

# Technical Appendices

Appendix A

# **Consultation and Coordination**

## Appendix A

# Consultation and Coordination

This appendix contains a summary of correspondence and consultation pertinent to this Supplemental EIS and its preparation. The contents are listed in chronological order.

Date	From	To	Regarding
September 16, 1999	Utah Department of Transportation	Utah Division of Parks and Recreation	Agreement for Section 4(f) and 6(f) Land Exchange
June 22, 2000	Federal Highway Administration	State Historic Preservation Office	Section 106 Memorandum of Agreement Regarding Legacy Parkway Project
February 21, 2001	Christopher Lizotte (Utah Department of Transportation)	Barbara L. Murphy (State Historic Preservation Office)	Submission of ILS Documentation for 650 West State Street, Farmington
March 8, 2001	Barbara L. Murphy (State Historic Preservation Office)	Christopher Lizotte (Department of Transportation)	ILS Documentation for 650 West State Street, Farmington
September 20, 2001	Christopher Lizotte (Utah Department of Transportation)	Barbara Murphy (State Historic Preservation Office)	Legacy Parkway Haul Routes for Construction
October 19, 2001	Barbara Murphy (State Historic Preservation Office)	Christopher Lizotte (Utah Department of Transportation)	Legacy Parkway Haul Routes for Construction
August 9, 2002	Byron Parker (Utah Department of Transportation)	Max Forbush (Farmington City)	Roundabout at Intersection of 650 West and State Street, Equestrian Trail Termination at 650 West
August 30, 2002	David Connors (Farmington City)	Byron Parker (Utah Department of Transportation)	Roundabout at Intersection of 650 West and State Street
January 24, 2003	David Gibbs (Federal Highway Administration) and Brooks Carter (U.S. Army Corps of Engineers)	Robert Roberts (Environmental Protection Agency) Lee Waddleton (Federal Transit Administration) Ralph Morgenweck (U.S. Fish and Wildlife Service)	February 21, 2003, Meeting Invitation and Cooperating Agency Request

Date	From	To	Regarding
April 11, 2003	Nancy Kang (U.S. Army Corps of Engineers)	See List of Recipients following letter	Invitation to Participate in Environmental Scoping Process
April 17, 2003	Chadwick Greenhalgh (Clark Lane Historic District)	Federal Highway Administration	Request for Review of Potential Construction Effects on Historic District
May 2, 2003	Henry Maddux (U.S. Fish and Wildlife Service)	Greg Punske (Federal Highway Administration)	Comments on Notice of Intent
May 20, 2003	Mary Henry (U.S. Fish and Wildlife Service)	David Gibbs (Federal Highway Administration)	Acceptance of Invitation to Be a Cooperating Agency
June 10, 2003	Leon Bear, THPO Skull Valley Band of Gosiute Indians	Greg Punske, (Federal Highway Administration)	Scoping Comments
June 13, 2003	Nancy Kang (U.S. Army Corps of Engineers)	See List of Local Government Recipients (following letter)	Participation Opportunities in Preparation of Supplemental Environmental Impact Statement
June 13, 2003	Nancy Kang (U.S. Army Corps of Engineers)	See List of Recipients (following letter)	Participation Opportunities in Preparation of Supplemental Environmental Impact Statement
October 2, 2003	Nancy Kang (U.S. Army Corps of Engineers)	Nancy Keate (Utah Department of Natural Resources)	Review of Revised Wetland Section
November 18, 2003	Mike Perkins (Legacy Parkway Team)	Field Supervisor (U.S. Fish and Wildlife Service)	Environmental Re-Evaluation of Final Environmental Impact Statement
December 3, 2003	Henry Maddux (U.S. Fish and Wildlife Service)	Mike Perkins (Legacy Parkway Team)	Environmental Re-Evaluation of Final Environmental Impact Statement
July 15, 2004	Utah Department of Transportation and Utah Transit Authority		Weber County to Salt Lake City Commuter Rail Project Partnering Charter
September 23, 2004	Mark W. Franc (Bountiful City Engineering Department)	John Thomas (Utah Department of Transportation)	Bountiful Recreation Pond South of Bountiful Sanitary Landfill
November 3, 2004	Federal Highway Administration and Utah Department of Transportation	Wilson Martin (State Historic Preservation Office)	Determination of Eligibility and Finding of Effect for Legacy Parkway
November 4, 2004	Federal Highway Administration	State Historic Preservation Office	Draft Memorandum of Agreement Regarding the Legacy Parkway Project

Date	From	To	Regarding
November 4, 2004	Ray Grow (Natural Resources Conservation Service)	Laynee Jones (Legacy Parkway Team)	Farmland Conversion Impact Rating for Corridor Type Projects
November 8, 2004	Nancy Kang (U.S. Army Corps of Engineers)	John Thomas (Utah Department of Transportation)	Reverification of Wetland Delineation

# AGREEMENT

THE UNDERSIGNED hereby agree to the following:

UTAH DEPARTMENT OF TRANSPORTATION (UDOT) has taken possession of the following described property which it acquired for exchange of land owned by the Utah Division of Parks and Recreation (DPR) further identified as the "Jordan River OHV Park" located between I-215 and the Jordan River, approximately 2600 North Rosepark Lane, Salt Lake City, Salt Lake County, Utah.

The legal description of the "UDOT parcel(s)" are attached to and made part of this Agreement and identified as Parcel No. 0067:1B and 0067:1D.

It is understood and agreed that "DPR" will transfer title to "UDOT" those certain lands identified by the Utah Department of Transportation under the "Legacy Parkway" project as needed for right of way from the area of the "Jordan River OHV Park," identified as 4F and 6F properties. Said exchange will take place when the following conditions are met: 1) A "Record of Decision" (ROD) is received from the Federal Highway Administration which (a) approves an alignment which would require the acquisition of the property subject to this agreement.

It is understood and agreed that said exchange will be based upon acreage for acreage. Excess land remaining, if any; from the parcel 1B/1D exchange will be acquired by "DPR" at the purchase price "UDOT" paid of \$14,000 per acre, provided that the exchange occurs within the 5 year time frame contemplated under this agreement, and/or exchanged for certain parcels of land identified and agreed upon by both parties to this agreement. Transfer of titles between said parties will be by "Quit Claim Deed."

It is understood and agreed that if the conditions for acquisition are not met within 5 years from the date this agreement is signed, the "DPR" agrees to acquire the properties at the current "Fair Market Value" at time of transfer of title, and/or exchange for certain parcels of lands identified and agreed upon by both parties to this agreement. Said exchange will be based upon "value for value" at the "current fair market value," at time of transfer of title.

"UDOT" agrees to allow the "DPR" to lease parcel 0067:1B and 0067:1D for \$1.00 per year, commencing at the date this agreement is signed. Said "DPR" agrees not to sublease, encumber or to construct permanent structures or change the characteristic of the property without the written permission of UDOT.

Witness the hands of said UNDERSIGNED DATED this 16<sup>th</sup> day of SEPT 1999

Courtland Nelson

Utah Division of Parks and Recreation (DPR)

STATE OF UTAH )  
 ) ss.  
COUNTY OF SL )

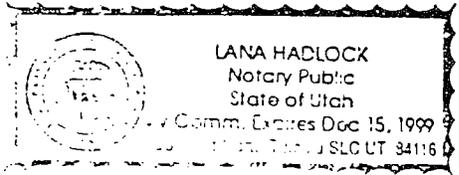
On the date first above written personally appeared before me.

COURTLAND NELSON signer of the within instrument, who duly acknowledge to me that he executed the same.

Lana Hadlock

NOTARY PUBLIC

Residing at: SALT LAKE CITY



\*\*\*\*\*

[Signature]

Utah Department of Transportation (UDOT)

STATE OF UTAH )  
 ) ss.  
COUNTY OF SL )



On the date first above written personally appeared before me.

LYLE MC MILLAN signer of the within instrument, who duly acknowledge to me that he executed the same.

James H. Brown

NOTARY PUBLIC

Residing at: SALT LAKE CITY

Salt Lake County

Parcel No. 0067:1B:T  
Project No. SP-0067( )0

in Salt Lake County, State of Utah, to-wit:

An undivided 58.45% interest in two tracts of land in fee, being all of an entire tract of property situate in the NW~~SW~~ and the W~~NW~~ of Section 15, T. 1 N., R. 1 W., S.L.B & M. The boundaries of said tracts of land are described as follows:

Beginning at a Northwest corner of said entire tract, which point is 19.970 m (65.52 ft.) S 0°33'38" E and 129.378 m (424.47 ft.) N 89°26'22" E from the West Quarter corner of said Section 15; running thence S 85°45'40" E 167.286 m (548.94 ft.) along a northerly boundary line of said entire tract; thence S 31°45'49" W 93.574 m (307.00 ft.) along a southeasterly boundary line of said entire tract; thence N 89°45'49" E 37.490 m (123.00 ft.) along a northerly boundary line of said entire tract; thence S 38°42'49" W 5.624 m (18.45 ft.) along a southeasterly boundary line of said entire tract; thence S 55°38'54" E 11.677 m (38.31 ft.) along a northeasterly boundary line of said entire tract to the east bank of the original Jordan River, also being the easterly boundary line of said entire tract; thence along said easterly boundary line the following four (4) courses and distances: (1) S 40°19'42" W 213.028 m (698.91 ft.); thence (2) S 17°40'52" W 58.500 m (191.93 ft.); thence (3) S 0°46'35" E 62.478 m (204.98 ft.); thence (4) S 8°35'36" E 8.544m (28.03 ft.); thence S 87°30'00" W 96.707 m (317.28 ft.) along the southerly boundary line of said entire tract to an easterly right of way fence line of the existing frontage road of record; thence along said easterly right of way fence line the following three (3) courses and distances: (1) N 7°10'48" W 21.211 m (69.59 ft.); thence (2) N 4°32'07" E 62.981 m (206.63 ft.); (3) N 15°30'22" E 323.984 m (1,062.94 ft.) to the point of beginning. The above described tract of land contains 51,070.9 square meters (12.62 acres), more or less.

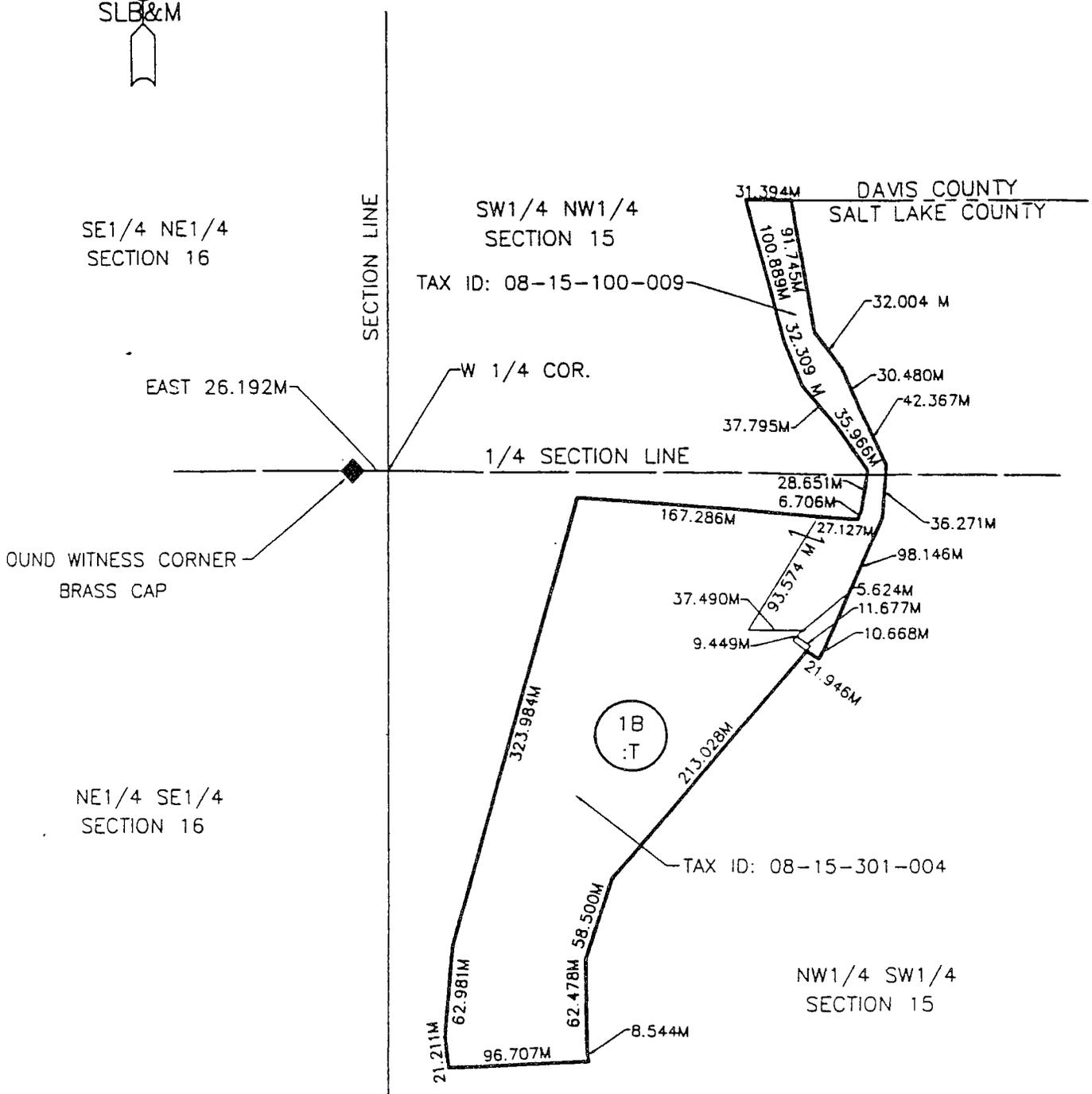
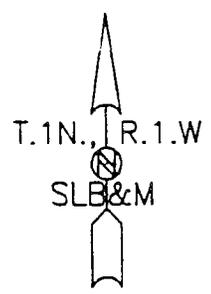
PAGE 2

Parcel No. 0067:1B:T  
Project No. SP-0067( )0

ALSO:

Beginning at a northwest corner of said entire tract at a point 268.834 m (882 ft.) east and 168.554 m (553 ft.) north (by record, but measures 246.5 m (808.73 ft.) east and 186.2 m (610.85 ft.) north) from said West Quarter corner of Section 15; running thence along a westerly boundary line of said entire tract the following six (6) courses: (1) S 15°07' E 100.889 m (331 ft.); thence (2) S 22°20' E 32.309 m (106 ft.); thence (3) S 40°49' E 37.795 m (124 ft.); thence (4) S 35°40' E 35.966 m (118 ft.); thence (5) S 8°40' W 28.651 m (94 ft.); thence (6) S 26°56' W 6.706 m (22 ft.); thence N 85°30' W 27.127 m (89 ft.) along a northerly boundary line of said entire tract; thence S 32° W 93.574 m (307 ft.) along a northwesterly boundary line of said entire tract; thence East 37.490 m (123 ft.) along a south boundary line of said entire tract; thence S 38°57' W 9.449 m (31 ft.), more or less, along a northwesterly boundary line of said entire tract; thence S 54° E 21.946 m (72 ft.) to an easterly boundary line of said tract; thence along said easterly boundary line the following seven (7) courses: (1) N 28°01' E 10.668 m (35 ft.); thence (2) N 24°02' E 98.146 m (322 ft.); thence (3) N 4°29' E 36.271 m (119 ft.); thence (4) N 25°40' W 42.367 m (139 ft.); thence (5) N 23°58' W 30.480 m (100 ft.); thence (6) N 37°16' W 32.004 m (105 ft.); thence (7) N 9°48' W 91.745 m (301 ft.), more or less, to a north boundary line of said entire tract; thence West 31.394 m (103 ft.), more or less, along said north boundary line to the point of beginning. The above described tract of land contains 9,712.4 square meters (2.40 acres), more or less.

Both tracts of land contain a total of 60,783.3 square meters (15.02 acres), more or less.



OWNER: LAWRY J. BOWDEN, 58.45%; CHRIS J. BOWDEN, 13.85%							
OWNER: JAMES J. BOWDEN, 13.85%; NANCY BOWDEN REGIER, 13.85%							
CEL NO.	NET SQ. m	SQ. FT.	ACRES	EXIST. R/W SQ. m IN DEED	OWNERSHIP SQ. m	REMAINING SQ. m	
						LEFT	RIGHT
7:1B:T	60,783.3	654,271.2	15.02	NONE	60,783.3	NONE	NONE

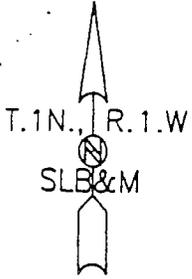
in Davis County, State of Utah, to-wit:

An undivided 58.45% interest in a tract of land in fee, being all of an entire tract of property situate in the SW~~1~~NW~~4~~ of Section 15, T. 1 N., R. 1 W., S.L.B & M. The boundaries of said tract of land are described as follows:

Beginning in the south line of Davis County at the southwest corner of said entire tract at a point 3.048 (10 ft.) east of a county boundary monument. Said point of beginning is also 268.834 m (882 ft.) east and 168.554 m (553 ft.) north (by record, but measures 246.5 m (808.73 ft.) east and 186.2 m (610.85 ft.) north) from the West Quarter corner of said Section 15; running thence along the westerly boundary line of said entire tract, and along the west bank of the abandoned Jordan River channel the following four (4) courses and distances: (1) N 11°07' W 57.912 m (190 ft.); thence (2) N 5°25' W 55.474 m (182 ft.); thence (3) N 6°14' W 48.768 m (160 ft.); thence (4) N 11°15' W 42.062 m (138 ft.), more or less, to the north boundary fence line of said entire tract, adjoining the Clyde S. Hill, et.al., property; thence East 16.764 m (55 ft.) along said north boundary fence line to the easterly boundary line of said entire tract, which is the east bank of said abandoned Jordan River channel; thence along said easterly boundary line and east bank the following five (5) courses and distances: (1) S 9°29' E 39.624 m (130 ft.); thence (2) S 15°59' E 50.597 m (166 ft.); thence (3) S 6°41' E 54.864 m (180 ft.); thence (4) S 17°31' E 55.169 m (181 ft.); thence (5) S 9°48' E 7.010 m (23 ft.), more or less, to said county line; thence West 31.394 m (103 ft.) along said county line to the point of beginning. The above described tract of land contains 4,653.8 square meters (1.15 acres), more or less.

Together with any and all water rights appurtenant to the above described tract of land.

Property 0067:1D  
 Project No. SP-0067( )0  
 West Davis Highway



NE1/4 NE1/4  
 SECTION 16

NW1/4 NW1/4  
 SECTION 15

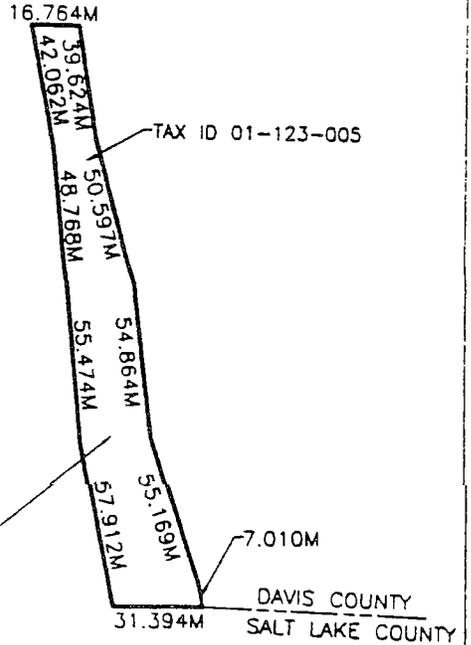
40 ACRE LINE

SE1/4 NE1/4  
 SECTION 16

SW1/4 NW1/4  
 SECTION 15

SECTION LINE

1D  
 :T



EAST 26.192M

FOUND WITNESS CORNER  
 BRASS CAP

1/4 SECTION LINE

NE1/4 SE1/4  
 SECTION 16

NW1/4 SW1/4  
 SECTION 15

OWNER: LAWRY J. BOWDEN, 58.45%; CHRIS J. BOWDEN, 13.85%; JAMES J. BOWDEN, 13.85%;  
 OWNER: NANCY BOWDEN REGIER, 13.85%.

ARCEL NO.	NET SQ. m	SQ. FT.	ACRES	EXIST. R/W SQ. m IN DEED	OWNERSHIP SQ. m	REMAINING SQ. m	
						LEFT	RIGHT
367:1:D	4,653.8	50,094.0	1.15	NONE	4,653.8	NONE	NONE

Appendix O  
**Section 106 Memorandum of Agreement  
Regarding the Legacy Parkway Project**

Signers:

Advisory Council on Historic Preservation  
Federal Highways Administration  
Utah State Historic Preservation Officer  
Utah Department of Transportation  
Utah Division of Indian Affairs

Tribal Concurrence:

The Northwest Band of Shoshoni of Idaho and Utah  
The Shoshone Bannock Tribes of Idaho  
The Ute Indian Tribe (of the Uintah-Ouray Agency)  
Confederated Tribes of the Goshute (Ibapah)  
Skull Valley Goshute Tribe

# Advisory Council On Historic Preservation

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The Old Post Office Building  
1100 Pennsylvania Avenue, NW, #809  
Washington, DC 20004

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JUN 21 2000

Mr. David C. Gibbs, P.E.  
Division Administrator  
Federal Highway Administration  
2520 West 4700 South, Suite 9A  
Salt Lake City, UT 84118-1847

REF: Legacy Parkway  
Project No. SP-0067()  
Davis and Salt Lake Counties, Utah

Dear Mr. Gibbs:

Enclosed are your copies of the fully executed Memorandum of Agreement for the referenced project. By carrying out the terms of the Agreement, you will have fulfilled your responsibilities under Section 106 of the National Historic Preservation Act and the Council's regulations for this project. We recommend that you also provide a copy of the fully-executed agreement to the Utah State Historic Preservation Officer, the Utah Department of Transportation, the Utah Division of Indian Affairs, the Northwest Band of Shoshoni, the Shoshone Bannock Tribe, the Ute Indian Tribe, the Confederated Tribes of the Goshute, and the Skull Valley Goshute Tribe. We have retained an original version of the agreement in this office where it will remain on file.

Should you have need to discuss this matter further, you may contact MaryAnn Naber at (202) 606-8534. We appreciate your cooperation.

Sincerely,



 Don L. Klima  
Director  
Office of Program Review

Enclosure

## MEMORANDUM OF AGREEMENT REGARDING THE LEGACY PARKWAY PROJECT

**WHEREAS**, the Federal Highway Administration Utah Division has determined that the Legacy Parkway Project between the I-215 Interchange, northern Salt Lake County, Utah and Burton Lane north of Farmington, Davis County, Utah (hereinafter called the Project) will have an effect upon **42DV2, 42DV70, and 10N 650 W. Clark Lane Farmington, Utah** properties included in or eligible for inclusion in, the National Register of Historic Places, and has consulted with the Utah State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f) and Section 4(f) of the Department of Transportation Act of 1966 (23 CFR 771.135); and

**WHEREAS**, the Project constitutes a federal action and requires compliance under federal statutory requirements; and the Federal Highway Administration, Utah Division (hereinafter called the FHWA) is the lead Federal Agency, will carry out the terms of this agreement (hereinafter called Agreement); and

**WHEREAS**, the Utah Department of Transportation (UDOT) is the agency coordinating this project, and has participated in the consultation, and been invited to concur in this Memorandum of Agreement (MOA); and

**WHEREAS**, the FHWA and UDOT recognize that the Shoshone Bannock Tribes of Idaho are a sovereign government located outside the exterior boundaries of the State of Utah, and that technical and government to government consultation will be directly with the Shoshone Bannock Tribes of Idaho ; and

**WHEREAS**, the Project is large and complex, with a potential for the discovery of additional properties eligible for inclusion in, the National Register of Historic Places, the UDOT intends to use the provisions of this Agreement to address all activities that may result in impacts to both known and inadvertently discovered historic properties; and

**WHEREAS**, the Project area of potential effect (hereinafter called APE) for this undertaking includes all lands subject to project activities or activities directly funded by the Project as delineated in Appendix A.

**WHEREAS**, All areas within the APE were surveyed for cultural resources as detailed in *A Cultural Resources Inventory of the proposed Legacy/West Davis Highway in Davis and Salt Lake Counties Utah (Colman and Colman 1998)*; and

**WHEREAS**, the Northwest Band of Shoshone of Idaho and Utah the, the Ute Indian Tribe of the Uintah-Ouray, Utah, Confederated Tribes of the Goshute (Ibapah), Utah, the Skull Valley Goshute Tribe and the Shoshone Bannock Tribes of Idaho (hereafter called Tribes) participated in the technical coordination and consultation and have been invited to concur in this Memorandum of Agreement; and

**WHEREAS**, the Utah Division of Indian Affairs (DIA) is the agency responsible for Native American graves protection and repatriation for the State of Utah and the tribes located in the State of Utah, which has participated in the consultation and has been invited to be party to this Memorandum of Agreement; and

**WHEREAS**, the consulting parties have considered the applicable requirements of the Utah Native American Graves Protection and Repatriation Act of 1992 (U.C.A. 9-9-401, et seq., hereinafter called NAGPRA, and its implementing Rule R230-1), and the Utah Code 76-9-704, in the course of consultation; and

**WHEREAS**, the parties to this agreement recognize that every reasonable effort should be made to protect, from possible harm by the project, Traditional Cultural Properties it is incumbent upon the tribes, or such interested party(ies), to identify any TCP's believed to exist within the project APE.

**WHEREAS**, the definitions given in Appendix B are applicable throughout this Memorandum of Agreement; and

**NOW, THEREFORE**, the FHWA, the Utah SHPO, and the Council agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of Legacy Parkway Project on historic properties.

### STIPULATIONS

The FHWA, shall ensure that the following measures are carried out:

**I. MITIGATION OF PROJECT IMPACTS TO KNOWN SITES: 42DV2, 42DV70, and 10N 650 W. Clark Lane Farmington, Utah.**

**A. Historic Structures**

The UDOT, or its consultant will complete a Full Utah Intensive Level Survey Form (ILS) form for each eligible and contributory structure.

1. Photographs: Photographs are required of all buildings or structures on the property at 10N 650 W. Clark Lane Farmington, Utah.. This means at least one photograph of all elevations, of professional quality black/white 35 millimeter photographs (3x5 prints with accompanying negatives) to show all exterior elevations (where possible to obtain all elevations), the street scape, and detailed photographs of all areas to be impacted by the adverse effect. Photographs of exterior architectural trim/decorations shall be

submitted. Photographs shall be numbered and labeled with address (street and city) and date the photograph was taken, and keyed to a site plan and floor plan. All prints and negatives shall be submitted in archival quality protective storage pages.

2. Drawings: Sketch floor plans of all eligible buildings on the properties at 10N 650 W. Clark Lane Farmington, Utah shall be submitted. The plans must be based on an accurate footprint (e.g., Sanborn maps, tax card drawings, or measurements taken on site) and show all existing construction. Rooms shall be labeled by use. These non-measured drawings are to be on 8.5 " x 11 " or 11 " x 17" sheets. A site sketch plan showing subject buildings and all out buildings is also required.
3. Research Materials: A legible photocopy of the entire historic tax card of the property and a 5x7 inch black and white, 35mm print and negative of the historic tax card photo shall be submitted. Label and submit print and negative as described above.
4. Repository: All materials shall be submitted to the Division of State History, Historic Preservation Office to be placed on file.

#### **B. Archaeological Sites**

1. Data recovery: The FHWA shall ensure that a data recovery plan is developed in consultation with the SHPO for the recovery of archeological data from 42DV2, and 42DV70. The plan shall be consistent with the Secretary of the Interior's Standards and Guidelines for Archeological Documentation (48 FR 44734-37) and take into account the Council's publication, Treatment of Archeological Properties (Advisory Council on Historic Preservation, 1980), subject to any pertinent revisions the Council may make in the publication prior to completion of the data recovery plan and to relevant SHPO or other guidance. It shall specify, at a minimum:
  - a. the research questions to be addressed through the data recovery, with an explanation of their relevance and importance;
  - b. the methods to be used, with an explanation of their relevance to the research questions;
  - c. the methods to be used in analysis, data management, and

- dissemination of data, including a schedule;
  - d. the proposed disposition of recovered materials and records;
  - e. proposed methods for involving the interested public in the data recovery;
  - f. proposed methods for disseminating results of the work to the interested public;
  - g. proposed methods by which the tribes or other interested parties will be kept informed of the work and afforded the opportunity to participate;
  - h. a proposed schedule for the submission of progress reports to the SHPO, the Council, and the tribes at their request; and
  - i. The data recovery plan shall be submitted by the UDOT to the SHPO, and also to the tribes at their request, for 30 days review. Unless these parties object within 30 days after receipt of the plan, the FHWA through the UDOT shall ensure that it is implemented.
- C. Reporting: The FHWA shall ensure that any/all reports on activities carried out pursuant to this agreement are provided to the SHPO, the Council, and upon request, to the Tribes or any other interested parties, following completion of the activities stipulated in the agreement.
- D. Personnel Qualifications: The FHWA shall ensure that all historic work carried out pursuant to this agreement is completed by or under the direct supervision of a person or persons meeting or exceeding the Secretary of interior's Standards for History or Archaeology as appropriate (36 CFR 61 Appendix A).

## II. THE PLAN OF ACTION FOR INADVERTENT DISCOVERY OF CULTURAL RESOURCES

The UDOT has developed a plan of action in consultation with the Tribes and SHPO regarding inadvertent discovery, of historic properties potentially eligible to the NRHP. The plan detailed below describes

coordinating efforts among UDOT, the Tribes, and USHPO; assessment of effects to historic properties (not affecting Utah NAGPRA related issues); inventory and evaluation process; treatment of TCPs, identified within the APE and mitigation strategies.

- A. In the Event that cultural resources are discovered:
1. work will stop in the immediate area of the discovery in accordance with UDOT Standard Specification 104.15 as detailed in Appendix D. The UDOT will notify the parties to the Agreement.
  2. The discovered resources will be evaluated for NRHP eligibility.
    - a. The UDOT will initiate internal coordination with their contractor.
      - (1) Designated contractor will prepare draft inventory reports and recommendations regarding the NRHP eligibility of identified properties.
      - (2) Content and scope of Draft and final report(s) on the results of the evaluation studies will follow state guidelines as found in the UDOT's Consultant Guidelines.
    - b. In consultation with USHPO, the UDOT will apply the NRHP criteria (36 CFR 60.4) to all archaeological cultural resources discovered during the project with regard to their potential for inclusion in the NRHP. This evaluation shall take into account the guidance found in all applicable National Register Bulletins.
  3. Determinations of effect will be made for all discovered NRHP eligible properties.
    - a. In situations affecting historic properties, application of the criteria of effect and adverse effect described in 36 CFR 800.9 (a) and (b) will be implemented.
    - b. A Determination of Eligibility and Finding of Effect (DOE-FOE) will be submitted to the USHPO and to the Tribes along with appropriate documents relative to the stipulations of this Agreement.

#### 4. Treating Effects

- a. If the undertaking might affect historic properties as defined by 36 CFR 800.2 (e), the UDOT, will develop site specific treatment plans to minimize or mitigate the effects of the historic properties located within the area of the discovery in coordination with the USHPO, the Tribes, and other interested parties as follows:
- (1) Human remains and the associated cultural items will be treated in accordance with the Utah NAGPRA (See Appendix C of this Agreement).
  - (2) The preferred alternative to mitigation is avoidance of impact to historic properties.
  - (3) Project redesign will be implemented when technically, economically, and environmentally feasible, to avoid the placement of the facility, or related construction activities in a manner that may affect historic properties.
  - (4) Development of site-specific mitigation plans/strategies for individual areas of effect will include:
    - (a) full analysis and documentation of the materials and data resulting from the studies according to a Research Design drafted in consultation with the SHPO.
    - (b) Submission of appropriate documents relative to the stipulations of this Agreement to the USHPO and to the Tribes.
    - (c) All properties identified during the inventory will be recorded or updated on Utah cultural resources inventory forms. Inventories completed after the initial scope of work is completed will follow the stipulations established in this document. All site documents, except as noted in Section III E,

will be included with each report as a detached appendix that is not available for public distribution in accordance with this Agreement and other statutory obligations including ARPA (43 CFR 7.18).

### III. ADMINISTRATIVE STIPULATIONS

#### A. Changes in the undertaking.

1. Changes in the Project will not relieve the UDOT of the responsibility of completing resource evaluations.
2. If, during the Project planning or implementation, modification and/or changes in the undertaking are proposed in ancillary areas that have not been previously inventoried for historic properties, the UDOT shall ensure that the area is inventoried and that historic properties are evaluated in a manner consistent with the inventory, evaluation, and standards identified in this Agreement. The UDOT will prepare a draft report(s) of the inventory results and submit said document(s) to the parties of this Agreement for review and comment. A final report incorporating the comments of the said parties will be prepared. Final reports will be provided to the parties of this Agreement.
3. The applicable Research Design shall be modified or appended, as appropriate by the contractor (s) under the direction of the UDOT, in consultation with USHPO, to incorporate treatment and management measures for previously unevaluated historic properties consistent with the Agreement. The Tribes may request participation to review and comment on the Research Design upon written notice to the UDOT.
4. The parties to this Agreement shall be afforded an opportunity to comment within 30 days on documents prepared in response to revisions to the undertaking.

#### B. Tribal Consultation Process

Tribal Consultation will occur between the UDOT and the Tribes throughout the project. In general, consultation will take place on two levels: Technical Interaction and Formal Government to Government

#### Consultation.

1. Technical Interaction. This means coordination between the technical staff of the parties to this Agreement. Such interaction may occur through communication by informal means, i.e. telephone conversations, etc. and/or formal interaction and correspondence. This level also may include seeking advise and opinion from other governmental agencies that share an interest or responsibility.
2. Formal Government to Government Consultation. Government to Government Consultation is considered consultation by definition. This involves interaction and communication between the policy/decision maker representatives of the parties to this Agreement, such as the UDOT, USHPO, ACHP, the Utah Division of Indian Affairs, and the respective Tribes. This process will be initiated by formal correspondence/notification as required by Utah NAGPRA or other applicable laws. At this point, after formal notification, the technical staff shall advise the government level representatives of the issue and make recommendations toward a viable decision/resolution.

#### C. Traditional Cultural Properties (TCP's)

1. If a TCP is identified to the UDOT, the UDOT and/or its contractor shall immediately secure the identified site from any potential impacts and notify the SHPO of such TCP. SHPO notification will occur within 1 working day. The UDOT and/or its contractor shall make an initial determination of possible effect to the identified TCP, and take reasonable steps to protect the TCP. Consultation with the affected tribal interest will be initiated. At the discretion of the UDOT and the party that identified the TCP, a formal consultation process, as described in section III B, may be utilized in this effort. If a dispute results, the Dispute Resolution described in section III G will be initiated.
2. In accordance with Section III A(5), if the party identifying the TCP provides the UDOT with a written request to safeguard the confidentiality of the identified TCP, the UDOT will make every reasonable effort to protect the confidentiality of the identified TCP.

#### D. Curation

1. Cultural material (artifact) curation. Upon discovery and gathering of cultural items within the Project APE, exclusive of Utah NAGPRA items as defined by that act, the UDOT will ensure that the items will be placed in an appropriate repository facility as described in 36 CFR 79.
2. Reporting and documentation curation. Upon the UDOT finalizing the documentation of the Project, all reports and documentation will accompany the cultural material consistent with the provisions described in 36 CFR 79. Upon written request of the Tribes, a copy of said documentation shall be provided for the tribal archives.
3. The cultural material, records, and other material resulting from the implementation of this Agreement and the Project will be subject to the provisions of the Freedom of Information Act, unless otherwise specified within this Agreement.

