

## Chapter 26: Mitigation Summary

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## 26.1 Introduction

This chapter provides a summary of the mitigation measures developed to avoid, minimize, rectify, reduce, or compensate impacts from the West Davis Corridor (WDC) alternatives. Funding for mitigation will be included in the cost of construction for the project with the Utah Department of Transportation (UDOT) having the final responsibility for implementation. UDOT or its designated contractor will implement a mitigation and monitoring tracking system to ensure that all mitigation identified in this Environmental Impact Statement is performed and that appropriate monitoring for effectiveness takes place. If a mitigation measure is determined to be not effective, the contractor will consult with UDOT to develop other appropriate mitigation.

## 26.2 Mitigation Measures for Land Use Impacts

Overall, the right-of-way for the WDC would be converted from its existing land uses discussed above to a more urban-related land use. The conversion to more urban land uses (right-of-way) would be similar among all of the action alternatives. This conversion would generally be consistent with local and regional land-use and growth plans, since improved roadway infrastructure has been included as part of all local and regional planning efforts. Additionally, the local and regional plans show much of the area proposed for the alternatives being converted to urban uses such as residential, commercial, industrial, and infrastructure uses. Therefore, no mitigation is proposed. Specific mitigation for impacts to conservation properties is discussed below.

***Mitigation for Impacts to the Great Salt Lake Shorelands Preserve.*** UDOT will continue to coordinate with TNC and URMCC regarding impacts to the Great Salt Lake Shorelands Preserve, including potential impacts to the current land uses on the preserve. UDOT is coordinating with these entities to ensure that water conveyance and property access are maintained at their current levels so that the conservation land use can also be maintained. UDOT is developing the necessary measures to minimize impacts to the preserve consistent with the intent of the 1996 Wetland Conservation Plan and the 2001 [Davis County Shorelands Master Plan](#) and in accordance with state and federal property acquisition laws.

As a result of this coordination, the current roadway design in this EIS maintains access to the preserve at the Central Davis Sewer Plant, Roueche Lane in Kaysville, 200 North in Kaysville, the proposed Layton interchange, 3200 West in Layton, and Gentile Street in Davis County. The roadway design for the WDC will include properly sized water conveyance pipes or culverts to maintain all existing water conveyance to the preserve. These conveyances include all creeks, storm drains, canals, ditches, and field drains.

As part of the wetland and wildlife mitigation process for the WDC Project, UDOT plans to mitigate for wetland and wildlife impacts by purchasing private in-holdings within the Great Salt Lake Shorelands Preserve. UDOT will be responsible for all mitigation for direct and indirect impacts to the Great Salt Lake Shorelands Preserve and will either preserve or improve wetland and wildlife functions on these properties and turn the properties over to

TNC and URMCC for long-term management. For additional mitigation measures, see Section 14.4.7, Mitigation Measures, in Chapter 14, Ecosystem Resources.

For the URMCC lands that would be directly affected by the WDC right-of-way, URMCC will transfer these properties to UDOT. These properties will be transferred out of federal ownership to State of Utah ownership. This process will require that URMCC prepare its own decision document based on the analysis in this EIS regarding the transfer of property.

***Mitigation for Impacts to the Farmington Ranches, Farmington Meadows, Hunters Creek, and Black Agriland Conservation Easements.*** If Alternative A1, A2, B1, or B2 is selected, UDOT will provide compensation in accordance with state and federal property acquisition laws for right-of-way impacts to land that is included in the Farmington Ranches, Farmington Meadows, and Hunters Creek conservation easements. If an A Alternative is selected, the same mitigation will apply to the Black Agriland conservation easement.

For any wetland and wildlife impacts that occur on the easements as a result of the WDC, UDOT is providing the appropriate mitigation in accordance with the Clean Water Act Section 404 permitting process. For more information regarding the mitigation for the ecological value of the conservation easements, see Chapter 14, Ecosystem Resources.

## **26.3 Mitigation Measures for Farmland Impacts**

### **26.3.1 Mitigation Measures for Impacts to Cropland, Century Farms, and Other Non-Century Farms of Interest**

Owners of farmland and farm-related businesses within the WDC right-of-way will be compensated according to the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and other state and federal guidelines if the owners' properties are affected by project construction. UDOT will ensure that affected irrigation infrastructure is replaced, ditch flow across the WDC is maintained, and all water use is maintained.

If irrigation infrastructure is replaced, the system will be designed to carry sufficient head pressure in order to deliver the needed flows and carrying capacity to get the water to the "end of the row." Irrigation will be maintained during construction. If during the right-of-way negotiations UDOT determines that providing irrigation to affected parcels is unreasonable, UDOT, in coordination with the property owner, will evaluate acquisition of the parcel.

### **26.3.2 Mitigation Measures for Impacts to FPPA-Eligible Farmland**

Since the ratings for all of the action alternatives are above the 160-point threshold, NRCS, as an administrator of the FPPA, recommends that FHWA consider the following issues as described under 7 CFR 658.4 and 658.5:

- Use of land that is not farmland or use of existing structures
- Alternate sites, locations, and designs that would serve the proposed project purpose but would convert fewer acres of farmland or other farmland that has a lower relative value
- Special siting requirements of the proposed project and the extent to which an alternate site fails to satisfy the special siting requirements as well as the originally selected site

As discussed in Chapter 2, Alternatives, an extensive alternatives analysis was conducted to develop the project alternatives. During the alternatives-refinement process, the WDC team made efforts to shift the alignments of the alternatives to be either on the edges of farm properties or on the parcel lines in some areas (instead of going through the middle of some farm properties). During the alternatives-refinement process, the WDC team also changed the Syracuse alignment of Alternative B from the previous alignment, which further reduced impacts to farmland in Syracuse.

However, because of the existing urban development and wetlands in the project area, alternatives that would avoid farmland would affect either homes and businesses or wetlands. The alternatives that were developed that met the project's purpose were refined during the alternatives-development process to convert the minimum amount of farmland while avoiding or minimizing impacts to existing developments and wetlands. The shifts moved the WDC alignments to the edges of farmland to avoid bisecting a farmland and thereby potentially rendering the entire parcel as not usable for farming. Therefore, the requirements of the FPPA have been met, and, to the maximum extent practicable, adverse agricultural impacts have been minimized or avoided.

Alternative B1 has the lowest NRCS-CPA-106 rating at 185 points and would have the lowest overall farmland impacts; however, no single alternative is rated under the 160-point threshold. No further mitigation is proposed.

### **26.3.3 Mitigation Measures for Impacts to Farmland Fragmentation**

For farmland fragmentation impacts, UDOT, in coordination with the property owner, will attempt to resolve conflicts; for example, by arranging additional property transfers to consolidate ownership. However, UDOT might not be able to resolve all issues created by severing parcels and would offer compensation to landowners who demonstrate a hardship due to severed parcels.

In addition, UDOT will consider options to provide access between the bisected farm segments. If a bisected farm segment (remnant) is too small to continue to use for agricultural

purposes (that is, under 5 acres), UDOT will evaluate acquisition of the remnant with the property owner.

### **26.3.4 Mitigation Measures for Impacts to Agriculture Protection Areas**

Officials with Davis and Weber Counties have identified the parcels that are protected by APAs defined by Utah Code. Prior to construction, UDOT will coordinate with the affected property owners who have land in an APA. Removing the APA status would require the approval of the landowner and either the Davis or Weber County Commission.

## **26.4 Mitigation Measures for Community Impacts**

The following mitigation measures apply to all action alternatives unless specified otherwise.

### **26.4.1 Mitigation Measures for Impacts to Community Cohesion**

To reduce the impacts of dividing the Bridgeway Island subdivision with the A Alternatives, UDOT will provide an underpass on Hammon Lane to ensure that all residents can access the clubhouse. To reduce the impacts of dividing residents along Bluff Road in Syracuse with the B Alternatives, UDOT will provide a grade-separated crossing to connect the Old Emigration Trail with Fremont Park. The underpass at Bridgeway Island was coordinated with the HOA, and the grade-separated crossing in Syracuse was coordinated with Syracuse City. For information about improvements to trail facilities made as part of the WDC Project that could improve community cohesion, see Chapter 10, Considerations Related to Pedestrians and Bicyclists.

