

## CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

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The purpose of this chapter is to provide the information necessary to understand the beneficial and adverse impacts of the proposed widening project to the built and natural environment. The chapter is divided into sections that discuss resources that could be affected by both the No Build and Build Alternative. Each section includes a discussion of the applicable regulations, study area; affected environment; environmental consequences; and avoidance, minimization, and/or mitigation specific for that resource. Relevant to all sections of Chapter 3, the study area is urban and fully planned and zoned by the City of Taylorsville and by Salt Lake County for Kearns Township. The study area is built out with few undeveloped parcels.

The analysis for this State Environmental Study (SES) included information gathered from agency and public input received during the public scoping process, a review of available data, and field investigations. The environmental resources known to exist or potentially could exist in the study area are addressed in the following sections.

- 3.1: Land Use
- 3.2: Social
- 3.3: Relocations
- 3.4: Economics
- 3.5: Bicyclist and Pedestrian Considerations
- 3.6: Water Resources
- 3.7: Natural Resources
- 3.8: Air Quality
- 3.9: Noise
- 3.10: Hazardous Materials
- 3.11: Cultural Resources
- 3.12: Visual Quality

As part of the scoping and environmental analysis, additional environmental resources were considered. However, because it was determined that the Build Alternative would have no potential impact on these specified resources, there is no further discussion of farmlands or floodplains.

### 3.1 LAND USE

#### 3.1.1 Regulations

The City of Taylorsville and Kearns Township/Salt Lake County regulate development and land uses in the study area according to the City of Taylorsville General Plan (Taylorsville 2006) and the Kearns Township General Plan (Kearns 2009). Policies, plans, and guidance from these plans relevant to the proposed widening project are discussed throughout this section and the SES.

*The 5400 South study area is dominated by commercial land uses on its east end and residential uses on its west end. The Build Alternative would convert approximately 6 acres of residential, 3.5 acres of commercial, and less than 0.25 acres of institutional uses to transportation use. These changes would not violate any goals or policies in the Kearns Township General Plan and the City of Taylorsville General Plan.*

### 3.1.2 Study Area

The study area for assessing land use impacts is the 5400 South corridor from Bangerter Highway to 4800 West, which includes a quarter-mile area around the corridor limits. A portion of the study area is located within the City of Taylorsville between Bangerter Highway and 4015 West. Between 4015 West and 4800 West, the study area is located within Kearns Township.

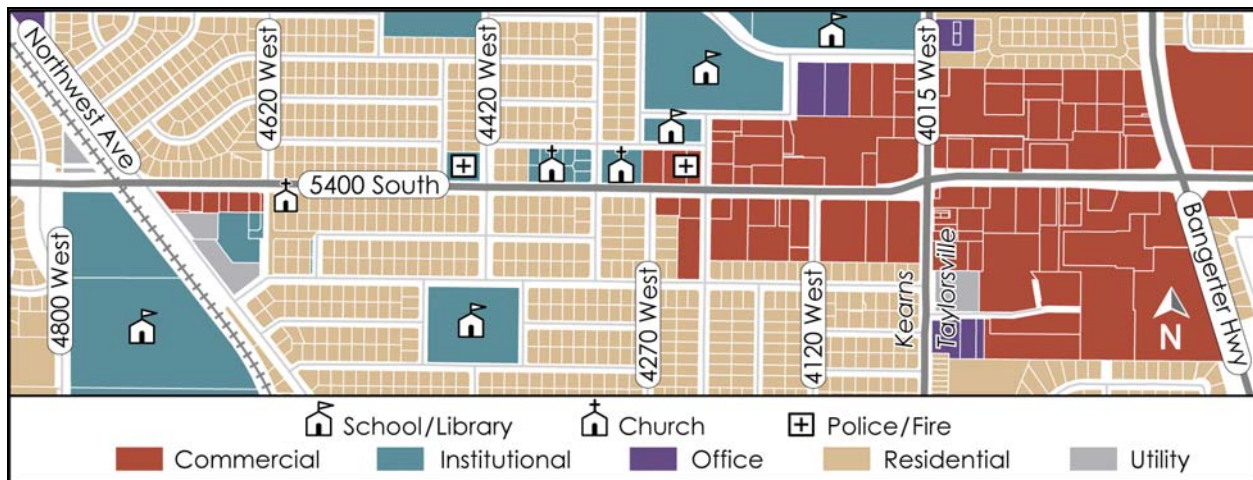
### 3.1.3 Affected Environment

#### 3.1.3.1 Existing Land Uses

The City of Taylorsville was historically an agricultural area that has developed into a robust suburban, residential area with diverse commercial centers that have regional economic influence. According to the Transportation Section of the City of Taylorsville General Plan, 5400 South is a Principal Arterial that is a priority for east and west traffic. The area north and south of 5400 South, between Bangerter Highway and 4015 West, is zoned Regional Commercial. Regional Commercial land uses are large scale, big-box anchored retail and commercial centers. (Taylorsville 2006)

Kearns Township is within the jurisdiction of Salt Lake County and is primarily a residential, suburban community. The area north and south of 5400 South between 4015 West and Northwest Avenue was part of a master planned development that was constructed in the 1950s. 5400 South was planned as the main transportation corridor with commercial land uses near the 4015 West and 5400 South intersection providing retail services to the community. This land pattern has generally remained in place, although the commercial area and school near Northwest Avenue were developed at a later time (**Figure 3.1-1**). The Kearns Township General Plan refers to 5400 South as the primary gateway into Kearns Township (Kearns 2009).

Figure 3.1-1 Land Uses in the Study Area



Sources: Taylorsville 2006 and Kearns 2009

Other land uses within the study area include:

- Two elementary schools, one junior high school, and one high school;
- Three churches;
- A fire station and police station;
- Union Pacific Railroad (parallel to Northwest Avenue); and
- Various utilities.

### 3.1.3.2 Future Land Uses

Future land uses within both the City of Taylorsville and Kearns Township are referred to in each city's general plans. These general plans identify goals and policies for future improvements.

The City of Taylorsville General Plan emphasizes that the intersection of 4015 West and 5400 South should be an attractive gateway to the City that establishes the City boundary, specifically including signage oriented toward eastbound traffic (Taylorsville 2006). The General Plan also identifies the area north and south of 5400 South between 4015 West and Bangerter Highway as an economic development priority. The General Plan cites the need for access improvements and building renovations to accomplish this goal (Taylorsville 2006).

The Kearns Township General Plan refers to improvement of 5400 South as the second highest community goal (Kearns 2009). Projects identified in the General Plan include:

- Reestablishing a central business district along 5400 South that is focused primarily at the intersection of 4015 West and 5400 South.
- Performing a 5400 South corridor analysis to determine how it can function more efficiently as well as serve as an important public place for the community.
- Completing a storm water management plan that would provide guidance for mitigating against frequent flooding in the 5400 South commercial area. (Kearns 2009)

### 3.1.4 Environmental Consequences

Impacts on land uses were based on the potential for land use change to occur within the study area and on consistency with each city's general plans. Direct impacts on land use include the conversion of land from developed uses to transportation use. Consistency with general plans was determined based on planning information summarized in Section 3.1.3.

#### 3.1.4.1 No Build Alternative

No impacts are anticipated for land use under the No Build Alternative as the study area is built out and is not expected to experience a change in development patterns from the existing configuration of 5400 South.

### 3.1.4.2 Build Alternative

The Build Alternative would require widening 5400 South by approximately 35 feet, which would convert about 6 acres of residential, 3.5 acres of commercial uses, and a quarter of an acre of institutional uses along 5400 South to transportation use. Because this is a small percentage of the overall land uses in Kearns Township, no impacts are expected as a result of the Build Alternative.

Changes in land use would occur entirely in Kearns Township, and these changes in land uses are consistent with and would not preclude implementation of recommendations in the Kearns Township General Plan. The plan recommends the redevelopment of the 5400 South corridor, including consolidating parcels into larger more usable development sites, protecting the edges of the remaining neighborhoods, and minimizing traffic access conflicts (Kearns 2009).

### 3.1.5 Avoidance, Minimization, and Mitigation Measures

No mitigation is required for land use.

## 3.2 SOCIAL

This section analyzes social conditions in the study area related to quality of life, including community character and cohesion, public services and facilities, and utilities.

### 3.2.1 Regulations

There are no applicable social regulations.

### 3.2.2 Study Area

The study area for assessing social impacts is the 5400 South corridor from Bangert Highway to 4800 West, which includes a quarter-mile area around the corridor limits. This section focuses on the Kearns Township community because there would be no social impacts within the City of Taylorsville.

*The proposed widening project is located in an urbanized area. The project would not result in substantial changes to community character and cohesion. The Veteran's Memorial located on the corner of 4015 West and 5400 South would have to be relocated. Additionally, there would be no negative impact on public services. A number of utilities may be relocated as a result of the Build Alternative, but these relocations would not affect utility services.*

### 3.2.3 Affected Environment

#### 3.2.3.1 Community Character and Cohesion

Community character is an attribute of a geographic area with identifiable characteristics that make it unique. Community cohesion is an attribute of a geographic area where segmentation or division of the area would reduce its desirability to current and future residents.

5400 South is an existing street that has served as a division between residential neighborhoods since the neighborhoods were planned and developed in the 1950s. The north side of 5400 South was developed independently of the south side, and each side generally maintains separate church and school facilities.

The eastern portion of the corridor has historically been the location of important community and commercial services (Section 3.4).

The demographic profile of the Kearns Township assists in understanding the characteristics of the community. Demographic information is referenced from the Kearns Township General Plan (Kearns 2009) and the United States Census (U.S. Census 2000). Data from the 2010 U.S. Census are not yet available and, as such, is not discussed.

- **Population:** In the year 2000, Kearns Township had a population of 33,659. In the year 2007, the total population decreased slightly to 32,237 due to the annexation of parts of Kearns Township to the cities of West Jordan and West Valley. The Kearns Township General Plan and the Wasatch Front Regional Council (WFRC) population projections do not anticipate future population growth in the township, since there is little undeveloped land in the township. (Kearns 2009)
- **Age:** The low median age (26.1 years) and the relatively high average household size (3.65 persons) indicate that there are many young families in the community. However, demographic projections also show a decline in the future population, indicating that a large segment of the population is aging and their children are leaving home. (Kearns 2009)
- **Homeownership:** Kearns Township has a higher percentage of owner-occupied homes in comparison to Salt Lake County, the State of Utah, and the U.S. Nearly 89 percent of the occupied homes in Kearns Township are owner-occupied. Also, there are few vacant homes within the Kearns Township boundaries (2.2 percent) (Kearns 2009). Many of the residents that attended the proposed widening project's public open house indicated that they had lived in the area for many years.
- **Race and Ethnicity:** The study area is racially and ethnically diverse. Census data indicate that nearly a quarter of the township's population is not Caucasian (U.S. Census 2000). To this fact, the three churches along the 5400 South corridor offer services in Tongan, Vietnamese, or Spanish.
- **Income and Poverty:** The median income for the Kearns Township is similar to the State of Utah's median income, although it is somewhat lower than the median income for Salt Lake County. However, Kearns Township has a smaller percentage of individuals below the poverty level in comparison to Salt Lake County, the State of Utah, and the country (Kearns 2009)

### 3.2.3.2 Community Facilities and Services

Community facilities in the study area consist of a library, schools, churches, public safety facilities, and recreation facilities.

#### ***Library and Schools***

The Kearns Library is located just north of the study area on 4220 West and is part of the Salt Lake County Library System. There are four public schools in the study area: two elementary schools, one high school, and one junior high school, all of which are within the Granite School District.

## **Churches**

There are three churches along 5400 South.

- **Trinity United Methodist Church:** The 270-member church provides a number of programs for the community (e.g., Boy Scouts, Girl Scouts, Alcoholics Anonymous, Narcotics Anonymous) and includes a Tongan congregation.
- **Lady of Perpetual Help Parish Vietnamese Catholic Parish:** This parish is the only Vietnamese Parish in the Salt Lake Valley and attracts worshipers from the cities of Ogden to Provo.
- **Church of Jesus Christ of Latter Day Saints (LDS):** This church facility serves as a stake center for seven ward congregations and is the weekly meeting house for two ward congregations.

## **Public Safety Facilities**

There are two public safety buildings in the study area. Both are located on 5400 South and use the corridor as an emergency response route.

- **Unified Police of Greater Salt Lake Kearns Precinct (4250 West 5415 South):** This precinct is centrally located and serves the entire Kearns Township.
- **Salt Lake Unified Fire Authority Station #109 (4444 West 5415 South):** This station is centrally located and serves most of the Kearns Township. (Kearns 2009)

## **Recreation Facilities**

There are three recreation facilities within Kearns Township:

- **Kearns Recreation Center (5670 South Cougar Lane):** This facility is operated by Salt Lake County and provides full-time child care, sports programs, classes, and community events.
- **Oquirrh Park Fitness Center (5624 Cougar Lane):** This facility is operated by the Kearns Township Improvement District and provides a fitness center, tennis courts, aquatic facilities, and a park and playground.
- **Utah Olympic Oval (5662 Cougar Lane):** Facilities include multiple ice rinks, an indoor running track, and an indoor soccer field.