E. Confidential Safeguards

In accordance with 36 CFR 79 AND Section 304 of the National Historic Preservation Act, all applicable information will be safeguarded and not provided to the general public.

F. Public Participation

1. The UDOT will afford interested parties with an adequate opportunity to receive information and to express their views regarding the Project. Public notice will be coordinated through NEPA as articulated in 23 CFR 771.

G. Dispute Resolution

1. Should the USHPO, the tribes, or DIA, or the Council, object within 30 days to any documentation provided for review pursuant to this agreement, the UDOT shall consult with the objecting party to resolve the objection. If the UDOT determines that the objection cannot be resolved, the UDOT shall request the further comments of the Council pursuant to 36 CFR § 800.6(b). Any Council comment provided in response to such a request will be taken into account by the UDOT in accordance with 36 CFR § 800.6(c)(2) with reference only to the subject of the dispute; the UDOT 's

responsibility to carry out all actions under this agreement that are not the subjects of the dispute will remain unchanged.

2. The Utah Division of Indian Affairs State NAGPRA Review Committee will arbitrate disputes relative to Utah NAGPRA in accordance with U.C.A. 9-9-405 (3)(c), if consultation fails to resolve the dispute.

#### H. Time Frames

1. Document Review. Unless otherwise stated, document review shall be 30 days following receipt of said document submitted for review. The UDOT may assume failure of any party to respond within 30 days indicates their concurrence.
2. Amendment. The UDOT will provide copies of written request(s) for amendment from any signatory party to all other signature parties within 3 days, and the parties agree to begin discussions regarding proposed amendments immediately.

#### I. Amendments

1. Any signature party to this Agreement may request an amendment (s), whereupon the other signature parties will consult to consider such amendment(s).
2. Any proposed amendment to this Agreement must be submitted to the UDOT in writing, with an explanation as to the reasoning for the requested change. The UDOT will initiate consultation with the signature parties for their consideration of the proposed amendment(s) under the time provisions as set forth in III Section H2.

#### J. Monitoring

1. A monitoring plan will be included in the Research Design(s). Project monitoring will ensure all parties to this Agreement that the activities and provisions of this Agreement are in compliance. Monitoring will also ensure that all parties to this Agreement will have oversight and updates to the Project as the Project commences.
2. After completion of the fieldwork component of the data recovery

provided for in Section I, the UDOT will ensure that particular care is taken during construction to avoid affecting any other archeological remains that may be associated with the sites recorded during the initial survey. Restrictions on construction work in all areas not previously cleared in the original Determination of Eligibility and Finding of Effect will be accomplished by erection of a temporary fence and flagging as necessary. Suitable arrangements for archeological monitoring, and any additional survey deemed necessary, will be made in consultation with the SHPO prior to construction in the APE. An archeologist meeting the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738-9) will monitor the construction activities. The Tribes will be invited to assist in the monitoring in conjunction with the authorized archaeologist. At a minimum, such monitoring will include recording and reporting of major features or artifact concentrations uncovered, and recovery and curation of a sample of uncovered remains where practicable.

Execution of this Memorandum of Agreement and implementation of its terms evidence that the FHWA has afforded the Council an opportunity to comment on the Legacy Parkway Project and its effects on historic properties, and that FHWA has taken into account the effects of the undertaking on historic properties.

ADVISORY COUNCIL  
ON HISTORIC PRESERVATION

By: Bernice M. Brown for John M. Fowler  
John M. Fowler, Executive Director

Date: 6-21-00

FEDERAL HIGHWAYS ADMINISTRATION

By: David C. Gibbs  
David C. Gibbs, P.E., Division Administrator

Date: 5/22/00

UTAH STATE HISTORIC PRESERVATION  
OFFICER

By: Max J. Evans  
Max J. Evans, Utah SHPO

Date: 3/15/2000

UTAH DEPARTMENT OF TRANSPORTATION

By: Thomas R. Warne  
Thomas R. Warne, Executive Director

Date: 2-24-00

UTAH DIVISION OF INDIAN AFFAIRS

By: Forrest S. Cuch  
Forrest S. Cuch, Director

Date: 5-11-00

Concur:

THE NORTHWEST BAND OF SHOSHONI OF  
IDAHO AND UTAH

By: Gwen T. Davis  
Gwen T. Davis, Chairman

Date: 3-31-2000

THE SHOSHONE BANNOCK TRIBES

By: \_\_\_\_\_  
Duane Thompson, Chairman

Date: \_\_\_\_\_

THE UTE INDIAN TRIBE (OF THE UINTAH-  
Ouray AGENCY)

By: \_\_\_\_\_  
Roland McCook, Chairman

Date: \_\_\_\_\_

CONFEDERATED TRIBES OF THE  
GOSHUTE (IBAPAH)

By: \_\_\_\_\_  
David Pete, Chairman

Date: \_\_\_\_\_

SKULL VALLEY GOSHUTE TRIBE

By: \_\_\_\_\_  
Leon Bear, Chairman

Date: \_\_\_\_\_

## APPENDIX B - DEFINITIONS

**“Area of Potential Effects”** (APE) is defined as geographic area within which an undertaking and/or connected action may cause changes in the character or use of heritage resource properties. Although treatment of properties may vary with land status, the area of potential effects was determined without regard for land status and includes both state and private lands as delineated in (Exhibit A). In defining the area of potential effect, the UDOT included all lands potentially affected by the proposed project within a thousand foot (1000') wide corridor between the I-215 interchange and Burton Lane north of Farmington.

**“Associated Funerary items”** are defined as items that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed intentionally at the time of death or later, with or near individual human remains.

**“Data Recovery Plan”** is a planning document that provides details for the recovery of information from historic properties on a site by site basis. Data recovery is a specific form of treatment usually associated with 36 CFR 60.4, Criterion D.

**“Day”** is defined as calendar day throughout this document.

**“Discovery Situation”** is an occurrence whereby human remains or an historic property are identified as a result of the process described in the Monitoring Plan, or during construction.

**The Legacy/West Davis Highway Research Design (Research Design)** is a planning document that is consistent with State and Federal technical standards which produces reliable, understandable and up-to-date information for decision making related to the identification, evaluation, and protection/treatment of historic properties and traditional cultural properties.

**“Historic Property”** is any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP. This term includes artifacts, records, and remains related to or located within such properties. This term also includes properties associated with traditional life-way values when such values are considered eligible for inclusion in the National Register. For the purposes of this agreement, a traditional life-way value must be associated with a definite location.

**“Interested Parties”** are defined as those organizations and individuals that are concerned with the effect of an undertaking on historic properties as defined in 36 CFR 800.5 (e)(1).

**“Monitoring Plan”** identifies the methods for assuring that historic properties discovered during the land disturbance activities of an undertaking will be subject to the provisions of the Agreement This planning document is incorporated into the Research design.

**“National Register of Historic Places”** (NRHP) refers to the national register of districts, sites, buildings, structures, and objects significant in history, architecture, archaeology, engineering and culture. The National Historic Preservation Act of 1966, as amended, authorizes the Secretary of interior to amend and maintain this register.

**“Objects of cultural patrimony”** means items having ongoing historical, traditional, or cultural importance central to the Indian tribe itself.

**“Traditional Cultural Property”** (TCP) is defined generally as one that is eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. For the purposes of this agreement the communities or social groups are the Northwest Band of Shoshone of Idaho and Utah, the Shoshoni Bannock Tribes, and The Ute Indian Tribe (Of the Uintah-Ouray Agency), and Confederated Tribes of the Goshute (Ibapah), individually or collectively.

**“UDOT”** ( the Utah Department of Transportation) is the agency responsible for the project and is the lead agency for purposes of compliance with the terms and regulations stipulated in this agreement as designated by the Federal Highway Administration, Utah Division (FHWA)

**“Tribe(s)”** is defined as The Northwest Band of Shoshone of Idaho and Utah, The Ute Indian Tribe (Of the Uintah-Ouray Agency) Confederated Tribes of the Goshute (Ibapah) and Skull Valley Goshute Tribe, and the Shoshone Bannock Tribes of Idaho. Although the collective term “Tribe” is applied within this agreement, each Tribe which participated in the consultation and concurs in this agreement, and will be notified individually for any and all actions described.

## APPENDIX C

### I. IMPLEMENTING UTAH NAGPRA U.C.A. 9-9-401 *et. seq.* AND ITS IMPLEMENTING RULE R230-1 AND UTAH CODE 76-9-704 ABUSE OR DESECRATION OF A DEAD HUMAN BODY

#### A. Purpose:

1. Purpose: The Parties to the Agreement intend to respect and be sensitive to the cultural perspectives and responsibilities, the religious and ceremonial rights, and sacred practices of the Tribes in fulfilling tribal interests in the discovery of Utah NAGPRA related items identified during the Project.

#### B. Objectives:

1. To implement the legislative provisions of Utah law specifically, U.C.A. 76-9-704 and 9-9-401 *et. seq.* within the intent of such legislation.
2. To implement legal requirements, while respecting and maintaining the dignity of the individual and the Utah NAGPRA related cultural items potentially discovered during the Project's construction, and in conjunction with the best interests of, the UDOT, the SHPO, and the Tribes.
3. To facilitate UDOT compliance with Utah NAGPRA, respective to decisions that must be made, and actions taken, regarding curation, disposition, re interment, data recovery, consultation and notification, and treatment, of human remains and cultural items as defined by Utah NAGPRA.
4. To provide guidance for UDOT construction personnel regarding the discovery and notification process upon location of human remains and cultural items as defined by Utah NAGPRA

C. Implementation of Objectives:

1. The UDOT will provide the construction personnel supervisors with a set of procedures to be followed in the event of an inadvertent discovery of human remains as detailed in Figure 1 of this Appendix.
2. In accordance with UDOT Standard Specification 104.15 (Appendix D), upon discovery of human remains (including cultural items as defined by Utah NAGPRA), construction activities within the immediate area of discovery shall cease, the site will be secured, and notification of law enforcement, Division of Indian Affairs and USHPO Antiquities Section as required by U.C.A.9-9-403, and U.C.A. 76-9-704, will commence immediately.
  - (1) If the site is determined not to contain Native American remains, UDOT will advise the Tribes of such determination. Work will resume at the direction of the UDOT archaeologist.
  - (2) If the site is determined to contain Native American remains, UDOT will provide notification to the Tribes according to the consultation and notification procedures outlined in section III B (1) of this agreement and applicable requirements of Utah NAGPRA [9-9-403(4)b and R-230-1-6(4)].
3. At such time a discovery of human remains is made and construction ceases in the area of the discovery, and having satisfied the requirements of U.C.A. 76-9-704:
  - a. If the remains are in immediate danger of harm, or in the event that construction could not move, they will be excavated in accordance with R-230-1-7(1)a. All records and documentation will be afforded as much confidentiality as desired by the tribes and allowable by such laws and regulations as apply according to Stipulation E III.

- b. If the site at which the remains are located can remain intact and free from immediate harm, the site will be secured and a preservation plan will be implemented according to R-230-1-7-1.
4. Any excavated Native American remains will remain in the custody of the UDOT or its consultant pending consultation and determination of ownership.
5. The repatriation of the individual will be consistent with, Utah NAGPRA [9-9-403 and R-230-1-13 et. seq.].

## II. GENERAL PROVISIONS:

- A. Dispute Resolution: Disputes on non Utah NAGPRA related issues will be resolved according to the dispute resolution procedures as described in the Agreement Section III G. The Utah NAGPRA Review Committee will resolve all Utah NAGPRA related disputes.
- B. Treatment of Utah NAGPRA related items and human remains:
  1. Human Remains
    - a. Any and all human remains that have been damaged or removed due to construction activity will be immediately returned to accompany the remains still present in the site.
  2. Associated Funerary Items/Items of Cultural Patrimony
    - a. Unless otherwise identified, Associated Funerary Items/Items of Cultural Patrimony found near or about the discovery of human remains will be immediately returned to accompany the human remains. Associated Funerary items are defined as items that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed intentionally at the time of death or later, with or near individual human remains. Objects of cultural patrimony means items having ongoing historical, traditional, or cultural importance central to the Indian tribe itself. If they are so identified,

documentation of these materials will be included in the reports as funerary objects and/or items of cultural patrimony.

# Legacy Parkway Project

## Procedure for Implementing Utah NAGPRA and Section 106

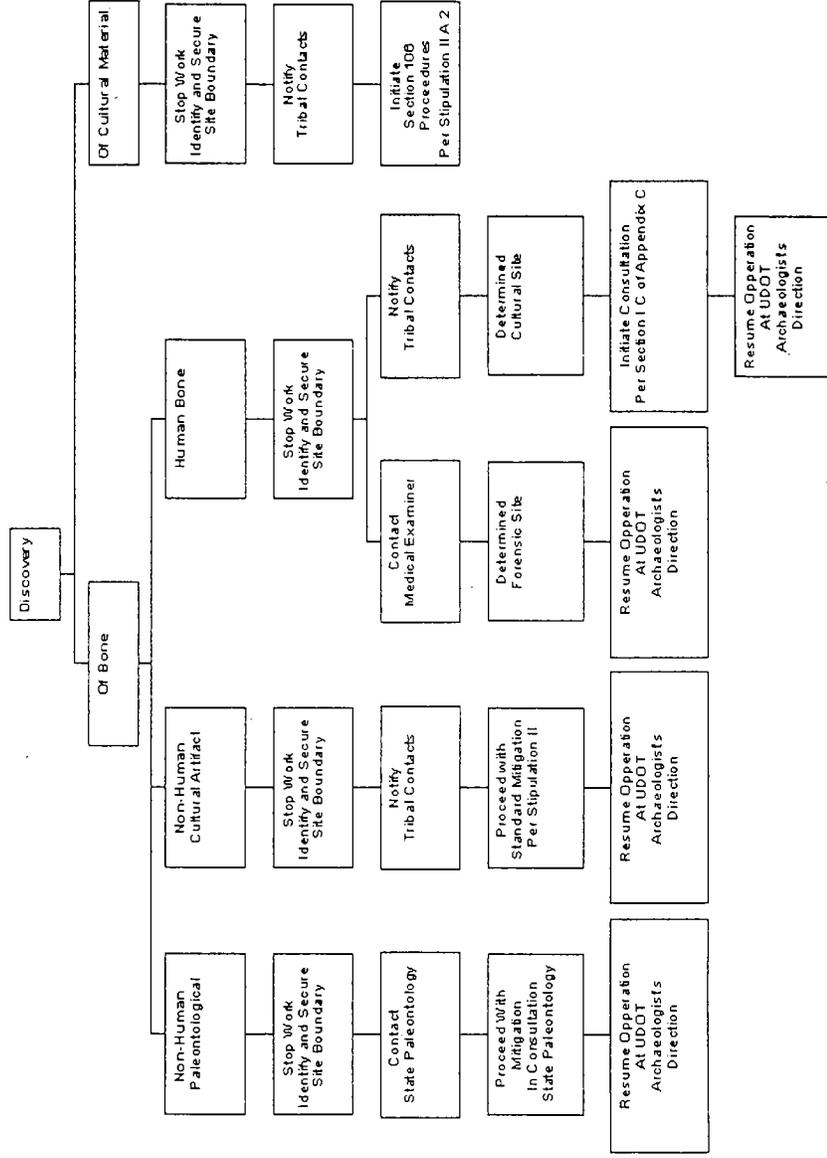


Figure 2. Outline of UDOT Discovery Procedure.

## APPENDIX D

### UDOT STANDARD SPECIFICATION FOR DISCOVERY OF HISTORIC, ARCHEOLOGICAL OR PALEONTOLOGICAL OBJECTS

#### **104.15 Discovery of Historic, Archeological or Paleontological Objects:**

If a suspected historic, archeological or paleontological item, feature, or site is encountered, construction operations shall be immediately stopped in the vicinity of the discovery and the ENGINEER shall be verbally notified of the nature and exact location of the findings. The CONTRACTOR shall not damage the discovered objects and shall provide written confirmation of the discovery to the ENGINEER within 2 calendar days.

After operations in the vicinity of the discovery have been restricted, the ENGINEER will keep the CONTRACTOR informed concerning the status of the restriction. The CONTRACTOR should be aware that the time necessary for the DEPARTMENT to handle the discovered item, feature, or site is variable and is dependent on the nature and condition of the discovered item, feature, or site. It is possible that a delay of as much as 2 weeks in the vicinity of the discovery can be expected. The ENGINEER will inform the CONTRACTOR when the restriction is terminated, with written confirmation following within 2 calendar days. If a changed condition is approved, it will be controlled in accordance with Subsection 104.2: Differing Site Conditions.





State of Utah  
DEPARTMENT OF TRANSPORTATION

FILE COPY

Michael O. Leavitt  
Governor  
Thomas R. Warne  
Executive Director  
John R. Njord  
Deputy Director

Ahmad O. Jaber, Director  
Region One  
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P.O. Box 12580  
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FAX: 801-399-5926  
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Commission  
Glen E. Brown  
Chairman  
James G. Larkin  
Hal M. Clyde  
Stephen M. Bodily  
Jan C. Wells  
Bevan K. Wilson  
Kenneth L. Warnick

February 21, 2001

Ms. Barbara L. Murphy  
Preservation Planner  
State Historic Preservation Office  
300 Rio Grande  
Salt Lake City, UT 84101-1182

RE: Project No. SP-0067(1)0: Legacy Parkway. Salt Lake and Davis Counties, Utah.  
Case #: 97-0375

**Submission of ILS Documentation for 650 West State Street  
Farmington**

Dear Ms. Murphy

In accordance with the MOA for the Legacy Parkway Project, please find enclosed an ILS package for 650 West State Street Farmington a property which will be adversely affected by the project.

Thank you for your efforts on our behalf. If you have any questions, please call me at 399-5921 ext. 371.

Sincerely,

Christopher Lizotte, M.A.  
Preservation Specialist  
Region One

enclosure

cc: w/o enclosure

Byron Parker, P.E., Legacy Team  
Vince Izzo, P.E., HDR Engineering, Inc.  
Asa Nielson Baseline Data Inc. 789 East Bamberger Hwy. American Fork 84003



# State of Utah

Department of Community and Economic Development  
Division of State History  
Utah State Historical Society



Michael O. Leavitt  
Governor  
Max J. Evans  
Director

300 Rio Grande  
Salt Lake City, Utah 84101-1182  
(801) 533-3500 FAX: 533-3503 TDD: 533-3502  
ushs@history.state.ut.us http://history.utah.org

March 8, 2001

Christopher Lizotte, M.A.  
Preservation Specialist  
Region One  
Utah Department of Transportation  
169 North Wall Avenue  
P.O. Box 12580  
Ogden UT 84412-2580

RE: Project No. SP-0067(1)0: Legacy Parkway - ILS Documentation for 650 West State Street,  
Farmington

In Reply Please Refer to Case No. 97-0375

Dear Mr. Lizotte:

Thank you for the submission of the documentation specified in the Memorandum of Agreement for the above referenced project. These materials will be placed on file in the Preservation Office of the Division of State History.

This information is provided to assist with Section 106 responsibilities pursuant to §36CFR800. If you have questions, please contact me at (801) 533-3563. My email address is: bmurphy@history.state.ut.us

Sincerely,

Barbara L. Murphy  
Preservation Planner  
State Historic Preservation Office

BLM:97-0375 DOT



Michael O. Leavitt  
Governor  
John R. Njord  
Executive Director  
Carlos M. Braceras  
Deputy Director

# State of Utah

DEPARTMENT OF TRANSPORTATION

Ahmad O. Jaber, Director  
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SEP 24 2001

**Commission**  
Glen E. Brown  
Chairman  
James G. Larkin  
Hal M. Clyde  
Stephen M. Bodily  
Jan C. Wells  
Bevan K. Wilson  
Kenneth L. Warnick

September 20, 2001

Ms. Barbara L. Murphy  
Preservation Planner  
State Historic Preservation Office  
300 Rio Grande  
Salt Lake City, UT 84101-1182

RE: Case #: 97-0375 Legacy Parkway Haul Routes for Construction

Dear Ms. Murphy:

The Utah Department of Transportation (UDOT or Department) has started construction on the Legacy Parkway. The UDOT has considered the effects of this undertaking on any historic or archeological resources which could be eligible for the State or National Registers, and to afford the Utah State Historic Preservation Office (USHPO) an opportunity to comment on the undertaking and its effects, as outlined in U.C.A. 9-8-404. In addition, the UDOT is complying with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulation, 36 CFR Part 800. This compliance is being conducted by UDOT on behalf of the Federal Highway Administration, Utah Division (FHWA). Please review this letter and the attached materials and, providing you agree with the finding contained herein, sign and date the signature line at the end of this letter.

The UDOT Contractor on the Legacy Parkway is a consortium of Fluor Daniel, Ames Construction, and Edward Kraemer and Sons (FAK), has identified a route to haul material from an existing commercial borrow site in Weber County to the Legacy Parkway. A notification regarding the haul route was provided to the public in the affected area at the end July 2001. Several comments were received from the public regarding potential impacts to historic structures along the haul route from vibration caused by the haul trucks.

The requirements for haul routes are identified in the contract between the Department and FAK. In July, FAK identified this particular haul road based on the limitations placed on them in the contract. The requirements include the need to minimize impacts to motorists, and to avoid congested areas around the Lagoon Amusement Park, during its peak operating season.

A key limitation in the contract requires FAK to limit their operations to State Roads, to avoid impacts to municipal roads not designed for truck traffic. Both State and Main Streets in Farmington are State Routes, regularly traveled by heavy trucks. And unlike other non-UDOT, non-project trucks on these roads, project trucks are weighed to insure no over-load violations. And the travel speed of the project trucks along this haul route is also monitored. These steps help to limit truck vibration and noise.

The possibility of vibration damage to structures is not a new issue to UDOT. UDOT regularly monitors vibration impacts at adjacent structures during the course of construction. UDOT employs a full time seismic operator, Jerry Ryan to monitor vibration effects. There are no mandated national or FHWA standards for vibration. Jerry and many FHWA people rely on research funded by the United States Department of Transportation. That research claims that in most soils, the *possibility* of architectural damage from traffic does not start until vibration reaches about .2 inches per second. And although plaster cracks have been recognized as low as .2 in/sec., actual damage is not to be expected until the vibration reaches a full two

Ms. Barbara L. Murphy, Letter  
September 20, 2001  
Page 2

(2) inches per second.

Consistent with normal Department practices, UDOT has monitored haul route traffic along the entire corridor for potential vibration impacts from haul trucks. This was accomplished by setting up seismic monitors along the project haul routes, including areas with historic structures (Attachment 1 and 3). The monitors were placed immediately behind the curb of the road approximately 20 to 30 feet from the residences along the route. The monitors were placed at the curb next to the road to detect the highest possible vibration level. Monitors on this route were operating over several days for a 2 hour period at each location during which time trucks, including Legacy Parkway haul trucks, were tracked (Attachments 2 and 4). In order to test the possibility of vibration damage to structures, Jerry set up his monitor at a setting of .15 in/sec. Vibration was so low, he could not get a reading, even at this lower setting and even in such close proximity to the vibration source.

Results of the monitoring showed that none of the seismic monitors registering any vibration at the curb that exceeded the conservative threshold level we established (.15 inches per second) at which the monitors were set to read. Therefore, the UDOT has determined that there will be **No Historic Properties Affected** from vibration associated with this material hauling operation.

Please note that this route is used by numerous other trucks, not associated with the Legacy Parkway. And UDOT also monitored noise associated with the truck haul route and found no increase from the FAK truck noise over the other traffic on the route.

Consistent with standard UDOT practices we will continue to monitor for project impacts. I will keep you informed of any findings if they occur. If you have any questions, please contact me at 399-5921 ext. 371.

Sincerely,

  
Christopher Lizotte, M.A.  
Archaeologist and NEPA Specialist  
Region One

I concur with the finding of **No Historic Properties Affected** from vibration associated with this material hauling operation on State Street Farmington, Davis County, Utah. Further, the UDOT has taken into account the effects of the proposed project on historical and archaeological resources, as required by Section 106 and U.C.A. 9-8-404.

---

Barbara L. Murphy, Preservation Planner

Date

CC:  
Byron Parker, P.E. Legacy Parkway Team  
Vince Izzo, HDR Engineering, Inc.



Department of Community and Economic Development  
Division of State History  
Utah State Historical Society

UTAH STATE  
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October 19, 2001

Christopher Lizotte, M.A.  
Archaeologist and NEPA Specialist  
Region One  
Utah Department of Transportation  
169 North Wall Avenue  
P.O. Box 122580  
Ogden UT 84412-2580

RE: Legacy Parkway Haul Routes for Construction

In Reply Please Refer to Case No. 97-0375

Dear Mr. Lizotte:

There are a number of issues we would like to address regarding the haul route through Farmington for the Legacy Parkway project. Many of these issues have been raised by residents of Farmington who have expressed deep concern about the affect of this particular undertaking and of future activities related to the parkway project.

As you are aware, the "undertaking" of intensive hauling of material for the Legacy Parkway along State and Main Streets in Farmington, where a number of historic properties exist, was well underway before consultation was initiated with our office. This precluded any ability on our part or on the part of consulting parties to participate in the discussion of avoidance through the use of other routes or in the exploration of mitigation options.

The vibration study conducted by UDOT a few weeks after the trucks were rolling was a sincere attempt on the part of UDOT to determine the vibration effects of this undertaking. However, the methodology and standards used in this study may not be appropriate for the resources involved. These historic buildings, constructed primarily in the late nineteenth century of unreinforced masonry, are far more vulnerable to vibrations than new buildings would be. Instead of the 0.2 inches per second standard that has been used as a benchmark for possible damage to new buildings, some experts, including the German Institute of Standards, have recommended 0.08 in/sec for historic structures *in good condition*. The UDOT vibration study apparently did not take into account the condition and characteristics (height, footprint, materials, etc.) of the buildings. Nor did it conduct any measurements on the buildings

themselves, as vibration studies conducted in other states have done, in order to more accurately measure the potential "whipping action" created on the buildings by the ground movement. The issues involved with road vibrations seem to be more complex than what this study addressed.

We are concerned that your letter of September 20, 2001, does not address future hauls along this route or hauls along other routes during the course of the construction project. We are aware of at least one other historic district near the parkway corridor (along Onion Street in West Bountiful), and, depending on which haul routes might be selected, numerous other historic properties might be affected. We would like there to be a clear understanding among all parties about how the routes will be selected and how impacts might be avoided or mitigated.

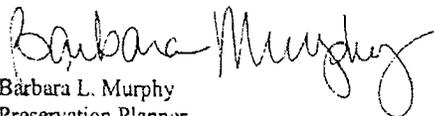
We are also concerned about other construction activities that have not been addressed in either your September 20 letter or in the MOA that was signed for this project. For example, the proposed demolition and reconstruction of the State Street overpass would likely create much greater ground vibrations than those generated by the haul. As a result, it is very likely that historic buildings in the Clark Lane Historic District, especially those on the west end of the district, would be adversely affected.

Due to the extent and complexity of this overall project we feel that it is appropriate to amend the existing MOA to include undertakings that were overlooked and potential issues that might yet surface. This will ensure that the project is in full compliance with both Section 106 of the National Historic Preservation Act and U.C.A. 9-8-404.

We look forward to working with you on an amended MOA that will address the full range of issues involved with this project.

This information is provided to assist with Section 106 responsibilities as specified in §36CFR800. If you have questions, please contact Roger Roper at (801) 533-3561 or myself at (801) 533-3563. My email address is: [bmurphy@history.state.ut.us](mailto:bmurphy@history.state.ut.us)

Sincerely,



Barbara L. Murphy  
Preservation Planner  
State Historic Preservation Office

BLM:97-0375

August 9, 2002

Mr. Max Forbush  
City Manager  
Farmington City  
130 North Main  
P.O. Box 160  
Farmington City, Utah 84025-0160

Re: Roundabout at the Intersection of 650 West and State Street  
Equestrian Trail Termination at 650 West

Dear Max,

The Legacy Parkway design team recently met with Horrocks Engineers to discuss the roundabout the City desires at the intersection of 650 West and State Street. After reviewing the design information provided by Horrocks it appears the roundabout can be incorporated into our design at this location without requiring additional right-of-way or causing major conflicts with utility relocations. If this change is to be incorporated into the Legacy Parkway project UDOT will need to issue a changeorder to FAK on the Legacy Parkway contract, because this is a change to the scope of work and FAK has completed much of the required design in this area.

UDOT will need written verification of the following items should Farmington City desire UDOT issue a changeorder to FAK for the roundabout at the intersection of 650 West and State Street:

1. Written notice from the City confirming their approval of a roundabout at this location.
2. Evidence the City has contacted the Whitakers and they approve of their property access within the roundabout.
3. Verification of the new narrower typical section required for State Street.
4. Acknowledgement that it will be the City's continual responsibility to maintain the roundabout.
5. Documentation of the design expenditures to Horrocks Engineers if the City desires reimbursement from UDOT for their services.

Farmington City's request for relocation of the equestrian trail termination from 650 West to Clark Lane will also be incorporated with the changeorder for the roundabout,

Max Forbush  
Page 2  
August 9, 2002

because this is also a change in scope of work for FAK and the trail termination occurs within the same project design area.

It is imperative that we receive the outlined items from the City by August 30, 2002, if the City desires to move forward with the design of a roundabout in this location. There is still time to incorporate this change into our design/build contract with FAK, but the window of opportunity is becoming narrower.

We appreciate the opportunity to work with the City to develop transportation solutions that meet the City's goals as well as the Department's goals.

Sincerely,



4197.tif

Byron Parker, P.E.  
Project Director

RECEIVED SEP 06 2002

Historic beginnings



David M. Connors  
*Mayor*

MAX FORBUSH  
*City Manager*

KEITH JOHNSON  
*Finance Director*

MARGY L. LOMAX  
*Recorder*

GLORIA B. ANDERSON  
*Treasurer*

130 North Main  
P. O. Box 160  
Farmington, Utah 84025-0160  
Telephone (801) 451-2383

DAVID S. HALE  
BOB HASENYAGER  
LARRY W. HAUGEN  
SUSAN TANNER HOLMES  
ED JOHNSON  
*Council Members*

August 30, 2002

Byron Parker, P. E.  
Project Director  
Legacy Parkway  
360 North 700 West, Suite F  
North Salt Lake, Utah 84054

Re: **Roundabout at Intersection of 650 West and State Street.**

Dear Byron:

I am responding on behalf of members of the Farmington City Council regarding requested documentation pertaining to the proposed roundabout at the intersection of 650 West and State Street. The documentation you requested is included as follows.

**Confirmation of City Approval of Roundabout.**

The City Council has approved the conceptual design and layout of the roundabout and width of east State Street as shown on drawings prepared by Horrocks Engineers based on certain conditions.

- 1) That the entire roundabout be constructed of concrete at a depth sufficient to support heavy truck and bus traffic.
- 2) That the City be permitted additional input into final detailed plans, including but not limited to, cross slopes, angle, side and center treatments (stamped concrete) and landscaping.

**Whitaker Family Support for the Proposed Roundabout.**

This family is in support of the proposal. See enclosed letter written to the Farmington City Council from Don and Donna Whitaker dated August 22, 2002.

**Cross Section of State Street Bridge Structure.**

It is the City's understanding that the planned pavement section of the State Street bridge structure is 52 feet in width. The City requests 8 ½ foot shoulders, two 11-foot lanes with a 13-foot

Byron Parker  
August 30, 2002  
Page 2

center turn lane. The City also requests that the sidewalk treatment on both sides remains as planned - 6 ½ feet on the south side and 8 feet on the north side.

**City's Commitment to Maintain the Roundabout.**

The City Council in their approving vote agreed to maintain the roundabout once completed and the final Legacy Project accepted by UDOT.

**Horrocks' Design Engineering Expenses.**

We appreciate your agreement to reimburse the City on these costs. The City is asking a deferral of the time requirement for sending the reimbursement request for costs accrued on this project by Horrocks Engineers. These costs are still being submitted. Once the final invoice is submitted and paid by the City, a request for reimbursement will be sent.

I trust this information meets the requirements of your previous letter. If not, please call Max Forbush and advise him of any deficiencies.

Sincerely,



David M. Connors  
Mayor

MF/ml

cc: Members of the City Council  
Max Forbush, City Manager  
Russell Youd, Horrocks Engineers

Don and Donna Whitaker  
P.O.Box 857  
601 W State Street (Whitaker Lane)  
Farmington, Utah 84025  
451-6159

August 22, 2002.

Farmington City Council  
130 North Main  
P.O.Box 160  
Farmington, Utah 84025-0160

To Whom It May Concern:

On August 15th, 2002, we met with Max Forbush to discuss the "roundabout" concept being proposed for the State Street and 650 West intersection. We were shown a concept drawing and it was explained to us.

We like the concept, as it was explained to us at that time. Provided there are no major design changes, we would be in favor of a roundabout at this intersection. We see several very favorable aspects of this type of design for this location. It would maintain the size and integrity of the State Street overpass and help keep this area safer for pedestrians. By keeping the bridge size down, it would also help to control the speed of traffic coming off the bridge and entering that intersection. We think this would be beneficial to both sides of the freeway. We have driven on this type of design in several different locations and found it very functional. We understand it has worked well in many other states.

One of our concerns, is that there be yield signs in place, and not stop signs on the roundabout. This would provide for a smoother traffic flow. It would slow traffic, possibly decreasing the amount of traffic at this intersection and provide a safer access point for our road, as long as the size and number of lanes feeding into it did not increase. Because traffic would be flowing smoother and hopefully slower, we feel that it would make it much nicer for larger vehicles like buses, delivery vans and horse trailers to make the turn without interfering with other lanes of traffic making turns.

We have watched traffic flow after major events, and it is not that intersection that causes traffic jams, but the vehicles turning on the east side of the overpass. By slowing traffic at 650 West, we think that traffic would not become so jammed up.

We would like the city council to know that in our opinion, this would be a good design and it would work very well for this location at this time.

*Don + Donna  
Whitaker*



U.S. Department  
of Transportation

Federal Highway  
Administration



US Army Corp  
of Engineers

FHWA Utah Division  
2520 West 4700 South, Suite 9A  
Salt Lake City, UT 84118

U.S. Army Corps of Engineers  
Utah Regulatory Office  
533 West 2600 South, Suite 150  
Bountiful, UT 84010

January 24, 2003

Mr. Robert Roberts  
Regional Administrator  
Environmental Protection Agency, Region 8  
999 18<sup>th</sup> Street, Suite 300  
Denver, CO 80202-2466

Dear Mr. Roberts:

Subject: Legacy Parkway, Davis and Salt Lake Counties, Utah  
Supplemental Environmental Impact Statement  
February 21, 2003, Meeting Invitation and Cooperating Agency Request

To continue to enhance the working relationships between Federal agencies, Dr. Christine Johnson, Director of Field Services, Federal Highway Administration (FHWA) and Colonel Conrad of the Army Corps of Engineers (ACOE) invite you and your staff to participate in a Federal agency partnering meeting for the proposed Legacy Parkway project in Utah. The meeting has been scheduled for February 21, 2003, from 9:00 am to 12:00 pm in the Rocky Mountain Room of the EPA Conference Center, 999 18th Street, Denver - 2nd floor. Mr. Lee Waddleton, Federal Transit Administration, Regional Administrator and Mr. Ralph Morgenweck, U.S. Fish and Wildlife Service, Regional Director, have also been invited to attend.

The objective of this meeting is to establish an environmental stewardship framework (expectations and process), with the endorsement of senior management, for the preparation of the Supplemental Environmental Impact Statement (SEIS) for the Legacy Parkway project that is consistent with the Executive Order, "Environmental Stewardship and Transportation Infrastructure Project Reviews." Our goal is to have an open discussion that allows all agencies to discuss their expectations and concerns for this high profile project and to identify improvements to the process previously used to develop the original Environmental Impact Statement (EIS).