### **26.4.2 Mitigation Measures for Impacts to Quality of Life**

For alternatives that are developed in residential and commercial areas, UDOT will work with the affected communities within UDOT's guidelines to identify measures to lessen project-related impacts to quality of life. These measures might include noise barriers (see Chapter 12, Noise, for locations), special landscaping and lighting, and accessibility considerations.

### **26.4.3 Mitigation Measures for Impacts to Recreation Resources**

Any loss of land from recreation resources due to the selected alternative will be compensated under the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act and the Utah Relocation Assistance Act for the loss of property and facilities, as appropriate [for more information about impacts to recreational resources and potential mitigation measures, see Chapter 27, Section 4(f)/6(f) Evaluation]. The following recreation resources are subject to property losses and compensation for the property taken, except for 1100 West Park, which will be relocated:

- Glen Eagle Golf Course (all action alternatives; more impact from B Alternatives)
- Fremont Park (both B Alternatives)
- South Park (all action alternatives)
- 1100 West Park (all action alternatives) – This park will be relocated as required under Section 4(f) adjacent to the Farmington Gymnasium and Regional Sports Complex at 294 South 650 West. For more information, see Chapter 27, Section 4(f)/6(f) Evaluation.

UDOT has coordinated with and will continue to coordinate with the owners of the golf course to ensure that the function of the golf course can be maintained through the mitigation process provided through the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act for the loss of property and facilities.

### **26.4.4 Mitigation Measures for Impacts to Community Facilities**

Any loss of land from community facilities due to the selected alternative will be compensated under the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act and the Utah Relocation Assistance Act for the loss of property and facilities, as appropriate. At this time, no right-of-way would be required from the Syracuse Arts Academy, but access to the school would be modified if one of the B Alternatives is selected. UDOT will coordinate with the school regarding access modifications. UDOT's current plans are to provide access to the school from 3000 West and access from the school by a new one-way loop road to the south that would connect to 3000 West.

### **26.4.5 Mitigation Measures for Impacts to Public Health and Safety**

UDOT will work with emergency providers, such as police, fire protection, and ambulance services, to ensure that the final roadway design does not hinder emergency provider access or affect responder response times. Proper access will be provided across the new highway near existing and future emergency service provider facilities. UDOT and the contractor will coordinate with emergency service providers before construction to ensure that access for their vehicles will be maintained. Before construction begins, the contractor will coordinate with the schools so that appropriate safety measures can be implemented.



UDOT has been coordinating with the Syracuse Arts Academy regarding potential impacts from Alternatives B1 and B2 during construction and operation of the WDC. The items discussed have included student safety at school and while walking to school, traffic circulation and safety, air quality, noise and vibration, and visual impacts. If one of the B Alternatives is selected, during the final design process, UDOT will develop and finalize necessary measures with the school to ensure that traffic circulation and safety and student safety at school and while walking to school meet applicable design standards, safety requirements, and traffic level-of-service goals. If one of the B Alternatives is selected, prior to construction, UDOT will meet with representatives from the school to discuss student and traffic safety requirements during construction.

Depending on the alternative that is selected, during construction, equipment and excavations could pose a safety hazard for students who walk to Canyon Creek and Kays Creek Elementary Schools and the Syracuse Arts Academy. Before construction begins, the contractor will coordinate with the schools so that appropriate safety measures can be implemented.

The construction contractor will develop a maintenance-of-traffic plan that defines measures to minimize construction impacts on traffic (for more information, see Section 20.3.10.3, Mitigation Measures for Construction-Related Impacts to Motorists, Pedestrians, Bicyclists, and Businesses).

Mitigation measures for construction-related impacts to air quality will be developed as part of the Emission Control Plan submitted to the State of Utah (for more information, see Section 20.3.3.1, Mitigation Measures for Construction-Related Impacts to Air Quality).

Construction noise would be minimized by following UDOT's Standard Specifications for Environmental Protection. No mitigation is proposed for construction-related vibration, since little vibration is anticipated.

#### **26.4.6 Mitigation Measures for Impacts to Public Services and Utilities**

The UDOT document *Accommodation of Utilities and the Control and Protection of State Highway Rights-of-Way*, Utah Administrative Code, Rule 930-6, will be followed. The construction contractor will contact local businesses and residences if any loss of utility service is required during construction.

#### **26.4.7 Mitigation Measures for Impacts to Housing and Relocations**

Property acquisitions, both partial and total, will be completed according to the provisions of the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and the Utah Relocation Assistance Act, Utah Code, Section 57-12.



## **26.5 Mitigation Measures for Environmental Justice Impacts**

Under the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, UDOT will ensure that property owners whose properties are directly affected by the WDC receive fair market value for the acquired right-of-way. It is UDOT's policy that persons relocated as a result of highway programs receive fair and humane treatment and not suffer unnecessarily as a result of programs designed for the benefit of the public.

To reduce the impacts of dividing the Bridgeway Island subdivision with the A Alternatives, UDOT will provide an underpass on Hammon Lane to ensure that all residents can access the clubhouse. To reduce the impacts of dividing residents along Bluff Road in Syracuse with the B Alternatives, UDOT will provide a grade-separated crossing to connect the Old Emigration Trail with Fremont Park. The underpass at the Bridgeway Island subdivision was coordinated with the homeowners association, and the grade-separated crossing in Syracuse was coordinated with Syracuse City.

As described in Chapter 12, Noise, under UDOT's noise-abatement policy, reasonableness factors must be collectively achieved in order for a noise-abatement measure to be considered reasonable. Based on UDOT's noise-abatement policy, noise-abatement measures are warranted at four locations, three of which are in areas with low-income and minority populations.

## **26.6 Mitigation Measures for Transportation Impacts**

No mitigation is proposed.

## **26.7 Mitigation Measures for Economic Impacts**

For impacts related to business displacements and relocations, this impacts analysis assumes that any businesses relocated as a result of this project would receive relocation assistance in accordance with UDOT's right-of-way acquisition practices. Property acquisitions will be completed according to the provisions of the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and the Utah Relocation Assistance Act, Utah Code Section 57-12. For businesses that experience short-term access and visibility problems during construction, a traffic access management plan will be developed and implemented by the construction contractor that maintains the public's access to the business during normal business hours.

Mitigation is not offered to local governments that are adversely affected when land is removed from their tax base. Over the long term, increased property values as a result of improved regional transportation access are expected by the WDC team to generate enough revenue to offset the short-term impact of the WDC on local government revenues.

Mitigation is not provided for residential properties close to, but not directly affected by, the WDC that could experience adverse noise and aesthetic impacts and potentially have a loss of property values. However, the project will include noise mitigation such as quiet pavement and aesthetic treatments to help offset some of the impacts.

## **26.8 Mitigation Measures for Joint Development Impacts**

No mitigation is proposed.

## **26.9 Mitigation Measures for Impacts to Considerations Relating to Pedestrians and Bicyclists**

Construction of any of the alternatives could disrupt bicyclists or pedestrians using existing facilities. However, the impacts would be temporary because all crossings will be accommodated to maintain continuity and access after construction. During construction, UDOT will coordinate with the local municipalities and/or trail groups to post information regarding any temporary trail closures or detours.

No specific mitigation efforts are proposed to address the new noise and visual elements from the WDC preferred alternative on the trail crossings. Any noise impacts and noise-abatement measures will be evaluated and identified pursuant to UDOT's current Noise Abatement Policy (for more information, see Chapter 12, Noise). Any aesthetic measures would be evaluated and identified pursuant to UDOT's current aesthetics policy (for more information, see Chapter 18, Visual Resources).