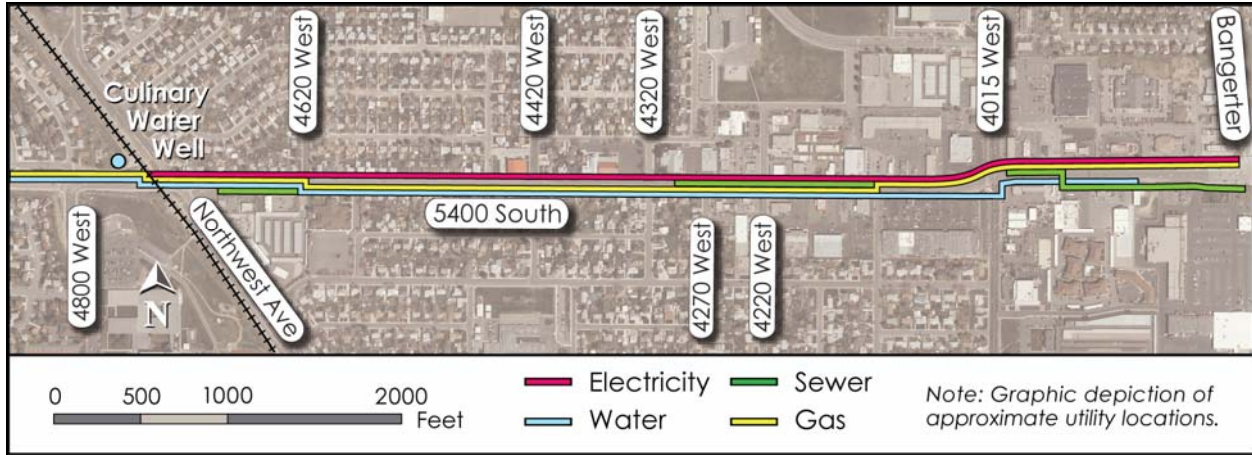
## **Veteran's Memorial**

Kearns Township was developed on the site of Camp Kearns, an Army Air Forces base during World War II. To commemorate that history and to honor veterans, a cannon was installed by the Lions and American Legion on the southwest corner of 4015 West and 5400 South with a memorial plaque naming soldiers from Kearns Township that were killed in action.

### **3.2.3.3 Utilities**

The utilities within the study area were identified by collecting utility mapping information from the utility owners within the potentially affected area (**Figure 3.2-1**).

Figure 3.2-1: Utilities along 5400 South



### **Electricity**

Rocky Mountain Power (a division of PacifiCorp) provides electricity to the study area, largely by overhead transmission and distribution lines along the north side of 5400 South. Rocky Mountain Power also operates an electrical substation on Northwestern Avenue just south of 5400 South.

### **Water and Sewer**

Kearns Township Improvement District provides culinary water and sewer services for the study area. The improvement district purchases 90 percent of their water from the Jordan Valley Water Conservancy District. The remaining 10 percent of the culinary water is delivered through 12 wells located in the Kearns Township area, including a well located on the northeast corner of 5400 South and 4800 West. (Kearns District 2009)

Kearns Township Improvement District has developed a Source Protection Plan that contains information about source protection zones, potential contamination sources, and management strategies to protect drinking water (Hansen 2003). The plan indicates the major roadways where hazardous materials are transported, and the potential risk hazardous material transportation can pose to drinking water. However, wells operated by the Improvement District have a low susceptibility to potential contamination, and the Improvement District has developed management strategies to protect water sources from contamination. (Kearns District 2009)

An eight-inch water line runs along the south side of 5400 South for the length of the alignment. Sewer lines intermittently run along the north and south sides of 5400 South.

### **Natural Gas**

Natural gas lines within the study area are owned and operated by Questar Gas. The primary gas line in the study area intermittently runs along the north and south sides of 5400 South with distribution lines branching out from the main line.

## 3.2.4 Environmental Consequences

Environmental consequences to social resources are generally the result of disruptions to the community character and cohesion, impacts to community facilities and services, and disruptions and relocations of utilities.

### 3.2.4.1 No Build Alternative

No impacts are anticipated for social conditions under the No Build Alternative.

### 3.2.4.2 Build Alternative

#### ***Community Character and Cohesion***

Transportation uses generally serve as boundaries to divide communities. 5400 South has traditionally been a boundary in the Kearns Township community, and the Build Alternative will continue to establish that boundary by providing a wider roadway that accommodates higher traffic volumes. Additionally, changes to land uses along the corridor would change the visual appearance and feel of the corridor as well as eliminate some of the businesses that provide services to the local community. Overall, these changes are minor and are not expected to have impacts on social relationships, isolate communities, or reduce/change patterns of interaction between a cohesive neighborhood or group.

Furthermore, the proposed widening project may have beneficial impacts on community character and cohesion. 5400 South is currently vehicle-oriented, and pedestrian amenities are deficient (Section 3.5), which limit the cohesive nature of community centers. The Build Alternative would improve sidewalks and may encourage pedestrian activity and uses along the corridor. Improved sidewalks would also increase the accessibility of the many community facilities and services located in the study area.

#### ***Community Facilities and Services***

There are a number of community facilities located in the study area, and 5400 South provides important vehicle and pedestrian access to those facilities. The Build Alternative has been designed to avoid the relocation of the community facilities located along the corridor. Beyond this, the Build Alternative would have a beneficial impact on the churches, schools, library, and other community facilities by improving sidewalks and pedestrian access. Reduction in congestion and corridor travel time is also anticipated to benefit police and fire emergency response times.

The Veteran's Memorial on the corner of 4015 West and 5400 South would have to be relocated as a result of the proposed widening project. The memorial is not specifically associated with the land that it currently occupies, and it is anticipated that a new location for the memorial could be found.

#### ***Utilities***

Utility impacts would occur if the Build Alternative conflicts with an existing utility line, resulting in a relocation of or modification to the utility. Potential impacts that have been identified in the preliminary design phase are discussed below. UDOT and/or its contractors would coordinate with utility providers that may be affected by construction to minimize service disruptions. Some utilities may be relocated

during construction; however, upon completion of construction, the function of existing utilities would be restored.

- The Build Alternative would require the relocation of the electrical transmission/distribution lines located on the north side of 5400 South in the vicinity of the 4015 West and 5400 South intersection and between 4620 West and Northwest Avenue. Power lines would be relocated just north of their current location. Most of the power lines along the corridor would not be affected by the Build Alternative. During construction, temporary power outages may occur, but these outages would not be widespread and would be brief in duration.
- The Build Alternative would have no effect on the culinary water well located at the northeast corner of 5400 South and 4800 West. 5400 South would remain the same distance from the well as it currently is. The Build Alternative would be consistent with the Source Protection Plan prepared by the Kearns Township Improvement District.
- The Build Alternative would require the relocation of the culinary water line located on the south side of 5400 South. During construction, temporary disruptions of culinary water service may occur, but these outages would not be widespread and would be brief in duration.
- Some portions of the sewer located within the 5400 South corridor may be relocated due to construction of the Build Alternative. This would be dependent on the depth of the sewer line and the potential for conflicts during construction. If sewer lines are replaced, the elevation of the sewer would be maintained to preserve the gravity flow of the facility. The provision of sewer services is not anticipated to be disrupted by construction.
- Some portions of natural gas lines located within the 5400 South corridor may be relocated due to construction of the Build Alternative. This would be dependent on the depth of the gas lines and the potential for conflicts during construction. Natural gas distribution is not anticipated to be disrupted by construction.

### 3.2.5 Avoidance, Minimization, and Mitigation Measures

Utah Department of Transportation (UDOT) would coordinate with Kearns Township Community Council, Salt Lake County, and other interested parties regarding the relocation of the Veteran's Memorial located at 4015 West and 5400 South.

## 3.3 RELOCATIONS

This section analyzes acquisitions and relocations that would be required under the Build Alternative.

*The Build Alternative would require the relocation of 38 residences, relocation of 8 businesses, and partial acquisition of 22 properties.*

### 3.3.1 Regulations

In acquiring properties, UDOT abides by the provisions of the Utah Relocation Assistance Act, which compensates owners for property acquisition. The purpose of the Utah Relocation Assistance Act is to establish a uniform policy for the fair and equitable treatment of persons displaced by the acquisition of real property by state or local land acquisition programs. (Utah Code Section 57-12-2)

### 3.3.2 Study Area

The study area for assessing relocations and acquisitions include parcels adjacent to 5400 South from Bangerter Highway to 4800 West. In addition, properties adjacent to 4015 West from 5115 South to 5580 South are included in the study area.

### 3.3.3 Affected Environment

Parcel data was obtained to identify specific properties that potentially require acquisition and/or relocation. Most of the properties adjacent to 5400 South are privately owned. Many of the buildings along 5400 South are setback from the roadway 40 feet or less.

### 3.3.4 Environmental Consequences

#### 3.3.4.1 No Build Alternative

No relocations or acquisitions would occur under the No Build Alternative.

#### 3.3.4.2 Build Alternative

Based on preliminary design of the Build Alternative, 68 properties along 5400 South and along 4015 West would potentially be impacted for road widening and intersection improvements. Continuing engineering efforts may result in some changes to property impacts and acquisitions. Of the 68 affected properties:

- Full acquisition of 46 properties would be required; and
- Partial acquisition of 22 properties would be required.

A full acquisition occurs when UDOT purchases a property in full, pays the owner for the property, and relocates the current use of the property. A partial acquisition occurs when UDOT purchases a portion of the property, pays the owner for the portion of the property that is acquired, and the property can still be used as it is currently being used.

Easements for construction and utilities may also be required for properties along 5400 South and 4015 West within the study area. Easements are outside the boundaries of a planned roadway, but would be required to accommodate project activities (i.e. movement of construction equipment, relocation of utilities, staging, and/or storage). UDOT provides compensation to the landowner for the use.

The Build Alternative would result in the relocation of 38 residences and 8 businesses. UDOT has a right-of-way division that will work with affected property owners throughout the acquisition and relocation process. Residents and businesses would be relocated in accordance with the Utah Relocation Assistance Act, which provides fair and equitable treatment of persons displaced by the acquisition of real property by UDOT. **Figure 3.3-1** shows the location of potential easements, acquisitions, and relocations, and **Table 3.3-1** lists acquisitions and relocations by address.

Figure 3.3-1 and Table 3.3-1 depict preliminary determinations of full and partial acquisitions. Impacts identified may be reduced during final design. Ultimately, whether a property will be a full or partial acquisition is determined case-by-case based on the appraised value of the property and estimation of damages to the property. UDOT is currently contacting impacted property owners to provide additional information on the acquisition process.

Figure 3.3-1: Easements, Acquisitions, and Relocations in the Study Area



Table 3.3-1: Acquisitions and Relocations in the Study Area

Address	Property Type	Type of Acquisition	Relocation (Yes/No)
5382 S 4015 W	Commercial	Partial Acquisition	No
4040 W Sams Blvd	School	Partial Acquisition	No
4015 W 5316 S	Commercial	Partial Acquisition	No
4015 W 5560 S	Commercial	Partial Acquisition	No
4060 W 5415 S	Commercial	Partial Acquisition	No
4620 W 5404 S	Residential	Full Acquisition	Yes
4648 W 5415 S	Residential	Full Acquisition	Yes
4656 W 5415 S	Residential	Full Acquisition	Yes
4666 W 5415 S	Residential	Full Acquisition	Yes
4674 W 5415 S	Residential	Full Acquisition	Yes
4682 W 5415 S	Residential	Full Acquisition	Yes
4690 W 5415 S	Residential	Full Acquisition	Yes
4698 W 5415 S	Residential	Full Acquisition	Yes
4706 W 5415 S	Residential	Full Acquisition	Yes
4714 W 5415 S	Residential	Full Acquisition	Yes
4724 W 5415 S	Residential	Full Acquisition	Yes
5405 S Northwest Ave	Residential	Full Acquisitions	Yes
5525 S Cougar Ln	School	Partial Acquisition	No
4703 W 5415 S	Commercial	Partial Acquisition	No
4675 W 5415 S	Commercial	Partial Acquisition	No
4655 W 5415 S	Commercial	Partial Acquisition	No
4595 W 5415 S	Commercial	Partial Acquisition	No
4575 W 5415 S	Church	Partial Acquisition	No

Address	Property Type	Type of Acquisition	Relocation (Yes/No)
4561 W 5415 S	Residential	Full Acquisition	Yes
4551 W 5415 S	Residential	Full Acquisition	Yes
4541 W 5415 S	Residential	Full Acquisition	Yes
4531 W 5415 S	Residential	Full Acquisition	Yes
4521 W 5415 S	Residential	Full Acquisition	Yes
4511 W 5415 S	Residential	Full Acquisition	Yes
4501 W 5415 S	Residential	Full Acquisition	Yes
4491 W 5415 S	Residential	Full Acquisition	Yes
4481 W 5415 S	Residential	Full Acquisition	Yes
4471 W 5415 S	Residential	Full Acquisition	Yes
4461 W 5415 S	Residential	Full Acquisition	Yes
4451 W 5415 S	Residential	Full Acquisition	Yes
4441 W 5415 S	Residential	Full Acquisition	Yes
4420 W 5431 S	Residential	Full Acquisition	Yes
4420 W 5430 S	Residential	Full Acquisition	Yes
4391 W 5415 S	Residential	Full Acquisition	Yes
4381 W 5415 S	Residential	Full Acquisition	Yes
4371 W 5415 S	Residential	Full Acquisition	Yes
4361 W 5415 S	Residential	Full Acquisition	Yes
4351 W 5415 S	Residential	Full Acquisition	Yes
4341 W 5415 S	Residential	Full Acquisition	Yes
4320 W 5426 S	Residential	Full Acquisition	Yes
4309 W 5415 S	Residential	Full Acquisition	Yes

Address	Property Type	Type of Acquisition	Relocation (Yes/No)
4299 W 5415 S	Residential	Full Acquisition	Yes
4289 W 5415 S	Residential	Full Acquisition	Yes
4279 W 5415 S	Residential	Full Acquisition	Yes
4261 W 5415 S	Commercial	Full Acquisition	Yes
4235 W 5415 S	Commercial	Full Acquisition	Yes
4219 W 5415 S	Commercial	Full Acquisition	Yes
4195 Kearns Blvd	Commercial	Partial Acquisition	No
4163 W 5415 S	Commercial	Full Acquisition	Yes
4147 W 5415 S	Commercial	Partial Acquisition	No
4153 W 5415 S	Commercial	Full Acquisition	Yes
4135 W 5415 S	Commercial	Full Acquisition	Yes
4140-4095 W 5415 S	Commercial	Partial Acquisition	Yes*
4015 W 5557 S	Commercial	Partial Acquisition	No
4015 W 5495 S	Post Office	Partial Acquisition	No
4007 W 5400 S	Commercial	Partial Acquisition	No
3965 W 5400 S	Commercial	Full Acquisition	Yes
3951 W 5400 S	Commercial	Partial Acquisition	No
3900 W 5400 S	Commercial	Partial Acquisition	No
3905 W 5400 S	Commercial	Partial Acquisition	No
3903 W 5400 S	Commercial	Partial Acquisition	No
3891 W 5400 S	Commercial	Partial Acquisition	No
3901 W 5400 S	Commercial	Partial Acquisition	No

\* Several buildings are located on this property. The one building (shaded in red) within the property boundaries would be acquired under the Build Alternative.