The Legacy Parkway is a proposed four-lane, limited access, divided highway extending from I-215 at 2100 North in Salt Lake City northward 14 miles to the interchange of I-15 and U.S. 189 in Farmington. The Final Environmental Impact Statement (FEIS) was completed in June 2000. On September 16, 2002, the Tenth Circuit Court issued an opinion finding the EIS inadequate and remanded the FEIS to the District Court for additional consideration in the following five areas:

1. The Denver & Rio Grande (D&RG) as an alternative alignment.
2. Alternative sequencing of the Shared Solution.
3. Integration of the Legacy Parkway and transit solutions.
4. Impacts to wildlife.
5. A narrower median as a practicable alternative.

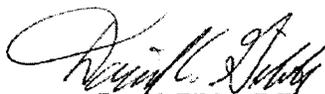
Currently, preliminary work is underway for the preparation of a SEIS to address the Tenth Circuit Court's opinion. The SEIS will focus on addressing the above five issues identified in the Tenth Circuit Court's decision. However, a formal re-evaluation of the original FEIS will be prepared to determine whether there have been changes in the project, its surroundings and impacts, or any new issues identified since the FEIS.

Because of your agency's expertise and jurisdiction regarding wetland issues that pertain to the SEIS, we are requesting that your agency be a cooperating agency. In accordance with the provisions of 40 CFR, Part 1501.6, your role would include:

- ◆ Consulting on relevant technical studies required for the project.
- ◆ Reviewing project information, including study results, and agreeing on a time frame for your review.
- ◆ Expressing your views on subjects within your jurisdiction and/or expertise.
- ◆ Participating in joint public involvement activities.
- ◆ Identifying EIS content necessary to discharge your National Environmental Policy Act (NEPA) responsibilities and other requirements regarding jurisdictional approvals, permits, licenses, and/or clearances.

We look forward to discussing your agency's participation in this project at our February 21, 2003 meeting. We would like to collaborate with your staff in developing the meeting agenda. If you have any questions regarding meeting, please have your staff contact Greg Punske, FHWA Environmental Program Manager at (801) 963-0078 x 237.

Sincerely,



**David Gibbs, P.E.**  
FHWA Division Administrator  
Salt Lake City, Utah



**Brooks Carter**  
ACOE Intermountain  
Regulatory Section Chief  
Bountiful, Utah

cc: Cynthia Cody, EPA Region 8, Chief NEPA Unit



U.S. Department  
of Transportation  
**Federal Highway  
Administration**



**US Army Corp  
of Engineers**

FHWA Utah Division  
2520 West 4700 South, Suite 9A  
Salt Lake City, UT 84118

U.S. Army Corps of Engineers  
Utah Regulatory Office  
533 West 2600 South, Suite 150  
Bountiful, UT 84010

January 24, 2003

Mr. Lee Waddleton  
Regional Administrator  
Federal Transit Administration, Region 8  
216 16<sup>th</sup> St., Suite 650  
Denver, CO 80202-5120

Dear Mr. Waddleton:

**Subject: Legacy Parkway, Davis and Salt Lake Counties, Utah  
Supplemental Environmental Impact Statement  
February 21, 2003, Meeting Invitation and Cooperating Agency Request**

To continue to enhance the working relationships between Federal agencies, Dr. Christine Johnson, Director of Field Services, Federal Highway Administration (FHWA) and Colonel Conrad of the Army Corps of Engineers (ACOE) invite you and your staff to participate in a Federal agency partnering meeting for the proposed Legacy Parkway project in Utah. The meeting has been scheduled for February 21, 2003, from 9:00 am to 12:00 pm in the Rocky Mountain Room of the EPA Conference Center, 999 18th Street, Denver - 2nd floor. Mr. Robert Roberts, Environmental Protection Agency, Regional Administrator and Mr. Ralph Morgenweck, U.S. Fish and Wildlife Service, Regional Director, have also been invited to attend.

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5. A narrower median as a practicable alternative.

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Because of your agency's expertise regarding transit issues that pertain to the SEIS, we are requesting that your agency be a cooperating agency. In accordance with the provisions of 40 CFR, Part 1501.6, your role would include:

- ◆ Consulting on relevant technical studies required for the project.
- ◆ Reviewing project information, including study results, and agreeing on a time frame for your review.
- ◆ Expressing your views on subjects within your jurisdiction and/or expertise.
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We look forward to discussing your agency's participation in this project at the February 21, 2003 meeting. If you have any questions regarding meeting, please have your staff contact Greg Punske, FHWA Environmental Program Manager at (801) 963-0078 x 237.

Sincerely,



**David Gibbs, P.E.**  
FHWA Division Administrator  
Salt Lake City, Utah



**Brooks Carter**  
ACOE Intermountain  
Regulatory Section Chief  
Bountiful, Utah



U.S. Department  
of Transportation

Federal Highway  
Administration



**US Army Corp  
of Engineers** ®

FHWA Utah Division  
2520 West 4700 South, Suite 9A  
Salt Lake City, UT 84118

U.S. Army Corps of Engineers  
Utah Regulatory Office  
533 West 2600 South, Suite 150  
Bountiful, UT 84010

January 24, 2003

Mr. Ralph O. Morgenweck  
Regional Director  
U.S. Fish and Wildlife Service, Region 6  
134 Union Boulevard  
Lakewood, CO 80228-1807

Dear Mr. Morgenweck:

**Subject: Legacy Parkway, Davis and Salt Lake Counties, Utah  
Supplemental Environmental Impact Statement  
February 21, 2003, Meeting Invitation and Cooperating Agency Request**

To continue to enhance the working relationships between Federal agencies, Dr. Christine Johnson, Director of Field Services, Federal Highway Administration (FHWA) and Colonel Conrad of the Army Corps of Engineers (ACOE) invite you and your staff to participate in a Federal agency partnering meeting on the proposed Legacy Parkway project in Utah. The meeting has been scheduled for February 21, 2003, from 9:00 am to 12:00 pm in the Rocky Mountain Room of the EPA Conference Center, 999 18th Street, Denver - 2nd floor. Mr. Robert Roberts, Environmental Protection Agency, Regional Administrator and Mr. Lee Waddleton, Federal Transit Administration, Regional Administrator have also been invited to attend.

The objective of this meeting is to establish an environmental stewardship framework (expectations and process), with the endorsement of senior management, for the preparation of the Supplemental Environmental Impact Statement (SEIS) for the Legacy Parkway project that is consistent with the Executive Order, "Environmental Stewardship and Transportation Infrastructure Project Reviews." Our goal is to have an open discussion that allows all agencies to discuss their expectations and concerns for this high profile project and to identify improvements to the process previously used to develop the original Environmental Impact Statement (EIS).

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4. Impacts to wildlife.
5. A narrower median as a practicable alternative.

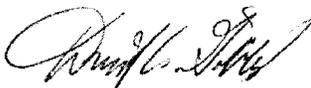
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Because of your agency's expertise regarding wildlife and migratory bird issues that pertain to the SEIS, we are requesting that your agency be a cooperating agency. In accordance with the provisions of 40 CFR, Part 1501.6, your role would include:

- ◆ Consulting on relevant technical studies required for the project.
- ◆ Reviewing project information, including study results, and agreeing on a time frame for your review.
- ◆ Expressing your views on subjects within your jurisdiction and/or expertise.
- ◆ Participating in joint public involvement activities.
- ◆ Identifying EIS content necessary to discharge your National Environmental Policy Act (NEPA) responsibilities and other requirements regarding jurisdictional approvals, permits, licenses, and/or clearances.

We look forward to discussing your agency's participation in this project at our February 21, 2003 meeting. We would like to collaborate with your staff in developing the meeting agenda. If you have any questions regarding meeting, please have your staff contact Greg Punske, FHWA Environmental Program Manager at (801) 963-0078 x 237.

Sincerely,



**David Gibbs, P.E.**  
FHWA Division Administrator  
Salt Lake City, Utah



**Brooks Carter**  
ACOE Intermountain  
Regulatory Section Chief  
Bountiful, Utah

cc: Mr. Henry Maddux, Utah Field Supervisor



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
1325 J STREET  
SACRAMENTO, CALIFORNIA 95814-2922

Regulatory Branch

April 11, 2003

Mr. Wayne Norwall, Regional Director  
Bureau of Indian Affairs  
P.O. Box 10  
Phoenix, AZ 85001

Dear Mr. Norwall:

This letter is to inform you that the environmental scoping process is currently under way for a Supplemental Environmental Impact Statement (SEIS) for the Utah Department of Transportation's (UDOT's) proposed construction of the Legacy Parkway Project. The U.S. Army Corps of Engineers (Corps) and the Federal Highway Administration (FHWA), as federal joint lead agencies under the National Environmental Policy Act (NEPA), are interested in your comments about the content of the Legacy Parkway Project SEIS and invite you to participate in the scoping process.

#### **Project Description**

The proposed Legacy Parkway Project is one component of the planned three-part "Shared Solution" for addressing transportation needs between Salt Lake City and Kaysville. The "Shared Solution" strategy includes expansion of public transit, improvements to the existing Interstate 15 (I-15) freeway, and construction of the Legacy Parkway project. The Legacy Parkway is intended to help meet the projected peak-hour traffic needs in the north corridor area through 2020. The proposed parkway would include a four-lane, limited access, divided highway extending approximately 14 miles from Interstate 215 (I-215) in Salt Lake City northward to I-15 in Farmington City. A multiple-use trail for pedestrians, bicyclists, and equestrians would parallel the highway, and a large nature preserve is also planned.

#### **Supplemental Environmental Impact Statement**

The SEIS will supplement the June 2000 Legacy Parkway Final EIS (FEIS) (FHWA-UT-EIS-98-02-F), which was the subject of litigation and a court decision in *Utahns for Better Transportation et al. v. U.S. Department of Transportation et al.* (305 F.3d 1152 (10th Cir. 2002)). To address concerns identified by the court, the Corps and FHWA are directing and managing the development of an SEIS.

In accordance with the court decision, several specific aspects of the FEIS require further study. The Corps and FHWA have made a preliminary decision to consider the following in the SEIS based on the court ruling: (1) the Denver & Rio Grande railroad (D&RG) alignment,

(2) a narrower right-of-way (ROW) for the proposed alignment, (3) alternative sequencing for construction of the various component projects of the Shared Solution, (4) concurrent integration of construction of the Legacy Parkway with expansion of public transportation, and (5) impacts to wildlife. In addition, the FEIS will be reevaluated to determine whether any other information should be updated and revised as part of the SEIS process.

#### **Agency Roles**

As a joint lead agency, the Corps must make a decision on UDOT's permit application pursuant to Section 404 of the Clean Water Act (CWA). The FHWA, as a joint lead agency must make a decision on the request to connect the proposed project to I-215 and I-15. As joint lead agencies, the Corps and FHWA are responsible for the SEIS and have selected an independent consultant to ensure the SEIS process is effective and objective. UDOT is the project applicant and proponent of the Legacy Parkway. As project proponent, UDOT will provide information and answer questions related to the proposed Legacy Parkway Project. The U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), and Federal Transit Administration (FTA) have agreed to serve as cooperating agencies in the preparation and review of the SEIS. As cooperating agencies, EPA, USFWS, and FTA are responsible for providing input to the lead agencies throughout the development of the SEIS. All agencies are committed to fully informing and engaging interested parties and agencies throughout the SEIS process.

#### **Participation in the Supplemental Environmental Impact Statement Process**

An open house has been scheduled to provide information about the SEIS process and to solicit input. All interested parties are invited to attend this open-house-style scoping meeting. Please drop by anytime on Thursday, April 17, 2003, between 4 p.m. and 8 p.m. to talk directly with agencies and consultants at a variety of information stations. The scoping meeting will be held at Woods Cross High School Auditorium, 600 West 2200 South, Woods Cross, Utah.

The following additional topic-specific focus group meetings are open to the public, and are planned for late April: (1) D&GR alignment corridor (Monday, April 28, 2003, 9 – 11 a.m.), (2) narrower ROW impact evaluation (Monday, April 28, 2003, 1 – 3 p.m.), (3) wildlife impacts (Tuesday, April 29, 2003, 9 – 11 a.m.), and (4) sequencing and integration (Tuesday, April 29, 2003, 1 – 3 p.m.). These meetings will be held at Davis County Fairpark, Building 1, 151 South 1100 West, Farmington, Utah.

Information is also available by calling our Information Hotline at (801) 951-1039. The hotline will be available throughout the SEIS process and will include general information, updates, and opportunities for public involvement.

We are interested in obtaining your input on the scope of the SEIS. You are welcome to attend any of the public meetings or focus group sessions. If you would like to submit written comments on the scope and content of the SEIS, please submit them directly to the Corps or FHWA by June 1, 2003, at the following addresses:

Nancy Kang  
Chief, Utah Office  
U.S. Army Corps of Engineers  
533 W. 2600 S., Suite 150  
Bountiful, UT 84010

Greg Punske  
Environmental Program Manager  
Federal Highway Administration  
2520 W. 4700 S., Suite 9A  
Salt Lake City, UT 84118

Your input is critical and important in this process. We look forward to hearing from you. If you have any questions regarding this request, please feel free to contact me by telephone at (801) 295-8380 extension 14, or by email at [nancy.kang@usace.army.mil](mailto:nancy.kang@usace.army.mil).

Sincerely,

Nancy Kang  
Chief, Utah Regulatory Office

cc: Greg Punske, Project Development Engineer, FHWA  
Andrew Gemperline, UDOT

## **List of Recipients**

### **Federal Transit Administration**

Federal Transit Administration  
Don Cover  
Region 8  
216 16th Street, Suite 650  
Denver, CO 80202-5120

### **Federal Emergency Management Agency**

Mr. David Maurstad, Regional Director  
Federal Emergency Management Agency  
Region VIII  
Building 710, Box 25267  
Denver, CO 80225-0267  
(303) 235-4800  
(303) 235-4976 FAX

### **Bureau of Indian Affairs**

Mr. Wayne Norwall, Regional Director  
Bureau of Indian Affairs  
P.O. Box 10  
Phoenix, AZ 85001  
(602) 379-4413  
(602) 379-4413 FAX

### **U.S. Fish and Wildlife Service**

Mr. Henry Maddux  
U.S. Fish and Wildlife Service  
2369 West Orton Circle, Suite 50  
West Valley City, UT 84119  
(801) 975-3330  
(801) 975-3331 FAX

### **U.S. Geological Survey**

U.S. Geological Survey  
Utah District  
2329 Orton Circle  
*(2329 West 2390 South)*  
West Valley City, Utah  
84119-2047  
Phone: (801) 908-5000  
Fax: (801) 908-5001

### **Environmental Protection Agency**

Cynthia Cody, NEPA Program Chief  
EPA Region 8 (EPR-N)  
999 18<sup>th</sup> Street, Suite 300  
Denver, CO 80202-2466

## **Natural Resources Conservation Service**

Phillip Nelson  
Utah State Office  
Natural Resources Conservation Services  
125 S. State St.  
Suite 4425  
Salt Lake City, UT 84111

## **State Agencies**

Forrest Cuch  
Community and Economic Development, Division of Indian Affairs  
324 South State Street  
Suite 500  
Salt Lake City, UT 84114

Ursula Truman  
Department of Environmental Quality, Division of Air Quality  
168 North 1950 West  
Salt Lake City, UT 84116

Kevin Brown  
Utah Division of Drinking Water  
P.O. Box 144830  
Salt Lake City, UT 84114-4830

Kent Gray, Director  
Utah Division of Environmental Response and Remediation  
168 North 1950 West (Building #2)  
First Floor Box 144840  
Salt Lake City, UT 84114-4840

Don Ostler  
Utah Division of Water Quality  
P.O. Box 144870  
Salt Lake City, UT 84114-4870

Robert L. Morgan  
Utah Department of Natural Resources  
1594 West North Temple  
Suite 3710  
Salt Lake City, UT 84114

Greg Mladenka  
Utah Division of Water Rights  
1594 West North Temple  
Suite 220  
Salt Lake City, UT 84114-6300

Tharold E. Green, Jr.  
Utah Division of Parks and Recreation  
1594 West North Temple  
Suite 116  
Salt Lake City, UT 84114-6001

Judy Watanabe  
Dept. of Public Safety, Division of Comprehensive Emergency Management  
Flood Loss Reduction Section  
1110 State Office Building  
Salt Lake City, UT 84114

Carolyn Wright  
Governor's Office, Resource Development  
Coordinating Committee, Dept. of Natural Resources  
1594 West North Temple  
Salt Lake City, UT 84102

James Dykemann  
State Historic Preservation Office  
300 South Rio Grande  
Salt Lake City, UT 84114

Larry Anderson  
Utah Division of Water Resources  
1594 W. North Temple  
Suite 310  
Salt Lake City, UT 84114

Kevin Conway  
Utah Division of Wildlife Resources  
1594 West North Temple  
Suite 2110  
Salt Lake City, UT 84114-6301

Dick Buehler  
Utah Division of Forestry, Fire & State Lands  
1594 W. North Temple  
Suite 3520  
Salt Lake City, UT 84114-5703

### **Native American**

David Pete  
Goshute Indian Tribe  
BIA Hwy #1  
Ibapah, UT 84034 (Box 6104)

Ivan Wongan  
Northwestern Band of Shoshone Tribe  
427 N. Main, Suite 101  
Pocatello ID 83204

Geneal Anderson  
Paiute Indian Tribe of Utah  
440 N. Paiute Dr  
Cedar City, UT 84720

Leon Bear  
Skull Valley Band of Goshute Indians  
3359 S. Main, #808  
SLC UT 84115

Ron Wopsock, Administration  
Ute Indian Tribe  
988 S. 7500 E.,  
Fort Duchesne UT 84026

New  
in 16



April 17, 2003

Dear members of the Federal Highway Administration,

As Davis County's only nationally recognized historic district, we would like to point out some potential adverse affects that Legacy Highway construction could have on the homes in our neighborhood. We also request that a complete and thorough Section 106 review of these affects be studied in cooperation with the Utah State Historic Preservation Officer.

The Clark Lane Historic District occupies both sides of State Street in Farmington, from the State Street overpass over I-15 east to 200 West. The homes in the district were constructed between the 1850s through the 1920s. Most are extremely fragile, as they were built of soft adobe and/or un-reinforced masonry and fieldstone foundations.

Some of the potential adverse affects we're concerned about include:

- Damage caused by ground borne vibrations during pile driving during the reconstruction of the State Street overpass
- Adverse affects to historic landscapes and properties during reconstruction of the State Street Overpass, including:
  - o Removal of street trees
  - o Changes in grade and elevations
  - o Changes in street width and elevation
- Damage caused by ground borne vibrations of heavy trucks hauling fill materials

We appreciate the current willingness of the FHA, UDOT, and FAK to utilize the frontage road and "jug handle" near the State Street Overpass an alternate haul route to hauling materials through the historic district.

We believe the best way to mitigate affects on our historic homes is to NOT rebuild the State Street overpass. With the newly completed Burke Lane overpass just to the north, and the Glover's Lane overpass to the south, the State Street overpass seems unnecessary. It would certainly be prudent to study the necessity of this overpass before spending the money to rebuild it or risking damage to these nationally recognized properties during pile driving, etc.

We appreciate your willingness to involve us in the project and will do everything we can to help.

Much success,

A handwritten signature in black ink, appearing to read "Chadwick Greenhalgh". The signature is fluid and cursive, with the first name being the most prominent.

Chadwick Greenhalgh  
208 West State Street  
Farmington, UT 84025  
801.245.1219  
chadwick.greenhalgh@eurorscg.com



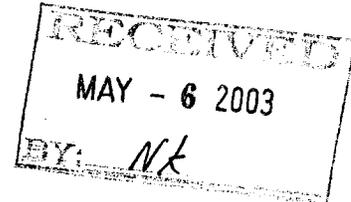
United States Department of the Interior  
FISH AND WILDLIFE SERVICE

UTAH FIELD OFFICE  
2369 WEST ORTON CIRCLE, SUITE 50  
WEST VALLEY CITY, UTAH 84119

In Reply Refer To

FWS/R6  
ES/UT  
03-0616

May 2, 2003



Greg Punske  
Environmental Program Manager  
Federal Highway Administration  
2520 West 4700 South, Suite A  
Salt Lake City, Utah 84118

Dear Mr. Punske

The U.S. Fish and Wildlife Service (Service) has reviewed the April 1, 2003, Federal Register Notice of Intent to Prepare a Supplemental Environmental Impact Statement (SEIS) for the Utah Department of Transportation's proposed construction of the Legacy Parkway project in Salt Lake and Davis Counties, Utah. The purpose of the project is to solve future traffic problems in Salt Lake and Davis Counties by implementing a three part "Shared Solutions" strategy that includes: 1) Constructing the Legacy Parkway; 2) improving and expanding Interstate 15; and 3) expanding the public transit system. This project will involve the construction of a roughly 14 mile highway from Interstate 215 in the south to U.S. 89 near Farmington, Utah in the north. A multiple use trail for pedestrians, bicyclists, and equestrians would parallel the highway. The SEIS is being prepared because the courts found certain aspects of the original EIS insufficient, including the wildlife impact analysis. The SEIS will build upon the EIS and specifically address the court-identified deficiencies.

The Service has agreed to be a cooperating agency for purposes of NEPA compliance for this project. We expect to assist the lead agencies in evaluating the potential impacts to fish and wildlife resources and developing measures to avoid, minimize, and compensate for unavoidable impacts. We are providing the following comments as general guidelines for wildlife issues we believe should be addressed. These comments are not meant to be exhaustive, however, because we expect to be closely involved with identification of wildlife issues, determining appropriate evaluation methodology, and interpreting results.

In Section 1 of this letter we convey our concerns that should be addressed in the SEIS. Section 2 of this letter addresses your responsibilities under section 7 of the Endangered Species Act (ESA) of 1973, 16 U.S.C. § 1536.

## Section 1.

We recommend that the SEIS evaluate the following potential direct, indirect, and cumulative impacts on fish and wildlife resources:

### Direct Effects

Mortality due to project implementation, construction, and maintenance.

Mortality due to ongoing activities associated with project (vehicle collisions with vehicles, contamination of soils/waters from road treatments, automotive fluids, truck spills, etc.).

Displacement of individuals/populations due to project implementation, construction, maintenance, and ongoing activities associated with the project. In particular, you should evaluate whether and to what extent organisms may be displaced to areas where fitness is reduced and/or mortality rates increased (population sinks).

Habitat loss/gain due to project implementation, construction, and maintenance.

Habitat loss/gain due to ongoing activities associated with project (contamination of soils/waters from road treatments, automotive fluids, truck spills, etc.).

Habitat fragmentation and its effects on mate search/selection, gene flow, predation rate, dispersal success, colonization events (as they pertain to metapopulation dynamics), and overall population size.

Effects on individual fitness (reduced nesting success, brood size, fledging success, number of matings, etc.) due to project implementation, construction, and maintenance.

Effects on individual fitness (nesting success, brood size, fledging success, number of matings, etc.) due to ongoing activities associated with project (vehicle collisions with vehicles, contamination of soils/waters from road treatments, automotive fluids, truck spills, etc.).

Effects to habitat and species diversity, both spatial and temporal, due to project implementation, construction, and maintenance.

### Indirect Effects

Effects on hydrology, both temporal and spatial that relate directly with quantity, quality, and distribution of habitats.

Effects on hydrology, both spatial and temporal, that may convert one type of wetland to another, thus changing its habitat function.

Effects on water quality as it relates to habitats for wildlife and fish.

Effects on air quality due to project implementation, construction, and maintenance.

Effects on air quality due to the ongoing activities associated with the project (vehicle emissions, increased air temperatures, etc.)

Effects of ground disturbance and ongoing activities (vehicular, bike, and horse traffic, trail/berm/median maintenance) that may facilitate the introduction of invasive/exotic/noxious species.

Effects of noise on wildlife populations and individuals. Possibilities include effects on mate identification, nest location, prey location, predator location, and territory defense.

Effects of an increase of human access/activity to formerly isolated wildlife habitats on wildlife populations, mating success, mortality, foraging/hunting opportunities, etc.

Effects on development opportunities that may further reduce/impair/eliminate wildlife habitats in the project area.

Effects of increased lighting during nighttime hours on predator/prey interactions, foraging behavior, and dispersal behavior.

### Cumulative Effects

Effects of continued degradation, fragmentation, and removal of wetlands in the Great Salt Lake ecosystem as it pertains to wildlife populations.

Effects of increased development and other economic opportunities as a result of improved access (induced or facilitated development) as it pertains to wildlife populations.

Effects of perpetuating single person/single vehicle transportation on future air quality, water quality, and habitat value inside and outside of the project area.

Section 2. Federal agencies have specific additional responsibilities under Section 7 of the ESA. To help you fulfill these responsibilities, we are providing an updated list of threatened (T) and endangered (E) species that may occur within the area of influence of your proposed action.

<u>County</u>	<u>Species</u>	<u>Status</u>
DAVIS		
Bald Eagle <sup>1,3</sup>	<i>Haliaeetus leucocephalus</i>	T
SALT LAKE		
Bald Eagle <sup>1,3</sup>	<i>Haliaeetus leucocephalus</i>	T

<sup>1</sup> Nests in this county of Utah.

<sup>3</sup> Wintering populations (only four known nesting pairs in Utah).

The proposed action should be reviewed and a determination made if the action will affect any listed species or their critical habitat. If it is determined by the Federal agency, with the written concurrence of the Service, that the action is not likely to adversely affect listed species or critical habitat, the consultation process is complete, and no further action is necessary.

Formal consultation (50 CFR 402.14) is required if the Federal agency determines that an action is "likely to adversely affect" a listed species or will result in jeopardy or adverse modification of critical habitat (50 CFR 402.02). Federal agencies should also confer with the Service on any action which is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat (50 CFR 402.10). A written request for formal consultation or conference should be submitted to the Service with a completed biological assessment and any other relevant information (50 CFR 402.12).

Candidate species have no legal protection under the Endangered Species Act (ESA). Candidate species are those species for which we have on file sufficient information to support issuance of a proposed rule to list under the ESA. Identification of candidate species can assist environmental planning efforts by providing advance notice of potential listings, allowing resource managers to alleviate threats and, thereby, possibly remove the need to list species as endangered or threatened. Even if we subsequently list this candidate species, the early notice provided here could result in fewer restrictions on activities by prompting candidate conservation measures to alleviate threats to this species.

Only a Federal agency can enter into formal Endangered Species Act (ESA) section 7 consultation with the Service. A Federal agency may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment by giving written notice to the Service of such a designation. The ultimate responsibility for compliance with ESA section 7, however, remains with the Federal agency.

Your attention is also directed to section 7(d) of the ESA, as amended, which underscores the requirement that the Federal agency or the applicant shall not make any irreversible or irretrievable commitment of resources during the consultation period which, in effect, would deny the formulation or implementation of reasonable and prudent alternatives regarding their actions on any endangered or threatened species.

Please note that the peregrine falcon which occurs in all counties of Utah was removed from the federal list of endangered and threatened species per Final Rule of August 25, 1999 (64 FR 46542). Protection is still provided for this species under authority of the Migratory Bird Treaty Act (16 U.S.C. § 703-712) which makes it unlawful to take, kill, or possess migratory birds, their parts, nests, or eggs. When taking of migratory birds is determined by the applicant to be the only alternative, application for federal and state permits must be made through the appropriate authorities. For take of raptors, their nests, or eggs, Migratory Bird Permits must be obtained through the Service's Migratory Bird Permit Office in Denver at (303) 236-8171.

We recommend use of the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* (Romin and Muck, January 2002) which were developed in part to provide consistent application of raptor protection measures statewide and provide full compliance with environmental laws regarding raptor protection. Raptor surveys and mitigation measures are provided in the Raptor Guidelines as recommendations to ensure that proposed projects will avoid adverse impacts to raptors, including the peregrine falcon.

If we can be of further assistance or if you have any questions, please feel free to contact Chris Witt, Ecologist, at the letterhead address or (801) 975-3330 extension 133.

Sincerely,



Henry R. Maddux  
Utah Field Supervisor

cc: Nancy Kang, Chief, Utah Office, U.S. Army Corps of Engineers, 533 West 4700 South, Suite 9A, Salt Lake City, Utah 94010

UDWR – Salt Lake City, Ogden

Regional Office – Region 6 (Attn: NEPA Coordinator)



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Mountain-Prairie Region



IN REPLY REFER TO:

FWS/R6

MAILING ADDRESS:

Post Office Box 25486  
Denver Federal Center  
Denver, Colorado 80225-0486

STREET LOCATION:

134 Union Blvd.  
Lakewood, Colorado 80228-1807

**MAY 20 2003**

David Gibbs, P.E.  
Federal Highway Administration  
Utah Division  
2520 West 4700 South, Suite 9A  
Salt Lake City, Utah 84118

Dear Mr. Gibbs:

The U.S. Fish and Wildlife Service has received your letter of January 24 inviting us to be a cooperating agency in preparation of a Supplemental Environmental Impact Statement for the proposed Legacy Parkway project in Davis and Salt Lake Counties, Utah. (An identical letter has been sent to Brooks Carter, U.S. Army Corps of Engineers.) We appreciate, and accept, the invitation. As described in your letter, our role would include:

- Consulting on relevant technical studies required for the project.
- Reviewing project information including study results and agree on a time frame for our review.
- Expressing our views on subjects within our jurisdiction or expertise.
- Participating in joint public involvement activities.
- Identifying Environmental Impact Statement content necessary to discharge our National Environmental Policy Act responsibilities and other requirements regarding jurisdictional approvals, permits, licenses, and/or clearances.

The Utah Ecological Services Field Office will be the lead office for the FWS on this project. Your principal FWS contact will be Dr. Lucy Jordan, Supervisory Fish and Wildlife Biologist, telephone: (801) 975-3330 extension 143; e-mail: lucy\_jordan@fws.gov. The project biologist will be Chris Witt, Ecologist, at extension 133; email: chris\_witt@fws.gov.

David Gibbs, P.E.

2

Again, we appreciate the opportunity to participate in the preparation of a Supplemental Environmental Impact Statement for the Legacy Parkway project.

Sincerely,



Mary Henry  
Assistant Regional Director  
Ecological Services

Identical letter to:

Brooks Carter  
U.S. Army Corps of Engineers

**THPO**

Skull Valley Band of Gosiute Indians  
3359 S. Main Street #808  
Salt Lake City, UT 84115  
[thpo@earthlink.net](mailto:thpo@earthlink.net)

Greg Punskey  
USDOT/FHWA  
Utah Division  
2520 West 4700 South, STE. 9A  
SLC, UT 84118-1847

June 10, 2003

RE: NA Consultation

Mr. Punskey,

We appreciate the USDOT/FHWA (FHWA) recent consultation requests. The following discusses procedures, compliance with HPL, and pressing issues that require resolution. For the immediate future until the relationship with the UDOT improves we request that FHWA continue consultation responsibilities for the Federally Funded State Agency. Please keep in mind DOT 186-99 "U.S. Transportation Secretary Slater Signs Order Establishing New Policy For Working with Native Americans".

First, We are extremely concerned with the Legacy Highway Project in the areas of environmental, sacred, and Cultural Resources issues. We understand that the USDOT/FHWA is a Joint Lead Agency. There are numerous compliance issues that arose during the original phase of this project which involve cultural resource and NAGPRA concerns.

As we understand two sets of skeletal remains and numerous archaeological sites were located during the original project. Federal Funding allows the FHWA and Army Corps of Engineers to be Lead Agencies for the Environmental Impact Statement. For these reasons and the expenditure of Federal Funding for the oversight of two sister Agencies, it is of utmost importance for your Agency to comply with relevant Historic Preservation Law. As we understand the State will utilize Federal Grants to build the proposed highway if approved. We expect Federal Oversight to continue throughout all phases of this project.

During January 2003 the Band sent your agency an Indigenous Lands Cultural Patrimony Map. We request that your Agency consult with the Band on all projects within this area. As can be gleaned from the map,

the Wasatch Front area between Ogden, and North of Utah Lake is an area the Gosiute utilized along with the Northern Ute and Northwest Band of the Shoshone Indians. We recommend in this area that all three Tribes be consulted.

Concerning skeletal remains unearthed and desecrated due to project planning for the proposed Legacy Highway Project, we request that these remains and associated and un-associated funerary objects be repatriated to the Band as soon as possible. Due to the use of Federal Funding for oversight of the project, the jurisdiction of the NAGPRA related human remains and objects falls within Federal Jurisdiction.

This is an official claim for the repatriation of skeletal remains, associated and unassociated funerary items and sacred objects desecrated and removed from ancestral land, in this case the Federal Law takes precedence due to the use of Federal Oversight. It is the responsibility of the Lead Agencies to comply with Historic Preservation Law before the expenditure for funding and license or permit of any project.

This repatriation claim is made under the authority of the Native American Grave Protection and Repatriation Act (NAGPRA: Public Law 101-601' 104 Stat. 3048: 25USC3001).

Our intention is to repatriate all, NAGPRA protected materials. We are basing this cultural affiliation claim on reserved Treaty Rights, Indian Claims Commission findings an historical documentation of ancestral lands, human rights, religious freedom, spirituality, and the preponderance of scientific evidence. As provided under NAGPRA 25 USC - Sec 2 - Sec 3 (1) (2) (a-b-c (1)), we request the immediate return of these ancestors and material culture objects.

No consumptive analysis of these remains is permitted or authorized and we are firm in our conclusions that the above referenced scientific an historical evidence supports this claim. Any further scientific analysis used to support undocumented scientific findings is unnecessary and would be a violation of NAGPRA.

As has been gleaned from recent NA Consultation requests from your Agency between November 26, 2003 and May 25, 2003 the following concerns are related.

**Sacred, Spiritual, Religious concerns:** Particular geography or power centers that emanate from Grandmother earth are cave

openings, rock-shelters, caves, springs, ponds, streams, lakes, rock overhangs, outcrops, canyons, mountain tops, volcanic vents, hot springs, geologic hoodoos, large trees, ancient trees, and so on, within striking natural features. Sacred Earth Matrix is considered holy places where "prayer offerings, and ceremonies take place. Any excavation or looting of these sites is extreme reasons for concern with the Band. In the future we would like to work with your staff in identifying sacred items removed from the matrix through excavation within the Gosiute ancestral land.

As is usually the case in areas where extreme disturbance and Urban Sprawl has occurred, many cultural resources are located through undertaking activities. We are concerned that when project oversight leaves the watchful oversight of the Federal Lead Agencies that the same care and protection provided by our Nations Historic Preservation Law is not considered fully. We request that Federal Oversight of entire project phases be done, so as to allow for compliance.

**The following discusses specific concerns with undertakings.**

A recurrent problem in reports is that the contemporary mainstream Culture History of the archaeology in the area is void of Gosiute modulation and orientation before 1,350 A.D. We do not agree with the Culture History. We are writing a Band Culture History for ancestral lands scheduled for completion in December of 2003 (Brewster, Dissertation 2003). However, this document is expected to change as new data are added. We would appreciate having an equal voice in the scientific analysis of our ancestral lands and at this time we require that a disclaimer be added to reports:

Presently, the Skull Valley Band of Gosiute Indians does not agree with the current Eastern Great Basin archaeological culture history due to its exclusion of Gosiute thought and disconnection from ancestors. A Band Culture History is in development to offer a Gosiute and Shoshone view on the history of its ancestors in the Region. For the present purpose, the Gosiute and Shoshone assert that the archaeology of the Region supports an in situ development for 12,000+ years.

We request a copy of final archaeological reports for our files. In addition, we will review in house projects only, in keeping with Cultural Resource Management compliance procedure. However, we urge the FHWA in the future, that contract Archaeological Consultant companies

and proponents write Native American Consultation fees into their proposals for work within ancestral Gosiute land.