The design of connections to pedestrian and bicyclist facilities, the accommodations for planned facilities, and the design of the WDC trail will be determined during the final design phase of the project. Prior to final design, UDOT will coordinate with local municipalities, WFRC, and the Davis County Trails Advisory Board to ensure that all existing and planned facilities identified in the local and regional plans and existing and proposed connections to such facilities are accommodated. Options for accommodations could include either constructing and routing the facility under the WDC roadway or routing the facility over the WDC roadway. Existing and planned facilities might also connect to the proposed WDC trail in a manner that avoids a direct crossing of the WDC and improves bicyclist and pedestrian access to or across the WDC corridor.

The following list summarizes the trail crossings for each WDC action alternative and the current mitigation proposals. The wetland avoidance options would not change the proposed mitigation listed below. Grade-separated crossings will be either a trail overpass or a trail underpass of the WDC alternative. The type of grade-separated crossing will be determined during the final design phase of the project in coordination with the local City and other interested parties.

- **Alternative A1**
  - Legacy Parkway Trail in Farmington (grade-separated crossings)
  - D&RGW Trail in Farmington (grade-separated crossing)
  - Buffalo Ranches Trail in Farmington (grade-separated crossing)
  - Great Salt Lake Shoreline Trail in Farmington (grade-separated crossing)
  - Old Emigration Trail at 1000 West in Syracuse (grade-separated crossing)
  - Old Emigration Trail at 1500 West in Syracuse (grade-separated crossing)
  - Old Emigration Trail at 1300 North in West Point (grade-separated crossing)
  - Bridgeway Island Trail in Syracuse (grade-separated crossing)
- **Alternative A2**
  - Legacy Parkway Trail in Farmington (grade-separated crossings)
  - D&RGW Trail in Farmington (grade-separated crossing)
  - Buffalo Ranches Trail in Farmington (grade-separated crossing)
  - Great Salt Lake Shoreline Trail in Farmington (grade-separated crossing)
  - Old Emigration Trail at 1000 West in Syracuse (grade-separated crossing)
  - Old Emigration Trail at 1500 West in Syracuse (grade-separated crossing)
  - Bridgeway Island Trail in Syracuse (grade-separated crossing)
- **Alternatives B1 and B2**
  - Legacy Parkway Trail in Farmington (grade-separated crossings)
  - D&RGW Trail in Farmington (grade-separated crossing)
  - Buffalo Ranches Trail in Farmington (grade-separated crossing)
  - Great Salt Lake Shoreline Trail in Farmington (grade-separated crossing)
  - Old Emigration Trail at 1000 West in Syracuse (grade-separated crossing)
  - Old Emigration Trail at 1500 West in Syracuse (grade-separated crossing)
  - Old Emigration Trail at 1300 North in West Point (grade-separated crossing)
- **Alternative B2**
  - Legacy Parkway Trail in Farmington (grade-separated crossings)
  - D&RGW Trail in Farmington (grade-separated crossing)
  - Buffalo Ranches Trail in Farmington (grade-separated crossing)
  - Great Salt Lake Shoreline Trail in Farmington (grade-separated crossing)
  - Old Emigration Trail at 1000 West in Syracuse (grade-separated crossing)
  - Old Emigration Trail at 1500 West in Syracuse (grade-separated crossing)

### **26.9.1 Mitigation Measures for the Relocation of the Old Emigration Trail for Alternatives B1 and B2**

If Alternative B1 or B2 is selected, the Old Emigration Trail will be relocated between about 500 South and 2100 South in Syracuse. The Old Emigration Trail will be relocated to an alignment on the east side of the WDC between 500 South and 3000 West. Between 3000 West and 2100 South, the Old Emigration Trail will be relocated on an alignment between the WDC and Bluff Road. The relocated Old Emigration Trail will cross Antelope Drive with a new grade-separated trail crossing. A grade-separated trail crossing that connects the Old Emigration Trail to Fremont Park will also be provided at about 1950 S. Bluff Road in Syracuse. Figure 10-5, Old Emigration Trail Relocation, in Volume IV shows the proposed relocation of the Old Emigration Trail with Alternatives B1 and B2.

## **26.10 Mitigation Measures for Air Quality Impacts**

The analyses conducted for the WDC Project show that the WDC would not cause an exceedance of the applicable transportation-related criteria pollutants for which NAAQS have been established. Due to EPA's ongoing programs to control hazardous air pollutants from mobile sources, annual MSAT emissions with the No-Action Alternative would decrease by a range of about 50% to more than 90% despite a 46% increase in VMT from 2015 to 2040.

VMT with any of the action alternatives would be similar to VMT with the No-Action Alternative, and MSAT emissions are also expected to be similar.

GHG emissions would increase in 2040 due to the higher number of vehicles and increased VMT in 2040. This increase would occur with or without the WDC. According to the analyses conducted for the WDC, the action alternatives would have similar GHG emissions, and these additional amounts of GHGs would be small compared to the expected amount without the WDC.

Because the WDC would not cause violations of existing air quality standards and would cause small increases for other pollutants such as MSATs and GHGs, no mitigation measures are proposed.

## **26.11 Mitigation Measures for Noise Impacts**

This section discusses UDOT's methodology for evaluating noise-abatement mitigation measures for the traffic noise impacts identified in Section 12.4.3, Alternatives A1–A2 and B1–B2. As stated in Section 12.4.1, Methodology, noise mitigation typically consists of installing a noise wall or other physical barrier that blocks the line of sight from the roadway noise source to nearby receptors.

According to the UDOT Policy 08A2-01, noise abatement will be considered for new highway construction where noise impacts are identified. The goal of noise abatement is to substantially reduce noise, which might or might not result in noise levels below the NAC.

The two primary criteria to consider when evaluating noise-abatement measures are feasibility and reasonableness. Noise abatement will be provided by UDOT only if UDOT determines that noise-abatement measures are *both* feasible and reasonable.

### 26.11.1 Feasibility Factors

The feasibility of noise-abatement measures deals primarily with construction and engineering considerations such as safety, presence of cross streets, sight distance, and access to adjacent properties, among others. Under UDOT’s policy, a noise barrier must also be considered “acoustically feasible” (that is, the barrier must reduce noise by at least 5 dBA for at least 50% of front-row receptors). A 5-dBA change in noise would be perceptible by most people under normal listening conditions.

#### What is a front-row receptor?

A front-row receptor is a noise-sensitive receptor that is adjacent or nearest to a WDC alternative.

If a noise-abatement measure is determined to be feasible, then the abatement measure will be evaluated to determine whether its construction is reasonable. If a noise-abatement measure is determined to be not feasible, it will not be considered any further.

### 26.11.2 Reasonableness Factors

Under UDOT’s noise-abatement policy, reasonableness factors must be collectively achieved in order for a noise-abatement measure to be considered “reasonable.” If any of the three reasonableness factors (noise-abatement design goal, cost-effectiveness, and viewpoints of property owners and residents) specified in the policy are not achieved, the noise-abatement measure will be considered not reasonable and therefore not included in the project.

- **Noise-Abatement Design Goal.** UDOT defines the minimum noise reduction (design goal) from proposed abatement measures to be 7 dBA or greater for at least 35% of front-row receptors. As a result, no abatement measure will be considered reasonable if the noise-abatement design goal cannot be achieved.
- **Cost-Effectiveness.** The cost of a noise-abatement measure must be considered reasonable for it to be included in the project. Noise-abatement costs are determined by multiplying a fixed unit cost per square foot by the height and length of the barrier.

For residential receptors (Activity Category B in Table 12-2 above, UDOT’s Noise-Abatement Criteria), cost-effectiveness is based on the cost of the abatement measure (for example, a noise wall) divided by the number benefited receptors (dwelling units at which noise is reduced by a minimum of 5 dBA as a result of the abatement measure). Currently, the maximum cost used to determine the reasonableness of a noise-abatement measure is \$30,000 per benefiting receptor based on a unit barrier cost of \$20 per square foot of barrier.