Notes: Table shading corresponds with parcel shading shown in Figure 3.3-1. Addresses are listed from 4015 West along the north side of 5400 South westward to Northwest Avenue, then the addresses continue eastward on the south side of 5400 South to 4015 West.

For businesses not relocated by the proposed widening project, UDOT has developed tools and resources to help business owners maintain their businesses throughout construction. The Partners for the Road Ahead guide is available on UDOT's website ([www.udot.utah.gov](http://www.udot.utah.gov)), located under the *Doing Business* link and then the *Business Guide* link.

### 3.3.5 Avoidance, Minimization, and Mitigation Measures

None Required

## 3.4 ECONOMICS

This section discusses the current and projected economic conditions and the potential impacts to the tax base as a result of the Build Alternative.

### 3.4.1 Regulations

There are no applicable economic regulations.

### 3.4.2 Study Area

The study area for assessing economic impacts focuses on Kearns Township because the potential for economic impacts on the City of Taylorsville would be negligible.

*The Build Alternative would impact approximately 3.5 acres of commercial property and relocate 7 businesses in Kearns Township and 1 business in Taylorsville. Because these changes would not substantially affect the City of Taylorsville or Kearns Township tax base or affect the feasibility of Kearns Township incorporation in the future, no impacts are expected under the Build Alternative.*

### 3.4.3 Affected Environment

In the year 1996, the State of Utah's Legislature created "townships" to protect areas not wanting to annex into an existing city or incorporate into a new municipality. In the year 2008, a survey was conducted to determine if residents within Salt Lake County's townships desired to incorporate or remain as townships. The survey results indicated that the majority of people living in townships wanted to retain Salt Lake County as their municipal-service provider (Nakamura 2009). The results showed that 73 percent of respondents prefer their status as residents of Salt Lake County's unincorporated area, either inside or outside township boundaries (Nakamura 2009).

Salt Lake County completed a feasibility study to determine the viability of each of the townships becoming cities (WEPC 2007). The study concluded the following regarding Kearns Township.

- **Tax Base:** The Kearns Township area has a relatively small tax base with approximately 9,800 households and 139 acres of commercial area.
- **Tax Revenue:** Commercial businesses in Kearns Township generate approximately \$3.6 million in sales tax revenue annually. Future land use plans identify approximately 50 acres of additional land for future commercial development.
- **Households:** The number of households in Kearns Township is not expected to increase.
- **Salt Lake County Spending:** Salt Lake County's spending is lower than incorporated jurisdictions' spending on parks; highway maintenance; capital investment for roads; upkeep for curbs, gutters, and sidewalks; and other related infrastructure expenditures.

- **Incorporation:** Incorporation of Kearns Township into a city would not be feasible. In order for Kearns Township to incorporate and become a city, their property tax rates would exceed the state statutory maximum.
- **Annexation:** It would not be feasible for Kearns Township to be annexed into the cities of West Valley or West Jordan, but may be feasible to be annexed into the City of Taylorsville. If Kearns Township was annexed into the cities of West Valley or West Jordan, each city's assessed value per household and sales tax per household would decrease. If Kearns Township was annexed into the City of Taylorsville, the City's assessed value per household would decrease, but the sales tax per household would slightly increase. (WEPC 2007)

### 3.4.4 Environmental Consequences

#### 3.4.4.1 No Build Alternative

No impacts are anticipated for economics under the No Build Alternative as there would be no physical improvements to 5400 South that would affect commerce or the tax base within the study area.

#### 3.4.4.2 Build Alternative

The proposed widening project would not substantially affect commerce or the tax base in the City of Taylorsville since the Build Alternative would only require the full acquisition of one business within the City of Taylorsville's municipal boundaries.

Implementation of the Build Alternative would result in the acquisition of approximately 3.5 acres of commercial properties and the relocation of 7 businesses within Kearns Township. These properties would no longer be taxable, and the businesses would not generate sales tax. However, the impacted commercial area (approximately 3.5 acres) is a small component of Kearns Township's 139 acre commercial tax base, and this would not affect the overall Kearns Township tax base.

Related to redevelopment in and around the study area, the Kearns Township General Plan identifies a desire to redevelop the commercial area around the 4015 West and 5400 South intersection (Kearns 2009). The proposed widening project may facilitate development plans by providing parcels in the commercial area that could be consolidated with other parcels for new development. Additionally, reduced congestion and traffic delays resulting from implementation of the Build Alternative may have beneficial effects on business accessibility in the study area.

Regarding residence relocations, approximately 38 homes would be acquired in full. Since homes do not contribute more to the tax base than they receive in services, there would not be any negative impact to the overall tax base from residential relocations.

The Build Alternative analysis also considered the 2007 Salt Lake County study for the feasibility of incorporation of Kearns Township and the effect of the proposed widening project on incorporation. The 2007 feasibility study indicates that it is not currently feasible for the township to incorporate nor is it projected to be feasible in the future (WEPC 2007). Additionally, Salt Lake County residents have indicated a desire not to incorporate in the future (Nakamura 2009). The Build Alternative is not

anticipated to have a positive or negative effect on the ability to incorporate. Furthermore, the proposed widening project would not substantially impact the existing tax base or change future projections.

### 3.4.5 Avoidance, Minimization, and Mitigation Measures

No mitigation is required for economics.

## 3.5 BICYCLIST AND PEDESTRIAN CONSIDERATIONS

Bicycle and pedestrian use of roadways is common within the Salt Lake Valley, and accommodations for bicyclists and pedestrians are important elements in the urbanized transportation network. This section evaluates impacts to bicyclists and pedestrians as a result of the proposed widening project.

*The proposed 5400 South widening project is located in an urbanized corridor that has substandard bicycle and pedestrian facilities. The Build Alternative would improve conditions by constructing wider sidewalks that would meet standards. The wider sidewalks would also provide better accommodations for students who walk along 5400 South. The Build Alternative also includes provisions for a shared roadway bicycle facility, an improvement over existing conditions.*

### 3.5.1 Regulations

Federal and state regulations govern bicycle and pedestrian facilities. Utah State Code defines bicycles as vehicles, and UDOT provides the following guidance for accommodating pedestrians and bicycles into roadway designs: the Guide for the Development of Bicycle Facilities (AASHTO 1999), the Pedestrian & Bicycle Guide (UDOT 2008), and Guidelines for Bicycle and Pedestrian Accommodations (UDOT 2007).

On the federal level, Title II of the Americans with Disabilities Act (ADA) requires UDOT to apply specific access design standards (e.g., sidewalk width, pedestrian ramp design) developed by the U.S. Access Board when constructing or altering pedestrian facilities.

### 3.5.2 Study Area

The study area for assessing bicycle and pedestrian impacts is the 5400 South corridor from Bangerter Highway to 4800 West, which includes a quarter mile area on both sides of the corridor limits.

### 3.5.3 Affected Environment

Local planning documents, including the City of Taylorsville General Plan, the Kearns Township General Plan, and the WFRC 2030 Regional Bicycle Plan within the 2030 RTP identify goals, policies, and routes for bicycle and pedestrian facilities in the study area.

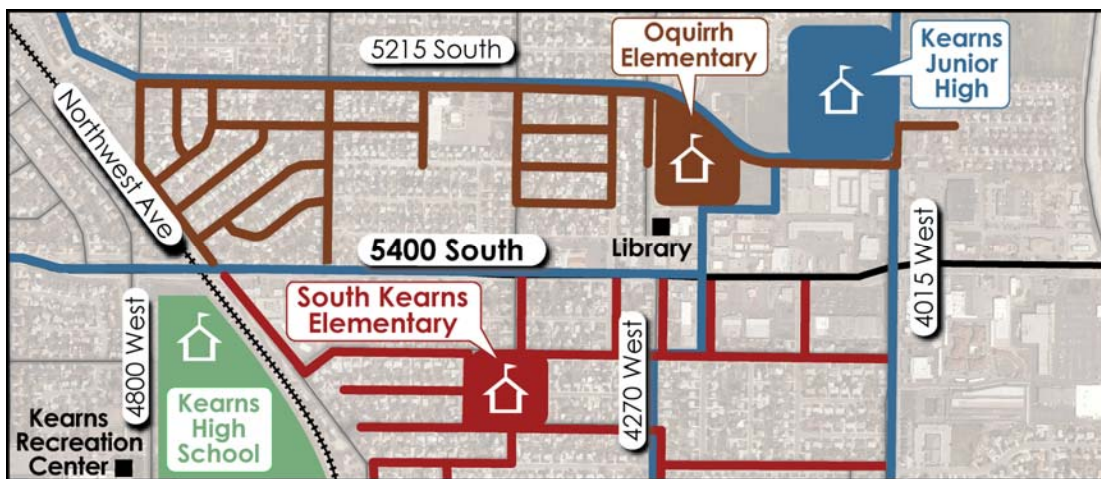
- The City of Taylorsville General Plan notes, “Transportation projects should include improvements such as street trees, public transit enhancements, enhanced pedestrian facilities, and other streetscape improvements that are necessary to improve community character” (Taylorsville 2006).
- The Kearns Township General Plan recommends completing a bicycle network plan to provide accommodations for bicyclists on streets in Kearns Township and includes implementing the proposed bicycle improvements provided in the WFRC 2030 Regional Bicycle Plan (Kearns 2009).

- WFRC 2030 Regional Bicycle Plan recognizes 5400 South as a proposed shared roadway bicycle facility (WFRC 2007). Shared roadway bicycle facilities are defined as unstriped, shared shoulders for bicycles.
- Salt Lake County also identifies 5400 South as a proposed shared roadway bicycle route on the 2011 Salt Lake County Bike Route Map (Salt Lake County 2011).

The existing condition of 5400 South does not provide adequate bicycle and pedestrian transportation facilities; there are no shoulders, and 3-foot wide sidewalks that abut the curb and gutter are used by both pedestrians and bicyclists. Since there is virtually no space for snow storage, snow is often pushed out of the roadway and onto the sidewalks, frequently making the sidewalks inaccessible during the winter months. During the public scoping period, members of the public indicated that these conditions create problems for students trying to get to/from school as well as for other pedestrians.

There are a number of community facilities, including schools, a library, and a recreation center that generate pedestrian traffic along the corridor (**Figure 3.5-1**). Utah law requires every elementary, middle, and junior high school to develop and implement a Student Neighborhood Access Program Plan (SNAP). This plan details the safest walking and bicycling routes within a one mile radius of the school and is distributed to local parents. **Figure 3.5-1** illustrates the SNAP routes for three schools in the study area, showing that while elementary students may not cross 5400 South, there are routes that cross and use 5400 South to get students to Kearns Junior High School.

Figure 3.5-1: SNAP Routes and Pedestrian Generators in the Study Area



Sources: SNAP 2011 and UDOT 2011

Multi-modal and transit facilities serve as both origins and destinations of pedestrian and bicycle trips. Transit in the study area consists of three bus routes. The 348 Fast Bus/Express Service Bus runs north-south and connects to downtown Salt Lake City. Routes 240 and 54 are community/city routes. The north-south Route 240 connects downtown Salt Lake City to Jordan Landing in West Jordan. Route 54 runs east-west along 5400 South and connects to the 5300 South TRAX Station. Route 54 is the only bus route that actually runs along 5400 South through the corridor. (UTA 2010)

## 3.5.4 Environmental Consequences

### 3.5.4.1 No Build Alternative

No impacts are anticipated on pedestrian and bicyclist facilities under the No Build Alternative. WFRC, the City of Taylorsville, and Kearns Township would continue to support planned pedestrian and bicycle facility improvements in accordance with their individual plans.

### 3.5.4.2 Build Alternative

Implementation of the Build Alternative would include construction of sidewalks that vary in width between 4 and 10 feet in adherence with ADA standards. These wider sidewalks would provide improved facilities for the disabled, transit users, pedestrians, and students who use 5400 South as a way to get to school. The larger sidewalks may also allow additional space for pedestrians to walk during winter months, when snow storage can become a problem.

Pedestrian crosswalks near Kearns Junior High School will be re-established, and a designated route would be identified to help students cross safely. The northern leg of the ThrU-Turn intersection on 4015 West would be located in front of Kearns Junior High School. Although the ThrU-Turn intersection would result in increased traffic volumes near the school, it is anticipated that the intersection would actually increase pedestrian safety at this location because crosswalks across 4015 West and Sam's Boulevard would be signalized. Students would have safe and reliable crosswalks with less potential for uncontrolled vehicle conflicts. In combination with crosswalk re-establishment, designated walking routes would be established in coordination with Kearns Junior High School. Additionally, a third leg of the ThrU-Turn intersection has been added on 5400 South to reduce traffic volumes using the northern leg of the ThrU-Turn near the school (see **Figure 2-3**). Overall, it is expected that ThrU-Turn will be a safer intersection for pedestrians.

