000,000
S-156	**I-15 Interchange** @ 100 South (HOT Ramps)	New Construction	Freeway / I-15 Bike Routes: Base	Needed Phase - 3 Funded Phase - U	2015 - $45,000,000 Phased - $110,900,000
S-157	**I-15 Interchange** @ I-215 (South)	Upgrade	Freeway / I-15 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $107,000,000 Phased - $130,200,000
S-194	**I-15 Interchange** @ 7200 South	Upgrade	Freeway / I-15 Bike Routes: Base	Needed Phase - 1 Funded Phase - 2	2015 - $15,000,000 Phased - $27,000,000
S-195	**I-15 Interchange** @ 9400 South	New Construction	Collector / I-15 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $45,000,000 Phased - $54,700,000
S-196	**I-80 Interchange** @ State Street	Upgrade	Freeway / I-80 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $15,000,000 Phased - $18,200,000
S-158	**13800 South Overpass** @ I-15	New Construction: 0 to 2 lanes	Collector / Local Bike Routes: Priority	Needed Phase - 3 Funded Phase - 3	2015 - $20,000,000 Phased - $49,300,000
S-159	**14600 South Rail Road Structure** @ D&RGW	Upgrade: 1 to 2 lanes	Minor Arterial / SR-140 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $20,000,000 Phased - $49,300,000
S-161	**I-80 Interchange** @ I-215 to Foothill Drive	Upgrade	Freeway / I-80 Bike Routes: None	Needed Phase - 1 Funded Phase - 2	2015 - $107,000,000 Phased - $192,700,000
S-162	**I-215 Interchange** @ 4500 South	Upgrade	Freeway / I-215 Bike Routes: Base	Needed Phase - 2 Funded Phase - 2	2015 - $15,000,000 Phased - $27,000,000
S-201	**I-215 Interchange** @ 6200 South	Upgrade	Freeway / I-215 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $15,000,000 Phased - $37,000,000
S-163	**Avalanche snow shed over Little Cottonwood Canyon Road @ Whitepine Chutes**	New Construction	Minor Arterial / SR-210 Bike Routes: Base	Needed Phase - 3 Funded Phase - U	2015 - $20,000,000 Phased - $49,300,000
DAVIS COUNTY, EAST-WEST FACILITIES					
D-1	**1800 North** West Davis Corridor to 2000 West	Widening: 2 to 4 lanes ROW:2015 - 80 ft. / 2040 - 120 ft.	Minor Arterial / 2.0 miles / SR-37 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $21,800,000 Phased - $39,300,000
D-2	**1800 North** 2000 West to SR-126	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 120 ft.	Minor Arterial / 2.0 miles / SR-37 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $23,300,000 Phased - $28,400,000
D-3	**SR-193 Extension** West Davis Corridor to 3000 West	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 110 ft.	Principal Arterial / 0.7 miles / SR-193 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $9,500,000 Phased - $17,000,000
D-70	**SR-193 Extension** 3000 West to 2000 West	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 110 ft.	Principal Arterial / 1.0 miles / SR-193 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $13,500,000 Phased - $16,400,000
D-50	**SR-193** I-15 to Hill Field Road (SR-232)	Widening: 4 to 6 lanes ROW:2015 - 110 ft. / 2040 - 150 ft.	Principal Arterial / 1.5 miles / SR-193 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $16,400,000 Phased - $29,500,000
D-6	**SR-193** Hill Field Road (SR-232) to US-89	Operational ROW:2015 - 150 ft. / 2040 - 150 ft.	Principal Arterial / 3.4 miles / SR-193 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $8,500,000 Phased - $15,300,000

D-51	**Antelope Drive (SR-127)** 4500 West to West Davis Corridor	Widening: 2 to 4 lanes ROW:2015 - 60 ft. / 2040 - 86 ft.	Minor Arterial / 1.7 miles / SR-127 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $15,400,000 Phased - $38,000,000
D-7	**Antelope Drive (SR-127)** West Davis Corridor to 2000 West	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 110 ft.	Minor Arterial / 0.8 miles / SR-127 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $8,000,000 Phased - $9,800,000
D-10	**Gordon Avenue (1000 North)** 1600 East to US-89	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 1.3 miles / Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $15,900,000 Phased - $28,700,000
D-11	**West Hill Field Road** 3650 West (Layton) to 2200 West (Layton)	Widening: 2 to 4 lanes ROW:2015 - 60 ft. / 2040 - 110 ft.	Minor Arterial / 1.5 miles / Local Bike Routes: None	Needed Phase - 2 Funded Phase – 3	2015 - $15,500,000 Phased - $38,200,000
D-52	**Gentile Street** Main Street to Fairfield Road	Widening: 2 to 4 lanes ROW:2015 - 68 ft. / 2040 - 86 ft.	Minor Arterial / 1.1 miles / Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $29,500,000 Phased - $53,200,000
D-12	**Layton Parkway** West Davis Corridor / 2700 West to 1700 West	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Minor Arterial / 1.0 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $12,200,000 Phased - $14,900,000
D-13	**200 North (Kaysville)** West Davis Corridor to I-15	Widening: 2 to 4 lanes ROW:2015 - 60 ft. / 2040 - 99 ft.	Minor Arterial / 2.3 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $22,400,000 Phased - $27,300,000
D-53	**Shepard Lane** West Davis Corridor to I-15	New Construction: 0 to 2/4 lanes ROW:2015 - 0 ft. / 2040 - 100 ft.	Minor Arterial / 1.2 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $15,600,000 Phased - $19,000,000
D-15	**Center Street** Legacy Parkway to US-89	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Collector / 1.6 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $4,000,000 Phased - $4,900,000
DAVIS COUNTY, NORTH-SOUTH FACILITIES					
D-16	**West Davis Corridor** Weber County Line to Antelope Drive (SR-127)	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 320 ft.	Freeway / 4.8 miles / SR-67 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $79,700,000 Phased - $143,500,000
D-17	**West Davis Corridor** Antelope Drive (SR-127) to I-15/US-89/ Legacy Parkway	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 320 ft.	Freeway / 14.2 miles / SR-67 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $500,000,000 Phased - $608,300,000
D-18	**West Davis Corridor** Weber County Line to Antelope Drive (SR-127)	Corridor Preservation ROW:2015 - 0 ft. / 2040 - 320 ft.	Freeway / 4.8 miles / SR-67 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $24,300,000 Phased - $29,600,000
D-20	**2000 West (SR-108)** Weber County Line to 300 North	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 110 ft.	Principal Arterial / 2.5 miles / SR-108 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $65,900,000 Phased - $80,200,000
D-54	**2000 West (SR-108)** 300 North to Antelope Drive (SR-108)	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 110 ft.	Principal Arterial / 2.0 miles / SR-108 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $52,700,000 Phased - $64,200,000
D-21	**2000 West** Antelope Drive (SR-108) to West Davis Corridor	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 99 ft.	Collector / 1.4 miles / Local Bike Routes: Base	Needed Phase - 3 Funded Phase - 3	2015 - $13,200,000 Phased - $32,600,000
D-55	**1000 West** 800 North to Antelope Drive	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Collector / 2.5 miles / Local Bike Routes: Base/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $6,300,000 Phased - $7,600,000
D-56	**500 West** Antelope Drive to 1980 South	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 84 ft.	Collector / 0.5 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $6,100,000 Phased - $7,400,000
D-57	**500 West** 1980 South to Gordon Avenue (2700 South)	Operational ROW:2015 - 84 ft. / 2040 - 84 ft.	Collector / 0.5 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $1,300,000 Phased - $1,500,000
D-22	**3650 West (Layton)** 700 North to Gentile Street	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 99 ft.	Collector / 0.8 miles / Local Bike Routes: Base	Needed Phase - 3 Funded Phase - 3	2015 - $10,300,000 Phased - $25,500,000
D-23	**2700 West (Layton)** 650 North to Layton Parkway	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 99 ft.	Collector / 1.2 miles / Local Bike Routes: None/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $15,500,000 Phased - $18,900,000
D-58	**Main Street / State Street (SR-126)** 300 North to Layton Parkway	Operational ROW:2015 - 100 ft. / 2040 - 100 ft.	Principal Arterial / 5.5 miles / SR-126 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $13,800,000 Phased - $16,700,000
D-59	**1000 East** SR-193 to Antelope Drive	Operational ROW:2015 - 66 ft. / 2040 - 70 ft.	Collector / 1.0 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $6,500,000 Phased - $7,900,000

D-25	**I-15** Weber County Line to Hill Field Road (SR-232)	Widening: 6 to 6+HOT lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 6.3 miles / I-15 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $109,600,000 Phased - $133,300,000
D-60	**University Park Boulevard** SR-193 to Antelope Drive	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Collector / 1.0 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 2	2015 - $2,500,000 Phased - $4,500,000
D-27	**Church Street Extension** I-84 to SR-193	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 66 ft.	Minor Arterial / 4.6 miles / Local Bike Routes: Base	Needed Phase - 3 Funded Phase - 3	2015 - $100,400,000 Phased - $247,500,000
D-61	**Redwood Road** Center Street (North Salt Lake) to Salt Lake County Line	Widening: 2 to 4 lanes ROW:2015 - 110 ft. / 2040 - 110 ft.	Principal Arterial / 1.4 miles / SR-68 Bike Routes: Base/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $10,800,000 Phased - $13,100,000
D-24	**Redwood Road** 500 South to 2600 South	Widening: 2 to 4 lanes ROW:2015 - 100 ft. / 2040 - 110 ft.	Principal Arterial / 1.6 miles / SR-68 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $13,200,000 Phased - $23,700,000
D-69	**1250 West / 650 West** 1900 North to 1275 North	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 66 ft.	Collector / 1.0 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $8,800,000 Phased - $10,700,000
D-28	**US-89** I-84 to Antelope Drive	Widening: 4 to 6 lanes ROW:2015 - 120 ft. / 2040 - 150 ft.	Freeway / 5.5 miles / US-89 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $107,700,000 Phased - $265,500,000
D-29	**US-89** Antelope Drive to I-15 (Farmington)	Widening: 4 to 6 lanes ROW:2015 - 120 ft. / 2040 - 150 ft.	Freeway / 8.9 miles / US-89 Bike Routes: Base/Priority	Needed Phase - 2 Funded Phase - 3	2015 - $174,300,000 Phased - $429,600,000
D-71	**US-89** Oak Hills Drive to Nicholls Road	New Construction: 0 to 2 lanes ROW:2015 - 60 ft. / 2040 - 60 ft.	Freeway / 2.5 miles / US-89 Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $13,300,000 Phased - $16,100,000
D-62	**Farmington Frontage Road Connection** Lagoon Drive to 200 West (SR-227)	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 70 ft.	Collector / 0.1 miles / Local Bike Routes: None	Needed Phase - 2 Funded Phase - 2	2015 - $1,000,000 Phased - $1,800,000
DAVIS COUNTY, SPOT FACILITIES					
D-30	**1800 North Overpass** @ 500 West Railroad Crossing	New Construction: 2 to 4 lanes ROW:2015 - ft. / 2040 - ft.	Minor Arterial / SR-37 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $20,000,000 Phased - $24,300,000
D-31	**I-15 Interchange** @ 1800 North	New Construction	Freeway / I-15 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $45,000,000 Phased - $54,700,000
D-32	**I-15 Interchange** @ 650 North	Upgrade	Freeway / I-15 Bike Routes: Base	Needed Phase - 1 Funded Phase - 2	2015 - $15,000,000 Phased - $27,000,000
D-63	**I-15 Interchange** @ SR-193	Upgrade	Freeway / I-15 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $45,000,000 Phased - $54,700,000
D-33	**I-15 Interchange** @ Antelope Drive	Upgrade	Freeway / I-15 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $15,000,000 Phased - $27,000,000
D-34	**1200 North Overpass (Layton)** @ I-15	New Construction: 0 to 4 lanes	Collector / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $20,000,000 Phased - $24,300,000
D-36	**I-15 Interchange** @ Shepard Lane	New Construction	Freeway / I-15 Bike Routes: Priority	Needed Phase - 1 Funded Phase – 1	2015 - $45,000,000 Phased - $54,800,000
D-37	**I-15 Interchange** @ Parrish Lane	Upgrade	Freeway / I-15 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $15,000,000 Phased - $27,000,000
D-64	**Porter Lane Overpass** @ I-15	New Construction: 0 to 2 lanes	Collector / Local Bike Routes: None	Needed Phase - 3 Funded Phase - 3	2015 - $20,000,000 Phased - $49,300,000
D-38	**I-15 Interchange** @ 500 West	Upgrade	Freeway / I-15 Bike Routes: None	Needed Phase - 3 Funded Phase - U	2015 - $15,000,000 Phased - $37,000,000
D-65	**500 South** @ 800 West Railroad Crossing	New Construction	Minor Arterial / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $20,000,000 Phased - $36,000,000
D-41	**2600 South / 1100 North** @ 1050 West Railroad Crossing	New Construction	Minor Arterial / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $20,000,000 Phased - $36,000,000
D-42	**Legacy Parkway Interchange** @ Center Street	New Construction	Freeway / SR-67 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $38,000,000 Phased - $93,700,000
D-66	**Center Street** @ 300 West Railroad Crossing	New Construction	Collector / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $20,000,000 Phased - $36,000,000
D-43	**I-215 Interchange** @ Legacy Parkway	Upgrade	Freeway / I-215 Bike Routes: None	Needed Phase - 3 Funded Phase - U	2015 - $107,000,000 Phased - $263,700,000

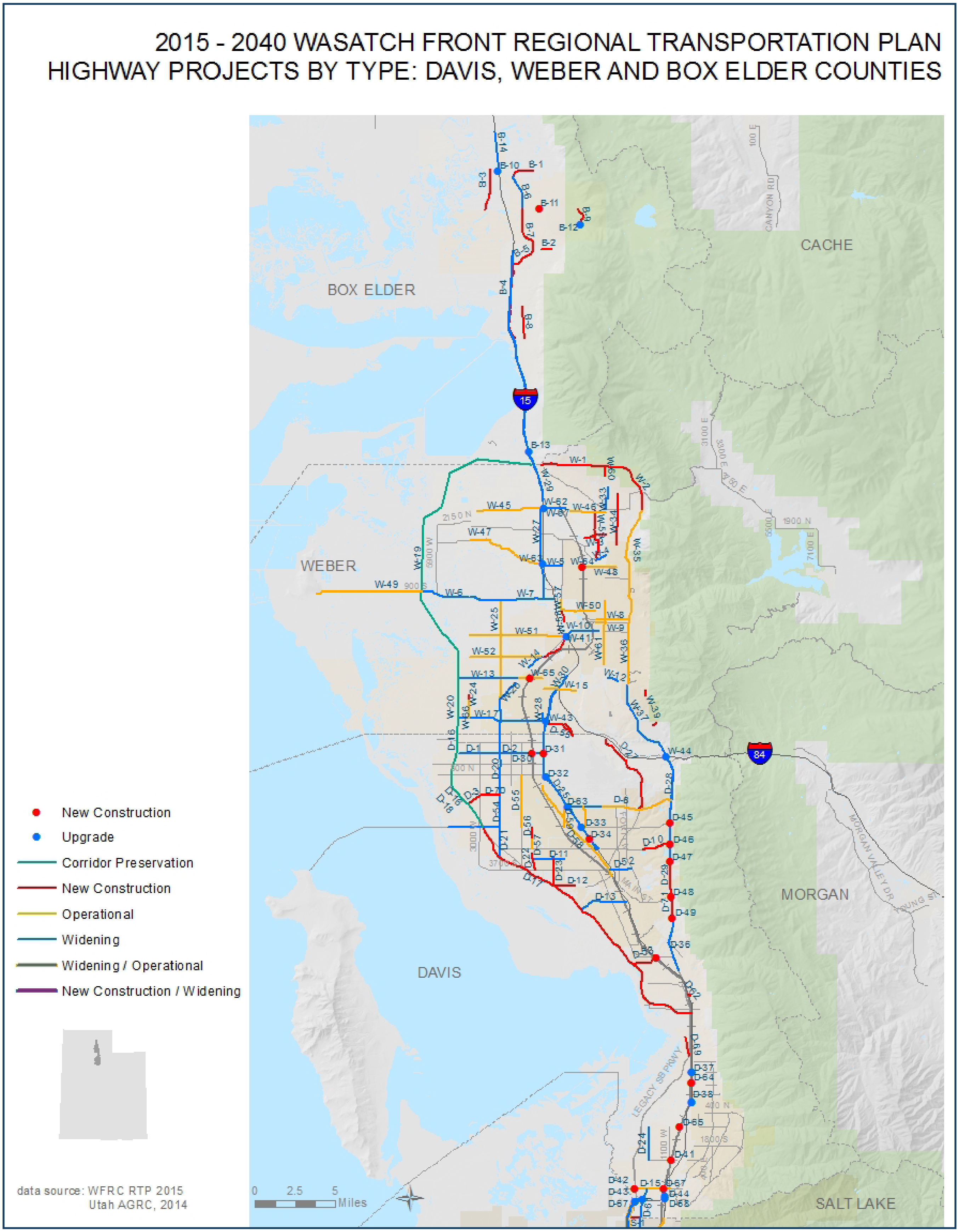
D-67	**I-215 Interchange** @ Redwood Road	Upgrade	Freeway / I-215 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $15,000,000 Phased - $18,200,000
D-44	**I-215 Interchange** @ I-15 / US-89	Upgrade	Freeway / I-215 Bike Routes: None	Needed Phase - 3 Funded Phase - U	2015 - $107,000,000 Phased - $263,700,000
D-68	**I-215 Interchange** @ I-15 / US-89	Intermediate Int. Improvements	Freeway / I-215 Bike Routes: None	Needed Phase - 1 Funded Phase - 2	2015 - $15,000,000 Phased - $27,000,000
D-45	**US-89 Interchange** @ Antelope Drive	New Construction	Freeway / US-89 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $38,000,000 Phased - $68,400,000
D-46	**US-89 Interchange** @ Gordon Avenue	New Construction	Freeway / US-89 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $38,000,000 Phased - $68,400,000
D-47	**US-89 Interchange** @ Oak Hills Drive (SR-109)	New Construction	Freeway / US-89 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $33,000,000 Phased - $59,400,000
D-48	**US-89 Interchange** @ 400 North (Fruit Heights)	New Construction	Freeway / US-89 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $33,000,000 Phased - $40,100,000
D-49	**Nicholl's Road Overpass** @ US-89	New Construction: 0 to 2 lanes	Collector / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $15,000,000 Phased - $18,200,000
WEBER COUNTY, EAST-WEST FACILITIES					
W-1	**Skyline Drive (North)** US-89 to 450 East	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 3.2 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $39,200,000 Phased - $47,700,000
W-2	**Skyline Drive (North)** 450 East to 2600 North	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 3.1 miles / Local Bike Routes: Base/Priority	Needed Phase - 2 Funded Phase - 2	2015 - $37,900,000 Phased - $68,300,000
W-45	**2700 North** 4200 West to I-15	Operational ROW:2015 - 80 ft. / 2040 - 80 ft.	Minor Arterial / 3.2 miles / SR-134 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $8,000,000 Phased - $14,400,000
W-67	**2700 North** I-15 to US-89	Widening ROW:2015 - 106 ft. / 2040 - 106 ft.	Principal Arterial / 0.9miles / SR-134 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $7,900,000 Phased - $9,600,000
W-46	**2550 North** US-89 to Washington Boulevard/400 East	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Collector / 1.7 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $4,300,000 Phased - $5,200,000
W-3	**1700 North** US-89 to Washington Boulevard/400 East	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 66 ft.	Collector / 1.1 miles / Local Bike Routes: None	Needed Phase - 2 Funded Phase - 2	2015 - $9,700,000 Phased - $17,400,000
W-4	**Larsen Lane** US-89/Wall Avenue to Washington Boulevard/400 East	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 89 ft.	Minor Arterial / 0.5 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $4,500,000 Phased - $5,400,000
W-47	**Pioneer Road (400 North)** 4700 West to I-15	Operational ROW:2015 - 88 ft. / 2040 - 88 ft.	Collector / 3.9 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $9,800,000 Phased - $17,600,000
W-5	**Pioneer Road (400 North)** I-15 to 1200 West	Re-stripe: 2 to 4 lanes ROW:2015 - 110 ft. / 2040 - 110 ft.	Collector / 0.9 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $0 Phased - $0
W-48	**North Street** 530 West to Monroe Boulevard	Operational ROW:2015 - 70 ft. / 2040 - 70 ft.	Collector / 1.6 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $4,000,000 Phased - $4,900,000
W-49	**1200 South** 11000 West to West Weber Corridor	Operational ROW:2015 - 110 ft. / 2040 - 110 ft.	Principal Arterial / 4.9 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $12,300,000 Phased - $14,900,000
W-6	**1200 South** West Weber Corridor to 4700 West	Widening: 2 to 4 lanes ROW:2015 - 76 ft. / 2040 - 110 ft.	Principal Arterial / 2.3 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $33,800,000 Phased - $41,200,000
W-7	**1200 South (SR-39)** 4700 West to I-15	Widening: 2 to 4 lanes ROW:2015 - 76 ft. / 2040 - 110 ft.	Principal Arterial / 4.0 miles / SR-39 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $50,000,000 Phased - $60,800,000
W-50	**17th Street** 1200 West to Wall Avenue	Operational ROW:2015 - 70 ft. / 2040 - 70 ft.	Collector / 1.6 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $4,000,000 Phased - $4,900,000
W-8	**20th Street** Wall Avenue to Harrison Boulevard	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Minor Arterial / 1.6 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $4,000,000 Phased - $4,900,000
W-9	**21st Street** Wall Avenue to Adams Avenue	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Minor Arterial / 0.6 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $1,500,000 Phased - $1,800,000
W-10	**24th Street** I-15 to Lincoln Avenue	Widening: 2 to 4 lanes ROW:2015 - 86 ft. / 2040 - 110 ft.	Minor Arterial / 1.6 miles / SR-53 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $114,300,000 Phased - $205,900,000

W-51	**2550 South** 4700 West to I-15	Operational ROW:2015 - 89 ft. / 2040 - 89 ft.	Collector / 4.6 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $11,500,000 Phased - $14,000,000
W-52	**3300 South** 4700 West to Midland Drive	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Collector / 3.4 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $8,500,000 Phased - $10,300,000
W-13	**4000 South (SR-37)** West Weber Corridor to Midland Drive	Widening: 2 to 4 lanes ROW:2015 - 86 ft. / 2040 - 110 ft.	Minor Arterial / 2.8 miles / SR-37 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $25,100,000 Phased - $30,500,000
W-53	**4000 South (SR-37)** Midland Drive to 1900 West (SR-126)	Operational ROW:2015 - 110 ft. / 2040 - 110 ft.	Minor Arterial / 1.2 miles / SR-37 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $3,000,000 Phased - $3,600,000
W-12	**Country Hills Drive** Adams Avenue to Gramercy Avenue	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 99 ft.	Minor Arterial / 0.6 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $5,700,000 Phased - $6,900,000
W-15	**4400 South** 1900 West (SR-126) to 700 West	Operational ROW:2015 - 110 ft. / 2040 - 110 ft.	Collector / 1.6 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $4,000,000 Phased - $4,900,000
W-17	**5600 South / 5500 South** West Weber Corridor to 3500 West	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 86 ft.	Principal Arterial / 2.1 miles / SR-97 Bike Routes: Base/Priority	Needed Phase - 2 Funded Phase - 2	2015 - $18,400,000 Phased - $33,100,000
W-18	**5600 South** 3500 West to 1900 West (SR-126)	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 86 ft.	Principal Arterial / 2.0 miles / SR-97 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $37,500,000 Phased - $67,600,000
W-54	**5600 South** 1900 West (SR-126) to I-15	Widening: 5 to 6 lanes ROW:2015 - 106 ft. / 2040 - 106 ft.	Principal Arterial / 0.2 miles / SR-97 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $1,500,000 Phased - $1,900,000
W-55	**Falcon Hill Road Connector** I-15 to 1150 West	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 2.4 miles / Local Bike Routes: None	Needed Phase - 3 Funded Phase - 3	2015 - $29,400,000 Phased - $72,400,000
WEBER COUNTY, NORTH-SOUTH FACILITIES					
W-19	**West Weber Corridor** I-15 (North) to 4000 South	Corridor Preservation ROW:2015 - 0 ft. / 2040 - 220 ft.	Freeway / 14.8 miles / SR-67 Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $51,600,000 Phased - $62,700,000
W-20	**West Weber Corridor** 4000 South to Davis County Line	Corridor Preservation ROW:2015 - 0 ft. / 2040 - 220 ft.	Freeway / 2.7 miles / SR-67 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $9,400,000 Phased - $11,400,000
W-21	**West Weber Corridor** 4000 South to 5500 South	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 220 ft.	Freeway / 1.8 miles / SR-67 Bike Routes: Priority	Needed Phase - 2 Funded Phase - U	2015 - $13,900,000 Phased - $34,200,000
W-22	**West Weber Corridor** 5500 South to Davis County Line	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 220 ft.	Freeway / 1.0 miles / SR-67 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $16,600,000 Phased - $29,900,000
W-24	**4700 West** 4600 South to 4800 South	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 110 ft.	Collector / 0.3 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $4,100,000 Phased - $4,900,000
W-66	**4700 West** 4800 South to 5500 South	Operational ROW:2015 - 66 ft. / 2040 - 66 ft.	Collector / 0.9 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $23,000,00 Phased - $2,700,000
W-25	**3500 West** 1200 South to Midland Drive	Operational ROW:2015 - 110 ft. / 2040 - 110 ft.	Collector / 4.6 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $11,500,000 Phased - $20,700,000
W-56	**Midland Drive (SR-108)** I-15 to 1900 West (SR-126)	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Minor Arterial / 1.4 miles / SR-108 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $17,100,000 Phased - $20,800,000
W-14	**Midland Drive (SR-108)** 1900 West (SR-126) to Hinkley Drive (SR-79)	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 110 ft.	Principal Arterial / 0.9 miles / SR-108 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $23,700,000 Phased - $42,700,000
W-26	**3500 West / Midland Drive (SR-108)** 4275 South to Davis County Line	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 110 ft.	Principal Arterial / 2.5 miles / SR-108 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $65,900,000 Phased - $80,200,000
W-27	**1900 West / 2000 West (SR-126)** 2700 North to 1200 South	Widening: 2 to 4 lanes ROW:2015 - 66 ft. / 2040 - 150 ft.	Principal Arterial / 4.3 miles / SR-126 Bike Routes: Priority	Needed Phase - 2 Funded Phase - U	2015 - $56,900,000 Phased - $140,300,000
W-28	**1900 West (SR-126)** Riverdale Road to 5600 South	Widening: 4 to 6 lanes ROW:2015 - 100 ft. / 2040 - 150 ft.	Principal Arterial / 0.4 miles / SR-126 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $4,600,000 Phased - $5,600,000
W-29	**I-15** Box Elder County Line to 2700 North	Widening: 4 to 6 lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 2.4 miles / I-15 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $13,700,000 Phased - $16,700,000
W-30	**I-15** I-84 to Davis County Line	Widening: 6 to 6+HOT lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 2.9 miles / I-15 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $50,400,000 Phased - $61,400,000
W-57	**1200 West** 12th Street to 17th Street	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Collector / 0.5 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $1,300,000 Phased - $1,500,000

W-58	**1200 West** 17th Street to 21st Street	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 0.6 miles / Local Bike Routes: None	Needed Phase - 2 Funded Phase - 2	2015 - $7,300,000 Phased - $13,200,000
W-59	**150 East** 2700 North to Larsen Lane	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 70 ft.	Collector / 2.5 miles / Local Bike Routes: None	Needed Phase - 2 Funded Phase - 3	2015 - $25,000,000 Phased - $61,600,000
W-60	**400 / 450 East** Skyline Drive to 3700 North	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 70 ft.	Collector / 0.4 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $4,000,000 Phased - $4,900,000
W-33	**400 / 450 East** 3300 North to 2600 North	Widening: 2 to 4 lanes ROW:2015 - 68 ft. / 2040 - 89 ft.	Collector / 0.8 miles / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 1	2015 - $7,000,000 Phased - $8,600,000
W-61	**Washington Boulevard** 12th Street to Riverdale Road	Operational ROW:2015 - 150 ft. / 2040 - 150 ft.	Principal Arterial / 3.1 miles / SR-89 Bike Routes: None/Base/Priority	Needed Phase - 1 Funded Phase - 2	2015 - $7,800,000 Phased - $14,000,000
W-34	**Monroe Boulevard** 3100 North to 1300 North	New Construction: 0/2 to 4 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Minor Arterial / 2.4 miles / Local Bike Routes: None/Base	Needed Phase - 2 Funded Phase - 2	2015 - $29,400,000 Phased - $52,900,000
W-35	**Harrison Boulevard / Mountain Road** 2600 North to 12th Street	Operational ROW:2015 - 86 ft. / 2040 - 86 ft.	Collector / 4.7 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $11,800,000 Phased - $14,300,000
W-36	**Harrison Boulevard** 12th Street to Country Hills Drive	Operational ROW:2015 - 110 ft. / 2040 - 110 ft.	Principal Arterial / 3.9 miles / SR-203 Bike Routes: None/Base/Priority	Needed Phase - 1 Funded Phase - 1	2015 - $9,800,000 Phased - $11,900,000
W-37	**Harrison Boulevard** Country Hills Drive to US-89	Widening: 4 to 6 lanes ROW:2015 - 99 ft. / 2040 - 123 ft.	Principal Arterial / 2.3 miles / SR-203 Bike Routes: Base/Priority	Needed Phase - 2 Funded Phase - 2	2015 - $23,200,000 Phased - $41,700,000
W-38	**US-89** Harrison Boulevard to I-84	Widening: 4 to 6 lanes ROW:2015 - 120 ft. / 2040 - 150 ft.	Freeway / 1.7 miles / US-89 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $33,300,000 Phased - $60,000,000
W-39	**Skyline Drive** 1. Quail Run Drive to 4600 South 2. Ogden City Limits to Megan Circle	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Collector / 0.5 miles / Local Bike Routes: Base/Priority	Needed Phase - 1 Funded Phase – 1	2015 - $6,400,000 Phased - $7,700,000
WEBER COUNTY, SPOT FACILITIES					
W-62	**I-15 Interchange** @ 2700 North	Upgrade	Freeway / I-15 Bike Routes: Priority	Needed Phase - 2 Funded Phase - 3	2015 - $15,000,000 Phased - $37,000,000
W-63	**I-15 Interchange** @ Pioneer Road	Upgrade	Freeway / I-15 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $15,000,000 Phased - $37,000,000
W-64	**400 North** @ 530 West Railroad Crossing	New Construction	Collector / Local Bike Routes: Base	Needed Phase - 1 Funded Phase - 2	2015 - $20,000,000 Phased - $36,000,000
W-41	**I-15 Interchange** @ 24th Street	Upgrade	Freeway / I-15 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $45,000,000 Phased - $54,700,000
W-65	**4000 South** @ 2500 West Railroad Crossing	New Construction	Minor Arterial / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $20,000,000 Phased - $36,000,000
W-43	**I-15 Interchange** @ 5600 South	Upgrade	Freeway / I-15 Bike Routes: Base	Needed Phase - 1 Funded Phase - 2	2015 - $15,000,000 Phased - $27,000,000
W-44	**US-89 Interchange** @ I-84	Upgrade	Freeway / US-89 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $107,000,000 Phased - $263,700,000
BOX ELDER COUNTY, EAST-WEST FACILITIES					
B-1	**Wilson Lane (1500 North)** Promontory Road (SR-13)/Watery Lane to 950 West	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 86 ft.	Minor Arterial / 1.0 miles / Local Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $12,200,000 Phased - $14,900,000
B-2	**1200 South** Commerce Way to US-89	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 66 ft.	Collector / 0.5 miles / Local Bike Routes: None	Needed Phase - 3 Funded Phase - 3	2015 - $4,400,000 Phased - $10,800,000

BOX ELDER COUNTY, NORTH-SOUTH FACILITIES					
B-3	**2400 West** Promontory Road (SR-13) to Forest Street	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 80 ft.	Collector / 2.0 miles / Local Bike Routes: None	Needed Phase - 3 Funded Phase - 3	2015 - $51,000,000 Phased - $125,800,000
B-14	I-15 3000 North to US-91	Widening: 4 to 6 lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 5.4 miles / I-15 Bike Routes: None	Needed Phase - 3 Funded Phase - U	2015 - $97,200,000 Phased - $239,600,000
B-4	**I-15** US-91 to Weber County Line	Widening: 4 to 6 lanes ROW:2015 - 328 ft. / 2040 - 328 ft.	Freeway / 9.5 miles / I-15 Bike Routes: None	Needed Phase - 1 Funded Phase - 1	2015 - $54,300,000 Phased - $66,000,000
B-5	**I-15 Frontage Road** US-91 to 750 North (SR-315)	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 60 ft.	Collector / 5.1 miles / Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $63,200,000 Phased - $113,800,000
B-6	**1200 West** Promontory Road (SR-13) to Forest Street	Widening: 2 to 4 lanes ROW:2015 - 106 ft. / 2040 - 106 ft.	Collector / 1.7 miles / Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 2	2015 - $41,000,000 Phased - $73,900,000
B-7	**1200 West** Forest Street to US-91	New Construction: 0 to 4 lanes ROW:2015 - 0 ft. / 2040 - 106 ft.	Collector / 1.8 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $39,600,000 Phased - $48,200,000
B-8	**Perry Street** 3600 South to 750 North (SR-315)	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 66 ft.	Collector / 1.5 miles / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 1	2015 - $13,200,000 Phased - $16,000,000
B-9	**Highland Boulevard** Karleen Drive to US-89 / US-91	New Construction: 0 to 2 lanes ROW:2015 - 0 ft. / 2040 - 66 ft.	Collector / 0.8 miles / Local Bike Routes: Priority	Needed Phase - 2 Funded Phase - 3	2015 - $19,000,000 Phased - $46,900,000
BOX ELDER COUNTY, SPOT FACILITIES					
B-10	**I-15 Interchange** @ Promontory Road (SR-13)	Upgrade	Freeway / I-15 Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $15,000,000 Phased - $27,000,000
B-11	**Forest Street Overpass** @ 900 West Railroad Crossing	New Construction	Minor Arterial / Local Bike Routes: Priority	Needed Phase - 1 Funded Phase - 2	2015 - $20,000,000 Phased - $36,000,000
B-12	**US-89 / US-91 Interchange** @ 200 South (SR-90)	Upgrade	Principal Arterial / SR-91 Bike Routes: Priority	Needed Phase - 3 Funded Phase - U	2015 - $45,000,000 Phased - $110,900,000
B-13	**I-15 Interchange** @ SR-126	Upgrade	Freeway / I-15 Bike Routes: Priority	Needed Phase - 2 Funded Phase - U	2015 - $15,000,000 Phased - $37,000,000

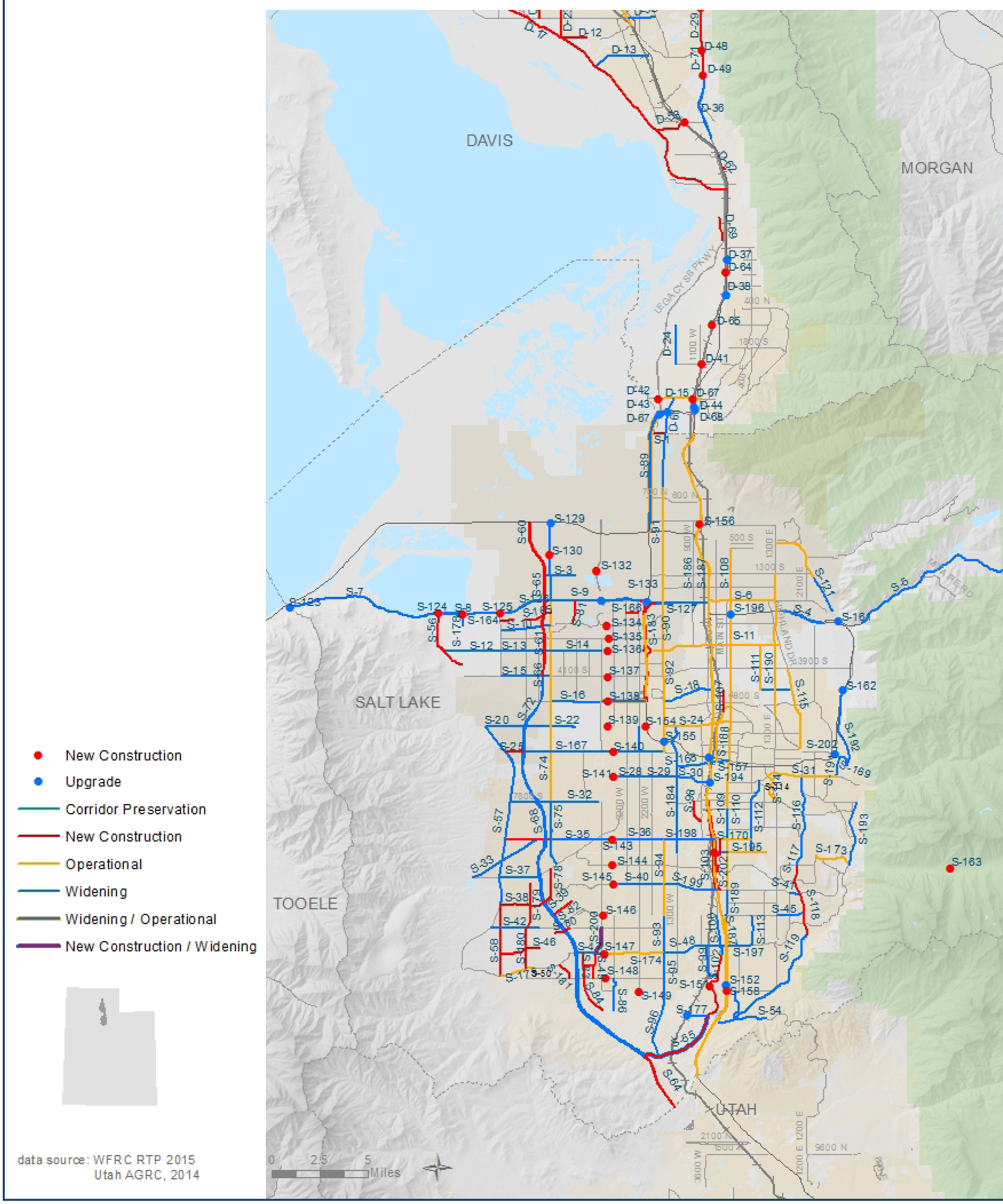
MAP 7 - 1



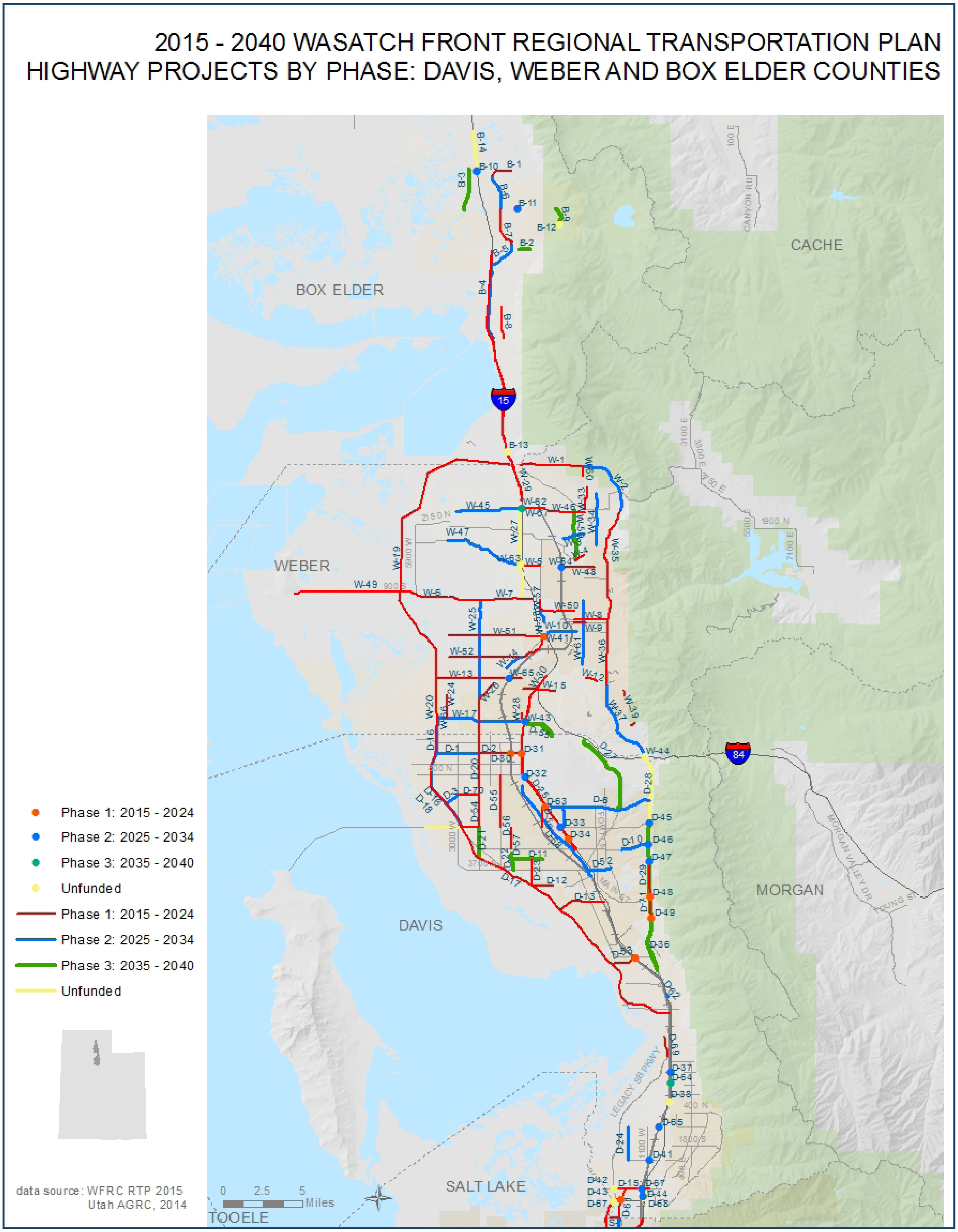
2015 - 2040 WASATCH FRONT REGIONAL TRANSPORTATION PLAN
HIGHWAY PROJECTS BY TYPE: DAVIS, WEBER AND BOX ELDER COUNTIES
BOX ELDER
CACHE
WEBER
MORGAN
DAVIS
SALT LAKE
New Construction
Upgrade
Corridor Preservation
New Construction
Operational
Widening
Widening / Operational
New Construction / Widening
data source: WFRC RTP 2015
Utah AGRC, 2014
0 2.5 5 Miles

MAP 7 - 2

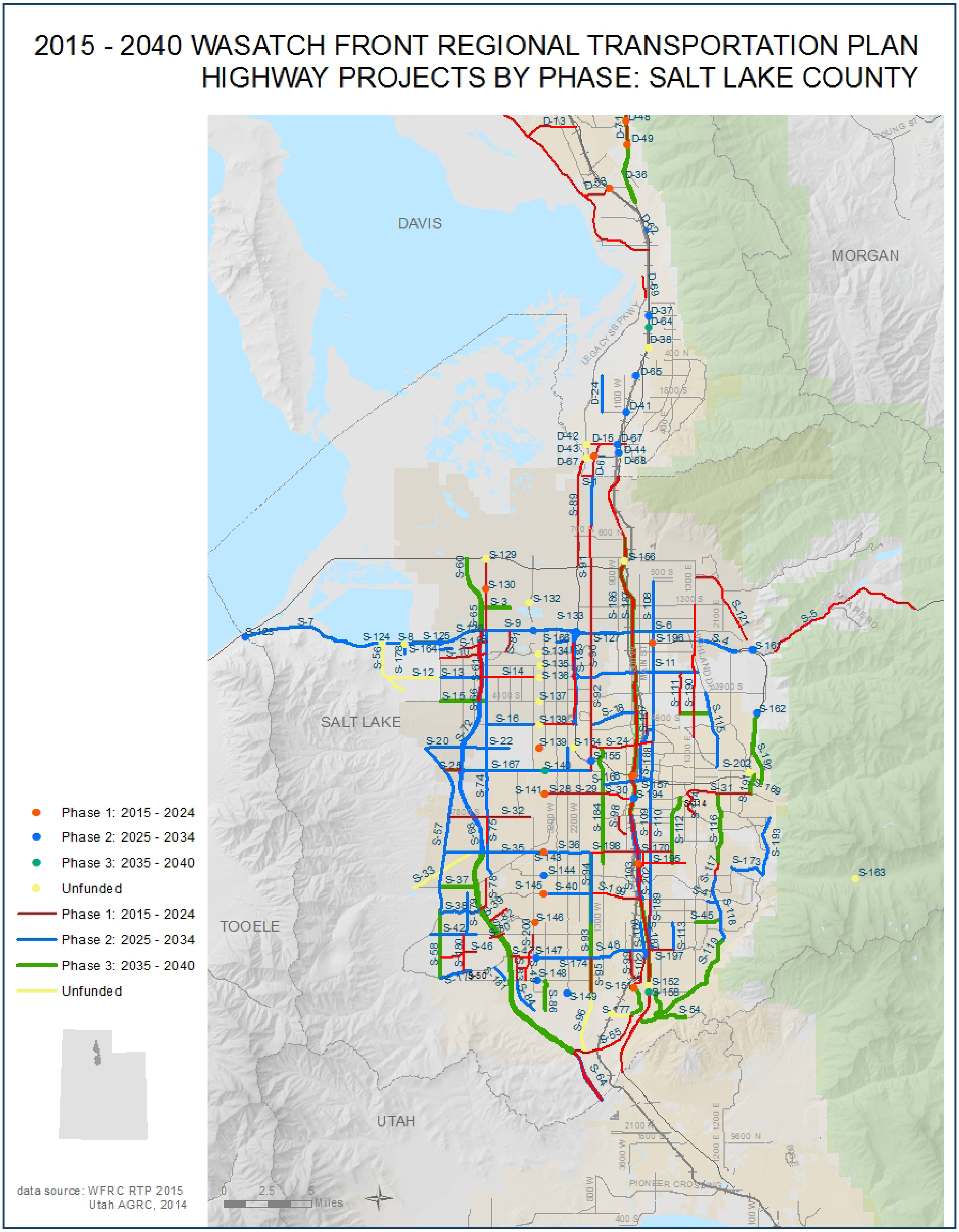
2015 - 2040 WASATCH FRONT REGIONAL TRANSPORTATION PLAN
HIGHWAY PROJECTS BY TYPE: SALT LAKE COUNTY



MAP 7 - 3

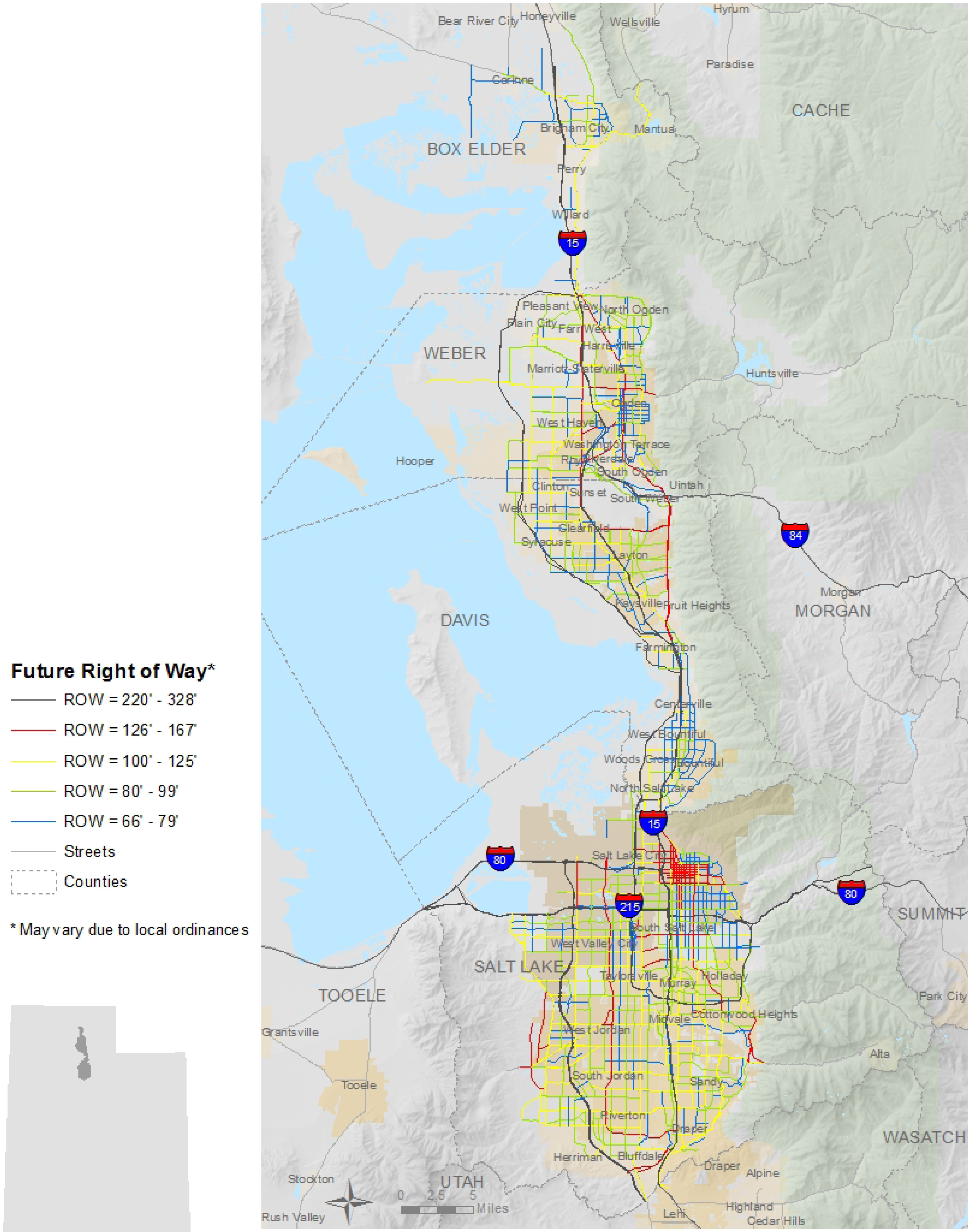

2015 - 2040 WASATCH FRONT REGIONAL TRANSPORTATION PLAN
HIGHWAY PROJECTS BY PHASE: DAVIS, WEBER AND BOX ELDER COUNTIES
BOX ELDER
CACHE
WEBER
MORGAN
DAVIS
SALT LAKE
TOOELE
Phase 1: 2015 - 2024
Phase 2: 2025 - 2034
Phase 3: 2035 - 2040
Unfunded
Phase 1: 2015 - 2024
Phase 2: 2025 - 2034
Phase 3: 2035 - 2040
Unfunded
data source: WFRC RTP 2015
Utah AGRC, 2014
0 2.5 5
Miles

MAP 7 - 4


2015 - 2040 WASATCH FRONT REGIONAL TRANSPORTATION PLAN
HIGHWAY PROJECTS BY PHASE: SALT LAKE COUNTY
DAVIS
MORGAN
SALT LAKE
TOOELE
UTAH
Phase 1: 2015 - 2024
Phase 2: 2025 - 2034
Phase 3: 2035 - 2040
Unfunded
Phase 1: 2015 - 2024
Phase 2: 2025 - 2034
Phase 3: 2035 - 2040
Unfunded
data source: WFRC RTP 2015
Utah AGRC, 2014
0 2.5 5 Miles

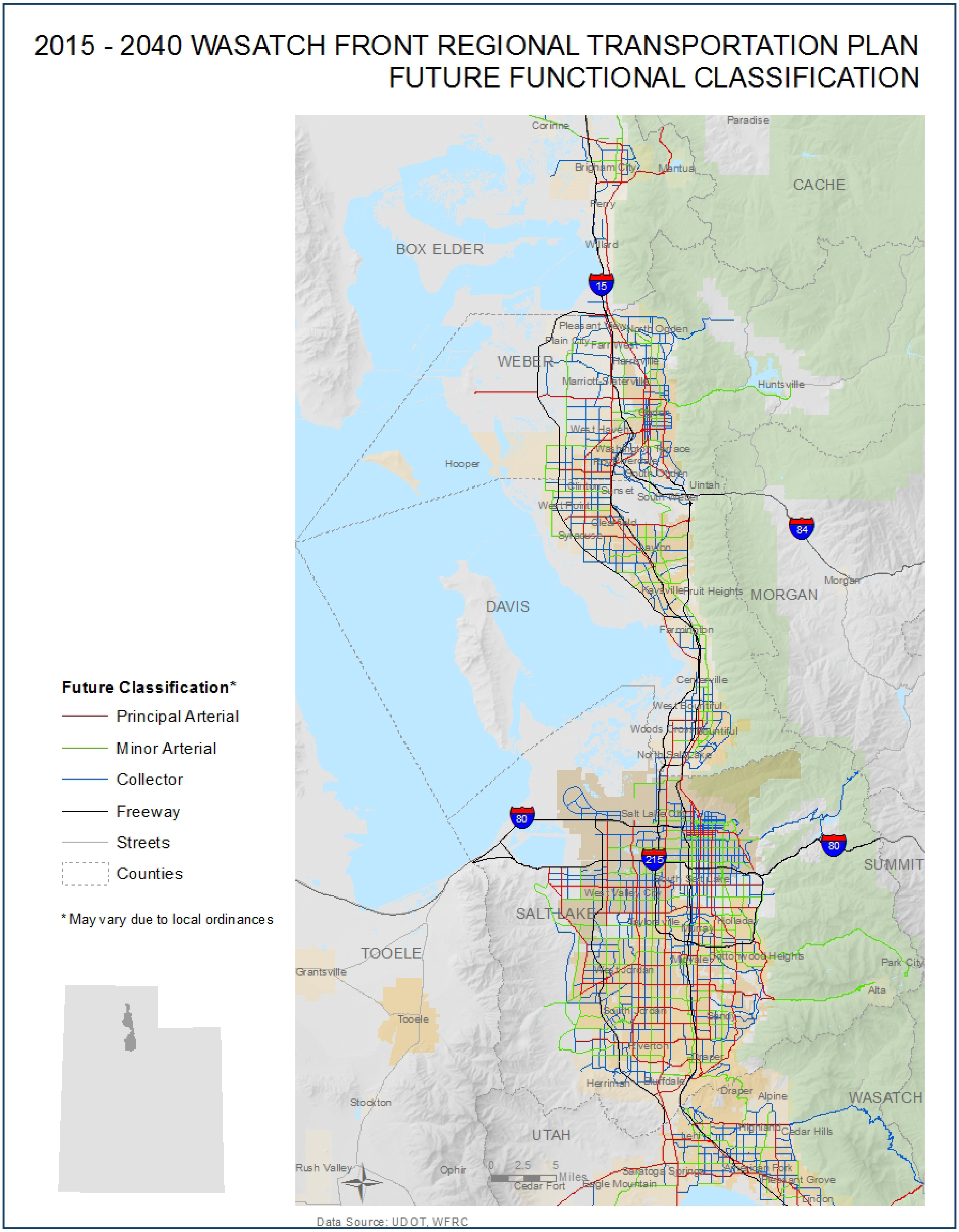
MAP 7 - 5

2015 - 2040 WASATCH FRONT REGIONAL TRANSPORTATION PLAN
FUTURE RIGHT-OF-WAY



Sources: Utah AGRC, WFRC

MAP 7 - 6


2015 - 2040 WASATCH FRONT REGIONAL TRANSPORTATION PLAN
FUTURE FUNCTIONAL CLASSIFICATION
Future Classification*
Principal Arterial
Minor Arterial
Collector
Freeway
Streets
Counties
* May vary due to local ordinances
BOX ELDER
CACHE
WEBER
DAVIS
MORGAN
SALT LAKE
TOOELE
SUMMIT
WASATCH
UTAH
Corinne
Paradise
Brigham City
Mantua
Perry
Willard
Pleasant View
North Ogden
Plain City
Farr West
Harrisville
Marriott-Slaterville
Huntsville
West Haven
Washington Terrace
Hooper
Clinton
Sunset
South Weber
Uintah
West Point
Clearfield
Syracuse
Layton
Kaysville
Fruit Heights
Morgan
Farmington
Centerville
West Bountiful
Woods Cross
Bountiful
North Salt Lake
Salt Lake City
South Salt Lake
West Valley City
Taylorsville
Murray
Holladay
Midvale
Cottonwood Heights
West Jordan
South Jordan
Sandy
Riverton
Herriman
Bluffdale
Draper
Alpine
Highland
Cedar Hills
Lehi
American Fork
Pleasant Grove
Saratoga Springs
Eagle Mountain
Cedar Fort
Lindon
Park City
Alta
Grantsville
Tooele
Stockton
Rush Valley
Ophir
15
84
80
215
0 2.5 5
Miles
Data Source: UDOT, WFRC

HORROCKS ENGINEERS

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To: Project Team

From: Judy Imlay

Date: February 28, 2017 **Memorandum**

Subject: I-15 SES; 12300 South to SR-201

Project of Air Quality Concern (POAQC) Memorandum

Project Overview

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on southbound Interstate 15 (I-15) between SR-201 and 12300 South in Salt Lake County and on 7200 South between I-15 and Bingham Junction Boulevard in Midvale. The project includes the following improvements:

- One additional southbound lane on I-15 between 2100 South and 12300 South
- One additional southbound to eastbound turning lane for 3300 South Interchange
- One additional travel lane on 7200 South in both directions between I-15 and Bingham Junction
- Changes to the existing collector/distributor system that provides the connections between I-15 and I-215 at the I-215 Interchange

Purpose and Need

Purpose

The purpose of this project is to address current and future travel demand on southbound I-15 between SR-201 and 12300 South and on 7200 South between I-15 and Bingham Junction Boulevard.