- **Viewpoints of Property Owners and Residents.** If a noise-abatement measure is both feasible and cost-effective, the viewpoints of property owners and residents

(non-owners) must be solicited to determine whether noise abatement is desired. Balloting will be conducted for those noise-abatement measures that both meet the noise-abatement design goal and are cost-effective.

### 26.11.3 Noise-Abatement Evaluation for the Proposed Alternatives

The effectiveness of noise barriers is generally limited to areas within about 300 feet of the proposed right-of-way. Beyond this distance, noise barriers do not effectively reduce noise levels at individual residences. In addition, differences in terrain and elevation between the roadway and the nearby residences can reduce the effectiveness of noise barriers.

The noise-abatement analysis discussed below was applied to those areas adjacent to each WDC action alternative where there were clustered residences that would potentially benefit from a noise barrier. As described in Section 12.4.5.2, Reasonableness Factors, in order to be considered a reasonable noise-abatement measure, a noise barrier had to reduce project-related noise levels by at least 5 dBA for 50% of front-row receptors, reduce project-related noise levels by 7 dBA for at least 35% of front-row receptors, and meet UDOT's cost-effectiveness criterion of costing \$30,000 or less per benefiting residence.

Noise barriers were evaluated at 31 locations. The locations of the 31 noise barriers are shown and labeled in Figures 12-1 through 12-36, Noise Receptor Impacts, in Volume IV.

For each noise barrier location, the feasibility and reasonableness of various barrier heights were evaluated to determine the following:

- The number of benefiting residences (those at which noise would be reduced by at least 5 dBA, regardless of whether they met or exceeded the residential NAC)
- Whether at least 50% of front-row residences would meet the noise-abatement feasibility goal of a 5-dBA reduction from the barrier
- Whether at least 35% of front-row residences would meet the noise-abatement design goal of a 7-dBA reduction from the barrier
- The cost-effectiveness of the barrier (cost per benefiting residence)
- Whether the barrier is overall both feasible and reasonable (cost-effective)

The results of the barrier evaluation are summarized in Appendix 12A, Barrier Mitigation Tables. Appendix 12A shows the abatement evaluation for each noise barrier that was considered. As shown in Appendix 12A, 4 of the 31 modeled noise barriers met UDOT's feasibility and reasonableness criteria.

The four modeled noise barriers that met UDOT's feasibility and reasonableness criteria are Barriers 4, 12, 14, and 25. These noise barriers are shown in Figures 12-7, 12-29, 12-31, and 12-21, Noise Receptor Impacts, in Volume IV.

**Noise-Abatement Consideration during Final Design.** If an action alternative is selected, the noise impact analysis will be revised during the final design phase of the project to more accurately reflect the alternative's proposed vertical and horizontal alignment. In addition, any new residential developments that receive a final building permit before the Record of

Decision for the project is approved by FHWA will be accounted for in this noise impact analysis. For these reasons, the final recommendations concerning noise-abatement measures will be determined during the final design of the selected alternative, and the results discussed above in Section 12.4.5.3 could change based on a revised analysis.

## **26.12 Mitigation Measures for Water Quality Impacts**

This section discusses mitigation measures for surface water and groundwater impacts.

### **26.12.1 Mitigation Measures for Impacts to Surface Water**

UDOT will mitigate stormwater runoff by discharging stormwater into detention basins before it is released into receiving waters or using vegetated filter strips where there are no adjacent water bodies that could potentially receive direct stormwater discharge. This practice will reduce impacts to streams by reducing peak-flow discharge and by allowing particulates and sediment in stormwater to settle to reduce the amount of pollutants discharged to the receiving water. The benefits of detention basins and vegetated filter strips were included in the numeric in-stream analyses for copper, lead, and zinc. The WDC stormwater system would be designed to meet UDOT's municipal stormwater permit requirements. UDOT will coordinate with the Utah Division of Water Quality during the final design phase of the project to ensure that water quality goals are being met. Other water treatment measures including the use of hydrodynamic separators and other inline treatments will be evaluated during the final design process.

### **26.12.2 Mitigation Measures for Groundwater Impacts**

UDOT will conduct pre- and post-construction monitoring of the upper aquifer to better understand how the WDC could change subsurface water flows under the highway.

### **26.12.3 Mitigation Measures for Impacts to Groundwater Wells**

There are groundwater wells within the proposed right-of-way for each of the action alternatives. Depending on the alternative selected, if a well needs to be relocated, UDOT will negotiate an agreement with the water right owner to either (1) purchase the water right or the land associated with the right or (2) replace the well at a different location acceptable to the owner.



## 26.13 Mitigation Measures for Ecosystem Impacts

To meet Clean Water Act and Section 4(f) requirements and to provide mitigation for direct and indirect impacts to wetlands and associated habitat, UDOT proposes to purchase and perform mitigation on privately owned properties within and around the Great Salt Lake Shorelands Preserve boundary and properties on the eastern and northern border of the Farmington Bay WMA. The plan proposes to mitigate for direct and indirect impacts to wetlands, wildlife habitat, the Great Salt Lake Shorelands Preserve, and the Farmington Bay WMA in a holistic and comprehensive manner that will provide a long-term benefit to the eastern shore of the Great Salt Lake ecosystem.

Specific properties included in this mitigation plan will be a component of meeting UDOT's Clean Water Act requirements for mitigating wetland impacts from the WDC Project and will provide Section 4(f) replacement properties and mitigation for the URMCC properties affected by the project.

The mitigation plan was developed based on meetings, site visits, and other input and feedback from the owners and managers of the Great Salt Lake Shorelands Preserve and the Farmington Bay WMA regarding the best approach to mitigate WDC wetland and wildlife impacts. The resource agencies have also provided input and feedback on this mitigation proposal in meetings and site visits to potential mitigation sites.

### 26.13.1 Mitigation Measures for Impacts to Wildlife and Wildlife Habitat

#### 26.13.1.1 Wildlife

##### Impacts to Nesting Birds

Mitigation for nesting birds falls under the requirements of the Migratory Bird Treaty Act. Eagles and raptor nests within the range of disturbance of project activities (Romin and Muck 2002) will be surveyed before construction if the construction will occur during the raptor nesting season (March 1 through August 31). USFWS recommends identifying nests before trees leaf out and surveying again after nesting has begun to determine which nests are active and which species are using them. If an active raptor nest is identified within the USFWS guidance distance (Romin and Muck 2002), UDOT will coordinate with USFWS and/or UDWR.

Clearing and grubbing of vegetation should occur outside migratory bird nesting season to make the area unattractive to nesting during nesting season. If clearing and grubbing of vegetation of any kind will occur during the migratory bird nesting season (March 15 through August 1), UDOT or its contractor will conduct preconstruction nesting surveys of the area that would be disturbed no more than 10 days before ground-disturbing activities to determine whether active bird nests are present. If active nests are found, the construction contractor will leave them untouched and will implement a 50-foot buffer of no disturbance until the young have fledged. Vegetation-clearing or -disturbance outside the migratory bird nesting season (August 2 through March 14) can occur without preconstruction surveys if no raptor nests or nest buffers are within the area to be cleared.

## **Impacts to Fish and Amphibians**

To mitigate potential impacts to fish and amphibians, when designing crossings of the WDC over water, UDOT will consider using natural-bottom culverts, maintaining existing gradients, and not adding any new points where slope changes could impede the movements of fish or amphibians. Consideration and identification of the locations for these types of crossings will be determined during the Clean Water Act Section 404 permitting process.

## **Impacts to the Great Salt Lake Shorelands Preserve**

In consultation with The Nature Conservancy and URMCC, UDOT prepared this mitigation plan that it believes will mitigate for impacts to the Great Salt Lake Shorelands Preserve. The mitigation includes acquiring lands in fee along with appurtenant water rights. These lands will be rehabilitated by UDOT to restore the ecological function unique to each parcel and will then be transferred in fee to The Nature Conservancy to be managed in perpetuity as part of the Great Salt Lake Shorelands Preserve. The mitigation will also include an endowment to fund the future management of the properties. The Section 404 permitting process will also include mitigation in areas beyond the Great Salt Lake Shorelands Preserve.