The Build Alternative would include a 3-foot wide shoulder that would accommodate a shared roadway bicycle facility, which is an improvement over the existing conditions. In UDOT's Guidelines for Bicycle and Pedestrian Accommodations, there are several questions to assist the study team in determining the type of bicycle facility that should be included as part of the Build Alternative (UDOT 2007). The study team considered the following issues, referenced in part from the guidelines, in determining the appropriate treatment of bicycle facilities on 5400 South:

- **Continuity:** The Build Alternative is only one mile in length and will not provide continuity or linkages with existing or proposed bicycle or pedestrian facilities.
- **Multi-modal connectivity:** The Build Alternative does not provide connectivity to a major multi-modal facility (e.g., rail transit, bus depot, airport).
- **Project impacts:** The Build Alternative includes a cross section that is narrower than the UDOT standard seven-lane cross section.
- **Project cost:** Limited funding is available to complete proposed roadway improvements. If additional funding were available, use of the funds would be prioritized as follows: full reconstruction of the road, additional median width, additional travel lane width, and then additional shoulder width to accommodate bicyclists.

### 3.5.5 Avoidance, Minimization, and Mitigation Measures

No mitigation is required for pedestrian and bicyclist considerations.

## 3.6 WATER RESOURCES

This section evaluates potential impacts to water resources in the study area and considers drainage needs for the 5400 South corridor.

*The existing storm drain system does not provide enough capacity resulting in localized flooding. The project includes a new storm drain system and detention basin to accommodate the 6.5 cubic feet per second increase in storm water and to accommodate existing storm water needs.*

### 3.6.1 Regulations

There are several federal and state regulations protecting water resources that apply to the proposed widening project. Federal regulations include the Clean Water Act (CWA) 401 (Certifications) and CWA 402 (National Pollutant Discharge Eliminations System [NPDES]).

On the state level, the NPDES permit program is administered by the Utah Department of Environmental Quality (UDEQ). The Utah Pollutant Discharge Elimination System (UPDES) permit fulfills the CWA Section 402 requirements. Further State of Utah regulations include Utah Rule 317, which notes that there shall be no discharge of wastewater, wastes, or other substances without a permit from the Water Quality Board and a General Construction Storm Water Permit (Permit UTR 30000). The UDEQ requires a project applicant to obtain a UPDES storm water permit if project construction disturbs more than one acre of land.

### 3.6.2 Study Area

The study area for assessing water resource impacts is the 5400 South corridor from Bangert Highway to 4800 West and 4015 West from 5115 South to 5580 South, including surface and ground waters located within this area. Drainage facilities for 5400 South are located within this study area. The study area is contained within the Jordan River Watershed. Eventually, all water flow and runoff in the watershed empties into the Jordan River.

### 3.6.3 Affected Environment

No natural rivers, streams, creeks, or waterways cross the study area. Therefore, these resources are not discussed further.

Storm water generally drains from the south to the north in the study area and once it reaches 5400 South, storm water generally drains from west to east until it reaches 4015 West. The adjacent commercial businesses and residential subdivisions to the south and west of 5400 South contribute storm water to the study area. Storm water from adjacent properties to the north of 5400 South also sheet flows from the properties to the roadway since there are no facilities to detain/retain the water. Flooding occurs at several locations in the study area during severe storms. These locations include the intersections of Bangert Highway and 5400 South, 4015 West and 5400 South, and Northwest Avenue and 5400 South.

The existing storm drain infrastructure in the study area includes a Salt Lake County-owned storm drain line that runs along 5400 South from Northwest Avenue to 4420 West and another storm drain line at the

intersection of 4015 West and 5400 South that runs to the north along 4015 West. No Storm drain infrastructure exists along 5400 South between 4015 West and 4420 West. (UDOT Drainage 2011)

### 3.6.4 Environmental Consequences

#### 3.6.4.1 No Build Alternative

No impacts are anticipated for water resources under the No Build Alternative as the existing footprint would not change. However, localized street flooding may persist under the No Build Alternative. Roadway runoff would continue to empty into the existing storm drain system.

#### 3.6.4.2 Build Alternative

The Build Alternative would add approximately 4.2 acres of impervious surface. The additional impervious surface would increase stormwater runoff by approximately 6.5 cubic feet per second. The increased stormwater runoff from the study area could potentially result in erosion and sedimentation impacts on nearby bodies of water or developed areas. However, UDOT would follow best management practices (BMPs) outlined in their standard specification for erosion control, which would minimize this impact.

To accommodate the additional runoff, storm drain lines would be installed between 4015 West and 4420 West, where none currently exist. The existing storm drain line from Northwest Avenue to 4420 West would be replaced with a larger diameter pipe. One potential site for a detention basin has been identified in the study area near the intersection of Northwest Avenue and 5400 South. The detention basin will have regulated flow both in and out of the basin. The proposed drainage improvements would capture, store, and provide treatment of runoff prior to release into Salt Lake County's storm drain system. Treatment of runoff may include oil-water and debris separators, if needed. These facilities would improve drainage conditions in the study area and reduce flooding at the 4015 West and 5400 South intersection.

The proposed project involves disturbing greater than one acre of ground surface (4.2 acres). Therefore, a UPDES Permit from the State Division of Water Quality is required. The UPDES Permit is obtained by submitting a Notice of Intent (NOI) to the State Division of Water Quality prior to construction. Before obtaining this permit, a Storm Water Pollution Prevention Plan (SWPPP) must be prepared for the project.

### 3.6.5 Avoidance, Minimization, and Mitigation Measures

None Required

## 3.7 NATURAL RESOURCES

This section evaluates impacts to natural resources by the proposed widening project in the study area. Natural resources evaluated in this section include wildlife, migratory birds, sensitive species, Waters of the U.S., and wetlands.

*The proposed widening project is located in an urbanized corridor with little or no potential to affect natural resources. However, care will be taken during construction to avoid the distribution of noxious weeds.*

### 3.7.1 Regulations

There are a number of federal and state laws and regulations that apply to the protection of natural resources (e.g., Endangered Species Act, Clean Water Act). However, no natural resources have been identified that could be affected by the proposed widening project and these laws and regulations would not apply.

### 3.7.2 Study Area

The study area for assessing natural resource impacts is the 5400 South corridor from Bangert Highway to 4800 West, which includes a half-mile area on both sides of the corridor limits.

### 3.7.3 Affected Environment

The study area is a highly disturbed and urbanized area, consisting primarily of commercial and residential properties. A letter from the UDOT wildlife biologist, Mr. Paul West, dated February 8, 2011, indicated that “no federally listed threatened, endangered, or candidate species or any critical habitat would be affected,” and no further Section 7 consultation should be required. In addition, “this project would have no effect to any state-sensitive species, important wildlife habitat, big game migration routes, habitat connectivity, migratory birds, or to fish passage” (Appendix A). A site visit was conducted to confirm these findings.

A site visit also concluded that there were no Waters of the U.S., or wetlands present in the study area that could be potentially affected by the proposed widening project. The site visit was documented in a memorandum approved by UDOT’s landscape architect (Appendix A).

### 3.7.4 Environmental Consequences

#### 3.7.4.1 No Build Alternative

No impacts are anticipated for natural resources (i.e., sensitive species habitat, wetlands, or wildlife) under the No Build Alternative.

#### 3.7.4.2 Build Alternative

There are no natural resources (i.e., Waters of the U.S., wetlands, or sensitive species and/or habitat) within the proposed widening project’s area of influence. Therefore, there would be no impacts to natural resources as a result of the Build Alternative.

Construction activities associated with the Build Alternative could introduce invasive species including spreading noxious weeds into currently non-infested areas or into properties vacated for the purpose of the proposed widening project. However, UDOT would follow BMPs outlined in their special provision for invasive species, which would minimize this impact and reduce the potential spread of noxious weeds.

### 3.7.5 Avoidance, Minimization, and Mitigation Measures

No mitigation is required for natural resources.

## 3.8 AIR QUALITY

This section defines Salt Lake County air quality designations and includes regional and project level air quality analysis. Analysis of ozone and particulate matter impacts is provided.

### 3.8.1 Regulations

Air quality is assessed at the federal, regional, and project level. The study area is under the jurisdiction of the United States Environmental Protection Agency (EPA) and the Utah Division of Air Quality (UDAQ), a division of the UDEQ.

*The proposed widening project is located in an urbanized area where exceedances of air quality standards have occurred. Air quality impacts resulting from the Build Alternative have been evaluated, and the project would conform to all regional and state requirements. As such, there are no anticipated impacts associated with air quality.*

Under the Clean Air Act (CAA), as amended in the year 1990, the EPA established the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. These six criteria pollutants are: particulate matter, sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), lead (Pb), Nitrogen Dioxide (NO<sub>2</sub>), and ozone (O<sub>3</sub>) (EPA 2011a). Particulate matter includes two categories of particle pollution, fine particulate matter or particulates with a diameter of 2.5 micrometers or less (PM<sub>2.5</sub>) and inhalable coarse particle matter or particulate matter with a diameter of 10 micrometers or less (PM<sub>10</sub>). The State of Utah has accepted the NAAQS as the state standards.

The CAA requires that all regionally-significant and federally-funded transportation projects meet the transportation conformity regulations. The proposed widening project is considered a regionally-significant project, and CAA conformity is required. Projects in non-attainment or maintenance areas (defined below) must conform to a state implementation plan (SIP) and ensure that transportation activities will not cause or contribute to new violations, worsen existing violations, or delay attainment of air quality standards (EPA 2011b).

Roadway construction can also affect the air quality in a study area and is, therefore, subject to Utah Administrative Code Rules 307-210, 307-401, and 307-415, which are enforced by UDEQ. All construction sites larger than a quarter of an acre in size that emit fugitive dust are required to minimize and control dust on site. Since the proposed widening project is located along the Wasatch Front, a fugitive dust control plan would need to be submitted to UDEQ prior to any construction activities. UDOT would follow the guidance provided in their standard specification on dust control and watering.

### 3.8.2 Study Area

The study area for assessing regional, air quality impacts is Salt Lake County, and the study area for assessing project-level, air quality impacts is the 5400 South corridor from Bangerter Highway to 4800 West.

### 3.8.3 Affected Environment

Municipalities (cities or counties) can be classified as being in attainment, non-attainment, or maintenance areas for each of the six criteria pollutants defined above. An area is classified as non-attainment when one or more of the criteria pollutants exceed the NAAQS. Conversely, an area is classified as an attainment area when there are no criteria pollutants that exceed the NAAQS. Areas previously designated as non-attainment status but have consistently demonstrated meeting the NAAQS are reclassified as maintenance areas. In accordance with the CAA, designated maintenance areas are required to develop maintenance plans.

Attainment is classified by pollutant. Municipalities can be in attainment for one pollutant and be in non-attainment for another. Salt Lake County is designated under the referenced classifications as follows:

- **Maintenance Area:** Ozone.
- **Non-Attainment Area:** PM<sub>10</sub>, PM<sub>2.5</sub>, and SO<sub>2</sub>
- **Attainment Area:** CO, NO<sub>2</sub>, and Pb.

Ozone is a regional pollutant and, therefore, cannot be assessed at the project level. However, a regional analysis was conducted to demonstrate if the proposed widening project meets regional air quality conformity requirements.

The EPA's Motor Vehicle Emission Simulator (MOVES) model is able to predict quantitative project-level PM<sub>2.5</sub> and PM<sub>10</sub> concentrations. However, it was approved for use on February 8, 2011, with a grace period for studies like this one that began prior to that approval. Official use of the MOVES model will be required in 2012. Instead, qualitative PM<sub>2.5</sub> and PM<sub>10</sub> hot-spot analyses were conducted. The next section includes a review of regional PM<sub>2.5</sub> and PM<sub>10</sub> modeling.

Although Salt Lake County is designated as a non-attainment area for SO<sub>2</sub>, there is no guidance for assessing SO<sub>2</sub>. Therefore, an analysis of SO<sub>2</sub> was not conducted for this proposed widening project.

Projects located in CO non-attainment/maintenance areas are typically required to conduct a project-level, CO hot-spot analysis. However, since the proposed widening project is located outside of the CO maintenance area, a CO hot-spot analysis was not conducted.

Lastly, because Salt Lake County is in an attainment area for NO<sub>2</sub> and Pb, no further study is required.

## 3.8.4 Environmental Consequences

### 3.8.4.1 No Build Alternative

No additional impacts are anticipated for air quality under the No Build Alternative because the proposed widening project would not be built. However, other regionally-significant transportation projects identified in the 2030 RTP would be constructed.

The most recent transportation conformity analyses conducted for the Salt Lake County non-attainment and maintenance areas indicate that in the year 2030, all regionally-significant transportation projects would be within the CO and PM<sub>10</sub> emission budgets established in the SIP (WFRC 2007). However, the State Division of Air Quality is developing a new SIP, which will be available by December 12, 2012.

### 3.8.4.2 Build Alternative

#### *Ozone Analysis*

According to EPA, there have been exceedances of ozone concentrations within Salt Lake County. Ozone formation is driven by two major classes of directly emitted precursors: Nitrogen oxide (NO<sub>x</sub>) and volatile organic compounds (VOCs). NO<sub>x</sub> emissions are mainly from automobiles, power plants, and other combustion processes. VOCs are emitted from automobiles, gasoline stations, paint fumes, degreasers, cleaning fluids, and other sources. The SIP, which outlines Ozone Maintenance Provisions for Salt Lake County, states that the projected VOC and NO<sub>x</sub> emissions from proposed projects listed in the 2030 RTP, including this proposed widening project, are anticipated to remain below the year 2002 attainment emission inventory level through the year 2014 (WFRC 2007). The projected VOC and NO<sub>x</sub> emissions are anticipated to remain below the year 2002 attainment level due to implementation of control measures such as vehicle inspection and maintenance programs as well as rules for reasonable and achievable control technologies for industrial sources. Therefore, since emissions from the Build Alternative are included in the conforming SIP, this proposed widening project meets regional conformity requirements.