The Band THPO has, it's own Principal Investigator and these fees are set at the standard rate of \$50.00 per hour. Field visits for complex projects with potential site visits include the standard mileage, field rates, and hourly wage for providing services.

Concerning "inadvertent discoveries", of skeletal remains and associated funerary objects and/or cached prayer offerings. We require immediate notification by phone so we can process and coordinate spiritual responsibilities of the Band toward ancestors.

We are planning a training August 28, 2003 for Federal, State, Public and Tribal Cultural Resources Management managers and government. The training concerns Compliance with Historic Preservation Law. We will contact you with the official notification for this training that will be held at the Indian Walk in Center. The Advisory Council on Historic Preservation will also provide a Lecture concerning the compliance at this training.

Please contact us at your earliest convenience and if you require further data please do not hesitate to contact us at the above address.

Thank You,

A handwritten signature in cursive script, appearing to read "Leon Bear".

LEON BEAR  
Band Executive



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
1325 J STREET  
SACRAMENTO, CALIFORNIA 95814-2922

Regulatory Branch

June 13, 2003

Mayor Rick Miller  
Fruit Heights  
910 S. Mountain Road  
Fruit Heights, UT 84037

RE: Participation Opportunities for Preparation of the Legacy Parkway Supplemental Environmental Impact Statement (SEIS)

Dear Mr. Mayor:

The U.S. Army Corps of Engineers (Corps) and Federal Highway Administration (FHWA) invite you to take an active role in the development of the supplemental environmental impact statement (SEIS) for the Legacy Parkway project.

#### **Community Planning and Information Committee (CPIC)**

At the Legacy Parkway public scoping meetings in April 2003, the citizens and communities informed us of their desire to be involved in the Legacy SEIS process. We are therefore forming a Community Planning and Information Committee (CPIC) to help us better collect and share information that is critical to our technical work on the environmental analysis.

Concurrent with the development of the Legacy SEIS, FHWA is reevaluating the draft environmental impact statement (DEIS) for the I-15 North project. Both the Legacy Parkway project and the I-15 North project are components of the "Shared Solution" for transportation issues in the north corridor. Since both projects are related and dependent upon one another, we'll be using the CPIC meetings to gather information for the I-15 North project as well. We welcome your participation in this effort, and ask that you designate two persons from your organization's Planning and Development Department or Public Works Department to participate in the CPIC and to attend the meetings. (No more than two representatives per organization please.)

#### **CPIC Meetings**

We currently anticipate three CPIC meetings this year related to the Legacy Parkway and I-15 North projects. In addition to these meetings, the Legacy Parkway team will be holding more meetings once development of the Legacy SEIS is initiated, and the I-15 North team will be holding more meetings as their process progresses.

The first CPIC meeting is scheduled for Thursday, July 10, 2003, from 2:00 to 4:00 p.m., at the Bountiful City Hall, 790 South 100 East, Bountiful, Utah. The first meeting will provide a status update on the I-15 North reevaluation and an opportunity to address Legacy Parkway topics,

including the proposed trail, the narrower right-of-way, and the D&RG Regional Alignment. The following issues will be covered:

- How would a roadway alignment within the D&RG corridor impact your community?
- Where would you like to see a trail in your community, if a trail is not proposed adjacent to the Legacy Parkway?

The second CPIC meeting is proposed for late July or early August. The meeting will address the findings of the I-15 North reevaluation and sequencing and integration of the Legacy Parkway project.

**Your Response**

We request your response to our invitation by Thursday, June 26, 2003. You may respond by calling or emailing Kimberly Stevens at 801-951-1026 ext. 317 or [kstevens@jsanet.com](mailto:kstevens@jsanet.com). If you have any questions about the CPIC, please call Nancy Kang at the Corps (801-295-8380 ext. 14) or Greg Punske at FHWA (801-963-0078 ext. 237).

Sincerely,

Nancy Kang  
Chief, Utah Regulatory Office  
U.S. Army Corps of Engineers

cc: Greg Punske, Project Development Engineer, FHWA  
Andrew Gemperline, UDOT

enclosure

Local Government Recipient List

Commissioner Dannie R. McConkie  
Davis County  
Davis County Memorial Courthouse  
P.O. Box 618  
Farmington, UT 84025

Mayor Carl Martin  
West Bountiful City  
550 North 800 West  
West Bountiful, UT 84087

Mayor Joe Johnson  
Bountiful City  
P.O. Box 369  
Bountiful, UT 84010-0369

Mayor Mike Deamer  
Centerville City  
3500 South Main, Suite 206  
Salt Lake City, UT 84115

Mayor Kay Briggs  
North Salt Lake City  
P.O. Box 208  
North Salt Lake, UT 84054

Mayor Jerry Larrabee  
Woods Cross City  
466 North 900 West  
Kaysville, UT 84037

Mayor David Connors  
Farmington City  
P.O. Box 160  
Farmington, UT 84025-0160

Mayor Nancy Workman  
Salt Lake County  
2001 S. State, Suite N2100  
Salt Lake City, UT 84190

Mayor Rocky Anderson  
Salt Lake City Corporation  
451 S. State  
Salt Lake City, UT 84111

Mayor Brian Cook  
Kaysville City  
23 E. Center  
Kaysville, UT 84037

Mayor Rick Miller  
Fruit Heights  
910 S. Mountain Road  
Fruit Heights, UT 84037



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
1325 J STREET  
SACRAMENTO, CALIFORNIA 95814-2922

Regulatory Branch

June 13, 2003

Mick Crandall  
UTA  
221 West 2100 South  
Salt Lake City, UT 84115

RE: Participation Opportunities for Preparation of the Legacy Parkway Supplemental Environmental Impact Statement (SEIS)

Dear Mr. Crandall:

The U.S. Army Corps of Engineers (Corps) and Federal Highway Administration (FHWA) invite you to take an active role in the development of the supplemental environmental impact statement (SEIS) for the Legacy Parkway project.

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At the Legacy Parkway public scoping meetings in April 2003, the citizens and communities informed us of their desire to be involved in the Legacy SEIS process. We are therefore forming a Community Planning and Information Committee (CPIC) to help us better collect and share information that is critical to our technical work on the environmental analysis.

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Sincerely,

Nancy Kang  
Chief, Utah Regulatory Office  
U.S. Army Corps of Engineers

cc: Greg Punske, Project Development Engineer, FHWA  
Andrew Gemperline, UDOT

enclosure

Recipient List

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

Mick Crandall  
UTA  
221 West 2100 South  
Salt Lake City, UT 84115

Stephen Holbrook  
Executive Director  
Envision Utah  
254 S. 600 E.  
Salt Lake City, UT 84102

David Schaller  
8P-R  
US EPA, Region 8  
999 18th Street, Suite 300  
Denver, CO 80202-2466

Roger Borgenicht  
Chair, Future Moves Coalition for  
Utahns for Better Transportation  
218 E. 500 S.  
Salt Lake City, UT 84111

Nina Dougherty  
Sierra Club  
Utah Chapter Office  
2120 S. 1300 E.  
Suite 204  
Salt Lake City, UT 84106-3785



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
1325 J STREET  
SACRAMENTO, CALIFORNIA 95814-2922  
October 2, 2003

RECEIVED OCT 06 2003

Regulatory Branch (200350493)

Nancy Keate  
Utah Department of Natural Resources  
Division of Wildlife  
1594 West North Temple, Suite 2110  
P.O. Box 146301  
Salt Lake City, Utah 84114-6301

Dear Dr. Keate:

The Corps of Engineers and the Federal Highway Administration are developing a Supplemental Environmental Impact Statement (SEIS) to re-evaluate the environmental effects of the Legacy Parkway Project proposed by Utah Department of Transportation. As you are aware, the project was subject to litigation and a court decision. This SEIS will be used to address limited deficiencies identified by the Court and, where needed, will update, when needed, portions of the original Final EIS (FEIS) dated June 2000.

We are currently reviewing our assessment of the project's impacts to wetlands made in the FEIS. In accordance with Nation Environmental Policy Act regulations (40 CFR 1502.9(c)), we are required to supplement our original environmental document if we determine (1) there were substantial changes in the proposed action that are relevant to environmental concerns; or, (2) there are significant new circumstances or information relevant to the environmental concerns and bearing on the proposed action or its impacts.

Although the Court upheld our reliance on the functional analysis methodology used in the original FEIS, we still must consider whether there is significant new information to warrant a supplement. As you are recognized as the State's leading wetland scientist and technical expert on the hydrogeomorphic functional assessment (HGM) methodology, we would like your assessment on whether recent improvements to the Great Salt Lake Ecosystem Slope Wetlands HGM model would constitute "significant new circumstances or information."

Under separate cover we have sent a copy of the original FEIS sections related to wetlands, including the technical appendix of the original HGM analysis for your review. While the decision to revise the wetland section is under the authority of the Corps of Engineers, we would appreciate your expert input.

Thank you for your cooperation. If you have any questions, please contact me at our Utah Regulatory Office, 533 West 2600 South, Suite 150, Bountiful, Utah 84010, or email Nancy.Kang@usace.army.mil, or telephone 801-295-8380, extension 14.

Sincerely,

**ORIGINAL SIGNED**

Nancy Kang  
Chief, Utah Regulatory Office

Copy furnished:

- ✓ Andrew Gemperline, P.E., Utah Department of Transportation, 360 North 700 West, Suite F  
2nd Floor, North Salt Lake, Utah 84054
- Greg Punske, P.E., Federal Highway Administration, 2520 West 4700 South, Suite 9A, Salt  
Lake City, Utah 84118-1847

November 18, 2003

Field Supervisor  
United States Department of the Interior  
Fish And Wildlife Service  
2369 West Orton Circle  
West Valley City, Utah 84119

RE: Environmental Re-Evaluation of the Legacy Parkway Final Environmental Impact Statement

Dear Field Supervisor:

The proposed Legacy Parkway would be a four-lane, limited-access, divided highway extending approximately 22.5 kilometers (14 miles) from Interstate 215 at 2100 North in Salt Lake City northward to I-15 and U.S. 89, near Farmington, Utah (see attached project location figures). The primary purpose of the Legacy Parkway project is to provide a portion of the transportation facilities needed in the North Corridor to accommodate the safe and efficient movement of people and goods projected for the year 2020.

A Final Environmental Impact Statement (FEIS) for the Legacy Parkway was released in June 2000, however, The United States Court of Appeals, 10<sup>th</sup> Circuit remanded the FEIS in September 2002 for further consideration. Under direction of the Federal Highway Administration and U.S. Army Corps of Engineers, an Environmental Re-evaluation of the Legacy Parkway Final Environmental Impact Statement (FEIS) is being prepared to support drafting of the Legacy Parkway Supplemental Environmental Impact Statement (SEIS).

Section 4.15 of the FEIS presented the following as federally listed Threatened or Endangered species potentially affected:

Species		Status	Known or Potential Effect
Common Name	Scientific Name		
Ute ladies' tresses	<i>Spiranthes diluvialis</i>	Threatened	No effect; not located in study area
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Threatened	Likely to be affected
Mountain Plover	<i>Charadrius montanus</i>	Proposed Threatened	Not likely to be affected because distribution is outside study area

A Final Formal Biological Opinion for the Legacy Parkway project was received from the USFWS, dated February 11, 1999, wherein the Service concurred with a biological assessment that the proposed project may affect and is likely to adversely affect the bald eagle and peregrine falcon (*Falco peregrinus*). The Biological Opinion also states that the Legacy Parkway is not likely to jeopardize the continued existence of the bald eagle and that no critical habitat has been designated for the bald eagle in Utah, so none would be affected.

A letter from the USFWS dated September 17, 1999, acknowledged the removal of the peregrine falcon from the federal list of endangered and threatened wildlife, and stated that the terms and conditions of its former Biological Opinion are no longer considered nondiscretionary with respect to the peregrine falcon. Nevertheless, the USFWS still recommended implementing all strategies outlined in the Biological Opinion to prevent any violations under the Migratory Bird Treaty Act.

Please let us know if the USFWS still concurs with the determination outlined in the Biological Opinion and whether information provided from the FEIS remains current for the subject proposed project.

Sincerely,  
HDR, Inc.

Mike Perkins  
Biologist  
Legacy Parkway Team  
360 North 700 West, Suite F  
North Salt Lake, UT 84054

cc: project files



United States Department of the Interior  
FISH AND WILDLIFE SERVICE

UTAH FIELD OFFICE  
2369 WEST ORTON CIRCLE, SUITE 50  
WEST VALLEY CITY, UTAH 84119

In Reply Refer To  
FWS/R6  
ES/UT  
04-0221

December 3, 2003

Mike Perkins  
Biologist  
Legacy Parkway Team  
360 North 700 West, Suite F  
North Salt Lake, UT 84054

Dear Mr. Perkins:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter of November 18, 2003 requesting concurrence outlined in the February 11, 1999 Biological Opinion (BO) for the Legacy Parkway Final Environmental Impact Statement. The Service maintains that the BO is still in effect. However, your document lists the mountain plover (*Charadrius montanus*) as Proposed Threatened. At this time, the mountain plover is no longer proposed for listing and can be removed from the species list for your project area.

We appreciate the opportunity to provide these comments. If you need further assistance, please contact Chris Witt, Ecologist, at the letterhead address or (801) 975-3330 ext. 133.

Sincerely,

For Henry R. Maddux  
Utah Field Supervisor

cc: UDWR - SLC  
✓ FHWA - Attn: Greg Punske  
COE - Attn: Nancy Kang

# Weber County to Salt Lake City Commuter Rail Project Partnering Charter July 15, 2004

## **Mission:**

---

We agree to work together as a team to complete the design and construction of the Weber County to Salt Lake City Commuter Rail Project in a way that meets the transit, highway and freight railroad needs in a safe, efficient and cost-effective manner.

The success of our efforts on behalf of the Commuter Rail project will be measured by the public in their acceptance and use of commuter rail and by the stakeholders, including neighborhoods and communities, as the commuter rail operates as part of an integrated and complementary transportation system that provides for the safe and efficient movement of people, goods and services.

## **Objectives:**

---

**Safety:** We agree to design, construct, and operate a project that will provide safe conditions for transit and highway system patrons, construction workers, pedestrians, freight railroad employees, highway construction and maintenance crews, and the people living and working adjacent to the corridor.

**Teamwork:** We agree to work together to achieve our mutually agreeable and beneficial goals in a spirit of cooperation, positive reinforcement, trust, respect and accountability and to work together in making decisions in a timely manner.

**Cost-Effectiveness:** We agree to maintain a strong focus on finding and implementing the most cost-effective solutions to the design and construction of the project and performing the work within the agreed budgets. All team members will continue to look for value engineering opportunities early on without compromising the integrity of the railroad, highway and transit systems.

**Quality:** We agree to design and construct the project in accordance with recognized standards which meet the long-term needs for transit users, communities, and adjacent railroad and highway systems, offers value for the investment, is compatible with the environment and provides a safe, reliable, clean, quiet, efficient and comfortable riding experience.

**Schedule:** We agree to make the on-time completion of the project a high priority by developing and adhering to a mutually agreeable schedule, timely resolving problems, and utilizing resources appropriately.

**Communication:** We agree to establish and maintain clearly defined channels of communication between the stakeholders and the public, and communicate in an open and positive manner.

**Construction Impacts:** We agree to collaborate as a team in minimizing construction impacts to the stakeholders and their customers.

**Issue Resolution:** We agree to seek early identification and timely resolution of differences in an atmosphere of openness, accessibility, fairness, understanding, mutual agreement, listening, mutual respect and attention to details.

**Environmental Awareness:** We agree to pursue the design, construction and operation of this system with conformance to the commitments within the environmental document and to existing laws, regulations and community concerns. Special attention will be given to communicating with the permitting/regulatory agencies.



Andrew Styerlain  
D.D.  
Walter Wood  
Randy Woyler  
Thomas J. Ogee  
Jerry White  
Tony K. Love  
Al Farrow  
Curtis Hill  
Kevin J. Smiley  
Michael Fisher  
Ala. Bach  
Dave, Orvell  
C. J. [unclear]  
Michael [unclear]  
M. J. Christensen

Wm. J. Jolley  
W. H. [unclear]  
Mark [unclear]  
Al. Hill  
Kevin [unclear]  
Randy [unclear]  
Howard J. Anderson  
Bill [unclear]  
Ted [unclear]  
Mela Farrow  
Jim [unclear]  
Paul M. [unclear]  
Ray W. [unclear]  
Rich [unclear]  
[unclear]  
[unclear]



RECEIVED SEP 27 2004

# BOUNTIFUL

*City of Beautiful Homes and Gardens*

JOE L. JOHNSON  
MAYOR

CITY COUNCIL  
BARBARA HOLT  
R. FRED MOSS  
JOHN S. PITT  
J. GORDON THOMAS  
TOM TOLMAN

CITY MANAGER  
TOM HARDY

September 23, 2004

John Thomas, P.E.  
Legacy Parkway Project Manager  
360 N. 700 West Suite F  
North Salt Lake, UT 84054

RE: Bountiful Recreation Pond  
South of Bountiful Sanitary Landfill

Dear Mr. Thomas

By letter of December 11, 1997 and a follow-up letter of September 2, 1999, we provided HDR Engineering, then the Utah Department of Transportation's (UDOT's) contractor for the Legacy Parkway Environmental Impact Statement, with information concerning the Bountiful Recreation Pond (the "Pond") and our views on possible impacts of the planned Legacy Parkway on this property. We asked that "impacts of the proposed highway should be kept as minimal as possible" and presented our views on several specific items.

In the years since those letters, we have been pleased to maintain an open dialogue with UDOT and the federal agencies working on the Legacy Parkway. We believe that the Legacy Parkway has been designed and planned to have no impacts to the Pond. Bountiful fully supports prompt development of the Legacy Parkway at the location known as the Preferred Alternative. To assist in the ongoing review of this project, Bountiful City offers additional information concerning the pond property.

The property upon which the Pond is located was originally acquired by Bountiful City with the intent of using the property in landfill operations, specifically as an area to mine clay cover soil for use at the landfill and/or possible landfill expansion or equipment and materials storage. In 1991 Bountiful received a 404 permit from the U.S. Army Corps of Engineers which allowed us to excavate over 650,000 cubic yards of clay soil from the property for use in our landfill operations. As part of this construction project, Barton/Stone creek was concrete lined and diverted into the excavation. This is how and why the Pond was created. At that point people began using the area for recreational purposes such as fishing and bird watching. These activities were not encouraged by the City and the property was not managed as a recreational facility by the City.

In December 2001 Bountiful City applied for and obtained a grant to improve and construct some recreational facilities at the Pond location. We previously submitted to you a copy of the grant agreement and a site plan which shows the improvements at the pond. The site plan clearly shows the areas which the City determined would be the most appropriate for recreational development

**Mark W. Franc P.E.**

Bountiful City Engineering Department

790 South 100 East • P.O. Box 369 • Bountiful, Utah 84011-0369 • (801) 298-6125 • FAX (801) 298-6033 • mfranc@bountifulutah.gov

and areas which would be most appropriate for potential other uses (the undeveloped areas). As part of the grant agreement Bountiful City agreed to maintain the recreational facilities for at least the next 30 years which we intend to do.

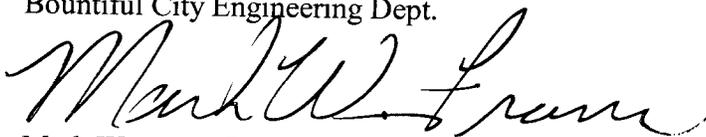
In addition to maintaining the designated recreational facilities at the property, the City intends to use other parts of the property for other municipal purposes as needed. These may include equipment and/or materials storage, staging, or as a source for additional clay soil. This multiple use management is necessary because Bountiful City cannot predict whether parts of the pond property may be needed for these or other municipal purposes.

Under current and future planned management, no recreational improvements or activities are existing or planned in the southeast corner of the Pond property. This area is unused acreage within the property boundary that Bountiful has long decided will be part of the Legacy Parkway Preferred Alternative alignment. The City approached the design of the recreational facilities and the ongoing management of the facilities with full knowledge and intent that this part of the property should be used for the Legacy Parkway and as future access to the recreational facilities.

It is our understanding that the current design for the Legacy Parkway does not impact any portion of the Pond and/or any recreational features associated with the Pond. We feel that our recreational facility and our ability to manage it as such will not be negatively impacted by construction of the Legacy Parkway as currently designed at the location known as the Preferred Alternative. In fact, we feel that the Parkway and the included frontage road adjacent to the Pond property will improve and create planned access to recreational areas of the property that currently have limited access.

We have taken steps in obtaining and administering the funds from the grant to carefully consider how the property can best be used under a multiple use management system. We understand that, based on our prior letters, the federal agencies considered the entire Pond property to be a significant recreational resource. As owners and managers of the property, we believe that conclusion is not correct. We would be happy to provide any additional information that you may find useful.

Sincerely,  
Bountiful City Engineering Dept.

A handwritten signature in cursive script, appearing to read "Mark W. Franc".

Mark W. Franc, P.E.  
Asst. City Engineer

DETERMINATION OF ELIGIBILITY  
AND  
FINDING OF EFFECT

for

PROJECT NO. SP-0067(1)0: LEGACY PARKWAY  
(FORMER LEGACY WEST DAVIS HIGHWAY)  
SALT LAKE AND DAVIS COUNTIES, UTAH

Prepared by the

FEDERAL HIGHWAY ADMINISTRATION, UTAH DIVISION

and the

UTAH DEPARTMENT OF TRANSPORTATION

Submitted to the

UTAH STATE HISTORIC PRESERVATION OFFICE

Wilson Martin, State Historic Preservation Officer

November 3, 2004

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SUMMARY SHEET

1. Project: SP-0067(1)0: Legacy Parkway
2. Location: Salt Lake to Farmington, Salt Lake and Davis Counties, Utah
3. Funding: State
4. Lead Federal Agency: Federal Highway Administration & U.S. Army Corps of Engineers
5. Inventory/Evaluation Reports:
 

Author(s)	Title
(Colman and Coleman et. al. 1998)	<i>A Cultural Resources Inventory of the Proposed Legacy-West Davis Highway in Davis and Salt Lake Counties, Utah</i>
(Colman 1999)	<i>Cultural Resource Inventory of Wetland Mitigation Areas for the Legacy Parkway,</i>
(Overstreet, Seacat et. al., 2004)	<i>Supplemental Cultural Resources Report for the Proposed Legacy Highway Project from Salt Lake City, Salt Lake County to Kaysville, Davis County, Utah</i>
(Wright 2001),	<i>Class III Cultural Resource Inventory for the Legacy Nature Preserve, Davis County, Utah</i>
(Elsken 2004),	<i>Documentation of the Woodman Townsite, the Antelope Island Improvement Company Boat Landing, the Lake Shore Bathing Resort, and Associated Features for the Legacy Parkway Project in Davis County, Utah</i>
(Seddon & Lundin, 2003),	<i>Site DV94: A Human Remains Discovery in the Jordan River Wetlands, Davis County, Utah</i>
(Seddon, et. al. 2004)	<i>Industrial Debris and the Bottle Louse: Data Recovery at the Lagoon Drive Discovery Site (42DV 93) on the Legacy Parkway project, Farmington, Davis County, Utah</i>
6. Historic Properties: See Table 1.
7. Affected Historic Properties:
 

Alt. A	42Dv2, 42Dv94, 42Dv97, D&RG railroad, 10 N 650 W, Farmington, Clark Lane Historic District, 662 W Clark Lane, Farmington
Alt. B	42Dv2, 42Dv70, 42Dv77, 42Dv90, 42Dv94, D&RG railroad, 1300 Glover Lane, Farmington, Clark Lane Historic District, Farmington, 662 W Clark Lane, Farmington, 10 N 650 W, Farmington

	Alt. C	42Dv2, 42Dv94, 42Dv97, D&RG railroad, Clark Lane Historic District, Farmington, 662 W Clark Lane Farmington, 10 N 650 W, Farmington
	Alt. D&E	42Dv2, 42Dv94, 42Dv97, D&RG railroad, Clark Lane Historic District, Farmington, 662 W Clark Lane Farmington, 10 N 650 W, Farmington
	Redwood Alt.	42Dv2, 42Dv67, 42Dv94, 836 S Redwood Woods Cross, 918 S Redwood, Woods Cross, 946 S Redwood, Woods Cross, 974 S Redwood, Woods Cross, 1650 S Redwood, Woods Cross, 2018/2020 S Redwood, Woods Cross, 2408 S Redwood, Woods Cross, 1095 N Redwood, North Salt Lake, D&RG railroad, Clark Lane Historic District, Farmington, 662 W Clark Lane Farmington, 10 N 650 W, Farmington
	Alt. A	42Dv2, 42Dv94, 662 W Clark Lane, Farmington, 10 N 650 W, Farmington
8.	Project Effect: Adverse Effect	Alt. B 42Dv70, 42Dv77, 42Dv90, 1300 Glover Lane, Farmington, 662 W Clark Lane Farmington, 10 N 650 W, Farmington
	Alt C	42Dv2, 42Dv94, 662 W Clark Lane, Farmington, 10 N 650 W, Farmington
	Alt D&E	42Dv2, 42Dv94, 662 W Clark Lane, Farmington, 10 N 650 W, Farmington
	Redwood Alt.	42Dv2, 42Dv67, 42Dv94, 836 S Redwood Woods Cross, 918 S Redwood, Woods Cross, 946 S Redwood, Woods Cross, 974 S Redwood, Woods Cross, 1650 S Redwood, Woods Cross, 2018/2020 S Redwood, Woods Cross, 2408 S Redwood, Woods Cross, 1095 N Redwood, North Salt Lake, 662 W Clark Lane, Farmington, 10 N 650 W, Farmington

Table 1: Sites Recorded during the Surveys

In-Period Historic Structures					
Address	City	Year	Type	Eligibility	
326 Burke Lane	Farmington	1920	Hall Parlor House	N	
1300 Glover Lane	Farmington	1950	Animal Facility	Y	
415 S 650 W	Farmington	1950	Animal Facility	Y	
637 S 650 W	Farmington	1910	Cross Wing House/Animal Facility	Y	*
2120 S 650 W	Farmington	1930	Animal Facility	Y	
1515 N 1100 W	W. Bountiful	1920	Foursquare House	Y	
2125 N 1100 W	W. Bountiful	1940	Animal Facility	Y	
772 S Redwood	Woods Cross	1930	Bungalow House	N	
808 S Redwood	Woods Cross	1930	Bungalow House	N	
836 S Redwood	Woods Cross	1950	WWII Era Cottage	Y	
864 S Redwood	Woods Cross	1930	Bungalow House	N	#
918 S Redwood	Woods Cross	1920	Cross Wing House	Y	
946 S Redwood	Woods Cross	1950	WWII Era Cottage	Y	*
974 S Redwood	Woods Cross	1920	Bungalow House	Y	
1430 S Redwood	Woods Cross	1920	Cross Wing House	N	*
1452 S Redwood	Woods Cross	1950	WWII Era Cottage	Y	
1650 S Redwood	Woods Cross	1920	Cross Wing House	Y	*
2018/2020 S Redwood	Woods Cross	1920	Cross Wing House	Y	
2408 S Redwood	Woods Cross	1950	WWII Era Cottage	Y	
1095 N Redwood	N. Salt Lake	1950	WWII Era Cottage	Y	
ca. 900 N Redwood	N. Salt Lake	1905	Foursquare House	Y	
3290 N 2200 W	N. Salt Lake	1950	Ranch House	Y	
3200 N 2200 W	N. Salt Lake	1955	Ranch House	Y	
2790 N 2200 W	N. Salt Lake	1950	WWII Era Cottage	N	#
2770 N 2200 W	N. Salt Lake	1920	Foursquare House	Y	
2704 N 2200 W	N. Salt Lake	1950	WWII Era Cottage	N	
2662 N 2200 W	N. Salt Lake	1930	Bungalow House	Y	
2650 N 2200 W	N. Salt Lake	1950	WWII Era Cottage	Y	
2664 N Rose Park Lane	N. Salt Lake	1910	Foursquare House	Y	
393 W State Street	Farmington	1910	Cross Wing House	N	
Clark Lane Historic District	Farmington	Varies	District	Y	*
662 W Clark Lane/ 650 W. Clark Lane	Farmington	1950	Animal Facility	Y	*
10 N. 650 West	Farmington	1910	Temple Form House	Y	*
453 W Glovers Lane	Farmington	1955	WWII Era Cottage	N	

### Archaeological Sites

Site Number	Type	Eligibility	
42Dv2	Prehistoric	Y	*
42Dv3	Prehistoric	?	
42 Dv4	Prehistoric	?	
42 Dv22	Prehistoric	N	
42 Dv35	Prehistoric	Y	
42Dv67	Historic	Y	*
42Dv68	Historic	N	*
42Dv69	Historic	N	#
42Dv70	Prehistoric	Y	*
42Dv71	Historic	N	*
42Dv72	Prehistoric	Y	*
42Dv73	Historic	N	*
42Dv74	Multi-Component	Y	*
42Dv75	Historic	N	*
42Dv76	Prehistoric	Y	*
42Dv77	Prehistoric	Y	*
42Dv80	Prehistoric	Y	***
42Dv88	Prehistoric	Y	***
42Dv89	Historic	N	#
42Dv90	Historic	Y	
42Dv91	Historic	N	**
42Dv92	Historic	N	**
42Dv93	Historic	N	
42Dv94	Prehistoric	Y	
42Dv97	Historic	Not Evaluated	
42Dv98	Multi-Component	Y	
42Dv102	Historic	N	
42Dv103	Historic	N	
42Dv112	Historic	N	
42Dv113	Historic	N	
42SI154/182	Multi-Component	Y	*
42SI155	Prehistoric	N	*
42SI197	Prehistoric	N	
42SI241	Historic	N	*
42SI242	Multi-Component	Y	*
42SI243	Historic	N	*
42SI244	Prehistoric	N	*
42SI245	Multi-Component	N	*
42SI246	Prehistoric	Y	*
42SI247	Historic	N	*
42SI248	Prehistoric	Y	*
42SI249	Prehistoric	N	*
42SI250	Historic	N	*

42SI251	Historic	N	*
42SI252	Prehistoric	N	*
42SI253	Historic	N	*
42SI254	Historic	N	*
42SI255	Historic	Y	*
D&RG Railroad	Historic	Y	
UP Railroad	Historic	Y	
* = Eligibility determined with SHPO concurrence in August 31, 1998 DOE/FOE			
** = Eligibility determined with SHPO concurrence in July 18, 2002 DOE/FOE			
*** = Eligibility determined with SHPO concurrence in June 5, 2002 DOE/FOE			
# = Change in eligibility determination from previous DOE/FOE			

### Introduction

This documentation is a Determination of Eligibility and Finding of Effect (DOE/FOE) for State highway project No. SP-0067(1)0; Legacy Parkway, Salt Lake and Davis Counties, Utah. This project will comply with all federal regulations because it has the potential to use Federal-aid highway funds. This document specifies the consideration given to historic properties in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, and 36 CFR 800: Protection of Historic Properties. The Federal Highway Administration, Utah Division (FHWA) and the U.S. Army Corps of Engineers are the lead federal agencies for purposes of Section 106. The Utah Department of Transportation (UDOT) is the state highway agency coordinating this project, and is the applicant for federal funds. A summary sheet condensing pertinent project data is provided at the beginning of this document to expedite Section 106 reviews.

A DOE/FOE was prepared for the Legacy Parkway project originally on August 31, 1998. A lawsuit was filed subsequent to the Record of Decision on the Environmental Impact Statement (EIS) prepared for the project. Based upon the results of the lawsuit, a Supplemental EIS will be prepared. This DOE/FOE re-examines and re-evaluates site eligibility and effects based upon proposed project design changes and the passage of time. This DOE/FOE replaces the August 31, 1998 DOE/FOE and will be used to evaluate impacts to historic properties in the Supplemental EIS. Differences in the reporting of historic properties between this document and the 1998 DOE/FOE are the result of additional inventories, more properties becoming in-period, and non-project related demolition/removal of historic standing structures. It should be noted that several sites eligible for the NRHP have been affected by construction work that took place on the project prior to the injunction. Portions of 42Dv2 have been excavated. Additional DOE/FOEs have been prepared for actions related to the project. They include a DOE/FOE dated July 18, 2002 for the Legacy Nature Preserve Questar Gas Utility Relocation and a June 5, 2002 DOE/FOE for a Cultural Resource Inventory of the Legacy Nature Preserve. Sites that have had prior eligibility determinations with SHPO concurrence are noted in Table 1.

Based upon the Record of Decision issued on the initial Legacy Parkway project, one historic property determined to be adversely affected was documented and removed, in accordance with the provisions of the associated Memorandum of Agreement (MOA). That property is the White House at 10N 650 W in Farmington. Please note that the White House has been completely removed. For the purposes of this document, and the Supplemental EIS, this property will be listed as having an adverse effect from all alternatives. Additionally,

because impacts to 42Dv2 and 42Dv94 have already occurred, these sites will be listed as having an adverse effect from all alternatives.

### **Project**

The proposed project consists of constructing a new four-lane facility with median and shoulders. The Legacy Parkway project area runs from approximately 2100 North in North Salt Lake to just north of Burton Lane north of Farmington. Several build alternatives and a No Action Alternative are being considered. Each of the build alternatives are four-lane, divided, limit-access highways, but each are on different alignments. This DOE/FOE will determine eligibility of historic properties within the project area and the effects that the various alternatives will have on those properties eligible for the National Register of Historic Places (NRHP).

### Project Alternatives

The build alternatives are shown in the attached map(s). The build alternatives are identified by the following titles: Alternative A, Alternative B, Alternative C, Alternative D & E, and the Redwood Road Alternative. Alternative D & E are combined in this discussion as they follow an identical alignment. The difference is that D includes a 328-foot right-of-way width and E has a 312-foot width. Impacts to Historic and Archaeological resources are the same, regardless of the reduction of width. The Redwood Road Alternative is receiving a cursory evaluation based upon existing data. Should this alternative be selected, additional cultural resource surveys would need to be performed in accordance with the provisions for phased identification in 36 CFR 800.4(b)(2).

### **Historic and Archaeological Resources**

The effort to identify and evaluate all historic and archaeological resources within the area of potential effects (APE), as defined by 36 CFR 800.2(c), has been completed and reported in several volumes. These volumes are:

Author(s)	Title
Colman and Coleman et. al. 1998	<i>A Cultural Resources Inventory of the Proposed Legacy-West Davis Highway in Davis and Salt Lake Counties, Utah</i>
Colman 1999	<i>Cultural Resource Inventory of Wetland Mitigation Areas for the Legacy Parkway</i>
Overstreet, Seacat et. al., 2004	<i>Supplemental Cultural Resources Report for the Proposed Legacy Highway Project from Salt Lake City, Salt Lake County to Kaysville, Davis County, Utah</i>
Wright 2001	<i>Class III Cultural Resource Inventory for the Legacy Nature Preserve, Davis County, Utah</i>
Elsken 2004	<i>Documentation of the Woodman Townsite, the Antelope Island Improvement Company Boat Landing, the Lake Shore Bathing Resort, and Associated Features for the Legacy Parkway Project in Davis County, Utah</i>
Seddon & Lundin, 2003	<i>Site DV94: A Human Remains Discovery in the Jordan River Wetlands, Davis County, Utah</i>
Seddon, et. al. 2004	<i>Industrial Debris and the Bottle Louse: Data Recovery at the Lagoon Drive Discovery Site (42DV 93) on the Legacy Parkway</i>

The inventory and evaluation efforts have been conducted in accordance with the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 Federal Register Part IV).