UDOT's plans are to compensate for right-of-way (direct) and indirect effects on the Great Salt Lake Shorelands Preserve caused by the WDC by purchasing private inholdings within the Great Salt Lake Shorelands Preserve. UDOT understands that there will be direct right-of-way impacts (72 acres), remnant parcel impacts (48 acres), and indirect impacts from other sources from the WDC including noise, visual, habitat fragmentation, and light. These impacts will reduce the wildlife habitat functions of those properties near the WDC within the Great Salt Lake Shorelands Preserve.

To mitigate for all impacts to the Great Salt Lake Shorelands Preserves, UDOT will mitigate by preserving and improving wetlands and wildlife habitats on private inholdings within the Great Salt Lake Shorelands Preserve (see Section 14.4.7.2, Mitigation Measures for Impacts to Wetlands). This will include purchasing about nine private inholdings totaling about 791 acres (note that UDOT has purchased some of the properties during the EIS process as part of the hardship acquisition process). Purchasing current private inholdings within the preserve and allowing them to be owned and managed by The Nature Conservancy will provide one contiguous and unfragmented wildlife habitat area not interrupted by private land holdings that could potentially be developed or used for other non-wildlife-habitat-related uses. In consultation with The Nature Conservancy and URMCC, UDOT believes that the purchase and improvements to these parcels is necessary to mitigate for the direct and indirect effects from the WDC on the Great Salt Lake Shorelands Preserve. UDOT coordinated with The Nature Conservancy as the land manager of the Great Salt Lake Shorelands Preserve to determine the mitigation that will compensate for WDC impacts.

## Overall Wildlife Impacts

The main high-quality wildlife habitat areas potentially affected by the WDC alternatives are the habitat set aside for wildlife protection in the Great Salt Lake Shorelands Preserve west of all of the WDC action alternatives from Kaysville to Syracuse and the areas near the Farmington Bay WMA south of Farmington. The other land adjacent to the WDC alternatives is either suburban land or farmland that typically provides a lower habitat value than the areas managed for wildlife conservation. Direct right-of-way mitigation for the Great Salt Lake Shorelands Preserve is described above in the section titled Impacts to the Great Salt Lake Shorelands Preserve.

Because different species could be affected by highways at different distances from the highway (Benitez-Lopez and others 2010), it is difficult to determine a specific distance from the highway at which to mitigate indirect effects. Highway noise could affect vocal communication in a number of special-status bird species that might be present near the WDC alternatives; the magnitude of this effect varies with the proximity of the birds to the highway and the required transmission distance of the species' vocal signals. Additionally, environmental variables such as wind, atmospheric turbulence, and background noise can all affect the distance that both highway noise and species' vocal signals can be transmitted. Moreover, behavioral adaptations by species could minimize the effects of highway noise masking. However, UDOT does realize that there would be some indirect effects on wildlife from the WDC and has worked with the resource agencies throughout the EIS process to determine satisfactory mitigation.

Under its current mitigation package, UDOT will purchase or provide about 1,111 acres (about 791 acres to The Nature Conservancy and URMCC and about 320 acres to UDWR) to these agencies for the continued management of wildlife and wetland habitat. The purchase or providing of this land will provide a contiguous and unfragmented wildlife habitat parcel west of the WDC from the Farmington Bay WMA to the north end of the Great Salt Lake Shorelands Preserve.

Additionally, UDOT will consider further opportunities to acquire and preserve land for wildlife habitat and/or buffers to development throughout implementation of the project. These opportunities would be based on working with willing land owners and could include using surplus properties, land exchanges, or other measures. UDOT would coordinate with USFWS and UDWR on these efforts.

## Disturbance from Artificial Lights

To reduce the potential impacts from artificial lights associated with the WDC, UDOT will use directional, downward-facing lighting instead of floodlights or lights on poles more than 25 feet high in the area of interchanges. No lighting will be placed on WDC outside of interchange areas.

## **Disturbance from Noise**

To reduce the impact from noise to wildlife, UDOT will construct the WDC using “quiet pavement.”

### **26.13.1.2 Vegetation**

Constructing the WDC would remove vegetation and could also introduce invasive species into the surrounding areas. To prevent further, permanent effects, temporary impacts to vegetation will be mitigated once construction is complete and no further disturbance is anticipated. Mitigation will include the following measures:

- All fill materials brought onto the project site will be required to be clean of any chemical contamination as per UDOT’s General Standard Specifications, Section 02056, Embankment, Borrow, and Backfill. Topsoil for landscaping must also be free of weed seeds as per UDOT’s General Standard Specifications, Section 02912, Topsoil.
- Compacted soils will be ripped, stabilized, and reseeded with native seed mixes.
- The contractor will be required to follow noxious weed mitigation and control measures identified in the most recent version of UDOT Special Provision Section 02924S, Invasive Weed Control.
- Reseeding with native plants, followed by monitoring seedlings and invasive species until the vegetation has re-established, will mitigate direct-disturbance impacts and reduce the potential for weed invasions. UDOT will be responsible for monitoring and determining when vegetation becomes re-established. The selection of native plant species will be coordinated with USFWS, UDWR, The Nature Conservancy, and URMCC.
- Tree and shrub removal will be timed to occur during the non-nesting season (about August 1 to March 14). If this is not possible, preconstruction surveys will be conducted to determine whether active bird nests are present. Active nests in the area will be left untouched until the young have fledged.
- Removal of riparian vegetation will be minimized to the greatest extent practicable. UDOT will revegetate temporarily affected riparian areas with native riparian plant mixes that include willows and cottonwoods.
- All directly affected riparian habitat as identified as part of the habitat evaluation in this EIS will be mitigated at a 1-to-1 ratio. Mitigation could include restoring other riparian areas near the affected area including areas in the Great Salt Lake Shorelands Preserve, Farmington Creek, Haight Creek, and waterways entering the preserve.

## 26.13.2 Mitigation Measures for Impacts to Wetlands

Before constructing the selected alternative, UDOT will submit a formal wetland delineation for the selected alternative in compliance with Section 404 of the Clean Water Act and will assess the functional value of the affected wetlands. The total acreage of jurisdictional wetlands identified during this process will determine the type and amount of mitigation required to offset impacts to waters of the U.S. A wetland mitigation plan consistent with the 2008 Mitigation Rule will be provided to USACE for approval.

### Wetland Impact and Mitigation Evaluation Processes

At the time of the release of this Final EIS, the final wetland mitigation plan has not been finalized with USACE, so all information is considered preliminary. UDOT will follow USACE's processes for determining wetland impacts and associated mitigation. The WDC Clean Water Act process will be carried out in accordance with 33 CFR 320, General Regulatory Policies.

The amount of compensatory mitigation, ratios used to determine adequate mitigation, and wetland mitigation site development will be carried out in accordance with 33 CFR 332.3, General Compensatory Mitigation Requirements. For this process, USACE will require a mitigation ratio greater than 1 to 1 where necessary to account for the method of compensatory mitigation (for example, preservation), the likelihood of success, differences between the functions lost at the impact site and the functions expected to be produced by the compensatory mitigation project, temporal losses of aquatic resource functions, the difficulty of restoring or establishing the desired aquatic resource type and functions, and/or the distance between the affected aquatic resource and the compensation site. This process will include USACE using the South Pacific Division's Standard Operating Procedures for Determination of Mitigation Ratios (12501-SPD) as part of the Section 404 permit review.

The WDC wetland mitigation plan process will follow the requirements of 33 CFR 332.4, Planning and Documentation. This plan will include detailed written specifications and work descriptions for the compensatory mitigation project and a description of long-term management as defined in 33 CFR 332.7, Management. An endowment process will evaluate the long-term management needs, evaluate the annual cost estimates for these needs, and identify the funding mechanism that will be used to meet those needs. UDOT is currently working with The Nature Conservancy (the future land manager) to develop the endowment for properties within the Great Salt Lake Shorelands Preserve.