#### *PM<sub>10</sub> Analysis*

Particulate matter is a mixture of suspended microscopic solids and liquid droplets made up of various components, including acids, organic chemicals, metals, dust particles, and pollen or mold spores. The size of a particle is directly linked to its potential for causing health problems. Small particles, that is, those less than 10 micrometers in diameter (PM<sub>10</sub>), pose the greatest problems because of their ability to penetrate deeply into the lungs and bloodstream. Exposure to such particles can affect both the lungs and heart. Particles larger than 10 micrometers act as an irritant to the eyes and throat.

PM<sub>10</sub> concentrations in the environment come from direct sources such as dust stirred up by vehicle tires as well as secondary reactions of NO<sub>x</sub> and SO<sub>x</sub> that form PM<sub>10</sub> in the atmosphere.

According to the EPA, there have been exceedances of the PM<sub>10</sub> NAAQS at monitoring stations within Salt Lake County. Therefore, a PM hot-spot analysis is required. The requirement for a quantitative PM<sub>10</sub> hot-spot analysis does not take effect until the year 2012 so a qualitative analysis is presented. PM<sub>10</sub> concentrations are related to a combination of direct PM<sub>10</sub> sources, such as fugitive dust that is a result of increased vehicle miles of travel, and secondary reactions of NO<sub>x</sub> and SO<sub>x</sub> that form PM<sub>10</sub> in the

atmosphere. It is believed that traffic volumes and corresponding level of service have less impact on  $PM_{10}$  concentrations than the larger regional trends related to emission rates and industrial controls. Therefore, it can be expected that  $PM_{10}$  in Salt Lake County will remain a regional issue related to prolonged temperature inversions and a gradual build-up of  $PM_{10}$  related pollutants throughout Salt Lake Valley and will not be influenced by localized  $PM_{10}$  concentrations on individual roadways.

According to the 2030 RTP, a conformity analysis was completed for Salt Lake County (WFRC 2007). Projected emissions were calculated from proposed projects listed in the RTP, including this proposed widening project. Emissions of direct particulates are estimated to be 11.43 tons per day by the year 2030, which are below the year 2030 emissions budget of 32.30 tons per day for Salt Lake County. Therefore, since emissions from the proposed projects listed in the 2030 RTP, including this proposed widening project, meet the year 2030 emission budgets, this proposed widening project meets conformity requirements.

It should also be noted that high values of  $PM_{10}$  tend to occur during the wintertime inversions when cold air is trapped near ground level for several days and is prevented from dispersing. Summertime high winds can also lead to unusually high  $PM_{10}$  values. Therefore, trends are difficult to evaluate since weather has a significant role in the data collected at monitoring stations. Additionally, regional trends have shown a general decrease in  $PM_{10}$ . The SIP indicates that the effect of emission reductions appears to be reflected in ambient measurements at monitoring sites and is evidence that the State's implementation of the  $PM_{10}$  SIP control measures has resulted in emission reduction (Air Quality Board 2005).

### ***PM<sub>2.5</sub> Analysis***

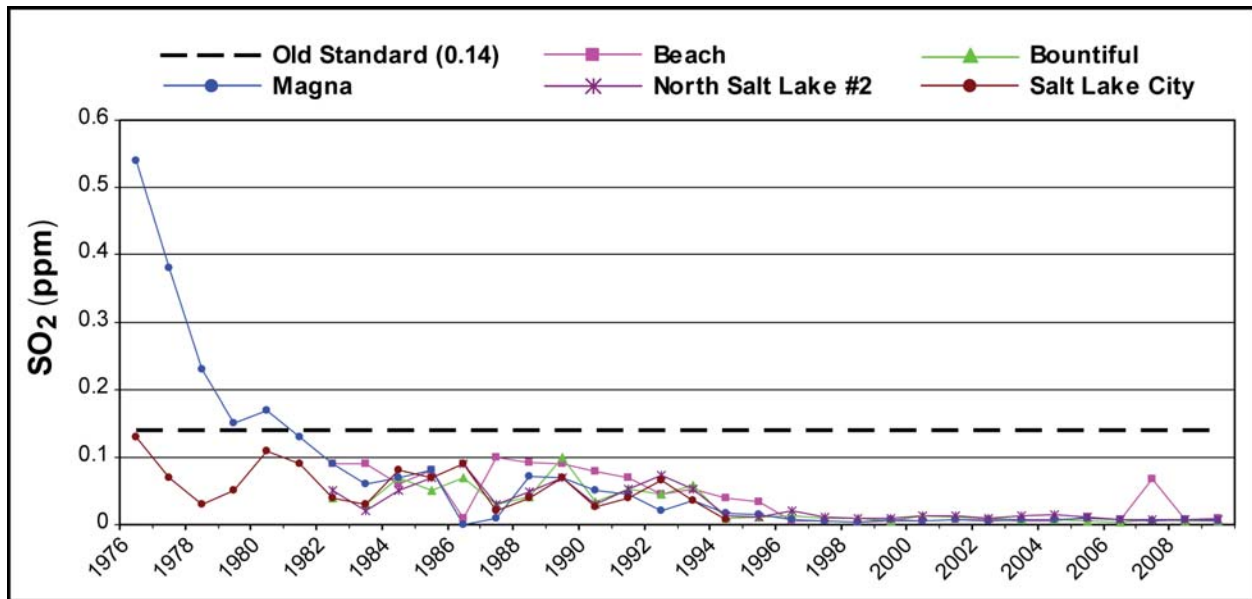
Fine particulate matter with a diameter less than 2.5 micrometers is called  $PM_{2.5}$ . Sources of fine particles include all types of combustion, including motor vehicles, particularly diesel exhaust, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes. Because these smaller particles penetrate deeper into the cardiovascular system, they have a strong association with circulatory (heart disease and strokes) disease and mortality.

The majority of the State of Utah's  $PM_{2.5}$  emissions are from secondary sources that include area, point, and mobile sources. According to the EPA, there have been exceedances of the  $PM_{2.5}$  NAAQS at monitoring stations within Salt Lake County. Attainment status is based on monitoring concentrations that are averaged over a consecutive three-year period (2006 to 2008), with Salt Lake County being designated as a non-attainment area on November 13, 2009. The closest monitoring station to the study area is located at 3275 West and 3100 South with a recorded  $PM_{2.5}$  concentration of 10.81  $\mu\text{g}/\text{m}^3$  and 11.09  $\mu\text{g}/\text{m}^3$  annually.

It should be noted that  $PM_{2.5}$  is a regional pollutant, and sources of  $PM_{2.5}$  and its precursors are numerous and generally located over a broad area, making it difficult to determine the exact sources of  $PM_{2.5}$  concentrations. To address this issue, regional and localized emissions will be assessed for the Salt Lake County  $PM_{2.5}$  SIP, which is currently being completed. Precursors of particulate matter include  $\text{SO}_2$  and  $\text{NO}_x$ . According to the  $PM_{10}$  SIP,  $\text{NO}_x$  emissions have been declining and will continue to decline as a result of  $\text{NO}_x$  control measures. The largest source of  $\text{SO}_2$  emissions in Salt Lake County includes the

Kennecott tailings pond, located approximately ten miles northwest of the study area. However, due to recent control strategies implemented at the Kennecott site and at other stationary source sites, SO<sub>2</sub> emissions have and will continue to decline within Salt Lake County (**Figure 3.8-1**). Therefore, since precursors of PM<sub>2.5</sub> are declining, it is anticipated that there would be a similar reduction in PM<sub>2.5</sub> emissions.

Figure 3.8-1: Sulfur Dioxide 2<sup>nd</sup> Highest 24-hour Values



Source: UDAQ 2011

Like PM<sub>10</sub>, high values of PM<sub>2.5</sub> tend also to occur during the wintertime inversions, which make it difficult to evaluate the trend of PM<sub>2.5</sub> emissions since weather has a significant role in the data collected at monitoring stations. However, regional trends have shown a slight reduction of PM<sub>2.5</sub>. This reduction will be further reduced due to the EPA's control measures. At the national level, EPA has established several control programs that will reduce emissions from most major sources of PM<sub>2.5</sub> and its precursor pollutants. The EPA's Tier 2 light-duty vehicle regulations and 2007 heavy-duty vehicle standards, along with control of the sulfur content of fuels, are expected to reduce motor vehicle emission rates by 59 percent between the year 2005 and 2015, with an additional 25 percent reduction between the years 2015 and 2030. The EPA's non-road engine regulations took effect in the year 2008 and are designed to reduce particulate matter and NO<sub>x</sub> emissions from these vehicles by 90 percent by the year 2030 (EPA 2004). EPA's MOBILE 6.2 emissions model predicts that, relative to the year 2005, diesel particulate emissions rates will decline by 80 percent by the year 2015 and 95 percent by the year 2030. That is, 100,000 vehicles in the year 2005 would have the same diesel particulate emissions as 500,000 vehicles in the year 2015 or 2,000,000 vehicles in the year 2030.

### 3.8.5 Avoidance, Minimization, and Mitigation Measures

No mitigation is required for air quality.

## 3.9 NOISE

For purposes of this study, noise is primarily caused by roadway traffic or construction. This section identifies noise-sensitive receivers and evaluates noise impacts from traffic as a result of the proposed widening project. A *Preliminary Noise Analysis* was prepared for this SES and is included in Appendix B.

*Existing noise levels along 5400 South are between 53 dBA and 75 dBA, and the future noise levels are generally anticipated to increase between 1 and 6 dBA, depending on location. A total of 46 noise-sensitive receivers would be impacted by the proposed project. Noise barriers were considered in four areas for impacted noise-sensitive receivers but were determined to not be feasible.*

### 3.9.1 Regulations

In determining noise impacts and potential mitigation measures, both federal and state regulations were followed. Federal regulations include the Federal Highway Administration (FHWA) *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (23 CFR Part 772) and *Highway Traffic Noise Analysis and Abatement, Policy and Guidance* (FHWA 1995). On the state level, noise regulations include UDOT's *Noise Abatement Policy* (UDOT 2010) and Utah Code 72-6-111 & 112.

Specific to noise evaluations, it is important to define commonly referenced abbreviations and terms used throughout the regulatory guidance and this section. The following terms are used to quantify impacts and define sound levels.

- **Decibel:** A decibel is a unit of measure for sound. Decibels are presented with the units dB(A) or dBA.
- **dBA:** dBA represents the noise levels in decibels measured with an A-weighted frequency. The A-weighting corresponds to the A-scale on a standard sound level instrument that closely approximates frequencies that the human ear can detect. The A-weighted sound level is the most widely used measurement of environmental noise.
- **Leq(h):** Leq(h) is defined as the equivalent sound level for a one-hour time period.
- **Noise-sensitive receivers:** These receivers are located where frequent outdoor human use would occur that may be affected by existing and/or future transportation conditions.

#### 3.9.1.1 Noise Abatement Criteria

Within the *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, FHWA has established Noise Abatement Criteria (NAC) that define noise levels for typical land uses (i.e., land activity categories) (23 CFR 772). UDOT's NAC is consistent with FHWA's NAC (**Table 3.9-1**). UDOT considers noise abatement (i.e., mitigation measures) for a proposed project if the NAC for an activity is met or exceeded. UDOT also considers noise abatement when future, worst-case noise levels substantially exceed existing noise levels. UDOT defines a substantial increase as a 10-dBA or more increase above existing noise levels.

Table 3.9-1: UDOT Noise Abatement Criteria

Activity Category	$L_{eq}(h)^*$ , dBA	Description of Activity Category
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)	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, hospitals, and cemeteries.
C	71 (exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	—	Undeveloped lands.
E	51 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

\* Hourly A-weighted sound level in decibels, reflecting a 1-dBA approach value below 23 CFR 772 values.

Source: UDOT 2010

### 3.9.1.2 Traffic Data

The UDOT noise policy states that Level of Service (LOS) C traffic volumes must be used to model future, worst-case noise levels unless there is compelling reason not to use this LOS. LOS C traffic conditions are characterized by high-traffic volumes and high speeds, which cause the greatest amount of traffic noise.

### 3.9.1.3 Traffic Noise Model

Federal and State of Utah regulations require the use of FHWA’s Traffic Noise Model (TNM) to establish existing and future noise levels. FHWA’s TNM Version 2.5 was used to estimate the traffic noise levels at identified noise-sensitive receivers for existing (year 2010) and build (year 2040) conditions.

## 3.9.2 Study Area

The study area for assessing noise impacts is the 5400 South corridor from Bangerter Highway to 4800 West and 4015 West from 5115 South to 5580 South, and this study area includes all noise-sensitive receivers that may be impacted as a result of the proposed widening project. Noise-sensitive receivers within the study area include residential properties and three churches.

## 3.9.3 Affected Environment

### 3.9.3.1 Existing Noise Levels

Existing noise levels were collected on January 26 and January 27, 2011, at four noise-sensitive receiver locations. The locations represent ambient conditions within the study area. Traffic counts and operating speed data were input into the TNM 2.5 for validation. The difference between the field measurements and the model-predicted noise levels was 3-dBA or less, which is considered validated. Three dBA is relevant because the human ear can begin to detect a change in noise level greater than 3-dBA. The noise levels at the measured noise-sensitive receiver locations are summarized in the **Table 3.9-2**.