### Inventory

A total of 85 in-period structures and sites were identified during the inventories for this project. Many more structures are located within the project area, but only those historic or archaeological resources dating prior to 1959 were included for evaluation in the inventories. Included in the various reports for this project, there are a total of 50 prehistoric and historic sites and 35 historic standing structures. Of these properties, 20 prehistoric and historic sites and 25 historic standing structures are considered eligible for the NRHP under one or more criteria. Two prehistoric sites remain unevaluated for eligibility. Two could not be located in the field (42Dv3 and 42Dv4) and the other will require additional testing to make a determination (42Dv97).

### Evaluation

In accordance with 36 CFR 800.4(a-d), the NRHP criteria have been applied to all 83 in-period sites. All of the sites are identified below by either an address or a site number. The UDOT/FHWA has made determinations on each of the sites below based upon NRHP requirements

For a complete list of the sites located during the Legacy Parkway surveys, both eligible and non-eligible, see Table 1. All sites from Table 1 are described briefly below and are accompanied by an eligibility determination. A more thorough discussion of each of the sites can be found in the attached reports.

### Historic Structures

All of the standing historic structures are determined eligible under criterion C. Because they are eligible for their architecture, boundaries of these historic properties only include the structural elements that contribute to the properties significance.

326 Burke Lane – This is a 1920's hall parlor house that has had substantial alterations. The UDOT/FHWA has determined it ineligible for the NRHP.

1300 Glover Lane, Farmington – This is a ca. 1950's animal facility consisting of several outbuildings. The UDOT/FHWA has determined this site eligible for the NRHP under criterion C.

415 S 650 W, Farmington – This is a ca. 1950's barn. The UDOT/FHWA has determined this site eligible for the NRHP under criterion C.

637 S 650 W, Farmington – This originally was a cross wing house from 1910 that has since been used to house animals. The UDOT/FHWA has determined this site eligible for the NRHP under criterion C.

2120 S 650 W, Farmington – This is a ca. 1930's barn. The UDOT/FHWA has determined this site eligible for the NRHP under criterion C.

1515 N 1100 W, West Bountiful – This is a 1920's Foursquare house. The UDOT/FHWA has determined this site eligible for the NRHP under criterion C.

2125 N 1100 W, West Bountiful—This is a 1940's era animal facility. The UDOT/FHWA has determined this eligible for the NRHP under criterion C.

772 S. Redwood Road, Woods Cross –This is a 1930's bungalow with alterations. The UDOT/FHWA has determined it ineligible for the NRHP.

808 S. Redwood Road, Woods Cross – This is a 1930's bungalow with alterations. The UDOT/FHWA has determined it ineligible for the NRHP.

836 S Redwood Road, Woods Cross – This is a 1950's World War II (WWII) Era Cottage. The UDOT/FHWA has determined this house eligible for the NRHP under criterion C.

864 S. Redwood Road, Woods Cross -- This is a 1930's bungalow with alterations. The UDOT/FHWA has determined it ineligible for the NRHP.

918 S Redwood Road, Woods Cross – This is a 1920's Cross Wing House. The UDOT/FHWA has determined this house eligible for the NRHP under criterion C.

946 S Redwood Road, Woods Cross – This is a 1950's WWII Era Cottage. The UDOT/FHWA has determined this house eligible for the NRHP under criterion C.

974 S Redwood Road, Woods Cross – This is a 1920's Bungalow house. The UDOT/FHWA has determined this house eligible for the NRHP under criterion C.

1430 S Redwood Road, Woods Cross – This is a 1920's Cross Wing House with alterations. The UDOT/FHWA has determined the house ineligible for the NRHP.

1452 S Redwood Road, Woods Cross – This is a 1950's WWII Era Cottage. The UDOT/FHWA has determined the house eligible for the NRHP under criterion C.

1650 S Redwood Road, Woods Cross -- This is a 1920's Cross Wing House. The UDOT/FHWA has determined this house eligible for the NRHP under criterion C.

2018/2020 S Redwood Road, Woods Cross -- This is a 1920's Cross Wing House. The UDOT/FHWA has determined this house eligible for the NRHP under criterion C.

2408 S Redwood Road, Woods Cross -- This is a 1950's WWII Era Cottage. The UDOT/FHWA has determined this house eligible for the NRHP under criterion C.

1095 N Redwood Road, North Salt Lake -- This is a 1950's WWII Era Cottage. The UDOT/FHWA has determined this house eligible for the NRHP under criterion C.

ca. 900 N Redwood Road, North Salt Lake – This is a 1900's Foursquare house. The UDOT/FHWA has determined this house eligible for the NRHP under criterion C.

3290 N 2200 W, North Salt Lake – This is a 1950's Ranch style house. The UDOT/FHWA has determined this house eligible for the NRHP under criterion C.

3200 N 2200 W, N. Salt Lake –This is a 1950's era ranch style house. The UDOT/FHWA has determined it eligible for the NRHP under criterion C.

2790 N 2200 W, N. Salt Lake – This is a 1950's WWII era cottage with alterations. The UDOT/FHWA has determined it ineligible for the NRHP.

2770 N 2200 W, N. Salt Lake – This is a 1920's foursquare home. The UDOT/FHWA has determined it eligible for the NRHP under criterion C.

2704 N 2200 W, N. Salt Lake – This is a 1950's WWII era cottage with alterations. The UDOT/FHWA has determined it ineligible for the NRHP.

2662 N 2200 W, N. Salt Lake – This is a 1930's bungalow style house. The UDOT/FHWA has determined it eligible for the NRHP under criterion C.

2650 N 2200 W, N. Salt Lake – This is a 1950's WWII era cottage. The UDOT/FHWA has determined it eligible for the NRHP under criterion C.

2664 N Rose Park Lane, N. Salt Lake – This is a 1910's era foursquare house. The UDOT/FHWA has determined it eligible for the NRHP under criterion C.

393 W State Street, Farmington –This is a 1910's era cross wing house with alterations. It is located in the Clark Lane Historic District. The UDOT/FHWA has determined that it does not contribute to the district and it is individually not eligible for the NRHP.

Clark Lane Historic District, Farmington – This is a listed historic district.

662 W. Clark Lane, Farmington – This is a 1950's era animal facility. The UDOT/FHWA determines that the structure is eligible for the NRHP under criterion C.

10 N 650 W, Farmington – This was a 1910 era Temple Form home. It was removed as part of the initial Legacy Highway effort in accordance with the MOA.

453 W Glovers Lane, Farmington – This is a 1950's WWII era cottage with alterations. The UDOT/FHWA has determined it ineligible for the NRHP.

### Archaeological Resources

42Dv2 – This property is a large Prehistoric campsite spanning both the prehistoric and historic periods. Excavation were begun in accordance with the original MOA. Excavations were halted prior to completion. During the excavation, human remains were encountered. This site is determined eligible for the NHRP under criterion D.

42Dv3 – This site was identified in the literature search. Site forms did not provide sufficient information to locate the site in the field. Because it could not be located, its eligibility is undetermined.

42Dv4 – This is a prehistoric site that was encountered in the literature search but was not found in the field. Location information was insufficient to locate it and as such, eligibility is undetermined.

42Dv22 – This is a prehistoric human burial located during the earthmoving activities at the Bountiful city dump. The burial was removed and the site is not eligible for the NRHP.

42Dv35 – Is a prehistoric lithic and groundstone scatter. It has previously been determined eligible for the NRHP under criterion D.

42Dv67 – This is a homestead site west of Woods Cross in the Salt Lake Valley. It consists of a collapsed stone, brick, and frame house and the remains of eight outbuildings. Historic trash is present. Data recovery potential is high. It is eligible for the NRHP under criteria C and D.

42Dv68 – This site consists of six structures, two brick and four metal. There are debris mounds indicative of three other structures that are now collapsed. A rail spur runs directly into the site. This site has been removed in association with the Foxboro Development. The UDOT/FHWA has determined the site ineligible for the NRHP.

42Dv69 – This site appears to be associated with 42 DV 68. It also contains six structures, two of brick and four of metal. The site has been removed in association with the Foxboro Development. The UDOT/FHWA has determined the site ineligible for the NRHP.

42Dv70 – Auger testing revealed subsurface artifacts at this site including mano fragments, lithic tools and debris, and a diagnostic Fremont sherd. The UDOT/FHWA has determined the site eligible for the NRHP under criterion D.

42Dv71 – This is a well consisting of a large metal pipe extending about 20 cm above the ground, a stump of a wooden pole and a long, curved piece of metal. There is little potential for subsurface deposits, data recovery potential is minimal, and no association can be made to a person or event. Because of this, the UDOT/FHWA has determined the site ineligible.

42Dv72 – This site is an open camp site near the Jordan River. The site surface exhibited lithic debitage, fire-cracked rock, and groundstone fragments. Diagnostic Fremont sherds were also present. The UDOT/FHWA has determined the site eligible for the NRHP under criterion D.

42Dv73 – This site consists of over 100 shards of glass. In addition, the site contains 20 pieces of white stoneware, all apparently from a single plate. The site bears no indication of buried deposits. Because of the limited potential for data recovery and the lack of association with a person or event, the UDOT/FHWA has determined this site ineligible.

42Dv74 – This is a multi-component site containing lithic material, fire-cracked rock, faunal bone and groundstone fragments. The historic component is a stone and brick foundation, shards of historic glass, and an irrigation ditch and two ponds. The UDOT/FHWA has determined this site eligible for the NRHP under criterion D.

42Dv75 – This site is the remains of a water conveyance system. It includes 12-18 inch wide open metal pipe held in place by a 2 x 4 inch wooden slat framework. The site exhibits low potential for yielding new information on the region's history and is not connected with a person or event of note. Because of this, the UDOT/FHWA has determined this site ineligible.

42Dv76 – Auger testing revealed diagnostic late prehistoric body and rim sherds, chipped stone debitage, and faunal bone. The UDOT/FHWA has determined this site eligible for the NRHP under criterion D.

42Dv77 – Auger testing revealed this site after an obsidian flake was observed on the surface. Thirteen artifacts were recovered including unburned faunal bone, a McKean Lancolate point base of obsidian, and lithic debitage. The UDOT/FHWA has determined this site eligible for the NRHP under criterion D.

42Dv80 – This is an lithic and ceramic scatter located on an old Jordan River channel. Purple glass fragments are also associated with the site. The UDOT/FHWA has determined this site eligible for the NRHP under criterion D.

42Dv88 – This site is a prehistoric lithic and ceramic scatter. Artifacts include lithic debitage and tools, prehistoric ceramics, and fire-cracked rock. The UDOT/FHWA has determined this site eligible for the NRHP under criterion D.

42Dv89 – This site consists of two historic earthen and rock slag berms associated with 24 wooden posts located on the marshy eastern shore of Farmington Bay. The elements may relate to a rail spur and dock associated with the Lake Shore Resort. In a determination made June 5, 2002, the UDOT then determined this site eligible for the NRHP. However, because this site does not appear to contain significant cultural data, and there is little potential for this site to contribute to specialized research questions, the UDOT/FHWA has determined this site ineligible.

42Dv90 – This site consists of a buried historical debris deposit, burned structural material and three concrete foundations. The UDOT/FHWA has determined this site eligible for the NRHP under criterion D.

42Dv91 -- This is a earthen water diversion ditch. No structures or features associated with the ditch were located. Because of the lack of association with any important person or event, the UDOT/FHWA has determined this site ineligible.

42Dv92 -- This is an earthen water diversion ditch. No structures or features associated with the ditch were located. Because of the lack of association with any important person or event, the UDOT/FHWA has determined this site ineligible.

42Dv93 – This is a historic trash scatter located by construction monitoring of the Legacy Parkway project. The site consists of a historical/trash debris deposit of glass, ceramics, and metal. Because it was discovered during construction, data recovery and excavation has taken place. The UDOT/FHWA has determined this site ineligible for the NRHP because data recovery has provided a valid sample of the deposit and physical remains capable of yielding relevant information.

42Dv94 – This site consists of human remains discovered eroding from the margins of the City Drain Canal in North Salt Lake City, Utah. The human remains have been fully excavated, but because there is sufficient potential for additional remains to be present in the area, the UDOT/FHWA has determined this site eligible for the NRHP.

42Dv97 -- This is a privy located at 1395 W. Parish Lane, Centerville that was discovered during property acquisition. In consultation with the Utah SHPO, it was determined that testing

would be necessary to determine the eligibility of the site. Because the current injunction prohibits ground disturbance, the UDOT/FHWA has decided to test the site when and if the injunction is lifted. If testing occurs, the UDOT/FHWA will determine eligibility at that time.

42Dv98 – This is a multi-component site consisting of a prehistoric lithic and ceramic scatter and a historical trash scatter. The prehistoric assemblage consists of one ceramic fragment, one groundstone fragment, one projectile point tip and approximately 20 lithic flakes. The historic component contains four ironstone plate fragments and three glass fragments. The historic debris was scattered across the site. A 1 x 1 meter test pit was dug to test the prehistoric component. Prehistoric artifacts were recovered from the pit to a depth of 25 cm. Based upon this information, the UDOT/FHWA has determined the prehistoric component of the site eligible for the NRHP under criterion D and the historic component is determined to be a non-contributory part of the site.

42Dv102 – This is a historic artifact scatter consisting of glass and ceramics. Rodent burrowing and utility excavation have heavily impacted the site. The UDOT/FHWA has determined this site ineligible for the NRHP.

42Dv103 – This is a historic abandoned sewer line located in the Legacy Nature preserve. The site consists of to 685 m long east-west oriented rows of concrete risers and two concrete frames. Overall, the site is in poor condition due to decay and dismantling. The UDOT/FHWA has determined this site ineligible for the NRHP.

42Dv112 – This is the townsite of Woodman. This includes five east/west blocks and four north/south blocks laid out in a grid pattern. Apparently all that was done with the townsite was to blade the roads. Two capped wells may be related to the townsite as well. Because it is unlikely that the site contains buried deposits, and no additional surface artifacts are associated with the site, the UDOT/FHWA has determined this site ineligible for the NRHP.

42Dv113 – This site is a historic boat landing consisting as an earthen and slag berm. Because this site does not appear to contain significant cultural data, and there is little potential for this site to contribute to specialized research questions, the UDOT/FHWA has determined this site ineligible for the NRHP.

42SI154/182 – This is a multi-component site consisting of a prehistoric lithic scatter and an historic glass scatter. Based upon testing, the prehistoric component appears to be an open Archaic site. The UDOT/FHWA has determined this site eligible for the NRHP under criterion D.

42SI155 – This site is an open lithic scatter. Two possible diagnostic projectile points were recovered from the site, but testing showed there was no depth to the cultural deposits. Because the potential for data recovery is limited, the UDOT/FHWA has determined this site ineligible.

42SI197 – This is a Fremont site recorded in 1994 located near North Temple and west of Redwood Road. Little information is available from the site form and it has been determined ineligible for the NRHP.

42SI241 – This is a historic trash scatter containing glass shards, bricks, metal strips, ceramic sherds, and other metal objects. Because the site lacks buried cultural deposits and is not associated with a noteworthy person or event, the UDOT/FHWA has determined the site ineligible.

42SI242 – This is a multi-component site consisting of an open prehistoric camp and an historic trash scatter. A test pit revealed buried cultural deposits and data recovery potential for the prehistoric component of the site. The UDOT/FHWA has determined the site eligible for the NRHP under criterion D.

42SI243 – This is an historic open trash scatter consisting of glass, ceramics, and terra cotta ceramics. The site lacks depth of cultural fill and no association can be made with any noteworthy event or person. The UDOT/FHWA has determined the site ineligible.

42SI244 – This is a prehistoric open camp. The site contains two manos. Interviews with the property owner revealed that the land has been plowed over many times and the owner does not recollect seeing any other type of artifact besides groundstone. Two test pits were dug, recovering quartzite shatter, faunal bone, a charcoal sample, and historic metal. Because of the limited amount of artifacts on the surface, the instability of the site, and the lack of artifact recovery from the test pits, the UDOT/FHWA has determined the site ineligible.

42SI245 – This multi-component site contains a prehistoric open lithic scatter and a historic trash scatter. The site is located in a plowed alfalfa field. Three test pits were dug, with only one groundstone fragment being recovered. The lack of artifacts in the test pits suggests limited potential for data recovery. In addition, the agricultural modifications to the land have affected the integrity of the site. Because of this, the UDOT/FHWA has determined this site ineligible.

24SI246 – This site is a prehistoric open lithic scatter containing three diagnostic projectile points, lithic flakes, and groundstone. Two test pits were dug with additional artifacts being recovered. Based upon the buried cultural deposits, the diagnostic points, and other artifacts, the UDOT/FHWA has determined this site eligible under criterion D.

42SI247 – This is a historic trash scatter located in an alfalfa field. The artifacts included numerous glass fragments and sherds from ceramic plates. The site has no evidence for cultural depth and has been perpetually disturbed by agricultural activities. The UDOT/FHWA has determined this site ineligible.

42SI248 – This is a prehistoric lithic scatter consisting primarily of lithic debitage. Two test pits were dug revealing additional lithic material. Because of the large quantity of chipped stone on the surface and test pits, the UDOT/FHWA has determined this site eligible under criterion D.

42SI249 – This is a prehistoric lithic scatter with chipped stone and fire-cracked rock. Three test pits were dug with very few artifacts recovered. Because of the lack of cultural depth, the UDOT/FHWA has determined this site ineligible.

42SI250 – This is a historic trash scatter with cans, glass, metal fragments, milled wood, and white-ware ceramics. Data recovery potential is low and it is unlikely to be able to link this site with a person or event of importance. The UDOT/FHWA has determined this site ineligible.

42SI251 – This is a historic foundation. Erosion has revealed portions of two wall courses are still attached to the foundation. The first course consists of two red sandstone blocks and several yellow bricks. The second course consists entirely of yellow bricks. This site has limited data recovery potential because of the lack of diagnostic elements. In addition, the site

stability is in jeopardy due to an adjacent canal. The UDOT/FHWA has determined this site ineligible.

42SI252 – This is a prehistoric lithic scatter containing lithic debitage and groundstone. It is located on top or on the north slope of an old railroad grade. Two test pits were dug revealing additional lithic material and groundstone. Because of the location on the railroad grade, the site was disturbed during the rail line construction and site integrity has been destroyed. The UDOT/FHWA has determined this site ineligible.

42SI253 – This is a historic, single episode trash dump. It is located in a 3 x 3 meter area and consists of glass fragments, tin can fragments, chicken bones, a piece of ceramic pipe, ceramic dish fragments, and other items. Because the site is not associated with any known historical person or event and is unlikely to lend new information to the history of the region, the UDOT/FHWA has determined it ineligible for the NRHP.

42SI254 – This is historic construction debris consisting of concrete forms, milled wood, cinder block fragments, slag, fencing, fence post, steel bar and other items. The site has no known association with important people or events and has no data recovery potential. The UDOT/FHWA has determined the site ineligible for the NRHP.

42SI255 – This is a historic structural site consisting of a pond, a ditch, and four depressions. One of the depressions contains much trash, bottles, and ceramics. Trash is also scattered throughout other areas of the site. Because of the large quantities of surface artifacts and also the presence of the depressions suggest buried cultural deposits, the UDOT/FHWA has determined this site eligible for the NRHP under criterion D.

Denver and Rio Grande Railroad – The grade is present throughout the project area. In some places, rails and ties are present. This site is determined eligible for the NHRP under criteria A and D.

Union Pacific Railroad – This railroad is currently operational throughout the entire corridor. Because of its importance to the history and development of Utah, the UDOT/FHWA has determined the railroad eligible for the NRHP under criteria A and D.

### Assessment of Avoidance

The attached exhibits illustrate the relationship of the build alternatives design to all potentially affected NRHP eligible historic properties. In general, the eligible sites listed above are considered avoided by the project under the various alternatives if they are at least over 15 feet distant from the toe of slope or top of cut, and are determined NRHP eligible only under criterion C (a type, period, or method of construction) or criterion D (information potential only).

None of the build alternatives would avoid all NRHP eligible historic properties located along the corridor. Please refer to the attached maps to see the relationship of the sites to the various build alternatives. All sites (both eligible and ineligible) are plotted on the map, with their current boundaries, except for those that are not located within the boundaries of the map. Sites not plotted include all of the Salt Lake County sites with the exception of 42SI243, 42SI244, 42SI245, and 42SI247. Implementation of Alternative A would impact 4 NRHP eligible

properties, Alternative B would impact 7, Alternative C would impact 6, Alternative D&E would impact 6, and the Redwood Road Alternative would impact 12 properties eligible for the NRHP. As expected, the various alternatives affect different sites. The sites impacted by each alternative are shown in the table below.

Table 2

Property	A	B	C	D&E	Redwood
42Dv2	X		X	X	X
42Dv67					X
42Dv70		X			
42Dv72					
42Dv74					
42Dv76					
42Dv77		X			
42Dv80					
42Dv88					
42Dv90		X			
42Dv94	X	X	X	X	X
42Dv97	X			X	
42Dv98					
42SI154/182					
42SI242					
42SI246					
42SI248					
42SI285					
D&RG Railroad	X	X	X	X	X
UP Railroad					
1300 Glover Lane, Farmington		X			
415 S 650 W, Farmington					
637 S 650 W, Farmington					
2120 S 650 W, Farmington					
1515 N 1100 W, W. Bountiful					
2125 N 1100 W, W. Bountiful					
836 S Redwood Road, Woods Cross					X
918 S Redwood Road, Woods Cross					X
946 S Redwood Road, Woods Cross					X
974 S Redwood Road, Woods Cross					X
1452 S Redwood Road, Woods Cross					
1650 S Redwood Road, Woods Cross					X
2018/2020 S Redwood Road, Woods Cross					X
2408 S Redwood Road, Woods Cross					X
1095 S Redwood Road, North Salt Lake					X
Ca. 900 N. Redwood Road, North Salt Lake					
3290 N 2200 W, North Salt Lake					

3200 N 2200 W, North Salt Lake					
2770 N 2200 W, North Salt Lake					
2662 N 2200 W, North Salt Lake					
2650 N 2200 W, North Salt Lake					
2664 N Rose Park Lane, North Salt Lake					
Clark Lane Historic District, Farmington	X	X	X	X	X
662 W Clark Lane, Farmington	X	X	X	X	X
10 N 650 West, Farmington	X	X	X	X	X
Totals	7	9	7	7	15

### Finding of Effect

The UDOT/FHWA has determined that 24 of the 45 eligible properties will not be impacted by any of the build alternatives. Eligible sites that will not be impacted by any alternative have a grey background on Table 2. Based upon this, the UDOT/FHWA has determined that implementation of any build alternative will have **no effect** on those 24 properties listed above pursuant to 36 CFR 800.5(a-d). Below the impacts of the various alternatives are outlined. All effect determinations are made in accordance with 36 CFR 800.5(a-d).

As described earlier, each alternative will result in an **Adverse Effect** on 42Dv2, 42Dv94 and 10 W 650 N, Farmington. Impacts to each of these properties have already occurred from previous work on the project. Mitigation, in accordance with the previous MOA, has been performed on 10 W 650 N, Farmington. Excavations of both 42Dv2 and 42Dv94 have also taken place.

Each build alternative will also impact 662 W Clark Lane, Farmington, requiring the removal of the structure resulting in an **Adverse Effect**. Each build alternative will also impact the D&RG railroad with an at-grade crossing, resulting in a **No Adverse Effect**. Additionally, each build alternative will require temporary use of property in the Clark Lane Historic District. Extensive coordination has taken place to minimize disturbances and will result in a **No Adverse Effect**. Any additional effect determinations on each of the alternatives is described below.

Alternative A will impact 42Dv97. The eligibility of 42Dv97 is still undetermined and will be resolved by testing should the injunction be lifted.

Alternative B will impact 42Dv70, 42Dv77, 42Dv90, and 1300 Glover Lane, Farmington,. This alternative would result in an **Adverse Effect** for 42 DV 70, 42 DV 77, and 42 DV 90. In addition, the alternative would require the removal of the structures at 1300 Glover Lane, resulting in an **Adverse Effect**.

Alternative C will impact 42Dv97. The eligibility of 42Dv97 is still undetermined and will be resolved by testing should the injunction be lifted.

Alternatives D & E will impact 42Dv97. The eligibility of 42Dv97 is still undetermined and will be resolved by testing should the injunction be lifted

The Redwood Road Alternative will impact 42Dv67, 836 S Redwood Road, Woods Cross, 918 S Redwood Road, Woods Cross, 946 S Redwood Road, Woods Cross, 974 S Redwood Road, Woods Cross, 1650 S Redwood Road, Woods Cross, 2018/2020 S Redwood Road, Woods Cross, 2408 S Redwood Road, Woods Cross, and 1095 S Redwood Road, North Salt Lake. This alternative would result in an **Adverse Effect** for 42Dv67. The alternative would require the removal of the properties at 836 S Redwood Road, Woods Cross, 918 S Redwood Road, Woods Cross, 946 S Redwood Road, Woods Cross, 974 S Redwood Road, Woods Cross, 1452 S Redwood Road, Woods Cross, 1650 S Redwood Road, Woods Cross, 2018/2020 S Redwood Road, Woods Cross, 2408 S Redwood Road, Woods Cross, and 1095 N Redwood Road, North Salt Lake, resulting in an **Adverse Effect**.

In summary, implementation of all of the build alternatives would impact different historic properties and the overall project finding of effect will be **adverse** for each alternative.

To ensure the implemented build alternative will have no effect on the historic properties not directly impacted by the project, a special provision will be added to the construction contract. This special provision prohibits any ground-disturbing activities by the construction contractor outside of the right-of-way, as shown in the design plans and as exhibited by orange fencing in the field. Archaeological monitoring will occur during construction.

Finally, pursuant to 36 CFR 800.13, the UDOT and FHWA have planned for post-review discoveries using UDOT Standard Specification Section 01355, part 1.10.

### **Proposed Mitigation**

Pursuant to 36 CFR 800.6, the following measures are offered to facilitate consultation with the USHPO regarding methods to minimize the effects of the project on the historic qualities of these properties. The UDOT/FHWA is in the process of soliciting the views of interested parties. Further, the UDOT/FHWA recommends the historic properties eligible under criterion A and C be documented to Utah State Intensive Level Survey (ILS) standards in advance of relocation or demolition and that a marketing plan be developed and implemented in applicable cases.

### **Section 4(f) considerations**

The UDOT/FHWA consider the following properties to be Section 4(f) resources. They are included in Table 3.

Table 3.

Property
42Dv2
42Dv67
42Dv94
D&RG Railroad
UP Railroad

1300 Glover Lane, Farmington
415 S 650 W, Farmington
637 S 650 W, Farmington
2120 S 650 W, Farmington
1515 N 1100 W, W. Bountiful
2125 N 1100 W, W. Bountiful
836 S Redwood Road, Woods Cross
918 S Redwood Road, Woods Cross
946 S Redwood Road, Woods Cross
974 S Redwood Road, Woods Cross
1452 S Redwood Road, Woods Cross
1650 S Redwood Road, Woods Cross
2018/2020 S Redwood Road, Woods Cross
2408 S Redwood Road, Woods Cross
1095 S Redwood Road, North Salt Lake
Ca. 900 N. Redwood Road, North Salt Lake
3290 N 2200 W, North Salt Lake
3200 N 2200 W, North Salt Lake
2770 N 2200 W, North Salt Lake
2662 N 2200 W, North Salt Lake
2650 N 2200 W, North Salt Lake
2664 N Rose Park Lane, North Salt Lake
Clark Lane Historic District, Farmington
662 W Clark Lane, Farmington
10 N 650 West, Farmington

42Dv2 is a Section 4(f) property important to remain in place because of the potential for additional human remains and the fact that it is perhaps the last remaining archaeological site of its magnitude along the Wasatch Front. 42Dv67 is a Section 4(f) property because of the architectural value of the remaining standing structures. 42Dv94 is also a Section 4(f) property important to remain in place because of the potential for additional human remains. The D&RG and UP rail lines are Section 4(f) properties because of their contribution to the development of Utah. The remaining Section 4(f) properties are buildings valued for their architecture.

**DRAFT  
MEMORANDUM OF AGREEMENT**

**Regarding the**

**LEGACY PARKWAY PROJECT**

**Project No. SP-0067(1)0  
Salt Lake and Davis Counties, Utah**

**WHEREAS**, the Federal Highway Administration, Utah Division (FHWA) has determined that the Legacy Parkway Project between the I-215 Interchange, northern Salt Lake County, Utah and Burke Lane north of Farmington, Davis County, Utah (hereinafter called the Project) may have an effect upon properties included in or eligible for inclusion in, the National Register of Historic Places (NRHP), and has consulted with the Utah State Historic Preservation Officer (USHPO) in accordance with 36 CFR 800.6(b)(1), regulations implementing Section 106 of the National Historic Preservation Act (NHPA)(16 U.S.C. 470f) to resolve the adverse effects; and

**WHEREAS**, the Utah Department of Transportation (UDOT) is the agency coordinating this Project on behalf of the FHWA and has participated in the consultation, the FHWA has invited them to sign this Memorandum of Agreement (MOA) pursuant to 36 CFR 800.6(c)(2) as an invited signatory; and

**WHEREAS**, the Northwestern Band of Shoshone of the Shoshone Nation, Idaho and Utah; the Ute Indian Tribe of the Uintah-Ouray, Utah; the Confederated Tribes of the Goshute (Ibapah), Utah; the Skull Valley Band of Gosiute, Utah; and the Shoshone Bannock Tribes, Idaho (hereafter called Tribes); participated in the technical coordination and consultation and have been invited by FHWA to sign this MOA pursuant to 36 CFR 800.6(c)(3) as concurring parties; and

**WHEREAS**, the residents of the Clark Lane Historic District (CLHD), Farmington, have participated in the technical coordination and consultation and have been invited by FHWA to sign this MOA pursuant to 36 CFR 800.6(c)(3) as a concurring party; and

**WHEREAS**, in accordance with 36 CFR 800.6(a)(1), the FHWA will notify the Advisory Council on Historic Preservation (Council) of its adverse effect determination, with specified documentation, and invite the Council to participate in the consultation pursuant to 36 CFR 800.6(a)(1)(iii); and

**WHEREAS**, a legal injunction halted archaeological and construction activities done under a prior MOA for this Project, the parties to this MOA agree that upon execution, all stipulations and conditions contained within this MOA will take precedence over the previously executed MOA for the Project; and

**WHEREAS**, the Project is large and complex, with a potential for the discovery of additional properties eligible for inclusion in the NRHP, the FHWA intends to use the provisions of this MOA to address all activities that may result in impacts to both known and inadvertently discovered

historic properties; and

**WHEREAS**, the Project's area of potential effect (APE) for this undertaking includes all lands subject to Project activities or activities directly funded by the Project as delineated by Alternatives A, B, C, D, E, and Redwood in Appendix A; and

**WHEREAS**, the parties to this MOA have considered the applicable requirements of the Utah Native American Graves Protection and Repatriation Act of 1992 (Utah NAGPRA)(U.C.A. 9-9-401, et seq., and its implementing Rule R230-1), and the Utah Code 76-9-704 in the course of consultation; and

**WHEREAS**, the parties to this MOA recognize that every reasonable effort should be made to protect Traditional Cultural Properties (TCP) from possible harm by the Project, it is incumbent upon the tribes or such interested party(ies), to identify any TCPs believed to exist within the Project APE;

**NOW, THEREFORE**, the FHWA, the UDOT and the USHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the Project on historic properties.

## **STIPULATIONS**

The FHWA shall ensure that the following measures are carried out. To aid the signatories of this MOA, the stipulations are organized in the following order:

1. Environmental Control Supervisor
2. Clark Lane Historic District
3. Archaeological Testing
4. Archaeological Data Recovery
5. Historic Structures
6. Inadvertent Discovery of Cultural Resources
7. Project Specific Procedures for Implementing Utah NAGPRA
8. Administrative Stipulations

### **1. ENVIRONMENTAL CONTROL SUPERVISOR**

An Environmental Control Supervisor (ECS) will be required for the Project. The ECS will be responsible for monitoring and ensuring compliance with the stipulations and mitigation commitments contained within this MOA. The ECS's contact information will be provided to the FHWA, the UDOT, the USHPO, the Tribes, and the homeowner(s) and tenant(s) located at 393, 398, and 399 W. State Street, Farmington, UT prior to the resumption of construction activity.

## 2. CLARK LANE HISTORIC DISTRICT (CLHD)

### 2.1 *Design Measures to Minimize Harm*

The following measures have been developed to ensure that project-related impacts from the Project are minimized and stipulations are in place to return the conditions of the CLHD and its contributory elements to their original pre-construction condition.

- No Change in Capacity or Function of Bridge. The existing bridge over I-15 and Lagoon Drive will be replaced with a structure of similar design and orientation, thereby maintaining a 2-lane configuration and not altering appearance or traffic patterns in the area.
- Lighting and Associated Safety Concerns. Standard lighting fixtures have been incorporated into the design of the new bridge.
- No Haul Route Traffic. Truck traffic and associated impacts will be reduced during construction by not allowing State Street to be used as the principle haul route for the Project. Construction vehicle traffic will occur around the juncture of Clark Lane and State Street while removing and replacing existing traffic and pedestrian bridges.
- Minimal Grade Change. Efforts have been made to design a new bridge with as little grade change to State Street as possible. The new grade height is estimated at 18” on the east side of the bridge and will taper to existing road grade in front of 393 W. State Street. The change in height for 399 W. State Street is estimated at 12”. The driveways of 393 and 399 W. State Street will be tapered to the new State Street grade.
- Sidewalk Moved. Sidewalks will be incorporated within the new bridge structure, requiring the redesign of the sidewalk in front of 399 W. State Street. This redesign moves the sidewalk further from the house and improves control of water runoff.
- Water Control. Several water catchments will be added to the east of the new bridge structure, which in conjunction with the new curbs, will improve the management of water runoff so as not to impact the yards or foundations of the historic homes.
- Pavement Converted to Green Space. The new State Street design east of the new bridge will convert approximately 1068 square feet of pavement within existing right-of-way to green space within right-of-way. Existing homeowner irrigation lines will be extended to water this new green space with homeowner’s approval. If no irrigation system exists, or if the homeowners do not want to extend their irrigation lines to the new green space, then appropriate landscaping will be used.
- Mature Trees Protected. The mature trees in front of 393 and 399 W. State Street will be protected from fill through the use of short block (or rock) walls surrounding the trunks. Material to be used in the construction of these small walls will be determined in consultation with the property owner.
- No Historic Property Takes. There will be no property takes from any of the historic properties. Temporary easements will be needed to move the sidewalk, slope (or terrace) the yard towards the new sidewalk, taper the driveways of 393 and 399 W. State Street and add curb and gutter on the northeast of State Street and Clark Lane.
- No Change to Sound Walls. Existing sound walls will be left in place along the west side of 399 W. State Street.

- Maintain Existing Landscape Features. The existing landscape wall and associated plantings in the front of 399 W. State Street will be protected to the extent possible during construction. Upon removal of the sidewalk, new landscaping will take into consideration the existing wall and match with in-kind materials to the extent possible.

## 2.2 *Measures to Minimize Potential Harm from Construction-Related Vibration*

The following measures are included within the MOA to reduce the likelihood of potential impacts caused by construction-related vibration. In the unlikely event that the ECS or homeowner(s)/tenant(s) believe such harm has occurred, the responsibilities of all parties is described below.