UDOT will obtain water rights for properties purchased as part of the mitigation process as well as properties purchased as part of the WDC right-of-way requirements. UDOT will coordinate with USACE and The Nature Conservancy to ensure that the water rights are enough to result in successful wetland mitigation. This process will include a determination by a qualified wetland scientist regarding the amount of water needed to support successful implementation of wetland mitigation. UDOT will also coordinate with The Nature Conservancy regarding additional water rights beyond those required for successful implementation of mitigation to provide the opportunity for enhancement of Great Salt Lake Shorelands Preserve wetlands.

## Proposed Wetland Mitigation

The WDC team coordinated with The Nature Conservancy, URMCC, and UDWR to develop the specific details for wildlife and wetland mitigation described in this EIS. In addition, the WDC team conducted field visits to the proposed mitigation parcels with The Nature Conservancy, URMCC, UDWR, USFWS, and USACE. The WDC team felt that coordinating with the land managers of conservation areas affected by the WDC would provide the most-valuable input regarding how to mitigate potential impacts.

The WDC preferred alternative would have direct impacts to about 41 acres of wetlands. Additionally, there could be indirect effects on about 90 acres of wetlands (wetlands within 300 feet of the right-of-way). These wetland acreage impact numbers could change based on the USACE permit process review. Although the mitigation plan and the wetland mitigation identified in the plan have not been approved, UDOT's preliminary estimates anticipate that about 245 acres of wetland mitigation will be required for direct wetland impacts. This will include about 109 acres of wetland preservation (13.6 acres of impacts mitigated at a ratio of 8 to 1) and about 136 acres of wetland rehabilitation (27.3 acres of impacts mitigated at a ratio of 5 to 1). Again, the final ratios and total mitigation will be determined by USACE once a permit application is submitted, so UDOT expects the above numbers to change. However, UDOT anticipates that it will acquire about 1,111 acres for mitigation of impacts to wetlands, wildlife, and the Great Salt Lake Shorelands Preserve.

For the indirect wetland effects, UDOT's preliminary estimates anticipate about 61 acres of wetland mitigation, which will include about 30 acres of wetland preservation (33.5 acres of impacts mitigated at a ratio of 0.89 to 1) and 31 acres of wetland rehabilitation (56 acres of impacts mitigated at a ratio of 0.56 to 1). Preservation mitigation will compensate for some direct and indirect impacts to Category I wetlands. Rehabilitation mitigation will generally compensate for impacts to Category II and III wetlands and the remaining Category I wetlands that were not mitigated with preservation. Wetland rehabilitation will generally include the following:

- Remove ditches, dikes, and fill on the eastern shore of the Great Salt Lake to restore lost wetland acreage and function.
- Remove trash, non-native plants, and other non-native items.
- Include upland buffers adjacent to wetland mitigation sites to protect the wetland areas from future adjacent development.
- Prioritize wetland mitigation sites that provide the opportunity to restore and preserve large, undeveloped, unfragmented Great Salt Lake wetland complexes and aquatic-dependent wildlife habitats at risk from future development. The Clean Water Act implementing regulations prioritize mitigation sites that are located within the same watershed and represent an in-kind replacement of wetland type and function.

USACE, USFWS, and EPA felt that wetland and wildlife impacts should be mitigated in locations that would enhance the Great Salt Lake Shorelands Preserve or the Farmington Bay WMA. Mitigation on these parcels would provide the opportunity to provide a large, unfragmented Great Salt Lake wetland complex from Farmington Bay WMA to the north end



of the Great Salt Lake Shorelands Preserve. Therefore, UDOT intends to provide the wetland mitigation on the private lands that are surrounded by the Great Salt Lake Shorelands Preserve and on parcels adjacent to the Farmington Bay WMA. UDOT already owns a few of these properties and will plan to purchase the remaining properties.

In order to provide the wetland mitigation of about 306 acres (245 acres for direct impacts and 61 acres for indirect effects), and based on preliminary estimates, UDOT will acquire about 948 acres of land. Note that about 414 of these 948 acres have been purchased by UDOT during the EIS process under the hardship acquisition process. These 948 acres will be the majority of the planned about 1,111 acres that UDOT will acquire within the Great Salt Lake Shorelands Preserve and adjacent to the Farmington Bay WMA. The additional acreage beyond 306 acres of wetland mitigation will provide appropriate upland wildlife habitat adjacent to the mitigated wetlands and will provide mitigation for both direct and indirect impacts to the preserve and wildlife habitat.

Engineering/structural avoidance options, such as additional alignment shifts and/or bridging some of the larger wetland complexes, might be incorporated into the final design in order to satisfy avoidance and minimization requirements during Section 404 permitting. The planning and design process for the WDC avoided and minimized impacts to wetlands and waters of the U.S. by shifting the alignments and constructing retaining walls to the extent feasible while complying with engineering specifications, such as minimum radius of curvature (see Section 14.4.3.10, Summary of WDC Wetland Avoidance Measures).

When feasible, during the final design phase of the project, UDOT will apply design modifications and further minimizations including shifts of the highway within the right-of-way to avoid or minimize wetland impacts through sensitive, high-quality wetland areas and adjacent to terrestrial areas that support aquatic-dependent wildlife species. The design minimization effort will look at the potential to shift the right-of-way or the highway within the right-of-way to preserve upland buffers between wetlands and the roadway to reduce the potential for indirect effects.

Additionally, FHWA and UDOT will require the construction contractor to limit ground and wetland disturbance to the area necessary for the highway improvement that is defined in the Section 404 permit. However, during construction, if any activities not covered by the Section 404 permit would affect wetlands, the contractor would need to coordinate with UDOT to determine appropriate action and permitting requirements.

Where vegetation is disturbed or destroyed, the contractor will reseed these areas with a seed mix of native wetland plants approved by the appropriate agency. Additionally, the contractor will take steps to ensure that noxious weeds are not introduced into wetland plant communities (UDOT Special Provision Section 02924S, Invasive Weed Control). Best management practices required by FHWA and UDOT will require that construction equipment entering the highway construction site be washed to remove noxious weed seeds.

Another concern that must be addressed concerning indirect effects on wetlands is the effect that the WDC could have on hydrology. The WDC design will include structures (for example, pipes, culverts, or bridges) that would allow the conveyance and hydrologic connection of all surface waters crossed by the WDC. Culverts would be designed and



constructed at channelized drainages to maintain surface flow, thereby maintaining hydrology in open-water areas, areas abutting riparian wetlands, and hydrologically connected adjacent wetlands. During the final design phase of the project, UDOT will conduct additional evaluation of the hydrologic connection of wetlands to minimize impacts to hydrologic connection features comparable to the existing hydrologic conditions. UDOT will also conduct pre- and post-construction monitoring of the upper aquifer to better understand how the WDC could change subsurface water flows under the highway.

Along the WDC action alternatives are four locations where wetlands would be bisected. These locations are a complex south of Glovers Lane in Farmington where a small drainage feature connects the wetlands, a wetland area in west Farmington on the conservation easements where a drainage feature connects the wetlands, a wetland area north and west of the intersection of Gentile Street and Bluff Road which is connected by groundwater, and immediately south of 1800 North and 4100 West where wetlands are connected by a drainage feature that has been altered by development. In these locations, UDOT will try to maintain hydraulic connectivity through the use of culverts and other design features.