Table 3.9-2: Field Recorded and Predicted Noise Measurements at Noise-sensitive Receivers

Receiver #	Location	Field Measured Leq (dBA)	TNM Predicted Leq (dBA)	Difference (+/-)
M1	Resident: 5400 South (between 4460 West and 4620 West)	76	74	-2
M2	Resident: 5400 South (east of 4320 West)	74	72	-2
M3	Resident: 5460 South (second row, west of 4420 West)	54	55	+1
M4	Resident: 5460 South (second row, west of 4320 West)	53	55	+2

**Figure 3.9-1** shows the locations of the receivers (M1 through M4) where sound level measurements were taken and locations of receivers (R1 through R150) where sound levels were modeled using TNM. **Table 3.9-3** summarizes noise levels at modeled noise-sensitive receivers for the existing (year 2010) and build (year 2040) conditions. Because some receivers (R) are close in proximity and experience similar predicted future noise levels, certain receivers were combined, which is noted under the “Numbers of Receivers by Activity” column.

Figure 3.9-1: Noise-sensitive Receivers and Impacted Receivers

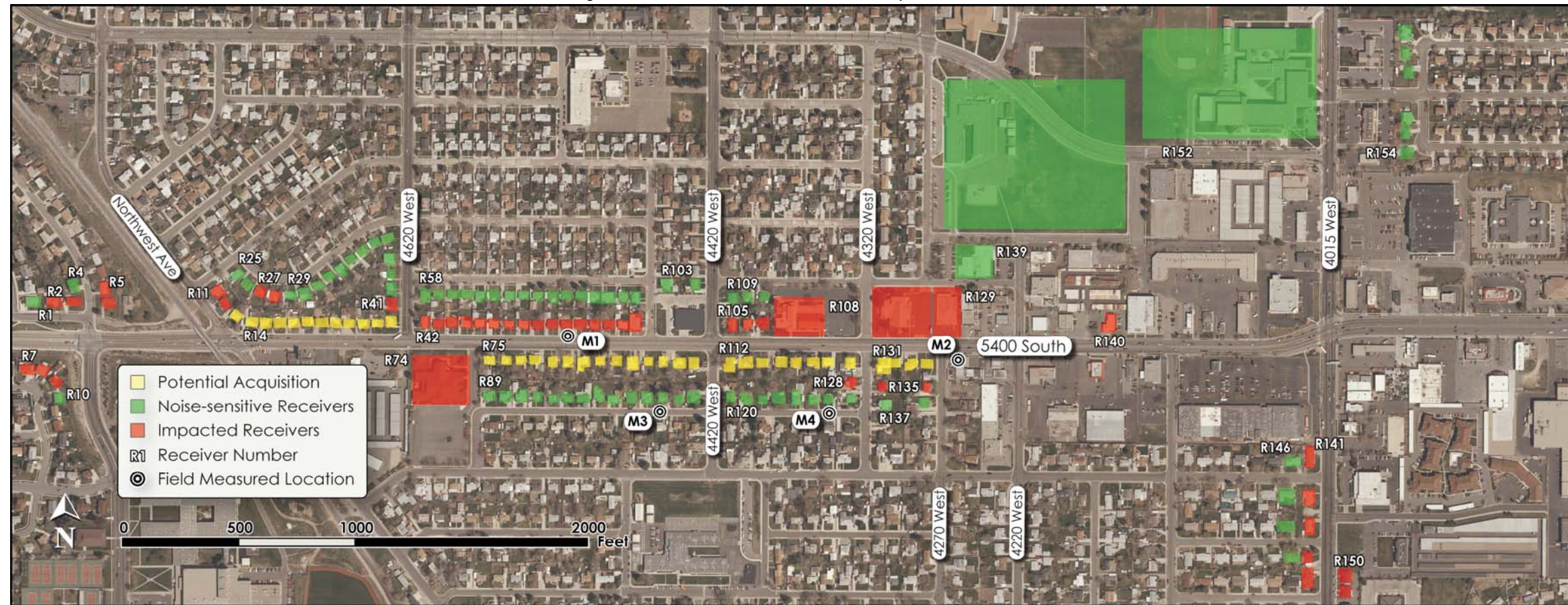


Table 3.9-3: Noise Levels at the Modeled Noise-sensitive Receivers

Receiver No.	Number of Receivers by Activity	UDOT NAC (dBA)	Existing 2011 (dBA)	Build Alternative 2040 (dBA)	Difference (+/-) (Existing vs. Build)	Build Noise Impact?
<b>West of Northwest Avenue</b>						
R1	1	66	64	65	+1	No
R2	2	66	65	67	+2	Yes
R4	1	66	63	65	+2	No
R5	2	66	65	67	+2	Yes
R7	3	66	65	66	+1	Yes
R10	1	66	64	65	+1	No
<b>4620 West and Northwest Avenue</b>						
R11	2	66	66	68	+2	Yes
R14	12	66	71	N/A	N/A	N/A
R25	2	66	60	63	+3	No
R27	2	66	61	66	+5	Yes
R29	12	66	60	65	+5	No
R41	1	66	62	66	+4	Yes

Receiver No.	Number of Receivers by Activity	UDOT NAC (dBA)	Existing 2011 (dBA)	Build Alternative 2040 (dBA)	Difference (+/-) (Existing vs. Build)	Build Noise Impact?
<b>4420 West to 4620 West</b>						
R42	16	66	69	71	+2	Yes
R58	16	66	60	63	+3	No
R74	1	66	66	69	+3	Yes
R75	14	66	69	N/A	N/A	N/A
R89	14	66	58	64	+6	No
R103	2	66	59	61	+2	No
<b>4320 West to 4420 West</b>						
R105	3	66	69	71	+2	Yes
R108	1	66	68	70	+2	Yes
R109	3	66	61	63	+2	No
R112	8	66	69	N/A	N/A	N/A
R120	8	66	61	65	+4	No
R128	1	66	62	68	+6	Yes

Receiver No.	Number of Receivers by Activity	UDOT NAC (dBA)	Existing 2011 (dBA)	Build Alternative 2040 (dBA)	Difference (+/-) (Existing vs. Build)	Build Noise Impact?
<b>4015 West to 4320 West</b>						
R129	2	66	67	70	+3	Yes
R131	4	66	70	N/A	N/A	N/A
R135	2	66	61	67	+6	Yes
R137	2	66	59	64	+5	No
R139	1	66	59	62	+3	No
R140	1	66	69	70	+1	Yes
R141	5	66	65	68	+3	Yes
R146	4	66	61	64	+3	No
R150	2	66	65	69	+4	Yes
R152	2	66	50	54	+4	No
R154	6	66	53	57	+4	No

N/A = Potential acquisition

## 3.9.4 Environmental Consequences

### 3.9.4.1 No Build Alternative

No impacts are anticipated related to noise under the No Build Alternative.

### 3.9.4.2 Build Alternative

The UDOT noise policy states that an impacted receiver is one that is or will be subjected to highway traffic noise that meets or exceeds the UDOT NAC or exceeds existing noise levels by 10-dBA or more. Under the Build Alternative, traffic volumes and noise along 5400 South are anticipated to increase (**Figure 3.9-1** and **Table 3.9-3**). Existing noise levels along 5400 South are already high, and the future noise levels are generally anticipated to increase between 1 and 6 dBA, depending on location. There are 46 noise-sensitive receivers that would experience noise levels that meet or exceed the UDOT NAC as a result of the proposed improvements (receivers marked in red on **Figure 3.9-1**). Therefore, noise abatement was considered for these impacted receivers (discussed below). Potentially, there are 38 noise-sensitive receivers that would be acquired as a result of the Build Alternative (receivers marked in yellow on **Figure 3.9-1**). Noise levels were not predicted for these noise-sensitive receivers.

Temporary increases in noise may occur as a result of construction activities for the Build Alternative. Noise levels during construction would depend on the specific construction activity conducted. Construction noise would generally occur during daytime hours when noise levels are typically higher due to everyday activities. UDOT would follow their standard specification for environmental protection related to minimizing construction noise.

### 3.9.4.3 Mitigation Analysis

The UDOT noise policy states that noise abatement can only be provided if determined to be both feasible and reasonable. Feasibility of abatement is based on constructability and engineering considerations. For example, a noise barrier with gaps allowed for driveways would be ineffective and result in inadequate sight distance and visibility constraints and would, therefore, not be feasible. Furthermore, if a noise barrier cannot provide a minimum of 5-dBA noise reduction for at least 75 percent of front-row (adjacent) receivers, it is not considered feasible. Reasonable mitigation implies common sense and good judgment. For example, construction of the noise abatement measure must be cost-effective per receiver benefited. A benefited receiver is defined by UDOT as a receiver predicted to receive a minimum noise reduction of 5-dBA as a result of noise abatement.

Of the 46 impacted noise-sensitive receivers, 29 receivers were dismissed from further noise abatement consideration because abatement was not deemed feasible. R2, R5, R42, R105, R140, and R141 would require gaps in any proposed noise barriers to allow for driveway access to the properties, rendering the barriers ineffective for noise abatement. Further, placing walls close to access points would result in inadequate sight distance, which would be a safety concern.

The properties associated with R7 are higher in elevation than the roadway, and any barrier proposed would have to be placed near the back of sidewalk. Therefore, a very tall noise barrier would be needed to provide adequate noise reduction, which would not be cost effective and reasonable. R74, R108, and R129 (the three churches in the study area) are facilities that do not provide frequent outdoor use. As such, only the interior noise levels were considered (Category E on Table 3.9-1). Following FHWA guidelines established in the Highway Traffic and Noise Analysis and Abatement Policy, the exterior noise levels were decreased by 25 dBA, resulting in predicted interior noise levels of 44 dBA for R74 and 45 dBA for R108 and R129. Since the threshold for considering noise abatement is 51 dBA, mitigation was not considered.

For the remaining receivers, eight-foot high noise barriers were considered in four areas for the outstanding ten impacted noise-sensitive receivers. Three of these areas—R11, R128, and R135—are on 5400 South, and the fourth area—R150—is south of 5400 South on 4015 West. For each area on 5400 South, the barrier was modeled in two different locations: five feet behind the new sidewalk and at the back edge of acquired properties (placing the barriers at the back edge of the acquired properties typically provides a greater noise reduction because the barrier would be closer to the impacted noise-sensitive receiver). For the area on 4015 West, only one modeling location was feasible: along the edge of the UDOT right-of-way. The results of the barrier analysis for the four areas modeled are described below.

- **R11, R27, and R41 (representing five receivers):** The noise barrier modeled five feet behind the new sidewalk provided less than a 1-dBA noise reduction for the two receivers grouped in R11, a 4-dBA noise reduction for the two receivers grouped in R27, and a 2-dBA noise reduction for R41. Therefore, the barrier was not deemed feasible at this location because it would not meet the 5-dBA noise reduction requirement. Although the barrier modeled at the back edge of acquired property would provide at least a 6-dBA noise reduction for the two receivers grouped in R27 and for R41, it would provide less than 1-dBA noise reduction for the two receivers grouped in R11. Therefore, the barrier would not meet the criterion of providing a minimum of 5-dBA noise reduction for at least 75 percent of front-row (adjacent) receivers at this location.
- **R128:** The noise barrier modeled five feet behind the new sidewalk and at the back edge of acquired property only resulted in a 2-dBA noise reduction. Therefore, the barrier was not deemed feasible at either location because it would not meet the 5-dBA noise reduction requirement.
- **R135 (representing two receivers):** The noise barrier modeled five feet behind the new sidewalk provided a 3-dBA noise reduction, and the noise barrier modeled at the back edge of acquired property would provide a 3-dBA noise reduction. Therefore, the barrier was not deemed feasible at either location because it would not meet the 5-dBA noise reduction requirement.
- **R150 (representing two receivers):** The noise barrier modeled at the edge of the UDOT right-of-way only resulted in a 2-dBA noise reduction for R150 and a 5-dBA noise reduction for R151. Therefore, the barrier would not meet the criterion of providing a minimum of 5-dBA noise reduction for at least 75 percent of front-row (adjacent) receivers at this location.

### 3.9.5 Avoidance, Minimization, and Mitigation Measures

Noise abatement was not feasible or reasonable in accordance with the UDOT noise policy (UDOT 2010). Therefore, no mitigation is required for noise.

## 3.10 HAZARDOUS MATERIALS

Hazardous materials, which can be encountered during the construction of roadway projects, include asbestos, lead-based paint, and total petroleum hydrocarbons. This section evaluates hazardous material impacts resulting from the proposed widening project in the study area.

*The Build Alternative could disturb 7 sites with potential hazardous material contamination. Additionally, 45 buildings potentially containing asbestos or lead based paint would be demolished. UDOT would follow their standard specification for environmental protection that outlines proper removal and disposal of hazardous materials, asbestos, and lead-based paint during construction, if discovered.*

### 3.10.1 Regulations

Hazardous waste sites are regulated on both federal and state levels. Federal mandates concerning hazardous materials fall under the Resource Conservation and Recovery Act (RCRA) of 1976 and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. RCRA mandates strict federal requirements for treatment, storage, and disposal of hazardous waste to minimize present and future risks. CERCLA provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA also establishes hazardous waste cleanup liability requirements. According to CERCLA, owners of property or those who acquire property may be held accountable for contamination found on their property.

### 3.10.2 Study Area

The study area for assessing hazardous material impacts is the 5400 South corridor from Bangerter Highway to 4800 West, including a half-mile area around the corridor.

### 3.10.3 Affected Environment

Land uses along the study area from Bangerter Highway to approximately 4270 West are comprised of commercial uses, including several gas stations, auto care centers, and dry cleaners. These are locations that may contain hazardous materials. Database searches of the EPA's EnviroMapper and Envirofacts Warehouse and Utah Division of Environmental Response and Remediation's (DERR) Interactive Map were completed on February 17, 2011. The database search identified 23 hazardous material sites within the study area. These sites include:

- Eleven underground storage tank (UST) sites,
- Seven leaking underground storage tank (LUST) sites,
- Four Tier 2 facilities (defined below), and
- One CERCLA site, the 5400 South 3600 West plume located east of the study area near 3600 West.