Need

The project is needed to address current and future traffic congestion and travel demand on southbound I-15 and 7200 South.

- Current conditions on southbound I-15 indicate that various segments are highly congested and inadequately meeting travel needs. By 2040, traffic on I-15 is projected to substantially grow and congestion on existing and additional segments of I-15 will increase.
- By 2040, all intersections on 7200 South within the study area will experience substantial delay (over 100 seconds) and operate at failing conditions.

Study Area Attainment Status

On September 21, 2006, the EPA issued revisions to the National Ambient Air Quality Standards (NAAQS) for particle pollution. The EPA strengthened the 24-hour $PM_{2.5}$ standard from the 1997 level of 65 $\mu g/m^3$ to 35 $\mu g/m^3$, and retained the current annual fine particle standard at 15 $\mu g/m^3$. All or parts of seven Utah counties did not meet this new 24-hour standard, including Salt Lake County in which this project is located. The state had been attaining the old 24-hour standard, and continues to attain the annual $PM_{2.5}$ standard at all locations.

On December 3, 2014, the Utah Air Quality Board approved a $PM_{2.5}$ State Implementation Plan (SIP) meeting the moderate area planning requirements of both Subparts 1 and 4, of Part D, of title 1, of the Clean Air Act. A separate SIP was adopted for each of Utah's three nonattainment areas, which includes the Salt Lake City UT nonattainment area in which Salt Lake County is included. Also adopted were amendments to SIP Subsections IX.H. 11, 12, and 13, which contain emission limits and operating practices for the large stationary sources specifically addressed by the SIPs for the Salt Lake City and Provo nonattainment areas. There were no such sources identified in the Logan nonattainment area.

Project Assessment

This project is not exempt under either 40 CFR 93.126 or 40 CFR 93.128. This memorandum assesses whether this project qualifies as a project of air quality concern that would require a project level conformity analysis.

Level Conformity Requirements

Projects of air quality concern are certain highway and transit projects that involve a significant level of diesel vehicle traffic or any other project that is identified in the $PM_{2.5}$ or PM_{10} SIP as a localized air quality concern, such as:

- i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;
- ii) Projects affecting intersections that are at LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
- iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;
- iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and
- v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM_{10} or $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

If the project qualifies as a project of air quality concern, the hot-spot demonstration must be based on both i) quantitative analysis methods in accordance with 40 CFR 93.116(a) and ii) the consultation requirements of 40 CFR 93.105(c)(1)(i). If the project does not qualify as a project of air quality concern, it must be qualitatively shown that the project will not contribute to any new localized violations, increase the frequency or severity of any existing violations, or delay the timely attainment of the NAAQS or any required emission reductions or milestones in any nonattainment or maintenance area.

Appendix A of the *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* provides examples of projects that would be considered projects of air quality concern under 40 CFR 93.123(b)(1)(i) and (ii), which are:

- A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) and 8% or more of such AADT is diesel truck traffic;
- New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal;
- Expansion of an existing highway or other facility that affects a congested intersection (operated at Level-of-Service D, E, or F) that has a significant increase in the number of diesel trucks; and,
- Similar highway projects that involve a significant increase in the number of diesel transit busses and/or diesel trucks.

Appendix A also provides examples of projects that would not qualify as projects of air quality concern under 40 CFR 93.123)(b)(1)(i) and (ii). These examples included:

- Any new or expanded highway project that primarily services gasoline traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles), including such projects involving congested intersections operating at LOS D, E or F.
- An intersection channelization project or interchange configuration project that involves either turn lanes or slots, or lanes or movements that are physically separated. These kinds of projects improve freeway operations by smoothing traffic flow and vehicle speeds by improving weave and merge operations, which would not be expected to create or worsen $PM_{2.5}$ or PM_{10} violations; and,
- Intersection channelization projects, traffic circles or roundabouts, intersection signalization projects at individual intersections, and interchange reconfiguration projects that are designed to improve traffic flow and vehicle speeds, and no not involve any increases in idling. Thus, they would be expected to have a neutral or positive influence on $PM_{2.5}$ or PM_{10} emissions.

Project Analysis

New Highway with Significant Volume of Diesel Truck Traffic

Standard: New highway projects that have a significant number of diesel vehicles.

Analysis: The proposed project does not involve the construction of a new highway.

Expanded Highway with Significant Increase in Diesel Truck Traffic

Standard: Expanded highway projects that have a significant number of or significant increase in diesel vehicles.

Analysis: The proposed project would involve expansion of an existing highway; however, it would not result in a significant increase in diesel truck traffic in the project area.

Table 1. ADT and Diesel Truck Traffic on I-15

Segment		2016 ADT	2040 ADT		2014 UDOT		Final 2040	
		PeMS	No Build	Preferred	Single	Combo	Single	Combo
	I-15	228,930	263,700	269,200	14.7%	4.7%	12.8%	4.2%
3300 South								
	I-15	225,670	262,100	268,000	18.5%	5.3%	16.6%	4.8%
4500 South								
	I-15	227,310	262,100	267,500	22.3%	5.8%	20.4%	5.3%
5300 South								
	I-15	225,840	265,300	269,800	21.2%	6.1%	19.3%	5.6%
I-215								
	I-15	179,350	216,000	218,200	20.1%	6.5%	18.2%	6.0%
7200 South								
	I-15	266,430	317,000	320,500	18.7%	6.2%	16.8%	5.7%
9000 South								
	I-15	234,990	278,900	294,000	16.0%	5.6%	14.1%	5.1%
10600 South								
	I-15	224,870	286,900	287,700	16.0%	5.6%	14.1%	5.1%
11400 South								
	I-15	211,060	269,400	274,200	14.6%	5.3%	12.7%	4.8%
12300 South								
	I-15	190,630	254,100	255,500	15.3%	5.6%	13.4%	5.1%
Bangerter								
	I-15	172,050	238,900	239,200	16.2%	6.0%	14.3%	5.5%
				Average	17.6%	5.7%	15.7%	5.2%

Projects Affecting Congested Intersections

Standard: Projects affecting intersections that are at LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project.

Analysis:

Most of the intersections in the project area currently operate at LOS D, E, or F and will continue to do so in 2040 under both the No-action and the Preferred Alternative. However, the I-15 Corridor primarily services gasoline vehicles and will continue to do so in the design year of 2040, with anticipated percentages of diesel trucks actually declining in 2040. Further, there would only be a slight increase in ADT in the project area between the No-Build and the Preferred Alternative. Therefore, although there would be an increase in diesel truck traffic in the project area due to the increase in ADT, there would not be a significant increase in diesel emissions as a result of the project.

New Bus and Rail Terminals

Standard: New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location.

Analysis: This project does not involve construction of or connections to a new bus or intermodal terminal that accommodates a significant number of diesel vehicles.

Expanded Bus and Rail Terminals

Standard: Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location

Analysis: This project does not involve construction of or connections to an expanded bus or intermodal terminal that accommodates a significant number of diesel vehicles.

Projects In or Affecting PM_{10} or $PM_{2.5}$ Sites of Violation or Possible Violation

Standard: Projects in or affecting locations, areas, or categories of sites which are identified in the PM_{10} or $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

Analysis:
There are two distinct nonattainment areas for the 2006 $PM_{2.5}$ standards residing entirely within the state of Utah. These are the Salt Lake City, UT, and Provo, UT nonattainment areas, which together encompass what is referred to as the Wasatch Front. A third nonattainment area is more or less geographically defined by the Cache Valley which straddles the border between Utah and Idaho (the Logan, UT – ID nonattainment area.) Davis County is included in the Salt Lake City nonattainment area. None of these three areas has violated the annual NAAQS for $PM_{2.5}$.

On November 14, 1991, Utah submitted a SIP for the Salt Lake and Utah County nonattainment areas. The SIP demonstrated attainment of the PM_{10} standard for 10 years, 1993 through 2003. EPA published approval of the SIP on July 8, 1994 (59 FR 35036), and Utah achieved attainment of the standard in both areas by 1996. The control measures adopted as part of those plans have proven successful. Both the Salt Lake and the Utah County areas continue to show compliance with the federal health standards for $PM_{10.}$

For the 24-hour $PM_{2.5}$ standard, the standard is met when a three-year average of 98th percentile values is less than or equal to 35 $\mu g/m^3$. According to the $PM_{2.5}$ SIP for the Salt Lake City, UT Nonattainment Area, Section IX. Part A.21, there were noted exceedances of the 24-hour $PM_{2.5}$ standard at the Hawthorne monitoring station, which is the closest station to the project area located in Salt Lake County. The Salt Lake City, UT Nonattainment Area SIP stated that, without exception, the exceedances leading to 24-hr NAAQS violations are associated with relatively short-term meteorological occurrences. Further, winter speciation studies conducted to better characterize $PM_{2.5}$ during winter high pollution episodes were conducted, which lead to the conclusion that the exceedances of the $PM_{2.5}$ NAAQS are a result of the increased portion of the secondary $PM_{2.5}$ that was chemically formed in the air and not primary $PM_{2.5}$ emitted directly into the troposphere.

Project of Air Quality Concern Determination

Standard: State whether the project is a POAQC and summarize the support that determination. Document the relevant agencies that require interagency consultation on any input for the determination from federal, state, and local transportation and air agencies as necessary for this project per 40 CFR 93.105. This information will be included in any subsequent air quality analysis and project level conformity determination reports.

Answer: This project does not qualify as a project of air quality concern since it would not result in a significant increase in diesel traffic in the project area. The project is not expected to influence the vehicle mix in the project area nor attract a significant number of new diesel vehicles to the area. The project is not expected to influence the vehicle mix in the project area nor attract a significant number of new diesel vehicles to the area. The project involves improvements to the I-15 Corridor from 2100 South to 12300 South and 7200 South from Bingham Junction Boulevard to I-15 to address current and future traffic congestion and travel demand. The project is intended to improve traffic flow and vehicle speeds and reduce delays along the I-15 Corridor and 7200 South in the project area, including delays at the intersections on 7200 South. This project is not a project of air quality concern. Since the project has been determined to not be a project of air quality concern, no project level analysis is required for conformity purposes under 40 CFR 93.123(b).

Air Quality Memorandum

REPORT NO. 33

DATE January 28, 2016

SUBJECT CONFORMITY ANALYSIS FOR THE AMENDED WFRC 2015-2040 REGIONAL TRANSPORTATION PLAN.

ABSTRACT The Moving Ahead for Progress in the 21st Century (MAP-21) and the Clean Air Act Amendments (CAAA) require that all regionally significant highway and transit projects in air quality non-attainment and maintenance areas be derived from a "conforming" Regional Transportation Plan and Transportation Improvement Program. A conforming Plan or Program is one that has been analyzed for emissions of controlled air pollutants and found to be within emission limits established in the State Implementation Plan (SIP) or within guidelines established by the Environmental Protection Agency (EPA) until such time that a SIP is approved. This conformity analysis is made by the Wasatch Front Regional Council (WFRC), as the Metropolitan Planning Organization for the Salt Lake-West Valley and Ogden-Layton urbanized areas, and submitted to the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) for their concurrence. This conformity analysis is being prepared according to the transportation conformity rulemakings promulgated by the EPA as of March 2010 and according to FHWA final rulemakings found in the MAP-21 legislation. The EPA approved MOVES model for estimating vehicle emissions was used for this conformity analysis.

This conformity analysis addresses the emissions impact of the October 2015 amendments to 2015-2040 RTP which are described in detail in Appendix 4. The projected vehicle activity is based on Version 8.0 of the WFRC travel demand model and the 2012 Household Travel Survey of trip making activity. For a detailed description of projects included in the new 2040 RTP, see *http://www.wfrc.org/new_wfrc/index.php/projects/project-lists* and select the link for "Highway Projects List" or "Transit Projects List". Refer to Appendices 2 and 3 of this document for projects in Box Elder and Tooele Counties.

Wasatch Front Regional Council
295 North Jimmy Doolittle Road
Salt Lake City, Utah 84116

Based on the analysis presented in this document, the amended WFRC 2015-2040 RTP conforms to the State Implementation Plan or the Environmental Protection Agency interim conformity guidelines for all pollutants in applicable non-attainment or maintenance areas. Therefore, all transportation projects in Box Elder, Weber, Davis, Salt Lake, and Tooele Counties included in the amended 2015-2040 RTP are found to conform.

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A. Conformity Requirements

Conformity Process

Since the commencement of the federal planning requirements in the late 1960s, further requirements (most recently the 2012 Moving Ahead for Progress in the 21st Century (MAP-21) and the 1990 Clean Air Act Amendments) have added to the responsibilities and the decision making powers of local governments through the Metropolitan Planning Organization. The Wasatch Front Regional Council (WFRC) is the Metropolitan Planning Organization for the Salt Lake/West Valley and Ogden / Layton Urbanized Areas. This report summarizes WFRC's conformity analysis of the 2015-2040 RTP with the Division of Air Quality's State Implementation Plan (SIP) and the Environmental Protection Agency's interim conformity guidelines. This conformity analysis is subject to public and agency review, and requires the concurrence of the Federal Highway Administration and Federal Transit Administration.

In November, 1993, the Environmental Protection Agency and the U.S. Department of Transportation issued rules establishing the procedures to be used to show that transportation plans and programs conform to the SIP. The conformity rules establish that federal funds may not be used for transportation projects that add capacity in areas designated as "non-attainment (or maintenance) with respect to the National Ambient Air Quality Standards", until and unless a regional emissions analysis of the Plan and TIP demonstrates that the projects conform to the SIP. This restriction also applies to "regionally significant" transportation projects sponsored by recipients of federal funds even if the regionally significant transportation project uses local funds exclusively.

Davis, and Salt Lake Counties, Salt Lake City, Ogden City and portions of Weber, Box Elder and Tooele Counties are designated as non-attainment (or maintenance) for one or more air pollutants. Specifically, there are four areas in the Wasatch Front region for which the conformity rules apply. These areas are listed in Table 1 below.

Table 1
Wasatch Front Region Non-attainment Designations

Area	Designation	Pollutant
Salt Lake City	Maintenance Area	Carbon Monoxide (CO)
Ogden City	Maintenance Area	Carbon Monoxide (CO)
	Moderate Non-Attainment Area	Particulate Matter (PM_{10})
Salt Lake County	Moderate Non-Attainment Area	Particulate Matter (PM_{10})
Salt Lake (including Davis, Salt Lake, and portions of Weber, Box Elder, and Tooele Counties)	Moderate Non-Attainment Area	Particulate Matter ($PM_{2.5}$)

The CAAA established requirements for conformity. These requirements are outlined in 40 CFR 93.109 and include the following:

- Latest planning assumptions
- Transportation Control Measures (TCM)
- Emissions budget
- Project from a conforming plan and TIP
- PM_{10} control measures
- Latest emissions model
- Consultation
- Currently conforming plan and TIP
- CO and PM_{10} "hot spots"

Each of these requirements will be discussed in the following paragraphs.

Latest Planning Assumptions
Current travel models are based on socioeconomic data and forecasts from local building permits, the Utah Division of Workforce Services, and the Governor's Office of Management and Budget (GOMB). Base year socioeconomic data are for calendar year 2011. Forecasts of population and employment by traffic analysis zone were developed by WFRC in 2013 and are controlled to county-level forecasts published by GOMB in October, 2012.

Latest Emissions Model
The conformity analysis presented in this document is based on EPA mobile source emissions models: MOVES2014 for tailpipe emissions and AP-42 section 13.2.1 for paved road dust emissions. The application of these models will be discussed in greater detail in the Emissions Model section of this document.

Consultation Process
Section 105 of 40 CFR Part 93 (Conformity Rule) requires, among other things, interagency consultation in the development of conformity determinations. To satisfy this requirement, the State Division of Air Quality (DAQ) prepared a Conformity SIP to outline the consultation procedures to be used in air quality and transportation planning. The Conformity SIP also defines the membership of the Interagency Consultation Team (ICT) as representatives from DAQ, WFRC, Mountainland Association of Governments, Utah Department of Transportation, Utah Transit Authority, EPA, FHWA, and the FTA. The Conformity SIP has been approved by EPA. WFRC followed the consultation procedures as outlined in the Conformity SIP in the preparation of this conformity analysis. As part of the consultation procedures defined in the Conformity SIP, WFRC presented this report to the Transportation Committee (or TransCom) for review and comment. This committee includes a member of the Utah Air Quality Board as well as representatives of UDOT, UTA, and FHWA. In addition, management level staff members from the Utah Division of Air Quality are notified of meetings and agendas of the above committees. The Utah Division of Air Quality and other members of the ICT were also provided with a copy of this report during the public comment period for the 2015-2040 RTP.

This Conformity Analysis for the 2015-2040 RTP was made available for public inspection and comment for a 30-day period in accordance with EPA conformity regulations. This analysis was also posted on the WFRC website during the comment period. Notification of the comment period was sent by electronic mail to interested stakeholders. In addition, public comment was taken during various committee meetings of the Wasatch Front Regional Council.

TCM Implementation
A conformity analysis for the 2015-2040 RTP must certify that the RTP does not interfere with the implementation of any Transportation Control Measure (TCM) identified in the applicable State Implementation Plan (SIP). There is one TCM from the original SIP section for the 1-hour ozone standard which has been carried forward to the current ozone maintenance plan, even though the 1-hour ozone standard has been revoked. This TCM, the employer-based trip reduction program, applies to local, state, and federal government employers. The program emphasizes measures to reduce the drive-alone rate such as subsidized bus passes, carpooling, telecommuting, and flexible work schedules. UTA has in place the ECO pass discount for a number of large employers including the University of Utah and Weber State University. Ridesharing, telecommuting, and flexible work schedules are programs currently managed, promoted, or operated by UTA Rideshare and the UDOT Travelwise program. Congestion Mitigation and Air Quality (CMAQ) funds and other transportation funds are used to support these ongoing programs.

Emissions Budget
A comparison of mobile source emission estimates to emission budgets defined in the SIP is outlined in this document in Section D - Conformity Determination.

Currently Conforming Plan and TIP
The existing 2040 RTP for the Wasatch Front Area conforms to State air quality goals and objectives as noted in a letter from FHWA and FTA dated September 8, 2014. The existing 2015-2020 TIP for the Wasatch Front Area was also found to conform and this was noted in a letter from FHWA and FTA dated September 29, 2014.

Projects from a Conforming Plan and TIP
TIP Time Frame - All projects which must be started no later than 2020 in order to achieve the transportation system envisioned by the 2015-2040 RTP are included in the 2015-2020 TIP. The TIP is fiscally constrained, meaning that only those projects with an identified source of funds are included in the TIP. Estimated funding availability is based on current funding levels and reasonable assumptions that these funds will continue to be available. Conformity for the 2015-2020 TIP is addressed separately in Air Quality Memorandum 31a.

Regionally Significant
All regionally significant projects, regardless of funding source (federal, state, or local) are included in the RTP. All regionally significant projects are also included in the regional emissions analysis of the RTP. Regionally significant projects are identified as those projects functionally classified as a principal arterial or higher order facility, and certain minor arterials as identified through the interagency consultation process (see Appendix 1 for a complete definition of regionally significant projects). The latest Utah Department of Transportation Functional Classification map is used to identify functional classification. Interstate highways, freeways, expressways, principal arterials, certain minor arterials, light rail, and commuter rail are treated as regionally significant projects.

Because of their relative impact on air quality, all regionally significant projects regardless of funding source must be included in the regional emissions analysis, and any significant change in the design or scope of a regionally significant project must also be reflected in the analysis. All regionally significant projects have been included in the regional emissions analysis, and the modeling parameters used for these projects are consistent with the design and scope of these projects as defined in the RTP. In order to improve the quality of the travel model, minor arterials and collectors, as well as transit service, are also included in the regional travel model (and thus the regional emissions analysis) but these facilities are not considered regionally significant since they do not serve regional transportation needs as defined by EPA. For a list of projects included in this conformity analysis, see *http://www.wfrc.org/new_wfrc/index.php/projects/project-lists* and select the link for "Highway Projects List" or "Transit Projects List". Refer to Appendices 2 and 3 of this document for projects in Box Elder and Tooele Counties.

CO, PM_{10} and $PM_{2.5}$ "Hot Spot" Analysis

In addition to the regional emissions conformity analysis presented in this document, specific projects within carbon monoxide (CO) and particulate matter (PM_{10} and $PM_{2.5}$) non-attainment areas are required to prepare a "hot spot" analysis of emissions. The "hot spot" analysis serves to verify whether localized emissions from a specific project will meet air quality standards. This requirement is addressed during the NEPA phase of project development before FHWA or FTA can issue final project approval.

FHWA has issued guidance on quantitative PM_{10} and $PM_{2.5}$ "hot spot" analysis to be used for the NEPA process. This guidance can be found at:
http://www.epa.gov/otaq/stateresources/transconf/projectlevel-hotspot.htm.

PM_{10} Control Measures

Construction-related Fugitive Dust - Construction-related dust is not identified in the Utah SIP as a contributor to the PM_{10} non-attainment area. Therefore, there is no conformity requirement for construction dust. Section 93.122(d) (1) of 40 CFR reads as follows:

> "For areas in which the implementation plan does not identify construction-related fugitive PM10 as a contributor to the non-attainment problem, the fugitive PM10 emissions associated with highway and transit project construction are not required to be considered in the regional emissions analysis."

In the Utah PM_{10} SIP, construction-related PM_{10} is not included in the inventory, nor is it included in the attainment demonstration or control strategies. Control of construction-related PM_{10} emissions are mentioned in qualitative terms in Section IX.A.7 of the SIP as a maintenance measure to preserve attainment of the PM_{10} standard achieved by application of the control strategies identified in the SIP. Section IX.A.7.d of the SIP requires UDOT and local planning agencies to cooperate and review all proposed construction projects for impacts on the PM_{10} standard. This SIP requirement is satisfied through the Utah State Air Quality Rules. R307-309-4 requires that sponsors of any construction activity file a dust control plan with the State Division of Air Quality.

Other Conformity Requirements

Transit Fares - Transit fares have increased periodically and will continue to increase in response to rising operating costs. The RTP assumes that transit fare box revenues will cover a constant percentage of all transit operating cost, so future fare increases are consistent with the Plan. With any price increase some market reaction is expected. While there have been some short term fluctuations in transit patronage in response to fare increases, the implementation of light rail service and other transit improvements has retained and increased transit patronage consistent with the levels anticipated by the RTP.

Plans to expand light rail service, to increase and enhance bus service, and to extend commuter rail operations are moving forward. These transit projects are envisioned in the Plan and the steps necessary to implement these projects are moving forward including various voter approved sales tax increases for transit funding.

B. Transportation Modeling

Improvement to the WFRC travel demand model practice and procedure is an ongoing process. This conformity analysis is based on the latest version (8.0) of the travel demand model. Version 8.0 of the travel demand model updates the former 2007 base year with socio-economic data and transportation networks for the new 2011 base year. The new model also incorporates the results of the 2012 Household Travel Survey conducted by WFRC. Version 8.0 of the model adds more traffic analysis zones, and the transit mode choice portion of the model has been enhanced. Details of Version 8.0 of the travel model are documented in a report titled “WFRC/MAG Version 8.0 Travel Demand Model Documentation” which is available upon request.

Planning Process

Federal funding for transportation improvements in urban areas requires that these improvements be developed through a comprehensive, coordinated, and continuous planning process involving all affected local governments and transportation planning agencies. The planning process is certified annually by the Regional Council and reported to the Federal Highway Administration and Federal Transit Administration. Every four years FHWA and FTA conduct a comprehensive certification review. The certification review of August 2013 found that the WFRC planning process meets federal requirements. Recommendations were made to improve WFRC’s planning process and these are being addressed.

The documentation of the planning process includes at a minimum, a twenty-year Regional Transportation Plan updated at least every four years; and a four-year Transportation Improvement Program (capital improvement program) updated and adopted at least every four years. The planning process includes the involvement of local elected officials, state agencies, and the general public.

Travel Characteristics

The WFRC travel model is used to estimate and forecast highway Vehicle Miles Traveled (VMT) and vehicle speeds for Weber, Davis, and Salt Lake Counties. A separate travel model is used to estimate VMT and speed in Tooele County. For VMT and speed estimates in Box Elder County, WFRC relied on forecasts provided by the Utah Department of Transportation. The WFRC travel demand model is based on the latest available planning assumptions and a computerized representation of the transportation network of highways and transit service. The base data for the travel demand model is reviewed regularly for accuracy and updates. The travel model files used for this conformity analysis are available upon request on compact disc.

Shown below in Table 2 is a summary of weekday VMT for the cities and counties in designated non-attainment areas. Totals for VMT are given for various air quality analysis years from 2015 to 2040. Note that the VMT values for Box Elder, and Tooele Counties are not for the entire county but only that portion of the county designated as non-attainment for a criteria pollutant.

Table 2
Vehicle Miles Traveled
(Average Winter Weekday, Corrected to HPMS Data)

Vehicle Miles Traveled (HPMS Adjusted Average Winter Weekday)

	2015	2024	2034	2040
Salt Lake City	6,583,384	7,470,524	8,415,712	8,904,106
Ogden City	1,465,638	1,635,011	1,915,336	2,049,808
Salt Lake County	28,495,411	34,265,855	39,346,894	42,466,875
Davis County	7,565,570	8,873,843	10,018,067	10,595,221
Weber County*	4,985,904	6,022,480	7,142,020	7,661,831
Box Elder County*	2,370,372	2,846,983	3,378,619	3,738,885
Tooele County*	2,107,733	2,621,722	3,379,647	4,158,310

**non-attainment portion of the county*

Peak and Off-Peak Trip Distribution

The modeled VMT and the modeled vehicle speed depend on the number of vehicle trips assigned for each time period (AM, midday, PM, and evening) defined in the travel demand model. The percentage of trips by purpose varies for each time period. The percentages in Table 3 and Table 4 below are based on data from the 2012 Household Travel Survey.

Table 3
Percent of Trips by Time of Day

Trip Purpose	AM	Mid Day	PM	Evening	Grand Total
Home Based - Other	11%	27%	24%	37%	100%
Home Based - Personal Business	9%	50%	25%	16%	100%
Home Based - School	40%	29%	26%	5%	100%
Home Based - Shopping	2%	43%	26%	29%	100%
Home Based - Work	35%	18%	28%	19%	100%
Non-home Based - Non-work	6%	46%	25%	23%	100%
Non-home Based - Work	13%	49%	29%	9%	100%
Grand Total	**15%**	**34%**	**26%**	**25%**	**100%**

Table 4
Percent of Trips by Purpose

Trip Purpose	AM	Mid Day	PM	Evening	Grand Total
Home Based - Other	25%	26%	31%	50%	33%
Home Based - Personal Business	3%	8%	5%	4%	5%
Home Based - School	19%	6%	7%	1%	7%
Home Based - Shopping	1%	13%	10%	12%	10%
Home Based - Work	37%	8%	17%	12%	16%
Non-home Based - Non-work	7%	25%	18%	18%	19%
Non-home Based - Work	8%	13%	11%	3%	9%
Grand Total	**100%**	**100%**	**100%**	**100%**	**100%**

Comparison of Modeled Speeds with Observed Data

WFRC continues to adjust modeled speeds to improve consistency with samples of observed speeds. Observed speed data were collected in 2013 through a FHWA program known as "Here Data" that uses cell phone signals to track vehicle movements. The observed speeds for freeways and arterials during AM and PM periods of congestion were compared to speeds estimated using the WFRC travel demand model for the 2011 base year. A review of median speeds for the three-county WFRC planning area is shown in Table 5. WFRC area modeled speeds are within -3.2% to 3.1% of observed Here Data speeds.

Table 5
WFRC Planning Area Modeled Speeds Compared to Observed Speeds

	Arterial		Freeway	
	AM Peak	PM Peak	AM Peak	PM Peak
2011 Modeled Speeds (mph)	33	30	66	63
2013 Observed Speeds (mph)	32	31	64	64
Percent Difference	**3.1%**	**-3.2%**	**3.1%**	**-1.6%**

C. Emission Modeling

I/M Programs
Assumptions for the input files for EPA's MOVES vehicle emissions model include I/M programs in Salt Lake, Davis, and Weber Counties. Box Elder and Tooele Counties do not presently have I/M programs.

VMT Mix
The VMT mix describes how much a particular vehicle type is used in the transportation network. While no longer a required input for the MOVES model as it was for MOBILE6.2, VMT mix is used in several instances to generate the input files required to run the MOVES model. The national default VMT mix found in the MOVES database was used to disaggregate local vehicle type data collected in 2008. The local vehicle type data is collected by UDOT as part of the federal HPMS data collection system and is based on automated counters which classify vehicles based on axle spacing. The UDOT classification is used to calculate control percentages for light duty (LD) vehicles and heavy duty (HD) vehicles for each facility type. The EPA default VMT mix is then applied to disaggregate the two UDOT control percentages into detailed percentages for the thirteen vehicle classes used in MOVES.

Vehicle Weights
Facility specific VMT mix data described above was also used to estimate the average vehicle weight on each facility type. Since vehicle weight affects the rate of re-entrained road dust emissions estimated using the AP-42 method, vehicle weight variations on different facilities will affect the amount of fugitive dust created. The VMT mix for each facility type was used to estimate an average vehicle weight for each facility type with the following results:

Facility	Average Vehicle Weight
Urban - Freeway	6,500 lbs, or 3.25 tons
Urban - Arterial	6,100 lbs, or 3.05 tons
Urban - Local	3,900 lbs, or 1.95 tons

Post Model Adjustments

For conformity analyses prior to 2000, the WFRC applied post model adjustments to vehicle emission estimates. Emission credits for work trips were modeled for reductions in single occupant vehicle rates based primarily on increased investments in transit service and rideshare programs, and the projected increase in telecommuting. Other less significant post model adjustments were also estimated for incident management, pavement re-striping, and signal coordination. Additional emission reducing programs and projects supported by CMAQ funds such as park and ride lots, bicycle facilities, transit vehicles, intelligent transportation systems (ITS), and intersection improvements have also been implemented.

WFRC believes that these programs have a positive effect in reducing vehicle emissions. In practice, however, WFRC has found that documenting the air quality benefits of these programs can be challenging. WFRC will continue to support these emission reduction programs, but credits from these programs have not been included in this conformity analysis.

MOVES Inputs

The MOVES model is a very data intensive computer program based on the MySQL database software. Through the interagency consultation process the required MOVES inputs reflecting local conditions have been established.

Data files defining local conditions by county and year are required inputs to the MOVES model including vehicle population, emission testing programs, fuel supply, fuel formulation, meteorological conditions, and vehicle age. Vehicle population estimates are based on the latest registration data by county and the estimated VMT for the same year. This vehicle population to VMT ratio is then applied to model projections of VMT to estimate future year vehicle population. By estimating vehicle population in this way the calculation considers the effects of human population and employment projections, as well as mode choice options that are included in the travel demand model.

Vehicle activity input files for the MOVES model are generated by the WFRC travel demand model using a customized in-house program for this purpose. The MOVES input files required include data for ramp fractions, road distribution, speed distribution, and VMT by vehicle type for each county (Box Elder, Davis, Salt Lake, Tooele, and Weber) and analysis year (base year 2011, 2019, 2024, 2034, and 2040) as required for operating the MOVES model.

The input files listed above are read into the MOVES program as database files. The input database folders in Table 6 below contain the database files used for each county and year modeled using MOVES2014 for this conformity analysis. The results of the MOVES model are stored in the output database "Conf15a_out" for Box Elder, Tooele, and all other areas for analysis year 2019; and "Conf15b_out" for all other areas for analysis years 2024, 2034, and 2040.

Table 6
MOVES Data – Input Database Folders

Box Elder	Weber	Davis	Salt Lake	Tooele	Salt Lake City	Ogden
conf15a_beW2011_in	conf15a_weW2011_in	conf15a_daW2011_in	conf15a_slW2011_in	conf15a_toW2011_in	conf15a_scW2011_in	conf15a_ogW2011_in
conf15a_beW2019_in	conf15a_weW2019_in	conf15a_daW2019_in	conf15a_slW2019_in	conf15a_toW2019_in	conf15a_scW2019_in	conf15a_ogW2019_in
conf15a_beW2024_in	conf15b_weW2024_in	conf15b_daW2024_in	conf15b_slW2024_in	conf15a_toW2024_in	conf15b_scW2024_in	conf15b_ogW2024_in
conf15a_beW2034_in	conf15b_weW2034_in	conf15b_daW2034_in	conf15b_slW2034_in	conf15a_toW2034_in	conf15b_scW2034_in	conf15b_ogW2034_in
conf15a_beW2040_in	conf15b_weW2040_in	conf15b_daW2040_in	conf15b_slW2040_in	conf15a_toW2040_in	conf15b_scW2040_in	conf15b_ogW2040_in

Road Dust Estimates

In January 2011, the EPA released new guidance for estimating dust emissions from paved roads. These guidelines are published in Chapter 13.2.1 of the AP-42 document. The new formula is

$$E = k\,(sL)^{0.91} \times (W)^{1.02}$$

where:
E = particulate emission factor (grams/mile),
k = particle size multiplier for particle size range and units of interest (for PM_{10}, k=1.0 and for $PM_{2.5}$ k=0.25),
sL = road surface silt loading (grams per square meter - g/m^2), and
W = average weight (tons) of the vehicles traveling the road.

Based on vehicle type counts on roads in the WFRC region, average vehicle weights for local roads, arterials, and freeways are 1.95, 3.05, and 3.25 tons respectively. The silt load (sL) factor varies by highway functional class and by traffic volume. The default silt load factors found in Table 13.2.1-2 of the AP-42 document are summarized below.

Traffic Volume	Functional Class	Silt Load (grams/meter^2)
500-5,000	local roads	0.200
5,000-10,000	arterial roads	0.060
limited access	freeways	0.015

A precipitation reduction factor is also applied to the above equation using the following expression:

$$(1 - P/4N)$$

Where:
P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and
N = number of days in the averaging period (e.g., 365 for annual, 91 for seasonal, 30 for monthly).

The AP-42 guidance recommends a value of 90 precipitation days per year for the Wasatch Front region. Using these values, the precipitation reduction factor yields a value of 0.9384. Combined with the basic road dust emission rate, the net $PM_{2.5}$ and PM_{10} road dust factors by highway functional class are as follows:

Functional Class	PM_{10} Road Dust Rate (grams/mile)	$PM_{2.5}$ Road Dust Rate (grams/mile)
local roads	0.429	0.107
arterials	0.226	0.057
freeways	0.068	0.017

D. Conformity Determination

The following conformity findings for the 2015-2040 Regional Transportation Plan for the Wasatch Front are based on the transportation systems and planning assumptions described in this report and the EPA approved vehicle emissions model (MOVES2014).

Salt Lake City CO Conformity
The carbon monoxide maintenance plan for Salt Lake City was approved by EPA effective September 30, 2005 as recorded in the Federal Register (Vol. 70, No. 146, August 1, 2005). The maintenance plan defines a motor vehicle emission budget for the years 2005 and 2019 of 278.62 tons/day. Table 7 below demonstrates that projected mobile source emissions are within the emission budget defined in the maintenance plan for the 2019 budget year. The other years listed in Table 7 are in accordance with requirements of the Conformity Rule (40 CFR Part 93) as noted in the table.

From this demonstration it is concluded that the Amended RTP conforms to the applicable controls and goals of the State Implementation Plan (Maintenance Plan) for Carbon Monoxide in Salt Lake City.

Table 7

Salt Lake City - CO

Conformity Determination

	b	*b*	*c*	*c*
Year	**2019**	**2024**	**2034**	**2040**
Budget# (tons/day)	278.62	278.62	278.62	278.62
emission rate (grams/mile)	*5.29*	*3.94*	*2.18*	*1.73*
seasonal VMT	*6,958,685*	*7,470,524*	*8,415,712*	*8,904,106*
Projection* (tons/day)	40.59	32.47	20.24	16.99
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

 # Federal Register Vol. 70 No. 146, August 1, 2005, Table V-2.

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Ogden CO Conformity
The carbon monoxide maintenance plan for Ogden City was approved by EPA effective November 14, 2005 as recorded in the Federal Register (Vol. 70, No. 177, September 14, 2005). The maintenance plan defines a motor vehicle emission budget for the years 2005 and 2021 of 75.36 and 73.02 tons/day respectively. Table 8 below demonstrates that projected mobile source emissions are within the emission budget defined in the maintenance plan for the 2021 budget year. The other years listed in Table 8 are in accordance with requirements of the Conformity Rule (40 CFR Part 93) as noted in the table.

From this demonstration it is concluded that the 2015-2040 RTP conforms to the applicable controls and goals of the State Implementation Plan (Maintenance Plan) for Carbon Monoxide in Ogden City.

Table 8

Ogden City - CO
Conformity Determination

Year	2019 [c]	2021 [b]	2024 [c]	2034 [c]	2040 [e]
Budget# (tons/day)	75.36	73.02	73.02	73.02	73.02
emission rate (grams/mile)	*6.58*	*5.79*	*4.69*	*2.47*	*1.88*
seasonal VMT	*1,524,886*	*1,568,936*	*1,635,011*	*1,915,336*	*2,049,808*
Projection* (tons/day)	11.06	10.02	8.45	5.21	4.26
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**	**Pass**

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

 # Federal Register Vol. 70 No. 177, September 14, 2005, Table V-2.

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Ogden PM10 Conformity
Ogden City was designated as a PM_{10} non-attainment area in August of 1995 based on PM_{10} violations in 1993 or earlier. Since a PM_{10} SIP for Ogden has not yet been approved by EPA, it must be demonstrated that Ogden PM_{10} emissions are either less than 1990 emissions or less than "no-build" emissions. The analysis years 2019, 2024, 2034, and 2040 were selected in accordance with the requirements of 40 CFR Section 93.119(e).

PM_{10} emissions are present in two varieties referred to as primary and secondary PM_{10}. Primary PM_{10} consists mostly of fugitive road dust but also includes particles from brake wear and tire wear and some "soot" particles emitted directly from the vehicle tailpipe. The methods defined in the January 2011 version of the EPA publication known as "AP-42" were used to estimate dust from paved roads. Secondary PM_{10} consists of gaseous tailpipe emissions that take on a particulate form through subsequent chemical reactions in the atmosphere. Nitrogen oxides are the main component of secondary PM_{10} emissions with sulfur oxides a distant second.

As summarized in Tables 9a and 9b, emission estimates for the 2015-2040 RTP satisfy the “Build < 1990” test for secondary PM_{10} (NOx precursors) and primary PM_{10} (direct tailpipe particulates, brake wear, tire wear, and road dust) in Ogden City. The 1990 emission estimates based on the Mobile6.2 vehicle emissions model for the 2003 conformity analysis have been updated for this conformity analysis using the MOVES model and the January 2011 AP-42 road dust methodology for consistency with current emission modeling requirements. Specifically, the NOx precursor budget (1990 emission estimate) changes from 4.57 tons/day to 6.92 tons/day, and the direct PM10 budget (1990 estimate) changes from 2.28 tons/day to 1.28 tons/day. The 1990 primary PM_{10} estimate for Ogden City includes emissions from the unpaved access road to the Ogden landfill which was closed in 1998.

For projections of primary PM_{10} emissions, no credit was taken for a number of programs adopted since Ogden City last violated the PM_{10} standard. These particulate reducing programs include covered load ordinances, increased frequency of street sweeping, and reduced application of deicing and skid resistant materials (salt and sand). Documentation of these programs has been provided by Ogden City but the actual benefits of these programs are not included in the emission projections below. Other areas that have estimated the benefit of these programs have found a silt load reduction of over 30% for effective street sweeping programs and a 5% silt load reduction when limiting the amount of sand and salt applied to the roads. Ogden City has also implemented a number of specific projects that have a positive effect in reducing particulate emissions including park and ride lots, storm water improvements, shoulder widening and edge striping, and addition of curb and gutter on several projects.

From this demonstration it is concluded that the 2015-2040 RTP conforms under the Emission Reductions Criteria for areas without motor vehicle emissions budgets for PM_{10} in Ogden City.

Table 9a

Ogden City - PM10 (NOx Precursor) Conformity Determination

Year	2019 *d*	2024 *c*	2034 *c*	2040 *e*
1990 Emissions (tons/day)	6.92	6.92	6.92	6.92
emission rate (grams/mile)	*0.81*	*0.44*	*0.21*	*0.18*
seasonal VMT	*1,524,886*	*1,635,011*	*1,915,336*	*2,049,808*
Projection* (tons/day)	1.36	0.80	0.45	0.40
Conformity (Projection < 1990 Emissions?)	**Pass**	**Pass**	**Pass**	**Pass**

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Table 9b

Ogden City - PM10 (Primary Particulates**)
Conformity Determination

	d	c	c	e
Year	**2019**	**2024**	**2034**	**2040**
1990 Emissions (tons/day)	1.28	1.28	1.28	1.28
emission rates (grams/mile)				
exhaust particulates - (Ec, Oc, SO4)	*0.0332*	*0.0176*	*0.0088*	*0.0078*
brake particulates	*0.0665*	*0.0701*	*0.0725*	*0.0741*
tire particulates	*0.0129*	*0.0125*	*0.0127*	*0.0128*
road dust particulates	*0.2618*	*0.2579*	*0.2572*	*0.2568*
seasonal VMT	*1,524,886*	*1,635,011*	*1,915,336*	*2,049,808*
Projection* (tons/day)	0.63	0.65	0.74	0.79
Conformity (Projection < 1990 Emissions?)	**Pass**	**Pass**	**Pass**	**Pass**

*** Includes road dust, elemental carbon, organic carbon, gasoline exhaust particulates, tire wear, and brake wear.*

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Salt Lake County PM10 Conformity

The PM_{10} SIP for Salt Lake County does not define a budget beyond the year 2003. Therefore, conformity tests are required only for analysis years which are identified in accordance with 40 CFR 93.118. All analysis years after 2003 must meet the 2003 budgets for primary particulates and secondary particulates (see the discussion above under Ogden PM_{10} Conformity for an explanation of primary and secondary PM_{10} emissions). The State air quality rule R307-310 allows a portion of the surplus primary PM_{10} budget to be applied to the secondary PM_{10} budget for conformity purposes. For the analysis years 2019, 2024, 2034, and 2040, no budget adjustments were necessary.

Table 10

Salt Lake County - PM10 Budgets

Direct (Dust) and Precursor (NOx) PM10 Emission Budgets

(tons/day)

Year	2019	2024	2034	2040
Total PM10 Budget#	72.60	72.60	72.60	72.60
Direct PM10 Budget to be Traded	*0.00*	*0.00*	*0.00*	*0.00*
Direct PM10 Budget	40.30	40.30	40.30	40.30
NOx Precursor PM10 Budget	32.30	32.30	32.30	32.30

Table 11a and Table 11b below demonstrate that projected mobile source emissions are within the emission budget defined in the SIP. The years listed in Table 10a and Table 10b are in accordance with requirements of the Conformity Rule (40 CFR Part 93) as noted in the tables.

From this demonstration it is concluded that the 2015-2040 RTP conforms to the applicable controls and goals of the State Implementation Plan for PM_{10} in Salt Lake County.

Table 11a

Salt Lake County - PM10 (NOx Precursor)

Conformity Determination

	c	*c*	*c*	*e*
Year	**2019**	**2024**	**2034**	**2040**
Budget# (tons/day)	32.30	32.30	32.30	32.30
emission rate (grams/mile)	*0.52*	*0.40*	*0.21*	*0.18*
seasonal VMT	*31,323,413*	*34,265,855*	*39,346,894*	*42,466,875*
Projection* (tons/day)	18.07	14.97	9.11	8.54
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

 # WFRC Memo to Jeff Houk of EPA, April 15, 1994.

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Table 11b

Salt Lake County - PM10 (Primary Particulates**) Conformity Determination

Year	2019 [c]	2024 [c]	2034 [c]	2040 [e]
Budget# (tons/day)	40.30	40.30	40.30	40.30
emission rates (grams/mile)				
exhaust particulates - (Ec, Oc, SO4)	*0.0300*	*0.0207*	*0.0102*	*0.0090*
brake particulates	*0.0485*	*0.0585*	*0.0595*	*0.0588*
tire particulates	*0.0111*	*0.0116*	*0.0116*	*0.0115*
road dust particulates	*0.2101*	*0.2073*	*0.2005*	*0.1964*
seasonal VMT	*31,323,413*	*34,265,855*	*39,346,894*	*42,466,875*
Projection* (tons/day)	10.35	11.26	12.22	12.91
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**

*** Includes road dust, elemental carbon, organic carbon, gasoline exhaust particulates, tire wear, and brake wear.*

 # WFRC Memo to Jeff Houk of EPA, April 15, 1994.

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Salt Lake $PM_{2.5}$ Conformity

Davis, Salt Lake, and portions of Weber, Tooele, and Box Elder Counties have been designated as a non-attainment area under the new $PM_{2.5}$ standard (35 µg/m^3) that was established in 2006. Work has begun on a $PM_{2.5}$ section of the State Implementation Plan which will establish a motor vehicle emission budget for emissions associated with $PM_{2.5}$. Until the $PM_{2.5}$ SIP is completed and approved by EPA, $PM_{2.5}$ interim conformity requirements apply. EPA interim conformity for $PM_{2.5}$ emissions requires that future NOx emissions (a precursor to $PM_{2.5}$) and primary particulate emissions not exceed 2008 levels.

Table 12a below demonstrates that projected mobile source emissions of NOx (a precursor to $PM_{2.5}$ emissions) in the five-county $PM_{2.5}$ non-attainment area are less than 2008 NOx emissions. Table 12b below demonstrates that direct particle emissions of $PM_{2.5}$ in the five-county $PM_{2.5}$ non-attainment area are also less than 2008 direct particle emissions. Direct particle emissions include exhaust emissions of elemental carbon, organic carbon, and sulfates (SO4); and mechanical emissions from brake wear and tire wear.

From this demonstration it is concluded that the RTP conforms under the interim conformity guidelines for $PM_{2.5}$ areas without an approved motor vehicle emissions budget for the Salt Lake $PM_{2.5}$ non-attainment area.

Table 12a
Salt Lake Area# - PM2.5 (NOx Precursor)
Conformity Determination

Year	2019 c	2024 c	2034 c	2040 e
2008 Emissions (tons/day)	89.35	89.35	89.35	89.35
emission rate (grams/mile)	*0.61*	*0.43*	*0.23*	*0.20*
seasonal VMT	*49,810,959*	*54,630,883*	*63,265,247*	*68,621,122*
Projection* (tons/day)	33.54	25.83	15.79	15.05
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**

 # Salt Lake PM2.5 Non-Attainment Area includes: Davis, Salt Lake, and portions of Weber, Box Elder and Tooele Counties.

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Table 12b
Salt Lake Area# - PM2.5 (VOC Precursor)
Conformity Determination

Year	2019 c	2024 c	2034 c	2040 e
2008 Emissions (tons/day)	53.55	53.55	53.55	53.55
emission rate (grams/mile)	*0.52*	*0.40*	*0.27*	*0.24*
seasonal VMT	*49,810,959*	*54,630,883*	*63,265,247*	*68,621,122*
Projection* (tons/day)	28.73	23.89	18.68	18.42
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**

 # Salt Lake PM2.5 Non-Attainment Area includes: Davis, Salt Lake, and portions of Weber, Box Elder and Tooele Counties.

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

Table 12c

Salt Lake Area# - PM2.5 (Direct PM Emissions**)

Conformity Determination

	c	c	c	e
Year	**2019**	**2024**	**2034**	**2040**
2008 Emissions (tons/day)	7.06	7.06	7.06	7.06
emission rate (grams/mile)	*0.09*	*0.08*	*0.07*	*0.07*
seasonal VMT	*49,810,959*	*54,630,883*	*63,265,247*	*68,621,122*
Projection* (tons/day)	4.94	4.80	4.79	5.01
Conformity (Projection < Budget?)	**Pass**	**Pass**	**Pass**	**Pass**

 # Salt Lake PM2.5 Non-Attainment Area includes: Weber, Davis, Salt Lake, and portions of Box Elder and Tooele Counties.

a - attainment year, b - budget year, c - 10-year rule, d - no budget 5-year rule, e - last year of Plan,

** Projection = Emission Rate x seasonal VMT / 453.6 grams per pound / 2,000 pounds per ton.*

*** Direct PM for interim conformity includes gasoline particulates, elemental carbon, organic carbon, SO4, brake wear, and tire wear.*

Salt Lake and Davis County Ozone Conformity

The 1-hour ozone standard was revoked on June 19, 2005. Therefore, a conformity analysis under the 1-hour ozone standard in Salt Lake and Davis Counties is no longer required.

The current 8-hour ozone standard is 75 ppb. All counties within the Wasatch Front area are in attainment of the current 8-hour ozone standard.

A new ozone standard of 70 ppb was proposed on October 1, 2015 and is scheduled to be implemented in October 2017. Areas of non-attainment for the new ozone standard have not yet been designated by EPA.

Appendix – 1
Definition of Regionally Significant Projects

Process for Determining Regionally Significant Facilities
for Purposes of Regional Emissions Analysis (see CFR 93.105.2.c.1.ii)

Background: 40 FR 93.101 defines "regionally significant project" and associated facilities for the purpose of transportation conformity. The federal definition does not specifically include minor arterials. The following definitions and processes will be used by the Wasatch Front Regional Council (WFRC) and Mountainlands Association of Governments (MAG) in consultation with DAQ, UDOT, UTA, FHWA, FTA, and EPA to determine which facilities shall be considered regionally significant for purposes of regional emissions analysis. It is the practice of the MPO to include minor arterials and collectors in the travel model for the purpose of accurately modeling regional VMT and associated vehicle emissions. The inclusion of minor arterials and collectors in the travel model, however, does not identify these facilities as regionally significant.

1. Any new or existing facility with a functional classification of principal arterial or higher on the latest UDOT Functional Classification Map shall be considered regionally significant (see http://www.dot.utah.gov/index.php/m=c/tid=1228).

2. Any fixed guide-way transit service including light rail, commuter rail, or portions of bus rapid transit that involve exclusive right-of-way shall be considered regionally significant.

3. As traffic conditions change in the future, the MPO's - in consultation with DAQ, UDOT, FHWA, and EPA (and UTA and FTA in cases involving transit facilities) - will consider 1) the relative importance of minor arterials serving major activity centers, and 2) the absence of principal arterials in the vicinity to determine if any minor arterials in addition to those listed in Exhibit A should be considered as regionally significant for purposes of regional emissions analysis.

Exhibit A
Minor Arterials Determined to be Regionally Significant
for Purposes of Regional Emissions Analysis

40 FR 93.105(c)(ii), "Consultation – Interagency consultation procedures: Specific processes" specifies that Interagency Consultation shall include a process to identify which minor arterials should be considered as "regionally significant" for the purpose of regional emissions analysis. In consultation with DAQ, UDOT, FHWA, and EPA; and based on inspection and engineering judgment of current traffic conditions; and based on application of the "Process for Determining Regionally Significant Facilities for Purposes of Regional Emissions Analysis" agreed upon by the aforementioned agencies; the WFRC designated eight minor arterials as regionally significant.

Since 2015, all but one of the minor arterials referenced above have been reclassified with the functional type of principal arterial and are therefore by definition regionally significant. The remaining minor arterial to be considered as regionally significant for emissions analysis is listed below. It should also be noted that all collectors, minor arterials, and principal arterials are included in the highway network used in the WFRC travel demand model.

Davis County
none

Salt Lake County
none

Weber County
SR-79 (Hinckley Drive): SR-108 to I-15

Process for Determining Significant Change in Design Concept and Scope for Purposes of Regional Emissions Analysis (see CFR 93.105.2.c.1.ii)

Changes to regionally significant projects may or may not necessitate a new regional emissions analysis. The following definitions and processes will be used to determine what changes to project concept and scope are to be considered significant or not for purposes of regional emissions analysis.

1. Adding or extending freeway auxiliary lanes or weaving lanes between interchanges is not considered a significant change in concept and scope since these lanes are not normally included in the travel model.

2. Adding or extending freeway auxiliary/weaving lanes from one interchange to a point beyond the next interchange is considered a significant change in concept and scope.

3. A change to a regionally significant project defined in the Regional Transportation Plan that does not change how the project is defined in the travel model is not considered a significant change in concept and scope. These changes include but are not limited to lane or shoulder widening, cross section (other than the number of through lanes), alignment, interchange configuration, intersection traffic control, turn lanes, continuous or center turn lanes, and storage lanes.

4. A change to a regionally significant project defined in the Regional Transportation Plan that does alter the number of through lanes, lane capacity, or speed classification as defined in the travel model is considered a significant change in concept and scope.

5. Advancing or delaying the planned implementation of a regionally significant project that does not result in a change in the transportation network described in the travel model for any horizon year (as defined in CFR 93.101) is not considered a significant change in concept and scope.

6. Advancing or delaying the planned implementation of a regionally significant project that does result in a change in the transportation network described in the travel model for any horizon year (as defined in CFR 93.101) is considered a significant change in concept and scope.

7. Project changes not addressed in the above statements will be decided on a case by case basis through consultation by representatives from DAQ, WFRC, MAG, UDOT, UTA, FHWA, FTA, and EPA.

Appendix-2

Box Elder County
Highway and Transit Projects
2040 RTP

Box Elder County

Box Elder County
Regionally Significant Project List – January 2015

Line	Source	County	Need Phase	Constrained Phase	Capacity Need	Priority Score	Improvement Type	Project Name	Project Description	Cost 2014	Route	Begin	End
1	LRP	Box Elder/ Cache	STIP 2016	1	Before 2012	44	Passing Lane	SR-30 MP 97 to MP 101	Add one travel lane in each direction	$5,000,000	0030	97.00	101.34
9	LRP	Box Elder/ Cache	3	2	begin by Phase 1	27	Widening	SR□30 MP 95.1 to MP 102.3, SR□38 to SR□23	Add one travel lane in each direction	$32,040,000	0030	95.10	102.30
10	LRP	Box Elder	4	2		36	Passing Lane	I□84 Widen WB from MP 17.3 to MP 19.9	Add one travel lane in WB direction	$7,150,000	0084	17.30	19.90
11	LRP	Box Elder	4	2		43	Passing Lane	I□84 Widen EB from MP 6.8 to MP 17.7	Add one travel lane in EB direction	$29,975,000	0084	6.80	17.70
13	LRP	Box Elder	2	2	before 2012	28	Widening	SR□30 MP 90.7 to MP 95.1, I□15 to SR□38 (Collinston)	Add one travel lane in each direction	$19,580,000	0030	90.70	95.10
14	Model	Box Elder	3	3		25	Widening	I□15 Widen from MP 365.7 to MP 372.6, SR□13 to Honeyville (WFRC boundary from MP 365.7 to 368.3)	Add one travel lane in each direction	$22,145,000	0015	368.30	372.60
15	LRP	Box Elder	4	3		43	Passing Lane	I□84 Widen WB from MP 29.3 to MP 32.3	Add one travel lane in WB direction	$8,250,000	0084	29.30	32.30
16	LRP	Box Elder	4	3		37	Passing Lane	I□84 Widen EB from MP 25.3 to MP 29.7	Add one travel lane in EB direction	$12,100,000	0084	25.30	29.70
17	LRP	Box Elder	4	3		46	Passing Lane	I□84 Widen WB from MP 33.5 to MP 35.6	Add one travel lane in WB direction	$5,775,000	0084	33.50	35.60
22	Model	Box Elder	4	4		37	Widening	I□15 Widen from MP 372.6 to MP 379.5, Honeyville to Tremonton	Add one travel lane in each direction	$35,535,000	0015	372.60	379.50

Appendix-3

Highway and Transit Projects
2040 RTP

Tooele County

Tooele Valley RPO Long Range Plan Highway Projects
February 9, 2015

Phase 1 (To be built by 2025)

Main Street (SR-138) in Grantsville (West St – Center St, and Bowery St – SR-112)
Widen from 1 lane to 2 lanes per direction

SR-36 (Stockton Town – Skyline Drive)
Widen from 1 lane to 2 lanes per direction

Tooele Parkway (SR-112 – Droubay Road)
New collector, 1 lane per direction

Midvalley Highway (SR-138 – I-80)
New freeway, 2 lanes per direction

Midvalley Highway (SR-36 – Utah Avenue)
New principal arterial, 2 lanes per direction

SR-112 (Sheep Lane - Utah Ave)
Widen from 1 lane to 2 lanes per direction

Sheep Lane (SR-112 – SR-138)
Widen from 1 lane to 2 lanes per direction

SR-138 (SR-112 – Midvalley Highway)
Widen from 1 lane to 2 lanes per direction

I-80 (SR-36 – SR-201)
Widen from 2 lanes to 3 lanes per direction

SR-112 (SR-138 – Sheep Lane)
Widen from 1 lane to 2 lanes per direction

400 West (2000 North – Village Blvd)
New collector, 1 lane per direction

1000 North (SR-36 – Droubay Road)
Widen from 1 lane to 2 lanes per direction

Tooele Boulevard (SR-36 – Vine St)
New collector, 1 lane per direction

Bates Canyon Road (1200 West – 400 West)
New collector, 1 lane per direction

Village Boulevard (SR-138 – current western terminus)
New collector, 1 lane per direction

Appendix-4

RTP Amendments

October 2015

RTP 2015-2040 Amendments
October 2015

BACKGROUND:
Every four years the Wasatch Front Regional Council (WFRC) prepares and adopts a regional transportation plan (RTP) to identify and implement needed transportation improvements. The WFRC adopted the current RTP in May 2015. While the RTP receives considerable review before being formally adopted, the identification of new funding sources, the determination of the final environmental impact statements, or the rapid development of certain projects, may warrant a change to the RTP. A process has been formally adopted by WFRC to consider periodic revisions.