- Pre-drilled Pilings an Option. Pre-drilling of pilings may be used by the contractor to increase the distance from piles to the historic homes thereby reducing the potential for vibration effects on the homes.
- Energy of Pile-Driving Hammers Limited. The maximum rated energy of pile-driving hammers will be limited to 54,000 foot-pounds for all impact-driven piles within 200 feet of the buildings within the CLHD.
- Homeowner and Tenant Notification. The homeowner(s) and tenant(s) at 393, 398, and 399 W. State Street will be notified of any pile-driving activities five (5) days in advance.
- Pre- and Post-Construction Surveys of Structures. A pre-and post-construction survey of all buildings or structures located on the property of 393, 398, and 399 W. State Street will be required. The survey will consist of photo and written documentation of the structures' exterior and interior condition to the extent possible. This means at least one photograph of all elevations from all cardinal directions, of professional quality black/white 35 mm photographs (3 x 5" prints with accompanying negatives) to show all exterior elevations (where possible to obtain all elevations), the streetscape, and detailed photographs of all areas most sensitive to vibration effects. Photographs of exterior architectural trim/decorations shall also be submitted. Photographs shall be numbered and labeled with address (street and city) and date the photograph was taken, and keyed to a site plan and floor plan. All prints and negatives shall be submitted in archival quality protective storage pages. When allowed by owners, interior photographs shall be taken of each wall in every room of these structures for the purposes of documenting present conditions.
- Vibration Monitoring. A vibration monitor will be placed on the foundation and upper elevation of the home at 399 W. State Street and record vibration levels throughout the duration of pile driving activities within two hundred (200) feet of the home. The vibration monitor will be set to read vibration levels at 0.12 in/sec.
- Exceeding Vibration Threshold of 0.12 in/sec. Pile-driving activities will stop and other less vibration-intense activities must be employed if the vibration monitor readings exceed 0.12 in/sec or if there is visual evidence that the pile driving is causing damage to a structure. The selection of alternative methods will be made between the contractor and UDOT with input from the ECS and approval from FHWA when necessary. Such methods may include using smaller pile drivers or continuing

with pre-drilled piles.

- Identification of Damage. If damage to the structures located at 393, 398, or 399 W. State Street is observed by the ECS, the ECS will be responsible for identifying and stopping the responsible activity if known and within the control of the Project team.
- Notification of Damage. If the homeowner(s) and/or the tenant(s) of 393, 398, or 399 W. State Street observe damage or believe damage to be caused by pile driving activities, they are responsible for notifying the ECS as soon as possible within the next twenty-four (24) hours. The ECS will assess the claim and report to the homeowner(s) and/or tenant(s) within twenty-four (24) hours.
- Resolving Damage Claims: If it is agreed amongst the UDOT and the homeowner(s) that damage has occurred to a structure as a result of the activities of the Project, the damage will be documented and the structures must be restored to the documented condition existing before damage occurred with in-kind materials and workmanship.
- Contact Information: If any of the homeowner(s) or tenant(s) within the CLHD believes that the terms of this MOA are not being met, or that their concerns are not being heard or addressed by the Project's ECS, they may contact the Legacy Project Office or the FHWA Utah Division Office directly.

Legacy Parkway Office  
360 N. 700 W., Suite F  
North Salt Lake, UT 84054  
(801) 951-1026  
(800) 483-4587

U.S. Department of Transportation  
Federal Highway Administration  
Utah Division  
2520 West 4700 South, Suite 9a  
Salt Lake City, UT 84118-1847  
(801) 963-0182

### **3. ARCHAEOLOGICAL TESTING**

Site 42Dv97 (Historic Privy) will be tested subsurface to make a final determination of eligibility or assess data recovery potential. A written testing plan will be developed by UDOT and submitted to the USHPO for review and comment. If Site 42Dv97 is subsequently determined by FHWA to meet NRHP eligibility requirements for its information potential and will be adversely effected by the Project, then significant deposits at the site will undergo archaeological data recovery in accordance with Stipulation 4.

### **4. ARCHAEOLOGICAL DATA RECOVERY**

Data Recovery: The FHWA shall ensure that a data recovery plan is developed by UDOT in consultation with the USHPO, the Tribes, and consulting parties for the recovery of archeological data from NRHP eligible sites adversely effected by the final alignment of the Project. The plan shall be consistent with the Secretary of the Interior's Standards and Guidelines for Archeological Documentation (48 FR 44734-37) and take into account the Council's publication, Treatment of Archeological Properties (Advisory Council on Historic Preservation, 1980), subject to any pertinent revisions the Council may make in the publication prior to completion of the data recovery plan and to relevant USHPO or other guidance.

The Data Recovery Plan shall specify, at a minimum:

- the research questions to be addressed through the data recovery, with an explanation of their relevance and importance;
- the methods to be used, with an explanation of their relevance to the research questions;
- the methods to be used in analysis, data management, and dissemination of data, including a schedule;
- the proposed disposition of recovered materials and records;
- proposed methods for involving the interested public in the data recovery, including an invitation to Utah State Archaeological Society (USAS) members to volunteer where safe conditions present themselves;
- proposed methods for disseminating results of the work to the interested public, including;
  - Offering to present a talk to the local USAS chapter;
  - Preparing an article for publication in a local paper; and
  - Preparing a scripted slide show for FHWA/UDOT for future use in public education programs;
- proposed methods by which the Tribes or other consulting parties will be kept informed of the work and afforded the opportunity to participate, including;
  - Extending an invitation to the Tribes (including school age children) to tour the sites while fieldwork is ongoing and where safe conditions present themselves,
  - Offering to make a presentation about the project findings to all interested Tribes at a location convenient to the Tribes;
  - Recognizing the benefits of ‘Multiple Voices’ by offering Tribes and Tribal members an opportunity to present interpretations and views that may augment or counter current archaeological theory, findings, and interpretation.
- a proposed schedule for the submission of progress reports to the FHWA, the UDOT, and the USHPO; and
- The data recovery plan shall be submitted by the UDOT to the USHPO, and also to the Tribes, for 30 days review. Unless these parties object within 30 days after receipt of the plan, the FHWA through the UDOT shall ensure that it is implemented.

Table 1 identifies archaeological sites potentially impacted by the Project. However, only those sites located within the APE of the preferred alternative identified in FHWA’s Record of Decision and adversely effected will undergo data recovery.

Table 1. NRHP Eligible Archaeological Sites Impacted by Project (Listed by Alternative).

Site Number	A	B	C	D	E	Redwood
42Dv2	X		X	X	X	X
42Dv67						X
42Dv70		X				
42Dv77		X				
42Dv90		X				
42Dv94	X	X	X	X	X	X
42Dv97	X			X	X	

Of special note are sites 42Dv2 and 42Dv94:

42Dv2 – This property is a large site spanning both the prehistoric and historic periods. Excavations were begun in accordance with the original MOA but were halted prior to completion. During the excavation, human remains were encountered. This site is determined eligible for the NHRP under Criterion D and warrants Section 4(f) protection due to the presence of human remains and the sanctity of these burial grounds. The sacred nature of burials has been formally communicated to FHWA on numerous occasions specifically by Dr. Brewster, Director of the Tribal Historic Preservation Office of the Skull Valley Band of the Gosiutes. The site limits will be delineated and protected from construction activities through the use of construction fencing. If portions of the site are deemed necessary for the current Project at a later time, then additional consultation with the USHPO, the Tribes, and consulting parties will become necessary.

Although future work within the APE of the current Project will avoid the site, prior impacts have already adversely effected the site. In addition, a future I-15 ramp may tie into the present Project and may further impact the site. Because the I-15 ramp is a foreseeable action, its potential impacts are disclosed in this document. However, additional data recovery for potential impacts to 42Dv2 will not take place until the need for the ramp is determined and final design and environmental clearance of the ramp is complete. Avoidance, minimization, and if necessary, mitigation measures for these future impacts will be evaluated as part of the I-15 project development. Mitigation for past impacts to 42Dv2 as a result of the present Project will include completion of the archaeological analysis and reports already underway.

42Dv94 – This site consists of human remains discovered eroding from the margins of the City Drain Canal in North Salt Lake City, Utah. The identified human remains have already been fully excavated. However, because there is sufficient potential for additional remains to be present in the site vicinity, the UDOT/FHWA has determined this site eligible for the NRHP and warrants preservation in place, and thus Section 4(f) protection, due to the sanctity of the potential burials. Like 42Dv2, site 42Dv94 lies in an area potentially impacted by a future I-15 ramp connecting into the Project. For the purposes of the current Project, a 50-foot buffer zone around 42Dv94 site limits will be delineated and protected from construction activities through the use of construction fencing. If portions of the site are deemed necessary for the current Project at a later time, then additional consultation with the USHPO, the Tribes, and consulting parties will become necessary.

## 5. HISTORIC STRUCTURES AND RAILROADS

Table 2 identifies Historic Structures and Railroads potentially impacted by the Project. However, only those properties located within the APE of the preferred alternative identified in FHWA’s Record of Decision and adversely effected will require the Full Intensive Level Survey.

Table 2. Historic Structure and Railroad Impacts (Listed by Alternative).

Property	A	B	C	D	E	Redwood
1300 Glover Lane, Farmington		X				
836 S Redwood Road, Woods Cross						X
918 S Redwood Road, Woods Cross						X
946 S Redwood Road, Woods Cross						X
974 S Redwood Road, Woods Cross						X
1650 S Redwood Road, Woods Cross						X
2018/2020 S Redwood Road, Woods Cross						X
2408 S Redwood Road, Woods Cross						X
1095 S Redwood Road, North Salt Lake						X
Clark Lane Historic District, Farmington	X	X	X	X	X	X
662 W Clark Lane, Farmington	X	X	X	X	X	X
10 N 650 West, Farmington	X	X	X	X	X	X
D&RG Railroad	X	X	X	X	X	X

Of special note is 10 N 650 West, Farmington (The White House). This historic property was comprised of a 1910 era Temple Form home. It was razed following recordation according to the stipulations of the original MOA. For the purposes of the Supplemental Environmental Impact Statement for the Project, this property is being recognized as an adverse effect. However, the property is no longer extant and has been fully mitigated per the requirements of the original MOA, therefore, the property does not warrant further work.

- 5.1 *Intensive Level Survey:* An ILS (Historic Site Form) will be completed for any Historic Property that will be adversely affected by the Project.
- 5.2 *Photographs:* Photographs are required of all buildings or structures on the property. An adequate number of professional quality black-and-white photographs (3x5 prints with accompanying negatives) to show all exterior elevations (where possible to obtain all elevations), streetscapes, all outbuildings, detailed photographs of all areas to be impacted by the adverse effect, and photographs of exterior architectural trim/decorations, shall be submitted. Photographs shall be numbered and labeled with address (street and city) and date photograph was taken, and keyed to a site plan and floor plan. All prints and negatives shall be submitted in archival stable protective storage pages.
- 5.3 *Floor Plans:* Sketch floor plans of all eligible buildings shall be submitted. The plans must be based on an accurate footprint (e.g., Sanborn maps, tax card drawings, or measurements taken on site) and show all existing construction. Rooms shall be labeled by use. These non-

measured drawings are to be on 8.5x11 or 11x17 sheets. A site sketch plan showing subject buildings and all outbuildings is also required.

- 5.4 *Research:* A legible photocopy of the entire historic tax card of the property and a 5x7 black-and-white print and negative of the historic tax card photo (if available) shall be submitted. Label and submit print and negative as described above. Other research shall be conducted as necessary to obtain complete information on the property; sources include the title abstracts, Sanborn maps, building permits, architects' file, city directories, family histories, and others.
- 5.5 *Filing:* All materials shall be submitted to the Utah Division of State History, Preservation Section, to be placed on file.

## **6. INADVERTENT DISCOVERY OF CULTURAL RESOURCES**

The FHWA and the UDOT have developed a plan of action for consultation with the Tribes and the USHPO regarding inadvertent discovery of historic properties potentially eligible to the NRHP. The plan detailed below describes coordinating efforts among the FHWA, the UDOT, the Tribes, and the USHPO; assessment of effects to historic properties (not affecting Utah NAGPRA related issues); inventory and evaluation processes; and mitigation strategies.

In the event that cultural resources are discovered:

- 6.1 *Cease Activity:* Work will stop in the immediate area of the discovery in accordance with UDOT Standard Specification 01355, Part 1.10 as detailed in Appendix B. The UDOT will notify the USHPO and FHWA. The FHWA will subsequently notify the Council and Tribes. If Human Remains are encountered, the contractor will follow procedures detailed in Stipulation 7 below.
- 6.2 *Evaluate Resource:* The UDOT will initiate internal coordination with their contractor to evaluate the resource for NRHP eligibility. The designated contractor will prepare draft inventory reports and recommendations regarding the NRHP eligibility of identified properties. The content and scope of the draft and final report(s) on the results of the evaluation studies will follow state guidelines as found in the UDOT's Consultant Guidelines.
- 6.3 *Determine Eligibility:* In consultation with the USHPO, the UDOT will apply the NRHP criteria (36 CFR 60.4) to all cultural resources discovered during the Project with regard to their potential for inclusion in the NRHP. This evaluation shall take into account the guidance found in all applicable National Register Bulletins.
- 6.4 *Assessment of Effect:* In situations affecting historic properties, application of the criteria of effect and adverse effect described in 36 CFR 800.9 (a) and (b) will be implemented. A Determination of Eligibility and Finding of Effect (DOE-FOE) will be submitted to the USHPO and to the Tribes along with appropriate documents relative to the stipulations of this MOA.

6.5 *Treating Effects:* If the undertaking might affect historic properties as defined by 36 CFR 800.2 (e), the UDOT will develop site specific treatment plans to minimize or mitigate the effects of the historic properties located within the area of the discovery in coordination with the USHPO, the Tribes, and other interested parties as follows:

- Human remains and the associated cultural items will be treated in accordance with the Utah NAGPRA (See Stipulation 7 of this MOA).
- The preferred alternative to mitigation is avoidance of impacts to historic properties.
- Project redesign will be implemented when technically, economically, and environmentally feasible and prudent, to avoid the placement of the facility, or related construction activities in a manner that may affect historic properties.

6.11 *Data Recovery:* The FHWA shall ensure that a data recovery plan is developed in accordance with Stipulation 4 of this MOA.

6.12 *Reporting:* The FHWA shall ensure that all reports on activities carried out pursuant to this MOA are provided to the USHPO, the Council, the Tribes, and upon request to any other consulting parties, following completion of the activities stipulated in the MOA.

6.13 *Personnel Qualifications:* The FHWA shall ensure that all historic work carried out pursuant to this MOA is completed by or under the direct supervision of a person or persons meeting or exceeding the Secretary of interior's Standards for History or Archaeology as appropriate (36 CFR 61 Appendix A).

## **7. PROJECT SPECIFIC PROCEDURES FOR IMPLEMENTING UTAH NAGPRA (U.C.A. 9-9-401 et. seq. AND ITS IMPLEMENTING RULE R230-1 AND UTAH CODE 76-9-704)**

### *7.1 Purpose*

7.1.1 The Parties to the MOA intend to respect and be sensitive to the cultural perspectives and responsibilities, the religious and ceremonial rights, and sacred practices of the Tribes in fulfilling tribal interests in the discovery of Utah NAGPRA related items identified during the Project.

7.1.2 If circumstances warrant and a determination is made by FHWA that federal NAGPRA applies to a discovery case during construction, then FHWA will ensure that all applicable federal procedures and requirements are met.

### *7.2 Objectives*

7.2.1 To implement the legislative provisions of Utah law, specifically U.C.A. 76-9-

704 and 9-9-401 et. seq. within the intent of such legislation.

- 7.2.2 To implement legal requirements, while respecting and maintaining the dignity of the individual and the Utah NAGPRA related cultural items potentially discovered during the Project's construction, and in conjunction with the best interests of the Tribes.
- 7.2.3 To facilitate UDOT compliance with Utah NAGPRA, respective to decisions that must be made, and actions taken, regarding curation, disposition, re-interment, data recovery, consultation and notification, and treatment of human remains and cultural items as defined by Utah NAGPRA.
- 7.2.4 To provide guidance for construction personnel regarding the discovery and notification process upon location of human remains and cultural items as defined by Utah NAGPRA.

### 7.3 *Implementation of Objectives*

- 7.3.1 The UDOT will provide the Project ECS with a set of procedures to be followed in the event of an inadvertent discovery of human remains.
- 7.3.2 In accordance with UDOT Standard Specification 01355, Part 1.10 (Appendix B), upon discovery of human remains (including cultural items as defined by Utah NAGPRA), construction activities within the immediate area of discovery shall cease, the site will be secured, and notification of law enforcement, Division of Indian Affairs and USHPO Antiquities Section as required by U.C.A.9-9-403, and U.C.A. 76-9-704, will commence immediately. In addition, Tribes desiring to be notified at this time will be included on the contact list.
- 7.3.3 If the site is determined not to contain Native American remains, the UDOT will contact the FHWA, and the FHWA will notify the Tribes of such determination. Work will resume at the direction of the UDOT archaeologist.
- 7.3.4 If the site is determined to contain Native American remains, the UDOT will contact FHWA within one (1) working day. The FHWA will provide notification to the Tribes within one (1) working day and invite the Tribes to visit the site containing the remains. If contact with the FHWA cannot be made within this timeframe, the UDOT may contact the Tribes directly for the purposes of expediting notification. The Tribes will be allowed access to the remains for the purpose of performing ceremonies, discussing treatment options, and monitoring excavation if removal is deemed necessary.
- 7.3.5 The Tribes will be compensated for expenses incurred to visit the burial site and/or perform ceremonies. Compensation will be based on and limited to those activities included within FHWA's Native American Tribal Consultation

Policies and Guidelines.

- 7.4 *Excavation versus Preservation in Place:* At such time a discovery of human remains is made and construction ceases in the area of the discovery, and having satisfied the requirements of U.C.A. 76-9-704:
- 7.4.1 If the remains are in immediate danger of harm, or in the event that construction could not move, they will be excavated in accordance with R-230-1-7(1)a.
  - 7.4.2 If the site at which the remains are located can remain intact and free from immediate harm, the site will be secured and a preservation plan will be implemented according to R-230-1-7-1.
- 7.5 *Custody of Remains:* Any excavated Native American remains will remain in the custody of the UDOT pending:
- 7.5.1 Consultation and determination of ownership by the Native American Remains Review Committee (NARRC) pursuant to Utah NAGPRA [9-9-403 and R-230-1-13 et. seq.], or
  - 7.5.2 In the event of multiple requests for repatriation, the requesting parties agree upon its disposition, or
  - 7.5.3 The dispute is otherwise resolved by a court of competent jurisdiction.
- 7.6 *Repatriation:* The repatriation of the individual will be consistent with Utah NAGPRA [9-9-403 and R-230-1-13 et. seq.]. It is incumbent upon all parties to this MOA to work towards the repatriation of human remains in as timely manner as allowable by law. FHWA is responsible for ensuring that the UDOT and its consultants follow state law procedures and the stipulations contained herein.
- 7.8 *Status Inquiry:* At any time in the process, the Tribes may inquire with FHWA as to the status of human remains associated with this Project. It is the responsibility of the FHWA to address the questions and concerns of any Tribe within five (5) working days. If the Tribes are interested in verifying the physical condition and storage treatment of any human remains, a verbal or written request must be submitted to FHWA. FHWA is responsible for arranging a meeting within five (5) working days, or at the earliest convenience of the interested Tribe(s).
- 7.9 *Dispute Resolution:* Disputes on non-Utah NAGPRA related issues will be resolved according to dispute resolution procedures described in this MOA (Stipulation 8.5). The Utah NARRC Committee will resolve all Utah NAGPRA related disputes.

## 7.10 *Treatment of Utah NAGPRA Related Items and Human Remains*

### 7.10.1 Human Remains

- Any and all human remains that have been damaged or removed due to construction activity will be immediately returned to accompany the remains still present in the site.
- Pursuant to Utah NAGPRA, scientific study of human remains may be carried out only with approval of the owner of the human remains as established in 9-9-403(1) and (2). If ownership is unknown, scientific study shall be restricted to that sufficient to identify ownership but will be limited to non-destructive analysis.

### 7.10.2 Associated Funerary Items/Items of Cultural Patrimony

- Unless otherwise identified, Associated Funerary Items/Items of Cultural Patrimony found near or about the discovery of human remains will be immediately returned to accompany the human remains. Associated Funerary items are defined as items that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed intentionally at the time of death or later, with or near individual human remains. Objects of cultural patrimony means items having ongoing historical, traditional, or cultural importance central to the Indian tribe itself. If they are so identified, documentation of these materials will be included in the reports as funerary objects and/or items of cultural patrimony.

## **8. ADMINISTRATIVE STIPULATIONS**

### 8.1 *Changes in the Undertaking*

- 8.1.1 Changes in the Project will not relieve the FHWA or UDOT of the responsibility of completing resource evaluations.
- 8.1.2 If, during the Project planning or implementation, modification and/or changes in the undertaking are proposed in ancillary areas that have not been previously inventoried for historic properties, the UDOT shall ensure that the area is inventoried and that historic properties are evaluated in a manner consistent with the inventory, evaluation, and standards identified in Stipulation 6 of this MOA. The UDOT will prepare a draft report(s) of the inventory results and submit said document(s) to the parties of this MOA for review and comment. A final report incorporating the comments of the said parties will be prepared. Final reports will

be provided to the parties of this MOA.

- 8.1.3 The applicable Research Design shall be modified or appended, as appropriate by the contractor (s) under the direction of the UDOT, in consultation with the USHPO and the Tribes, to incorporate treatment and management measures for previously unevaluated historic properties consistent with the MOA.
- 8.1.4 The parties to this MOA shall be afforded an opportunity to comment within 30 days on documents prepared in response to revisions to the undertaking.
- 8.2 *Tribal Consultation Process:* Unless otherwise agreed upon, Tribal consultation will occur between the FHWA and the Tribes throughout the Project.
- 8.3 *Curation*
  - 8.3.1 Cultural material (artifact) curation. Upon discovery and gathering of cultural items within the Project APE, exclusive of Utah NAGPRA items as defined by that act, the UDOT will ensure that the items will be placed in an appropriate repository facility as described in 36 CFR 79.
  - 8.3.2 Report and Documentation curation. Upon the UDOT finalizing the documentation of the Project, all reports and documentation will accompany the cultural material consistent with the provisions described in 36 CFR 79. Upon written request of the Tribes, a copy of said documentation shall be provided for the tribal archives.
- 8.4 *Dispute Resolution*
  - 8.4.1 Should the USHPO, the Tribes, the DIA, or the Council, object within 30 days to any documentation provided for review pursuant to this MOA, the FHWA shall consult with the objecting party to resolve the objection. If the FHWA determines that the objection cannot be resolved, the FHWA shall request further comments of the Council pursuant to 36 CFR § 800.6(b). Any Council comment provided in response to such a request will be taken into account by the FHWA in accordance with 36 CFR § 800.6(c)(2) with reference only to the subject of the dispute; the FHWA/UDOT's responsibility to carry out all actions under this MOA that are not the subject of the dispute will remain unchanged.
  - 8.4.2 The Utah Division of Indian Affairs State Native American Remains Review Committee (NARRC) will arbitrate disputes relative to Utah NAGPRA in accordance with U.C.A. 9-9-405 (3)(c), if consultation fails to resolve the dispute.
- 8.5 *Document Review.* Unless otherwise stated, document review shall be 30 days following

receipt of said document submitted for review. Unless notified, the FHWA may assume failure of any party to respond within 30 days indicates their concurrence.

## 8.6 *Amendment*

- 8.6.1 Any signatory party to this MOA may request an amendment (s), whereupon the other signature parties will consult to consider such amendment(s).
- 8.6.2 Any proposed amendment to this MOA must be submitted to the FHWA in writing, with an explanation as to the reasoning for the requested change. The FHWA will initiate consultation with the signature parties for their consideration of the proposed amendment(s) under the time provisions as set forth in 8.7.3.
- 8.6.3 The FHWA will provide copies of written request(s) for amendment from any signatory party to all other signature parties within 3 days, and the parties agree to begin discussions regarding proposed amendments immediately.

## 8.7 *Monitoring*

- 8.7.1 A monitoring plan will be included in the Research Design(s). Project monitoring will ensure all parties to this MOA that the activities and provisions of this MOA are in compliance. Monitoring will also ensure that all parties to this MOA will have oversight and updates to the Project as the Project commences.
- 8.7.2 The UDOT will ensure that particular care is taken during construction to avoid affecting any other archeological remains that may be associated with the sites recorded during the initial survey. Restrictions on construction work in all areas not previously cleared in the original Determination of Eligibility and Finding of Effect will be accomplished by erection of a temporary fence and flagging as necessary. Suitable arrangements for archeological monitoring, and any additional survey deemed necessary, will be made in consultation with the USHPO prior to construction in the APE. An archeologist meeting the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738-9) will monitor the construction activities. At a minimum, such monitoring will include recording and reporting of major features or artifact concentrations uncovered, and recovery and curation of a sample of uncovered material where practicable.
- 8.7.3 The Tribes will be invited to assist in the monitoring in conjunction with the authorized archaeologist and will be compensated for their participation in such monitoring activities based on FHWA's compensation policies. Compensation is restricted to FHWA approved and authorized activities and allowances.

Execution of this Memorandum of Agreement and implementation of its terms evidence that the FHWA has afforded the Council an opportunity to comment on the **Legacy Parkway Project, Project No. SP-0067(1)0, Salt Lake and Davis Counties, Utah** and its effects on historic properties, and that FHWA has taken into account the effects of the undertaking on historic properties.

**SIGNATORIES**

FEDERAL HIGHWAY ADMINISTRATION

By:

Mr. David C. Gibbs, P.E., Division Administrator

Date: \_\_\_\_\_

UTAH STATE HISTORIC PRESERVATION  
OFFICER

By:

Mr. Wilson Martin, State Historic Preservation  
Officer

Date: \_\_\_\_\_

**INVITED SIGNATORIES**

UTAH DEPARTMENT OF TRANSPORTATION

By:

Mr. John Njord, Director

Date: \_\_\_\_\_

**CONCURRING PARTIES**

CLARK LANE HISTORIC DISTRICT

By:

Date: \_\_\_\_\_

UTAH DIVISION OF INDIAN AFFAIRS?

By:

Forrest S. Cuch, Director

Date: \_\_\_\_\_

Northwestern Band of Shoshone of the  
Shoshone Nation, Idaho and Utah?

Ute Indian Tribe of the Uintah-Ouray,  
Utah?

Confederated Tribes of the Goshute  
(Ibapah), Utah?

Skull Valley Band of Gosiute, Utah?

Shoshone Bannock Tribes, Idaho?

## **APPENDIX A - AREA OF POTENTIAL EFFECT (APE)**

### **Includes:**

**Cultural and 4(f) Sites Under Discussion (11x 17)**

**Historic Structures Under Discussion (11 x 17)**

**Historic Structures Under Discussion-Continued (11 x 17)**

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## APPENDIX B

### UDOT STANDARD SPECIFICATION FOR DISCOVERY OF HISTORIC, ARCHEOLOGICAL OR PALEONTOLOGICAL OBJECTS

#### **Standard Specification Section 01355, Part 1.10, Discovery of Historical, Archaeological or Paleontological Objects**

Standard Specification Section 01355, Part 1.10, Discovery of Historical, Archaeological or Paleontological Objects, will be enforced during this project. This specification stipulates procedures to be followed should any archaeological, historic, or paleontological resources be discovered during construction of the project. These procedures are as follows:

1. Immediately suspend construction operations in the vicinity of the discovery if a suspected historic, archeological or paleontological item, feature, prehistoric dwelling sites or artifacts of historic or archeological significance are encountered.
2. Notify the ENGINEER verbally of the nature and exact location of the findings.
3. The ENGINEER will contact the State archeological authorities who will determine their disposition.
4. Protect the discovered objects and provide written confirmation of the discovery to the ENGINEER within 2 calendar days.
5. The ENGINEER will keep the CONTRACTOR informed concerning the status of the restriction.
  - The time necessary for the DEPARTMENT to handle the discovered item, feature, or site is variable and dependent on the nature and condition of the discovered item.
  - Expect a two (2) week or more delay in the vicinity of the discovery.
  - Written confirmation will be given by the ENGINEER when the restriction is terminated.
6. If a changed condition is approved, it will be controlled in accordance with Section 00725, paragraph: Differing Site Conditions.

Should a discovery occur, the FHWA will consult with the USHPO/THPO, and the Council in accordance with 36 CFR 800.13(b)(3) toward developing and implementing an appropriate treatment plan prior to resuming construction.

United States Department of Agriculture



Natural Resources Conservation Service  
Murray Field Office  
1030 W. 5370 S. Suite100  
Murray, Ut. 84123  
1 801 263-3204  
FAX: 1801 263-3667

---

NOV 09 2004

Laynee G. Jones  
Legacy Parkway Project Manager  
HDR Engineering, Inc.

Dear Laynee,

The enclosed CPA 106 forms are for your use as requested. Let me know if there are questions

Sincerely,

A handwritten signature in cursive script that reads "Ray Grow".

Ray Grow, NRCS Murray, Utah

FARMLAND CONVERSION IMPACT RATING  
FOR CORRIDOR TYPE PROJECTS

PART I (To be completed by Federal Agency)		3. Date of Land Evaluation Request	9/24/04	4. Sheet 1 of 2
1. Name of Project Legacy Parkway		5. Federal Agency Involved FHWA, UDOT		
2. Type of Project Roadway Preferred Alternative (Corridor E)		6. County and State Davis and Salt Lake Counties; Utah		
PART II (To be completed by NRCS) Applicant's		1. Date Request Received by NRCS	9/27/04	2. Person Completing Form Ray Grow
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form).		YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		4. Acres Irrigated 27,768
				Average Farm Size 114.5
5. Major Crop(s) alfalfa, grain, corn, vegetables, grass hay, p	6. Farmable Land in Government Jurisdiction Acres: 148,124 % 1.3		7. Amount of Farmland As Defined in FPPA Acres: 11,320 % 1.3	
8. Name Of Land Evaluation System Used Utah NRCS LE	9. Name of Local Site Assessment System none		10. Date Land Evaluation Returned by NRCS	

PART III (To be completed by Federal Agency)	Alternative Corridor For Segment			
	Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly	338	501	240	315
B. Total Acres To Be Converted Indirectly, Or To Receive Services	43	7	10	17
C. Total Acres In Corridor	381	508	250	332

PART IV (To be completed by NRCS) Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	23	88	28	31
B. Total Acres Statewide And Local Important Farmland	0	2	0	0
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0	0	0	0
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	5	5	5	5

PART V (To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)				
	79	86	79	79

PART VI (To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))		Maximum Points			
1. Area in Nonurban Use	15	0	0	0	0
2. Perimeter in Nonurban Use	10	0	0	0	0
3. Percent Of Corridor Being Farmed	20	8	9	4	6
4. Protection Provided By State And Local Government	20	0	20	0	0
5. Size of Present Farm Unit Compared To Average	10	9	9	9	9
6. Creation Of Nonfarmable Farmland	25	2	25	6	2
7. Availability Of Farm Support Services	5	5	5	5	5
8. On-Farm Investments	20	5	10	6	5
9. Effects Of Conversion On Farm Support Services	25	5	10	6	5
10. Compatibility With Existing Agricultural Use	10	10	10	10	10
TOTAL CORRIDOR ASSESSMENT POINTS	160	44	98	46	42

PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V)	100	79	86	79	79
Total Corridor Assessment (From Part VI above or a local site assessment)	160	44	98	46	42
TOTAL POINTS (Total of above 2 lines)	260	123	184	125	121

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
-----------------------	---	-----------------------	---

5. Reason For Selection:

Signature of Person Completing this Part: Ray Grow (NRCS part) DATE: 11/04/04

NOTE: Complete a form for each segment with more than one Alternate Corridor

## CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

- (1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?  
 More than 90 percent - 15 points  
 90 to 20 percent - 14 to 1 point(s)  
 Less than 20 percent - 0 points
- (2) How much of the perimeter of the site borders on land in nonurban use?  
 More than 90 percent - 10 points  
 90 to 20 percent - 9 to 1 point(s)  
 Less than 20 percent - 0 points
- (3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?  
 More than 90 percent - 20 points  
 90 to 20 percent - 19 to 1 point(s)  
 Less than 20 percent - 0 points
- (4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?  
 Site is protected - 20 points  
 Site is not protected - 0 points
- (5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County?  
 (Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with \$1,000 or more in sales.)  
 As large or larger - 10 points  
 Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points
- (6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?  
 Acreage equal to more than 25 percent of acres directly converted by the project - 25 points  
 Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)  
 Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points
- (7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?  
 All required services are available - 5 points  
 Some required services are available - 4 to 1 point(s)  
 No required services are available - 0 points
- (8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?  
 High amount of on-farm investment - 20 points  
 Moderate amount of on-farm investment - 19 to 1 point(s)  
 No on-farm investment - 0 points
- (9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?  
 Substantial reduction in demand for support services if the site is converted - 25 points  
 Some reduction in demand for support services if the site is converted - 1 to 24 point(s)  
 No significant reduction in demand for support services if the site is converted - 0 points
- (10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?  
 Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points  
 Proposed project is compatible to existing agricultural use of surrounding farmland - 9 to 1 point(s)  
 Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points

FARMLAND CONVERSION IMPACT RATING  
FOR CORRIDOR TYPE PROJECTS

PART I (To be completed by Federal Agency)		3. Date of Land Evaluation Request 9/27/04	4. Sheet 1 of 2		
1. Name of Project Legacy Parkway		5. Federal Agency Involved FHWA, UDOT (this form shows alt. E under Corridor A)			
2. Type of Project Roadway preferred alternative (corridor E)		6. County and State Davis and Salt Lake Counties; Utah			
PART II (To be completed by NRCS) <i>Applicant's</i>		1. Date Request Received by NRCS 9/27/04	2. Person Completing Form Ray Grow		
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form.)		YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	4. Acres Irrigated   Average Farm Size 27,768   114.5		
5. Major Crop(s) alfalfa, grain, corn, vegetables, grass hay, p	6. Farmable Land in Government Jurisdiction Acres: 148,124 % 1.3		7. Amount of Farmland As Defined in FPPA Acres: 11320 % 1.3		
8. Name Of Land Evaluation System Used Utah NRCS LE	9. Name of Local Site Assessment System none		10. Date Land Evaluation Returned by NRCS		
PART III (To be completed by Federal Agency)		Alternative Corridor For Segment			
		Corridor <b><i>AE</i></b>	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly		307			
B. Total Acres To Be Converted Indirectly, Or To Receive Services		16			
C. Total Acres In Corridor		323	0	0	0
PART IV (To be completed by NRCS) Land Evaluation Information					
A. Total Acres Prime And Unique Farmland		29			
B. Total Acres Statewide And Local Important Farmland		0			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted		0			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value		5			
PART V (To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)		<b>78</b>			
PART VI (To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))		Maximum Points			
1. Area in Nonurban Use		15	0		
2. Perimeter in Nonurban Use		10	0		
3. Percent Of Corridor Being Farmed		20	6		
4. Protection Provided By State And Local Government		20	0		
5. Size of Present Farm Unit Compared To Average		10	9		
6. Creation Of Nonfarmable Farmland		25	2		
7. Availability Of Farm Support Services		5	5		
8. On-Farm Investments		20	5		
9. Effects Of Conversion On Farm Support Services		25	5		
10. Compatibility With Existing Agricultural Use		10	10		
TOTAL CORRIDOR ASSESSMENT POINTS		160	42	0	0
PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V)		100	<b>78</b>		
Total Corridor Assessment (From Part VI above or a local site assessment)		160	42	0	0
TOTAL POINTS (Total of above 2 lines)		260	<b>AE 120</b>	0	0
1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		
5. Reason For Selection:					

*Ray Grow (NRCS part)*  
Signature of Person Completing this Part:

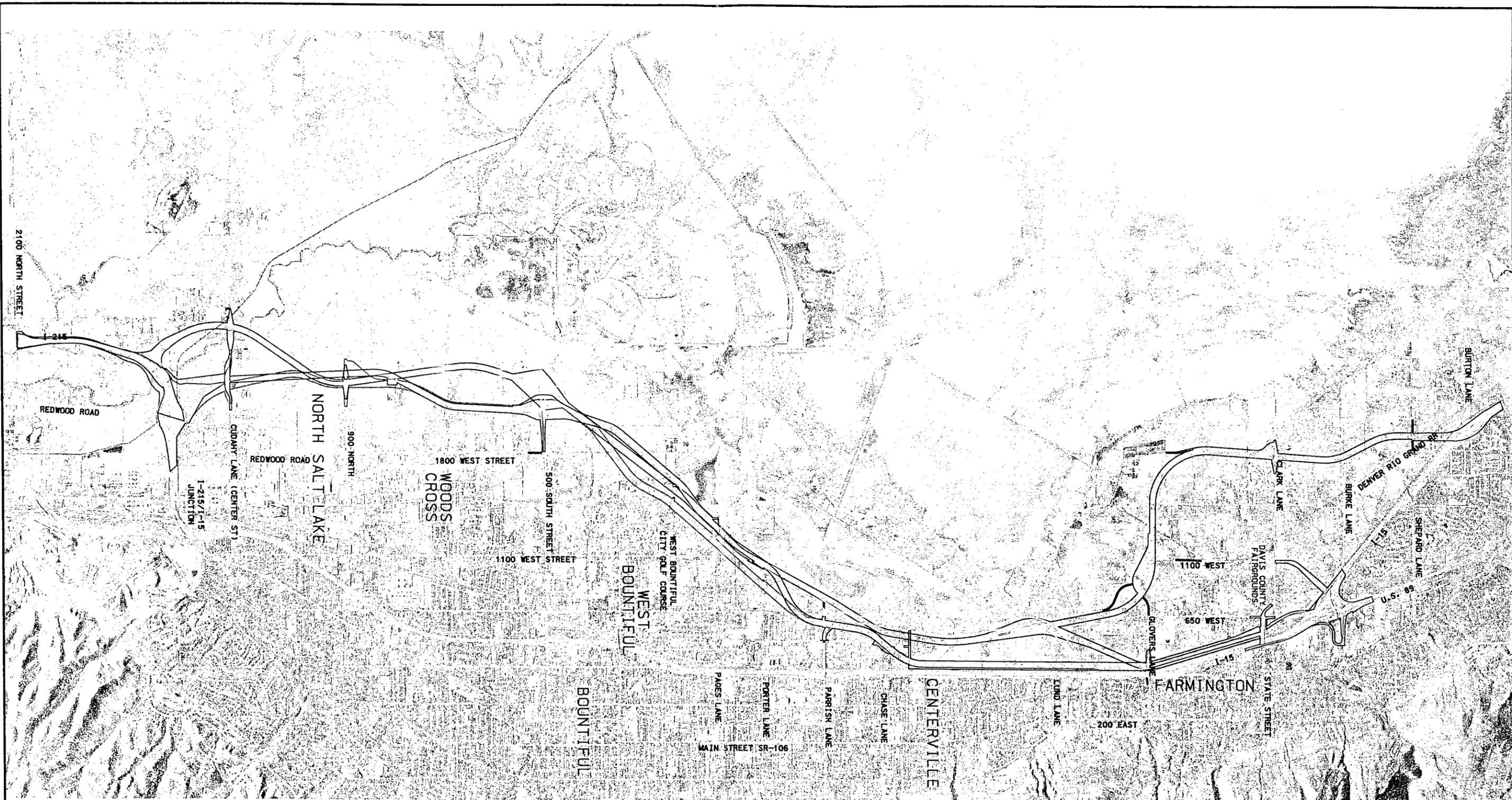
DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

## CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

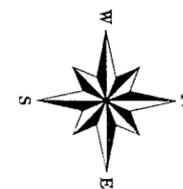
- (1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?  
 More than 90 percent - 15 points  
 90 to 20 percent - 14 to 1 point(s)  
 Less than 20 percent - 0 points
- (2) How much of the perimeter of the site borders on land in nonurban use?  
 More than 90 percent - 10 points  
 90 to 20 percent - 9 to 1 point(s)  
 Less than 20 percent - 0 points
- (3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?  
 More than 90 percent - 20 points  
 90 to 20 percent - 19 to 1 point(s)  
 Less than 20 percent - 0 points
- (4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?  
 Site is protected - 20 points  
 Site is not protected - 0 points
- (5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County?  
 (Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with \$1,000 or more in sales.)  
 As large or larger - 10 points  
 Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points
- (6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?  
 Acreage equal to more than 25 percent of acres directly converted by the project - 25 points  
 Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)  
 Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points
- (7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?  
 All required services are available - 5 points  
 Some required services are available - 4 to 1 point(s)  
 No required services are available - 0 points
- (8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?  
 High amount of on-farm investment - 20 points  
 Moderate amount of on-farm investment - 19 to 1 point(s)  
 No on-farm investment - 0 points
- (9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?  
 Substantial reduction in demand for support services if the site is converted - 25 points  
 Some reduction in demand for support services if the site is converted - 1 to 24 point(s)  
 No significant reduction in demand for support services if the site is converted - 0 points
- (10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?  
 Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points  
 Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)  
 Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points



**LEGEND**

- ∨ Alternative A
- ∨ Alternative B
- Alternative C
- ∨ Alternative D and E

*E is 321 ft. wide  
D is 328 ft. wide*



**LEGACY PARKWAY**

Form NRCS-CPA-106  
 Identification Number: UT-2004-0002  
 Davis and Salt Lake Counties, Utah  
 Federal Agency Involved: FHWA  
 September 27, 2004



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
1325 J STREET  
SACRAMENTO, CALIFORNIA 95814-2922

November 8, 2004

Regulatory Branch (199650197) (200350493)(FJD)

Mr. John Thomas, P.E.  
Utah Department of Transportation  
360 North 700 West  
Suite F 2nd Floor  
North Salt Lake, Utah 84054

Dear Mr. Thomas:

We are responding to your request to reverify the original jurisdictional determination for the UDOT Legacy Parkway Project. We issued Permit 199750197 in January 2001, authorizing UDOT to fill up to 114 acres of wetlands for the construction of the Legacy Parkway. Portions of the right-of-way were cleared and filled before construction was halted in November 2001. Therefore, the area disturbed by this construction needed specific study to determine to what extent wetlands have changed subsequent to the impact analysis performed for the June 2000 *Legacy Parkway Final Environmental Impact Statement*. The survey area is located in the cities of Salt Lake, North Salt Lake, West Bountiful, Woods Cross, Centerville and Farmington, in Davis County, Utah.

Based on available information and the March 24, 2004 reverification report prepared by Jones and Stokes, Inc., we hereby reverify the original delineation, *Wetland Delineation, Legacy-West Davis Highway* (Baseline Data, Inc. et al, February 18, 1998) and its 1999 update with the following modification:

Within the right-of-way, 47.9 acres have been filled. Adjacent to the right-of-way, up to 4.5 acres have been filled; this includes 4.2 acres of wetlands were filled by activities not associated with the Legacy Parkway. (This figure does not include 12.9 acres of wetlands filled in association with the Foxboro project at the northwest corner of Center Street and Redwood Road, in North Salt Lake.) We concur with the acreage tally on the enclosed Table 1 from the Jones and Stokes reverification report.

These waters are regulated under Section 404 of the Clean Water Act since they are either tributary and/or adjacent to the Great Salt Lake (GSL), a waters of the United States in accordance with 33 CFR 328(a)(5) and (7). Adjacent means neighboring, bordering or contiguous. We consider wetlands that form complexes on the low terraces surrounding the GSL to be wetlands adjacent to the GSL.

This verification is valid for five years from the date of this letter, unless new information warrants revision of the determination before the expiration date. A *Notification of Administrative Appeal Options and Process and Request for Appeal* form is enclosed. If you wish to appeal this approved jurisdictional determination, please follow the procedures on the form. You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

Please refer to identification number 200350493 in any correspondence concerning this project. If you have any questions, please contact me at our Utah Regulatory Office, 533 West 2600 South, Suite 150, Bountiful, Utah 84010-7744, email [Nancy.Kang@usace.army.mil](mailto:Nancy.Kang@usace.army.mil), or telephone 801-295-8380, extension 14. You may also use our website: [www.spk.usace.army.mil/regulatory.html](http://www.spk.usace.army.mil/regulatory.html).

Sincerely,

A handwritten signature in black ink that reads "Nancy Kang". The signature is written in a cursive, flowing style.

Nancy Kang  
Chief, Utah Regulatory Office

Enclosure(s)

Copy furnished without enclosure(s):

Greg Punske, P.E., Federal Highway Administration, 2520 West 4700 South, Suite 9A, Salt Lake City, Utah 84118-1847  
Christy Corzine, Jones and Stokes, 2600 V Street, Sacramento, CA 95818-1914.

Appendix B  
**Travel Demand**

# Appendix B

## 2020 Travel Demand Analysis

### **B1 Introduction and Setting**

This document presents the travel demand methodology used for evaluating transportation improvements as part of the Legacy Parkway supplemental environmental impact statement (Supplemental EIS). The Legacy Parkway Supplemental EIS identifies the need for major highway improvements in the North Corridor, together with maximum future transit improvements as part of a coordinated multi-modal program (Shared Solution). The detailed discussions of the travel demand model that follow have as their starting point the Wasatch Front Regional Council (WFRC) travel demand model (version 3.2) (released February 2004) and various WFRC documentation including a memo describing “What’s new in Version 3.1” by WFRC staff.

#### **B1.1 Purpose and Organization of Report**

This report has five sections.

- Section 1, Introduction and Setting, describes the purpose of the report.
- Section 2, Model Input and Assumptions, outlines the inputs and assumptions of the WFRC travel demand forecasting model, such as socio-economic projections and highway and transit networks.
- Section 3, Travel Demand Modeling Process, reports the procedures that were used to develop travel demand forecasts for the Legacy Parkway project, using the WFRC model, and explains the basic process used by WFRC, and the changes in the modeling process that were incorporated by the study team led by FHWA and the Corps.
- Section 4, Changes to the WFRC Model and Processing Model Results, highlights specific post-model adjustments to the WFRC model incorporated to:
  - Account for factors not considered by the model
  - Process raw traffic volumes and transit assignments in the WFRC travel demand model to create “passenger car equivalent volumes” consistent with the procedures in the 2000 *Highway Capacity Manual* (Transportation Research Board 2000).
- Section 5, Supporting Alternatives Analysis, was added at the request of the lead federal agencies to provide a richer understanding of the traffic analysis evaluated to understand and compare alternatives.

Note that it is difficult to separate the WFRC travel demand model from modeling performed specifically for the Legacy Parkway Project. The WFRC travel demand model refers to all modeling processes and data inputs. In order to test alternatives, certain data inputs have been changed but all other data inputs and modeling processes have not been changed. This report describes both the WFRC modeling processes and data inputs and will highlight, where appropriate, data inputs have been changed to reflect modeling performed specifically for the Legacy Parkway Supplemental EIS.

## **B1.2 Background of Modeling Domain**

In the past, WFRC maintained two separate models, one covering the modeling domain of the Salt Lake Urbanized Area and one covering the modeling domain of the Ogden Urbanized Area. In addition, the Mountainland Association of Governments (MAG) maintained a travel model of the Provo-Orem Urbanized Area. The Salt Lake Urbanized Area consisted of the southern portion of Davis County, generally south of but including portions of Farmington, as well as urbanized areas of Salt Lake County. The modeling domain for the Ogden Urbanized Area was contiguous to and north of the Salt Lake Urbanized Area. The modeling domain for the Provo-Orem Urbanized Area was contiguous to and south of the Salt Lake Urbanized Area.

Beginning in approximately 1999, WFRC and MAG began a process to combine the three separate models into a single regional travel demand model, built upon a less formal process that began earlier within WFRC to combine the models for the Salt Lake and Ogden Urbanized Areas. The less formal process began by ensuring that “external trips” from the Salt Lake model and the Ogden Urbanized Area model were identical. The more formal process reviewed individual trip purposes and redefined the definition of “external trip” as well as other improvements facilitated through consultant support. Now one single travel model covers the four contiguous counties. Salt Lake, Davis, and Weber Counties are within the WFRC planning area, and Utah County is within the MAG planning area. The following discussion includes data reported across the four-county area, relating to totals from the entire modeled area. Data reported from the WFRC area covers only Salt Lake, Davis, and Weber Counties.

## **B1.3 Description of the North Corridor**

The North Corridor is explained in detail elsewhere in the Supplemental EIS, but from a modeling standpoint, it generally refers to the area that parallels I-15 from Kaysville to the northern part of Salt Lake City. The North Corridor includes all or parts of Salt Lake City, Salt Lake County, North Salt Lake, Woods Cross, Bountiful, West Bountiful, Centerville, Farmington, Kaysville, and Davis County. Figures 1-1 (Regional Location) and 1-2 (North Corridor) in the Legacy Parkway Final EIS illustrate the regional location and the specific limits of the North Corridor, respectively. It is pointed out that the modeling domain includes the four urban counties: Salt Lake, Davis, Weber, and Utah County. Consequently, this report will utilize, as needed, information from the four urban counties, the three urban counties that fall within the WFRC planning area, or just the North Corridor. The use of four county total values is typically included as a matter of convenience in summarizing the results of the entire modeling domain, but smaller geography results are provided where necessary based on consistent geographic definitions built from the Traffic Analysis Zone (TAZ) level of detail.

## **B2 Model Input Assumptions**

The WFRC travel demand model uses a variety of input data as the basis for forecasting future traffic and ridership volumes in the North Corridor. The three key inputs are:

- Land use and socio-economic data (as a basis for estimating trip generation);
- Highway network definition, including the physical and operating characteristics of highways and arterial streets within the model area; and
- Transit network definition, describing the transportation modes, service levels, and operating characteristics of the public transit system.

Additional information on modeling input and assumptions is included in Section B3.2.2 (*Transit Network Assumptions*).

### **B2.1 Land Use and Socio-Economic Projections**

#### ***B2.1.1 Source of the Projections***

The socio-economic data sets developed and maintained by WFRC in coordination with local governments are the basis of estimating future travel demand within the region. These data also support a variety of other comprehensive planning activities throughout the region. This section describes the development and application of the socio-economic data, in particular the forecast population and employment.

To provide reliable projections of population, land use, and other parameters for planning, the counties and communities of the Wasatch Front region have maintained a cooperative process through WFRC for nearly thirty years. The process has generally relied on the state's Utah Process of Economic and Demographic (UPED) model for regional and county control totals of population and employment. Regional and county totals need to be assigned to more specific locations, which respect land constraints at the small area level by WFRC. In April 1992, WFRC published *Wasatch Front Regional Planning Projections Technical Report 29*, which introduced the Stratified Iterative Dis-aggregation (SID) method of projecting socioeconomic data on geographic areas smaller than the county level. The basic concept underlying SID is to use historical growth rates to produce TAZ level projections, which are then summed to county and regional control totals. The latest TAZ projections developed by WFRC were produced during 2003 using a modification of the SID method, with control totals published in the *2003 Economic Report to the Governor*, and are the basis of the travel demand projections used in the February 2004 WFRC model provided for the Legacy Parkway Supplemental EIS project.

#### ***B2.1.2 Methodology for Developing Projections***

There are four basic components to the projections methodology: collecting base data, obtaining control totals, calculating projections, and reviewing projections. These are discussed below.

## Collecting Base Data

Base data for population and households come from the 2000 Census SF1 dataset at the census block level. Census blocks are summed to the TAZ and census tract levels.

Base employment data originally came from the 3rd Quarter, 2001 Utah Department of Workforce Services ES 2002 database for the WFRC model development and calibration. WFRC periodically inputs updated data as it becomes available. Once base population and employment were collected, the land supply was examined and mapped. Land that was deemed un-developable due to environmental constraints was taken out of the total and density was calculated using the total land available for development. The developable land was further classified as residential or commercial using the master plans from each city and county.

## Obtaining Control Totals

Control totals for the years 2002–2030 for population, households, and employment were provided at the county level by the Governor’s Office of Planning and Budget (GOPB), as published in the *2003 Economic Report to the Governor* (Governor’s Office of Planning and Budget 2003). Both GOPB and WFRC staffs collaborate on the review of these county level totals before their publication. The UPED is a hybrid economic-demographic model. UPED integrates a cohort-component demographic model with an economic base employment model. It generates long term demographic (population) and economic (employment) forecasts. The demographic component of UPED produces projections of births, deaths, and non-employment related in- and out-migration, while the economic component generates projections of employment and employment related net migration. **The single most important driver of population growth or decline in this model is the growth rate of employment associated with a region's economic base.**

The demographic component of the model employs the cohort survival population projection technique combined with econometric techniques for projecting the migration portion of population change. The UPED model begins with a census count base-year population distributed by age and gender. The model then incorporates specific assumptions with regard to survival and fertility rates for each age and gender group and projects the change in population over the next five-year period. This produces a natural increase in population notwithstanding in- or out- migration. Non-employment related migrants, such as retirees or students, are added or subtracted to the base year population such that the result is a first approximation of the end of period population, that is, the expected end of period population in the absence of employment related migration. This value becomes input to the economic side of the model.

The economic component of UPED is an economic base employment model with the organizing concept of a labor market that controls employment related migration. The central premise of this model is that external demand for a region's exports is the primary driving force behind the region's economic and demographic growth or decline. This demand is registered in the model as basic employment, which is used to produce goods and services for export. Estimates and projections of basic employment by industry sector are input to the model.

The population in the region also demands goods and services. Local production of goods and services for local consumption requires labor. The demand for this labor is represented in the model as population-dependent employment. As the population of the region changes, this population-dependent employment will change in a like direction. In the model, the following factors determine the level of this category of employment.

- The population size and age structure.
- Trends in national per capita employment by industry (reflecting changes in national consumption patterns and productivity).
- The local differences from national production rates (reflecting regional differences in consumption patterns as compared with the U.S.) and the region's import structure.

The total demand for labor, measured in jobs, is the sum of basic and population-dependent employment.

Population (age and gender components), labor force participation rates, and multiple job holding rates determine the supply of labor (measured in terms of the number of jobs). Given the population from the demographic component of the model, if the supply of labor exceeds the demand for labor in sufficient numbers to yield an unemployment rate, which exceeds the equilibrium rate, employment related net out-migration occurs. On the other hand, if the unemployment rate is less than the equilibrium rate, employment related net in-migration results. If the labor market is in equilibrium, i.e., the unemployment rate is sufficiently close to the equilibrium rate, no migration occurs and the model proceeds to the next projection year. Non-employment related migration is also projected in this section of the model, since the population base for this category of migration is the natural increase population plus employment related to net migration.

In the event of migration, the size and composition of the population changes, this, in turn, affects the population-dependent demand for labor, thus inducing further migration. This is solved iteratively. When equilibrium is achieved, the model proceeds to the next projection year. The ending population of the current year becomes the beginning population of the following year.

UPED makes projections at the multi-county district (MCD) level. GOPB and WFRC then disaggregate the MCD projections to counties based on growth trends, available land, etc. The UPED does not have a land supply component as part of the model structure, thus the process of disaggregating the regional control totals provided by GOPB into county, city, and TAZ level forecasts is the responsibility of WFRC (or each appropriate Association of Governments). Final products from UPED include population by age and gender, components of population change, households, household size, and 66 sectors of employment.

### Calculation of Projections

These control totals are used by WFRC to make TAZ projections using the Modified Stratified Iterative Dis-aggregation (MSID) process with several (off model/on model) enhancements (also by WFRC). Small area projections were controlled to the regional control totals of UPED but were initially allocated to each area using the Census 2000 population values, the Utah Department of Workforce Services employment values, as well as the zonal density for each data item. A growth rate for each variable is applied based on its density and corresponding historical growth trends from 1980 to 2000. The annual growth rates are applied for five years. At each five-year interval, densities are recalculated using the new population and employment and new growth rates are applied to the next five-year period. This process is repeated until the horizon year (2030) is reached. For more information, refer to *Wasatch Front Region Small Area Socioeconomic Projections: 2002-2030 Technical Report #42*. The accuracy of past land use forecasts is controlled in several steps by the accuracy of the control totals provided by the Utah Office of Planning and Budget and the small area forecasts developed by the WFRC. Each of these agencies, as well as the individuals who assist these agencies, has tracked historic accuracy by various statistical and

non-statistical means. As part of the WFRC Technical Report # 39, a brief review of historic accuracy was offered. In this report, a brief review of historic projections in Salt Lake County concluded, “Historically, the projections have tracked well with the actual trends.” Although the Supplemental EIS uses an updated set of socio-economic forecasts included in Technical Report #42, the methodology and results are considered consistent with earlier forecasts. The Utah Office of Planning and Budget also provides *An Analysis of the Accuracy of UPED’s Historical Projection Work* (April 2001), which makes several observations, notably that “Utah’s projection history includes periods of both over and under projecting population.”

Interim year projections, such as projections used for the Legacy Supplemental EIS, make use of published interim year projections of WFRC (and MAG). At the time of the Legacy Final EIS, the year 2020 was the horizon year of WFRC Small Area Projections. In order for the Supplemental EIS to remain consistent with the Final EIS, the interim year 2020 of the WFRC projection horizon (year 2030) has been used. The *Wasatch Front Urban Area Long Range Transportation Plan Update, 2004–2030* (WFRC long range plan) (Wasatch Front Regional Council 2003) includes projects and projections to the year 2030. The Legacy Parkway Supplemental EIS used the year 2020 land use projections and applied those to the list of highway and transit projects included in Phase I and Phase II of the three-phased transportation plan. Phase II of the plan extends to the year 2022, which was considered consistent with the year 2020 land use projections. A comparison between the population and employment projections in the Final EIS and those included in the Supplemental EIS are presented in Table B-1a and B-1b, respectively.

**Table B-1a.** Comparison of Final EIS and Supplemental EIS Population Data and Forecasts

	Final EIS Base Year 1995 Population	Supplemental EIS Base Year 2002 Population	Final EIS Forecast 2020 Population	Supplemental EIS Forecasts 2020 Population
Salt Lake County	819,000	924,000	1,302,000	1,284,000
Davis County	218,000	250,000	355,000	347,000
Weber County	174,000	200,000	284,000	287,000
Urban Area Total	1,211,000	1,374,000	1,941,000	1,918,000

Note: Population summaries in the travel demand models may vary slightly from published values due to rounding of disaggregate forecasts of household size. Population and employment are rounded to the nearest 1,000.

**Table B-1b.** Comparison of Final EIS and Supplemental EIS Employment Data and Forecasts

	Final EIS Base Year 1995 Employment	Supplemental EIS Base Year 2002 Employment	Final EIS Forecast 2020 Employment	Supplemental EIS Forecasts 2020 Employment
Salt Lake County	447,800	522,000	753,600	734,000
Davis County	73,000	89,000	133,200	124,000
Weber County	76,500	84,000	126,200	129,000
Urban Area Total	597,300	695,000	1,013,000	987,000

Note: Population summaries in the travel demand models may vary slightly from published values due to rounding of disaggregate forecasts of household size. Population and employment are rounded to the nearest 1,000.

## Review of Projections

The projections were subject to several rounds of review and revision. The projections are reviewed by individual jurisdictions (cities and counties within WFRC) for consistency with boundaries, the land use element of their Master Plans, and reasonableness. By forming a Working Group, WFRC allowed the review of the final socio-economic projections by local “experts” including experienced land use planners in the region, state government economists, and other interests. The following list identifies the entities that comprised the WFRC Working Group. According to WFRC, the Working Group concluded that the methodology was sound and the results were reasonable at the regional level. The following entities comprise the working group.

- Weber County
- Davis County
- Sierra Club
- Envision Utah
- Town of Herriman
- Homebuilders Association of Greater Salt Lake
- Utah Department of Transportation
- Utah Transit Authority
- State Data Center
- Greater Ogden Area Board of Realtors
- West Valley City
- Bureau of Economic and Business Research
- Sandy City
- Governor’s Office of Planning and Budget

In addition to land use, population, and employment, auto ownership is also an important variable in forecasting future travel demand, but is calculated from other socio-economic data. The socio-economic and land use forecasts have been updated from those used in the demand forecasts performed for the Legacy Parkway Final EIS and I-15 North Corridor Draft EIS. A more detailed discussion of current land-use and socio-economic forecasts, by county, city and TAZ, along the Wasatch Front is included in *Technical Report #42: Wasatch Front Region Small Area Socioeconomic Projections: 2002-2030* (Wasatch Front Regional Council 2003).

### ***B2.1.3 Summary of Socio-Economic Projections in Wasatch Front***

#### **Population**

Population along the Wasatch Front (Weber, Davis, and Salt Lake Counties) is expected to grow from about 1,374,000 in 2002 to approximately 1,918,000 in 2020, an increase of 40%. Increases in population density are also projected throughout much of Davis County resulting from a combination of infill development in the more developed areas of the county and the continued spread of development in the presently undeveloped portions of the county. This increase in population, and to a lesser extent population density, will contribute to increased traffic volumes on the major transportation facilities in Davis County.

#### **Households**

Households for the three-county area are projected to increase from about 450,000 in 2002 to over 677,000 in 2020, or over 50%. The growth rate for households is higher than population because household size is forecast to continue to decrease over time. According to the WFRC, national trends support a declining household size, with a more significant reduction in household sizes in the Davis County, according to the Utah Office of Planning and Budget, due to the increasing urbanization of the area and the increasing loss of vacant or under-developed land.

#### **Employment**

Employment for the three-county area is projected to increase at close to, but slightly above the rate of population growth. Employment projections in Salt Lake County represents a slightly smaller share of the three-county employment as compared from the Final EIS to the Supplemental EIS, but remains the dominant employment location.

### ***B2.1.4 Summary Results***

Overall, the growth projections for both population and employment in the Supplemental EIS for the year 2020 are slightly below growth projections in the Final EIS for the same year. This is due to revised regional control totals offered by the GOPB. The Utah Governors Office of Planning and Budget presently maintains growth forecasts to the year 2030 for which the year 2020 forecasts represent an interim year. During the Final EIS, growth forecasts for the year 2020 represented the furthest future year of official forecasts.

## **B3 Travel Demand Modeling Process for Legacy Parkway Project**

The travel demand model, its input data, and its application methodologies have changed since the Legacy Parkway Final EIS and I-15 North Draft EIS were prepared. The Legacy Parkway Supplemental EIS used the February 2004 WFRC regional travel demand model with changes to the highway and transit input networks as described in this memo. Consequently, the traffic forecasts used are not the same as those published in the earlier environmental documents. Developments to the WFRC travel demand model have been implemented by WFRC to improve the accuracy of forecasts produced. Selected application methodologies have changed in the WFRC model to reflect updated standards and recommendations from peer reviews. Updates to input data by WFRC have been made to better reflect current plans, and forecasts. The Legacy Parkway modeling included all of the latest advancements of the

WFRC model and methodologies with changes made to the input networks for the Legacy Parkway Supplemental EIS. The verification of the accuracy of the WFRC modeling process can be found in several internal documents to the WFRC, most recently including the “Wasatch Front Regional Council Speed Study,” December 2003. Informal model calibration efforts are often done on a model-by-model basis. The *Legacy Parkway Technical Memorandum: Integration of Mass Transit with Legacy Parkway* (Fehr & Peers 2004) also offers a brief review of the accuracy of the WFRC model for application in the North Corridor.

The travel demand models used for the I-15 and Legacy Parkway environmental studies in 1998-2000 were described in detail in their respective supporting documentation. Major differences between those models, input data, and methodologies are included in the discussion of the structure and four steps within the model that follow.

### **B3.1 Land Use and Induced Growth**

Land use projections for all of the alternatives are the official 2020 data set for WFRC model, version 3.2. The Supplemental EIS transportation analysis does not vary the land use assumptions from one transportation alternative to another. The WFRC model predicts future travel demand based on a full range of relevant factors, including projected land use. The model is not designed to address the concept of “induced growth,” which can be described as variations in where and when growth may occur in relation to enhancements of transportation systems. Rather, the model projects future travel demand using land use projections of the local communities combined with the data described above from the GOPB. WFRC model analysis utilizes the following in projecting total travel demand.

- The future land use inputs to the WFRC model are based on plans that include Legacy Parkway and based on input from each community in the corridor.
- The calibrated base year conditions include future trip rates and peak period factors that are unchanged from the base year.
- The WFRC model was calibrated to base year conditions that generally have low to moderate congestion.

Therefore, the total travel demand generated in the north corridor for the Shared Solution represents a reasonable maximum level. As described in Section 5.1 of this appendix, land use in the corridor for the No-Build Alternative could vary from the WFRC estimates because the No-Build would make more land available for development in the corridor than anticipated by WFRC. Under a Legacy Parkway No-Build scenario, the 800 acres of developable land within the Legacy Parkway right-of-way and preserve would become available for development. Section 5.1 describes the sensitivity of the No-Build travel forecasts to the possible development of these acres.

Given the use of consistent land use assumptions in the analysis of all of the alternatives, the main variations in corridor travel demand from one alternative to the next relate to the different levels of accessibility and travel ease offered by the respective alternatives. Specific travel routes and mode used by the total travel demand will be affected by the Shared Solution as discussed in Section B3.3.4 of this appendix.

## B3.2 Highway and Transit Networks

### B3.2.1 Highway Networks

Highway networks include links defining all freeways, highways, arterial and collectors in each of the four counties. TAZs are connected into the highway network by links called “centroid connectors.” Centroid connectors represent local streets and driveways in the model and serve to connect trips to the transportation network. The parameters that define a highway link generally are:

- Distance
- Free-flow travel speed
- Number of lanes
- Lane capacity
- Functional classification

Highway networks for the entire four-county region (including Utah County) as developed by WFRC and MAG were held constant for each of the alternatives evaluated for the Legacy Parkway Supplemental EIS except for changes necessary to reflect each alternative in the North Corridor. Highway networks in both the build and no-build conditions included a combination of programmed and non-programmed projects as included in the WFRC long range plan as included in the “end of phase II” model set. The extension of Legacy Parkway north of the project limits is also included in the WFRC Long Range Plan, but was excluded from all model runs so as not to bias the results by including an extension of a project still being evaluated.

As part of applying the travel demand forecasting process for the Legacy Parkway Supplemental EIS, the Legacy Parkway project developed a 2020 highway network, using the WFRC information and model to represent no-build conditions as well as to provide a background for evaluating the build alternatives. The “no-build” highway network was defined to include all of the projects included in Phase I (year 2012) and Phase II (year 2022) of the entire transportation system as described by the WFRC 2030 long range plan (adopted December 2003) with the exception of the Legacy Parkway between I-215 and US-89, the Legacy North project, and major improvements to I-15 between 600 North in Salt Lake City and 200 North in Kaysville. I-15 improvements in the south Davis County study area are actually included in Phase III of the WFRC 2030 long range plan, so this project was not removed to define the no-build as much as it was added to reflect several of the build alternatives, in order to remain consistent with the alternatives included in the Final EIS.

Phase I and Phase II of the WFRC long range plan include highway and transit projects projected to be financially feasible by the year 2022. The long range plan also includes a third phase of projects, which are projected to be financially feasible by the year 2030. In order for the Supplemental EIS to be consistent with the design year of the Final EIS, only the first two phases of the three-phase plan were included in the No-Build network to approximate the transportation system in the year 2020. Land use projections for the year 2020, as provided by the WFRC, were modeled on this base transportation system.

The most notable projects included in the no-build network are:

- Widening of Redwood Road from two to four lanes from 1000 North in Salt Lake City to 500 South in Woods Cross, which WFRC plans between 2013 and 2022.
- Widening of 500 South in Woods Cross to four lanes from I-15 to Legacy Parkway by 2012.
- Widening of Parrish Lane in Centerville to four lanes from I-15 to Legacy Parkway by 2012.
- Construction of Mountain View Corridor from I-80 to 13400 South in Riverton Jordan, which WFRC plans in varying stages beginning with SR-201 to 6200 South prior to 2012, 6200 South to 13400 South prior to the year 2022.

A capacity enhancement project is programmed for 2004 on I-15 between Beck Street and I-215 that will construct a short segment of general purpose lanes in order to relieve a bottleneck in the highway system. This improvement project is also included in the no-build highway network.

As part of the modeling for the Legacy Parkway Supplemental EIS, the WFRC model was modified to reflect various alternative “build” possibilities. It should be noted that the model structure, including all of the mathematical coding which is part of the WFRC regional travel model, remained unchanged for the Legacy Parkway analysis as compared to the WFRC long range plan. Changes to the model were limited to the inputs, which define the level and type of transportation infrastructure in the year 2020.

For the Legacy Parkway Supplemental EIS modeling, which included “I-15 build” alternatives, I-15 was coded as four general purpose lanes plus an HOV lane. The HOV lane was included in the distribution and assignment portions of the analysis. Various other projects were also analyzed as alternatives to Legacy Parkway. The most notable newly evaluated highway alternative included what was termed a “Redwood Road Arterial.” The Redwood Road Arterial Alternative assumed four lanes in each direction on Redwood Road in its existing alignment (and then extending north to the I-15/US-89 interchange). Speeds and capacities for Redwood Road assumed a limited access, at-grade, signalized facility similar in operational characteristics to Bangerter Highway. The Redwood Road Arterial Alternative modeled for the Legacy Parkway Supplemental EIS included a capacity of 797 cars per lane per hour (with four lanes in each direction) and a coded free flow speed of 47.4 miles per hour from I-215 to Parrish Lane and 51.4 miles per hour from Parrish Lane to US-89. Roadway link speeds and capacities are inputs to the regional travel demand model. Since these inputs often require estimates of future conditions that do not have corresponding data, the WFRC employs a process of assigning speeds and capacities based on functional classification, area type, and a more subjective variable based on the degree of access control. For the Redwood Road Arterial Alternative, model inputs were patterned after Bangerter Highway.

Table B-2 provides a brief description of the components of each alternative analyzed as part of the Supplemental EIS. Alternative names included in the table are provided as a convenience of the modelers and are not intended to over-simplify or otherwise alter the value of each alternative. Specific model coding assumptions as well as further descriptions of specific alternatives are discussed elsewhere in this appendix.

**Table B-2. Modeled Alternative Summary**

Alternative	I-15 Configuration	Legacy Parkway	Transit	Arterial Street Plans	Demand Year
Existing 2001	Highway and transit network as they existing in 2001 as per the calibrated WFRC model				2001
Shared Solution	8 Lanes + 2 HOV	4 Lanes	Maximum Future	WFRC Long Range Plan <sup>1</sup>	2020
No-Build	8 Lanes	Not Built	WFRC Long Range Plan	WFRC Long Range Plan <sup>1</sup>	2020
Redwood Road Arterial Alternative w/out I-15	8 Lanes	Not Built	Maximum Future	WFRC Long Range Plan plus Eight-Lane Redwood w/ Access Control <sup>1</sup>	2020
Maximum Future Transit w/out I-15	8 Lanes	Not Built	Maximum Future	WFRC Long Range Plan <sup>1</sup>	2020
Maximum Future Transit	8 Lanes + 2 HOV	Not Built	Maximum Future	WFRC Long Range Plan <sup>1</sup>	2020
Redwood Road Arterial Alternative	8 Lanes + 2 HOV	Not Built	Maximum Future	WFRC Long Range Plan plus Eight-Lane Redwood w/ Access Control <sup>1</sup>	2020
I-15 Improvements Beyond Ten Lanes	10 Lanes + 2 HOV	Not Built	Maximum Future	WFRC Long Range Plan <sup>1</sup>	2020

<sup>1</sup> WFRC long range plan used for the modeling was modified based on changes described in the text above.

Detailed modeling results of each alternative in Table B-2 are not always presented in this appendix in order to simplify the results for the reader. For example, the results of the Redwood Road Arterial and Maximum Future Transit Alternatives without I-15 improvements generally do not result in improvements in any performance measure evaluated over their respective comparisons with I-15 improvements included. Therefore, this appendix provides a comprehensive description of the travel modeling and modeling results, but does not comprehensively present the results of all alternatives not carried forward past the alternative screening.