The Emergency Planning and Community Right-to-Know Act (EPCRA) requires industrial facilities to provide information annually to emergency planning committees and the local fire department. This information is known as the Tier 2 Chemical Inventory Report. Tier 2 data are used by local emergency response agencies (i.e., local fire departments) to determine what materials may be involved in the event of an emergency and how the response agency must mobilize to a facility experiencing an emergency.

In addition to the hazardous materials sites identified in the databases, most of the buildings adjacent to the study area were built in the 1950s. Buildings constructed in this era were often made with materials containing asbestos, such as vinyl floor tile, linoleum, ceiling tile, pipe boiler insulation, roofing material, and other materials in common use prior to 1978. Certain asbestos-containing materials (ACMs), such as roofing and roofing adhesives, were still commonly used after the year 1978. In addition to ACMs, many buildings constructed prior to the year 1978 were painted with lead-based paint. Based on the construction date of buildings along the corridor, the presence of lead-based paint and asbestos should be considered.

### 3.10.4 Environmental Consequences

#### 3.10.4.1 No Build Alternative

No impacts are anticipated for hazardous materials under the No Build Alternative as there would be no disturbances to the hazardous material sites.

#### 3.10.4.2 Build Alternative

The proposed widening project is located in an urbanized corridor, and, as such, there is potential to encounter hazardous materials during construction. **Table 3.10-1** lists the 23 hazardous material sites of potential concern associated with the Build Alternative. **Figure 3.10-1** approximates the location of each site and identifies which sites have a high, moderate, or low potential for concern for potential hazardous material contamination.

Four sites are of high concern for potential hazardous material contamination. The extent of the potential contamination on the site is unknown. The Build Alternative would require the full acquisition of these sites and would require excavation, earthwork, and/or demolition. However, sites that have had tanks removed (Map ID #10 and # 16) would have had soil remediation at the time of removal, minimizing the risk of finding soil contamination.

Three sites are of moderate concern for potential hazardous material contamination. The extent of the potential contamination on the site is unknown. The Build Alternative would require the partial acquisition of one of the sites (Map ID #19). However, the UST has been removed from the site and no impact is expected. The other sites (Map ID #17 and #18, located on the same property) had a recent release of a hazardous substance and are of moderate concern due to potential migration of hazardous materials. However, no property acquisition would be required, and no impact is expected.

Forty-five buildings constructed prior to the year 1978 are anticipated to be acquired and demolished for the Build Alternative (refer to Section 3.3 for further discussion of acquisitions). UDOT would follow their standard specification for environmental protection that outlines proper removal and disposal of hazardous materials, asbestos, and lead-based paint during construction, if discovered.

### 3.10.5 Avoidance, Minimization, and Mitigation Measures

No mitigation is required for hazardous materials.



## 3.11 CULTURAL RESOURCES

Cultural resources include archaeological sites and historic architectural resources that are more than 50 years of age. Surveys were completed to document cultural resources in the study area (Rayle 2011, Steele 2011, Mullins 2011, and Giraud 2011).

### 3.11.1 Regulatory Setting

The Utah State Antiquities Act of 1992 requires that, prior to spending state funds, state agencies take into account the effect of any undertaking on districts, sites, buildings, structures, or specimens that are included in or are eligible for the National Register of Historic Places (NRHP) or the Utah State Register of Historic Sites.

The Utah Paleontological Resources Rule (UCA 79-3-508 [formerly 63-73-19]) requires any agency to take into account the effects of an undertaking or expenditure on a specimen that is included in or is eligible for inclusion in the State Paleontological Register.

### 3.11.2 Study Area

The study area for assessing cultural resource impacts is the 5400 South corridor from Bangerter Highway to 4800 West, including one property to the north and south of the road. In addition, properties adjacent to 4015 West from 5115 South to 5580 South are included in the study area.

### 3.11.3 Survey Methodology

The purpose of the cultural resource assessment is to identify properties eligible for the NRHP and assess the effects on those properties resulting from the proposed widening project. Archaeological investigations for the proposed widening project included a file search to identify previously documented cultural resources in the study area along with intensive pedestrian and reconnaissance inventories of the study area.

The survey was conducted by a qualified archaeologist and architectural historian as a selective survey, and all buildings over 45 years of age within the study area were evaluated for eligibility for listing in the NRHP. The methodology for the survey was based on the Reconnaissance Level Surveys, Standard Operating Procedures (revised January 2009) from the Certified Local Government Manual produced by State Historic Preservation Society (SHPO).

Cultural resource sites were evaluated for the NRHP under four specific criteria and with seven elements of integrity, all in accordance with the Utah State Antiquities Act (UCA 9-8-404). A cultural resource may be considered eligible for listing in the NRHP if it is associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is associated with the lives of persons significant in the past (Criterion B); embodies the distinctive characteristics of a type, period, or

*In surveying and assessing National Register of Historic Places (NRHP) eligible properties within the study area, 48 historic buildings and 1 historic linear resource were identified. The Build Alternative would have an Adverse Effect on 28 historic buildings. Mitigation would reduce the impact of the loss of these resources.*

method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction (Criterion C); or has yielded, or may be likely to yield, information important to prehistory or history (Criterion D).

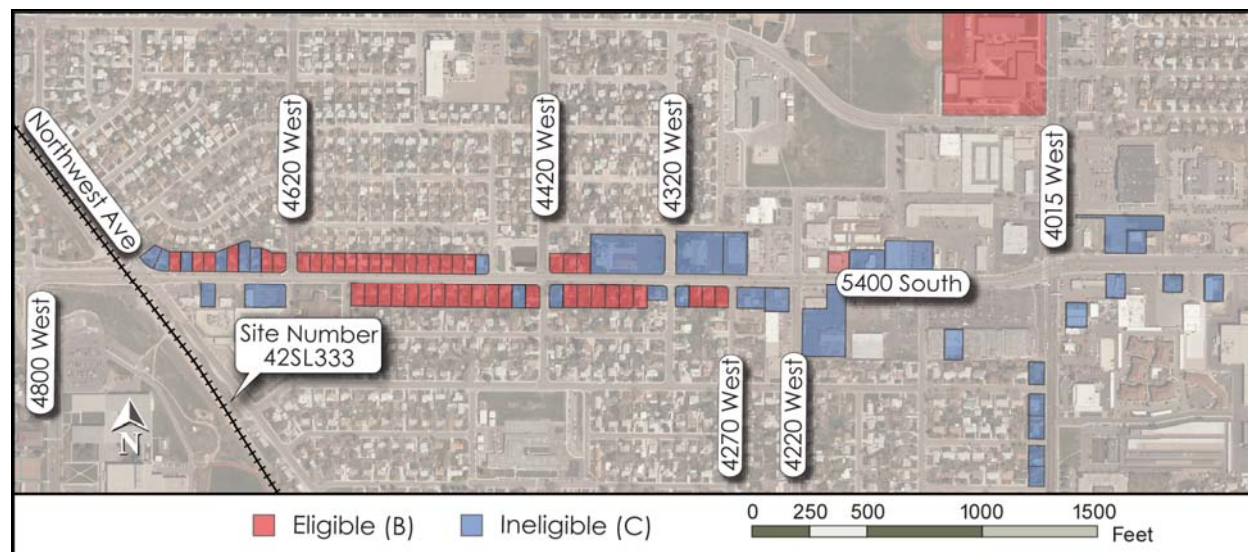
Buildings considered to meet one of the four significance criteria must also be evaluated for integrity of location, design, setting, materials, workmanship, feeling, and association. To be eligible for listing in the NRHP, a property must possess integrity of these elements as each relates to the criterion or criteria under which it would be determined eligible. Additionally, within Utah, all architectural resources documented at a reconnaissance level are evaluated using a rating system established by the SHPO. This rating system allows for the assignment of one of four ratings to buildings based upon the degree to which they retain historical and architectural integrity. Buildings that are rated A or B are considered eligible for the NRHP. Buildings that are rated C or D are not considered eligible for the NRHP (SHPO 2009).

### 3.11.4 Affected Environment

#### 3.11.4.1 Historic Linear Resources

The cultural resources surveys resulted in the identification and recording of one new segment of the Denver & Rio Grande Western Railroad (D&RGW), the Garfield Branch (Site 42SL333) (**Figure 3.11-1**). The new segment is located directly west of Northwest Avenue, and it crosses over 5400 South via a modern railroad trestle bridge. The railroad has been previously recorded at several locations outside of the study area. Because the D&RGW Garfield Branch is associated with the development of mines and communities in the western Salt Lake Valley, both of which are significant historic events, the site has been previously determined eligible for the NRHP under Criterion A (association with a significant historic event) (Baxter 2001). The site within the study area was determined eligible for the NRHP under Criterion A.

Figure 3.11-1: Surveyed Properties in the Study Area



Sources: Rayle 2011, Steele 2011, Mullins 2011, and Giraud 2011

### 3.11.4.2 Historic Architecture

The selective reconnaissance-level architectural survey of the study area resulted in the identification of 80 historic buildings, none of which were previously recorded or evaluated (**Figure 3.11-1**). The documented buildings include 62 single-family dwellings, 15 commercial buildings, one school, and two churches. All of the buildings are located within the core of Kearns Township, which was established as a planned community by developers Arthur and S. D. Caplan in 1949.

Of the 80 properties documented within the study area, 52 of the properties have been modified to some extent and warrant a B-rating under the SHPO rating system. Of these 52 NRHP-eligible properties, one is commercial, one is a school, and the remaining 50 are single-family residences, many of which were among the first houses constructed in Kearns Township between 1949 and 1951. The remaining 28 properties (12 single-family residences, two churches, and 14 commercial properties) have been substantially modified since their original construction to render them ineligible for the NHRP. As such, these properties warrant a C-rating under the SHPO rating system.

### 3.11.5 Environmental Consequences

#### 3.11.5.1 No Build Alternative

No impacts are anticipated for cultural resources (i.e., historic linear resources, historic architecture, or paleontological resources) under the No Build Alternative as no construction would occur.

#### 3.11.5.2 Build Alternative

##### *Historic Linear Resources*

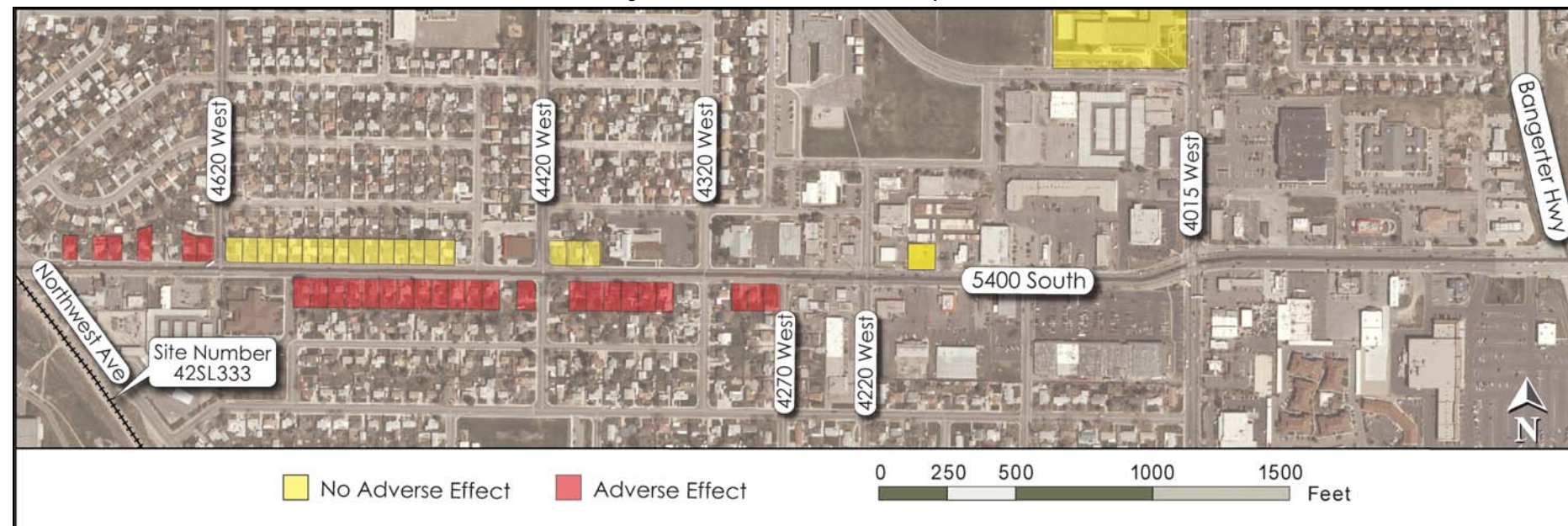
The Build Alternative would not impact the newly recorded portion of the D&RGW (Site 42SL333). Proposed widening activities would be contained within the area underneath the modern railroad bridge, and this area is wide enough to allow widening without impacting the site.

Construction activities could result in the discovery of previously unidentified historical, archaeological, or paleontological objects, features, sites, or human remains. However, UDOT would follow their standard specification for environmental protection that would minimize impacts to these resources.

##### *Historic Architecture*

The eligibility and effect determinations for historic properties that would be affected by the Build Alternative are listed in **Table 3.11-1**. The locations of affected resources are shown on **Figure 3.11-2**. Of the 48 NRHP eligible buildings in the study area, the Build Alternative would have an Adverse Effect on 28 buildings that would have to be demolished. Easements could be required for 19 historic properties to accommodate proposed widening project activities (e.g., movement of construction equipment, relocation of utilities, staging, and/or storage). A small portion of the Kearns Junior High School property would also be acquired. The easements and partial acquisition would not directly or indirectly alter any of the characteristics that contribute to the significance of the properties. Therefore, the Build Alternative would have No Adverse Effect on 20 eligible historic properties.