Recently, the WFRC received requests from the Utah Department of Transportation (UDOT), the Utah Transit Authority (UTA), and Layton City to amend the 2015-2040 RTP to consider the changes listed below.

WFRC staff has analyzed the potential financial implications of including these projects in Phase 1 and determined that there are adequate resources available and potential cost savings from a reprioritization of projects. The plan is able to maintain its fiscal constraint while accommodating construction of these projects in phase I. WFRC is reviewing the air quality impacts to ensure that all applicable air quality conformity requirements are met; results will be provided at the meeting.

The formal public comment period will take place from November 2 to December 1. The WFRC staff, UDOT, UTA, and Layton City representatives will present these amendments to the Regional Growth Committee's Ogden-Layton Technical Advisory Committee and the Salt Lake County PlanTac on December 16, 2015. The Regional Growth Committee and the Regional Council will review all comments and make a final recommendation in January 2016.

UDOT PROPOSED MODIFICATIONS TO THE 2015-2040 RTP

US-89 Improvements **Total Cost: $275 million**

The Utah Department of Transportation is making a request to amend the current 2015-2040 RTP for (1) construction of new interchanges at Antelope Drive, Gordon Avenue, Oak Hills Drive and 400 North, (2) construction of frontage roads from Oak Hills Drive to Eagle Way, (3) construction of two overpasses at Crestwood Road and Nicholls Road, (4) potential widening of US-89 from 4 to 6 lanes from just north of the US-89/I-15 interchange in Farmington to Antelope Drive. The 2015-2040 RTP includes the Interchange at 400 North, the overpass at Nicholls Road, and frontage roads from Oak Hills Drive to Nicholls Road in Phase 1. The proposed amendment includes the following modifications to the RTP.

1. **New Construction of US-89 Interchange @ Antelope Drive**
   This project will be moved from Phase 2 to Phase 1.

2. **New Construction of US-89 Interchange @ Gordon Avenue**
   This project will be moved from Phase 2 to Phase 1.
3. **New Construction of US-89 Interchange @ Oak Hills Drive**
   This project will be moved from Phase 2 to Phase 1.

4. **Widening of US-89 from Antelope Drive to I-15 (Farmington)**
   This project will be moved from Phase 3 to Phase 1.

5. **New Construction of US-89 Frontage from Eagle Way to Oak Hills Drive**
   The frontage road project limits will be extended to Eagle Way in the south. This project is currently in Phase 1.

6. **New Construction of Crestwood Road Overpass @ US-89**
   This new project provides connectivity for pedestrians, bicycles, and vehicular traffic across US-89 and is requested to be included in Phase 1.

While these elements are presented as separate projects in the current RTP and proposed amendment, they are part of the preferred alternative developed for the US-89 Environmental Impact Statement (EIS) completed in 1996. Since the completion of the EIS, UDOT has worked to construct elements of the preferred alternative. With this project, there is an opportunity to complete most of the remaining elements of the preferred alternative. The priority components include the construction of the interchanges, the overpasses, and the frontage roads. The widening project is included in the amendment because UDOT believes a favorable bidding climate could result in enough project savings to complete the widening from Antelope Drive to I-15 in Farmington. The widening from 4 to 6 lanes from I-84 to Antelope Drive is not part of this project. The current cost estimate for the US-89 project is $275 million and is funded from UDOT's Transportation Improvement Fund (TIF).

Project benefits include costs savings due to project efficiencies and future inflation costs, improved traffic flow, delay reductions from the elimination of at-grade intersections, and improved access and connectivity with the development of the frontage road system and overpasses.

UTA PROPOSED MODIFICATIONS TO THE 2015-2040 RTP

7. **Ogden-Weber State University Corridor - Transit Project 11 Cost: $ 41.0 million**
   The Utah Transit Authority is making a request to amend the current 2015-2040 RTP to include 25th Street as the approved alignment in Ogden City with the project mode as a modern Bus Rapid Transit (BRT) system in mixed flow traffic and with exclusive lanes. Currently, the RTP indicates that 30th Street would be the preferred alignment, with the mode undetermined. On July 28, 2015, the Ogden City Council and Mayor adopted Resolution #2015-24 approving a locally preferred alternative (LPA) for the Ogden/WSU Transit Project Study. This project is in Phase 1 of the RTP and the Environmental Assessment is expecting to be completed in 2016/2017.

Layton City PROPOSED MODIFICATIONS TO THE 2015-2040 RTP

8. **Gordon Avenue from 1600 East to US-89 Cost: $ 28.7 million**
   Layton City is coordinating with UDOT on the US-89 improvements from Antelope Drive to I-15 in Farmington. As part of the US-89 project, an interchange at Gordon Avenue will be constructed. This project is a new facility and will connect US-89 with the existing Gordon Avenue at 1600 East in Layton. The construction of Gordon Avenue is a vital component of the US-89 improvement project and will improve safety, connectivity and accessibility for state and local emergency services, citizens and pedestrians and bicyclist. The project is currently in Phase 2, and Layton City is requesting this project be moved to Phase 1 due to the change in the US-89 project. Layton City does not have full funds for this project but is planning on utilizing impact fees and pursuing alternative sources.

PROPOSED ADDITIONS TO THE 2015-2040 RTP

9. I-15 Improvements **Total Cost: $250 million**

The entire I-15 project includes the (1) construction of southbound auxiliary lanes from SR-201 to SR-71 (12300 South), (2) construction of an additional southbound general purpose lane from SR-201 to 12300 South (SR-71), (3) upgrade of the I-215/I-15 Interchange, and (4) construction of Managed Motorways along the corridor. The 2015-2040 RTP includes an operational project on I-15 throughout Salt Lake County and an Interchange upgrade at I-215/I-15 in Phase 1. The proposed amendment calls for an additional southbound general purpose lane in Phase 1 from SR-201 to 12300 South (SR-71).

This project was originally programmed for construction in FY 2015-2016. UDOT put the project on hold to evaluate additional alternatives, including advanced ramp metering (Managed Motorways), freeway to freeway ramp meeting, whether to include a GP lane and whether to extend the project to 12300 South (SR-71) from its original terminus of 9000 South (SR-209). The evaluation concluded that the project should move forward with the components outlined above. The current cost estimate for the Salt Lake County I-15 project as outlined above is $250 million and is funded from UDOT's Transportation Improvement Fund (TIF).

Project benefits include congestion/delay reduction, safety improvements, the elimination of physical choke points, and improved main-line capacity to handle traffic inflow from adjacent facilities including I-80, SR-201, and I-215.

10. I-15 Operational Projects in Weber County **Total Cost: $80 million**

11. I-15 Operational Projects in Davis County

Operational improvements can include a variety of different project types including axillary lanes, ramp extensions and technology enhancements. One technology enhancement UDOT is evaluating is the concept of Managed Motorways. Managed Motorways are smart freeways that prevent congestion by continuously monitoring traffic flows and controlling access to the freeway with state-of-the-art ramp metering signal technologies that are more precise and sophisticated than other applications currently in use. Current project estimates for managed motorways in Davis and Weber Counties in $80 million. Project benefits include improved facility capacity, travel reliability and safety performance during heavy traffic demand periods by effectively preventing congestion. Preliminary analysis indicates that freeway facilities with these improvements could see a 20% increase vehicle carrying capacity and a 30% reduction in crashes. UDOT requests that this project be included in Phase 1.

1.0 INTRODUCTION

This Noise Analysis was prepared in accordance with 23 CFR §772 and the UDOT Noise Abatement Policy, last revised March 2017.

1.1 STUDY AREA

The study area is approximately 14 miles long. It begins at SR-201 and extends south to 12300 South (see Figure 1).

For I-15, the logical termini for this SES are just south of the SR-201 interchange to the north and 12300 South to the south.

1.2 DESCRIPTION OF PROJECT

The proposed action for this study includes improvements to I-15 in Salt Lake County, Utah, between State Route 201 and 12300 South (refer to Figure 1 for study area). These improvements include the following:

- An additional lane on southbound I-15 between SR-201 and 12300 South
- An additional southbound to eastbound left-turn lane at the 3300 South interchange (for a total of three lanes)
- An additional lane in both directions on 7200 South between southbound I-15 and Bingham Junction Boulevard
- Modification of the I-215 interchange with I-15
- Construction of an additional lane in both directions on 7200 South between southbound I-15 and Bingham Junction Boulevard

1.3 APPLICABILITY

The UDOT Noise Abatement Policy states that "noise abatement will be considered for all Type I projects where noise impacts are identified." Type I projects are projects that include any of the following: the construction of a highway at a new location, the physical alteration of an existing highway that substantially alters its alignment, the addition of a through traffic lane, the addition of an auxiliary lane, or the addition or relocation of interchange lanes or ramps. This project is considered a Type I project because of the addition of a southbound travel lane on I-15 and the addition of through lanes on 7200 South.

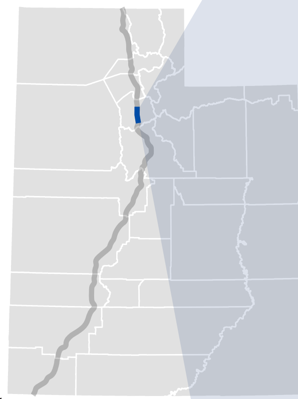

Figure 1. Project Location Map

2.0 ANALYSIS OF TRAFFIC NOISE IMPACTS

Traffic noise is measured in A-weighted sound levels in decibels (dBA) which most closely approximates the way the human ear hears sounds at different frequencies (see Figure 2). Since traffic noise varies over time, the sound levels for this noise analysis are expressed as "equivalent levels" or Leq, representing the average sound level over a one hour period of time. Unless noted otherwise, all sound levels in this noise analysis are expressed in the hourly equivalent noise level.

2.1 NOISE ABATEMENT CRITERIA

FHWA has established Noise Abatement Criteria for several categories of land use activities (see Table 1). FHWA's noise criteria is based on sound levels that are considered to be an impact to nearby property owners, also known as receptors. Primary consideration is to be given for exterior areas where frequent human use occurs.

UDOT has developed a Noise Abatement Policy for transportation projects, which conforms to FHWA noise abatement requirements outlined in 23 CFR §772. UDOT's Noise Abatement Policy states that a traffic noise impact occurs when either 1) the future worst case noise level is equal to or greater than the UDOT Noise Abatement Criteria for specified land use categories or, 2) the future worst case noise level is greater than or equal to an increase of 10 dBA over the existing noise level.

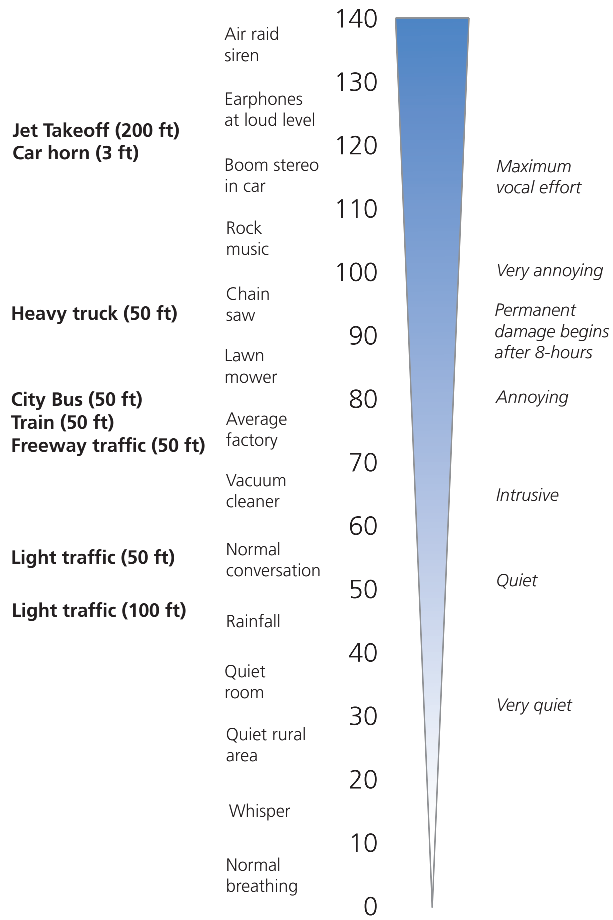

Figure 2. Sound Levels (in dBA) of Common Sounds (Compiled from Federal Transit Administration and Environmental Protection Agency Data)

Table 1: Noise Abatement Criteria

Activity Category	Leq (h)	Activity Description
A	56 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 (Exterior)	Residential.
C	66 (Exterior)	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings.
D	51 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	71 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	---	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	---	Undeveloped lands that are not permitted.

Source: UDOT Noise Abatement Policy

Noise impact and abatement analyses are required within Land Use Activity Categories A, B, C, D, and E (see Table 1) only when development exists or has been permitted (formal building permit issued prior to the date the final environmental decision document is approved). Activity Categories F and G include lands that are not sensitive to traffic noise. There are no impact criteria for these land use types and an analysis of noise impacts is not required.

2.2 NOISE SENSITIVE LAND USES

TThere are no Activity Category A land uses within the study area. Activity Category B land uses include all residences. Activity Category C land uses within the study area include churches (multiple meetinghouses for the Church of Jesus Christ of Latter-day Saints, Calvary Church of Salt Lake, K2 Church), schools (American International School of Utah, Realms of Inquiry (private school), Stevens-Henager College, Columbia College, Oquirrh Mountain Phlebotomy School, Eagle Gate College, Grant Elementary School, Midvale Elementary School, MIdvale Middle School, Salt Lake Community College Miller Campus, Challenger School), parks (Hidden Village Park, Copperview Recreation Center Park, Midvale City Park), non-profit institutional structures (Humane Society, Alano Club, Utah Foster Care, The Road Home shelter), the Midvale City Cemetery, and Lone Peak Hospital. The interior of the churches, schools, hospital, and non-profit institutional structures would be considered Activity Category D. Activity Category E land uses include all other businesses, offices, restaurants, and hotels/motels located within the study area. The UDOT Noise Policy states that a noise impact analysis will not be required for Activity Categories F and G.

2.3 EXISTING NOISE

The primary source of noise in the study area is automobile and truck traffic on I-15, I-215, and other roadways in the area. Existing traffic sound levels for each receptor in the study area were calculated using the Traffic Noise Model (TNM) 2.5 software using existing conditions (travel lane configurations and the posted speed limit). Existing noise levels were determined using the greatest hourly traffic noise conditions likely to occur on a regular basis, or Level-of-Service (LOS) C traffic volumes.

On-site measurements were made to verify the accuracy of the model and are shown in Table 2. To verify that the model represents real-life conditions, the noise measurements must be within 3 dBA of the model's predicted noise level, using the traffic volumes and speeds actually present when the noise measurements were taken.

Table 2. Field Noise Measurements

Site #	Location	Field Noise Level (dBA)	TNM Output (dBA)	Difference
1	Econolodge, 8955 S. 255 W., Sandy, UT	63.3	63.0	0.3
2	Challenger School #2, 9424 S. 300 W., Sandy, UT	68.3	69.2	0.9
3	Private residence, 253 W. 9400 S., Sandy, UT	67.7	68.0	0.3
4	Windmill Cove Apts, 9551 S. Brandy Spring Lane, Sandy, UT	65.3	66.1	0.8
5	Private residence, 385 Gregson Ave., South Salt Lake, UT	67.6	70.3	2.7
6	Denny's restaurant, 420 W. 4500 S., Murray, UT	66.9	67.1	0.2
7	4700 S. Commerce Drive, Murray, UT	68.3	70.7	2.4
8	American International School, 4998 S. 360 W., Murray, UT	63.0	64.9	1.9
9	English Manor Apts., 532 Wasatch Avenue, Midvale, UT	68.8	70.3	1.5
10	The Road Home, 7200 South	64.5	67.3	2.8

2.4 PROJECTED NOISE

Projected traffic noise levels for the Proposed Action were calculated with TNM 2.5 software using build conditions (travel lane configurations and traffic volumes). Noise levels were determined using the greatest hourly traffic noise conditions likely to occur on a regular basis, or LOS C traffic volumes.

The Proposed Action would generally result in a slight noise level increase throughout the study area. The average increase in noise would be 0.4 dBA, with no receptor having an increase of more than 1.5 dBA (see Table 3). The number of receptors that would be impacted by traffic noise is 255 (see maps in Appendix B).

Projected future worst case noise levels and impacted receptors can be seen in the maps in Appendix B.

2.5 SUMMARY

Table 3 shows a summary of Existing and Proposed Action noise levels (the letter on the Map Label represents the activity category). Refer to the maps in Appendix B for receptor locations.

Table 3: Summary of Existing and Proposed Action Noise Levels

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B2	70.7	YES	71.3	YES
B3	70.6	YES	71.1	YES
B4	70.5	YES	71.4	YES
B5	63.4	NO	64.6	NO
B6	68.3	YES	68.3	YES
B7	67.5	YES	68.2	YES
B8	61.6	NO	62.2	NO
B9	61.5	NO	62.1	NO
B10	61.6	NO	62.2	NO
B11	64.5	NO	65.1	NO
G1	65.7	N/A	67.0	N/A
C1	65.8	NO	66.3	YES
C2	67.2	YES	67.7	YES
B12	64.4	NO	64.5	NO
B13	63.6	NO	63.8	NO
B14	62.3	NO	62.5	NO
B15	62.8	NO	63.0	NO
B16	62.3	NO	62.5	NO
G2	63.2	N/A	63.4	N/A
B17	61.9	NO	62.2	NO
B18	62.0	NO	62.3	NO
B19	61.7	NO	61.9	NO
B20	62.0	NO	62.2	NO
B21	62.2	NO	62.4	NO
B22	62.0	NO	62.3	NO
B23	61.9	NO	62.1	NO
B24	60.3	NO	60.4	NO
B25	61.4	NO	61.7	NO
B26	61.7	NO	61.9	NO
B27	61.5	NO	61.8	NO
E1	69.4	NO	69.4	NO
E2	68.4	NO	68.4	NO
E3	65.7	NO	65.9	NO
E4	65.1	NO	65.3	NO
E5	65.4	NO	65.5	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
E6	64.0	NO	64.2	NO
E7	64.0	NO	64.2	NO
E8	63.5	NO	63.7	NO
E9	63.3	NO	63.5	NO
C3	72.0	YES	72.1	YES
C4	73.5	YES	73.6	YES
C5	67.8	YES	68.4	YES
C6	63.8	NO	64.3	NO
B28	70.0	YES	70.1	YES
B29	68.5	YES	68.6	YES
B30	64.3	NO	64.6	NO
B31	61.5	NO	61.7	NO
B32	67.6	YES	67.4	YES
B33	69.7	YES	70	YES
B34	71	YES	71.2	YES
B35	70.8	YES	71.1	YES
C9	65.7	NO	65.9	NO
B36	65.8	NO	65.9	NO
B37	65.8	NO	66.1	YES
B38	65.4	NO	65.7	NO
B39	65.9	NO	66.2	YES
B40	65.5	NO	65.8	NO
B41	64	NO	64.2	NO
B42	63.6	NO	63.9	NO
B43	64	NO	64.3	NO
B44	63.8	NO	64	NO
B45	65.7	NO	66	YES
B46	65.8	NO	66	YES
B47	64.6	NO	64.8	NO
B48	65.7	NO	65.9	NO
B49	64.7	NO	65.2	NO
B50	62.9	NO	63.4	NO
B51	61.2	NO	61.7	NO
B52	61.3	NO	61.7	NO
B53	64.8	NO	65.1	NO
B54	67.7	YES	67.9	YES
B55	66.6	YES	66.8	YES
B56	81.9	YES	82.2	YES
C10	64.6	NO	65	NO
D1	75.3	YES	75.9	YES

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
C11	69.1	YES	69.3	YES
C12	68.9	YES	69.0	YES
D2	64.9	NO	65.1	NO
D3	70.2	NO	70.3	NO
D4	69.4	NO	69.6	NO
D5	69.0	NO	69.1	NO
D6	66.2	NO	66.4	NO
C13	64.2	NO	64.4	NO
B57	61.5	NO	62.0	NO
B58	61.7	NO	61.8	NO
B59	61.6	NO	61.8	NO
E10	64.6	NO	65.3	NO
C14	68.1	YES	68.8	YES
C15	69.0	YES	69.7	YES
C17	69.6	YES	70.3	YES
G3	67.5	N/A	68.2	N/A
G4	67.3	N/A	68.0	N/A
G5	65.4	N/A	66.1	N/A
G6	66.9	N/A	67.6	N/A
C18	67.3	YES	67.9	YES
C19	72.7	YES	73.3	YES
C20	63.4	NO	64.0	NO
C21	62.1	NO	62.7	NO
B60	61.9	NO	62.5	NO
B61	60.8	NO	61.4	NO
B62	61.5	NO	62.0	NO
B63	82.6	YES	83.1	YES
B64	79.8	YES	80.3	YES
B65	59.4	NO	59.8	NO
B66	60.9	NO	61.4	NO
B67	60.6	NO	61.1	NO
B68	60.3	NO	60.8	NO
B69	59.5	NO	60.0	NO
B70	60.9	NO	61.4	NO
B71	61.5	NO	62.0	NO
B72	60.7	NO	61.2	NO
B73	60.3	NO	60.8	NO
B74	59.9	NO	60.4	NO
B75	59.2	NO	59.7	NO
B76	59.0	NO	59.5	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B77	60.1	NO	60.7	NO
B78	60.3	NO	60.8	NO
B79	59.5	NO	60.0	NO
B80	59.0	NO	59.5	NO
D7	63.2	NO	63.7	NO
D8	63.1	NO	63.6	NO
D9	61.9	NO	62.5	NO
D10	62.9	NO	63.5	NO
D11	65.3	NO	65.9	NO
D12	65.2	NO	65.8	NO
D13	62.9	NO	63.4	NO
C22	65.4	NO	66.0	YES
C23	67.2	YES	67.7	YES
C24	63.2	NO	63.7	NO
C25	63.3	NO	63.9	NO
C26	68.7	YES	69.3	YES
C27	72.1	YES	72.7	YES
C28	71.8	YES	72.4	YES
C29	61.8	NO	62.3	NO
C30	67.5	YES	68.1	YES
B81	63.0	NO	63.6	NO
B82	63.8	NO	64.4	NO
B83	63.4	NO	64.0	NO
B84	63.1	NO	63.7	NO
B85	62.4	NO	63.0	NO
B86	62.1	NO	62.7	NO
B87	61.7	NO	62.2	NO
B88	60.9	NO	61.4	NO
B89	60.6	NO	61.2	NO
B90	59.7	NO	60.2	NO
B91	59.5	NO	60.0	NO
B92	60.1	NO	60.6	NO
B93	59.9	NO	60.4	NO
B94	59.8	NO	60.3	NO
B95	59.6	NO	60.1	NO
B96	59.4	NO	59.9	NO
B97	61.9	NO	62.5	NO
G7	62.1	N/A	62.7	N/A
G8	63.0	N/A	63.6	N/A
G9	60.9	N/A	61.5	N/A

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
G10	60.5	N/A	61.0	N/A
G11	60.7	N/A	61.2	N/A
G12	59.6	N/A	60.0	N/A
G13	59.6	N/A	60.1	N/A
B98	61.7	NO	62.2	NO
B99	60.9	NO	61.4	NO
B100	59.8	NO	60.3	NO
B101	62.8	NO	63.4	NO
B102	63.2	NO	63.7	NO
B103	63.1	NO	63.7	NO
B104	60.5	NO	61.0	NO
B105	60.6	NO	61.1	NO
B106	60.9	NO	61.5	NO
B107	63.2	NO	63.8	NO
B108	63.5	NO	64.1	NO
B109	61.7	NO	62.3	NO
B110	60.8	NO	61.3	NO
B111	60.6	NO	61.1	NO
B112	63.2	NO	63.8	NO
B113	63.1	NO	63.8	NO
C31	62.0	NO	62.7	NO
C32	61.5	NO	62.2	NO
C34	59.1	NO	59.7	NO
C35	58.1	NO	58.7	NO
B114	64.2	NO	64.9	NO
B115	63.9	NO	64.6	NO
B116	63.2	NO	63.8	NO
B117	62.5	NO	63.1	NO
B118	61.9	NO	62.5	NO
B119	61.6	NO	62.3	NO
B120	61.8	NO	62.4	NO
B121	62.0	NO	62.6	NO
B122	62.2	NO	62.8	NO
B123	61.2	NO	61.9	NO
B124	61.3	NO	61.9	NO
B125	61.5	NO	62.2	NO
B126	61.8	NO	62.5	NO
B127	61.8	NO	62.4	NO
B128	61.7	NO	62.3	NO
B129	60.7	NO	61.3	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B130	61.3	NO	61.9	NO
B131	61.1	NO	61.7	NO
B132	60.6	NO	61.2	NO
B133	62.0	NO	62.6	NO
D14	66.3	NO	67.0	NO
B134	62.3	NO	62.9	NO
B135	61.1	NO	61.7	NO
B136	61.2	NO	61.8	NO
B137	62.4	NO	63.0	NO
B138	62.5	NO	63.1	NO
B139	62.8	NO	63.4	NO
B140	63.0	NO	63.6	NO
B141	63.2	NO	63.8	NO
B142	63.5	NO	64.1	NO
B143	61.1	NO	61.7	NO
B144	61.4	NO	62.0	NO
B145	61.7	NO	62.3	NO
B146	61.4	NO	62.0	NO
B147	60.9	NO	61.5	NO
B148	61.0	NO	61.5	NO
B149	60.6	NO	61.2	NO
B150	60.6	NO	61.2	NO
B151	60.1	NO	60.7	NO
B152	60.0	NO	60.6	NO
B153	63.6	NO	64.2	NO
B154	63.5	NO	64.1	NO
B155	63.3	NO	63.9	NO
B156	63.9	NO	64.5	NO
B157	62.6	NO	63.2	NO
B158	61.9	NO	62.5	NO
B159	62.7	NO	63.3	NO
B160	62.2	NO	62.8	NO
B161	61.0	NO	61.5	NO
B162	61.3	NO	61.9	NO
B163	62.8	NO	63.4	NO
B164	63.6	NO	64.2	NO
B165	63.3	NO	63.8	NO
B166	63.3	NO	63.8	NO
B167	63.6	NO	64.2	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B168	63.0	NO	63.5	NO
B169	62.3	NO	62.9	NO
B170	62.5	NO	63.1	NO
B171	64.0	NO	64.5	NO
B172	64.4	NO	65.0	NO
B173	64.9	NO	65.4	NO
B174	71.4	YES	72.2	YES
B175	72.2	YES	73.0	YES
B176	72.2	YES	72.9	YES
B177	72.5	YES	73.2	YES
B178	66.2	YES	66.7	YES
B179	66.5	YES	67.0	YES
B180	66.1	YES	66.7	YES
B181	65.5	NO	66.0	YES
B182	65.4	NO	65.9	NO
B183	66.0	YES	66.6	YES
B184	67.1	YES	67.7	YES
B185	65.0	NO	65.6	NO
B186	72.4	YES	73.1	YES
B187	66.3	YES	66.9	YES
B188	65.3	NO	65.9	NO
B189	65.4	NO	66.0	YES
B190	66.2	YES	66.8	YES
B191	72.7	YES	73.4	YES
B192	72.3	YES	73.0	YES
B193	71.9	YES	72.6	YES
B194	71.3	YES	72.0	YES
B195	66.4	YES	67.0	YES
B196	66.6	YES	67.2	YES
B197	65.6	NO	66.2	YES
B198	64.7	NO	65.3	NO
B199	70.9	YES	71.6	YES
B200	70.4	YES	71.1	YES
B201	66.1	YES	66.7	YES
B202	67.1	YES	67.7	YES
B203	66.5	YES	67.0	YES
B204	65.8	NO	66.3	YES
B205	66.0	YES	66.6	YES
B206	66.5	YES	67.1	YES

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B207	67.3	YES	67.9	YES
B208	64.3	NO	64.9	NO
B209	68.3	YES	68.9	YES
B210	69.4	YES	70.1	YES
B211	66.4	YES	67.0	YES
B212	66.3	YES	66.9	YES
B213	65.8	NO	66.5	YES
B214	65.3	NO	66.0	YES
B215	66.3	YES	66.9	YES
B216	63.5	NO	64.1	NO
B217	67.6	YES	68.2	YES
B218	67.1	YES	67.8	YES
B219	66.6	YES	67.2	YES
B220	63.0	NO	63.7	NO
B221	68.4	YES	69.1	YES
B222	66.8	YES	67.5	YES
B223	66.8	YES	67.4	YES
B224	66.3	YES	66.9	YES
B225	67.1	YES	67.7	YES
B226	66.3	YES	66.9	YES
B227	66.8	YES	67.4	YES
B228	67.9	YES	68.6	YES
B229	66.1	YES	66.7	YES
G15	67.0	N/A	67.7	N/A
B230	65.6	NO	66.2	YES
B231	64.6	NO	65.2	NO
B232	64.1	NO	64.7	NO
B233	63.7	NO	64.3	NO
B234	63.1	NO	63.7	NO
B235	64.3	NO	64.9	NO
B236	63.0	NO	63.6	NO
B237	62.5	NO	63.0	NO
B238	61.5	NO	62.1	NO
B239	60.9	NO	61.5	NO
B240	60.9	NO	61.5	NO
B241	61.8	NO	62.4	NO
B242	62.0	NO	62.6	NO
B243	62.6	NO	63.2	NO
B244	64.3	NO	64.9	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B245	64.6	NO	65.2	NO
B246	64.4	NO	65.0	NO
B247	64.6	NO	65.1	NO
B248	59.4	NO	59.9	NO
B249	61.1	NO	61.7	NO
B250	60.8	NO	61.4	NO
B251	59.2	NO	59.7	NO
B252	58.2	NO	58.8	NO
B253	64.7	NO	65.3	NO
B254	64.6	NO	65.1	NO
B255	64.7	NO	65.2	NO
B256	64.7	NO	65.2	NO
B257	59.4	NO	59.9	NO
B258	59.4	NO	59.9	NO
B259	59.7	NO	60.2	NO
B260	61.2	NO	61.8	NO
B261	61.0	NO	61.5	NO
B262	60.8	NO	61.4	NO
B263	61.1	NO	61.6	NO
B264	61.3	NO	61.8	NO
B265	63.8	NO	63.9	NO
B266	63.4	NO	63.6	NO
B267	64.8	NO	65.3	NO
B268	64.5	NO	65.0	NO
B269	63.0	NO	63.5	NO
B270	60.8	NO	61.3	NO
B271	60.5	NO	61.1	NO
B272	62.8	NO	63.0	NO
B273	63.2	NO	63.4	NO
B274	63.0	NO	63.2	NO
B275	63.2	NO	63.4	NO
B276	62.9	NO	63.1	NO
B277	63.6	NO	63.8	NO
B278	64.0	NO	64.1	NO
B279	63.3	NO	63.5	NO
B280	63.5	NO	64.0	NO
B281	64.4	NO	64.8	NO
B282	64.2	NO	64.7	NO
B283	64.6	NO	65.1	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B284	64.4	NO	64.9	NO
B285	64.7	NO	65.1	NO
B286	65.0	NO	65.4	NO
B287	63.8	NO	64.1	NO
B288	62.8	NO	63.2	NO
B289	58.8	NO	59.2	NO
B290	58.4	NO	58.8	NO
B291	58.3	NO	58.7	NO
B292	57.9	NO	58.4	NO
B293	57.6	NO	58.1	NO
B294	59.3	NO	59.8	NO
B295	59.3	NO	59.8	NO
B296	59.3	NO	59.8	NO
B297	59.5	NO	60.0	NO
B298	59.2	NO	59.6	NO
B299	60.4	NO	60.9	NO
B300	60.2	NO	60.7	NO
B301	60.4	NO	60.9	NO
B302	61.6	NO	62.0	NO
B303	60.8	NO	61.2	NO
B304	60.3	NO	60.6	NO
B305	59.5	NO	59.9	NO
B306	58.5	NO	58.9	NO
B307	62.2	NO	62.6	NO
B308	61.3	NO	61.8	NO
B309	59.5	NO	60.0	NO
B310	58.7	NO	59.1	NO
B311	59.1	NO	59.4	NO
B312	60.5	NO	60.7	NO
B313	58.0	NO	58.4	NO
B314	58.2	NO	58.6	NO
B315	63.5	NO	63.7	NO
C36	58.3	NO	58.6	NO
C37	58.1	NO	58.5	NO
C38	57.6	NO	58.0	NO
C39	60.0	NO	60.4	NO
C40	58.2	NO	58.6	NO
C41	59.0	NO	59.4	NO
C42	59.7	NO	60.0	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
C43	57.5	NO	57.9	NO
C44	57.3	NO	57.7	NO
D15	57.6	NO	58.0	NO
D16	59.4	NO	59.9	NO
D17	58.3	NO	58.7	NO
B316	56.4	NO	56.6	NO
B317	56.0	NO	56.2	NO
B318	55.4	NO	55.7	NO
B319	55.6	NO	55.9	NO
B320	55.4	NO	55.7	NO
B321	56.7	NO	57.0	NO
B322	54.0	NO	54.3	NO
B323	64.5	NO	64.5	NO
B324	58.5	NO	58.7	NO
B325	55.0	NO	55.3	NO
B326	56.5	NO	56.9	NO
B327	66.1	YES	66.5	YES
B328	65.4	NO	65.7	NO
B329	63.9	NO	64.2	NO
B330	64.8	NO	65.3	NO
B331	64.4	NO	64.9	NO
B332	64.9	NO	65.2	NO
B333	64.5	NO	65.0	NO
B334	64.1	NO	64.6	NO
B335	63.7	NO	64.2	NO
B336	64.5	NO	65.0	NO
B337	64.3	NO	64.8	NO
B338	64.3	NO	64.7	NO
B339	63.5	NO	64.0	NO
B340	62.7	NO	63.2	NO
B341	62.6	NO	62.9	NO
B342	62.7	NO	63.0	NO
B343	62.3	NO	62.8	NO
B344	61.3	NO	61.8	NO
B345	61.8	NO	62.2	NO
B346	62.6	NO	63.0	NO
B347	62.4	NO	62.6	NO
B348	59.6	NO	60.0	NO
B349	59.0	NO	59.5	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B350	59.4	NO	59.9	NO
B351	62.6	NO	62.9	NO
B352	62.6	NO	62.9	NO
B353	62.5	NO	62.9	NO
B354	59.5	NO	59.9	NO
B355	59.7	NO	60.1	NO
B356	60.9	NO	61.3	NO
B357	62.8	NO	63.1	NO
B358	62.7	NO	63.1	NO
B359	62.6	NO	63.0	NO
B360	62.2	NO	62.6	NO
B361	62.3	NO	62.7	NO
B362	62.3	NO	62.7	NO
B363	62.4	NO	62.7	NO
B364	62.4	NO	62.7	NO
B365	62.3	NO	62.6	NO
B366	62.6	NO	62.9	NO
B367	62.3	NO	62.7	NO
B368	62.3	NO	62.7	NO
B369	62.6	NO	62.9	NO
E10	66.2	NO	66.3	NO
E11	64.6	NO	64.8	NO
B370	58.9	NO	59.2	NO
B371	69.5	YES	69.9	YES
B372	71.3	YES	71.6	YES
B373	65.1	NO	65.5	NO
B374	64.0	NO	64.5	NO
B375	64.0	NO	64.4	NO
B376	63.2	NO	63.6	NO
B377	62.9	NO	63.3	NO
B378	62.8	NO	63.2	NO
B379	62.5	NO	62.9	NO
B380	62.6	NO	63.0	NO
B381	63.9	NO	64.4	NO
B382	63.6	NO	64.0	NO
B383	61.0	NO	61.5	NO
B384	59.9	NO	60.3	NO
B385	58.9	NO	59.3	NO
B386	58.3	NO	58.7	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B387	63.4	NO	63.9	NO
B388	61.8	NO	62.2	NO
B389	60.9	NO	61.3	NO
B390	61.2	NO	61.6	NO
B391	61.6	NO	62.0	NO
B392	61.7	NO	62.1	NO
B393	62.0	NO	62.4	NO
B394	61.7	NO	62.1	NO
B395	62.5	NO	62.9	NO
B396	62.4	NO	62.9	NO
B397	62.8	NO	63.2	NO
B398	62.5	NO	62.9	NO
B399	63.1	NO	63.5	NO
B400	63.1	NO	63.5	NO
B401	62.3	NO	62.7	NO
B402	63.3	NO	63.8	NO
B403	63.5	NO	63.9	NO
B404	62.4	NO	62.8	NO
B405	61.0	NO	61.5	NO
B406	63.0	NO	63.5	NO
B407	63.0	NO	63.5	NO
B408	63.9	NO	64.4	NO
B409	63.3	NO	63.7	NO
B410	63.2	NO	63.6	NO
B411	69.2	YES	69.3	YES
B412	68.3	YES	68.5	YES
B413	67.5	YES	67.7	YES
B414	69.7	YES	69.9	YES
B415	67.8	YES	68.0	YES
B416	66.9	YES	67.2	YES
B417	70.5	YES	70.7	YES
B418	68.7	YES	68.9	YES
B419	68.2	YES	68.4	YES
B420	65.0	NO	65.3	NO
B421	64.3	NO	64.6	NO
B422	64.3	NO	64.6	NO
B423	66.1	YES	66.4	YES
C45	67.8	YES	68.0	YES
C46	65.2	NO	65.4	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B424	66.6	YES	66.8	YES
B425	65.7	NO	65.9	NO
B426	65.7	NO	65.9	NO
B427	66.2	YES	66.5	YES
B428	66.1	YES	66.3	YES
B429	65.6	NO	65.9	NO
B430	65.2	NO	65.4	NO
B431	64.7	NO	65.0	NO
B432	64.8	NO	65.0	NO
B433	64.8	NO	65.1	NO
B434	68.7	YES	68.9	YES
B435	68.7	YES	68.8	YES
B436	68.9	YES	69.0	YES
B437	68.8	YES	69.0	YES
B438	68.8	YES	68.9	YES
B439	68.9	YES	69.0	YES
B440	69.3	YES	69.4	YES
B441	69.2	YES	69.3	YES
B442	69.3	YES	69.4	YES
B443	69.9	YES	70.0	YES
B444	70.4	YES	70.5	YES
B445	70.4	YES	70.5	YES
B446	70.5	YES	70.6	YES
B447	68.7	YES	68.8	YES
B448	69.8	YES	69.9	YES
B449	69.2	YES	69.3	YES
B450	69.3	YES	69.4	YES
B451	69.3	YES	69.4	YES
B452	69.3	YES	69.4	YES
B453	69.2	YES	69.3	YES
B454	69.2	YES	69.3	YES
B455	69.2	YES	69.3	YES
B456	68.9	YES	69.0	YES
B457	69.1	YES	69.3	YES
B458	69.2	YES	69.4	YES
B459	69.0	YES	69.1	YES
B460	69.4	YES	69.5	YES
B461	69.8	YES	70.0	YES
B462	70.5	YES	70.6	YES

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B463	69.2	YES	69.4	YES
B464	69.2	YES	69.7	YES
B465	67.3	YES	67.8	YES
B466	66.6	YES	67.1	YES
B467	63.0	NO	63.5	NO
B468	71.9	YES	72.5	YES
B469	67.9	YES	68.4	YES
B470	68.0	YES	68.4	YES
G17	69.8	N/A	69.9	N/A
G18	68.9	N/A	69.0	N/A
G19	67.8	N/A	68.0	N/A
B471	67.0	YES	67.2	YES
B472	67.6	YES	67.8	YES
B473	67.7	YES	67.9	YES
B474	67.6	YES	67.8	YES
B475	68.9	YES	69.1	YES
B476	68.0	YES	68.2	YES
B477	68.6	YES	68.8	YES
B478	68.1	YES	68.6	YES
B479	67.9	YES	68.3	YES
B480	66.4	YES	66.9	YES
B481	67.2	YES	67.6	YES
B482	66.2	YES	66.7	YES
B483	65.4	NO	65.9	NO
B484	66.3	YES	66.8	YES
B485	66.4	YES	66.9	YES
B486	66.6	YES	67.1	YES
B487	66.7	YES	67.2	YES
B488	69.0	YES	69.2	YES
B489	68.4	YES	68.6	YES
B490	67.1	YES	67.3	YES
B491	67.8	YES	68.0	YES
B492	67.6	YES	67.7	YES
B493	70.0	YES	70.1	YES
B494	70.1	YES	70.2	YES
B495	70.3	YES	70.4	YES
B496	70.9	YES	71.0	YES
B497	69.6	YES	69.8	YES
B498	67.2	YES	67.4	YES

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B499	70.7	YES	70.9	YES
B500	70.8	YES	70.9	YES
B501	67.3	YES	67.7	YES
B502	62.9	NO	63.4	NO
B503	62.2	NO	62.6	NO
B504	62.4	NO	62.9	NO
B505	62.8	NO	63.3	NO
B506	66.8	YES	67.2	YES
B507	66.3	YES	66.8	YES
B508	65.5	NO	66.0	YES
B509	66.4	YES	66.8	YES
B510	64.5	NO	65.0	NO
B511	62.6	NO	63.1	NO
B512	62.9	NO	63.4	NO
B513	66.5	YES	66.9	YES
B514	66.5	YES	67.0	YES
B515	62.6	NO	63.1	NO
B516	63.3	NO	63.7	NO
B517	66.0	YES	66.5	YES
B518	70.5	YES	70.7	YES
B519	70.2	YES	70.4	YES
B520	64.1	NO	64.3	NO
B521	63.6	NO	63.8	NO
B522	63.3	NO	63.6	NO
B523	63.8	NO	64.0	NO
B524	62.5	NO	62.7	NO
B525	64.0	NO	64.2	NO
B526	64.3	NO	64.5	NO
B527	64.2	NO	64.4	NO
B528	70.6	YES	70.7	YES
B529	70.7	YES	70.8	YES
B530	71.2	YES	71.3	YES
B531	71.1	YES	71.2	YES
B532	71.1	YES	71.2	YES
B533	71.1	YES	71.2	YES
B534	66.2	YES	66.7	YES
B535	63.0	NO	63.5	NO
B536	65.0	NO	65.2	NO
B537	71.4	YES	71.5	YES

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
B538	66.2	YES	66.6	YES
B539	63.5	NO	• 64.0	NO
B540	63.2	NO	63.7	NO
B541	66.6	YES	67.2	YES
B542	64.1	NO	64.6	NO
B543	64.7	NO	65.2	NO
B544	68.4	YES	68.9	YES
B545	71.3	YES	71.4	YES
B546	64.7	NO	64.9	NO
B547	63.2	NO	63.4	NO
B548	63.8	NO	64.1	NO
B549	63.8	NO	64.1	NO
B550	64.1	NO	64.4	NO
B551	63.5	NO	63.8	NO
B552	63.5	NO	63.8	NO
B553	71.2	YES	71.3	YES
B554	71.7	YES	71.8	YES
B555	71.5	YES	71.6	YES
B556	71.4	YES	71.5	YES
B557	64.3	NO	64.7	NO
B558	64.6	NO	64.9	NO
B559	71.6	YES	71.8	YES
B560	71.7	YES	71.9	YES
B561	71.7	YES	71.9	YES
B562	71.2	YES	71.4	YES
B563	71.0	YES	71.2	YES
B564	62.2	NO	62.5	NO
B565	71.6	YES	71.7	YES
B566	71.9	YES	72.1	YES
B567	71.7	YES	71.9	YES
B568	71.8	YES	71.9	YES
B569	72.0	YES	72.2	YES
B570	72.0	YES	72.2	YES
B571	67.5	YES	67.8	YES
B572	68.3	YES	68.6	YES
B573	66.8	YES	67.1	YES
B574	67.2	YES	67.5	YES
C47	69.0	YES	69.2	YES
C48	68.9	YES	69.1	YES

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
C49	66.0	YES	66.3	YES
C50	67.0	YES	67.2	YES
G18	74.4	N/A	74.6	N/A
B575	63.4	NO	63.7	NO
B576	62.7	NO	63.0	NO
B577	59.9	NO	60.2	NO
B578	58.8	NO	59.0	NO
E12	66.2	NO	66.4	NO
C51	75.0	YES	75.2	YES
C52	69.6	YES	69.8	YES
C53	70.2	YES	70.5	YES
B579	71.4	YES	71.5	YES
B580	69.0	YES	69.2	YES
B581	64.8	NO	65.1	NO
B582	65.3	NO	65.5	NO
B583	66.0	YES	66.2	YES
B584	66.4	YES	66.7	YES
B585	67.4	YES	67.7	YES
B586	68.0	YES	68.2	YES
B587	68.5	YES	68.7	YES
B588	69.6	YES	69.9	YES
B589	70.6	YES	70.9	YES
B590	69.6	YES	69.9	YES
B591	67.0	YES	67.3	YES
B592	66.5	YES	66.8	YES
B593	66.4	YES	66.7	YES
B594	66.5	YES	66.7	YES
B595	69.9	YES	70.1	YES
B596	63.8	NO	64.1	NO
B597	63.9	NO	64.2	NO
B598	69.0	YES	69.2	YES
B599	67.8	YES	68.0	YES
B600	65.5	NO	65.8	NO
B601	64.0	NO	64.3	NO
B602	62.4	NO	62.7	NO
B603	63.0	NO	63.3	NO
C54	66.6	YES	67.2	YES
C55	68.3	YES	68.9	YES
D18	68.3	NO	68.9	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
D19	68.9	NO	69.5	NO
D21	65.0	NO	65.5	NO
D22	62.4	NO	62.8	NO
D23	59.7	NO	60.2	NO
D24	62.5	NO	63.0	NO
C56	65.0	NO	65.5	NO
C57	60.5	NO	60.9	NO
E13	77.0	YES	77.2	YES
E14	77.1	YES	77.3	YES
C58	57.1	NO	57.4	NO
E15	73.2	YES	73.7	YES
E16	70.5	NO	71.0	YES
E17	70.3	NO	70.9	NO
E18	68.8	NO	68.9	NO
E29	66.6	NO	66.7	NO
E19	68.7	NO	68.8	NO
E20	66.7	NO	66.9	NO
G19	65.6	N/A	66.2	N/A
G20	69.4	N/A	69.5	N/A
G21	70.2	N/A	70.4	N/A
G22	66.7	N/A	66.9	N/A
G23	66.7	N/A	66.9	N/A
G24	67.4	N/A	68.0	N/A
G25	68.8	N/A	69.5	N/A
G26	70.8	N/A	70.9	N/A
G27	67.0	N/A	67.2	N/A
G28	71.9	N/A	72.0	N/A
G29	67.5	N/A	67.7	N/A
G30	69.9	N/A	70.5	N/A
G31	66.4	N/A	67.1	N/A
G32	74.2	N/A	74.3	N/A
G33	69.8	N/A	70.0	N/A
G34	70.1	N/A	70.7	N/A
G35	70.8	N/A	71.5	N/A
G36	67.0	N/A	67.6	N/A
G37	76.1	N/A	76.2	N/A
G38	69.2	N/A	69.4	N/A
G39	64.4	N/A	65.1	N/A
E21	66.4	NO	67.1	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
E22	67.8	NO	68.4	NO
E23	75.1	YES	75.8	YES
C61	63.0	NO	63.3	NO
C62	62.4	NO	62.8	NO
G40	70.9	N/A	71.6	N/A
G41	70.6	N/A	71.2	N/A
G42	64.8	N/A	65.4	N/A
G43	75.4	N/A	75.4	N/A
G44	67.6	N/A	67.6	N/A
G45	72.4	N/A	72.3	N/A
G46	72.0	N/A	72.0	N/A
G47	72.5	N/A	72.4	N/A
G48	72.2	N/A	72.2	N/A
G49	67.1	N/A	67.0	N/A
G50	66.5	N/A	66.5	N/A
G51	69.7	N/A	69.6	N/A
G52	70.2	N/A	70.1	N/A
G53	73.8	N/A	73.8	N/A
G54	79.5	N/A	79.5	N/A
B604	66.1	YES	66.3	YES
B605	65.3	NO	65.5	NO
B606	65.1	NO	65.3	NO
B607	65.5	NO	65.7	NO
G55	67.7	N/A	67.9	N/A
G56	69.0	N/A	69.2	N/A
G57	70.8	N/A	71.0	N/A
G58	74.4	N/A	74.6	N/A
C63	63.1	NO	63.4	NO
C64	63.6	NO	63.9	NO
C65	61.6	NO	61.8	NO
G59	76.5	N/A	76.6	N/A
G60	67.6	N/A	67.9	N/A
G61	60.3	N/A	60.6	N/A
E24	73.9	YES	74.1	YES
C66	67.0	YES	67.2	YES
C67	64.7	NO	64.9	NO
E25	69.5	NO	69.8	NO
E26	69.6	NO	69.8	NO

Map Label	Existing Noise Levels (dBA)	Impact	Proposed Action Noise Levels (dBA)	Impact
E27	64.7	NO	65.0	NO
G62	70.2	N/A	70.9	N/A
G63	65.3	N/A	65.9	N/A
G64	67.6	N/A	68.2	N/A
C68	68.1	YES	68.8	YES
C69	70.4	YES	71.1	YES
C70	63.9	NO	64.5	NO
C71	66.6	YES	67.0	YES
B608	64.7	NO	64.9	NO
B609	63.8	NO	64.0	NO
B610	55.4	NO	55.8	NO
B611	55.3	NO	55.6	NO
B612	63.4	NO	63.6	NO
B613	58.5	NO	58.8	NO
C72	71.9	YES	72.5	YES
C73	71.0	YES	71.6	YES
C74	71.3	YES	71.8	YES

3.0 NOISE ABATEMENT

According to the UDOT Noise Abatement Policy, specific conditions must be met before traffic noise abatement is implemented. Noise mitigation must be considered feasible and reasonable. Some of the factors considered when determining if mitigation is feasible and reasonable include, but are not limited to, the following:

- **Engineering Considerations:** Engineering considerations such as safety, presence of cross streets, sight distance, access to adjacent properties, barrier height, topography, drainage, utilities, maintenance access and maintenance of the abatement measure must be taken into account as part of establishing feasibility.
- **Safety on Urban Non-Access Controlled Roadways:** To avoid a damaged wall from becoming a safety hazard, in the event of a failure, wall height shall be no greater than the distance from the back of curb to the face of proposed wall.
- **Acoustic Feasibility:** Noise abatement must be considered "acoustically feasible". This is defined as achieving at least a 5 dBA highway traffic noise reduction for at least 50% of front-row receptors.
- **Noise Abatement Design Goal:** Every reasonable effort should be made to obtain substantial noise reductions. UDOT defines the minimum noise reduction (design goal) from proposed abatement measures to be 7 dBA or greater for at least 35% of front-row receptors.
- **Cost Effectiveness:** The cost used to determine reasonable mitigation for Activity Category B is $30,000 per benefited receptor. (A benefited receptor is a noise-sensitive receptor that is predicted to receive a minimum of 5 dBA of noise reduction as a result of noise abatement.) The cost used to determine reasonable mitigation for Activity Categories A, C, D, or E is $360 per linear foot.
- **Viewpoints of Property Owners and Residents:** As part of the final design phase, public balloting would take place if noise abatement measures appear to meet the criteria outlined in UDOT's Noise Abatement Policy.

Under UDOT's Noise Abatement Policy, only Type I projects are eligible for noise abatement measures. Type I projects are projects that include any of the following: the construction of a highway at a new location, the physical alteration of an existing highway that substantially alters its alignment, the addition of a through traffic lane, the addition of an auxiliary lane, or the addition or relocation of interchange lanes or ramps. The Preferred Alternative is a Type I project so noise abatement was considered. The types of noise mitigation measures considered included traffic management measures and noise barriers.

3.1 TRAFFIC MANAGEMENT MEASURES

Traffic management measures include reducing speed or signing for the restriction of compression brakes. According to the Highway Traffic Noise Analysis and Abatement Policy and Guidance report produced by FHWA, a reduction in speed of more than 20 mph is necessary for a noticeable decrease in noise levels. Therefore, speed reduction is not a reasonable abatement measure for this project because it is not consistent with the roadway classification.

3.2 NOISE BARRIERS

For a sound wall to be effective, it must be high enough and long enough to block the view of the noise source from the receptor's perspective. The Highway Traffic Noise Analysis and Abatement Policy and Guidance states that a good rule of thumb is that the noise barrier should extend four times as far in each direction as the distance from the receptor to the barrier. For instance, if the receptor is 50 feet from the proposed noise barrier, the barrier needs to extend at least 200 feet on either side of the receptor in order to shield the receptor from noise traveling past the ends of the barrier.

Noise walls were analyzed for more than 20 different locations along I-15 where noise impacts occur. The majority of these walls were not found to be reasonable or feasible. The farther away a receptor is from I-15, the less likely the 7 dBA reduction for at least 35% of front-row receptors criteria can be met. This is because a noise wall creates a noise "shadow zone" behind it. The shadow zone is where the noise benefits are the greatest. When a receptor is farther from a potential wall at the edge of I-15, the benefits are decreased. Additionally, solitary receptors or receptors that are widely spaced are also less likely to receive a noise wall because it takes a longer wall to create a noise reduction benefit and the cost effectiveness criteria cannot be met.

See below for a summary of the noise walls considered.

Area 1: 3300 South Interchange

There are five residences and two non-profit structures (both owned by Granite School District) near the I-15/3300 South Interchange that are impacted by noise. All of the receptors are located east of I-15 and north of 3300 South. This is primarily an industrial area and the noise-sensitive uses are intermingled sporadically. A 1150-foot long noise wall was considered to reduce noise at all of the impacted receptors. It was determined a 6-foot to 16-foot tall noise wall would not provide at least a 7 dBA reduction at any of the first row receptors. This wall does not meet the UDOT Noise Abatement Design Goal and is not recommended.

Figure 3. Noise Barrier Analysis Area 1, 3300 South

Area 2: 4500 South Interchange

There are two residences and one non-profit structure (Humane Society of Utah) near the I-15/4500 South Interchange that are impacted by noise. All of the impacted receptors are located east of I-15. This is primarily a commercial/industrial area and the noise-sensitive uses are intermingled. It was found that a 16-foot noise wall would not reduce noise levels at Receptors B28, B29 by 7 dBA or more, no matter the length of the wall. A 550-foot long noise wall was considered to reduce noise at the Humane Society receptors (C3 and C4). It was determined a noise wall from 6-foot to 14-foot tall noise wall would not provide at least a 7 dBA reduction at any of the first row receptors. A 16-foot tall noise wall would reduce noise at Receptor C4 by 7.0 dBA, but the cost per benefitted receptor would be $88,000. This wall does not meet the Cost Effectiveness criteria and is not recommended.

On the south side of 4500 South, a noise wall from 6-foot to 16-foot tall did not reduce noise levels at Receptor B32 by 7 dBA or more and does not meet the UDOT Noise Abatement Design Goal. A noise wall is not recommended.

Figure 4. Noise Barrier Analysis Area 2, 4500 South

Area 3: 4800 South

There are six residences east of I-15 and north of 4800 South that are impacted by noise. A 1000-foot long noise wall was considered to reduce noise at all of the impacted receptors. It was determined even a 16-foot tall noise wall would not provide at least a 7 dBA reduction at any of the first row receptors. This wall does not meet the UDOT Noise Abatement Design Goal and is not recommended.

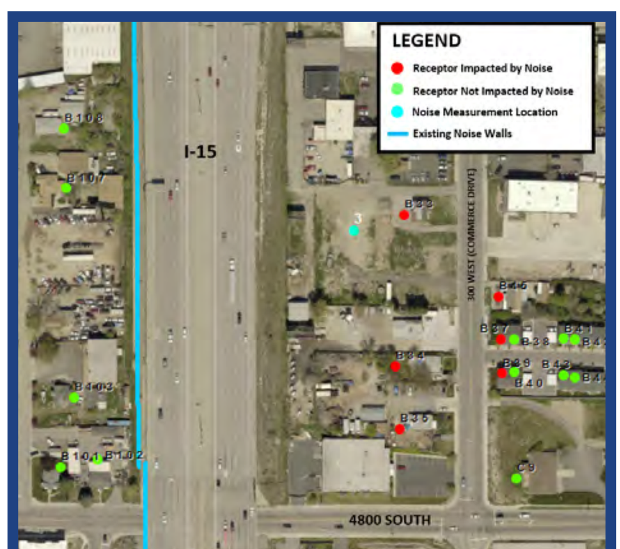

Figure 5. Noise Barrier Analysis Area 3, 4800 South

Area 4: 5100 South

West Side

On the west of I-15 at 5100 South, there is a park at the Hunters Woods Apartments (C22), a recreational area owned by the America International School of Utah (represented by Receptors C23, C26, C27, C28, and C30), two residences (B64 and B63), Stevens Henager College (C19) and an office with outdoor areas (C18). A 2300-foot long noise wall was considered to reduce noise at all of the impacted receptors. It was determined a 16-foot tall noise wall would provide at least a 7 dBA reduction at only one of the first row receptors. This wall does not meet the UDOT Noise Abatement Design Goal and is not recommended.

East Side

On the east side of I-15 at 5100 South, there are three residences impacted by noise (Receptors B54, B55, B56). A 290-foot long noise wall was analyzed from the south end of the storage units to the Vine Street bridge over I-15. It was determined a 6-foot to 16-foot tall noise wall would provide at least a 7 dBA reduction at the only first row receptor, Receptor B56. However, the lowest cost per benefited receptor was for a 6-foot wall at $34,800, which exceeds the allowed cost of $30,000 per benefited receptor. This wall is not recommended.