## 26.14 Mitigation Measures for Floodplain Impacts

Measures will be taken to reduce floodplain impacts and to ensure that constructing the WDC complies with all applicable regulations. These mitigation measures include the following:

- The proposed alternatives would require a number of stream and floodplain crossings. When bridges and culverts are designed, the design will follow the UDOT Manual of Instruction – Roadway Drainage and WDC Project and FEMA requirements, where applicable. Where no regulatory floodplain is defined, culverts and bridges will be designed to accommodate a 50-year (2% annual chance) or greater magnitude flood event. Where regulatory floodplains are defined, hydraulic structures will be designed to accommodate a 100-year (1% annual chance) flood.
- Stream alteration permits will be obtained for stream crossings as required by the Utah Division of Water Rights. Note that the stream alteration permitting process is a separate process from the floodplain permitting process. The stream alteration process is required to satisfy state regulations and may also be used to meet Clean Water Act Section 404 permitting requirements.
- Floodplain development permits will be obtained for all locations where the proposed roadway would encroach on a regulatory floodplain, and structures will be designed to meet the more stringent of FEMA requirements and local floodplain ordinances. FEMA requires that construction within a floodway must not increase the base (100-year) flood elevation. FEMA Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision processes will be executed in compliance with 44 CFR 60.3 and 65.12 as necessary based on hydrologic and hydraulic analyses and the nature of anticipated changes in base flood elevation and/or floodplain limits. The following cases apply:
  - For areas of Zone A floodplain impacts, the approach will be to analyze existing and proposed conditions and design project features such that compliance is

achieved (that is, such that a CLOMR is not required) as much as possible. In these areas, FEMA performed floodplain mapping based on approximate methods. The absence of a detailed study or floodway delineation places the burden on the project proponent (in this case, UDOT) to perform hydrologic and hydraulic analyses consistent with FEMA standards. These analyses will confirm or refine the FEMA floodplain mapping and could increase or decrease the estimate of affected areas. Near the Great Salt Lake, FEMA's floodplain mapping in confluence areas reflects divergent and/or uncertain flow paths. In these confluence areas, streams entering the Great Salt Lake will require evaluation based on an independent extreme event on that water course with average lake levels in the Great Salt Lake rather than concurrent flooding events. In accordance with FEMA standards, both the lake floodplain and the independent stream floodplain will be evaluated.

- For areas of Zone AE floodplain impacts, the approach will be to analyze proposed conditions relative to effective floodplain mapping (with base flood elevations defined) and design project features such that compliance is achieved (that is, such that a CLOMR is not required) as much as possible.
- Roadway elevations will be a minimum of 2 feet above adjacent floodplain elevations, where those elevations are defined, so that flooding will not interfere with a transportation facility needed for emergency vehicles or evacuation.
- In areas of longitudinal crossings near the Great Salt Lake, surface water conveyance structures will be installed to allow flood waters to flow freely between the northeast and southwest sides of the WDC. Maintenance of wetland hydrology will also be considered in the design of conveyance structures. Furthermore, erosion-control measures will be implemented at these structure locations. These actions will reduce impacts to natural and beneficial floodplain values.
- In areas of longitudinal crossings near the Great Salt Lake, potential wave action against the roadway embankment will be evaluated and, as necessary, mitigated with countermeasures such as rock riprap to reduce erosion potential and impacts to natural and beneficial floodplain values.

## **26.15 Mitigation Measures for Impacts to Historic, Archaeological, and Paleontological Resources**

Mitigation measures for architectural and archaeological resources are described in the Programmatic Agreement. The Programmatic Agreement was developed during the Final EIS process after consultation with the Utah SHPO and consulting parties to mitigate for unavoidable adverse effects. The Advisory Council on Historic Preservation was invited but declined to participate in the consultation. The Programmatic Agreement includes mitigation measures for the unavoidable adverse effects of the preferred alternative. A copy of the Programmatic Agreement is provided in Appendix 16B, Correspondence Pertaining to Historic, Archaeological, and Paleontological Resources.

## 26.16 Mitigation Measures for Impacts to Hazardous Waste Sites

No hazardous waste sites are expected to be affected, so no mitigation measures are proposed. However, previously unidentified sites or contamination (such as buried drums, fuel USTs, or solvent USTs) could be encountered during construction. In such a case, all work will stop in the area of the contamination according to the Standard Specifications of the Utah Department of Transportation (UDOT), and the contractor will consult with UDOT and DERR to determine the appropriate remedial measures. Hazardous wastes will be handled according to UDOT's Standard Specifications and the requirements and regulations of EPA and the Utah Department of Environmental Quality. Any remediation of a previously unidentified contaminated site would be considered a public health benefit.

## 26.17 Mitigation Measures for Visual Impacts

FHWA and UDOT will consider context-sensitive solutions when developing landscape and aesthetic treatments for the WDC alternatives. As part of any selected WDC alternative, FHWA and UDOT will consider mitigating the visual impacts of structural elements by incorporating architectural design elements that reflect local community or regional characteristics or the use of landscaping. The aesthetic features considered during the final design phase of the project could include lighting; vegetation and plantings; the color of bridges, structures, and retaining walls; and other architectural features such as railings.

### What are context-sensitive solutions?

Context-sensitive solutions is a philosophy that guides UDOT in planning, designing, constructing, and maintaining safe transportation solutions in harmony with the community and the environment.

All aesthetic treatments will be completed in accordance with UDOT Policy 08C-03, Project Aesthetics and Landscaping Plan Development and Review (UDOT 2011a), and UDOT's Aesthetics Guidelines (UDOT 2011b). UDOT's policy is to set a budget for aesthetics and landscape enhancements based on the aesthetics guidelines. Residents adjacent to a noise barrier will have the opportunity to vote on the noise barrier.

Aesthetic treatments are typically evaluated during the final design phase of the project after an alternative is selected in the Record of Decision and funding has been allocated for the project. UDOT will coordinate with the local municipalities to determine whether the desired aesthetics can be implemented within the project budget.

## 26.18 Mitigation Measures for Energy Impacts

No mitigation is proposed.

## **26.19 Mitigation Measures for Construction Impacts**

### **26.19.1 General Mitigation and Permit Requirements for Phased Construction**

As part of constructing a section of the WDC, UDOT would acquire the right-of-way needed to build that section. At the time of construction for each phase, UDOT would implement the mitigation measures required for that phase of construction for impacts to farmland, community impacts, relocations, economic impacts, pedestrian and bicyclist impacts, and impacts to archeological and paleontological resources.

UDOT will coordinate with the U.S. Army Corps of Engineers (USACE) during the Clean Water Act Section 404 permitting process. UDOT will mitigate the impacts to wetlands based on the Section 404 permit submitted to USACE. Mitigating the wetland impact from each phase during that phase would allow UDOT to fully consider any future design modifications that could develop once final design is completed for that phase and would also account for any future changes to wetlands in the project area. Wetlands might also be mitigated for the entire project depending on funding. Wetlands mitigation requirements will be specified by USACE Corps in the Section 404 permitting process. [For more information, see Section 25.2.1, Individual Permit under Section 404 of the Clean Water Act (USACE).]

If applicable, noise, floodplain, visual, and water quality mitigation measures will be implemented for the specific design for each phase. As part of the final design process during each phase, UDOT will conduct a noise analysis in accordance with UDOT's noise policy to determine the locations that will receive noise mitigation measures based on expected traffic volumes and the roadway design. This will allow UDOT to account for any future design modifications or changes in traffic volumes that could affect noise impacts. Future mitigation for subsequent phases will take into account the final design for that phase and any changes in regulations or potential improvements to best management practices at the time of construction.

The mitigation measures related to construction impacts, such as those listed in Chapter 11, Air Quality; Chapter 14, Ecosystem Resources; and this chapter, will be implemented during each phase as part of the construction activity.

## 26.19.2 Mitigation Measures for Construction-Related Impacts to Air Quality

Construction-related impacts to air quality will be minimized by implementing dust- and emission-control measures. These measures will be developed as part of the emission control plan submitted to the State of Utah. These measures will include the following:

- **Fugitive Dust Emission-Control Plan.** In accordance with UDOT specifications, the construction contractor will submit a fugitive dust emission-control plan to the Utah Department of Environmental Quality. The plan will describe project-specific activities for emission control and monitoring throughout construction in accordance with state and federal requirements. UDOT expects that strategies to control fugitive dust could include wetting excavation areas, unpaved parking and staging areas, and onsite stockpiles of debris, dirt, or dusty material; chemical stabilization; planting vegetative cover; providing synthetic cover and wind breaks; reducing construction equipment speed; covering loads; using conveyor systems; street sweeping at paved site-access points; setting limits on construction vehicle idling; and washing haul trucks before leaving the loading site.