Figure 3.11-2: Effects on Historic Properties



Sources: Rayle 2011, Steele 2011, Mullins 2011, and Giraud 2011

Table 3.11-1: Summary of Eligibility and Effects Determinations for Historic Properties

Address	Historical Eligibility	Type/ Width of Acquisition	NRHP Finding of Effect
5305 S 4040 W	B Rating/Eligible	Partial Acquisition	No Adverse Effect
4188 W 5415 S	B Rating/Eligible	Easement	No Adverse Effect
4380 W 5415 S	B Rating/ Eligible	Easement	No Adverse Effect
4390 W 5415 S	B Rating/ Eligible	Easement	No Adverse Effect
4420 W 5401 S	B Rating/ Eligible	Easement	No Adverse Effect
4476 W 5415 S	B Rating/ Eligible	Easement	No Adverse Effect
4486 W 5415 S	B Rating/ Eligible	Easement	No Adverse Effect
4496 W 5415 S	B Rating/ Eligible	Easement	No Adverse Effect
4504 W 5415 S	B Rating/ Eligible	Easement	No Adverse Effect
4514 W 5415 S	B Rating/ Eligible	Easement	No Adverse Effect
4526 W 5415 S	B Rating/ Eligible	Easement	No Adverse Effect
4534 W 5415 S	B Rating /Eligible	Easement	No Adverse Effect
4542 W 5415 S	B Rating /Eligible	Easement	No Adverse Effect
4552 W 5415 S	B Rating /Eligible	Easement	No Adverse Effect
4566 W 5415 S	B Rating /Eligible	Easement	No Adverse Effect
4576 W 5415 S	B Rating /Eligible	Easement	No Adverse Effect
4586 W 5415 S	B Rating /Eligible	Easement	No Adverse Effect

Address	Historical Eligibility	Type/ Width of Acquisition	NRHP Finding of Effect
4594 W 5415 S	B Rating /Eligible	Temporary Easement	No Adverse Effect
4604 W 5415 S	B Rating /Eligible	Easement	No Adverse Effect
4620 W 5405 S	B Rating /Eligible	Easement	No Adverse Effect
4620 W 5404 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4648 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4674 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4690 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4698 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4714 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4561 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4551 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4541 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4531 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4521 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4511 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4501 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4491 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect

Address	Historical Eligibility	Type/ Width of Acquisition	NRHP Finding of Effect
4481 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4471 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4461 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4451 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4420 W 5430 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4391 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4381 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4371 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4361 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4351 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4341 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4299 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4289 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect
4279 W 5415 S	B Rating /Eligible	Full Acquisition	Adverse Effect

Sources: Rayle 2011, Steele 2011, Mullins 2011, and Giraud 2011

## 3.11.6 Consultation

### 3.11.6.1 Paleontological Consultation

Consultation regarding the presence of and potential for encountering paleontological resources within the study area was undertaken via written correspondence with the Utah Geological Survey (UGS) (Appendix A). In a written letter, UGS indicated that there are no known paleontological localities recorded within the study area and that recent alluvial deposits that are exposed within the study area have a low potential for yielding significant fossil localities. UGS stated that unless paleontological resources are discovered during construction activities, the proposed widening project should have no effect on paleontological resources.

### 3.11.6.2 SHPO Consultation

In accordance with the Utah State Antiquities Act (UCA 9-8-404), the archaeological and architectural surveys will be submitted for SHPO consultation and concurrence. A Determination of Eligibility and Finding of Effect (DOE/FOE) was submitted to SHPO, and concurrence was received on June 1, 2011. A copy of the DOE/FOE is included in Appendix A.

### 3.11.6.3 Native American Consultation

Letters were sent to seven Native American tribes/bands (Appendix A). The letters provided information on the proposed widening project and requested tribal representatives to notify UDOT if there are any historic properties of traditional religious and/or cultural importance that may be affected by the proposed widening project. To date, no comments have been received.

### 3.11.6.4 Certified Local Government Consultation

The City of Taylorsville Certified Local Government (CLG) and Salt Lake County CLG were notified that the proposed widening project would have adverse effects in a letter dated March 17, 2011, and were invited to be a consulting party. To date, responses have been received from the City of Taylorsville CLG, Salt Lake County, and the Kearns Historical Society, providing historical information about the study area and indicating that they would like more information about the proposed widening project (Appendix A).

## 3.11.7 Avoidance, Minimization, and Mitigation Measures

A Memorandum of Agreement (MOA) has been prepared in consultation with City of Taylorsville CLG, Salt Lake County CLG, and SHPO to account for the effect of the Build Alternative on historic properties (Appendix A). The stipulations of the MOA are that UDOT will:

- Document the 28 historic properties that would be adversely affected by the Build Alternative according to Utah State Intensive Level Survey Standards.
- Provide funding for a Kearns Township historic preservation project.
- Report back to SHPO on activities carried out for the agreement.

- Ensure work is completed by persons meeting the Secretary of Interior’s Historic Preservation Qualification Standards
- Complete work within 5 years.
- Follow standard specifications in the event of inadvertent discoveries of historic properties, archaeological sites, and paleontological resources.

## 3.12 VISUAL QUALITY

The aesthetic quality of a community is dependent in part upon its visual resources, the physical features that make up the visible landscape, which includes natural aspects like mountains, land, and vegetation as well as human-made features such as buildings, roadways, signs, and bridges.

This section describes both the existing conditions related to the visual quality of the study area and the visual changes that would result from the proposed widening project.

*The Build Alternative would result in visual changes (e.g., a wider roadway, new sidewalks, demolition of some buildings), but it would not degrade the visual quality of the study area.*

### 3.12.1 Regulations

There are no applicable visual quality regulations.

### 3.12.2 Study Area

The study area includes all areas where physical changes associated with the proposed widening project could be seen, which includes two parcels adjacent to:

- 5400 South between Bangerter Highway and 4800 West, and
- 4015 West between 5115 South and 5580 South.

### 3.12.3 Affected Environment

Views in the study area are influenced by topography, vegetation, and the built environment. 5400 South is an east-west route, and the Wasatch and Oquirrh Mountains dominate background views to both the east and west, respectively. The following sections discuss typical views in the commercial and residential areas along the study area.

#### 3.12.3.1 Commercial Areas

Along 5400 South between Bangerter Highway and 4270 West as well as on the south side of 5400 South between 4620 West and Northwest Avenue, views are dominated by commercial land uses (**Figure 3.12-1**). Commercial areas largely consist of modern commercial buildings built between 1950 and 1985 ranging in style. Setbacks vary along the corridor from about 30 feet to 200 feet, resulting in a line of sight that is not cohesive. Buildings in this area are generally single story and vary from small, individual buildings (e.g., 1,600 square feet) to large, “big box” retail sites (e.g., 36,000+ square feet). Along the corridor, the most dominant visual features are business signs and above ground power lines. The signs

vary in size and height and do not contribute to a unified appearance. There is minimal landscaping to break up the urban environment.

Figure 3.12-1: Typical View within the Commercial Area in the Study Area



### 3.12.3.2 Residential Areas

Between 4270 West and Northwest Avenue, views are dominated by residential land uses (**Figure 3.12-2**). This section of the corridor largely consists of residences built in the 1950s. Residences are consistent in style and design. On the south side, most residences are Minimal Traditional style, and on the north side, most residences are Ranch style. Setbacks are consistently around 40 feet from the existing curb, providing a cohesive line of sight. There are a number of mature trees in yards set back from the corridor, and front yards are generally grass, which breaks up the urban development. Some of the residences along the corridor are well maintained, but there are a number of residences that are suffering from overgrown landscaping and the accumulation of refuse. The above ground power poles along the north side of the street are highly visible and are not necessarily consistent with the residential setting. The roadway, sidewalk, curb, and gutter are older infrastructure and are in various states of disrepair.

Figure 3.12-2: Typical View within the Residential Area in the Study Area



## 3.12.4 Environmental Consequences

A visual assessment was conducted by driving and walking the study area to consider the aesthetic effects of the alternatives.

### 3.12.4.1 No Build Alternative

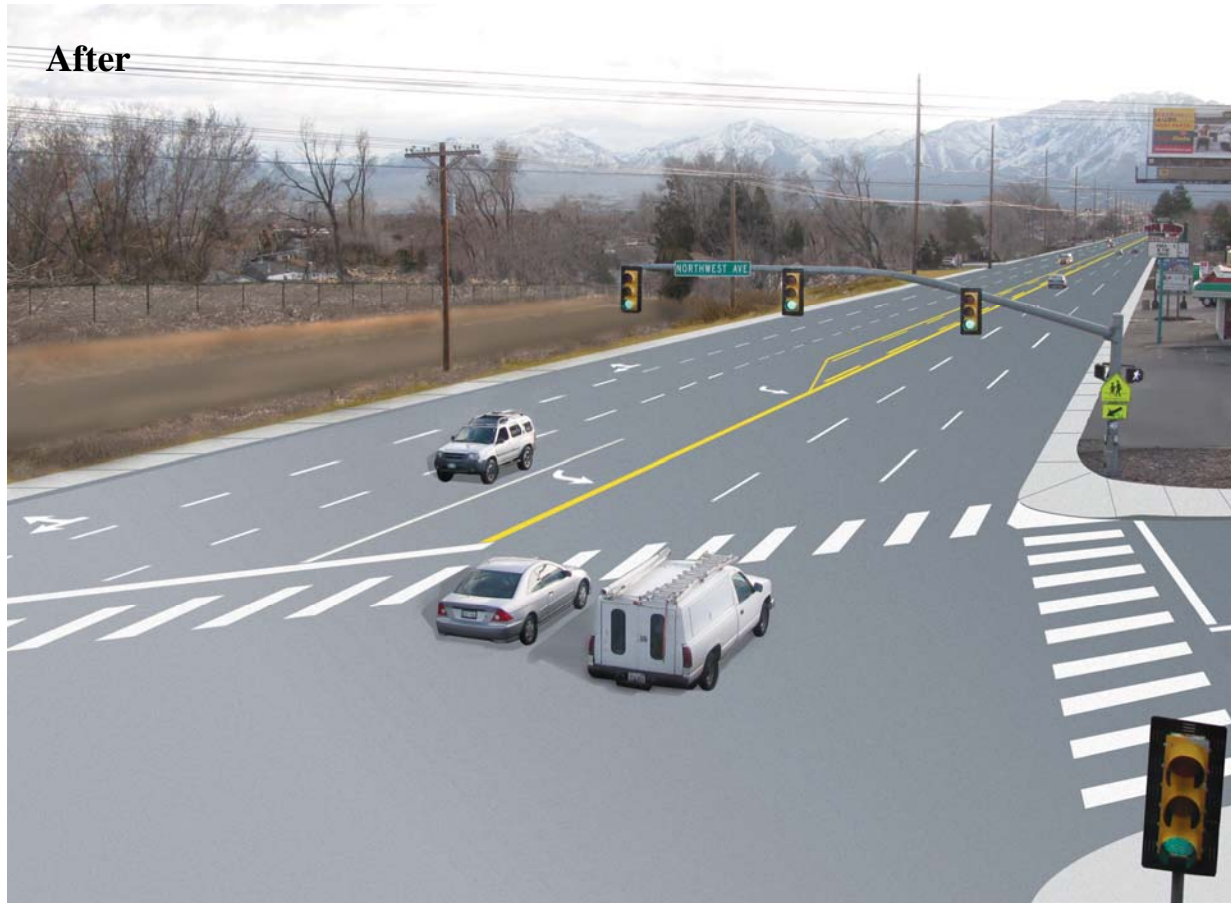
No impacts are anticipated for visual quality under the No Build Alternative as the study area is built out and is not expected to experience substantial visual changes along 5400 South.

### 3.12.4.2 Build Alternative

Background views of the mountains to the east and the west would not change as a result of the proposed widening project. The Build Alternative would directly affect foreground views within the study area. The existing 66 foot roadway between 4015 West and Northwest Avenue would be widened to approximately 100 feet. This wider footprint would necessitate the acquisition and demolition of a number of structures along the corridor (see Section 3.3). Between 4015 West and 4580 West, widening would occur to the south of the existing road, and several residences and businesses would be acquired and demolished. Between 4580 West and Northwest Avenue, widening would occur to the north of the existing roadway and residences on the north side of the street would be acquired and demolished. A visual simulation was prepared to demonstrate visual changes resulting from the Build Alternative (**Figure 3.12-3**).

Figure 3.12-3: 5400 South from Northwest Avenue Looking East Before and After





The Build Alternative would replace the roadway, sidewalk, curb, and gutter, upgrading its dilapidated appearance. Many of the residences along the corridor would be eliminated as a result of the proposed widening project. There would be about 80 feet of land between the roadway and the back property line of the second row of residences. At this time, it is not known what would happen to this property after project construction. A detention basin would be constructed to collect and store runoff near Northwest Avenue and 4620 West, and this facility would likely be vegetated. While these changes would be apparent, visual quality would generally remain the same. UDOT would provide baseline landscape treatments (topsoil, seeding, and mulch) in accordance with their Aesthetics Policy. Additional aesthetic treatments along 5400 South (e.g., park strips, lighting, landscaping, trails, and privacy walls) would not be provided by UDOT. However, UDOT is consulting with Salt Lake County to discuss betterments along the corridor.

### 3.12.5 Avoidance, Minimization, and Mitigation Measures

No mitigation is required for visual quality.