Figure 6. Noise Barrier Analysis Area 4, 5100 South

Area 5: 5300 South Interchange

West Side

On the west of I-15 at 5100 South, there are three office buildings with outdoor areas (C14, C15, and C17). A 1200-foot long noise wall was analyzed to reduce noise at all of the impacted receptors. It was determined a 6-foot to 16-foot tall noise wall would not provide at least a 7 dBA reduction at any of the first row receptors. This wall does not meet the UDOT Noise Abatement Design Goal and is not recommended.

East Side

On the east side of I-15 at 5400 South, there is an outdoor office space impacted by noise (Receptors

Figure 7. Noise Barrier Analysis Area 5, 5300 South

C12 and C13). A 1000-foot long noise wall was analyzed for this area. It was determined a 6-foot to 16-foot tall noise wall would not provide at least a 7 dBA reduction at any of the first row receptors. This wall does not meet the UDOT Noise Abatement Design Goal and is not recommended.

Area 6: 7200 South Interchange

On the west of I-15 at 7200 South, a homeless shelter, The Road Home, is impacted by noise. Noise walls were modeled at three separate locations: next to the I-15 mainline, on the west side of the I-215 to I-15 Southbound Collector, and at the property line between the Road Home and the UPRR/UTA tracks. It was found that a 6-foot to 16-foot wall at the I-15 mainline location would reduce noise at The Road Home receptors by less than 2 dBA. A 6-foot to 16-foot wall at the property line between The Road Home and the railroad tracks would reduce noise at the impacted receptors by about 4 dBA. Neither of these wall locations would meet the UDOT Noise Abatement Design Goal of a 7 dBA reduction for at least 35% of front-row receptors.

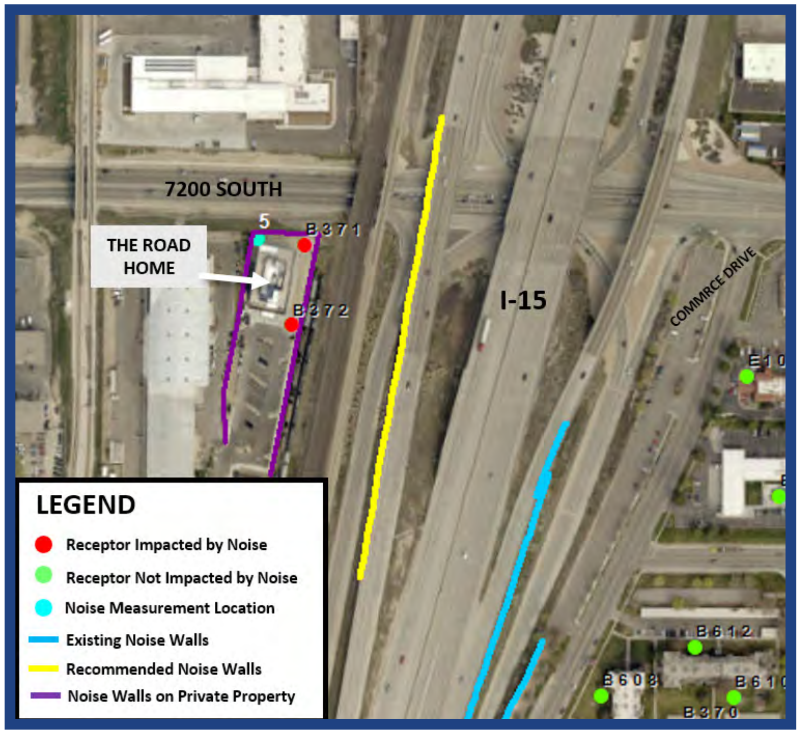

Figure 8. Noise Barrier Analysis Area 6, 7200 South

The wall modeled along the west side of the I-215 to I-15 Southbound Collector would extend from the approach to the bridge across 7200 South and continue for 1,100 feet. The wall would block noise from I-15 to The Road Home shelter for the homeless on the southwest corner of I-15 and 7200 South. A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for any of the front row receptors. A 16-foot wall would meet the acoustic feasibility requirements, reduce noise levels by 7 dBA for 50% of front row receptors, and would be cost-effective. This wall is found to be reasonable and feasible. It is recommended that a 16-foot noise wall be constructed along the west side of the I-215 to I-15 Southbound Collector Ramp, pending the results of balloting by affected property owners and tenants.

Area 7: Wasatch Street

This noise wall would be located on the west side of I-15 near the Wasatch Street bridge. The noise wall would extend approximately 1,200 feet as shown on the figure to the right. The wall would block noise from I-15 to the English Manor Apartments and three single-family homes on Wasatch Street and Allen Street. A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for any of the front row receptors. A 16-foot wall would meet the acoustic feasibility requirements, reduce noise levels by 7 dBA for 92% of front row receptors, and would be cost-effective. This wall is found to be reasonable and feasible. It is recommended that a 16-foot noise wall be constructed at this location, pending the results of balloting by affected property owners and tenants.

A noise wall was also modeled at the property line between the English Manor Apartments and the UPRR/UTA tracks. This wall would extend about 500 feet from the south end of the storage units, past the English Manor property, and terminate at Wasatch Avenue. This noise wall would not reduce the noise at any of the first-row receptors by 7 dBA or more and would not meet the UDOT Noise Abatement Design Goal. Therefore, a noise wall at this location is not recommended.

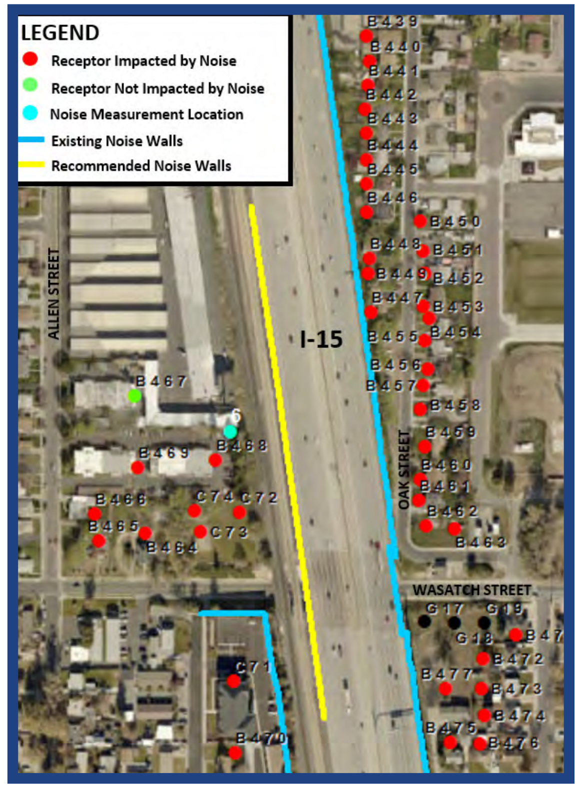

Figure 9. Noise Barrier Analysis Area 7, Wasatch Street

Area 8: Sandy Classic Fun Center

On the east side of I-15 just south of 9000 South, the outdoor recreation areas at the Sandy Classic Fun Center are impacted by noise. A noise wall of 825 feet in length was analyzed on the east side of the I-15 mainline at this location. A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for front-row receptors. A 16-foot noise wall would reduce noise levels by 7 dBA for Receptor C51, at a total wall cost of $264,640. A wall shorter than 825 feet in length would no longer produce a 7 dBA benefit at any of the receptors. This property has a frontage of about 315 feet. For non-residential receptors, the cost-effectiveness criterion is $360 per linear foot, allowing a total wall cost of $114,120. This wall exceeds the cost-effectiveness limit and a noise wall is not recommended for this location.

Figure 10. Noise Barrier Analysis Area 8, Sandy Classic Fun Center

Figure 11. Noise Barrier Analysis Area 9, 9400 South

Area 9: 9400 South

West Side

The playground at the Challenger School on the west side of I-15 at 9424 South 300 West is impacted by noise. A noise wall of 700 feet in length was analyzed on the west side of the I-15 mainline at this location. A 6-foot to 16-foot wall would not reduce noise levels by 7 dBA for any of the receptors. Therefore, a noise wall is not considered feasible and reasonable at this location.

East Side

Two single-family residences on 9400 South, ten homes on 175 West, several buildings and recreation areas at Windmill Cove apartments, and outdoor areas at the Hyatt House hotel are impacted by noise. A noise wall of 2725 feet in length was analyzed on the east side of the I-15 mainline at this location. A 6-foot to 16-foot wall would not reduce noise levels by 7 dBA for any of the receptors. Therefore, a noise wall is not considered feasible and reasonable at this location.

Figure 12. Noise Barrier Analysis Area 10, 9800 South

Area 10: 9800 South

West Side

Outdoor areas at an office building at 9850 South 300 West are impacted by noise. A noise wall of 1400 feet in length was analyzed on the west side of the I-15 mainline at this location. A 6-foot to 16-foot wall would not reduce noise levels by 7 dBA for any of the receptors. Therefore, a noise wall is not considered feasible and reasonable at this location.

Area 11: 10600 South

Outdoor areas of the Super 8 Motel at 10722 South 300 West are impacted by noise. A noise wall of 1400 feet in length was analyzed on the west side of the I-15 mainline at this location. A 6-foot to 16-foot wall would not reduce noise levels by 7 dBA for any of the receptors. Therefore, a noise wall is not considered feasible and reasonable at this location.

Figure 13. Noise Barrier Analysis Area 11, 10600 South

Area 12: 12000 South

Outdoor areas of the Cowabunga Bay waterpark and the Comfort Inn at 12033 South State Street are impacted by noise. A noise wall of 1650 feet in length was analyzed on the east side of the I-15 mainline at this location. A 6-foot to 16-foot wall would not reduce noise levels by 7 dBA for any of the receptors. Therefore, a noise wall is not considered feasible and reasonable at this location.

Figure 14. Noise Barrier Analysis Area 12, 12000 South

4.0 CONSTRUCTION IMPACTS

Construction noise impacts are considered temporary and will be minimized through adherence to UDOT Standard Specification 01355 Environmental Compliance, Part 3.6 - Noise Control. Extended disruption of normal activities is not anticipated, since no receptors are expected to be exposed to construction noise for a long duration of time.

5.0 INFORMATION FOR LOCAL OFFICIALS

According to the UDOT Noise Abatement Policy, UDOT will inform local officials of noise compatible planning concepts and an estimate of future noise levels on undeveloped lands or properties within the project limits for Type I projects. Undeveloped lands along the I-15 corridor are labeled with Noise Abatement Category G receptors and noise levels for each receptor can be found in Table 3.

6.0 CONCLUSION

The Proposed Action would result in noise levels increasing overall throughout the study area, with an average increase of 0.3 dBA. The number of receptors that would be considered impacted by traffic noise is 255.

Noise walls of varying heights were analyzed for the Proposed Action at 15 locations along I-15; however, a noise wall at most of these locations would either not provide the required 7 dBA reduction to 50% of front-row receptors or would not be cost effective.

Noise Wall 1

Noise Wall 1 would be located on the west side of I-15 near the 7200 South interchange. The noise wall would be constructed on the west side of the I-215 to I-15 Southbound Collector Ramp (see map 12 in Appendix B), would extend from the approach to the bridge across 7200 South, and continue for 1,100 feet. The wall would block noise from I-15 to The Road Home shelter for the homeless on the southwest corner of I-15 and 7200 South. A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for any of the front row receptors. A 16-foot wall would reduce noise levels by 7 dBA for 50% of front row receptors and is reasonable and feasible. A noise wall was also analyzed on the west side of the I-15 mainline, but it was found that a wall at this location would reduce noise at The Road Home receptors by less than 2 dBA. It is recommended that a 16-foot noise wall be constructed along the west side of the I-215 to I-15 Southbound Collector Ramp, pending the results of balloting by affected property owners and tenants.

A consideration for the property owners and tenants in their decision is that the proposed noise wall would be constructed on the east side of the UPRR/UTA tracks. It is possible that train noise might become more annoying as it reflects off the concrete sound wall toward the residences. This effect is impossible to model and it is unknown whether the increase in noise would be perceptible.

Noise Wall 2

Noise Wall 2 would be located on the west side of I-15 near the Wasatch Street bridge. The noise wall would extend approximately 1,200 feet as shown on map 14 in Appendix B. The wall would block noise from I-15 to the English Manor Apartments and three single-family homes on Wasatch Street and Allen Street. A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for any of the front row receptors. A 16-foot wall would reduce noise levels by 7 dBA for 92% of front row receptors and would meet the cost-effectiveness criteria. It is recommended that a 16-foot noise wall be constructed at this location, pending the results of balloting by affected property owners and tenants.

A consideration for the property owners and tenants in their decision is that the proposed noise wall would be constructed on the east side of the UPRR/UTA tracks. It is possible that train noise might become more annoying as it reflects off the concrete sound wall toward the residences. This effect is impossible to model and it is unknown whether the increase in noise would be perceptible.

All other existing noise walls impacted by the construction of the Preferred Alternative would be replaced "in-kind" consistent with the UDOT Noise Abatement Policy.

APPENDIX A: NOISE WALL ANALYSIS

3300 South Interchange Wall - Long Version

Wall Length: 1150 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 3

Name	# of DU	ID	1st Row	# of 1st Row
B2	1			0
B3	1			0
B4	1		Yes	1
B5	1			0
B6	1		Yes	1
B7	1		Yes	1
B8	1			0
B9	1			0
B10	1			0
B11	1			0
				0
				0
				0

Name	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B2	2.2	No	No	No	0	0
B3	2.3	No	No	No	0	0
B4	3.9	No	No	No	0	0
B5	1.4	No	No	No	0	0
B6	0.9	No	No	No	0	0
B7	1.5	No	No	No	0	0
B8	0.7	No	No	No	0	0
B9	0.7	No	No	No	0	0
B10	0.9	No	No	No	0	0
B11	0	No	No	No	0	0
	0	No	No	No	0	0
	0	No	No	No	0	0
	0	No	No	No	0	0

Name	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B2	3.3	No	No	No	0	0
B3	3.3	No	No	No	0	0
B4	4.5	No	No	No	0	0
B5	1.5	No	No	No	0	0
B6	1.1	No	No	No	0	0
B7	2.1	No	No	No	0	0
B8	0.8	No	No	No	0	0
B9	0.8	No	No	No	0	0
B10	1.1	No	No	No	0	0
B11	0	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B2	4.8	No	No	No	0	0
B3	4.8	No	No	No	0	0
B4	5.3	No	Yes	No	0	1
B5	1.9	No	No	No	0	0
B6	1.3	No	No	No	0	0
B7	2.5	No	No	No	0	0
B8	1.2	No	No	No	0	0
B9	1.3	No	No	No	0	0
B10	1.4	No	No	No	0	0
B11	0.1	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B2	5.6	No	Yes	No	0	1
B3	5.6	No	Yes	No	0	1
B4	5.9	No	Yes	No	0	1
B5	2.7	No	No	No	0	0
B6	1.4	No	No	No	0	0
B7	2.8	No	No	No	0	0
B8	1.8	No	No	No	0	0
B9	1.8	No	No	No	0	0
B10	2	No	No	No	0	0
B11	0.4	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B2	6.3	No	Yes	No	0	1
B3	6.3	No	Yes	No	0	1
B4	6.4	No	Yes	No	0	1
B5	3.1	No	No	No	0	0
B6	1.5	No	No	No	0	0
B7	3	No	No	No	0	0
B8	2.1	No	No	No	0	0
B9	2.2	No	No	No	0	0
B10	2.4	No	No	No	0	0
B11	0.6	No	No	No	0	0
	0	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	0
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	0.0%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefited:	0	0	1	3	3
Cost of Noise Wall:	$184,000.00	$230,000.00	$276,000.00	$322,000.00	$368,000.00
Cost per Benefited Receiver:	-	-	$276,000.00	$107,333.33	$122,666.67
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

3300 South Interchange Wall - Short Version

Wall Length: 404 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 1

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B2	1			0	2.2	No	No	No	0	0	3.1	No	No	No	0	0	4.5	No	No	No	0	0	5.2	No	Yes	No	0	1	5.8	No	Yes	No	0	1
B3	1			0	2.3	No	No	No	0	0	3.1	No	No	No	0	0	4.3	No	No	No	0	0	5	No	Yes	No	0	1	5.5	No	Yes	No	0	1
B4	1		Yes	1	3.9	No	No	No	0	0	4.5	No	No	No	0	0	5.3	No	Yes	No	0	1	5.9	No	Yes	No	0	1	6.3	No	Yes	No	0	1
B5	1			0	1.1	No	No	No	0	0	1.1	No	No	No	0	0	1.3	No	No	No	0	0	1.6	No	No	No	0	0	1.8	No	No	No	0	0
B6	1			0	0	No	No	No	0	0	0	No	No	No	0	0	0	No	No	No	0	0	0	No	No	No	0	0	0	No	No	No	0	0
B7	1			0	0	No	No	No	0	0	0	No	No	No	0	0	0	No	No	No	0	0	0	No	No	No	0	0	0	No	No	No	0	0
B8	1			0	0.3	No	No	No	0	0	0.3	No	No	No	0	0	0.4	No	No	No	0	0	0.5	No	No	No	0	0	0.6	No	No	No	0	0
B9	1			0	0.4	No	No	No	0	0	0.4	No	No	No	0	0	0.4	No	No	No	0	0	0.5	No	No	No	0	0	0.6	No	No	No	0	0
B10	1			0	0.5	No	No	No	0	0	0.5	No	No	No	0	0	0.5	No	No	No	0	0	0.6	No	No	No	0	0	0.7	No	No	No	0	0
B11	1			0	0	No	No	No	0	0	0	No	No	No	0	0	0	No	No	No	0	0	0.1	No	No	No	0	0	0.1	No	No	No	0	0
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	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	0
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	0.0%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefited:	0	0	1	3	3
Cost of Noise Wall:	$64,640.00	$80,800.00	$96,960.00	$113,120.00	$129,280.00
Cost per Benefited Receiver:	-	-	$96,960.00	$37,706.67	$43,093.33
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

4500 S NE Wall

Wall Length: 550 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 2

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C3	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.3	No	Yes	No	0	1
C4	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	7	Yes	Yes	Yes	1	1
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
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	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Benefited:	0	0	0	0	1
% of First-Row Benefited:	0.0%	0.0%	0.0%	0.0%	50.0%
Noise Abatement Design Goal:	No	No	No	No	Yes
# of Benefited:	0	0	0	0	2
Cost of Noise Wall:	$88,000.00	$110,000.00	$132,000.00	$154,000.00	$176,000.00
Cost per Benefited Receiver:	-	-	-	-	$88,000.00
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

NOTES: No wall height or length provides a 7 dBA reduction for C7, B28, or B29. A 16 ft wall, that provides 7 dBa reduction for at least one the Humane Society receptors must be 550 ft long and is not cost effective.

4800 South NE Wall

Wall Length: 999 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 3

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B33	1		YES	1	2.2	No	No	No	0	0
B34	1		YES	1	2.3	No	No	No	0	0
B35	1		YES	1	3.9	No	No	No	0	0
C9	1			0	1.1	No	No	No	0	0
B37	1			0	0	No	No	No	0	0
B38	1			0	0	No	No	No	0	0
B39	1			0	0.3	No	No	No	0	0
B40	1			0	0.4	No	No	No	0	0
B41	1			0	0.5	No	No	No	0	0
B42	1			0	0	No	No	No	0	0
B43	1			0	0	No	No	No	0	0
B44	1			0	0	No	No	No	0	0
B45	1			0	0	No	No	No	0	0

Name	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B33	3.1	No	No	No	0	0
B34	3.1	No	No	No	0	0
B35	4.5	No	No	No	0	0
C9	1.1	No	No	No	0	0
B37	0	No	No	No	0	0
B38	0	No	No	No	0	0
B39	0.3	No	No	No	0	0
B40	0.4	No	No	No	0	0
B41	0.5	No	No	No	0	0
B42	0	No	No	No	0	0
B43		No	No	No	0	0
B44		No	No	No	0	0
B45		No	No	No	0	0

Name	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B33		No	No	No	0	0
B34		No	No	No	0	0
B35		No	No	No	0	0
C9		No	No	No	0	0
B37		No	No	No	0	0
B38		No	No	No	0	0
B39		No	No	No	0	0
B40		No	No	No	0	0
B41		No	No	No	0	0
B42		No	No	No	0	0
B43		No	No	No	0	0
B44		No	No	No	0	0
B45		No	No	No	0	0

Name	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B33		No	No	No	0	0
B34		No	No	No	0	0
B35		No	No	No	0	0
C9		No	No	No	0	0
B37		No	No	No	0	0
B38		No	No	No	0	0
B39		No	No	No	0	0
B40		No	No	No	0	0
B41		No	No	No	0	0
B42		No	No	No	0	0
B43		No	No	No	0	0
B44		No	No	No	0	0
B45		No	No	No	0	0

Name	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B33	4.4	No	No	No	0	0
B34	5.9	No	Yes	No	0	1
B35	5.5	No	Yes	No	0	1
C9	3.6	No	No	No	0	0
B37	4.2	No	No	No	0	0
B38	4	No	No	No	0	0
B39	4.3	No	No	No	0	0
B40	4	No	No	No	0	0
B41	3.4	No	No	No	0	0
B42	3.4	No	No	No	0	0
B43	3.5	No	No	No	0	0
B44	3.5	No	No	No	0	0
B45	4	No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	0
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	0.0%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefited:	0	0	0	0	2
Cost of Noise Wall:	$159,840.00	$199,800.00	$239,760.00	$279,720.00	$319,680.00
Cost per Benefited Receiver:	-	-	-	-	$159,840.00
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

Barrier Descriptions Table : 3 - 4800 S area:4

Horrocks Engineers — 12 March 2017
Stephanee Eastman, P.E. — TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: PG-882-1607 I-15 SR-201 to 12300 S
RUN: 4800 South Barrier Analysis
BARRIER DESIGN: 4800 South NE 16ft

Barriers

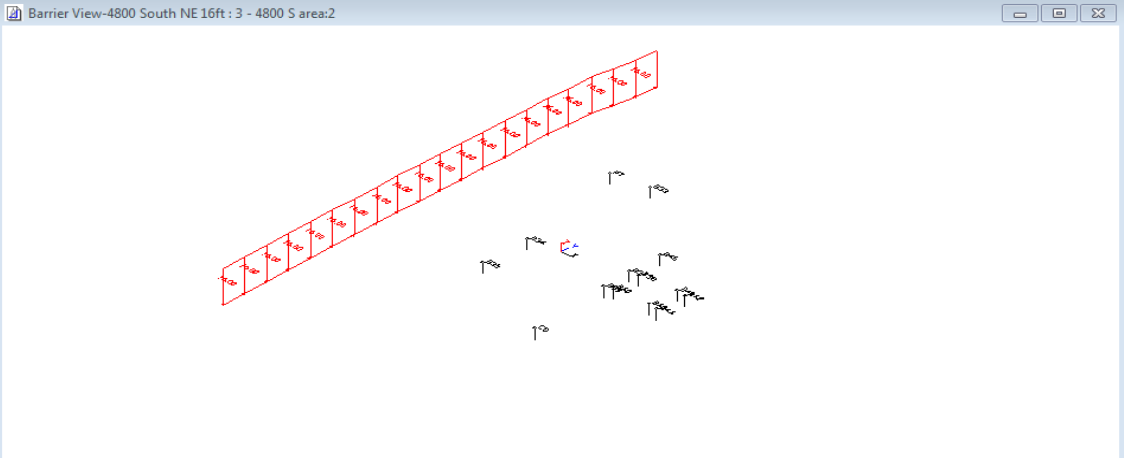
Name	Type	Heights along Barrier Min	Avg	Max	Length	If Wall Area	If Berm Volume
		ft	ft	ft	ft	sq ft	cu yd
Noise Wall A	W	16.00	16.00	16.00	999	15983	

Sound Levels : 3 - 4800 S area:3

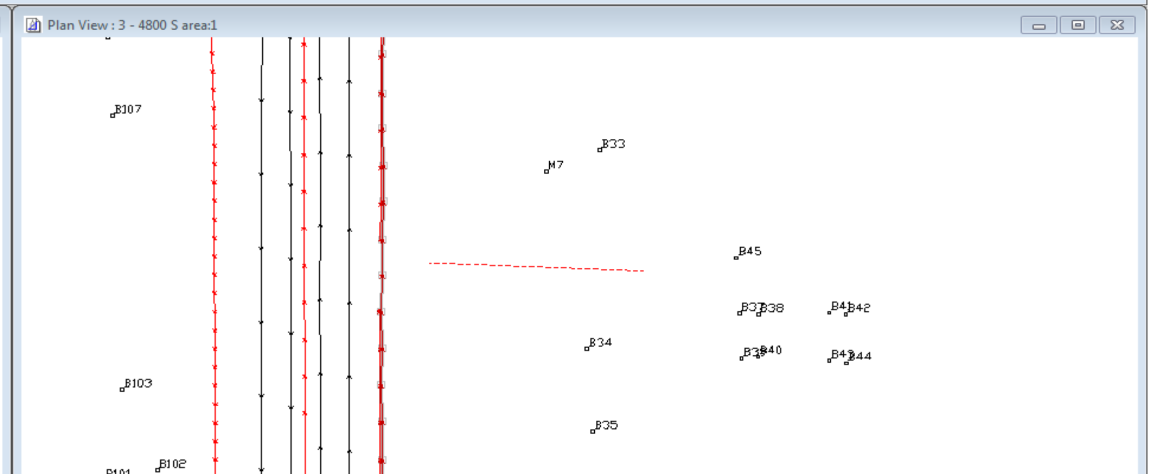
			LAeq1h	LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
B33	51	1	0.0	70.0	66	70.0	10	Snd Lvl	65.6	4.4	8	-3.6
B34	52	1	0.0	71.2	66	71.2	10	Snd Lvl	65.3	5.9	8	-2.1
B35	53	1	0.0	71.1	66	71.1	10	Snd Lvl	65.6	5.5	8	-2.5
C9	55	1	0.0	65.9	66	65.9	10	—	62.3	3.6	8	-4.4
B37	57	1	0.0	66.1	66	66.1	10	Snd Lvl	61.9	4.2	8	-3.8
B38	58	1	0.0	65.7	66	65.7	10	—	61.7	4.0	8	-4.0
B39	59	1	0.0	66.2	66	66.2	10	Snd Lvl	61.9	4.3	8	-3.7
B40	60	1	0.0	65.8	66	65.8	10	—	61.8	4.0	8	-4.0
B41	61	1	0.0	64.2	66	64.2	10	—	60.8	3.4	8	-4.6
B42	62	1	0.0	63.9	66	63.9	10	—	60.5	3.4	8	-4.6
B43	63	1	0.0	64.3	66	64.3	10	—	60.8	3.5	8	-4.5
B44	64	1	0.0	64.0	66	64.0	10	—	60.5	3.5	8	-4.5
B45	65	1	0.0	66.0	66	66.0	10	Snd Lvl	62.0	4.0	8	-4.0
M7	808	1	0.0	72.7	66	72.7	10	Snd Lvl	67.0	5.7	8	-2.3

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB

Barrier View-4800 South NE 16ft : 3 - 4800 S area:2



Plan View : 3 - 4800 S area:1



5100 South AISU Wall

Wall Length:	2301	ft
Wall Cost per sq ft:	$20	
# of First Row Receivers:	6	

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
D1	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	8.2	Yes	Yes	Yes	1	1
C19	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.4	No	Yes	No	0	1
C20	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.1	No	No	No	0	0
B62	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.7	No	No	No	0	0
B63	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.2	No	No	No	0	0
B64	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.4	No	Yes	No	0	1
C23	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.8	No	No	No	0	0
C24	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.7	No	No	No	0	0
D7	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.4	No	No	No	0	0
D8	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.4	No	No	No	0	0
D9	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.3	No	No	No	0	0
D10	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.1	No	No	No	0	0
D11	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.6	No	Yes	No	0	1
D12	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.5	No	Yes	No	0	1
D13	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.7	No	No	No	0	0
C22	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.5	No	Yes	No	0	1
C25	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.3	No	No	No	0	0
C26	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.6	No	Yes	No	0	1
C27	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.6	No	Yes	No	0	1
C28	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.8	No	Yes	No	0	1
C29	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.7	No	No	No	0	0
C30	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.2	No	Yes	No	0	1
B81	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.2	No	Yes	No	0	1
B82	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.8	No	No	No	0	0
B83	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.6	No	No	No	0	0
B84	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.6	No	No	No	0	0
B85	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.5	No	No	No	0	0
B86	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.4	No	No	No	0	0
B87	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.6	No	No	No	0	0
B88	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.1	No	No	No	0	0
B89	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.2	No	No	No	0	0
B90	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.6	No	No	No	0	0
B91	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.6	No	No	No	0	0
B92	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.4	No	No	No	0	0
B93	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.4	No	No	No	0	0
B94	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.4	No	No	No	0	0
B95	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.4	No	No	No	0	0
B96	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.3	No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Benefited:	0	0	0	0	1
% of First-Row Benefited:	0.0%	0.0%	0.0%	0.0%	16.7%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefited:	0	0	0	0	11
Cost of Noise Wall:	$368,160.00	$460,200.00	$552,240.00	$644,280.00	$736,320.00
Cost per Benefited Receiver:	-	-	-	-	$66,938.18
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

NOTES: A 16 ft wall, 2300 ft long, only provides a 7 dBA reduction at one receptor (D1). It is not reasonable or feasible.

5100 South NE Wall

Wall Length: 290 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 1

Name	# of DU	ID	1st Row	# of 1st Row
B65	1			0
B52	1			0
B56	1		YES	1
B55	1			0
B54	1			0
B53	1			0
C10	1			0
				0
				0
				0
				0
				0
				0
		1		

Name	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors
B65	0.3	No	No	No	0	0
B52	0	No	No	No	0	0
B56	12	Yes	Yes	Yes	1	1
B55	0.3	No	No	No	0	0
B54	1.3	No	No	No	0	0
B53	0.6	No	No	No	0	0
C10	0.8	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
			1			
			100.0%			
			Yes			

Name	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors
B65	0.3	No	No	No	0	0
B52	0	No	No	No	0	0
B56	14.2	Yes	Yes	Yes	1	1
B55	0.4	No	No	No	0	0
B54	1.3	No	No	No	0	0
B53	0.6	No	No	No	0	0
C10	0.9	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
			1			
			100.0%			
			Yes			

Name	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors
B65	0.3	No	No	No	0	0
B52	0	No	No	No	0	0
B56	15.6	Yes	Yes	Yes	1	1
B55	0.4	No	No	No	0	0
B54	1.3	No	No	No	0	0
B53	0.6	No	No	No	0	0
C10	0.9	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
			1			
			100.0%			
			Yes			

Name	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors
B65	0.3	No	No	No	0	0
B52	0	No	No	No	0	0
B56	16.9	Yes	Yes	Yes	1	1
B55	0.4	No	No	No	0	0
B54	1.4	No	No	No	0	0
B53	0.6	No	No	No	0	0
C10	0.9	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
			1			
			100.0%			
			Yes			

Name	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors
B65	0.3	No	No	No	0	0
B52	0	No	No	No	0	0
B56	17.9	Yes	Yes	Yes	1	1
B55	0.4	No	No	No	0	0
B54	1.4	No	No	No	0	0
B53	0.6	No	No	No	0	0
C10	0.9	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
			1			
			100.0%			
			Yes			

						1					1					1					1					1			
B65	1		0	0.3	No	N$46,400.00No	0	0	0.3	No	N$58,000.00No	0	0	0.3	No	N$69,600.00No	0	0	0.3	No	N$81,200.00No	0	0	0.3	No	N$92,800.00No	0	0	
B52	1		0	0	No	N$46,400.00No	0	0	0	No	N$58,000.00No	0	0	0	No	N$69,600.00No	0	0	0	No	N$81,200.00No	0	0	0	No	N$92,800.00No	0	0	
B56	1	YES	1	12	Yes	Yes No Yes	1	1	14.2	Yes	Yes No Yes	1	1	15.6	Yes	Yes No Yes	1	1	16.9	Yes	Yes No Yes	1	1	17.9	Yes	Yes No Yes	1	1	
B55	1		0	0.3	No	No **No** No	0	0	0.4	No	No **No** No	0	0	0.4	No	No **No** No	0	0	0.4	No	No **No** No	0	0	0.4	No	No **No** No	0	0	
B54	1		0	1.3	No	No No	0	0	1.3	No	No No	0	0	1.3	No	No No	0	0	1.4	No	No No	0	0	1.4	No	No No	0	0	
																						0	0	0.6	No	No No	0	0	
																						0	0	0.9	No	No No	0	0	
																						0	0		No	No No	0	0	
																						0	0		No	No No	0	0	
																						0	0		No	No No	0	0	
																						0	0		No	No No	0	0	
																						0	0		No	No No	0	0	
																						0	0		No	No No	0	0	

Barrier Descriptions Table : NE 5100 South:4

Horrocks Engineers — 13 March 2017
Stephanee Eastman, P.E. — TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: PG-882-1607 I-15 SR-201 to 12300 S
RUN: 4800 South Barrier Analysis
BARRIER DESIGN: 5100 NE 16 ft

Barriers

Name	Type	Heights along Barrier Min	Avg	Max	Length	If Wall Area	If Be Volu
		ft	ft	ft	ft	sq ft	cu y
East Side Proposed Noise Wall	W	16.00	16.00	16.00	290	4632	

Sound Levels : NE 5100 South:3

BARRIER DESIGN: 5100 NE 16 ft

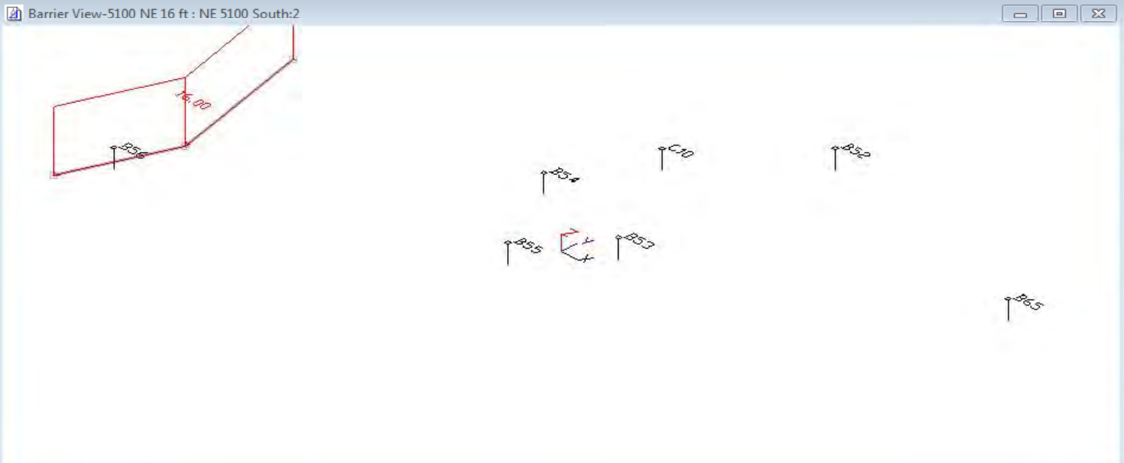
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

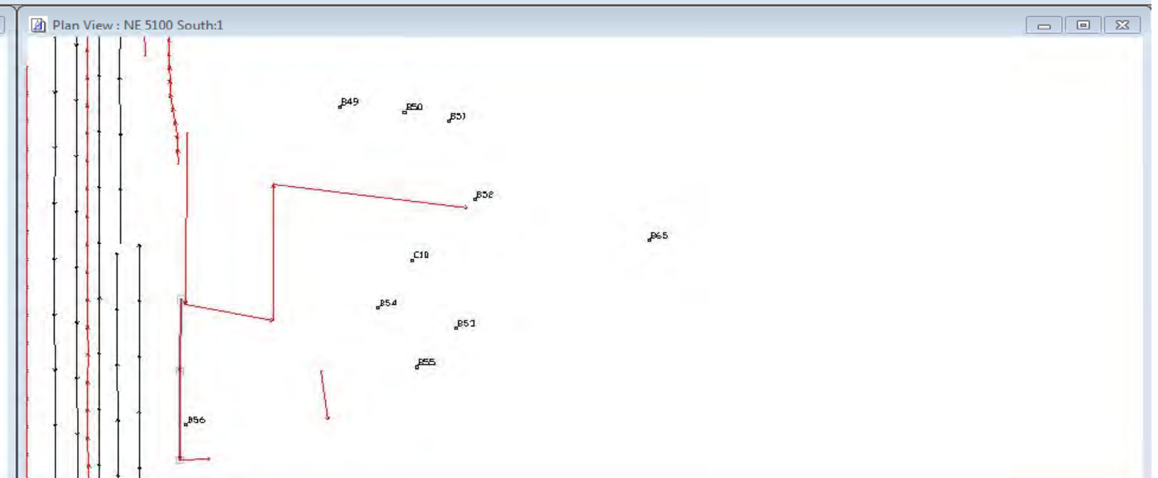
Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
B65	108	1	0.0	59.3	66	59.3	10	—	59.0	0.3	8	-7.7
B52	72	1	0.0	61.6	66	61.6	10	—	61.6	0.0	8	-8.0
B56	76	1	0.0	82.1	66	82.1	10	Snd Lvl	64.2	17.9	8	9.9
B55	75	1	0.0	64.7	66	64.7	10	—	64.3	0.4	8	-7.6
B54	74	1	0.0	64.2	66	64.2	10	—	62.8	1.4	8	-6.6
B53	73	1	0.0	63.1	66	63.1	10	—	62.5	0.6	8	-7.4
C10	77	1	0.0	63.0	66	63.0	10	—	62.1	0.9	8	-7.1

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	7	0.0	3.1	17.9

Barrier View-5100 NE 16 ft : NE 5100 South:2



Plan View : NE 5100 South:1



Inp...

Objects Shown: X: Y:

5300 South NE Wall

Wall Length: 1005 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 1

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C11	1		YES	1	2.2	No	No	No	0	0
C12	1			0	2.3	No	No	No	0	0
D2	1			0	3.9	No	No	No	0	0
D3	1			0	1.1	No	No	No	0	0
D4	1			0	0	No	No	No	0	0
D5	1			0	0	No	No	No	0	0
D6	1			0	0.3	No	No	No	0	0
C13	1			0	0.4	No	No	No	0	0
				0	0.5	No	No	No	0	0
				0	0	No	No	No	0	0
				0	0	No	No	No	0	0
				0	0	No	No	No	0	0
				0	0	No	No	No	0	0

Name	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C11	3.1	No	No	No	0	0
C12	3.1	No	No	No	0	0
D2	4.5	No	No	No	0	0
D3	1.1	No	No	No	0	0
D4	0	No	No	No	0	0
D5	0	No	No	No	0	0
D6	0.3	No	No	No	0	0
C13	0.4	No	No	No	0	0
	0.5	No	No	No	0	0
	0	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C11		No	No	No	0	0
C12		No	No	No	0	0
D2		No	No	No	0	0
D3		No	No	No	0	0
D4		No	No	No	0	0
D5		No	No	No	0	0
D6		No	No	No	0	0
C13		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C11		No	No	No	0	0
C12		No	No	No	0	0
D2		No	No	No	0	0
D3		No	No	No	0	0
D4		No	No	No	0	0
D5		No	No	No	0	0
D6		No	No	No	0	0
C13		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C11	4.4	No	No	No	0	0
C12	5.9	No	Yes	No	0	1
D2	5.5	No	Yes	No	0	1
D3	3.6	No	No	No	0	0
D4	4.2	No	No	No	0	0
D5	4	No	No	No	0	0
D6	4.3	No	No	No	0	0
C13	4	No	No	No	0	0
	3.4	No	No	No	0	0
	3.4	No	No	No	0	0
	3.5	No	No	No	0	0
	3.5	No	No	No	0	0
	4	No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	0
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	0.0%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefited:	0	0	0	0	2
Cost of Noise Wall:	$160,800.00	$201,000.00	$241,200.00	$281,400.00	$321,600.00
Cost per Benefited Receiver:	-	-	-	-	$160,800.00
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

Barrier Descriptions Table : NE 5100 South:4

Horrrocks Engineers 13 March 2017
Stephanee Eastman, P.E. TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: PG-882-1607 I-15 SR-201 to 12300 S
RUN: 4800 South Barrier Analysis
BARRIER DESIGN: 5100 S 16ft

Barriers

Name	Type	Heights along Barrier Min	Avg	Max	Length	If Wall Area	If Berm Volume	To Wi
		ft	ft	ft	ft	sq ft	cu yd	ft
Barrier89	W	16.00	16.00	16.00	1005	16073		

Sound Levels : NE 5100 South:3

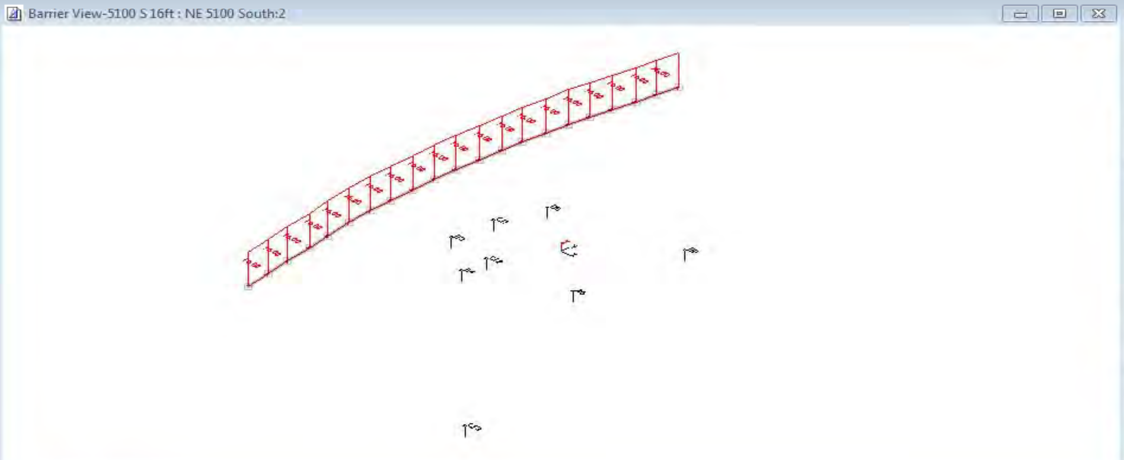
RUN: 4800 South Barrier Analysis
BARRIER DESIGN: 5100 S 16ft
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

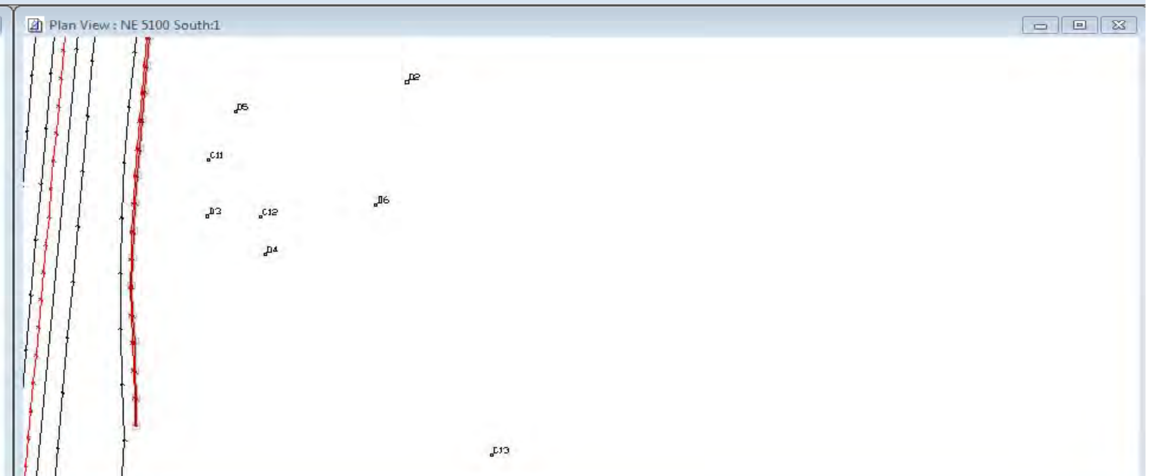
Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
C11	79	1	0.0	69.3	66	69.3	10	Snd Lvl	64.6	4.7	8	-3.3
C12	80	1	0.0	69.0	66	69.0	10	Snd Lvl	65.3	3.7	8	-4.3
D2	81	1	0.0	65.0	66	65.0	10	—	63.4	1.6	8	-6.4
D3	82	1	0.0	70.3	66	70.3	10	Snd Lvl	64.7	5.6	8	-2.4
D4	83	1	0.0	69.5	66	69.5	10	Snd Lvl	66.2	3.3	8	-4.7
D5	84	1	0.0	69.1	66	69.1	10	Snd Lvl	65.1	4.0	8	-4.0
D6	85	1	0.0	66.3	66	66.3	10	Snd Lvl	64.7	1.6	8	-6.4
C13	86	1	0.0	64.3	66	64.3	10	—	64.2	0.1	8	-7.9

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max

Barrier View-5100 S 16ft : NE 5100 South:2



Plan View : NE 5100 South:1



Inp...

5300 S NW Wall

Wall Length: 1200 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 3

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C14	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	1.1	No	No	No	0	0
C15	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.6	No	No	No	0	0
E10	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	0	No	No	No	0	0
C17	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.1	No	Yes	No	0	1
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	6			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
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				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Benefited:	0	0	0	0	0
% of First-Row Benefited:	0.0%	0.0%	0.0%	0.0%	0.0%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefited:	0	0	0	0	1
Cost of Noise Wall:	$192,000.00	$240,000.00	$288,000.00	$336,000.00	$384,000.00
Cost per Benefited Receiver:	-	-	-	-	$384,000.00
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

NOTES: A 16 ft wall along the exit ramp only provides a 7 dBA reduction at one receptor (C17). Did not model a mainline ramp, however, it be more expensive and even with this ramp, it would not be cost effective even if all receptors were benefitted.

Apple Cross Way Wall

Wall Length:	999	ft
Wall Cost per sq ft:	$20	
# of First Row Receivers:	3	

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B33	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.4	No	No	No	0	0
B34	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.9	No	Yes	No	0	1
B35	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.5	No	Yes	No	0	1
C9	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.6	No	No	No	0	0
B37	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.2	No	No	No	0	0
B38	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4	No	No	No	0	0
B39	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.3	No	No	No	0	0
B40	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4	No	No	No	0	0
B41	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.4	No	No	No	0	0
B42	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.4	No	No	No	0	0
B43	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.5	No	No	No	0	0
B44	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.5	No	No	No	0	0
B45	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4	No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	0
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	0.0%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefited:	0	0	0	0	2
Cost of Noise Wall:	$159,840.00	$199,800.00	$239,760.00	$279,720.00	$319,680.00
Cost per Benefited Receiver:	-	-	-	-	$159,840.00
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

NOTES: A 16 ft wall, 1000 ft long, does not provide a 7 dBA reduction at any receptors and only provides a 5 dBA benefit to two receptors. It is not reasonable or feasible.

Road Home Wall

Wall Length: 1102 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 20

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
M10	0			0		No	No	No	0	0
B372	10		YES	10		No	No	No	0	0
B371	10		YES	10		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0
	1			0		No	No	No	0	0

Name	# of DU	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
M10	0		No	No	No	0	0		No	No	No	0	0
B372	10		No	No	No	0	0		No	No	No	0	0
B371	10		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0

Name	# of DU	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
M10	0	5.5	No	Yes	No	0	0	6	No	Yes	No	0	0
B372	10	6.5	No	Yes	No	0	10	7	Yes	Yes	Yes	10	10
B371	10	5.6	No	Yes	No	0	10	6.2	No	Yes	No	0	10
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0
	1		No	No	No	0	0		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	10
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	50.0%
Noise Abatement Design Goal:	No	No	No	No	Yes
# of Benefited:	0	0	0	20	20
Cost of Noise Wall:	$176,320.00	$220,400.00	$264,480.00	$308,560.00	$352,640.00
Cost per Benefited Receiver:	-	-	-	$15,428.00	$17,632.00
Cost Effectiveness:	No	No	No	Yes	Yes
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**Yes**

Noise Wall along I-15 mainline does NOT work:

Barrier Descriptions Table : Road Home:5

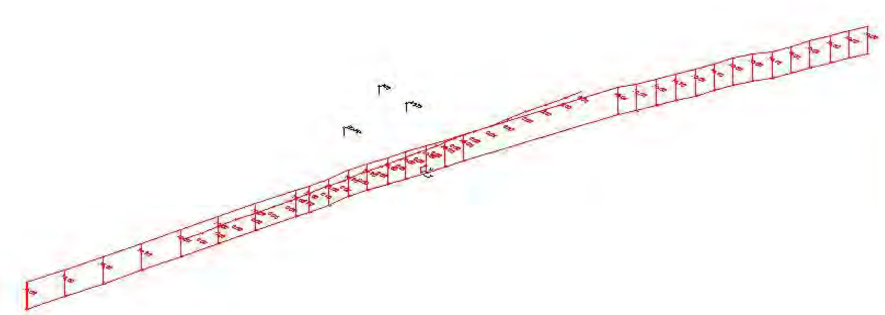
Horrocks Engineers | 27 February 2017
Angie Goodwin/Stephanee Eastman | TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Existing Noise
BARRIER DESIGN: Mainline 16ft

Barriers

Name	Type	Heights along Barrier Min	Avg	Max	Length	If Wall Area	If Berm Volume	Top Width	Run:Rise	Cost
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Road Home Wall on Mainline	W	16.00	16.00	16.00	2201	35212				0
Noise Wall - The Road Home	W	0.00	0.00	0.00	0	0				0
									Total Cost:	0

Barrier View-Mainline 16ft : Road Home:3



Sound Levels : Road Home:4

RUN: Existing Noise
BARRIER DESIGN: Mainline 16ft
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be use
a State highway agency substantiate
of a different type with approval of FH

Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reducti Calculated	G
			dBA	dBA	dBA	dB	dB		dBA	dB	dE
M10	810	1	0.0	69.2	66	69.2	10	Snd Lvl	67.5	1.7	
B372	460	1	0.0	71.5	66	71.5	10	Snd Lvl	70.2	1.3	
B371	459	1	0.0	69.8	66	69.8	10	Snd Lvl	68.3	1.5	

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	1.3	1.5	1.7
All Impacted	3	1.3	1.5	1.7
All that meet NR Goal	0	0.0	0.0	0.0

Inp... Inp... Inp... Pla... Pla...