Other measures recommended by the U.S. Environmental Protection Agency (EPA) that could be considered to reduce air quality impacts include the following:

- Develop requirements in the project contract package to require the contractor to implement an emission-reduction plan that limits idling and encourages the use of energy-efficient equipment, equipment maintenance, emission controls, and alternative fuels and/or engines to reduce consumption and limit emissions where feasible.
- Reroute truck traffic away from schools and communities when possible.

## 26.19.3 Mitigation Measures for Construction-Related Noise and Vibration Impacts

Construction noise would be minimized by following UDOT's Standard Specifications for Environmental Protection (Section 01355). No mitigation is proposed for construction-related vibration.

## 26.19.4 Mitigation Measures for Construction-Related Visual and Light Impacts

Impacts from lights used during nighttime construction will be minimized by aiming construction lights directly at the work area to avoid disturbing nearby residents.

### **26.19.5 Mitigation Measures for Construction-Related Impacts to Cultural Resources**

In accordance with UDOT's Standard Specifications for Environmental Protection, if cultural resources are discovered during construction, activities in the area of the discovery will immediately stop. The construction contractor will notify UDOT of the nature and exact location of the finding and will not damage or remove the resource. Work in the area of the discovery would be delayed until UDOT evaluates the extent and cultural significance of the site in consultation with the State Historic Preservation Officer. The course of action and the construction delay would vary depending on the nature and location of the discovery. Construction will not resume until the contractor receives written authorization from UDOT to continue.

### **26.19.6 Mitigation Measures for Construction-Related Impacts to Motorists, Pedestrians, Bicyclists, and Businesses**

In accordance with UDOT's standard operating procedures, the construction contractor will develop a maintenance-of-traffic plan that defines measures to minimize construction impacts on traffic. A requirement of this plan will be that, to the extent practicable, access to businesses and residences will be maintained and existing roads will be kept open to traffic unless alternate routes are provided. Information will be made available by phone and internet that describes construction activities and provides alternate transportation routes.

To the extent possible, trails will be kept open. If closure is required, a detour might be provided.

Even with the implementation of the maintenance-of-traffic plan, traffic congestion would increase in the short term around the construction area. Street closures would be short-term and limited to the closures that are specified in the maintenance-of-traffic plan as approved by UDOT before the start of construction.

UDOT and the contractor will coordinate with emergency service providers such as police, fire protection, and ambulance service before construction to ensure that access for their vehicles will be maintained.

### **26.19.7 Mitigation Measures for Construction-Related Impacts to Utility Service**

In accordance with UDOT's standard operating procedures, the construction contractor will coordinate with all utility providers to minimize utility service interruptions. UDOT will coordinate with railroad companies to ensure that their operations are maintained during construction. This mitigation could require constructing temporary tracks in the area of construction.

### **26.19.8 Mitigation Measures for Construction-Related Discoveries of Hazardous Materials**

If contamination is discovered during construction, mitigation measures will be coordinated according to UDOT Standard Specification 01355, Environmental Compliance, which directs the construction contractor to stop work and notify the engineer of the possible contamination. Any hazardous materials will be disposed of according to applicable state and federal guidelines.

## **26.20 Mitigation Measures for Indirect Effects**

Neither the CEQ regulations nor FHWA's environmental guidance documents implementing NEPA specifically mention mitigating indirect effects associated with highway projects. FHWA policy as stated in 23 CFR 771.105 discusses mitigation in Sections (d)(1) and (2) for adverse impacts that directly (not indirectly) result from a project; this mitigation must represent a reasonable public expenditure.

The permitting requirements associated with Section 404(b)(1) guidelines governing the USACE permit are limited to requiring mitigation for indirect effects that are specific and predictable in terms of location and degree. More-generalized indirect effects such as those associated with possible future development in a region do not require mitigation.

For a discussion of how the Cities could implement ways to minimize impacts to ecosystem resources, see Section 14.4.8, Recommendations to Minimize Growth Impacts to the Ecosystem.

### **26.20.1 Mitigation Measures for Potential Indirect Effects on Ecosystem Resources**

The WDC would indirectly affect 48 acres in the Great Salt Lake Shorelands Preserve. This land would be cut off from the main preserve by the WDC, and this fragmentation would reduce the wildlife habitat value. For the bisected properties, UDOT would work with the property owner (either the Utah Reclamation, Mitigation, and Conservation Commission or TNC) during the right-of-negotiation process to determine the appropriate mitigation of either monetary compensation or buying suitable replacement property as allowed by the UDOT right-of-way process.

### **26.20.2 Mitigation Measures for Potential Indirect Effects on Farmland**

An open-space-acquisition program that could be implemented by the Cities in the indirect effects impact analysis area can help shape and restrict the area of development. Farmlands and grazing lands are another source of open space and could be protected from conversion for development, where appropriate and feasible. This rural feature can relieve the pattern of uninterrupted urban development and retain some of the historic uses in Davis and Weber Counties. Such an open-space-acquisition plan can be accomplished by a partnership among city, county, and state governments.



## **26.21 Mitigation Measures for Cumulative Impacts**

### **26.21.1 Mitigation Measures for WDC Impacts to Wetlands and Wildlife Habitat**

Chapter 14, Ecosystem Resources, provides a detailed discussion of mitigation measures for impacts to wetlands, wildlife and wildlife habitat, vegetation, and threatened and endangered species. These mitigation measures include following:

- Develop and implement wetland mitigation sites that result in an overall no net loss of wetland functions affected by the WDC in accordance with Section 404 permit guidelines.
- Provide additional wildlife habitat as described in Chapter 14.

### **26.21.2 Mitigation Measures for WDC Impacts to Air Quality**

As described in Chapter 11, Air Quality, FHWA and UDOT conclude that the proposed WDC would not have a substantial impact on regional air quality, so no mitigation measures are proposed for direct impacts from the use of the WDC. Potential construction-related air quality mitigation measures are described in Section 20.3.3, Air Quality Construction Impacts, and include development of a Fugitive Dust Emission-Control Plan, street sweeping, and maintaining equipment to reduce emissions.

### **26.21.3 Mitigation Measures for WDC Impacts to Water Quality**

Chapter 13, Water Quality, provides a detailed discussion of water quality mitigation measures.

The following standard design practices will be incorporated into the selected alternative:

- Develop and implement an erosion-control plan during construction in accordance with Utah Construction Stormwater Permit conditions.
- Use detention basins or vegetated filter strips for the WDC to detain runoff, reduce the peak flow rate, and reduce pollutants in accordance with UDOT's Municipal Separate Storm Sewer System (MS4) permit conditions.

### **26.21.4 Mitigation Measures for WDC Impacts to Floodplains**

As described in Section 15.4.6, Mitigation Measures, in Chapter 15, Floodplains, measures will be taken to reduce floodplain impacts and to ensure that constructing the WDC complies with all applicable regulations. For all locations where the highway would encroach on a regulatory floodplain, structures will be designed to meet the more stringent of the FEMA or local floodplain ordinance requirements. FEMA requires that construction within a floodway must not increase the base (100-year) flood elevation.



### **26.21.5 Mitigation Measures for WDC Impacts to Farmland**

Section 4.4.6, Mitigation Measures, in Chapter 4, Farmland, provides a detailed discussion of measures for mitigating impacts to farmland. The mitigation measures include maintaining farm access and irrigation systems. As part of its standard procedures, UDOT would compensate owners of farmland and farm-related businesses within the WDC right-of-way according to the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and other state and federal guidelines if the owners' properties are affected by project construction.

### **26.21.6 Mitigation Measures for WDC Economic Impacts**

No mitigation is proposed for the cumulative economic effects on residential property values.

### **26.21.7 Mitigation Measures for WDC Community Impacts**

No mitigation is proposed for cumulative community impacts.

## 26.22 References

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