Barrier Descriptions Table : Road Home Revised:4
Sound Levels : Road Home Revised:3

Horrocks Engineers — 12 March 2017
Stephanee Eastman, P.E. — TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: PG-882-1607 I-15 SR-201 to 12300 S
RUN: Barrier Analysis at the Road Home
BARRIER DESIGN: Property Wall 16ft

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm
		Min	Avg	Max		Area	Volume
		ft	ft	ft	ft	sq ft	cu yd
Noise Wall at The Road Home	W	16.00	16.00	16.00	526	8423	

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PG-882-1607 I-15 SR-201 to 12300 S
RUN: Barrier Analysis at the Road Home
BARRIER DESIGN: Property Wall 16ft

ATMOSPHERICS: 68 deg F, 50% RH

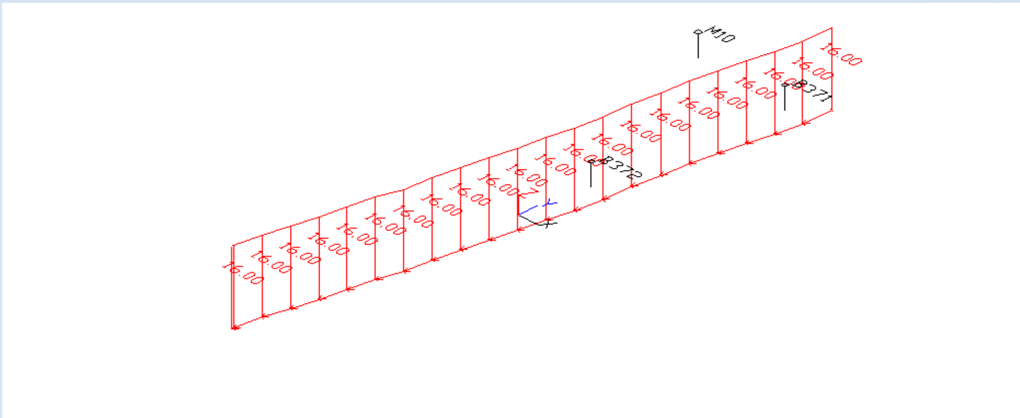
Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver

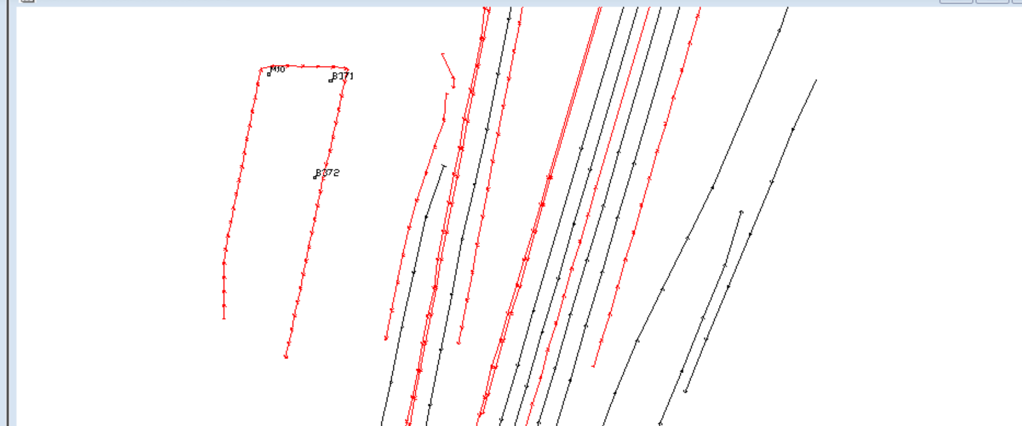
Name	No.	#DUs	Existing	No Barrier					With Barrier			
			LAeq1h	LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
B372	460	1	0.0	71.6	66	71.6	10	Snd Lvl	67.1	4.5	8	-3.5
B371	459	1	0.0	71.0	66	71.0	10	Snd Lvl	66.9	4.1	8	-3.9
M10	810	1	0.0	69.2	66	69.2	10	Snd Lvl	66.9	2.3	8	-5.7

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	2.3	3.6	4.5
All Impacted	3	2.3	3.6	4.5

Barrier View-Property Wall 16ft : Road Home Revised:2



Plan View : Road Home Revised:1



English Manor Apt

Wall Length: 514 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 13

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B464	1			0		No	No	No	0	0
B465	1			0		No	No	No	0	0
B466	1			0		No	No	No	0	0
B468	12		YES	12		No	No	No	0	0
B467	12			0		No	No	No	0	0
B469	12			0		No	No	No	0	0
C73	1			0		No	No	No	0	0
C72	1		YES	1		No	No	No	0	0
C74	1			0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0
				0		No	No	No	0	0

Name	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B464		No	No	No	0	0
B465		No	No	No	0	0
B466		No	No	No	0	0
B468		No	No	No	0	0
B467		No	No	No	0	0
B469		No	No	No	0	0
C73		No	No	No	0	0
C72		No	No	No	0	0
C74		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B464		No	No	No	0	0
B465		No	No	No	0	0
B466		No	No	No	0	0
B468		No	No	No	0	0
B467		No	No	No	0	0
B469		No	No	No	0	0
C73		No	No	No	0	0
C72		No	No	No	0	0
C74		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B464		No	No	No	0	0
B465		No	No	No	0	0
B466		No	No	No	0	0
B468		No	No	No	0	0
B467		No	No	No	0	0
B469		No	No	No	0	0
C73		No	No	No	0	0
C72		No	No	No	0	0
C74		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B464	1.7	No	No	No	0	0
B465	0.7	No	No	No	0	0
B466	0.8	No	No	No	0	0
B468	5.1	No	Yes	No	0	12
B467	0	No	No	No	0	0
B469	1.2	No	No	No	0	0
C73	4.3	No	No	No	0	0
C72	6.2	No	Yes	No	0	1
C74	4.3	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	0
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	0.0%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefited:	0	0	0	0	13
Cost of Noise Wall:	$82,240.00	$102,800.00	$123,360.00	$143,920.00	$164,480.00
Cost per Benefited Receiver:	-	-	-	-	$12,652.31
Cost Effectiveness:	No	No	No	No	Yes
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

Barrier Descriptions Table : 5 - CenterST_to_9000S:4

Horrocks Engineers — 26 February 2017
Angie Goodwin/Stephanee Eastman — TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Existing Noise
BARRIER DESIGN: English Manor 16ft

Barriers

Name	Type	Heights along Barrier Min	Avg	Max	Length	If Wall Area	If Berm Volume	Top Width	Run:Rise	Cost
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Noise Wall - English Manor	W	16.00	16.00	16.00	514	8227				
									Total Cost:	

Sound Levels : 5 - CenterST_to_9000S:3

Horrocks Engineers — 26 February 2017
Angie Goodwin/Stephanee Eastman — TNM 2.5
Calculated with TNM 2.5

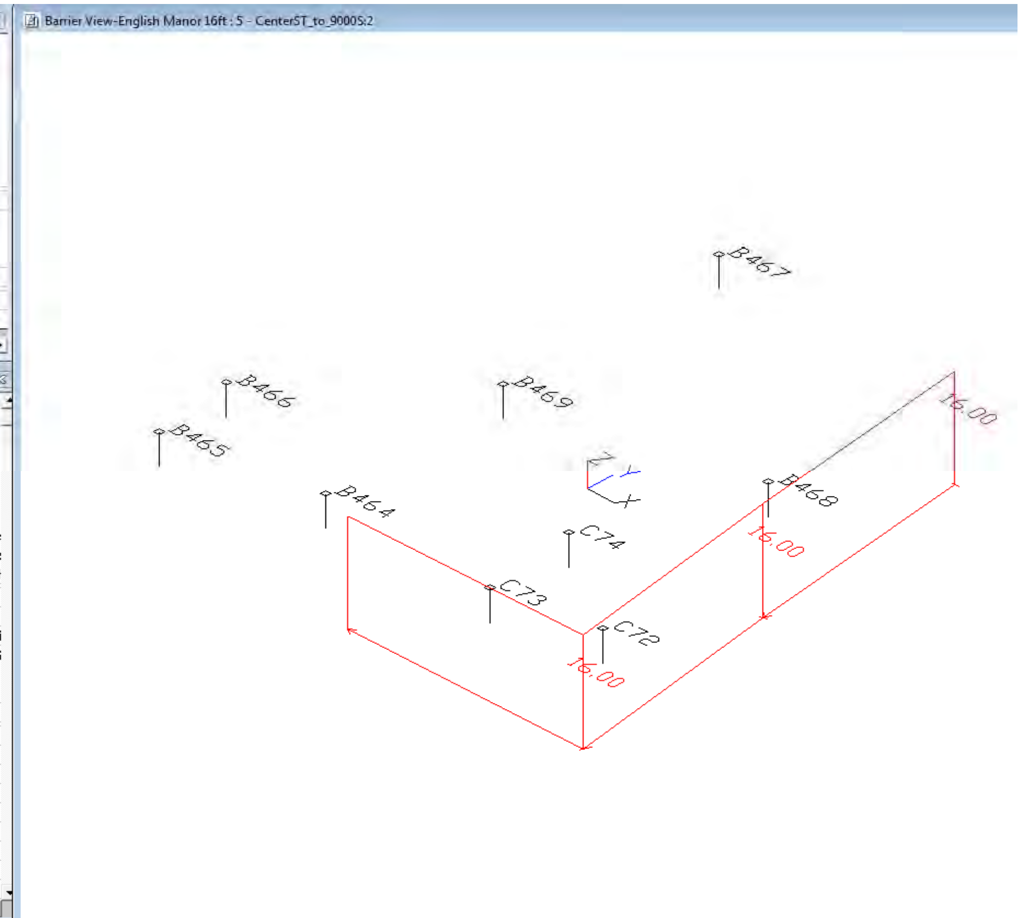
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Existing Noise
BARRIER DESIGN: English Manor 16ft
ATMOSPHERICS: 68 deg F, 50% RH

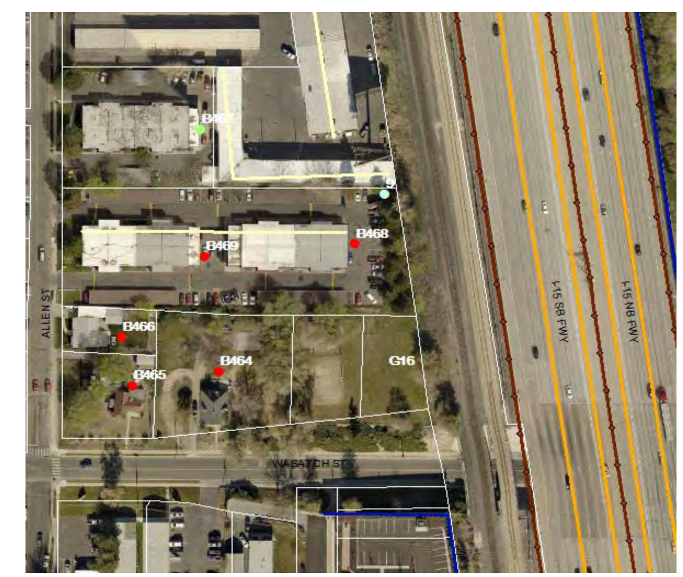
Average pavement type shall be use
a State highway agency substantiate
of a different type with approval of FI

Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reducti Calculated	G
			dBA	dBA	dBA	dB	dB		dBA	dB	d
C72	554	1	0.0	72.6	66	72.6	10	Snd Lvl	66.4	6.2	
C73	811	1	0.0	71.7	66	71.7	10	Snd Lvl	67.4	4.3	
C74	812	1	0.0	72.0	66	72.0	10	Snd Lvl	67.7	4.3	
B464	555	1	0.0	69.8	66	69.8	10	Snd Lvl	68.1	1.7	
B465	556	1	0.0	68.0	66	68.0	10	Snd Lvl	67.3	0.7	
B466	557	1	0.0	67.3	66	67.3	10	Snd Lvl	66.5	0.8	
B467	558	1	0.0	63.5	66	63.5	10	—	64.4	-0.9	
B468	559	1	0.0	72.6	66	72.6	10	Snd Lvl	67.5	5.1	
B469	560	1	0.0	68.2	66	68.2	10	Snd Lvl	67.0	1.2	

Barrier View-English Manor 16ft : 5 - CenterST_to_9000S:2





English Manor Apt

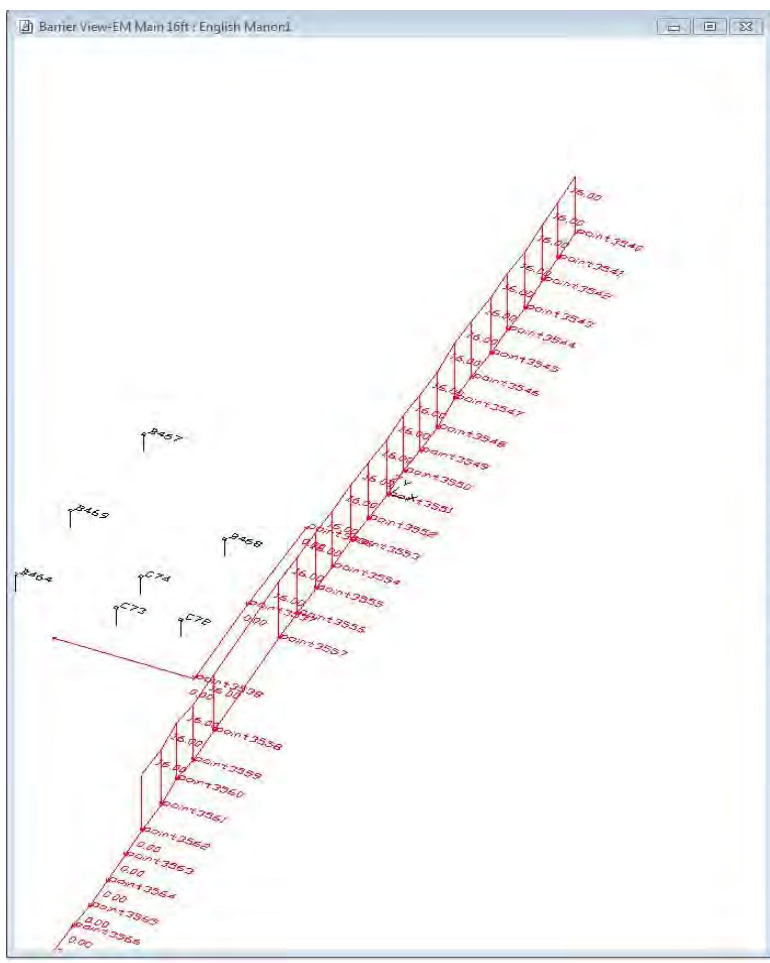
Wall Length: 1205 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 13

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B464	1			0		No	No	No	0	0		No	No	No	0	0
B465	1			0		No	No	No	0	0		No	No	No	0	0
B466	1			0		No	No	No	0	0		No	No	No	0	0
B468	12		YES	12		No	No	No	0	0		No	No	No	0	0
B467	12			0		No	No	No	0	0		No	No	No	0	0
B469	12			0		No	No	No	0	0		No	No	No	0	0
C74	1			0		No	No	No	0	0		No	No	No	0	0
C73	1			0		No	No	No	0	0		No	No	No	0	0
C72	1		YES	1		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0

Name	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B464		No	No	No	0	0	5.6	No	Yes	No	0	1
B465		No	No	No	0	0	4.3	No	No	No	0	0
B466		No	No	No	0	0	3.7	No	No	No	0	0
B468		No	No	No	0	0	6.2	No	Yes	No	0	12
B467		No	No	No	0	0	2.6	No	No	No	0	0
B469		No	No	No	0	0	5.3	No	Yes	No	0	12
C74		No	No	No	0	0	5.1	No	Yes	No	0	1
C73		No	No	No	0	0	5.9	No	Yes	No	0	1
C72		No	No	No	0	0	5.8	No	Yes	No	0	1
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0
		No	No	No	0	0		No	No	No	0	0

Name	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B464	6.1	No	Yes	No	0	1
B465	4.6	No	No	No	0	0
B466	4.1	No	No	No	0	0
B468	7	Yes	Yes	Yes	12	12
B467	2.6	No	No	No	0	0
B469	5.7	No	Yes	No	0	12
C74	6.8	No	Yes	No	0	1
C73	6.5	No	Yes	No	0	1
C72	6.4	No	Yes	No	0	1
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	12
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	92.3%
Noise Abatement Design Goal:	No	No	No	No	Yes
# of Benefited:	0	0	0	28	28
Cost of Noise Wall:	$192,800.00	$241,000.00	$289,200.00	$337,400.00	$385,600.00
Cost per Benefited Receiver:	-	-	-	$12,050.00	$13,771.43
Cost Effectiveness:	No	No	No	Yes	Yes
Feasible and Reasonable:	**No**	**No**	**No**	**No**	Yes



Sound Levels : English Manor2

Horrocks Engineers — 28 February 2017
Angie Goodwin/Stephanee Eastman — TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Existing Noise
BARRIER DESIGN: EM Main 16ft
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
B469	560	1	0.0	68.3	66	68.3	10	Snd Lvl	62.6	5.7	8	-2.3
B468	559	1	0.0	72.5	66	72.5	10	Snd Lvl	65.5	7.0	8	-1.0
B467	558	1	0.0	63.5	66	63.5	10	—	60.8	2.7	8	-5.3
B466	557	1	0.0	67.1	66	67.1	10	Snd Lvl	63.0	4.1	8	-3.9
B465	556	1	0.0	67.7	66	67.7	10	Snd Lvl	63.1	4.6	8	-3.4
B464	555	1	0.0	69.7	66	69.7	10	Snd Lvl	63.6	6.1	8	-1.9
C74	812	1	0.0	71.8	66	71.8	10	Snd Lvl	65.0	6.8	8	-1.2
C73	811	1	0.0	71.6	66	71.6	10	Snd Lvl	65.0	6.6	8	-1.4
C72	554	1	0.0	72.5	66	72.5	10	Snd Lvl	66.1	6.4	8	-1.6

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	9	2.7	5.6	7.0
All Impacted	8	4.1	5.9	7.0
All that meet NR Goal	0	0.0	0.0	0.0

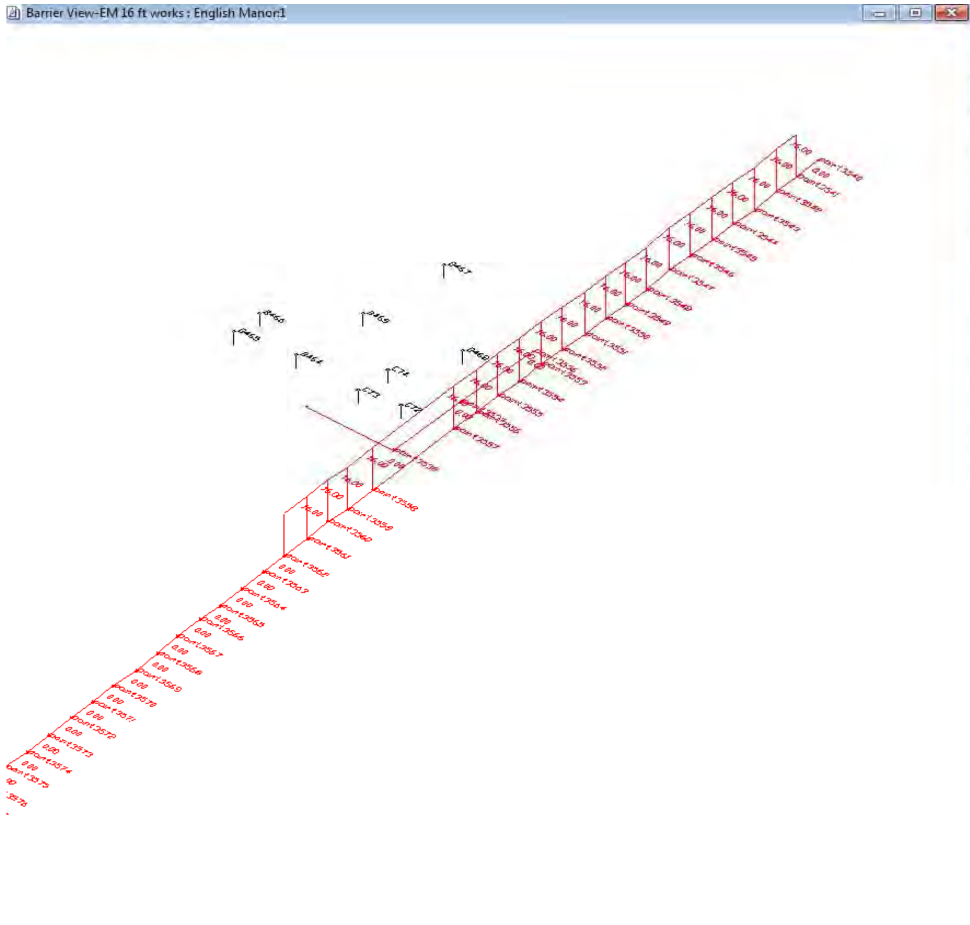
Barrier Descriptions Table : English Manor3

PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Existing Noise
BARRIER DESIGN: EM Main 16ft

Barriers

Name	Type	Heights along Barrier Min	Avg	Max	Length	If Wall Area
		ft	ft	ft	ft	sq ft
Noise Wall - English Manor	W	0.00	0.00	0.00	0	0
East Side Noise Wall	W	16.00	16.00	16.00	1256	20095

Barrier View-EM 16 ft works : English Manor:1



Sound Levels : English Manor:2

Horrocks Engineers
Angie Goodwin/Stephanee Eastman

28 February 2017
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Existing Noise
BARRIER DESIGN: EM 16 ft works

Average pavement type shall be used
a State highway agency substantiates
of a different type with approval of FH\

ATMOSPHERICS: 68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reductio Calculated	Go
			dBA	dBA	dBA	dB	dB		dBA	dB	dB
B469	560	1	0.0	68.3	66	68.3	10	Snd Lvl	62.6	5.7	
B468	559	1	0.0	72.5	66	72.5	10	Snd Lvl	65.5	7.0	
B467	558	1	0.0	63.5	66	63.5	10	—	60.9	2.6	
B466	557	1	0.0	67.1	66	67.1	10	Snd Lvl	63.1	4.0	
B465	556	1	0.0	67.7	66	67.7	10	Snd Lvl	63.1	4.6	
B464	555	1	0.0	69.7	66	69.7	10	Snd Lvl	63.6	6.1	
C74	812	1	0.0	71.8	66	71.8	10	Snd Lvl	65.1	6.7	
C73	811	1	0.0	71.6	66	71.6	10	Snd Lvl	65.1	6.5	
C72	554	1	0.0	72.5	66	72.5	10	Snd Lvl	66.1	6.4	

Dwelling Units	# DUs	Noise Reduction

Barrier Descriptions Table : English Manor:3

PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Existing Noise
BARRIER DESIGN: EM 16 ft works

Barriers

Name	Type	Heights along Barrier Min	Avg	Max	Length	If Wall Area	If Berm Volume	Top Width	Run:Rise	Cost
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Noise Wall - English Manor	W	0.00	0.00	0.00	0	0				0
East Side Noise Wall	W	16.00	16.00	16.00	1205	19279				0
									Total Cost:	0

English Manor Apt (Longer Length)

Wall Length:	3417	ft
Wall Cost per sq ft:	$20	
# of First Row Receivers:	29	

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C72	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.5	No	Yes	No	0	1
B464	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.9	No	Yes	No	0	1
B465	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.5	No	Yes	No	0	1
B466	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.7	No	No	No	0	0
B467	12			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.7	No	No	No	0	0
B468	12		YES	12		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	7	Yes	Yes	Yes	12	12
B469	12			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6	No	Yes	No	0	12
B470	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.6	No	Yes	No	0	1
B478	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	7	Yes	Yes	No	0	1
B479	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.3	No	No	No	0	0
B480	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.9	No	No	No	0	0
B481	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.1	No	Yes	No	0	1
B482	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.7	No	Yes	No	0	1
B483	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.5	No	Yes	No	0	1
B484	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.7	No	Yes	No	0	1
B485	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.7	No	Yes	No	0	1
B486	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.6	No	Yes	No	0	1
B487	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.6	No	Yes	No	0	1
B501	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.2	No	Yes	No	0	1
B502	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.5	No	No	No	0	0
B503	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.7	No	No	No	0	0
B504	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.8	No	No	No	0	0
B505	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4	No	No	No	0	0
B506	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.5	No	Yes	No	0	1
B507	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.4	No	Yes	No	0	1
B508	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.2	No	Yes	No	0	1
B509	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.4	No	Yes	No	0	1
B510	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.6	No	No	No	0	0
B511	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3	No	No	No	0	0
B512	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.5	No	No	No	0	0
B513	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.3	No	Yes	No	0	1
B514	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.3	No	Yes	No	0	1
B515	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.1	No	No	No	0	0
B516	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.8	No	No	No	0	0
B517	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.9	No	Yes	No	0	1
B534	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6	No	Yes	No	0	1
B535	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.4	No	No	No	0	0
B538	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.5	No	Yes	No	0	1
B539	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.2	No	Yes	No	0	1
B540	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.1	No	Yes	No	0	1
B541	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.9	No	No	No	0	0
B542	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.3	No	No	No	0	0
B543	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.7	No	No	No	0	0
B544	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.7	No	No	No	0	0
C71	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.6	No	Yes	No	0	1
M9	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.8	No	Yes	No	0	1
C73	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.6	No	Yes	No	0	1
C74	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.8	No	Yes	No	0	1
C73	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.6	No	Yes	No	0	1
C74	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.8	No	Yes	No	0	1
B464	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.9	No	Yes	No	0	1
B465	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.5	No	Yes	No	0	1
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	0
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	0.0%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefited:	0	0	0	0	14
Cost of Noise Wall:	$0.00	$0.00	$0.00	$0.00	$239,190.00
Cost per Benefited Receiver:	-	-	-	-	$17,085.00
Cost Effectiveness:	No	No	No	No	Yes
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

Classic Fun Wall

Wall Length: 827 ft Frontage: 317 ft per lineal foot of frontage: $ 360 per ft Allowed cost $ 114,120

Wall Cost per sq ft: $20

\# of First Row Receivers: 6

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C51	6		YES	6		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.7	No	Yes	No	0	6	7.1	Yes	Yes	Yes	6	6
C52	3			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.7	No	No	No	0	0	3.8	No	No	No	0	0
C53	3			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.5	No	No	No	0	0	3.6	No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
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				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
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				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	6
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	100.0%
Noise Abatement Design Goal:	No	No	No	No	Yes
# of Benefited:	0	0	0	6	6
Cost of Noise Wall:	$132,320.00	$165,400.00	$198,480.00	$231,560.00	$264,640.00
Cost per Benefited Receiver:	-	-	-	$38,593.33	$44,106.67
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

Sound Levels : 6 - 9000S_to_10000S:3

Horrocks Engineers 26 February 2017
Angie Goodwin/Stephanee Eastman TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Design Noise 9000 S to 10000 S
BARRIER DESIGN: Classic Fun 16ft

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h (dBA)	No Barrier LAeq1h Calculated (dBA)	No Barrier LAeq1h Crit'n (dBA)	Increase over existing Calculated (dB)	Increase over existing Crit'n Sub'l Inc (dB)	Type Impact	With Barrier Calculated LAeq1h (dBA)	Noise Reduction Calculated (dB)	Noise Reduction Goal (dB)	Calculated minus Goal (dB)
C53	682	1	0.0	70.5	66	70.5	10	Snd Lvl	66.8	3.7	8	-4.3
C52	681	1	0.0	69.8	66	69.8	10	Snd Lvl	65.9	3.9	8	-4.1
C51	680	1	0.0	75.2	66	75.2	10	Snd Lvl	68.0	7.2	8	-0.8

Dwelling Units	# DUs	Noise Reduction Min (dB)	Avg (dB)	Max (dB)
All Selected	3	3.7	4.9	7.2
All Impacted	3	3.7	4.9	7.2
All that meet NR Goal	0	0.0	0.0	0.0

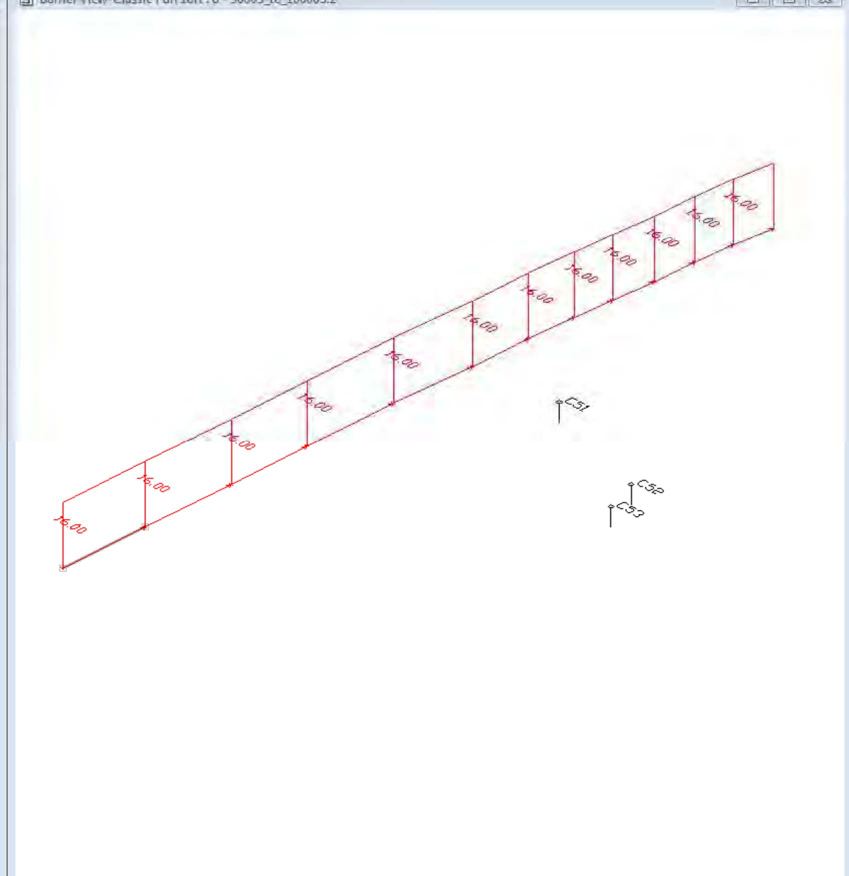
Barrier Descriptions Table : 6 - 9000S_to_10000S:4

Horrocks Engineers 26 February 2017
Angie Goodwin/Stephanee Eastman TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Design Noise 9000 S to 10000 S
BARRIER DESIGN: Classic Fun 16ft

Barriers Name	Type	Heights along Barrier Min (ft)	Avg (ft)	Max (ft)	Length (ft)	If Wall Area (sq ft)	If Berm Volume (cu yd)	Top Width (ft)	Run:Rise (ft:ft)	Cost ($)
Noise Wall A -Classic Fun	W	16.00	16.00	16.00	877	14038				0
									Total Cost:	0

Barrier View-Classic Fun 16ft : 6 - 9000S_to_10000S:2



Windmill Cove Wall

Wall Length: 2725 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 1

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
B579	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.6	No	No	No	0	0
B580	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.6	No	No	No	0	0
B581	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.3	No	No	No	0	0
B582	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.5	No	No	No	0	0
B583	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.7	No	No	No	0	0
B584	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3	No	No	No	0	0
B585	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.4	No	No	No	0	0
B586	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3	No	No	No	0	0
B587	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.2	No	No	No	0	0
B588	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.6	No	No	No	0	0
B589	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.9	No	No	No	0	0
B590	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.3	No	No	No	0	0
B591	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.8	No	No	No	0	0
B592	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	2.6	No	No	No	0	0
B593	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4	No	No	No	0	0
B594	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4	No	No	No	0	0
B595	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.8	No	No	No	0	0
B596	18			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.6	No	No	No	0	0
B597	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.3	No	No	No	0	0
B598	18			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.5	No	Yes	No	0	18
B599	18			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.2	No	Yes	No	0	18
B600	18			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.3	No	No	No	0	0
B601	18			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.1	No	No	No	0	0
B602	18			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.1	No	No	No	0	0
B603	18			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.4	No	No	No	0	0
E13	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.8	No	Yes	No	0	1
E14	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	5.1	No	Yes	No	0	1
C58	1			0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	1.5	No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	0
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	0.0%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefited:	0	0	0	0	38
Cost of Noise Wall:	$436,000.00	$545,000.00	$654,000.00	$763,000.00	$872,000.00
Cost per Benefited Receiver:	-	-	-	-	$22,947.37
Cost Effectiveness:	No	No	No	No	Yes
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

Barrier Descriptions Table : 6 - 9000S_to_10000S:4

Horrocks Engineers 26 February 2017
Angie Goodwin/Stephanee Eastman TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Design Noise 9000 S to 10000 S
BARRIER DESIGN: Wind Mill Cove 16ft

Barriers

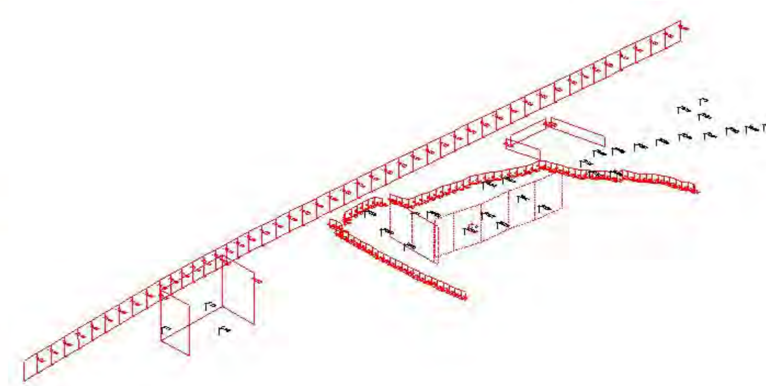
Name	Type	Heights along Barrier Min	Avg	Max	Length	If Wall Area	If Berm Volume	Top Width	Run:Rise	Cost
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier113	W	40.00	40.00	40.00	523	20929				
Barrier86	W	6.50	6.50	6.50	620	4032				
Barrier85	W	6.50	6.50	6.50	179	1165				
Windmill Cove north wall	W	6.50	6.50	6.50	1172	7618				
Wall around substation 2	W	8.00	8.00	8.00	143	1147				
Wall in front of substation	W	8.00	8.00	8.00	150	1200				
Wall around substation	W	8.00	8.00	8.00	225	1800				
Noise Wall C - Wind Mill Cove	W	16.00	16.00	16.00	2725	43607				

Sound Levels : 6 - 9000S_to_10000S:3

B595	699	1	0.0	70.1	66	70.1	10	Snd Lvl	65.3	4.8
B596	700	1	0.0	64.1	66	64.1	10	—	59.5	4.6
B597	701	1	0.0	64.2	66	64.2	10	—	59.9	4.3
B598	702	1	0.0	69.2	66	69.2	10	Snd Lvl	63.7	5.5
B599	703	1	0.0	68.0	66	68.0	10	Snd Lvl	62.8	5.2
B600	704	1	0.0	65.8	66	65.8	10	—	61.5	4.3
B601	705	1	0.0	64.3	66	64.3	10	—	60.2	4.1
B602	706	1	0.0	62.7	66	62.7	10	—	58.6	4.1
B603	707	1	0.0	63.3	66	63.3	10	—	58.9	4.4
E13	719	1	0.0	77.2	66	77.2	10	Snd Lvl	71.4	5.8
E14	720	1	0.0	77.3	66	77.3	10	Snd Lvl	72.2	5.1
C58	721	1	0.0	57.4	66	57.4	10	—	55.9	1.5
M3	807	1	0.0	71.3	66	71.3	10	Snd Lvl	67.2	4.1
M4	808	1	0.0	69.4	66	69.4	10	Snd Lvl	63.5	5.9

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	30	1.5	3.9	5.9
All Impacted	21	2.6	4.0	5.9
All that meet NR Goal	0	0.0	0.0	0.0

Barrier View-Wind Mill Cove 16ft : 6 - 9000S_to_10000S:3



Challenger School

Wall Length:	704	ft
Wall Cost per sq ft:	$20	
# of First Row Receivers:	0	

Name	# of DU	ID	1st Row	# of 1st Row
C54	1			0
C55	1	YES		0
D18	1	YES		0
				0
				0
				0
				0
				0
				0

Name	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C54		No	No	No	0	0
C55		No	No	No	0	0
D18		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C54		No	No	No	0	0
C55		No	No	No	0	0
D18		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C54		No	No	No	0	0
C55		No	No	No	0	0
D18		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C54		No	No	No	0	0
C55		No	No	No	0	0
D18		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C54	2.5	No	No	No	0	0
C55	3.1	No	No	No	0	0
D18	2.9	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	0
% of First-Row Design Goal:	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Noise Abatement Design Goal:	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
# of Benefited:	0	0	0	0	0
Cost of Noise Wall:	$112,640.00	$140,800.00	$168,960.00	$197,120.00	$225,280.00
Cost per Benefited Receiver:	-	-	-	-	-
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**

Even a 16 ft wall does not provide 7 dBA reduction at any receptors.

Barrier Descriptions Table : 6 - 9000S_to_10000S:4

Horrrocks Engineers 27 February 2017
Angie Goodwin/Stephanee Eastman TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Design Noise 9000 S to 10000 S
BARRIER DESIGN: Challenger 16ft

Barriers

Name	Type	Heights along Barrier Min	Avg	Max	Length	If Wall Area	If Be Volu
		ft	ft	ft	ft	sq ft	cu y
Noise Wall B - Challenger School	W	16.00	16.00	16.00	704	11272	

Sound Levels : 6 - 9000S_to_10000S:3

Horrrocks Engineers 27 February 2017
Angie Goodwin/Stephanee Eastman TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Design Noise 9000 S to 10000 S
BARRIER DESIGN: Challenger 16ft

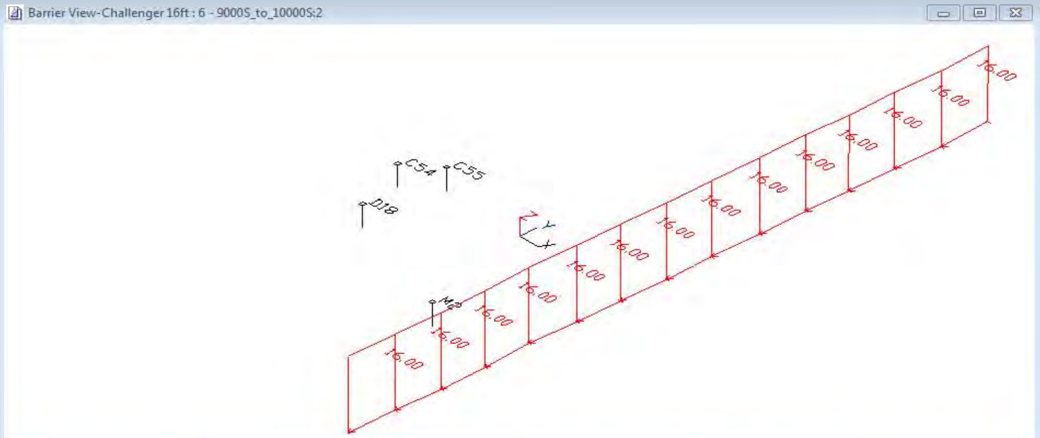
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

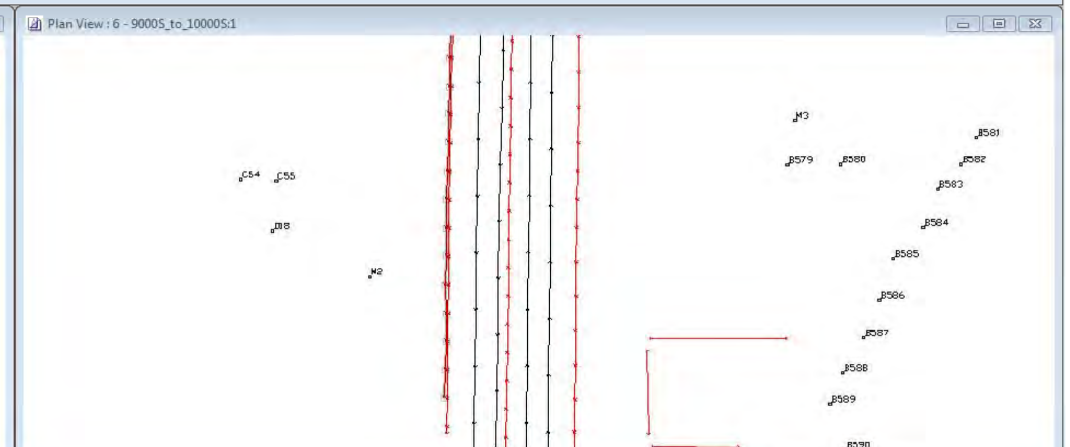
Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
C54	708	1	0.0	67.2	66	67.2	10	Snd Lvl	64.7	2.5	8	-5.5
C55	709	1	0.0	68.9	66	68.9	10	Snd Lvl	65.8	3.1	8	-4.9
D18	710	1	0.0	68.9	66	68.9	10	Snd Lvl	66.0	2.9	8	-5.1
M2	806	1	0.0	72.8	66	72.8	10	Snd Lvl	68.2	4.6	8	-3.4

Barrier View-Challenger 16ft : 6 - 9000S_to_10000S:2



Plan View : 6 - 9000S_to_10000S:1



9800 South Office Wall

Wall Length: 1400 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 3

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefitted Receptors
E16	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.3	No	No	No	0	0
E15	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.3	No	Yes	No	0	1
E17	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.6	No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	0
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	0.0%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefitted:	0	0	0	0	1
Cost of Noise Wall:	$224,000.00	$280,000.00	$336,000.00	$392,000.00	$448,000.00
Cost per Benefitted Receiver:	-	-	-	-	$448,000.00
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

Even a 16 ft wall does not provide 7 dBA reduction at any receptors.

Barrier Descriptions Table : 6 - 9000S_to_10000S:4

Horrocks Engineers — 12 March 2017
Stephanee Eastman, P.E. — TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: PG-882-1607 I-15 SR-201 to 12300 S
RUN: Design Noise 9000 S to 10000 S
BARRIER DESIGN: 9800 S 16ft

Barriers

Name	Type	Heights along Barrier Min	Avg	Max	Length	If Wall Area
		ft	ft	ft	ft	sq ft
Noise Wall D - SLCC	W	16.00	16.00	16.00	1400	22396

Sound Levels : 6 - 9000S_to_10000S:3

Horrocks Engineers — 12 March 2017
Stephanee Eastman, P.E. — TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PG-882-1607 I-15 SR-201 to 12300 S
RUN: Design Noise 9000 S to 10000 S
BARRIER DESIGN: 9800 S 16ft

ATMOSPHERICS: 68 deg F, 50% RH

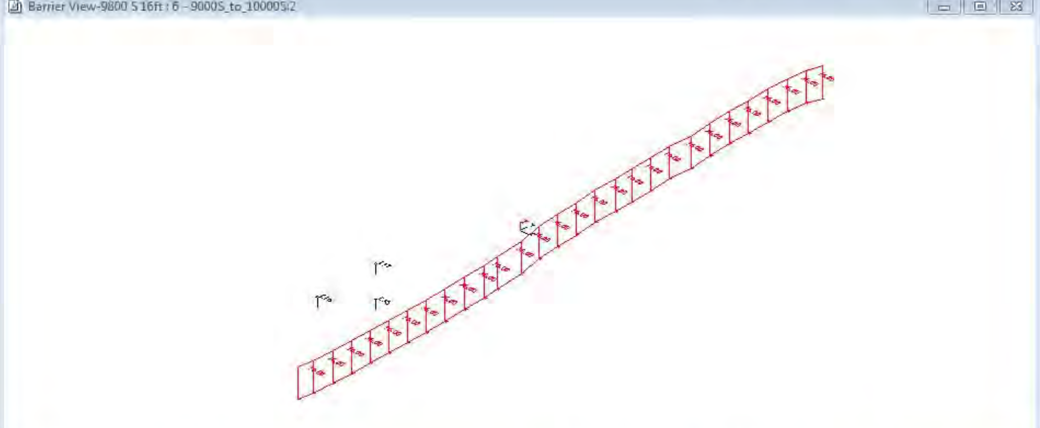
Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver

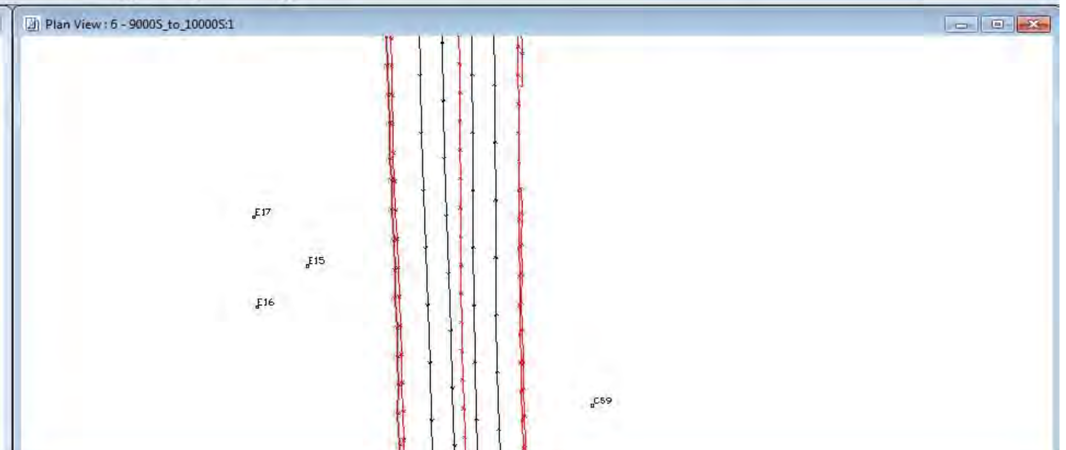
Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
E16	723	1	0.0	71.0	66	71.0	10	Snd Lvl	66.7	4.3	8	-3.7
E15	722	1	0.0	73.7	66	73.7	10	Snd Lvl	67.4	6.3	8	-1.7
E17	724	1	0.0	70.9	66	70.9	10	Snd Lvl	66.3	4.6	8	-3.4

Dwelling Units — # DUs — Noise Reduction

Barrier View-9800 S 16ft : 6 - 9000S_to_10000S:2



Plan View : 6 - 9000S_to_10000S:1

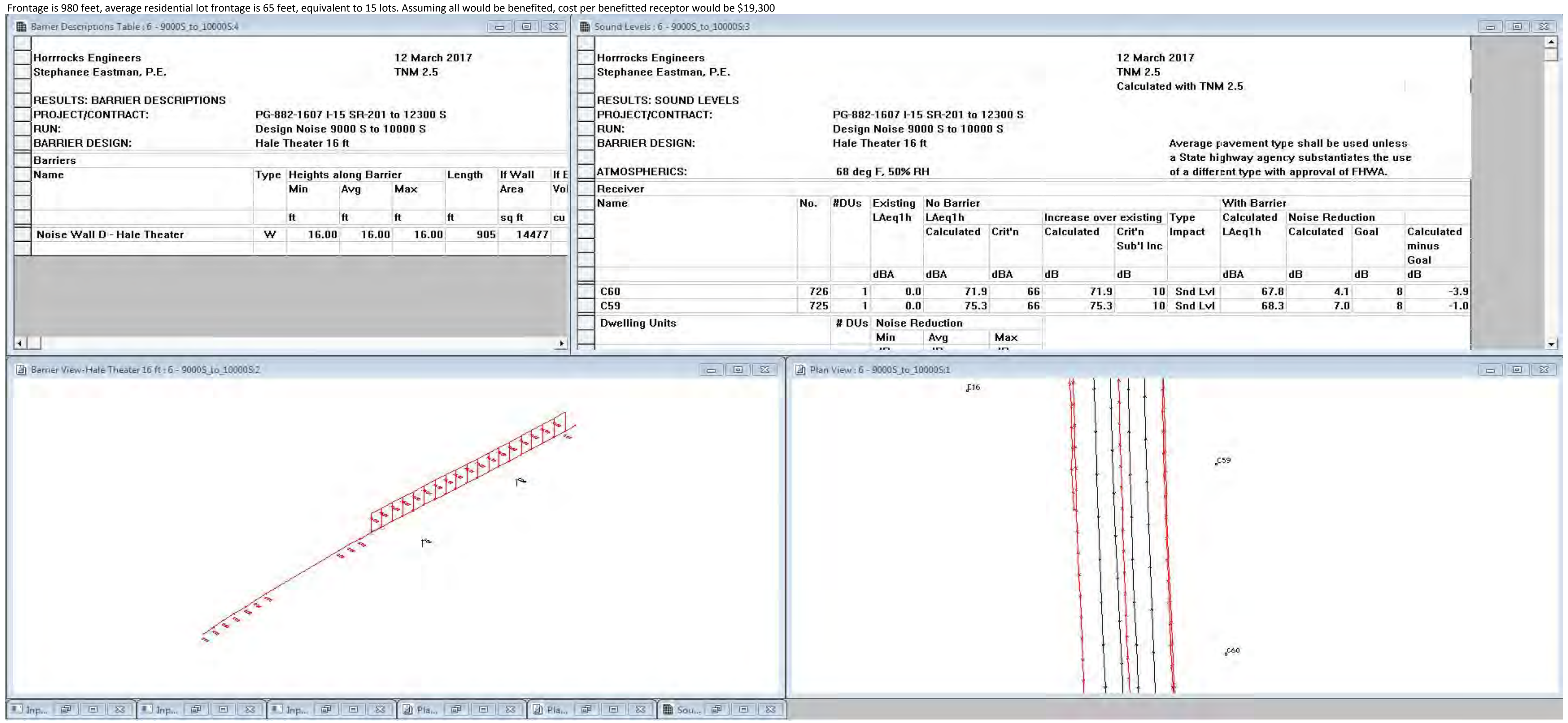


Hale Theater Wall

Wall Length: 905 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 2

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
C59	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.6	No	Yes	No	0	1	7	Yes	Yes	Yes	1	1
C60	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	4.5	No	No	No	0	0	4.1	No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				# of First-Row Design Goal:			0						0						0						0						1			
				% of First-Row Design Goal:			0.0%						0.0%						0.0%						0.0%						50.0%			
				Noise Abatement Design Goal:			No						No						No						No						Yes			
				# of Benefited:			0						0						0						1						1			
				Cost of Noise Wall:			$144,800.00						$181,000.00						$217,200.00						$253,400.00						$289,600.00			
				Cost per Benefited Receiver:			-						-						-						$253,400.00						$289,600.00			
				Cost Effectiveness:			No						No						No						No						No			
				Feasible and Reasonable:			**No**						**No**						**No**						**No**						**No**			

Even a 16 ft wall does not provide 7 dBA reduction at any receptors.
Frontage is 980 feet, average residential lot frontage is 65 feet, equivalent to 15 lots. Assuming all would be benefited, cost per benefitted receptor would be $19,300



Super 8 Wall

Wall Length: 967 ft
Wall Cost per sq ft: $20
# of First Row Receivers: 5

Name	# of DU	ID	1st Row	# of 1st Row	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
E23	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	6.9	No	Yes	No	0	1
E21	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.1	No	No	No	0	0
E22	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	3.8	No	No	No	0	0
C61	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	0.9	No	No	No	0	0
C62	1		YES	1		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0	0.7	No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0
				0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	0
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	0.0%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefited:	0	0	0	0	1
Cost of Noise Wall:	$154,720.00	$193,400.00	$232,080.00	$270,760.00	$309,440.00
Cost per Benefited Receiver:	-	-	-	-	$309,440.00
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

Even a 16 ft wall does not provide 7 dBA reduction at any receptors.

Barrier Descriptions Table : Cowabunga Bay:4

Horrocks Engineers — 10 March 2017
Angie Goodwin/Stephanee Eastman — TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Existing Noise
BARRIER DESIGN: Super 8 16 ft

Barriers

Name	Type	Heights along Barrier Min	Avg	Max	Length	If Wall Area	If I Vo
		ft	ft	ft	ft	sq ft	cu
Super 8 Noise Wall	W	16.00	16.00	16.00	967	15470	

Sound Levels : Cowabunga Bay:3

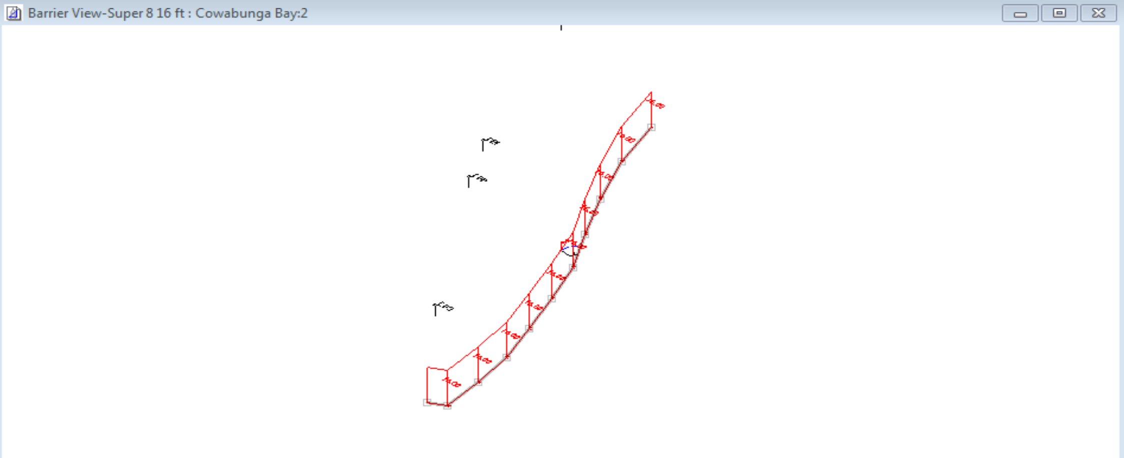
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PG-882-1607 I-15 SB 12300 South to SR-
RUN: Existing Noise
BARRIER DESIGN: Super 8 16 ft — Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.
ATMOSPHERICS: 68 deg F, 50% RH

Receiver

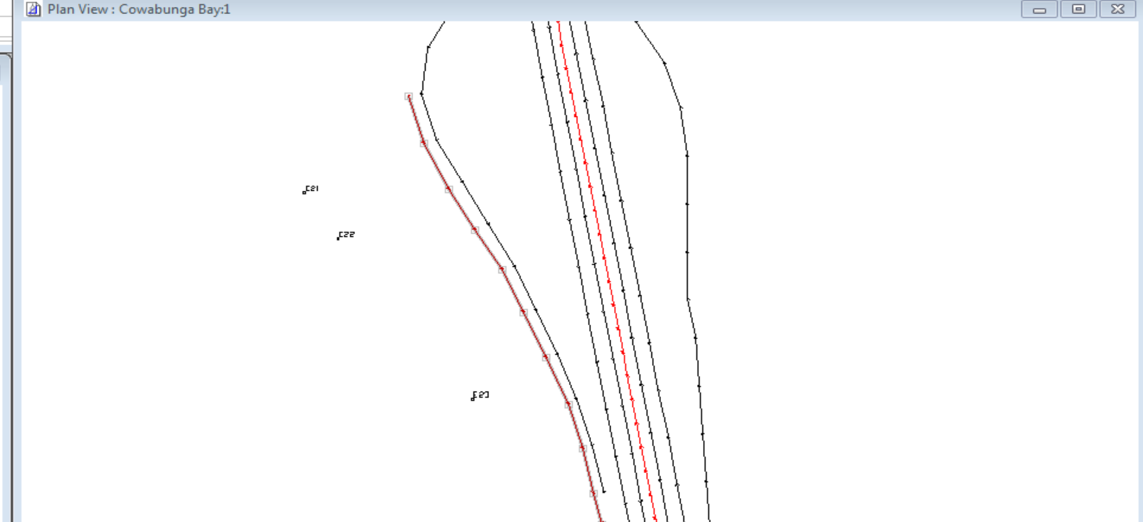
Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
E23	754	1	0.0	75.8	66	75.8	10	Snd Lvl	68.9	6.9	8	-1.1
E21	752	1	0.0	67.1	66	67.1	10	Snd Lvl	64.0	3.1	8	-4.9
E22	753	1	0.0	68.4	66	68.4	10	Snd Lvl	64.6	3.8	8	-4.2
C61	755	1	0.0	63.3	66	63.3	10	—	62.4	0.9	8	-7.1
C62	756	1	0.0	62.8	66	62.8	10	—	62.1	0.7	8	-7.3

Dwelling Units — # DUs — Noise Reduction

Barrier View-Super 8 16 ft : Cowabunga Bay:2



Plan View : Cowabunga Bay:1



Cowabunga Bay Wall

Wall Length:	1650	ft
Wall Cost per sq ft:	$20	
# of First Row Receivers:	3	

Name	# of DU	ID	1st Row	# of 1st Row
E27	1			0
E26	1		YES	1
E25	1		YES	1
C67	1			0
C66	1			0
E24	1		YES	1
				0
				0
				0
				0
				0

Name	8-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
E27		No	No	No	0	0
E26		No	No	No	0	0
E25		No	No	No	0	0
C67		No	No	No	0	0
C66		No	No	No	0	0
E24		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	10-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
E27		No	No	No	0	0
E26		No	No	No	0	0
E25		No	No	No	0	0
C67		No	No	No	0	0
C66		No	No	No	0	0
E24		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	12-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
E27		No	No	No	0	0
E26		No	No	No	0	0
E25		No	No	No	0	0
C67		No	No	No	0	0
C66		No	No	No	0	0
E24		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	14-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
E27		No	No	No	0	0
E26		No	No	No	0	0
E25		No	No	No	0	0
C67		No	No	No	0	0
C66		No	No	No	0	0
E24		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

Name	16-ft Wall	Design Goal	Benefitted	1st Row Design Goal	# 1st Row	# Benefited Receptors
E27	3	No	No	No	0	0
E26	5.1	No	Yes	No	0	1
E25	4.8	No	No	No	0	0
C67	2.8	No	No	No	0	0
C66	3.1	No	No	No	0	0
E24	4.9	No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0
		No	No	No	0	0

	8-ft Wall	10-ft Wall	12-ft Wall	14-ft Wall	16-ft Wall
# of First-Row Design Goal:	0	0	0	0	0
% of First-Row Design Goal:	0.0%	0.0%	0.0%	0.0%	0.0%
Noise Abatement Design Goal:	No	No	No	No	No
# of Benefited:	0	0	0	0	1
Cost of Noise Wall:	$264,000.00	$330,000.00	$396,000.00	$462,000.00	$528,000.00
Cost per Benefited Receiver:	-	-	-	-	$528,000.00
Cost Effectiveness:	No	No	No	No	No
Feasible and Reasonable:	**No**	**No**	**No**	**No**	**No**

Even a 16 ft wall does not provide 7 dBA reduction at any receptors.

Barrier Descriptions Table : Cowabunga Bay:4

Horrrocks Engineers 12 March 2017
Stephanee Eastman, P.E. TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: PG-882-1607 I-15 SR-201 to 12300 S
RUN: Design Noise 10600 S to 12300 S
BARRIER DESIGN: Cowabunga 16ft

Barriers

Name	Type	Heights along Barrier Min	Avg	Max	Length	If Wall Area
		ft	ft	ft	ft	sq ft
Noise Wall Cowabunga Bay	W	16.00	16.00	16.00	1650	26405

Sound Levels : Cowabunga Bay:3

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PG-882-1607 I-15 SR-201 to 12300 S
RUN: Design Noise 10600 S to 12300 S
BARRIER DESIGN: Cowabunga 16ft

ATMOSPHERICS: 68 deg F, 50% RH

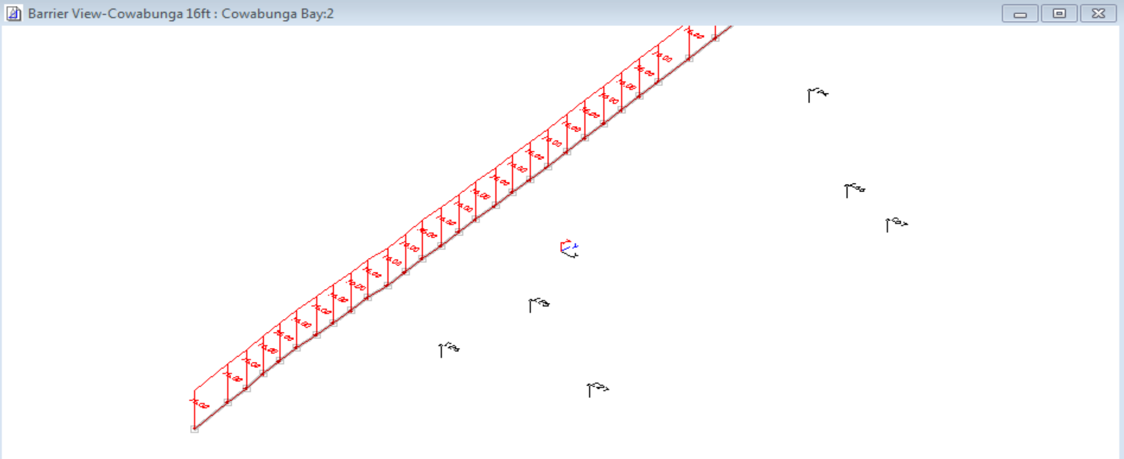
Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver

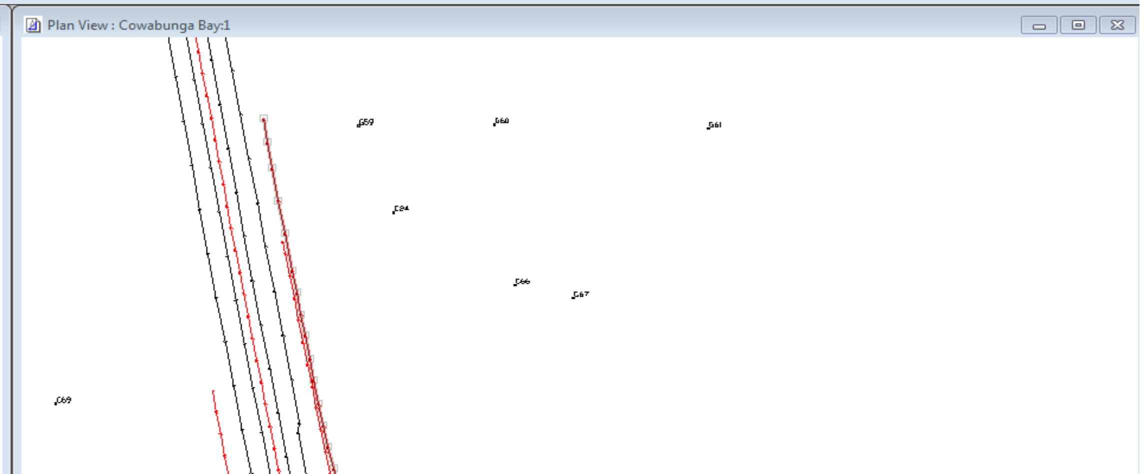
Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
E27	791	1	0.0	65.0	66	65.0	10	—	62.0	3.0	8	-5.0
E26	790	1	0.0	69.8	66	69.8	10	Snd Lvl	64.7	5.1	8	-2.9
E25	789	1	0.0	69.8	66	69.8	10	Snd Lvl	65.0	4.8	8	-3.2
C67	788	1	0.0	64.9	66	64.9	10	—	62.1	2.8	8	-5.2
C66	787	1	0.0	67.2	66	67.2	10	Snd Lvl	64.1	3.1	8	-4.9
E24	786	1	0.0	74.1	66	74.1	10	Snd Lvl	69.2	4.9	8	-3.1

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max

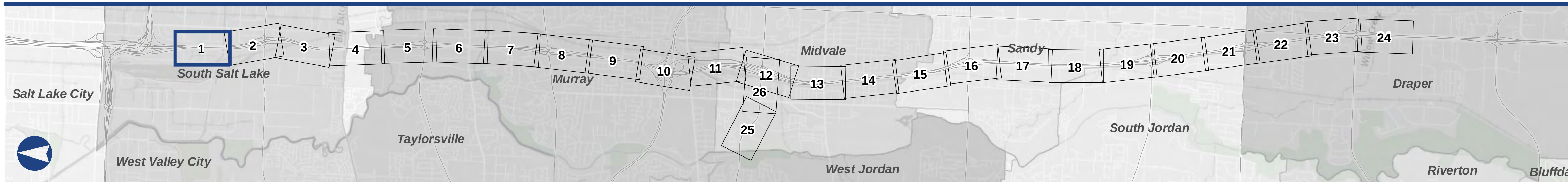
Barrier View-Cowabunga 16ft : Cowabunga Bay:2



Plan View : Cowabunga Bay:1



APPENDIX B: MAPS



SOUTH INTERSTATE 15 BOUND

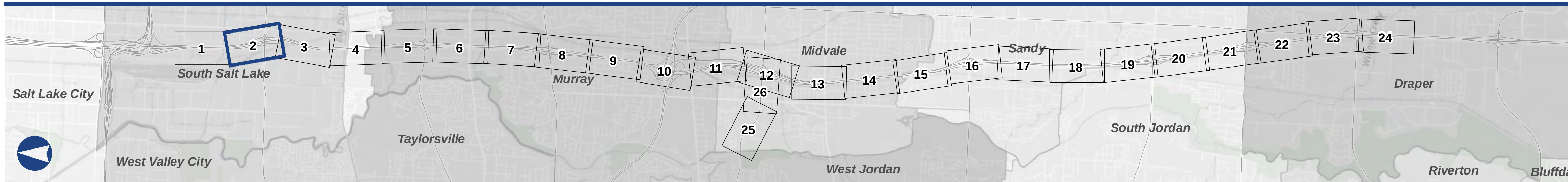
Existing Noise Impact

Preferred Alternative Noise Impact

Recommended Noise Walls (New)

Existing Noise Walls

Existing and Preferred Alternative Noise Levels



INTERSTATE SOUTH 15 BOUND

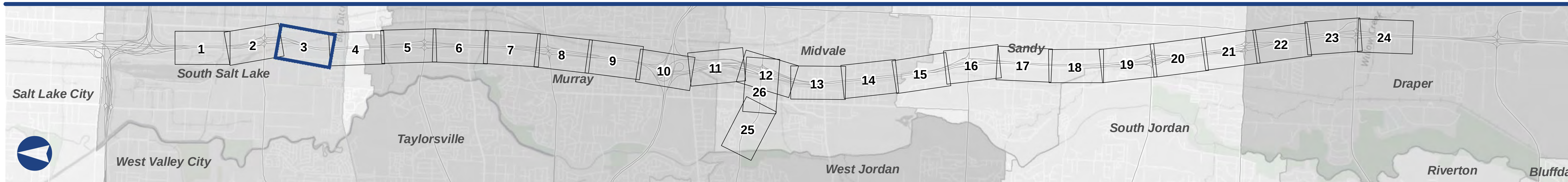
Existing Noise Impact

Preferred Alternative Noise Impact

Recommended Noise Walls (New)

Existing Noise Walls

Existing and Preferred Alternative Noise Levels



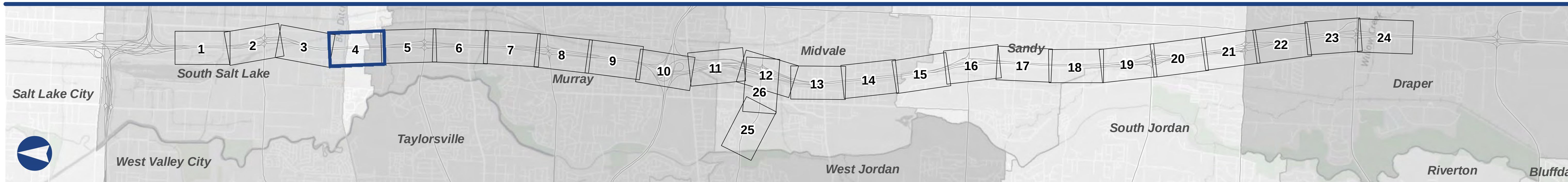
Existing Noise Impact

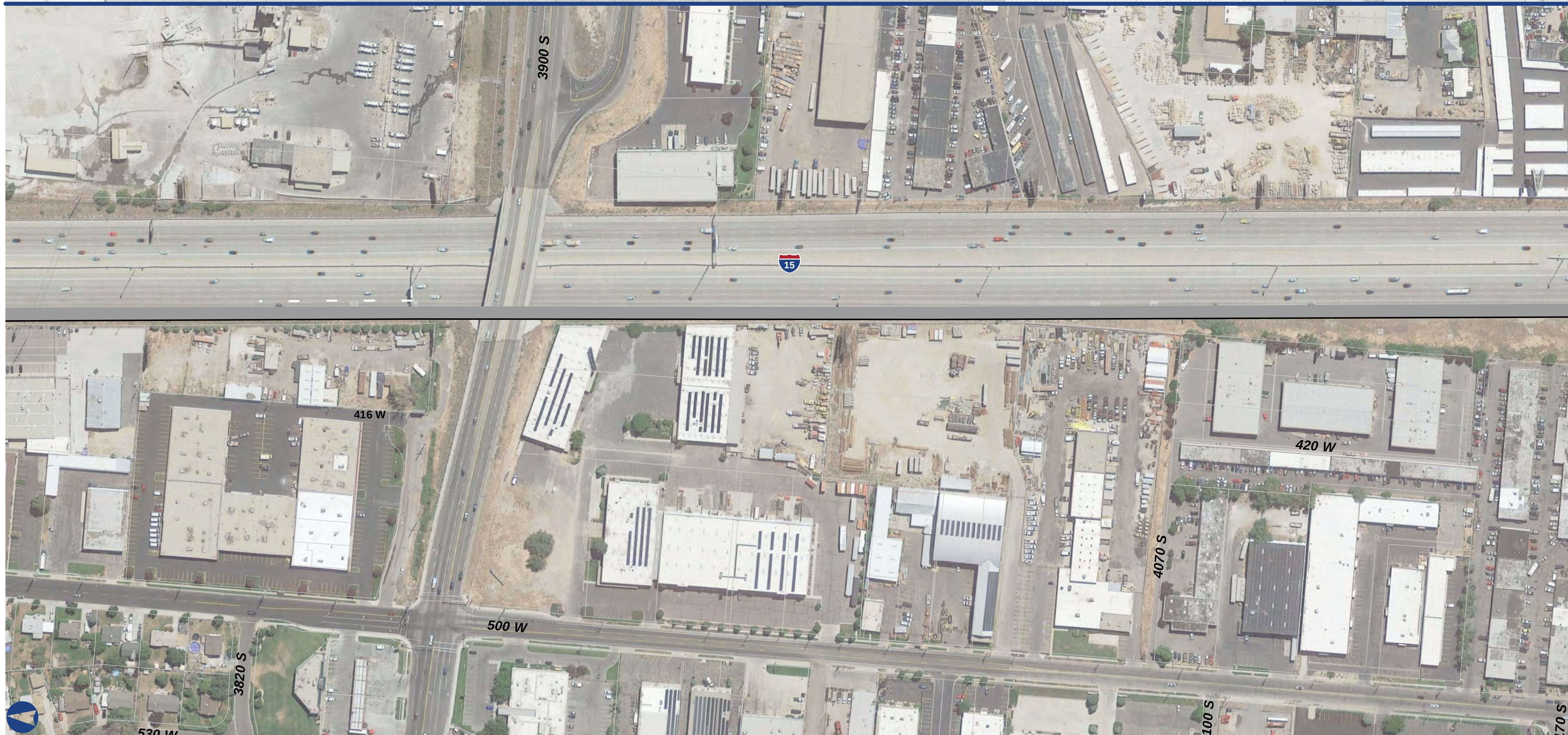
Preferred Alternative Noise Impact

Recommended Noise Walls (New)

Existing Noise Walls

Existing and Preferred Alternative Noise Levels





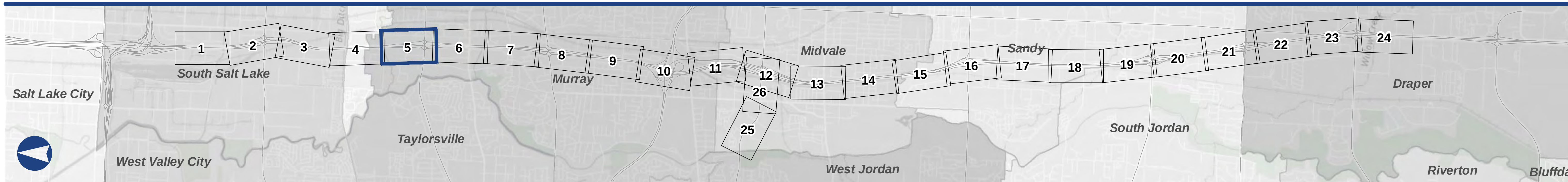
Existing Noise Impact

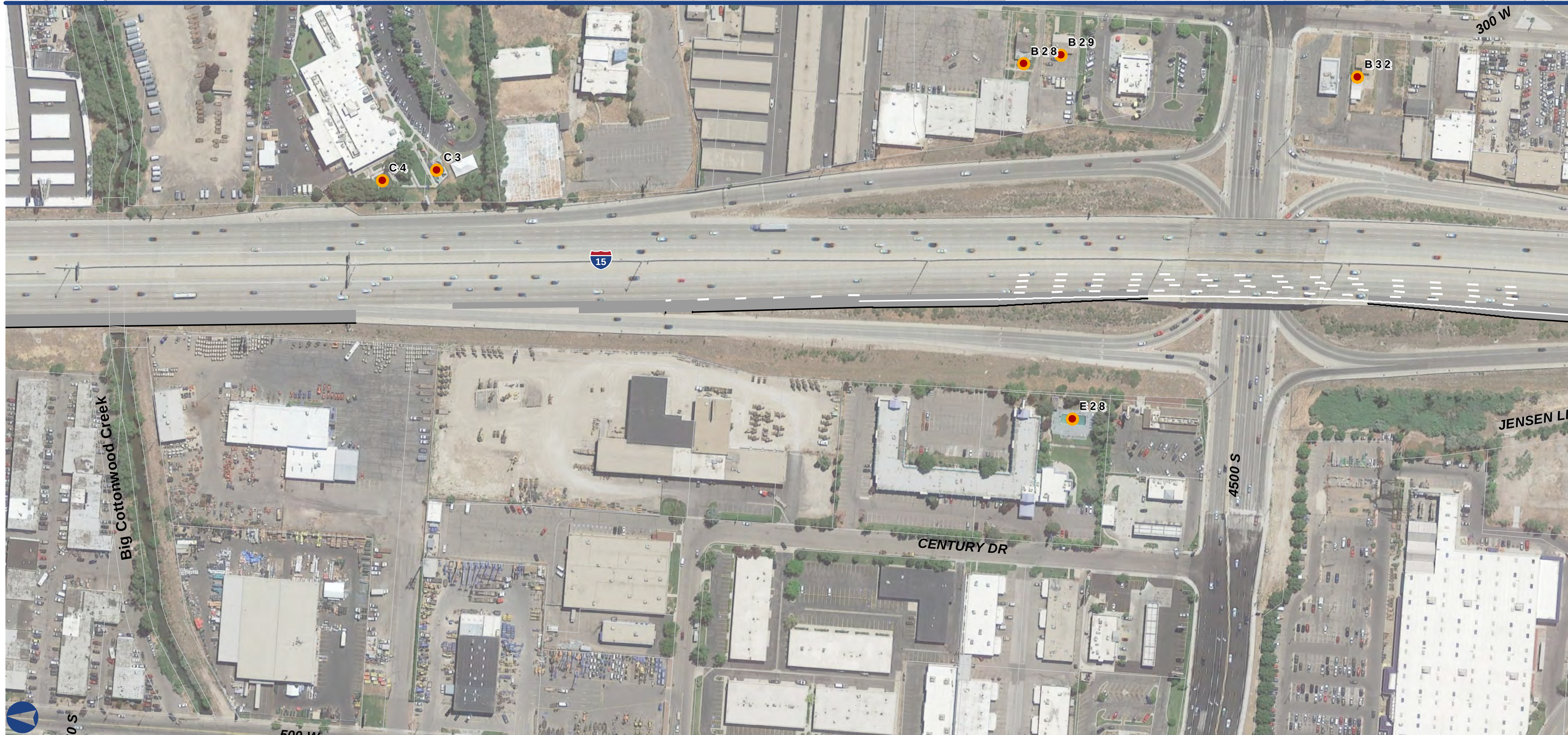
Preferred Alternative Noise Impact

Recommended Noise Walls (New)

Existing Noise Walls

Existing and Preferred Alternative Noise Levels





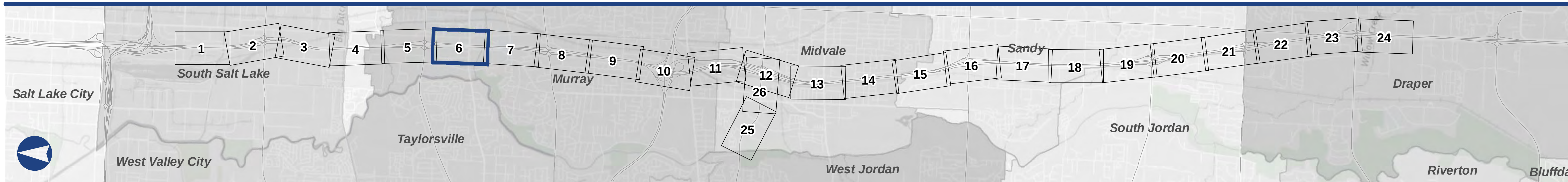
Existing Noise Impact

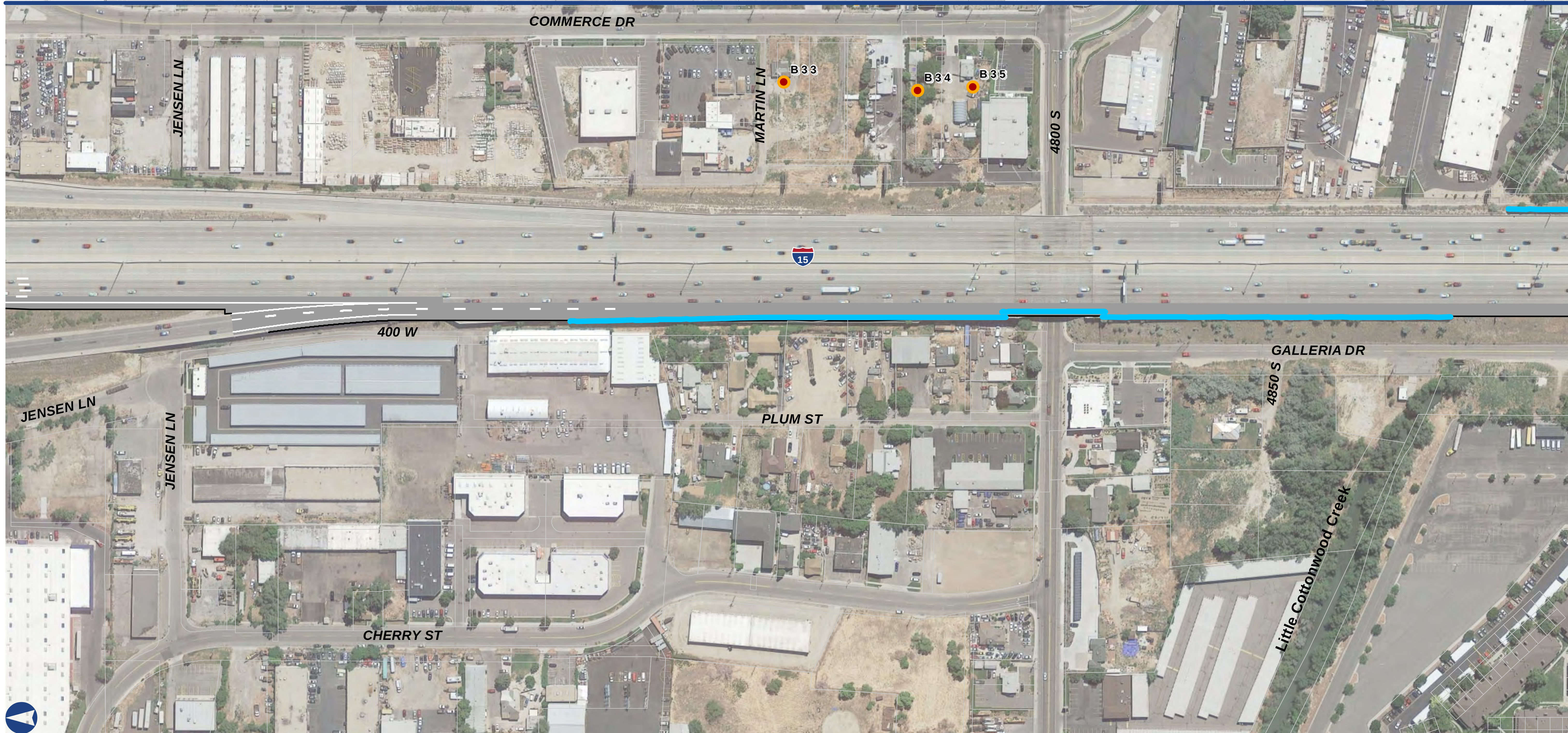
Preferred Alternative Noise Impact

Recommended Noise Walls (New)

Existing Noise Walls

Existing and Preferred Alternative Noise Levels





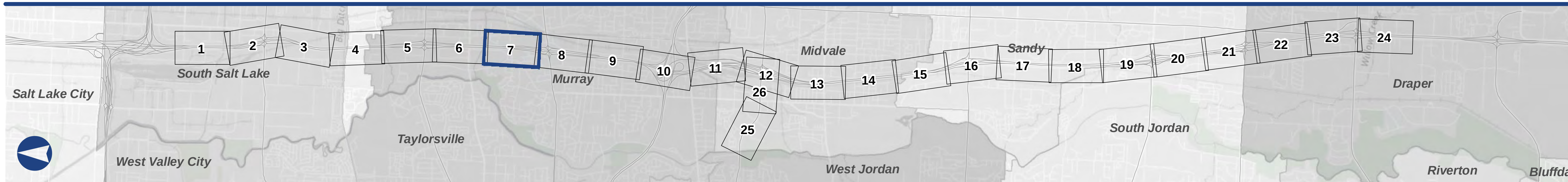
Existing Noise Impact

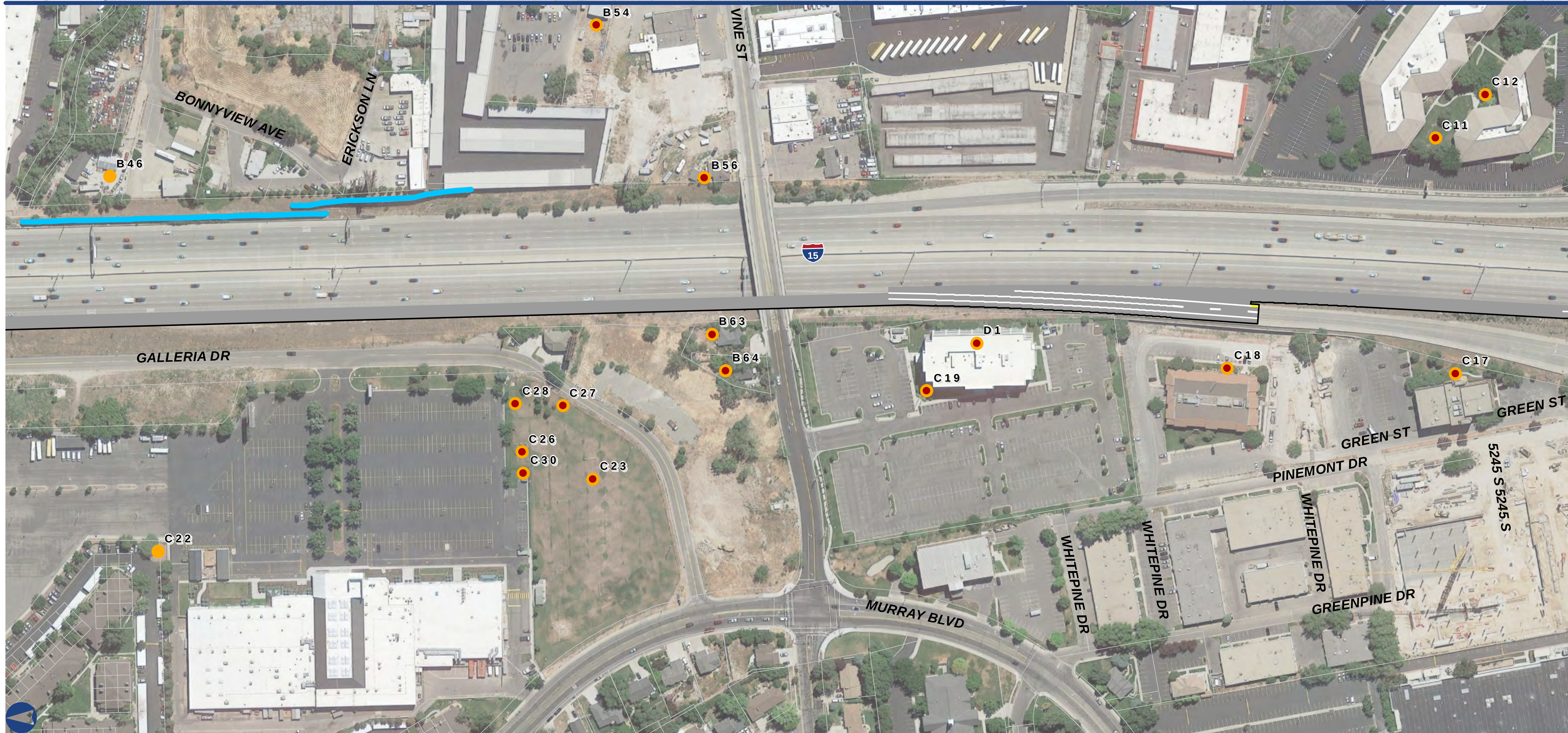
Preferred Alternative Noise Impact

Recommended Noise Walls (New)

Existing Noise Walls

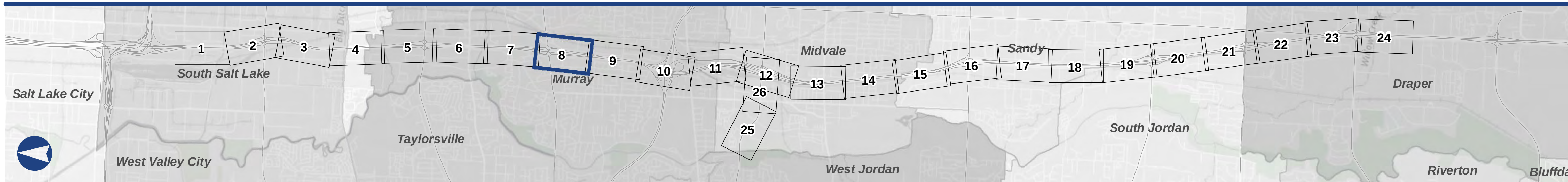
Existing and Preferred Alternative Noise Levels

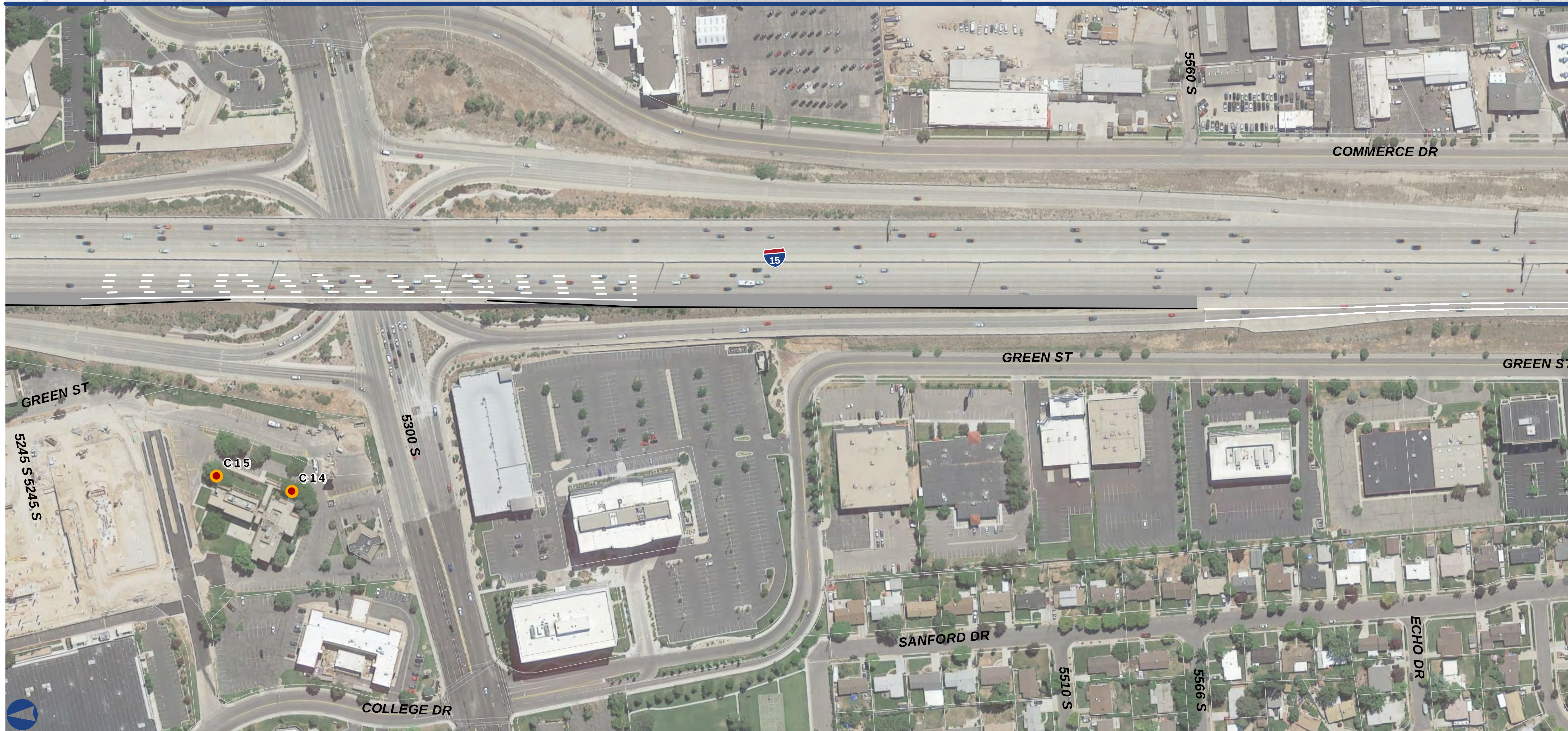




- Existing Noise Impact
- Preferred Alternative Noise Impact
- Recommended Noise Walls (New)
- Existing Noise Walls

Existing and Preferred Alternative Noise Levels





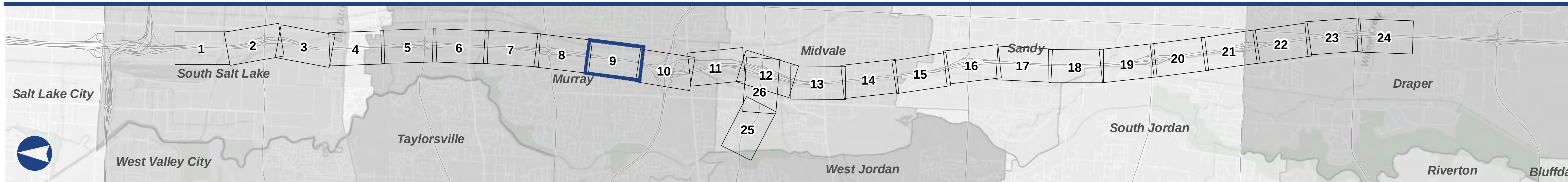
Existing Noise Impact

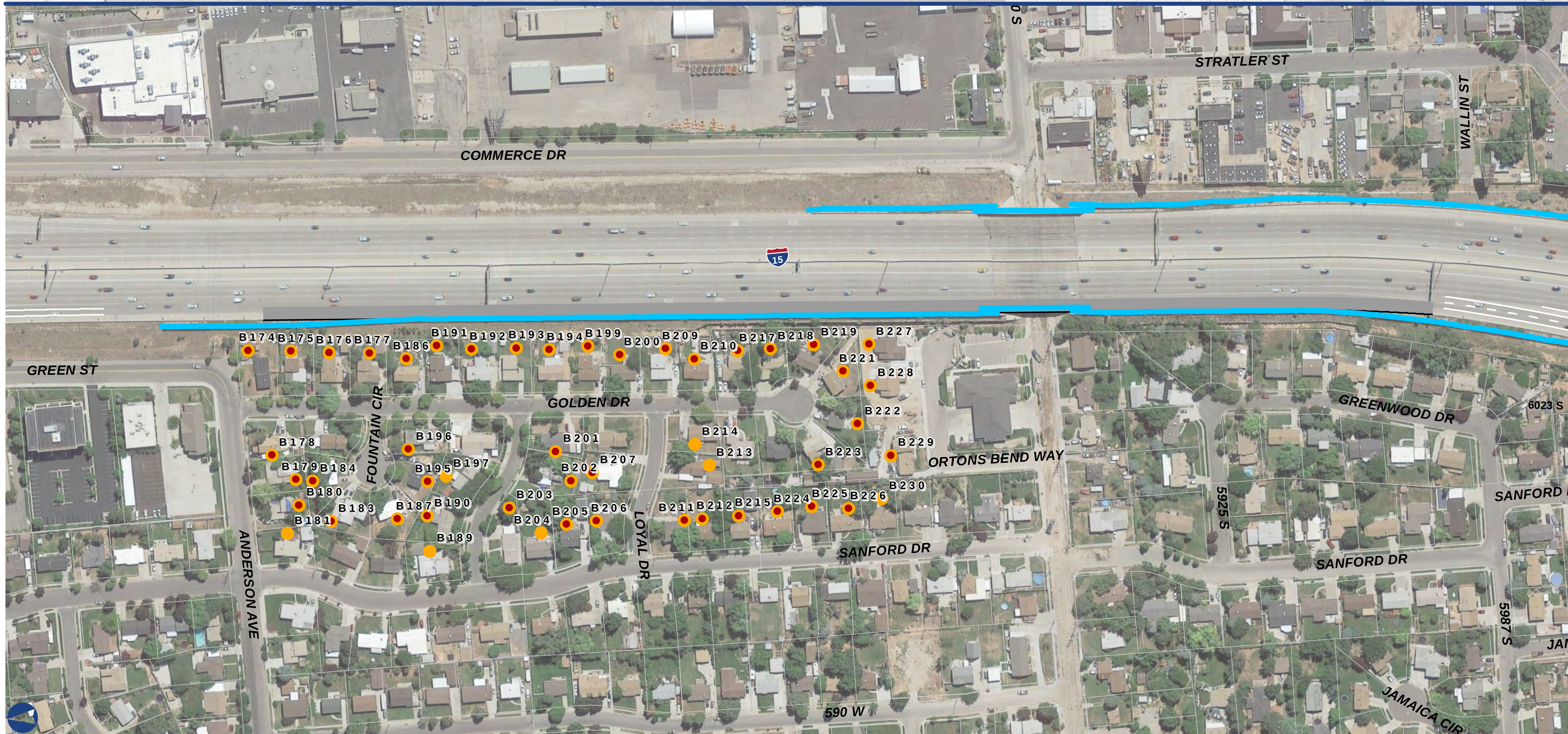
Preferred Alternative Noise Impact

Recommended Noise Walls (New)

Existing Noise Walls

Existing and Preferred Alternative Noise Levels

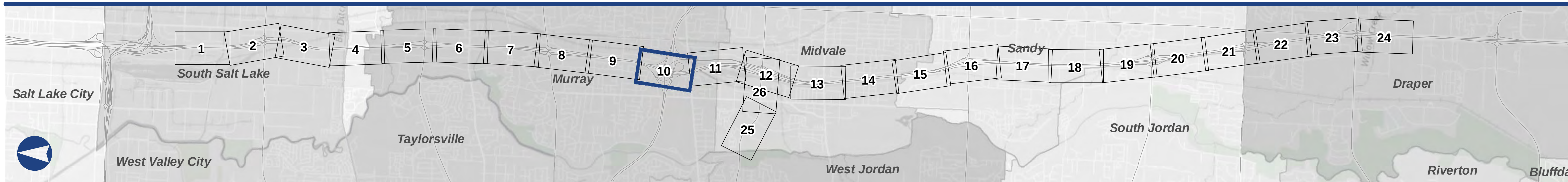




SOUTH INTERSTATE 15 BOUND

- Existing Noise Impact
- Preferred Alternative Noise Impact
- Recommended Noise Walls (New)
- Existing Noise Walls

Existing and Preferred Alternative Noise Levels



SOUTH INTERSTATE 15 BOUND

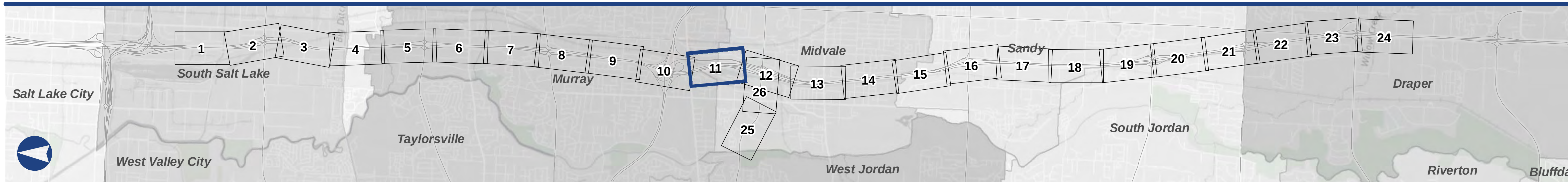
Existing Noise Impact

Preferred Alternative Noise Impact

Recommended Noise Walls (New)

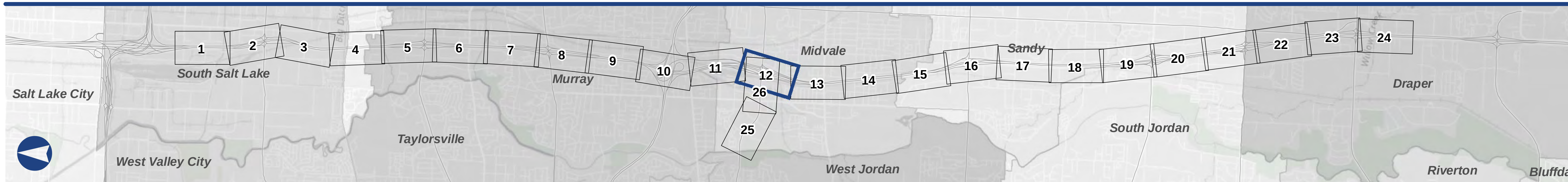
Existing Noise Walls

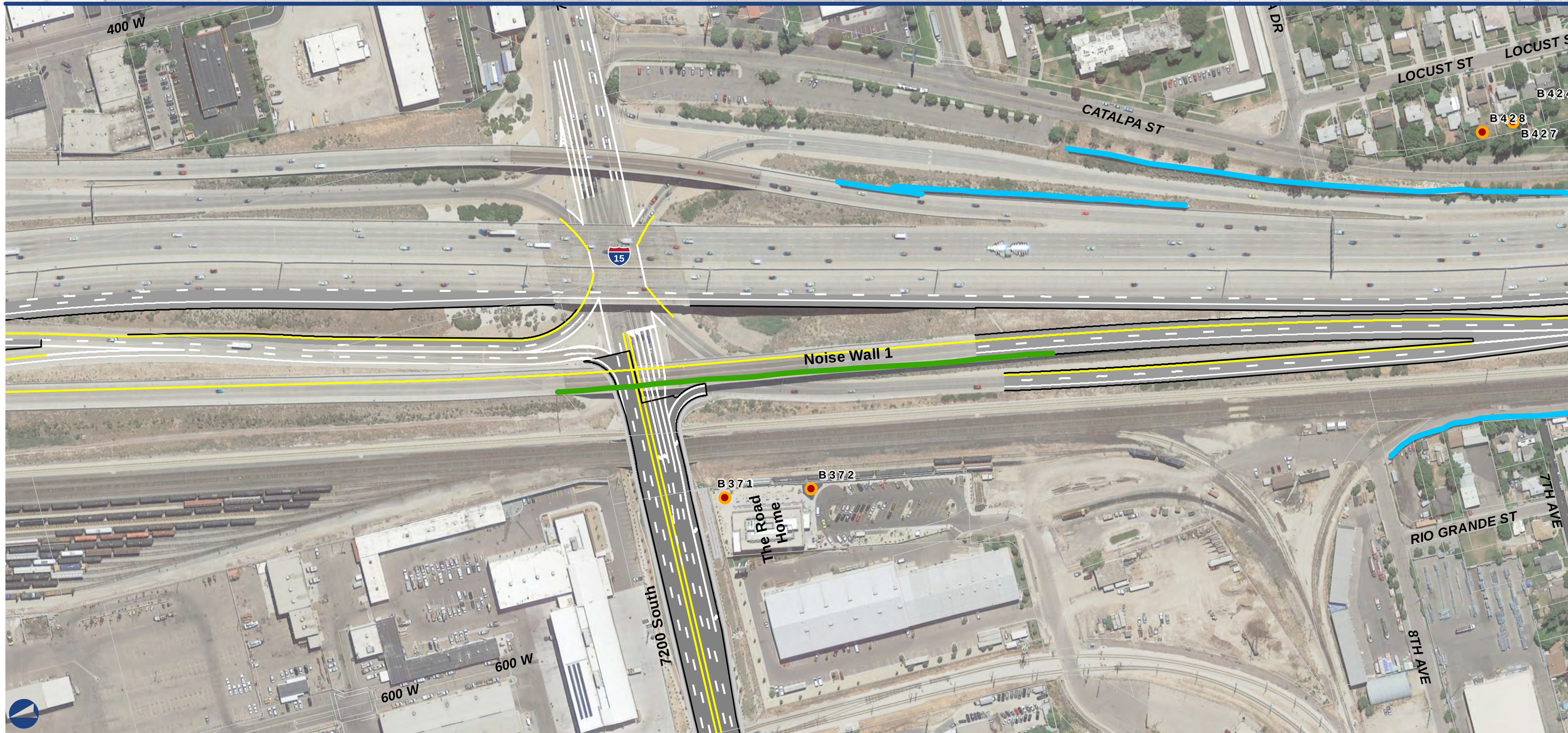
Existing and Preferred Alternative Noise Levels



- Existing Noise Impact
- Preferred Alternative Noise Impact
- Recommended Noise Walls (New)
- Existing Noise Walls

Existing and Preferred Alternative Noise Levels

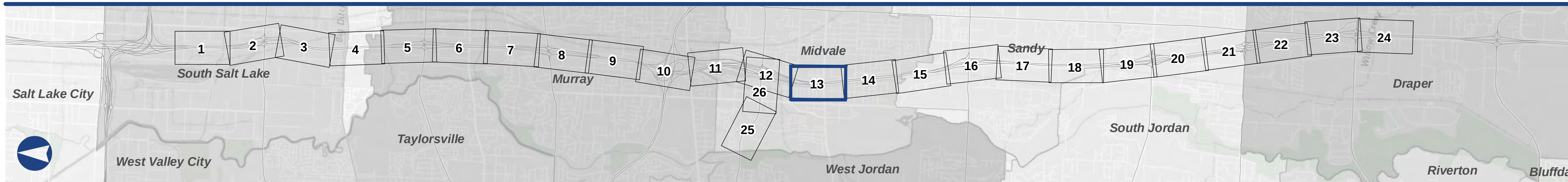




Existing Noise Impact
Preferred Alternative Noise Impact
Recommended Noise Walls (New)
Existing Noise Walls

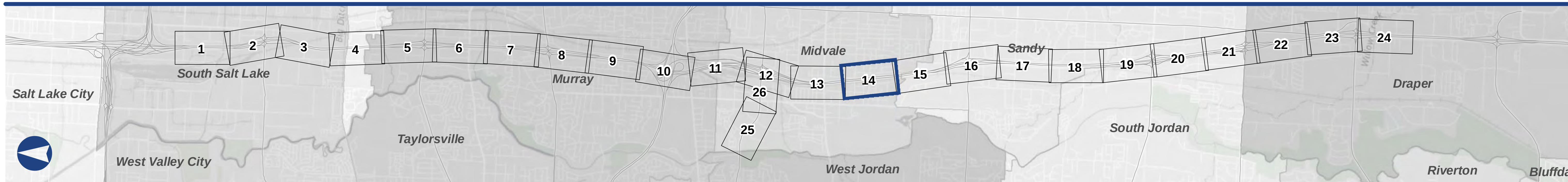
SOUTH INTERSTATE 15 BOUND

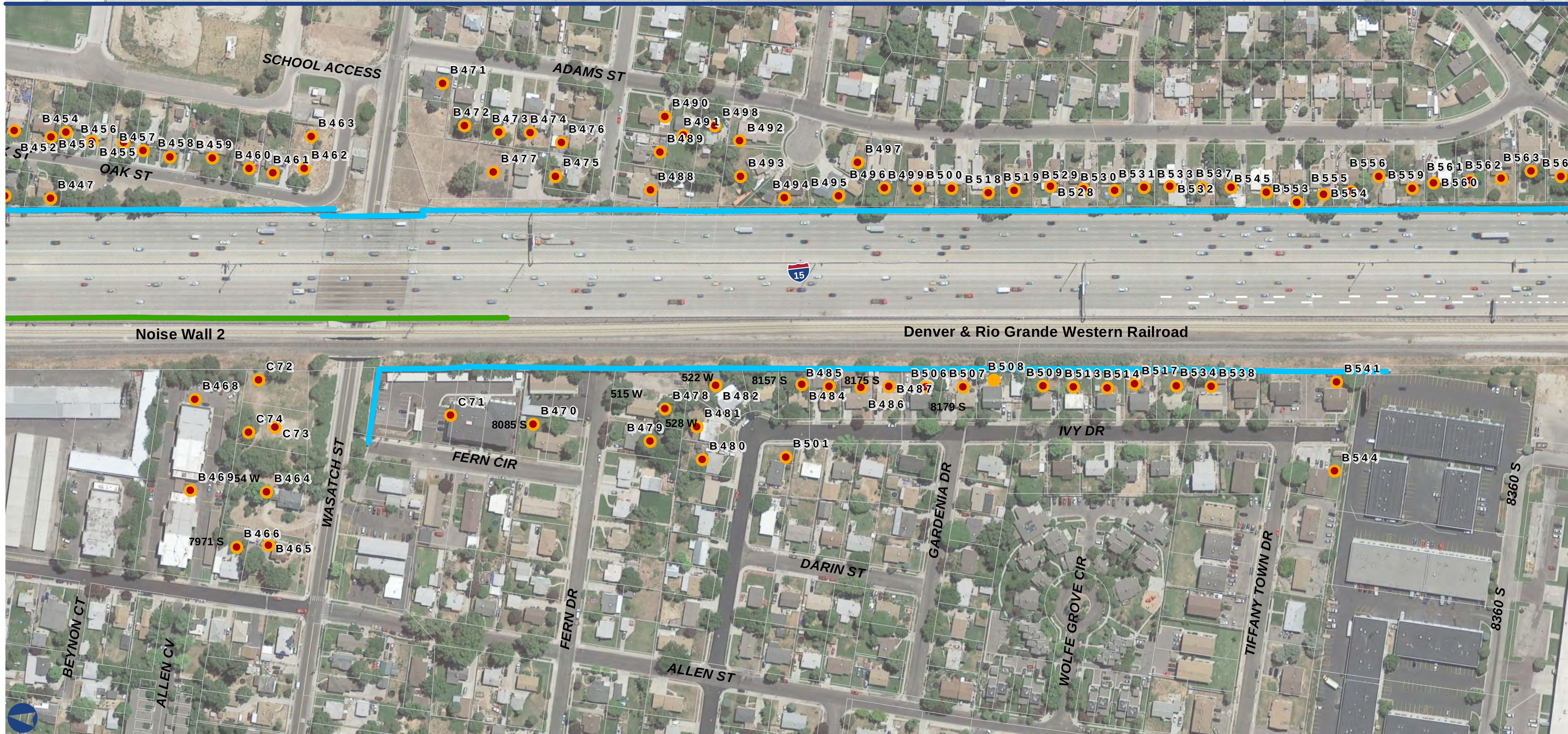
Existing and Preferred Alternative Noise Levels



Existing Noise Impact
Preferred Alternative Noise Impact
Recommended Noise Walls (New)
Existing Noise Walls

Existing and Preferred Alternative Noise Levels





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Existing Noise Walls

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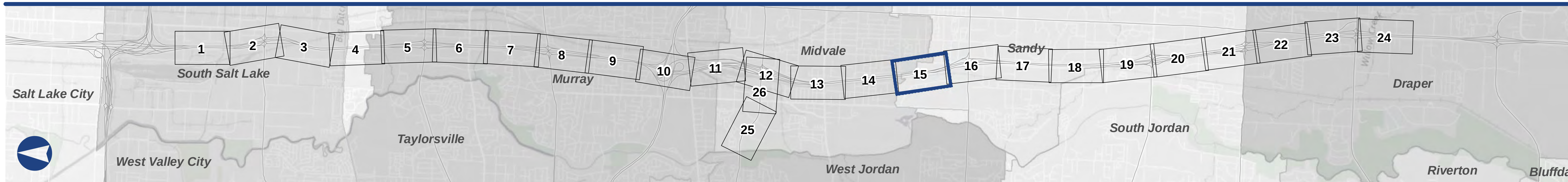

SOUTH 15 BOUND
INTERSTATE

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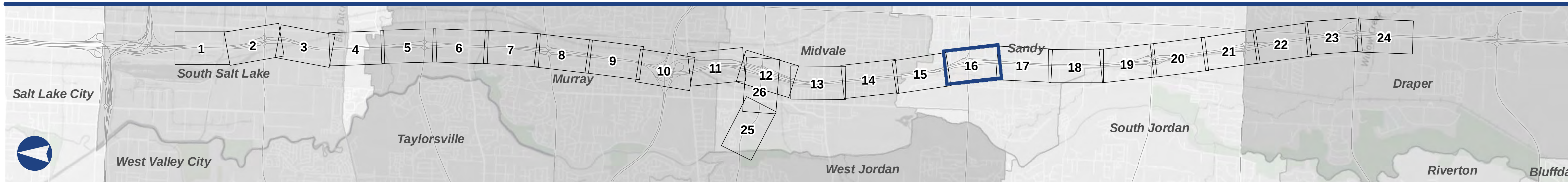

INTERSTATE SOUTH 15 BOUND

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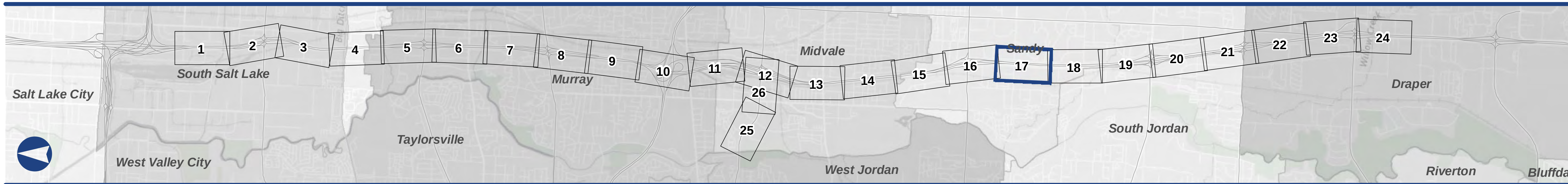

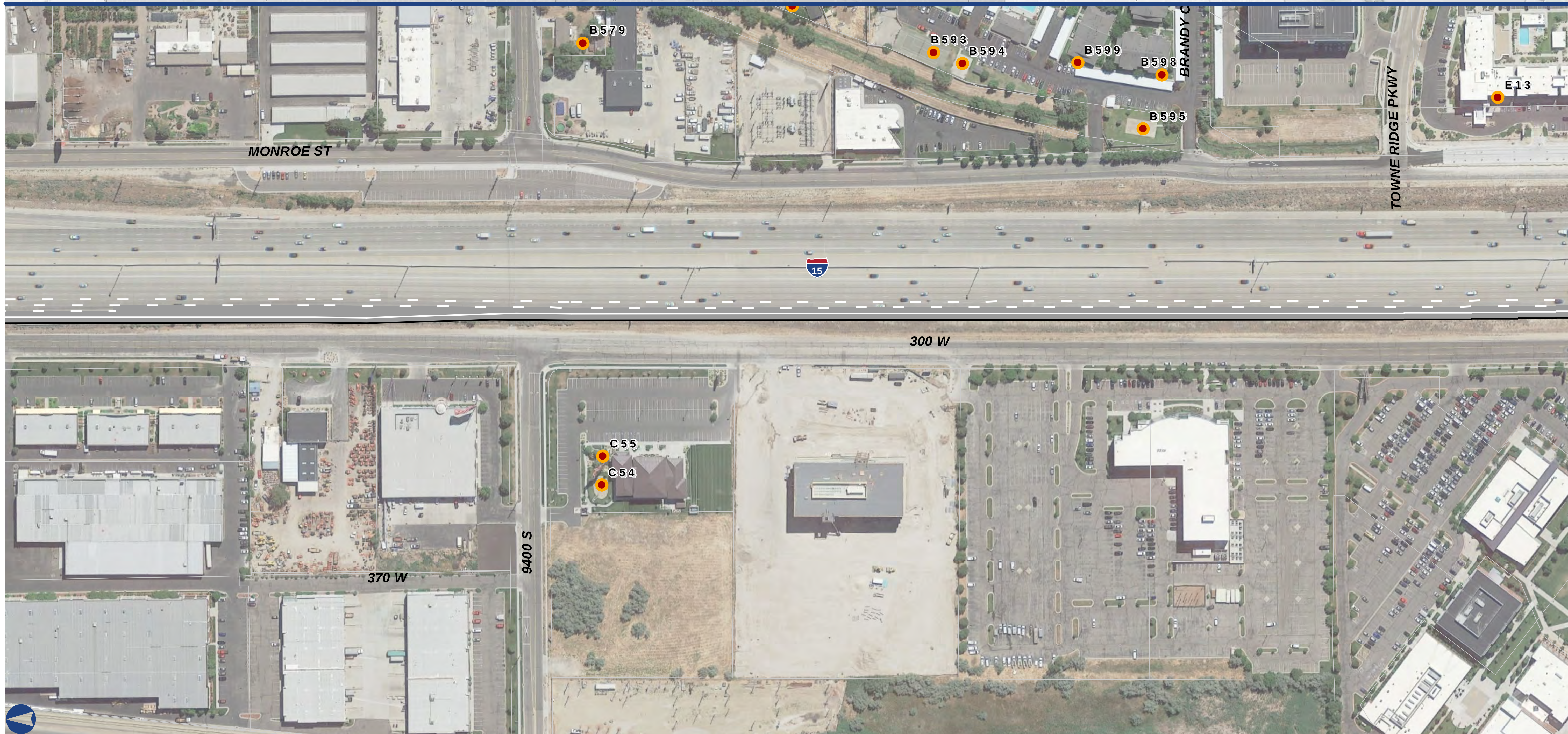

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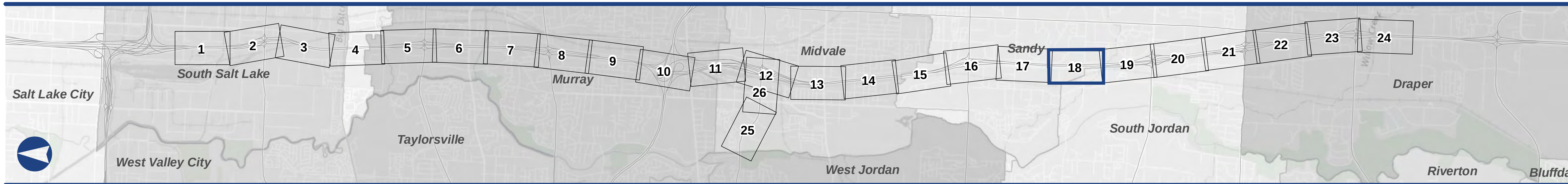

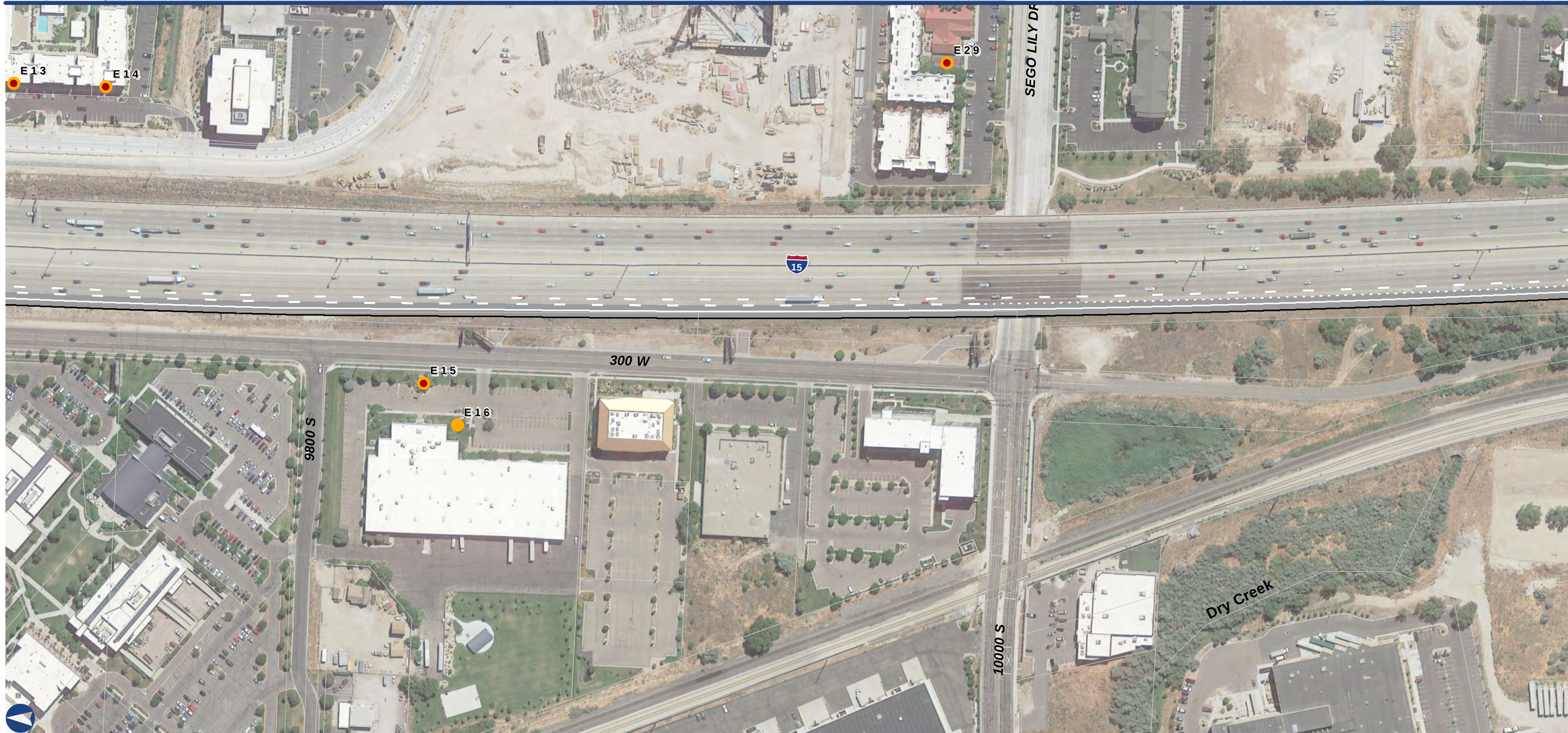

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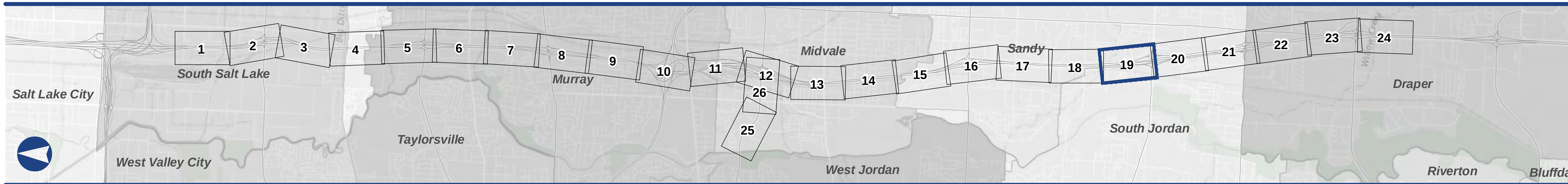

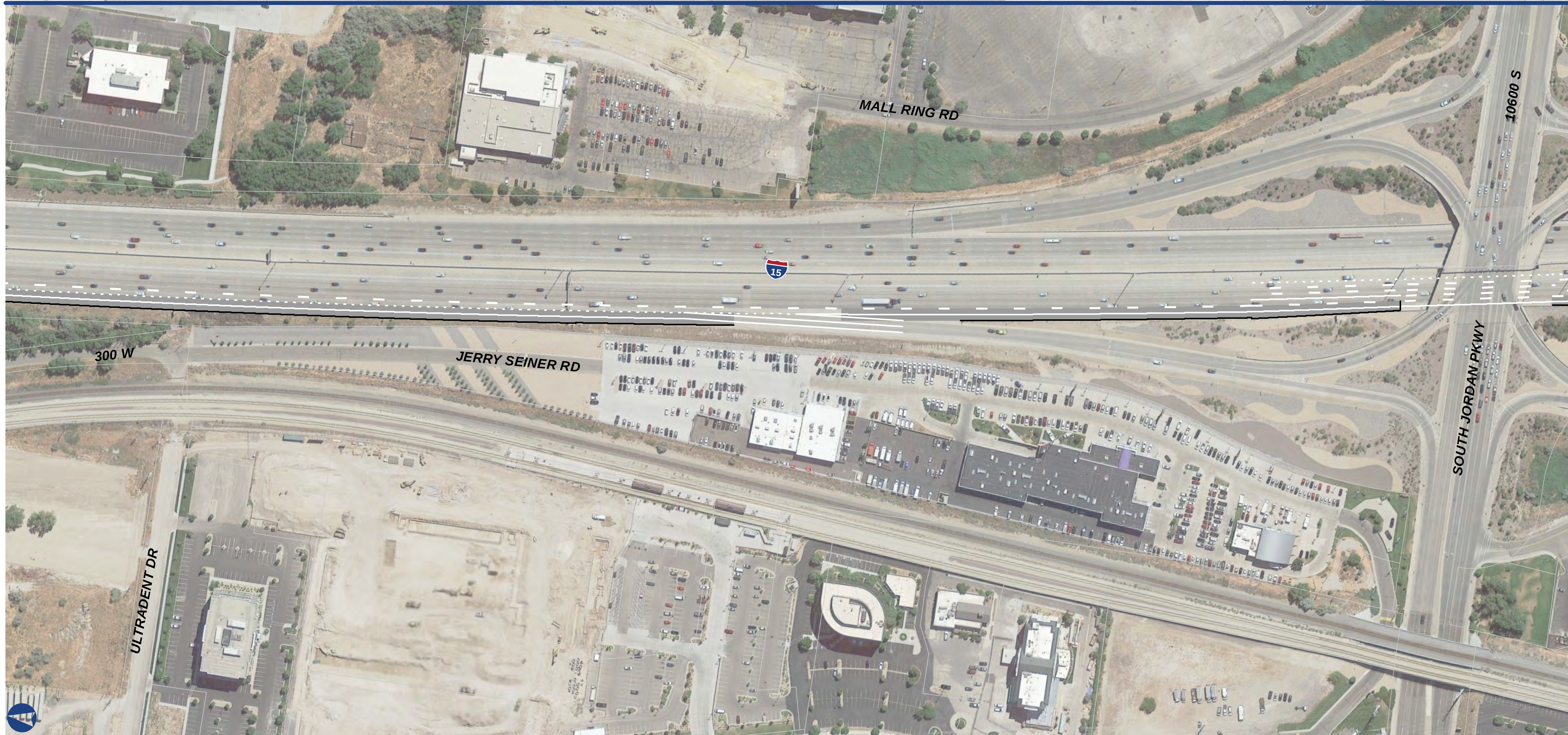

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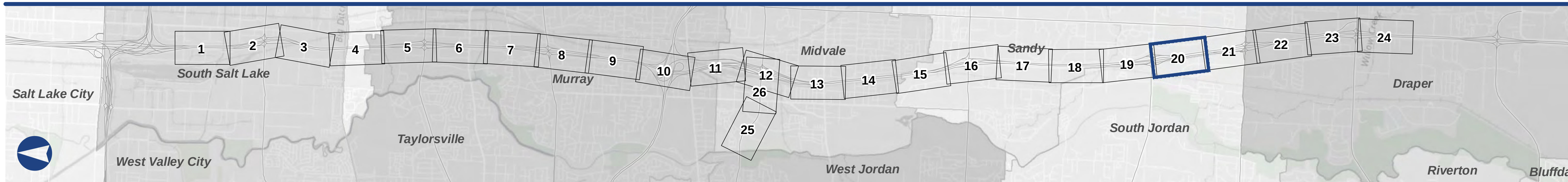

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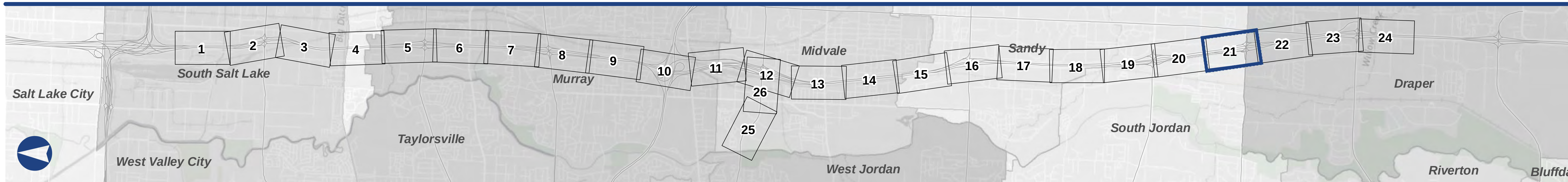

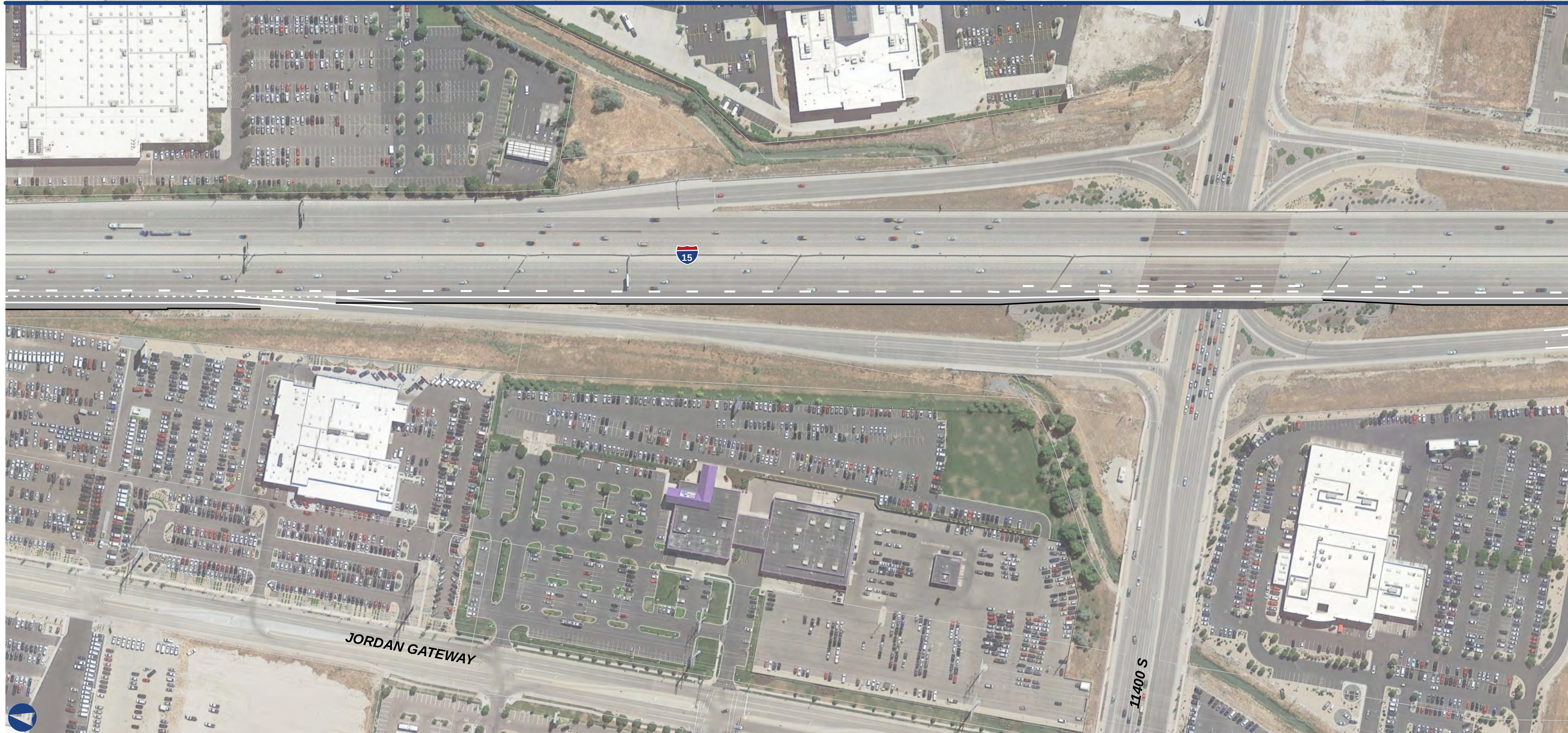

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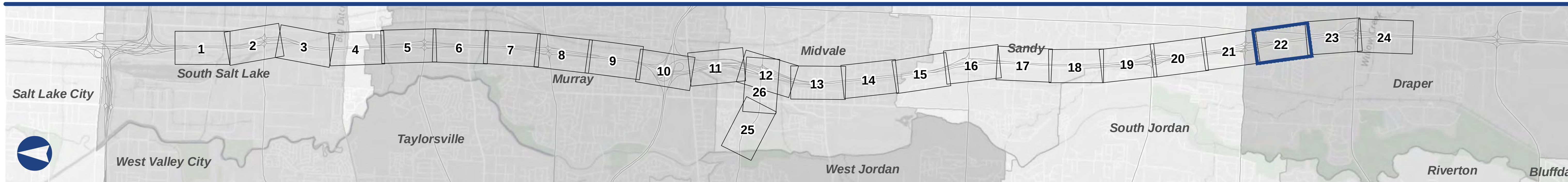

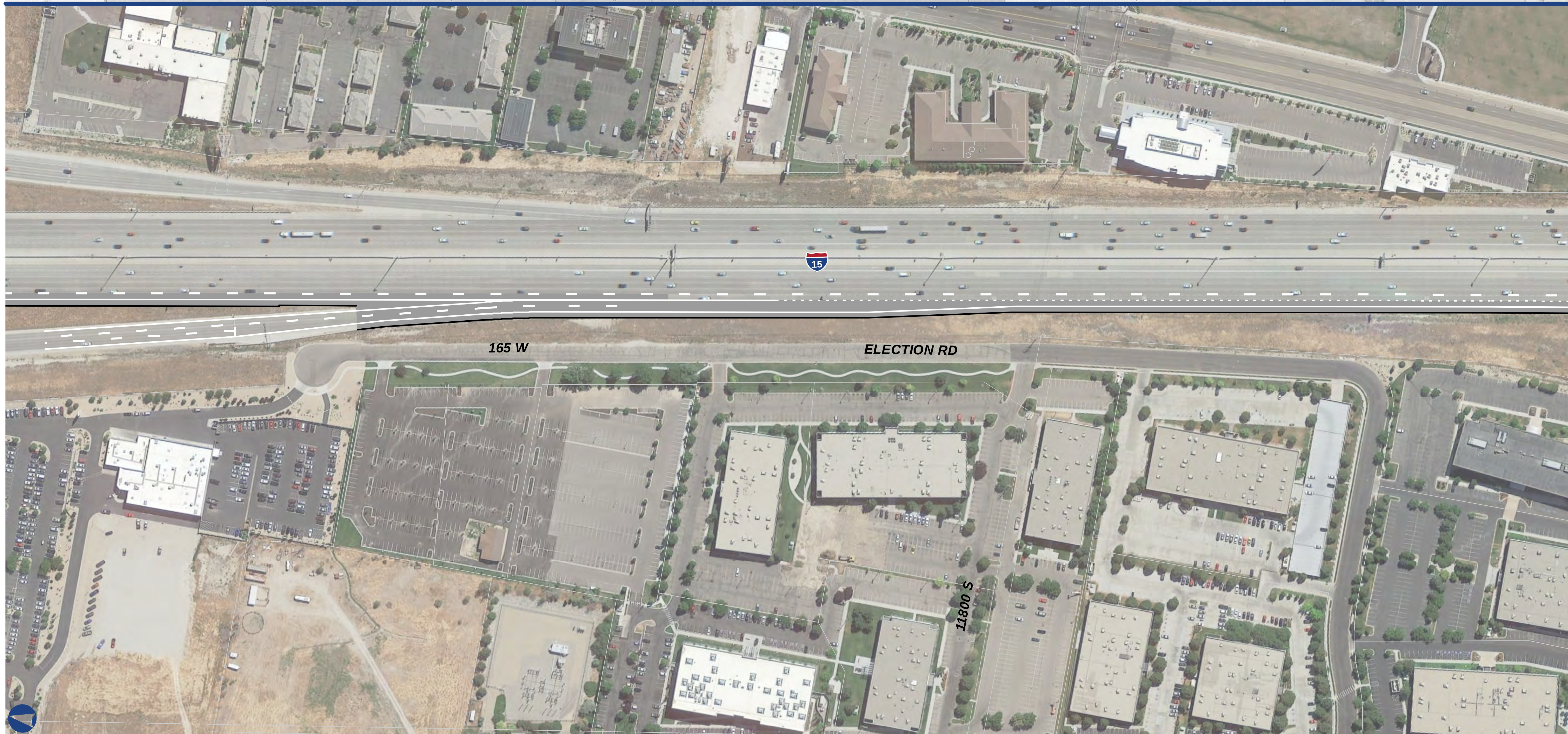

SOUTH INTERSTATE 15 BOUND

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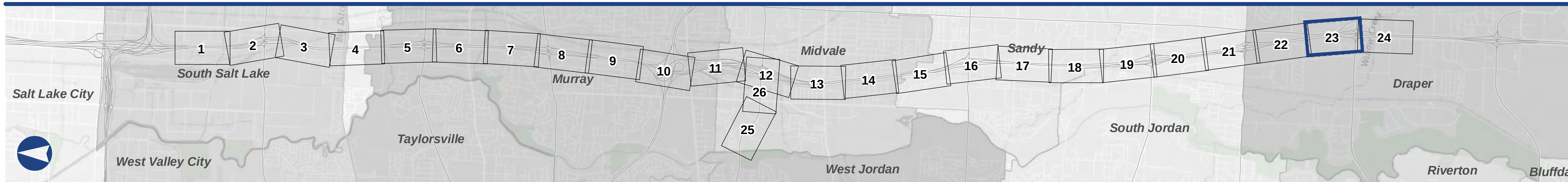

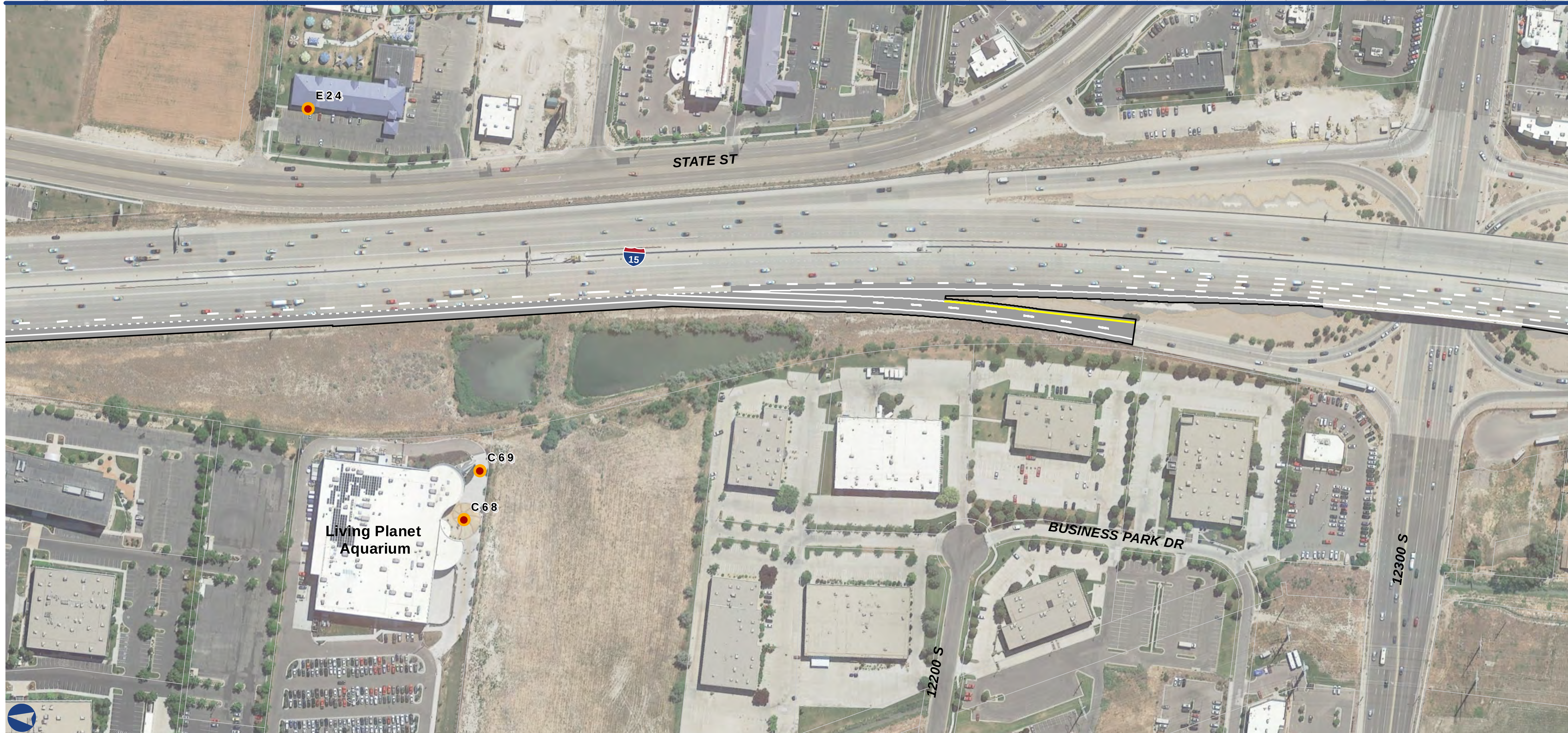

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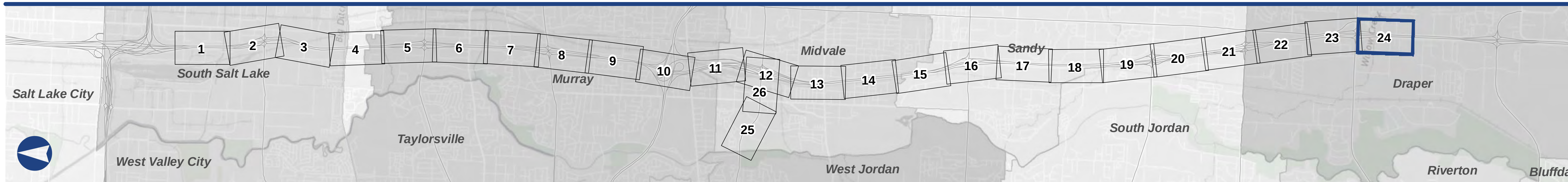

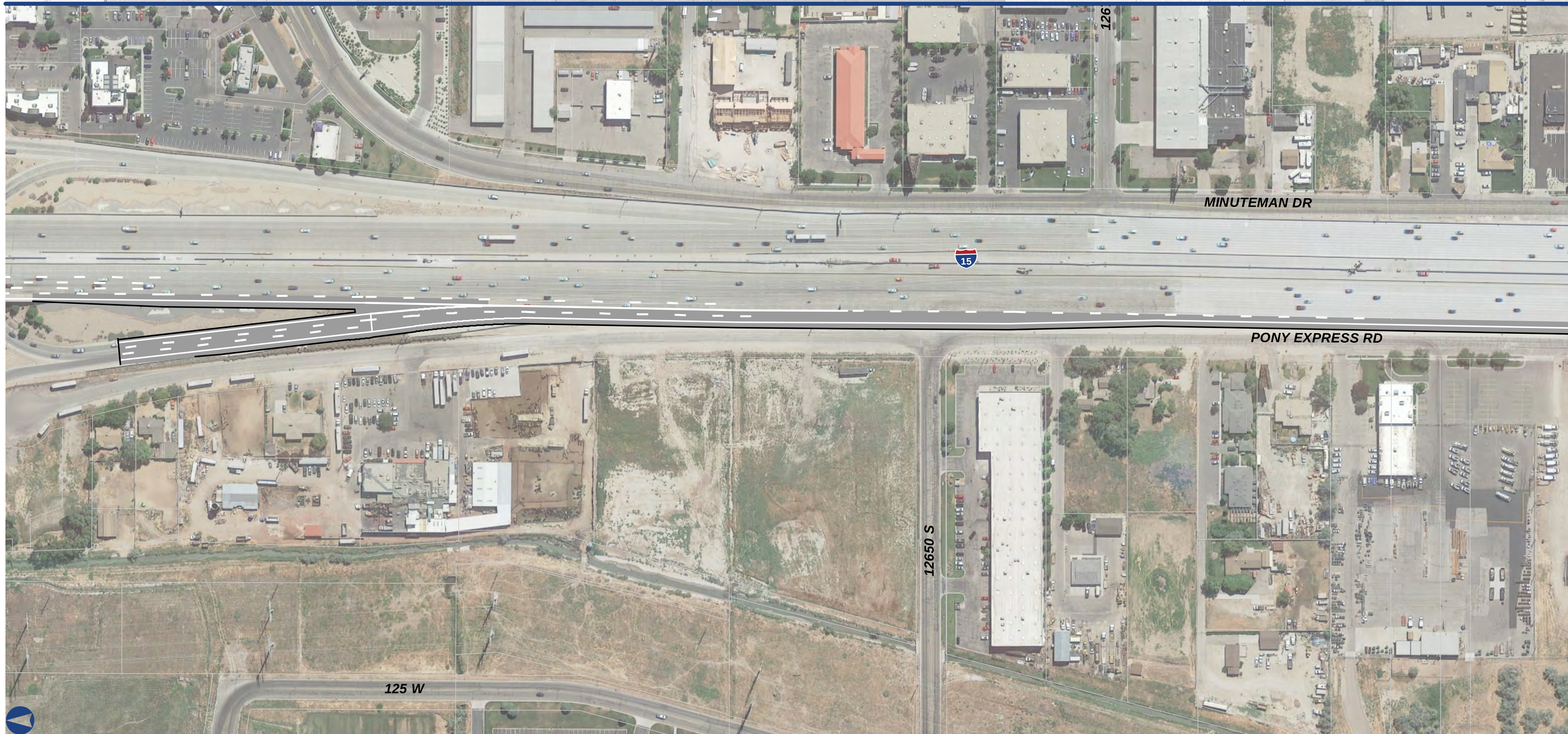

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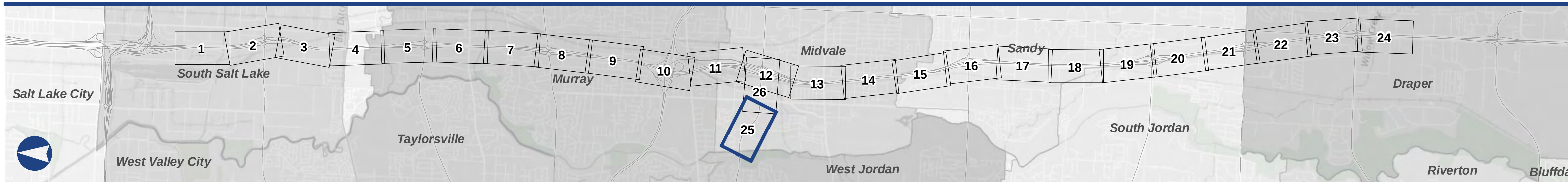

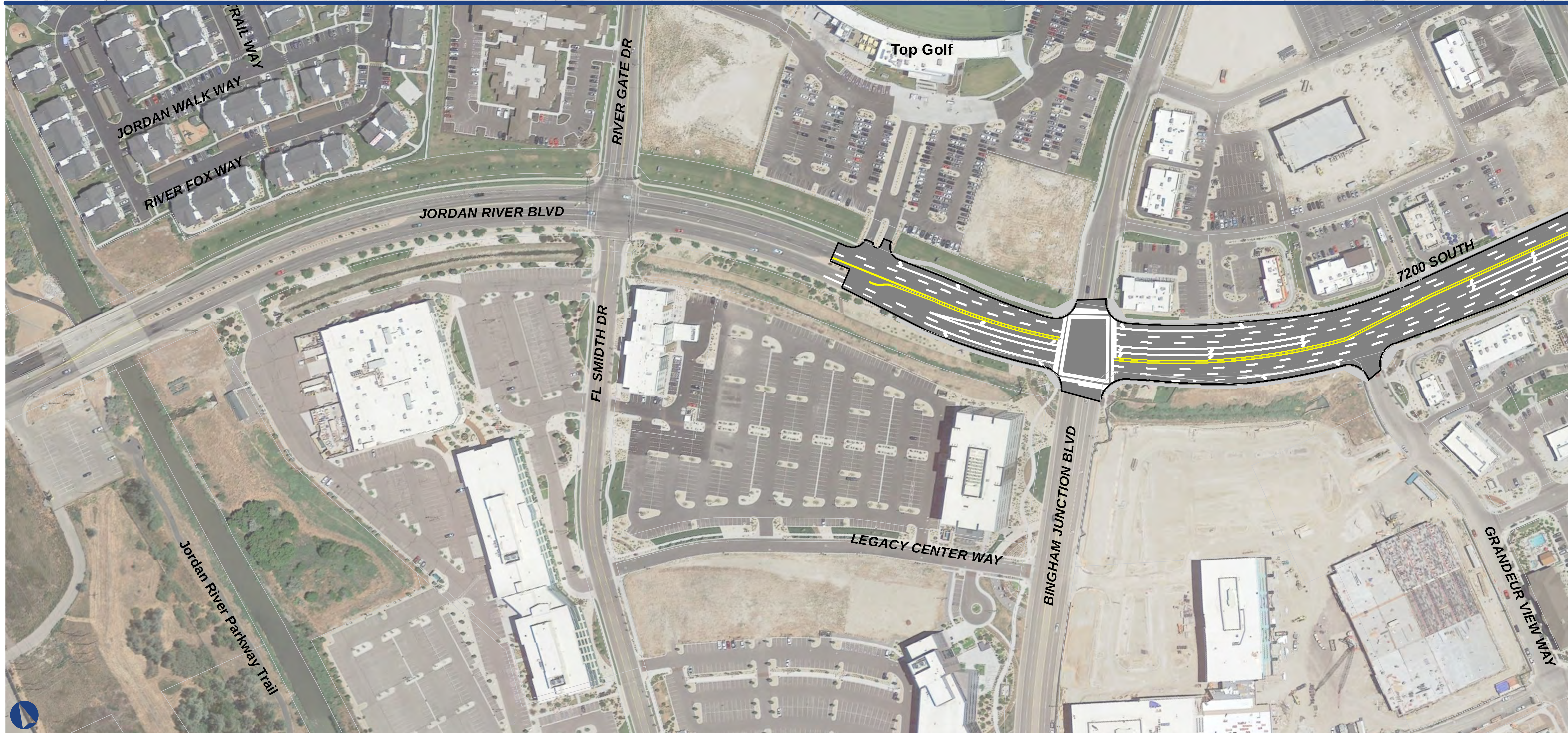

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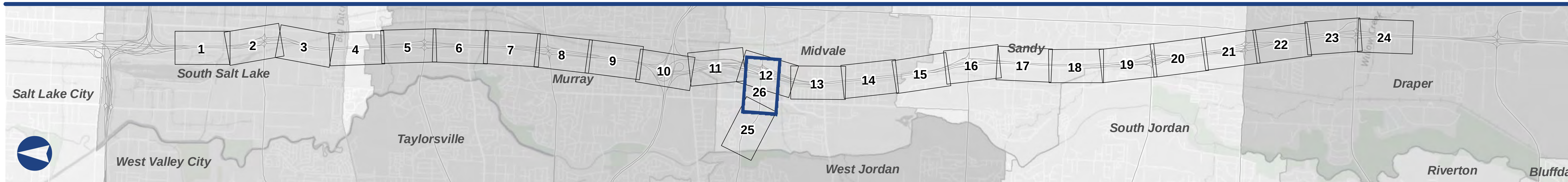

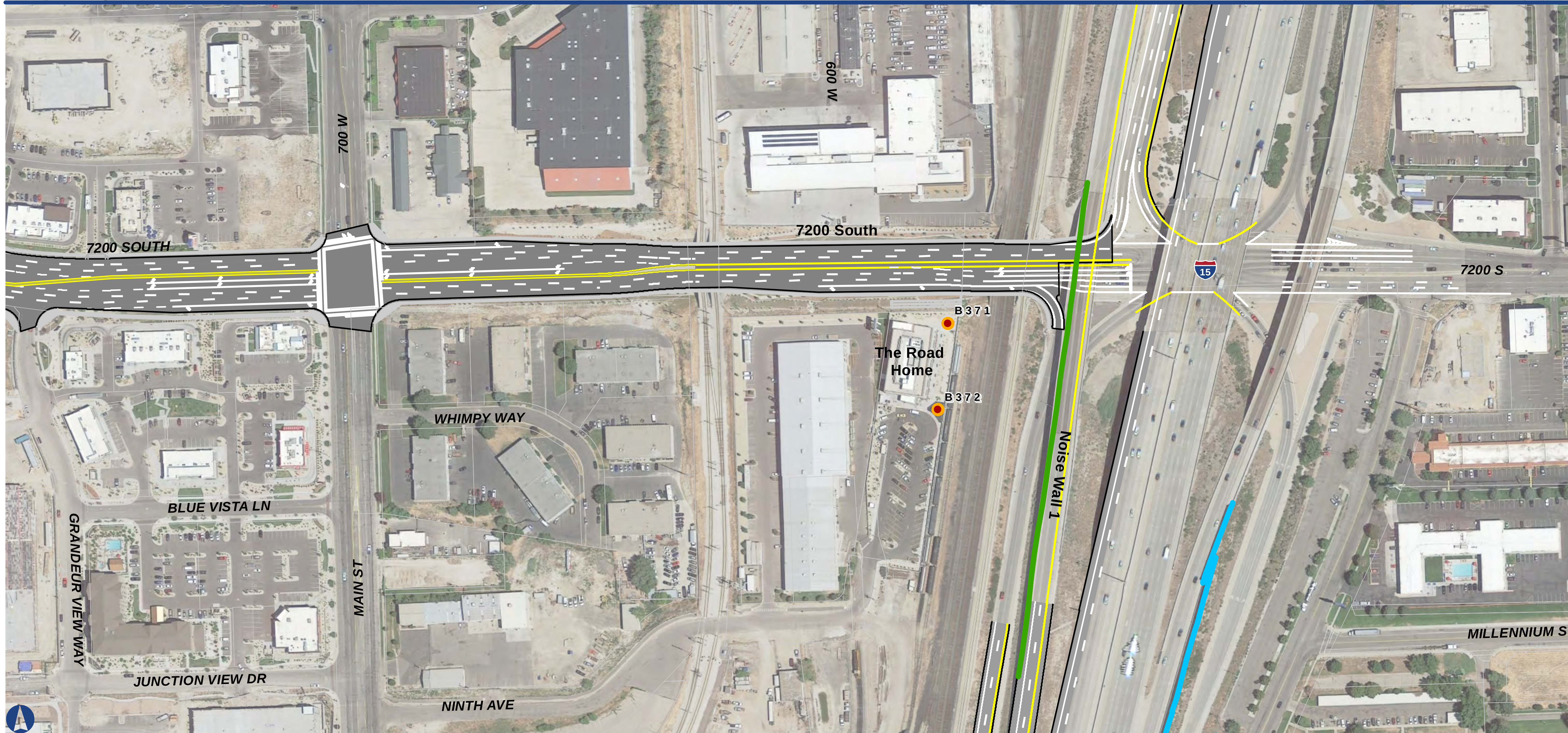

INTERSTATE SOUTH 15 BOUND

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Existing and Preferred Alternative Noise Levels

VOLUME 2

PREFERRED ALTERNATIVE MAPS

STATE
ENVIRONMENTAL STUDY

MARCH 2017

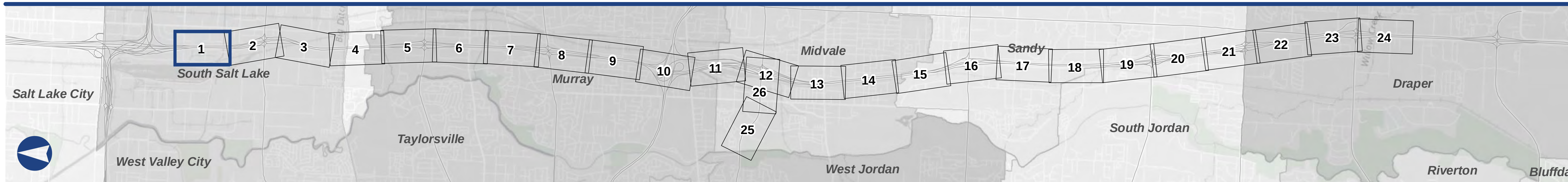
I-15; SR-201 TO 12300 SOUTH

SALT LAKE COUNTY, UTAH

SOUTH INTERSTATE 15 BOUND

UDOT PROJECT NUMBER: S-I15-7(324)297
PIN: 12587

UDOT
Keeping Utah Moving



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INTERSTATE SOUTH 15 BOUND

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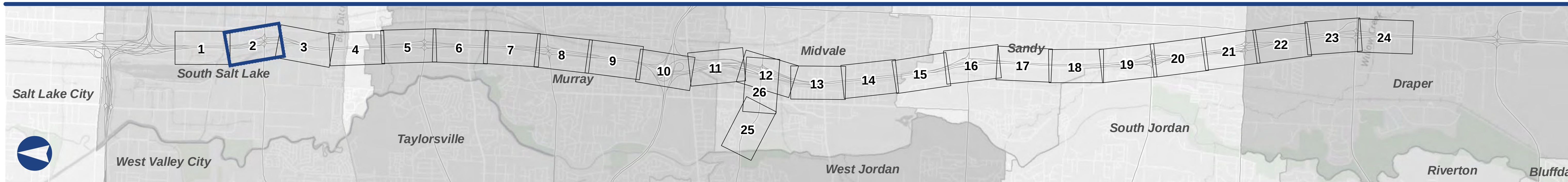

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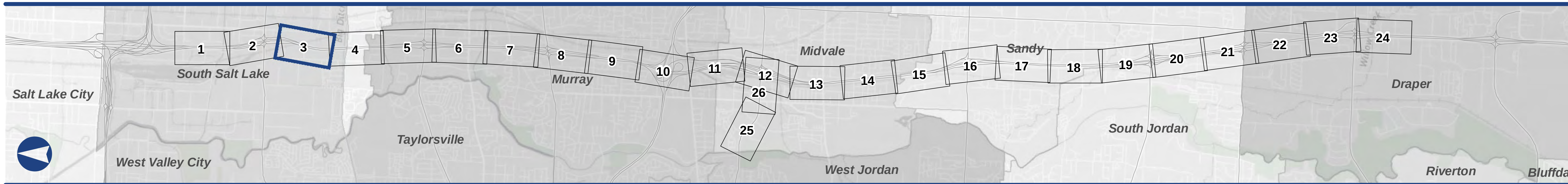

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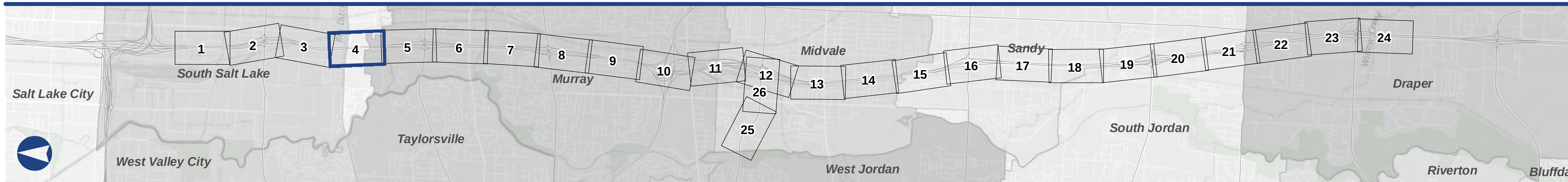

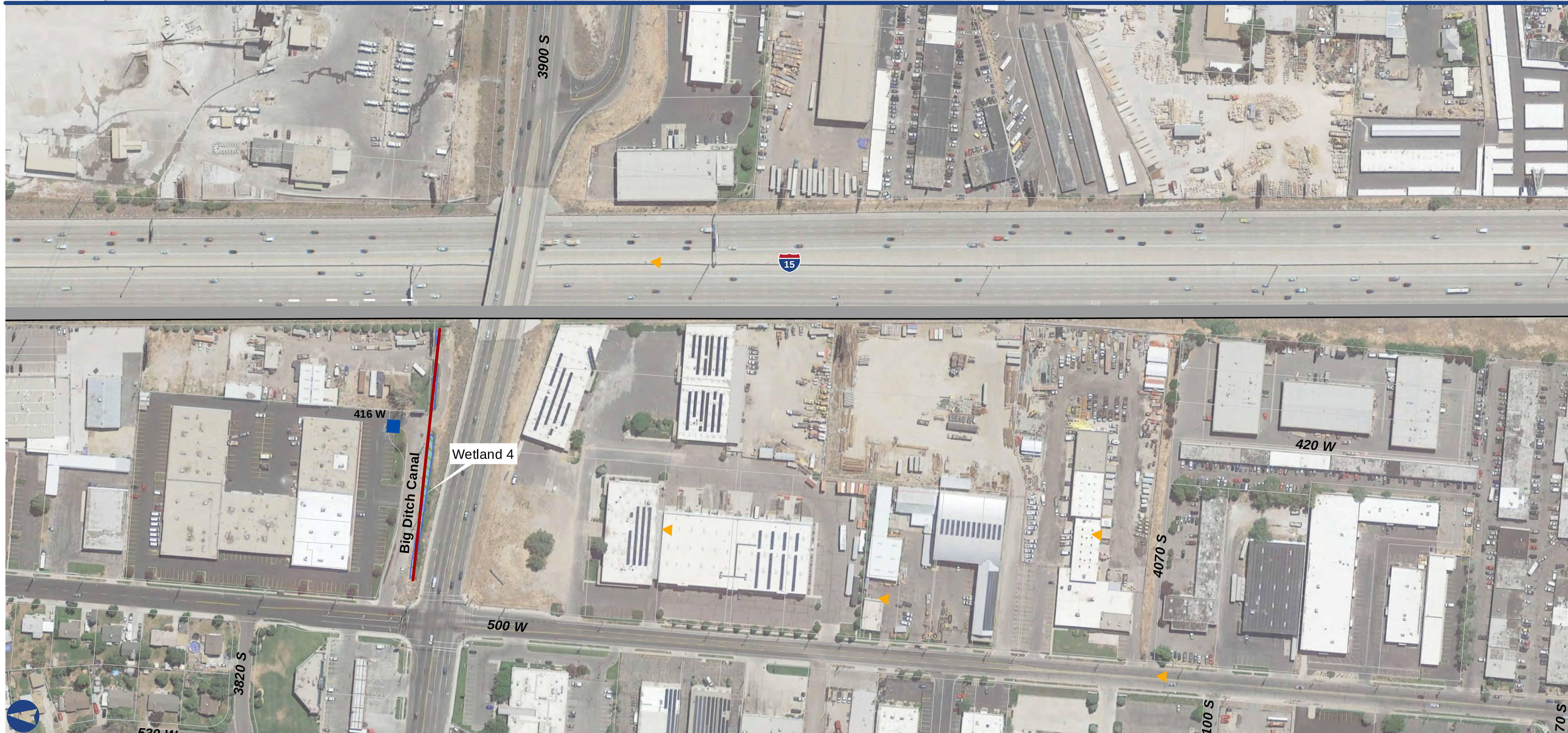

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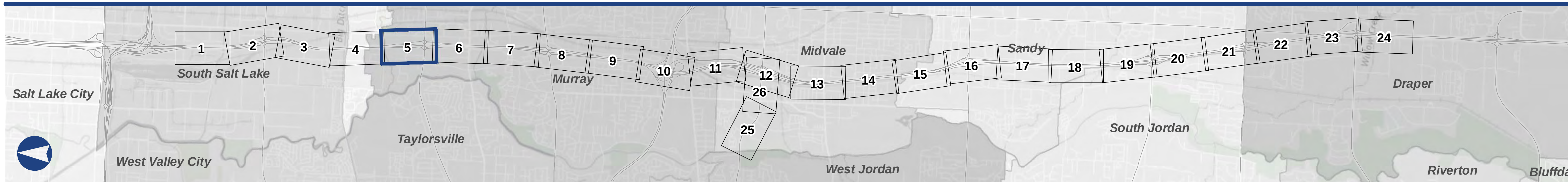

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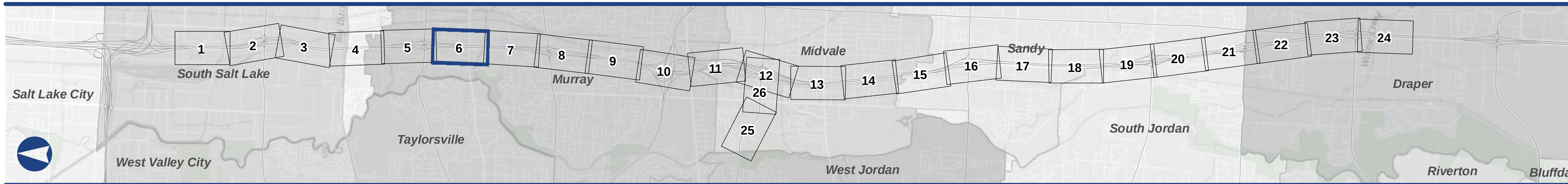

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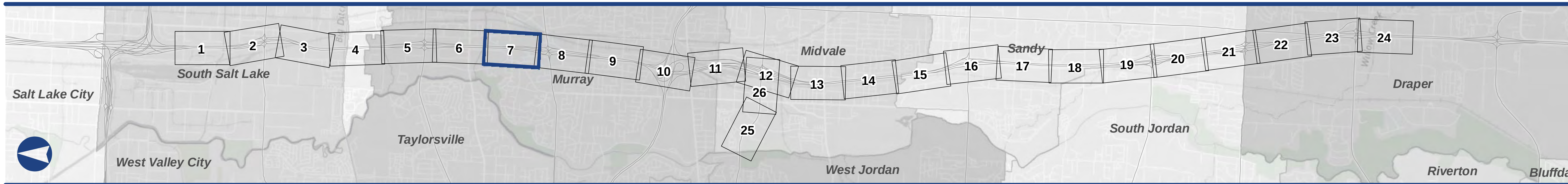

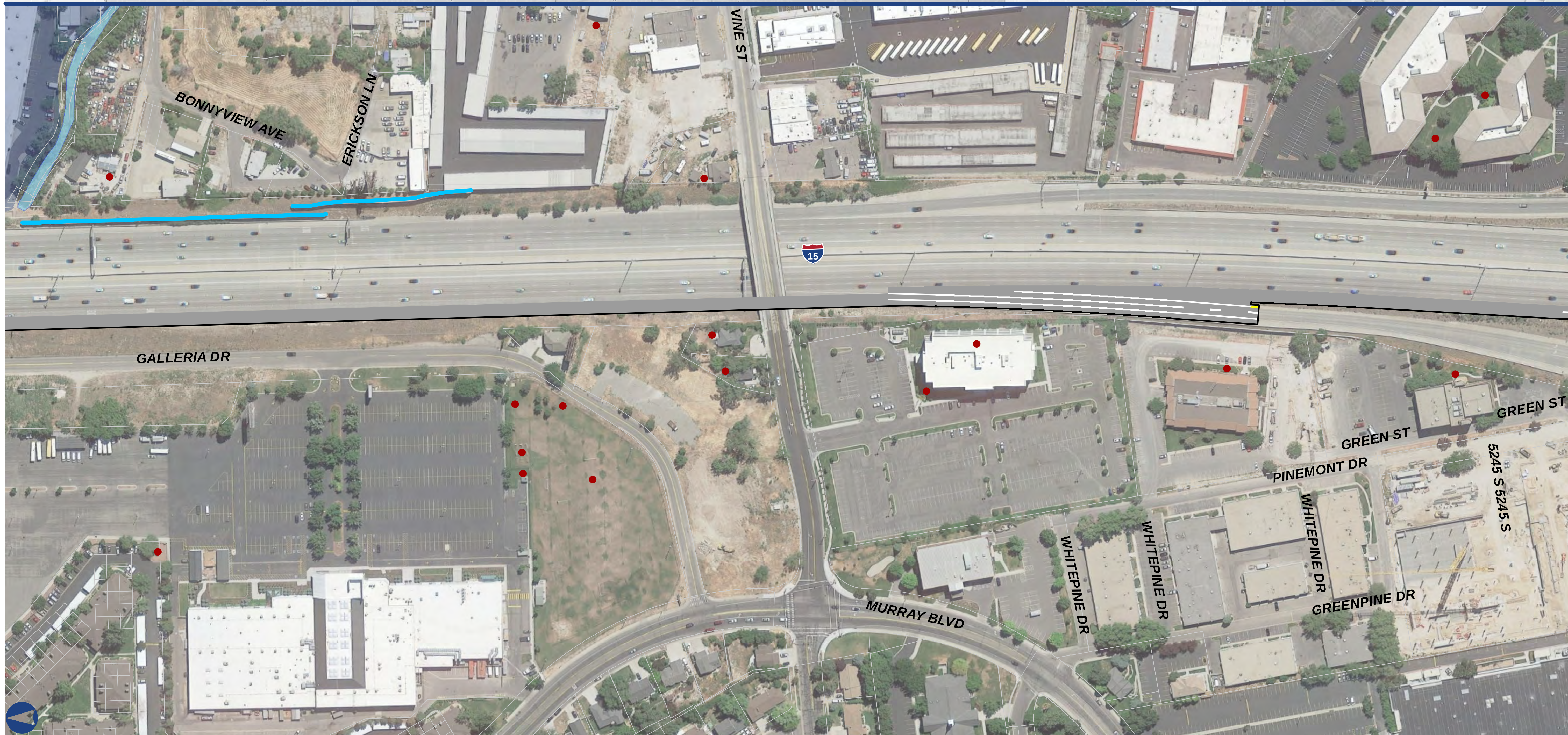

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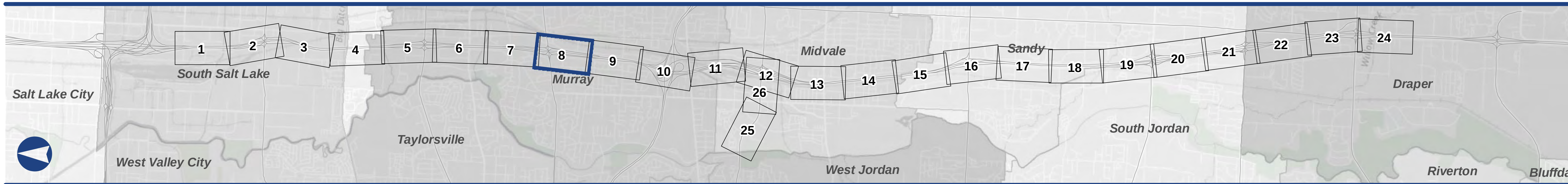

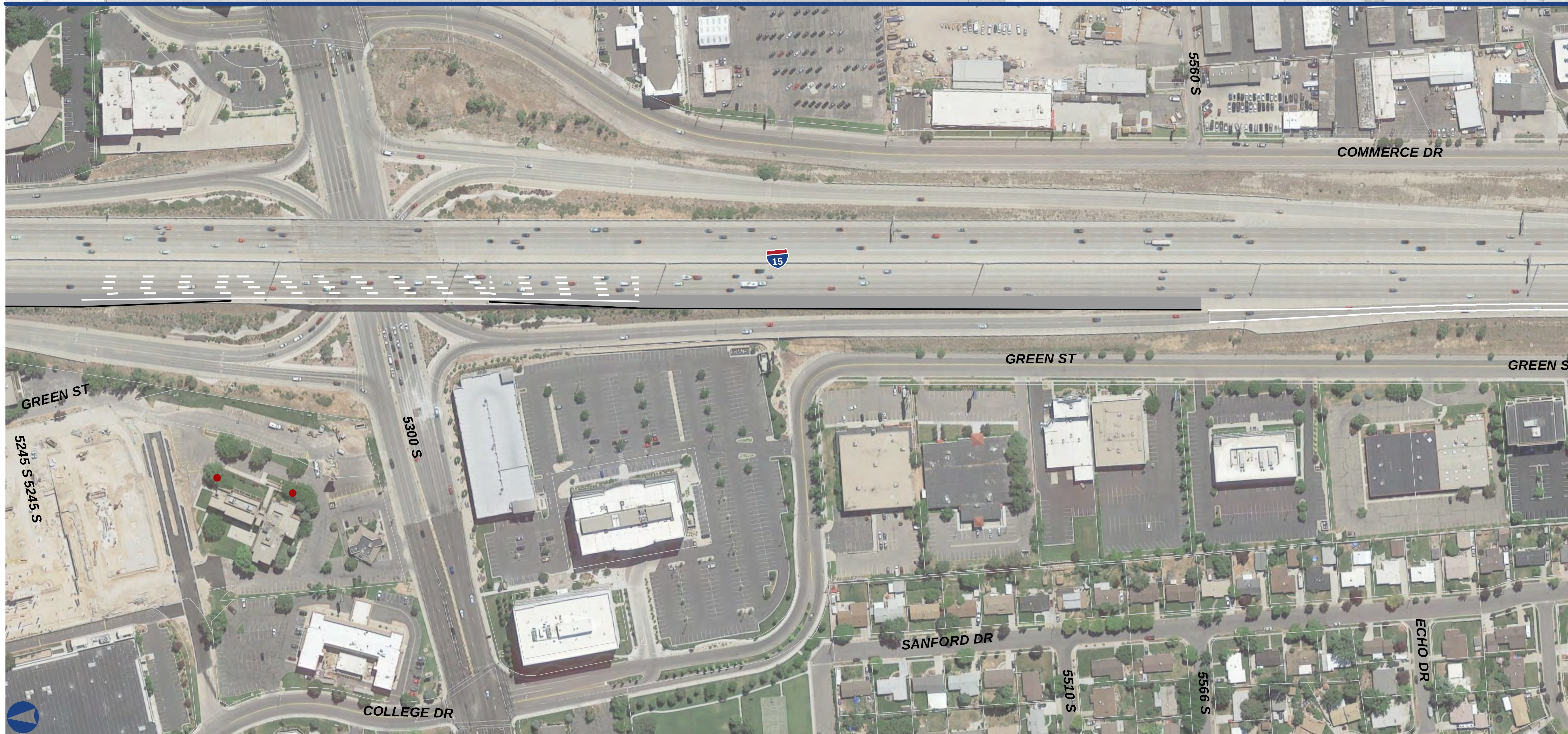

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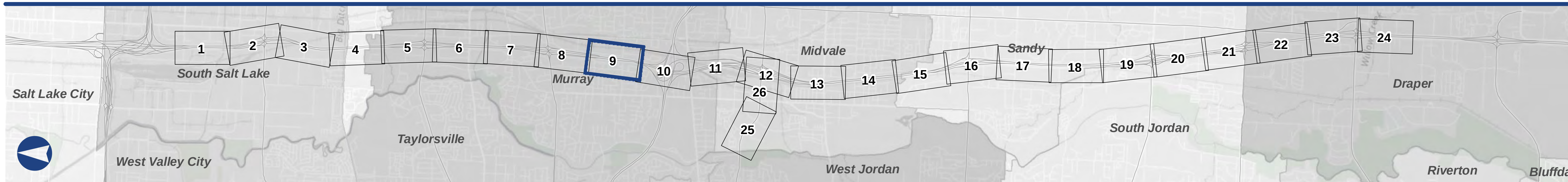

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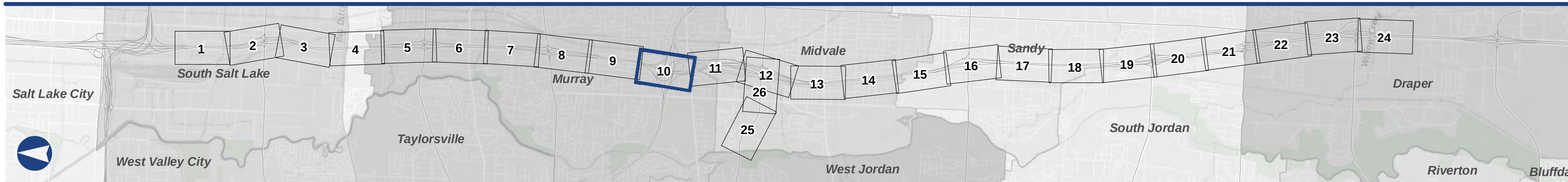

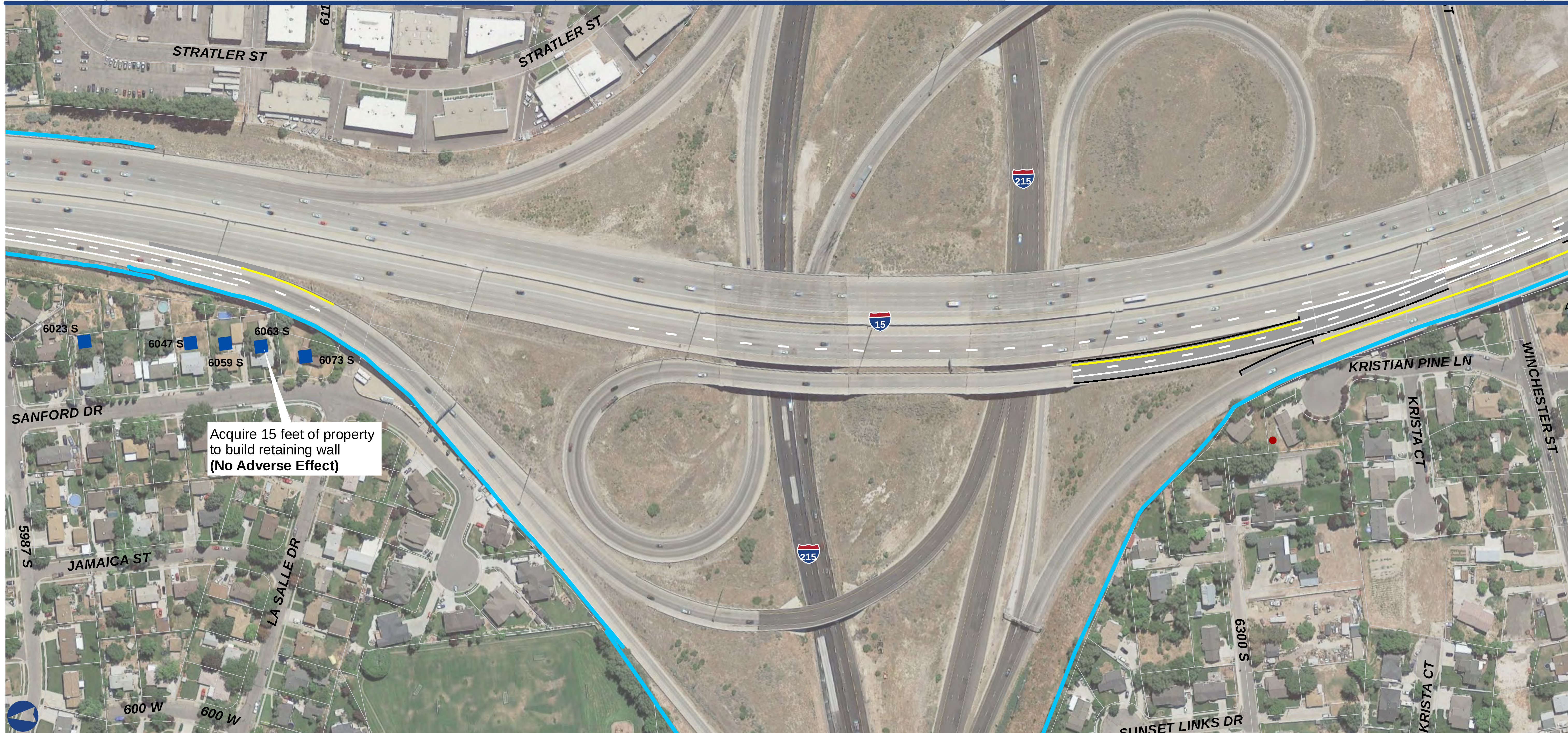

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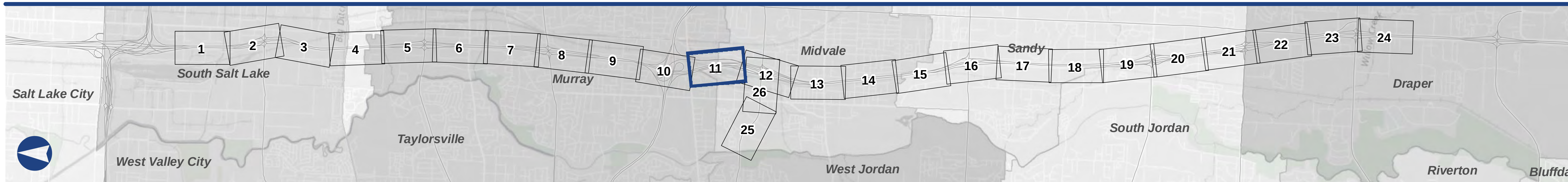

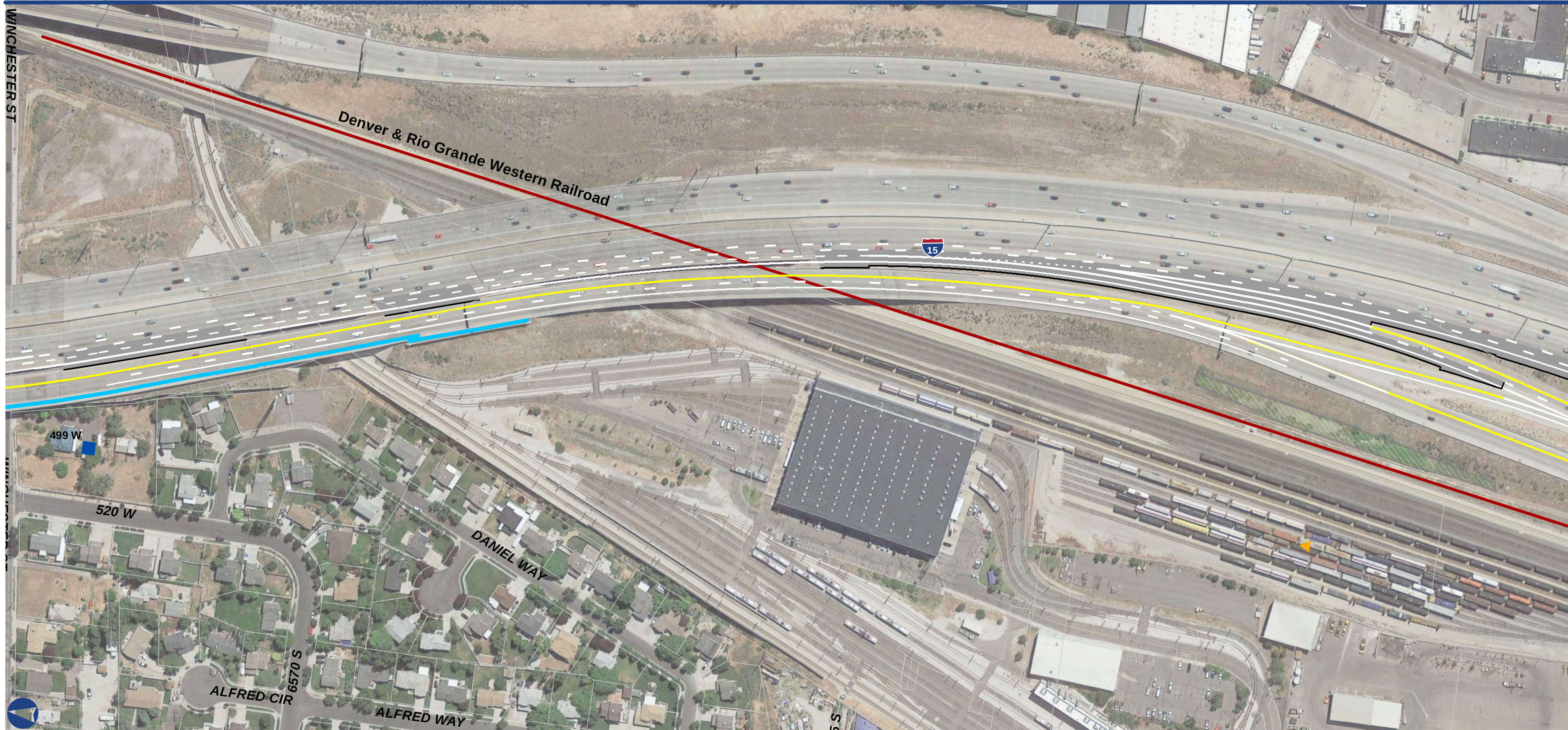

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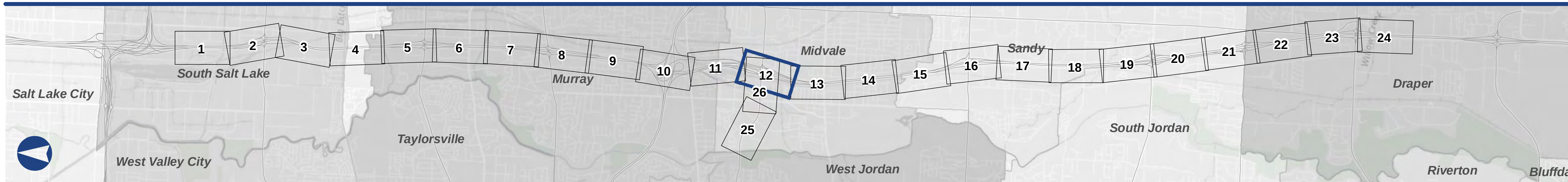

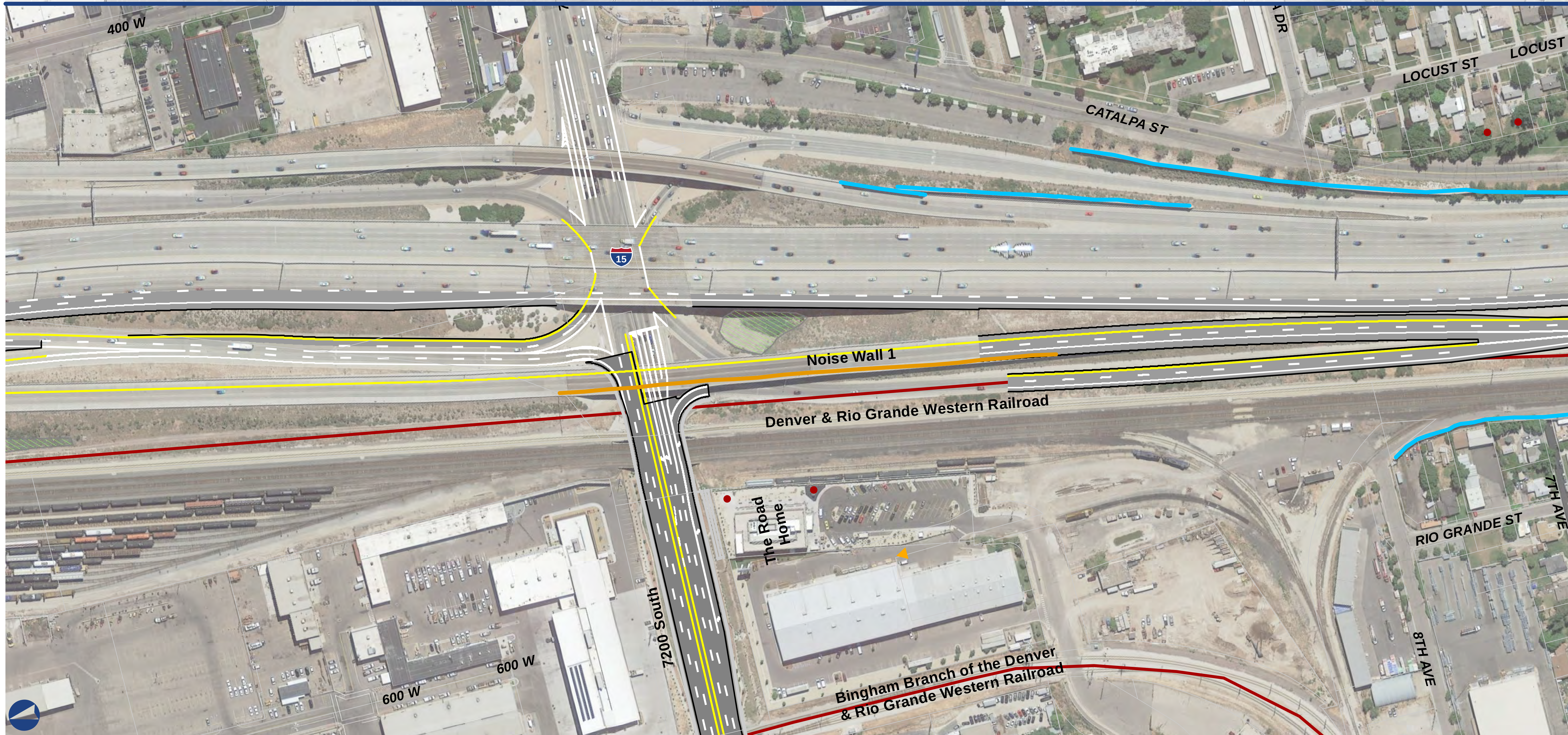

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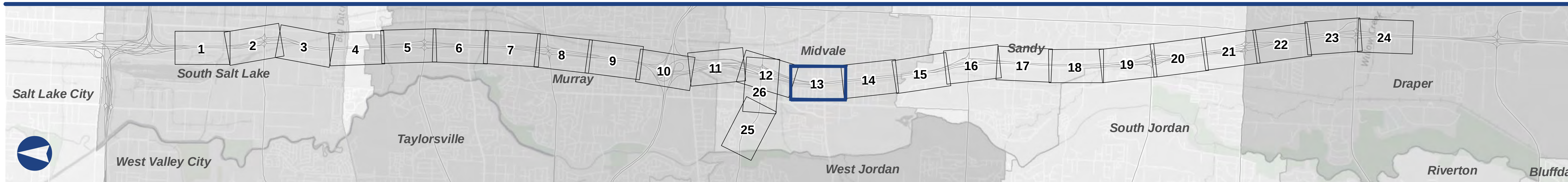

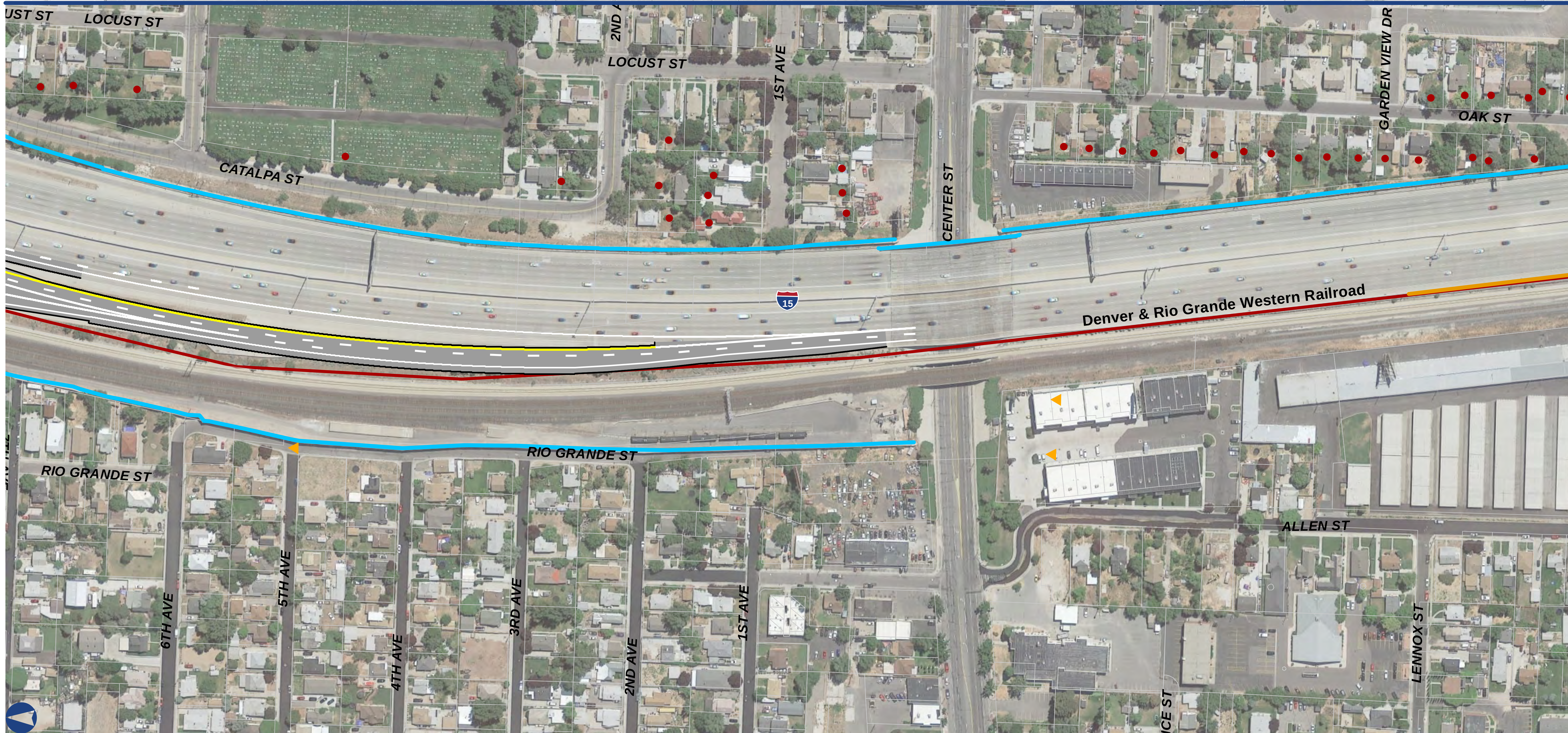

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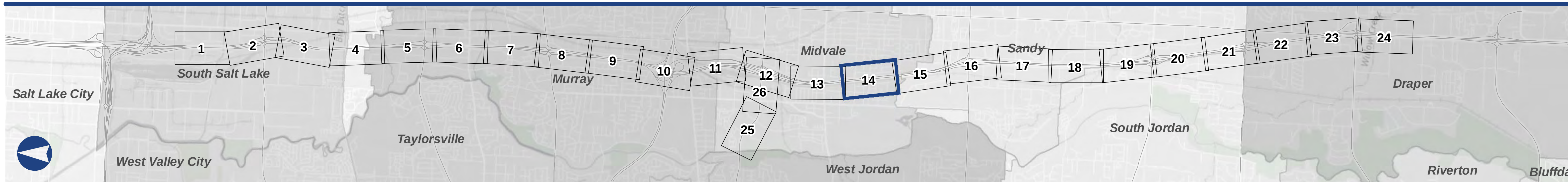

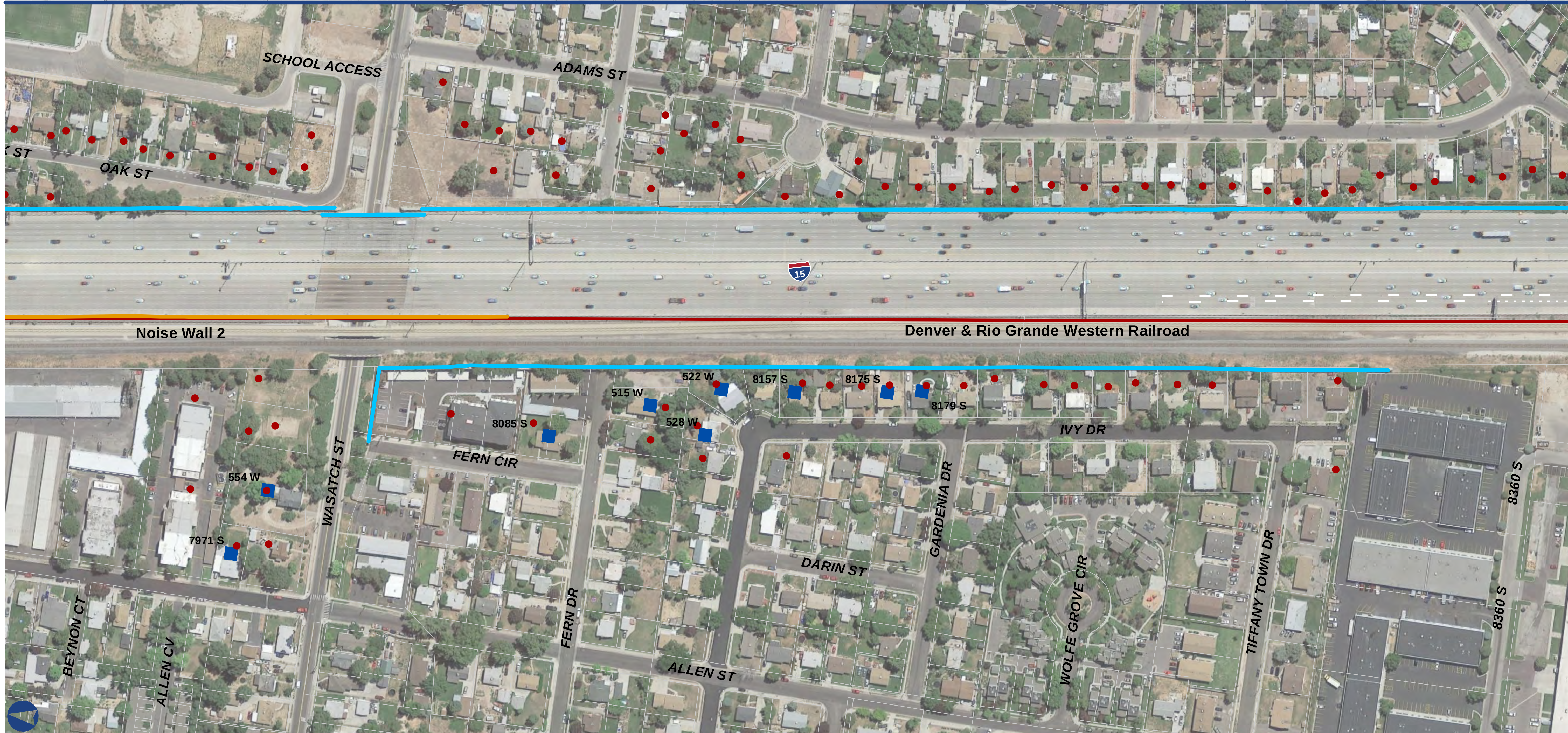

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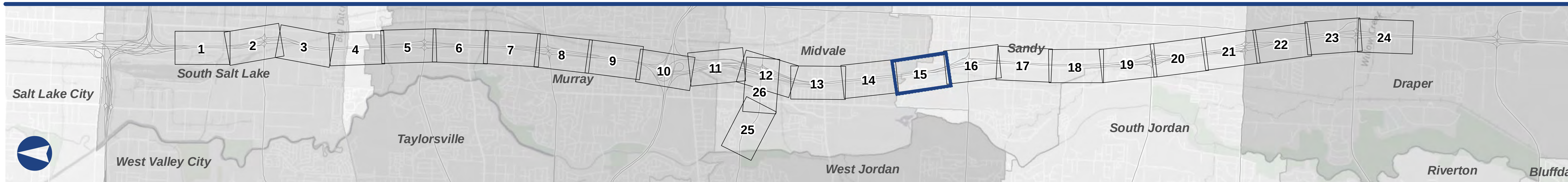

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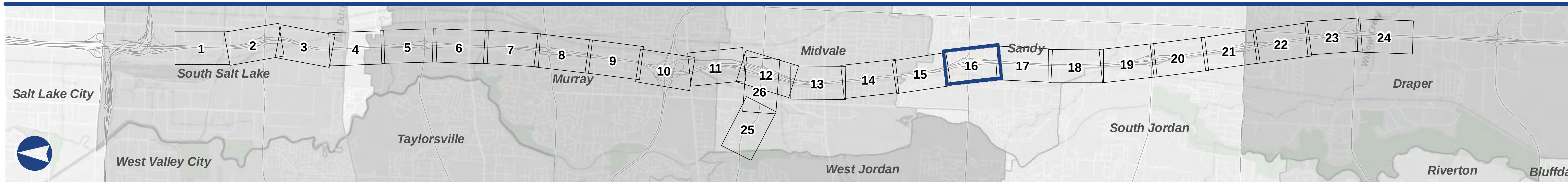

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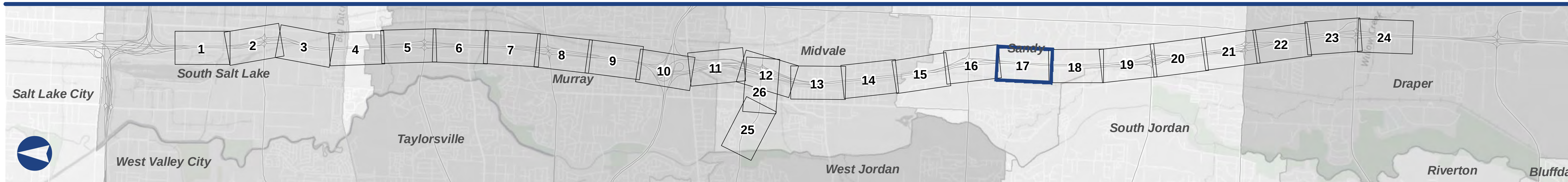

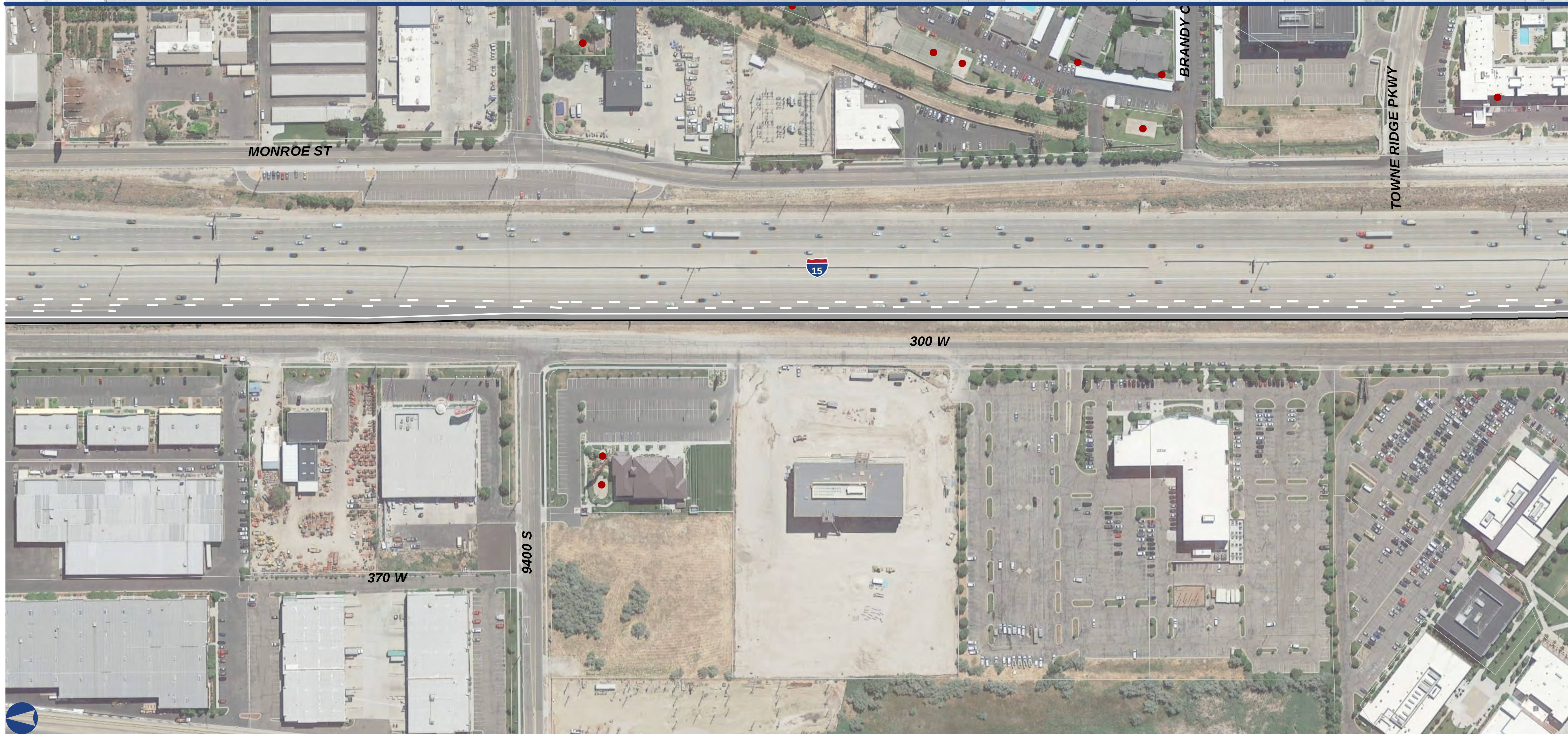

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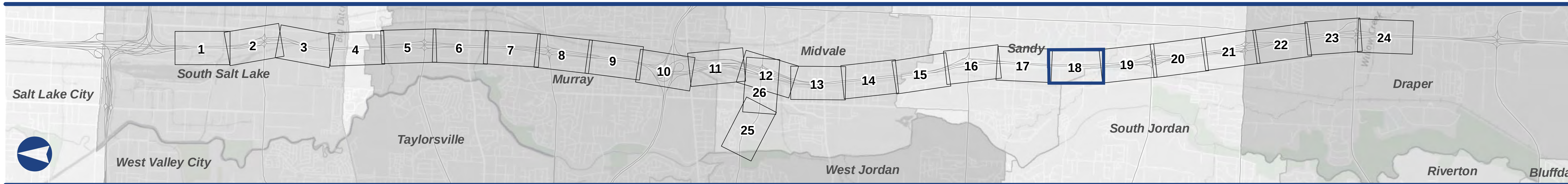

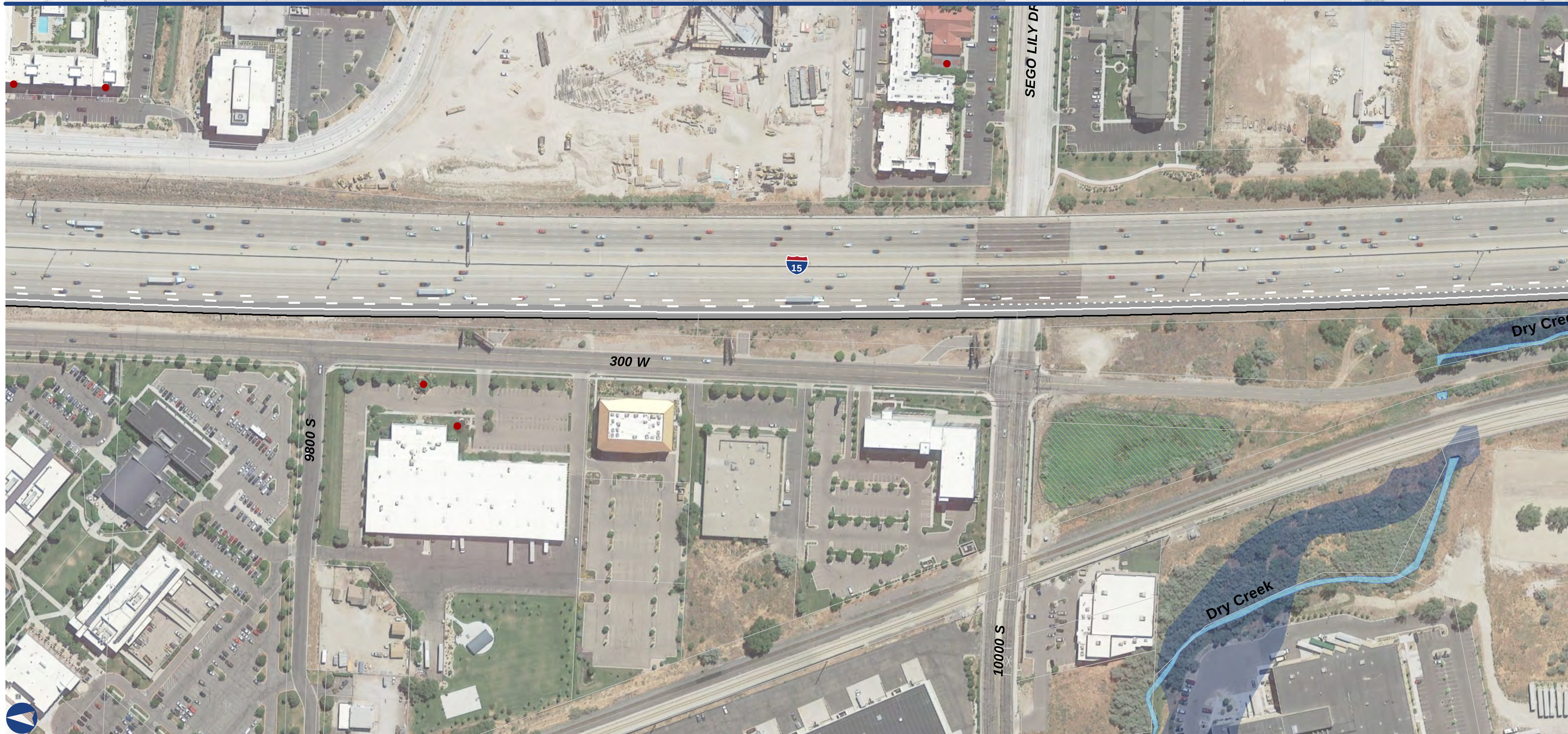

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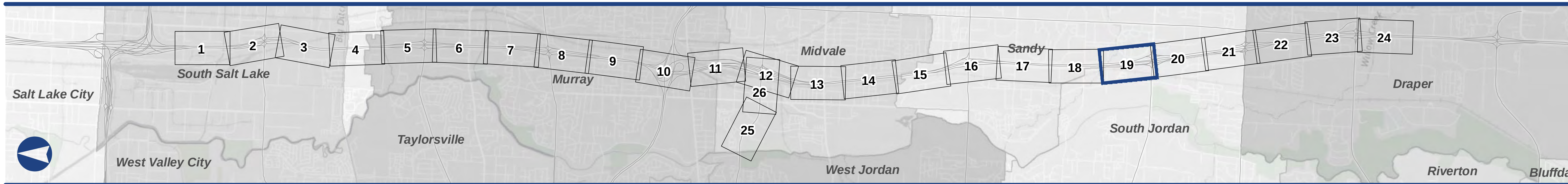
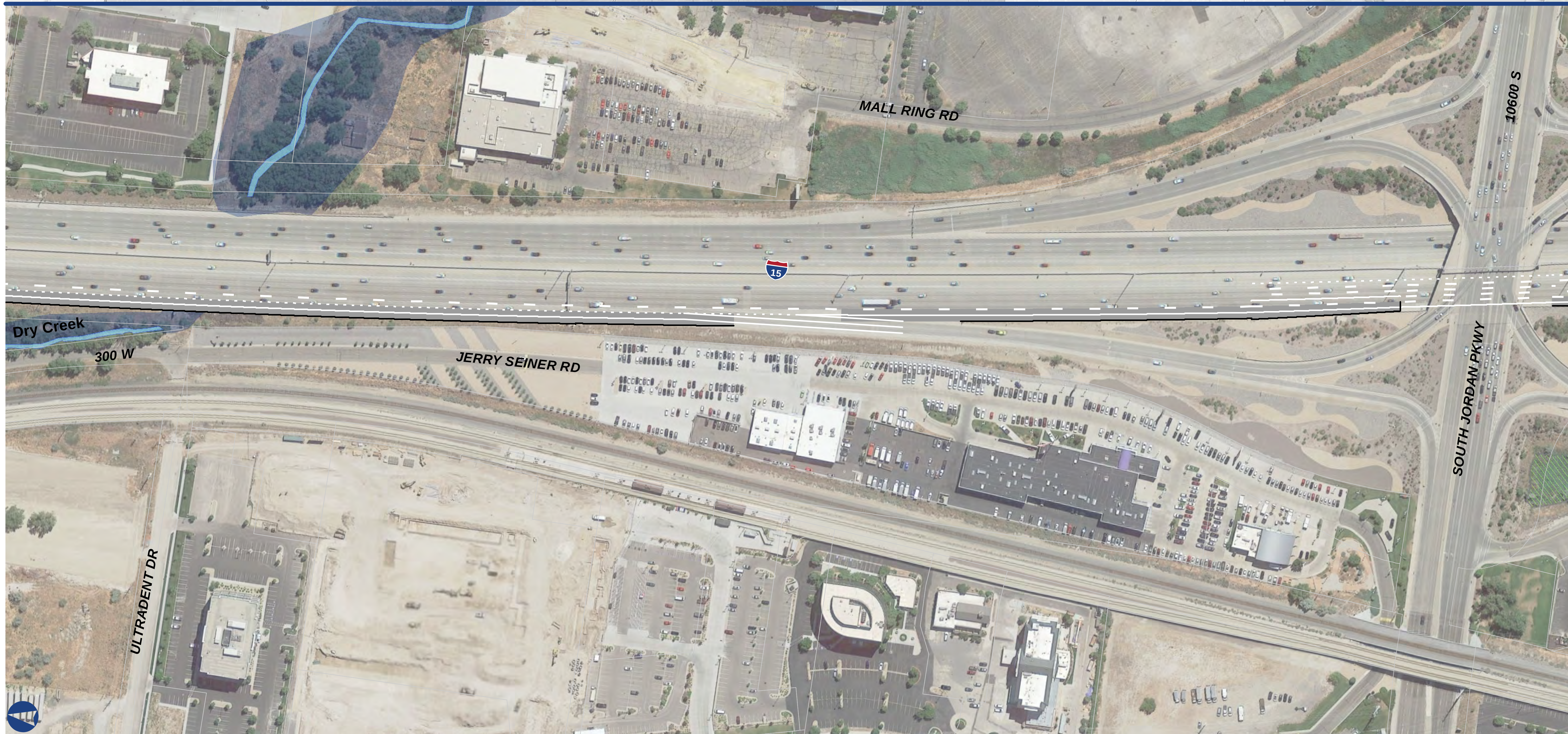




Noise Impacts

Existing Noise Walls

Recommended Noise Walls (New)

Historic Structures (Eligible for NRHP)

Archaeological Sites (Eligible for the NRHP)

Hazardous Waste Sites

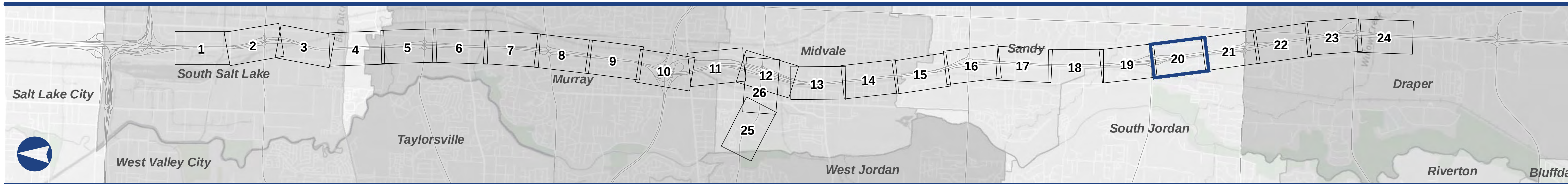
Existing Detention Pond

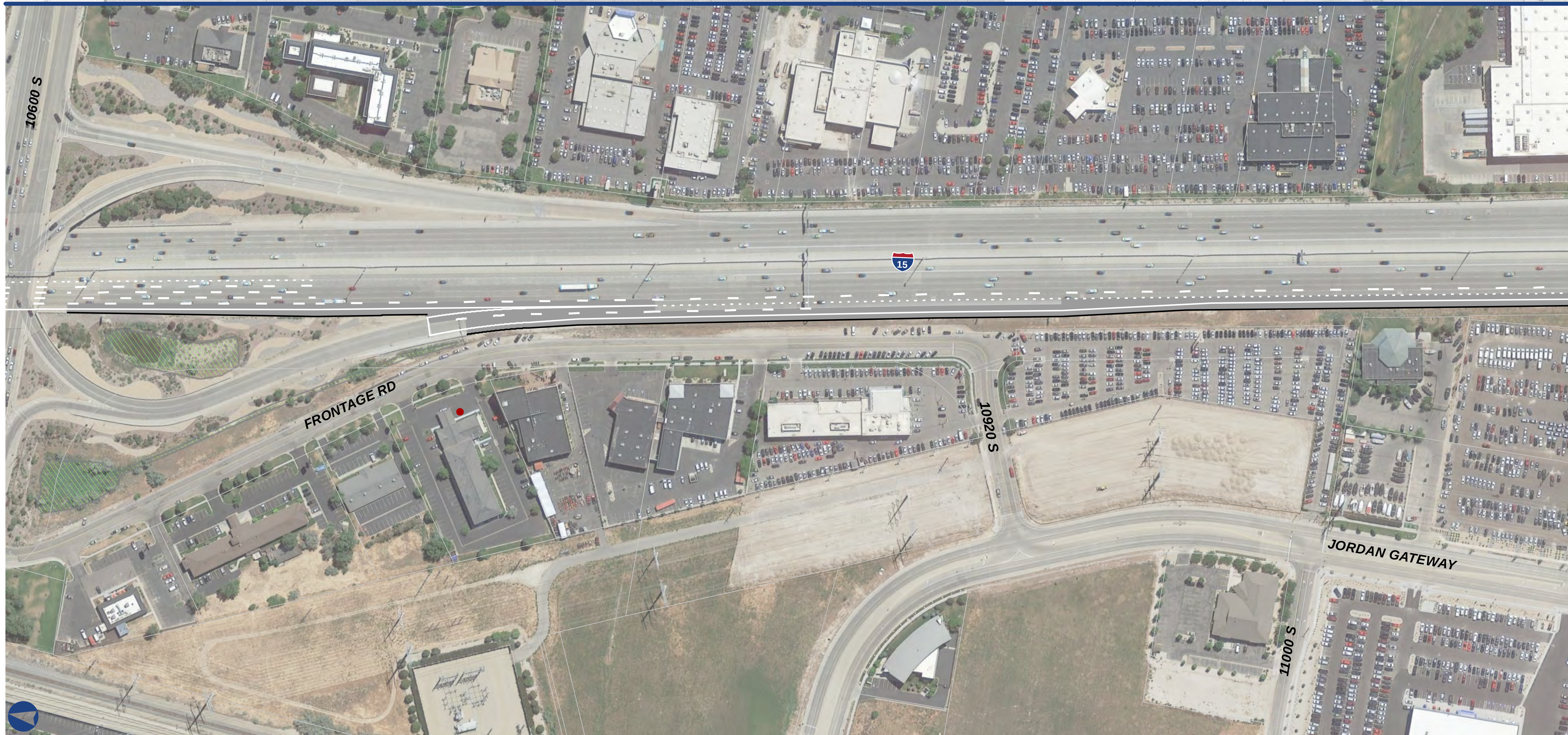
100 Year Floodplain

Waters of the U.S.

Possible Wetland

Preferred Alternative





SOUTH 15 BOUND

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- Recommended Noise Walls (New)
- Historic Structures (Eligible for NRHP)
- Archaeological Sites (Eligible for the NRHP)
- Hazardous Waste Sites
- Existing Detention Pond
- 100 Year Floodplain
- Waters of the U.S.
- Possible Wetland

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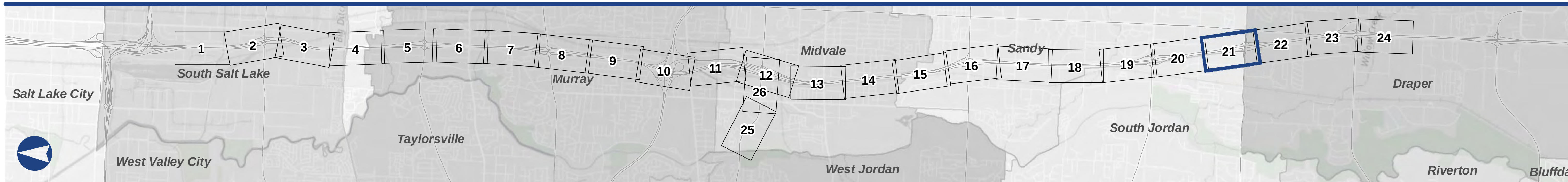

SOUTH 15 BOUND
INTERSTATE

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Archaeological Sites (Eligible for the NRHP)
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Existing Detention Pond
100 Year Floodplain
Waters of the U.S.
Possible Wetland

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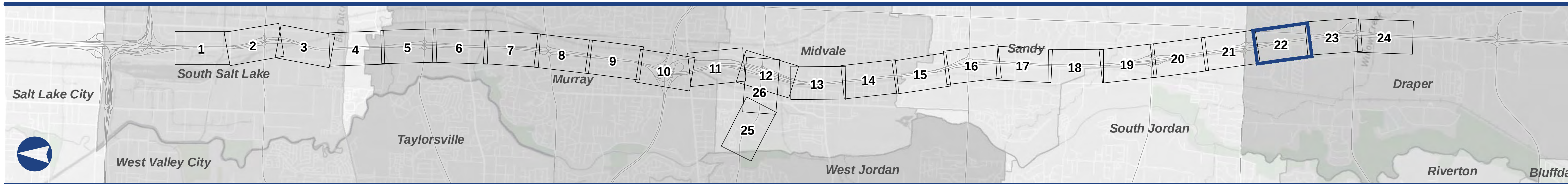

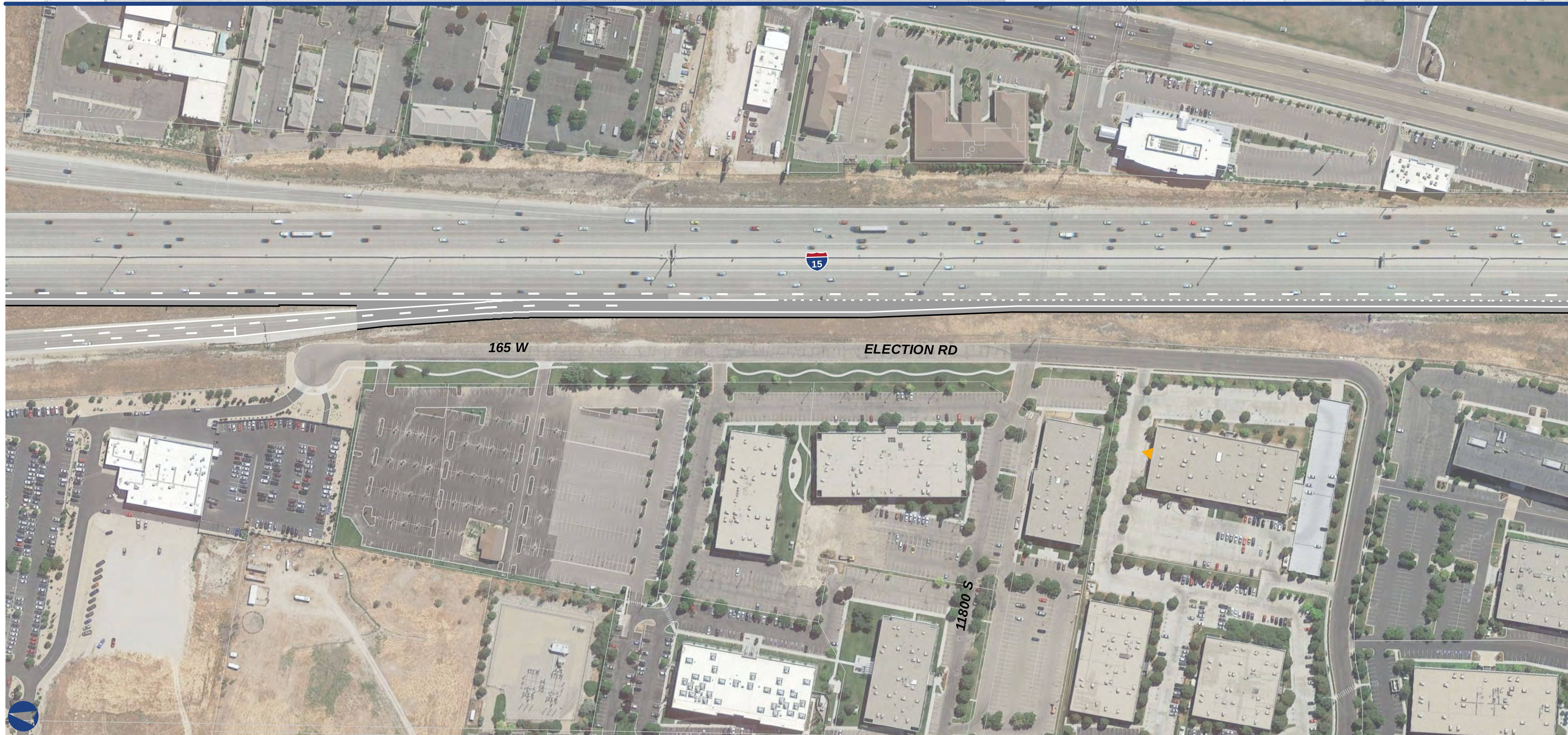

INTERSTATE 15 SOUTH BOUND

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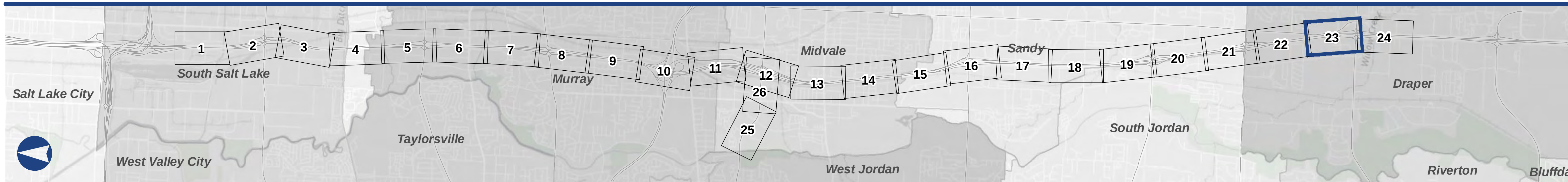

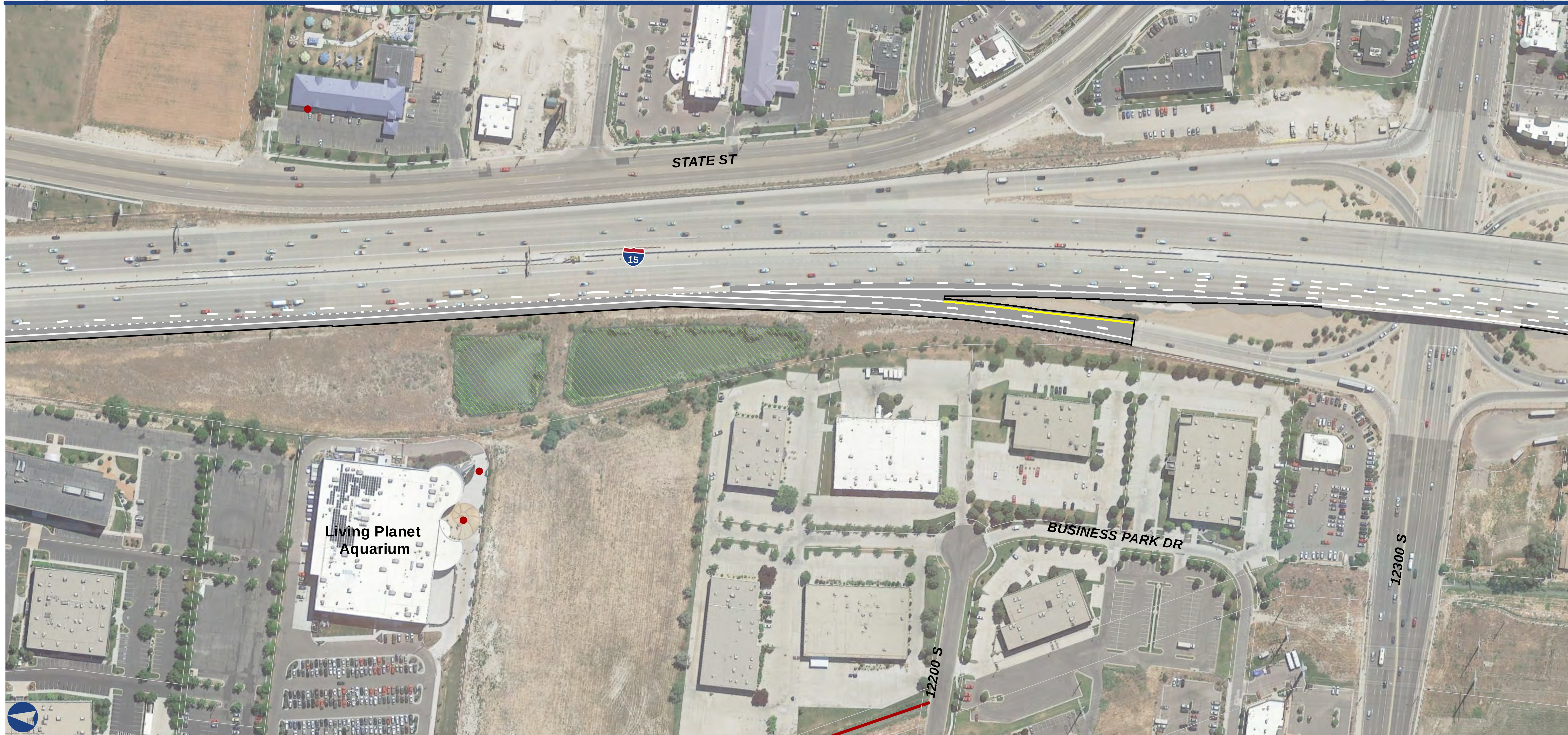

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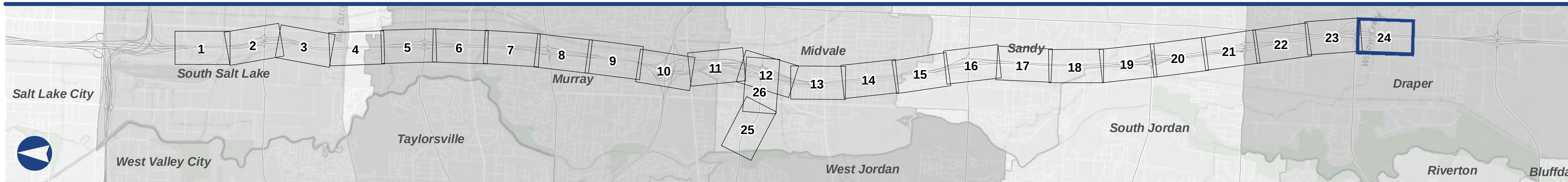

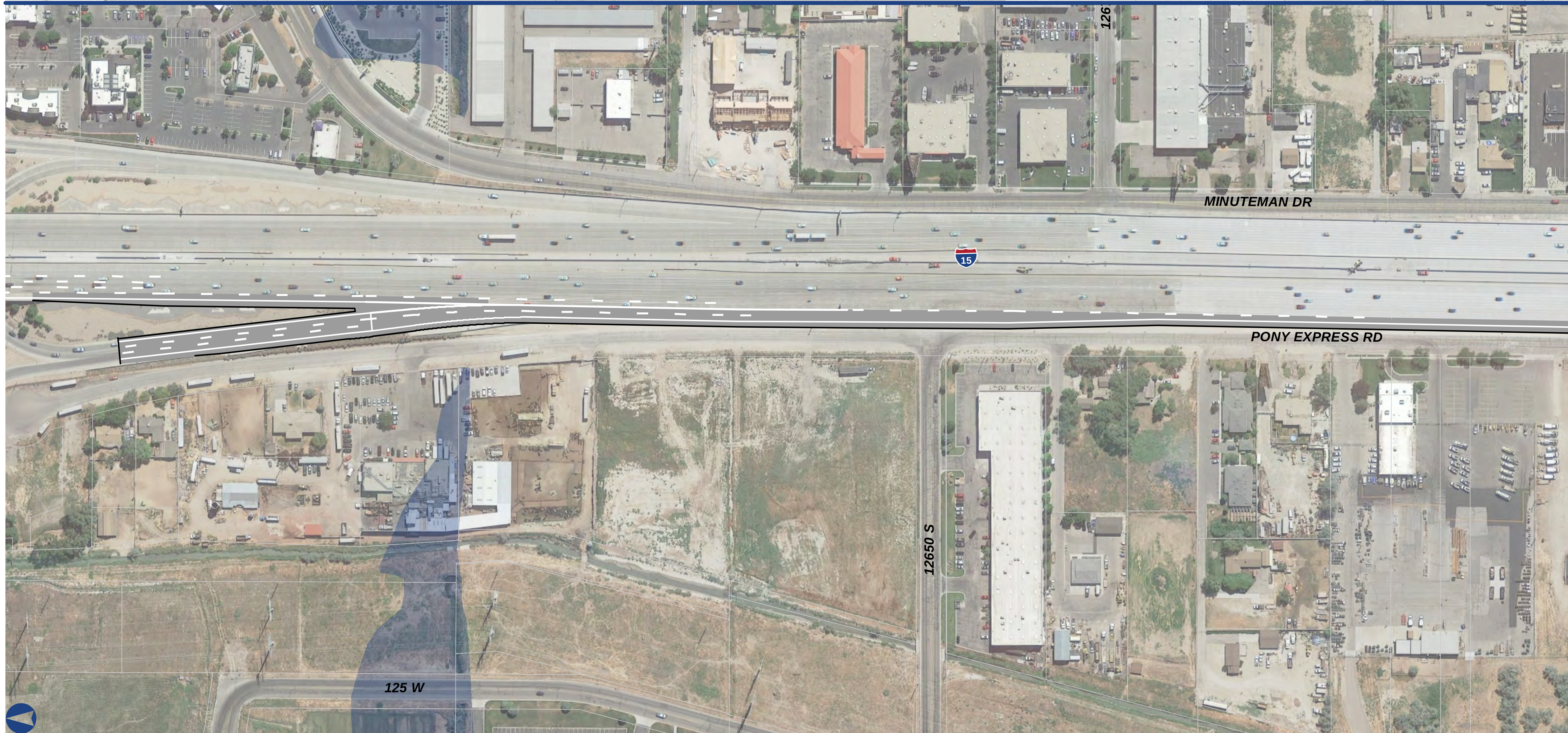

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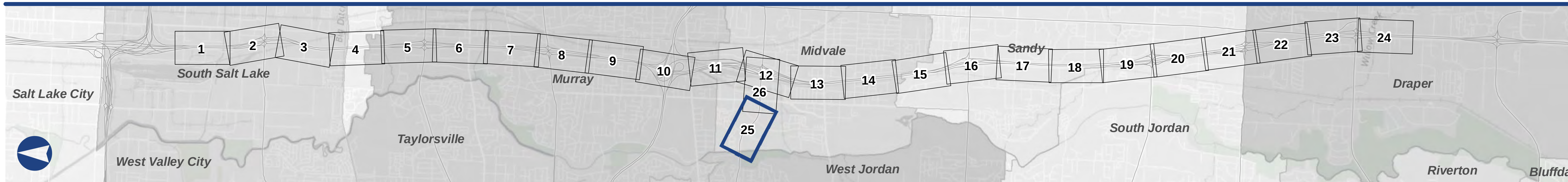

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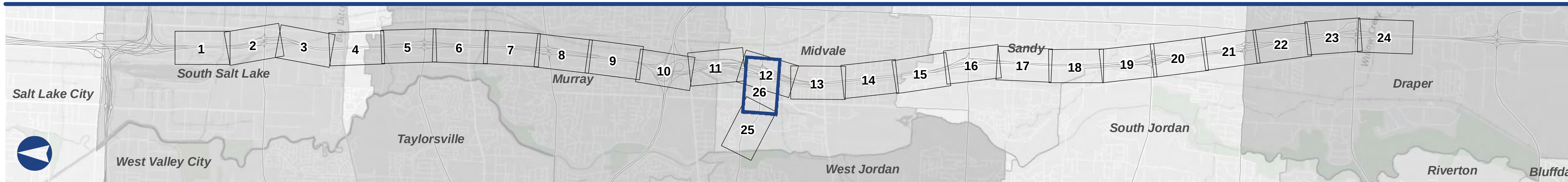

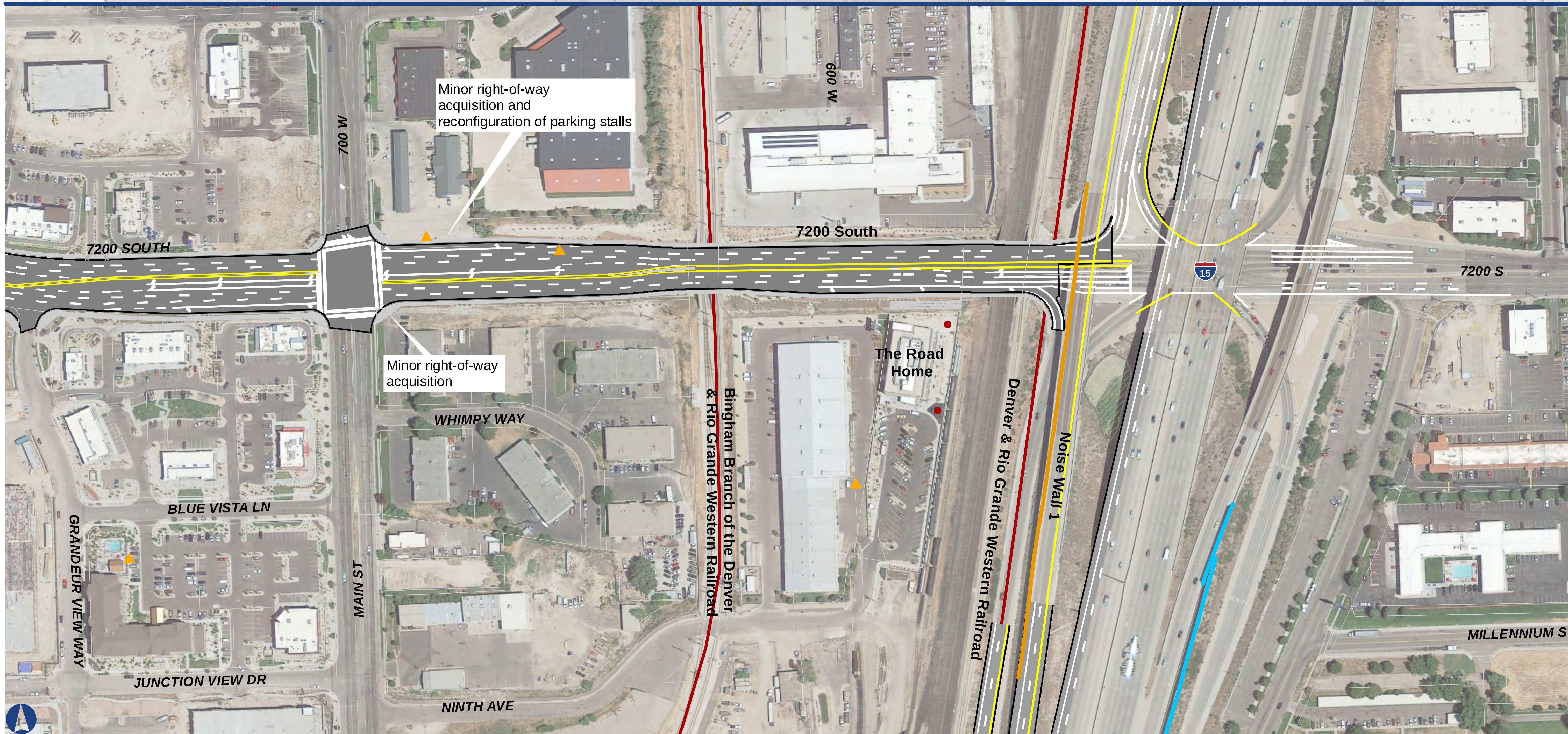

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