### **B3.2.2 Transit Network Assumptions**

The existing transit network was coded into the WFRC model to reflect current UTA operating plans. The future transit network as planned by WFRC is also represented in the WFRC model to reflect programmed transit projects as well as other transit projects included in the WFRC long range plan. The networks used in the Supplemental EIS analysis represent the highway and transit systems at the end of Phase 2 of the current WFRC long range plan. Projected completion date for Phase 2 projects is 2022. As the WFRC population and estimates represent 2020 projections, the Supplemental EIS analysis is termed a 2020 case, although travel conditions would be marginally worse in 2020 than predicted herein if key transportation network projects are delayed until 2022.

Below are listed the most notable transit projects included in the WFRC 2020 transit networks (the same for the build alternatives and the No-Build Alternative).

- Commuter rail operation from Salt Lake City to Ogden along the Union Pacific right-of-way, west of I-15.
- Increased express bus and local bus service on existing routes.
- Increased transit coverage by the extension of existing routes and addition of new routes.
- Provision of feeder bus service to commuter rail stations in Salt Lake, Davis, and Weber Counties.
- Several new light rail lines in Salt Lake County, including:
  - Mid-Jordan light rail serving Midvale and West Jordan.
  - Extension of the north-south TRAX line into Draper.
  - Airport light rail.
  - Light rail line into West Valley connecting east-west into the Sugar House area of Salt Lake City.
- Several new bus rapid transit lines, including:
  - North-south line connecting Davis County to the Salt Lake City central business district (CBD).
  - Additional bus rapid transit serving the proposed Mountain View Corridor, Redwood Road, and Salt Lake County, and 1300 East in Salt Lake County.

A “maximum future transit” analysis was coded for the Legacy Parkway modeling to reflect the more aggressive transit assumptions for the integration of mass transit with Legacy Parkway. The following bullets briefly define “maximum future transit” for the purpose of performing the Legacy Parkway travel modeling under the WFRC travel model (version 3.2) (February 2004).

- Transit routes estimated to be affordable by the year 2030 in the WFRC long range plan were assumed to be in place by the year 2020 (all transit \*.LIN files based on “End of Phase 3” of the WFRC long range plan).
- No changes to walk access from WFRC Code.
- Double parking costs of all zones from WFRC Code (\$0 parking remains \$0).
- No premium transit fares (all express and rail mode fares equal to local bus, in contrast to WFRC Code).
- Commuter rail set to 15-minute headway north of Salt Lake City during rush hours (approximately 6-9 AM and 4-7 PM) in contrast to WFRC 20 minute-headway during rush hours.
- South Davis BRT time factor set to 0.8 (from 1.0) but otherwise as coded (mode 7) reflective of a higher speed bus system with travel times that are 80% of travel time of a “typical” bus line.

- Maximum wait time equal to 1 minute at the following additional nodes (2070, 3404, 3415, 3440, 3463, 3470, 3473, 3548, 3646, 3739, 5506, 5516, 5640, 12631, 12633, 12636, 12637, 12642, 12652, 12661, 12707) to reflect a seamless transfer service for transit routes, in contrast to WFRC coding, which assumes transfers occur between two uncoordinated services, but does include a maximum wait time of 10 minutes (or one half of the headway).
- Post model adjustments to account for the effects of transit-oriented development (“3/4 D” land use) around transit stations as defined by the Integration Analysis (Fehr & Peers 2004), since the WFRC model does not account for transit oriented development at the sub-traffic analysis zone level.
- Peak hour, peak direction transit riders calculated as a fraction of daily riders as defined by the Integration Analysis (Fehr & Peers 2004).
- No other changes to WFRC travel demand model (version 3.2).

Wasatch Front Regional Council is presently completing a transit needs analysis study for south Davis County, with the final report expected to be complete by the end of 2004 (Wasatch Front Regional Council in preparation). The study suggests that a bus rapid transit (BRT), possibly a streetcar, is feasible and should be constructed in an exclusive lane along the US-89-Main Street-200 West alignment, at least up to Pages Lane in Centerville. Year 2030 ridership is anticipated to be around 7,000 to 8,000 passengers per day. These results are roughly consistent with a portion of the definition of maximum future transit for the Legacy Parkway Supplemental EIS. The BRT alignment recommended in the South Davis study is the same as the BRT alignment defined in the Supplemental EIS integration analysis between the start of the line in the Salt Lake City CBD and Pages Lane. The alignments deviate slightly from Pages Lane through Centerville, but re-join at State and Main Streets in Farmington, and continue together through Farmington to the Commuter Rail station. The ridership forecasts are also in general agreement. The South Davis ridership estimate of 7000 to 8000 riders in 2030 includes riders whose trips both board and alight without traveling across the Woods Cross screenline. The total number crossing the screenline in 2030 is projected to be about 4500 daily. When expressed as 2020 peak hour or peak period northbound ridership, the South Davis Study total screenline BRT ridership is similar to the Legacy Parkway integration analysis BRT estimate, and total transit ridership in the South Davis County Study is somewhat lower than the fully integrated maximum future transit system included in the Supplemental EIS.

Compared with the transit ridership forecasts prepared for the commuter rail Draft EIS, the fully enhanced and integrated maximum future transit system, including higher frequencies and lower fares on commuter rail, generates higher ridership in comparable service years.

### B3.3 Trip Generation

Trip generation within the WFRC model estimates the number of person-trips, produced in and attracted to each zone based on the socio-economic data characteristics and household characteristics (number of persons and automobile ownership) of that zone. Person-trips are estimated for internal-to-internal zones, internal-to-external, and external-to-internal zones. Eight trip purposes are defined in the trip generation module:

- Home-based work

- Home-based other
- Home-based school
- Home-based shopping
- Home-based personal business
- Non-home-based, work-related
- Non-home-based, non-work-related
- Commercial

Modeling for the Legacy Parkway Supplemental EIS did not change the trip generation process of the WFRC (and MAG) model as described in this section. Reference to base year calibration results generally refers to calibration efforts from WFRC on a regional basis, unless otherwise noted. Base year model calibration was generally performed for either a 2001 or a 2002 base year due to the lag of available socio-economic data and highway network traffic counts.

### ***B3.3.1 Socio-economic Data***

The 2000 Census was used by WFRC to classify households by size (people in the household), income quartile, and workers per household. Census curves are fitted to basic zonal information such as the total households, average household size, and average zonal income, to determine the total number of households in combinations of these categories: 6 HH size categories (1 person to 6+ person), 4 worker categories (0 to 3+), and 4 income quartile categories. This then becomes basic input to Auto Ownership, Trip Generation, and Mode Choice modules of the WFRC model.

### ***B3.3.2 Person-Trips***

The WFRC trip generation module estimates person-trips (productions and attractions) by trip purposes. Trip productions are estimated using a cross-classification household trip rate matrix based on information collected during the most recent home interview survey. Households are classified by the six household size categories and by car ownership. Four car ownership categories (0-car, 1-car, 2-car, and 3-or-more-car households) have been defined. WFRC estimated the trip rates for each class of households using information derived from the 1993 Home Interview Survey responses.

A “home interview” travel survey is relatively common practice in the travel demand modeling industry. Experience gained within the industry allows for a statistical sampling of households as opposed to extensive in-home interviews. The 1993 Home Interview Survey, performed by WFRC relied on advanced practice sampling techniques and activity based travel responses, which were coordinated with FHWA. The 1993 travel survey was an update of 30-year old survey data collected in the 1960s.

Despite statistical sampling techniques, travel surveys remain expensive undertakings and are not generally performed at frequencies sooner than every 10 years. The goal of travel surveys is to define travel attributes to specific demographic characteristics. For example, the number of trips generated by larger households with more vehicles as compared to smaller households with fewer vehicles is quantified by the survey. The actual numbers of households that fall into each socio-economic variable classification

can then be updated based on more recent data and forecasts of WFRC. Therefore, the trip rates of households of the same characteristics do not change, but the changing socio-economic characteristics of households within the four-county region will indicate changes in travel. The survey techniques and application to the travel model were successfully reviewed as part of the 1999 Peer Review of the WFRC travel model developed as part of the MPO Certification Process of the WFRC performed by FHWA/FTA as well as a more recent (2002) in-house Peer Review performed by WFRC. Peer Review attendees and summary findings are available from WFRC summarizing the 1999 FHWA Peer Review and the 2002 In-House Peer Review.

Trip attraction is a regression analysis that uses zonal trip attraction and socio-economic data. A regression analysis is performed for each of the eight trip purposes considering the following variables:

- Population
- Total (occupied) dwelling units
- Single-family (occupied) dwelling units
- Multifamily (occupied) dwelling units
- Total employment
- Retail employment
- Industrial employment
- Other employment

Following the estimation of person-trips, internal-to-external/external-to-internal (IX-XI) vehicle trips are calculated. These are trips that have one end (origin or destination) in a TAZ within the four-county model area, and the other end outside the (four-county) model area, as represented by the cordon stations. IX-XI trips are estimated by WFRC based on zonal factors developed from the *1993 Home Interview Survey* responses and the estimated total internal trips in each zone. External-to-internal trips are estimated to be attracted to each TAZ in the region by total TAZ employment, and distributed by travel time from the external stations. Since survey methods employed by WFRC to estimate travel demand did not directly survey trips that were based outside of the four-county region, external-to-internal productions are estimated by WFRC to match available survey data by factoring IX trips included in the home based survey and matching the total external station counts provided by the Utah Department of Transportation (UDOT).

### **B3.3.3 Special Generators**

Certain TAZs require special trip generation techniques because the intensity of activity is not accurately modeled with basic trip generation methods or with survey methods that determine trip making at the home-based level. These “special generator” TAZs are facilities such as large business parks, Hill Air Force Base, regional shopping malls, high-density urban zones such as the CBD and sports complexes. WFRC performs the calculations for all special generators and no additional analysis or adjustment of special generators was performed for the Legacy Parkway Supplemental EIS modeling. Special

generators affecting the study area include the Salt Lake City CBD, Hill Air Force Base, Lagoon Amusement park, and the Salt Lake International Airport.

### ***B3.3.4 External Trips***

External-external trips are those trips with both ends outside of the region. External-to-external trips are accounted for in the WFRC model via a fixed origin-destination vehicle trip matrix. For the model calibration year, 2001, the number of external-to-external trips crossing an external station plus the number of internal-to-external plus external-to-internal trips crossing the same station equals the average annual weekday volume crossing that station in 2001. Year 2002 data was also reviewed by WFRC to incorporate changes from 2001 data to 2002. Because of the I-15 reconstruction project in Salt Lake, the model calibration was performed in 2001 but model results were compared to both 2001 and 2002 traffic counts.

### ***B3.3.5 Unique Trip Tables***

Some major generators in the region have a trip distribution pattern that the current WFRC gravity trip distribution model would not adequately determine on its own. Each major college, Salt Lake International Airport and the Lagoon amusement park are examples where special generator trip data were available and the gravity model distribution was adjusted by WFRC to use pre-determined trip distribution matrices. Each of these special generator land uses has fixed trip tables created by WFRC that describe the distribution of trips across the region for current and future years. The Legacy Parkway modeling utilized these unique trip tables.

## **B3.4 Trip Distribution**

### ***B3.4.1 Travel Time Impedance***

Using the highway network, a matrix is created of the travel times from each TAZ to every other TAZ in the network. This is referred to as an impedance (or “skim”) table, and is one of the key input elements to the trip distribution model. In the WFRC modeling process, this table is created and updated iteratively through the feedback loop in the model process. The initial skim tables are created based on the free-flow link speeds assumed in the network. This skim table represents the travel times between TAZs during assumed uncongested conditions. This skim table is then used as one of the bases for distributing trips between TAZs, and the modeling process continues through assignment.

Following the assignment of trips to the highway network, link travel speeds are recalculated to reflect the relationship between traffic volume along a network and the capacity of that network—in other words, congestion. Skim tables are then developed using this “loaded” network containing capacity-constrained travel speeds output from trip assignment. These skim tables, containing travel times between zones under capacity-constrained or congested conditions, are fed back into the trip distribution process as one of the bases for distributing home-based work trips between TAZs. Home-based-work trips are assigned by the WFRC model to reflect congested conditions in the AM peak period assignment. Other trip purposes are assigned in the WFRC modeling process by the capacity constrained conditions of the mid-day assignment, where congestion has less of an impact on travel distribution patterns. The assignment process does not change the total number of trips generated in each period, it only changes the facility that origin and destination pairs travel on due to congestion. Since there is feedback between the assignment and distribution process, assignment and the effects of congestion will also change how trip production and trip attractions are paired into trip origins and trip destinations.

This more realistically represents the conditions under which drivers (particularly commuters) make travel decisions. Because travel time (more than travel distance) is a key factor for a driver in determining the reasonableness of a trip, basing the estimate of travel time on congested conditions will more realistically represent the spatial distribution between the home end of the work trip and the work destination.

Terminal and intrazonal times are added to the travel time for each interchange prior to distribution. The terminal times are based primarily on the parking situation in the TAZ. Normally a 1 minute terminal time is added at the origin and destination end of each travel time. For TAZs in the CBC or at other locations where the distance from parking to the ultimate destination is expected to be longer, additional time is added at the terminal end. Intrazonal times are derived from the area of the TAZ, assuming all traffic moves at 20 mph and that all traffic originates at a distance inside the TAZ boundary equal to  $\frac{1}{2}$  the square root of the TAZ's area.

Calibration efforts by WFRC beginning in the initial four-county regional model development in 1999 revealed that the region has four distinct geographic areas between which observed travel behavior patterns are different than predicted. For example, in attempting to reproduce observed volumes, the WFRC model initially predicted substantially more trips between Salt Lake County and Utah County than were observed. The model had no ability to account for perceived geographic barriers, or local preferences to live, work, and shop in the same county. WFRC adjusted the model to address this using a fixed "time penalty." This time penalty, as applied by WFRC, represents a relatively common model practice to account for certain social biases, such as different geographic versions of the Sunday newspaper, which are not described by other socio-economic variables. WFRC calibrated the regional model using fixed time penalties to achieve calibration to the year 2002 external station counts. These travel time penalties, as calibrated by WFRC, were used in the Legacy Supplemental EIS modeling.

### ***B3.4.2 Trip Distribution Analysis***

The WFRC model performs trip distribution using a gravity methodology. The original eight trip purposes are collapsed into five trip purposes in distribution. Home based other trip distribution includes the home based school, home based shopping, and home based personal business trips. Non-home based trips include all non-home based work related and non-home based non-work related trips. Internal-external and external-internal trips are also distributed separately since part of their trip length is not captured in the regional model domain. These changes from trip purposes generated to the trip purposes distributed are based on available data and accepted modeling practice in the WFRC model. Separate trip distribution is performed for each of the five trip types.

- Home-based work
- Home-based other
- Non-home-based
- Internal-external/external-internal
- Commercial trips

The impedance matrices developed based on highway travel times are input to the trip distribution process. For home-based work trips, travel time impedances are based on assumed congested speeds in

the AM peak period. For other trip purposes, the travel times are based on less congested conditions of the mid-day period, outside of either the AM or the PM peak. This is equivalent to saying that people choose the location of work based on a consideration of traffic congestion in the morning peak, but people choose the location of shopping, schools, and all other destinations based on uncongested conditions. In reality, these decisions may be much more complex, but the travel model is not locating jobs and schools and land uses, only matching up trips of previously estimated destinations. Home-based college trips are also deducted from the aggregate totals of home-based “other” trips based on student enrollment data collected by WFRC for each college and university. Home-based college trips are distributed based on a pre-established distribution created by WFRC to match base year enrollment distribution by zip code.

Friction factors define people’s propensity to make a trip based on the purpose of the trip and the length of the trip, as defined by travel time. The friction factors used in the WFRC travel demand models were developed and were calibrated by comparing (for each trip purpose) observed trip length frequency distributions obtained through responses to the 1993 Home Interview Survey to those estimated by the model. Work is presently underway by WFRC to review the reasonableness of trip length frequencies derived from highway travel times to account for transit trips, as derived from more recent transit on-board surveys. While there is no timeline for the completion of this work, other model checks and calibration performed by WFRC, such as aggregate work trip analysis resulting from the 2000 Census results, confirm that the trip length frequencies from the 1993 Survey along with screenline adjustments of the fixed time penalty, produce adequate model results of base year (2001 and 2002) conditions.

### ***B3.4.3 Average Trip Lengths***

Table B-3 (Average Trip Length) summarizes the average trip lengths of the WFRC model as run for the Legacy Parkway analysis, by trip purpose, for the base year 2001 and forecast years 2020 no-build conditions and the 2020 build alternatives. The average trip lengths are presented in minutes, actually representing the average duration of a trip, across the entire system (daily traffic volumes at the Woods Cross screenline are presented in Table B-5 below.). Results are presented for both Davis County (including north Davis County) and the entire four-county region as included in the WFRC model. As is typically the case, people are willing, on average, to travel further to work than they are willing to travel for non-work-related trips such as shopping or personal business. The similarities between average trip lengths for each purpose when comparing year 2001 data to year 2020 scenarios indicates that the trip distribution model is able to create future year origin-destination trip matrices that are able to replicate base-year observed trip length frequency distributions.

**Table B-3.** Average Trip Length (Minutes)

Type of Trip	2001		No-Build		Shared Solution	
	Davis Co.	Region	Davis Co.	Region	Davis Co.	Region
HBW (Home-Based Work)	20.11	20.17	21.47	20.58	19.50	20.20
HBC (Home-Based College)	27.50	16.66	29.14	17.32	27.29	17.22
HBO (Home-Based Other)	10.60	11.36	10.82	11.52	10.79	11.51
NHB (Non-Home-Based)	13.48	13.66	13.76	13.94	13.71	13.93
IX (Internal-to-External)	27.34	24.21	27.76	24.38	27.64	24.35
XI (External-to-Internal)	25.92	34.72	26.39	34.22	26.28	34.18
COMM (Commercial)	9.93	10.63	10.07	10.72	10.04	10.72
XX (External-to-External)	N.A.	45.19	N.A.	45.25	N.A.	45.15

Model Version 3.2 (Interplan 2004).

The current 2004 WFRC travel model (version 3.2) includes feedback loops that inform trip distribution of congested highway travel times resulting from assignment. As highway travel times increase due to congestion, trip distribution matches production TAZs to attraction TAZs that are closer together to maintain a reasonable pattern of trip lengths. This mechanism, along with mode choice, results in a varying total number of trips across any location, such as the Woods Cross screenline, that displays congestion.

This concept of varying distribution based on the feedback of traffic congestion resulting from the assignment step into the distribution step is one of the major improvements made by the WFRC to the travel model in recent years. Feedback from assignment to distribution was introduced into the WFRC model prior to the release of the Legacy Parkway Final EIS, but was not used in the Draft EIS. This is the reason that traffic volumes at the Woods Cross screenline were identical for all model alternatives in the Final EIS since no model feedback existed during the initial analysis. The concept of “unmet demand” was estimated from the model results, after the completion of the modeling, to estimate the number of passenger car equivalent trips that exceeded a level of service (LOS) D. Under the current WFRC model (version 3.2) as used in the Legacy Parkway Supplemental EIS, the number of passenger car equivalent trips across the Woods Cross screenline varies based on the congestion level of each alternative highway and transit network.

The feedback process used in the Legacy Parkway Supplemental EIS allows for speeds to become slower based on the effects of congestion which results in a different matching of origin and destination pairs which essentially removes trips from the Woods Cross screenline as congestion increases, but still matches those trip pairs to other (less congested) locations in the four county regional model. Although congestion begins at LOS D and becomes increasingly greater at worsening levels of service, the WFRC model does not prohibit trip pairs across the Woods Cross screenline based on congestion; it simply allows for the affects of congestion to alter the location and mode of a fixed number of trips (estimated in the WFRC model trip generation step).

Because the current WFRC model alters location and mode of trips in response to congestion, the Supplemental EIS no longer uses the concept of “unmet demand” which was used in the Final EIS. The concept of “unmet demand” was used in the Final EIS to compare projected travel demand against the capacity of future transportation systems. Changes in the WFRC model now vary total demand in direct

response to the capacities of the transportation system, making the concept of “unmet demand” less useful for the Supplemental EIS.

The varying of total demand is accounted for in both the distribution step of the WFRC model and the mode choice step of the WFRC model. Varying demand could be described in terms of “suppressed demand” or, its converse, “induced demand.” The terms describe opposite perspectives of the same phenomenon: as transportation system capacity is improved, additional trips make use of the enhanced capacity. Such trips can be viewed as suppressed demand: trips that would have been taken initially had the system offered sufficient mobility. Alternatively, they can be viewed as induced demand: trips that the traveling public finds attractive because mobility has been improved. The capacity-enhancing elements of the Shared Solution may result in demand levels increasing compared to the No-Build Alternative due to potential shifts in route or mode in the North Corridor. This is travel demand that would be “suppressed,” or not accommodated under the No-Build Alternative, but that would be accommodated under the Shared Solution. For the purposes of this study, demand accommodated under the Build alternatives that would not be accommodated under the No-Build is referred to as “suppressed demand.”

#### ***B3.4.4 Suppressed Demand***

The Final EIS used the concepts of “unmet demand” and “latent demand” to describe the effects of traffic capacity and congestion on travel demand. Changes in the WFRC model make using the “unmet demand” concept less useful for the Supplemental EIS for three reasons. First, the overall level of 2020 travel demand in the corridor is lower than in the Final EIS due to updates to the WFRC socio-economic forecasts. Second, the current WFRC model varies total demand depending upon the capacities of the transportation system, and alters location and mode of trips in response to congestion. As a result, the model better reflects typical traveler behavior and allows trips to be redistributed to other destinations or modes of travel rather than defining the demand as unmet. Third, the analysis now recognizes demand in excess of capacity in terms of worsening degrees of LOS F congestion and further reduced traffic speeds and associated impacts, rather than simply in terms of unmet demand. Consequently, the Supplemental EIS no longer uses the concept of “unmet demand” used in the Final EIS.

The varying of total demand is accounted for in both the distribution step and the mode choice step of the WFRC model. Decreases and increases in demand in response to increasing or decreasing congestion described in terms of “suppressed demand” or, its converse, “induced demand.” The terms describe opposite perspectives of the same phenomena. As transportation service levels decline, the propensity to travel also reduces; trips become shorter or redirected, rely on alternate modes, or occur at less convenient times of day. As transportation system capacity is improved, some of the suppressed trips will be renewed, or induced, in response to the enhanced capacity. Those trips can be viewed as suppressed demand, reflecting trips that the traveling public would have taken had the capacity been there. Or they can be viewed as induced demand, or manifest latent demand, reflecting trips that the traveling public finds attractive because the capacity has been enhanced. To capture both mirror-image phenomena, this study uses the term “suppressed demand.”

The build alternatives would increase roadway capacity and reduce travel times in the north corridor. The reduction in travel time is analogous to a reduction in travel cost. In measuring this change, the most significant effect would be a potential shift in travel routes for some drivers and a potential shift in mode choice. Other travel demand effects such as increased trip generation or time of day shifts (including peak spreading), due to capacity increases do not have as significant effects for analyzing the Shared Solution. The WFRC model captures suppressed demand and incorporates it as a part of total projected demand.

Given the use of consistent land use assumptions in the analysis of all of the alternatives, the main variations in corridor travel demand from one alternative to the next relate to the different levels of accessibility and travel ease offered by the respective alternatives. Specific travel routes and modes used by the total travel demand model will be affected by the Shared Solution. The WFRC model forecasts these types of demand changes, projecting that generally less than 3% of the total travel demand reflects suppressed demand. The WFRC model was tested specifically for its sensitivity to these types of changes. In November 2003, UDOT completed an analysis of the elasticity of demand estimated with the WFRC travel models (version 2.1) to changes in capacity. These changes occur due to trip distribution, mode choice, and trip assignment steps of the model. According to UDOT's sensitivity analysis (Cambridge Systematics, November 2003, WFRC Model Sensitivity Study):

*“Model elasticities fall within the expected range of expected range of acceptability based on comparisons with elasticity cited in a variety of research papers... Vehicle miles traveled generally increase with the addition of specific roadway projects while vehicle hours generally decreased.”*

Figure B-1 displays the changes in the Woods Cross screenline volume with various alternatives to Legacy Parkway evaluated in the Supplemental EIS in the PM peak period. The use of the Woods Cross screenline and the use of the PM peak period are explained later in this memorandum. As shown, total screenline demand increases relative to increases in screenline capacity, from about 51,300 under the No-Build to about 52,600 with the Shared Solution. The route and mode shifts associated with suppressed travel from Legacy Parkway are measurable, although generally less than 3% of total screenline volume, and are accounted for in the WFRC travel model.

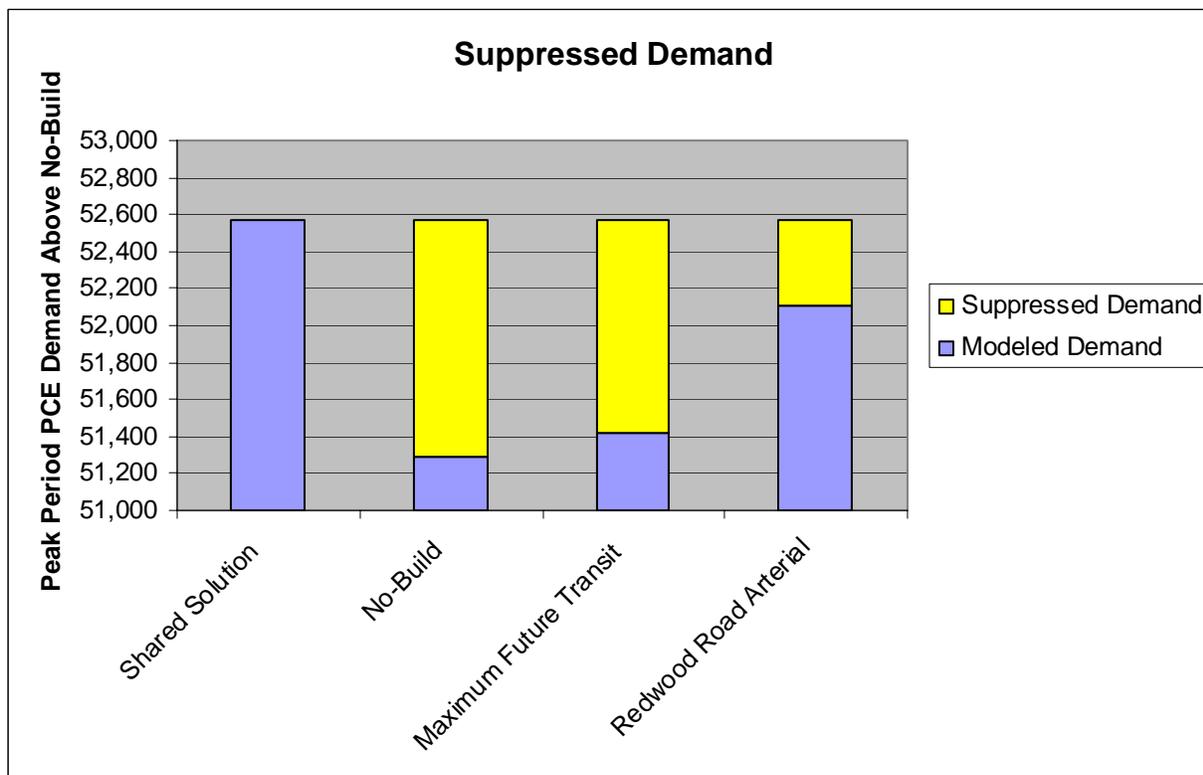
## **B3.5 Mode Choice**

### ***B3.5.1 Method of Mode Choice Analysis***

Transit ridership forecasting methodologies used to prepare the Legacy Parkway Supplemental EIS differ from those used in the preparation of the Legacy Parkway Final EIS. While the WFRC model used for the Final EIS had a mode choice model, output of that model was evaluated but the results were not directly used in developing the mode specific traffic volume forecasts presented in the Final EIS. Instead, the concept of an extraordinary transit system was estimated based on an aggressive projection developed with UTA. Four methods were actually examined in the Final EIS including the use of the WFRC mode split step of the WFRC travel model, as well as experience in other areas. The Final EIS selected the highest transit capacity of the four methods not as a prediction of future transit ridership, but rather as a maximum level of transit ridership that could occur given the financial and other assumptions in the plan.

The recommendation of the lead federal agencies in the Legacy Parkway Supplemental EIS was to estimate transit ridership based on the mode split step of the regional travel demand model. Therefore, while the Final EIS included transit capacity as the maximum reduction of highway use that could be accommodated by the transit system, the Supplemental EIS uses the mode choice model to estimate the passenger-car equivalent demand of transit use. The modeling for the Supplemental EIS continued to use the WFRC mode choice step of the WFRC model, but with coding changes, as described in the Section B3.2.2 *Transit Network Assumption*, to account for a more “robust” level of transit supply.

**Figure B-1. Peak Period Peak Direction Woods Cross Screenline Suppressed Demand**



Source: WFRC travel model ver. 3.2 (Feb. 2004) as modified. Note: Total Demand includes transit vehicle equivalent ridership showing the full extent of Latent Demand through both the Distribution step and the mode choice step.

### B3.5.2 Available Modes

Modal choice is the third step of the four-step travel demand modeling process. Productions and attractions of the trip generation module are linked in trip distribution, creating zone-to-zone person trip movements. These trips are then apportioned to the available travel modes through the application of the mode choice module.

The current WFRC mode choice module is calibrated to local data gathered for all modes that currently exist along the Wasatch Front as part of an on-board survey of transit riders conducted by UTA in 2002. The travel market that has mode choices available is segmented into four trip purposes; home-based work (HBW), home-based college (HBC), home-based other (HBO) and non-home-based (NHB). The trip purposes included in the mode choice analysis vary from the original trip generation and trip distribution purposes. Home-based college trips represent a sub-set of home-based other trips that have been found, through on-board surveys of the WFRC, to represent a reasonable portion of transit trips to estimate directly (as opposed to indirectly through home-based other trips). Commercial trips are generated as vehicle trips by definition, so no mode split component is necessary. Each trip purpose included in mode choice is also segmented in to three auto-ownership classes (zero-, one-, and two-car households) and two income classes (average/high and low) with the exception of non-home-based as by definition this purpose cannot be segmented by household data. As mentioned, HBC was subtracted from the HBO totals based on the data collected by each college and university. HBC is also a subset of Home-based

school trips, which include high school and lower grades as originally reported in the 1993 Home Interview Survey.

An independent nested logit mode choice module exists for each trip purpose. These modules specifically address the following modes.

- Drive Alone: single-occupant auto trips.
- Shared Ride 2: double-occupancy auto trips.
- Shared Ride 3+: auto trips with three or more occupants.
- Transit - Walk to Local Bus.
- Transit - Walk to Express Bus.
- Transit - Walk to Light Rail.
- Transit - Walk to Commuter Rail.
- Transit - Drive to Local Bus.
- Transit - Drive to Express Bus.
- Transit - Drive to Light Rail.
- Transit - Drive to Commuter Rail.
- Walk trips.
- Bicycle trips.

Auto-occupancy for HBW, HBC, HBO and NHB trips is defined via mode choice before trips are assigned to the highway. This differs from the auto-occupancy methodology included in models used for the Legacy Parkway Final EIS. With the current model, trips are not assumed to occur in vehicles of fixed auto-occupancy, with a reduction to account for transit; rather all trips for HBW, HBC, HBO and NHB purposes choose (per the logit nesting structure) to make either a motorized or non-motorized trip. If the trip is motorized, it is either transit or auto-based. If an auto trip is chosen, it is either a single or multiple-occupant vehicle. If a multiple-occupant vehicle is chosen, it is either a two-person carpool, or a three- or more person carpool. Similar decision processes occur for the other modes. This description of the mode choice portion of the model applies to the modeling done for the Legacy Parkway Supplemental EIS, except in the coding of transit networks as described earlier in this memorandum.

### **B3.6 Peak-Period Trip Tables**

In the updated WFRC regional travel demand model, peak-period trip tables are developed by applying factors, by purpose, to the daily person-trip tables. For example, the number of AM peak-period, home-based work trips are estimated as:

$$[\text{daily HBW trips}_{\text{ZONE } i,j}] \times (\text{AM peak factor}_{\text{HBW-P}})] + [\text{daily HBW trips}_{\text{ZONE } j,i}] \times (\text{AM peak factor}_{\text{HBW-A}})]$$

The AM and PM peak periods within the model have a three hour duration. The three hour forecast can therefore include trips that would spread from the peak one hour into the preceding, or following, shoulder hour and be accounted for in the peak period projection. The AM and PM peak-period factors were developed based on the 1993 Home Interview Survey. Table B-4 (Peak-Period Factors) shows the factors applied to each trip purpose to create the morning (AM) peak period and evening (PM) peak-period person-trip tables. Peak period factors are developed statically in the WFRC model, which means they do not change from the existing year to the future, and represent peak period demand as captured in the revealed (1993) data. Trip tables developed by WFRC were unchanged for the Legacy Parkway Supplemental EIS alternatives analysis.

**Table B-4. Peak-Period Factors**

	AM Peak Period	PM Peak Period
HBW – P	0.35	0.02
HBW – A	0.03	0.26
HBC – P	0.35	0.02
HBC – A	0.03	0.26
HBO – P	0.14	0.10
HBO – A	0.02	0.16
NHB	0.03	0.13
IX	0.02	0.22
XI	0.25	0.06
COMM	0.03	0.13

- HBW - P = Home-based work trips—productions (commuters leaving homes and traveling to work)
- HBW - A = Home-based work trips—attractions (work opportunities that attract travel by people)
- HBC - P = Home-based college trips—productions (students leaving homes and traveling to college)
- HBC - A = Home-based College trips—attractions (classrooms that attract college students)
- HBO - P = Home-based other trips—productions (people leaving homes and traveling to places other than work)
- HBO - A = Home-based other trips—attractions (places other than work that attract travel by people)
- NHB = Non-home-based trips
- IX/XI = Internal-external /external-internal
- COMM = Commercial

Source: WFRC Travel Demand Model, February 2004.

### B3.7 Highway Assignment

The highway assignment in the WFRC travel demand process is performed using a capacity- restrained, equilibrium-assignment technique. Capacity restraint is a general expression about the process of using congestion, and its impacts on travel time, as a means of simulating driver behavior under real-life conditions. All person trips that choose to travel in single occupancy vehicles, 2 person carpool or 3-plus

person carpool in mode choice are factored to reflect the number of vehicles those trips would be made in (i.e., two-person carpool person trips, divided by two equals the number of vehicle trips).

Internal-to-external, external-to-internal, external-to-external and commercial trips are calculated in vehicle trips throughout the modeling process. Non-motorized and transit trips resulting from mode choice are not assigned to the highway network. Bus routing, which is irrespective of mode choice results, generally has an insignificant impact on highway assignment (in the range of four vehicle trips per hour for a high frequency bus route). Initially, all vehicle trips are assigned to paths with minimum travel times, based on free-flow travel speeds. After all trips are assigned, the volume on each link is compared to its capacity and the travel time impedance is adjusted, based on the volume-to-capacity ratio on that link. The assignment process is repeated with the adjusted travel times. In an equilibrium assignment, this process is repeated iteratively until all trips are traveling along the optimum path, based on specified closure criteria.

The resulting output from the highway assignment process is a “loaded” highway network containing link volumes and travel speeds based on the volume-to-capacity ratio of the link. Statistics on vehicle miles of travel and vehicles hours of travel are also reported.

For each alternative analyzed, highway assignments are performed for:

- AM peak period
- Mid-day period
- PM peak period
- Evening period

The assignment periods included in the travel model include multi-hour periods representative of various levels of congestion throughout the day, but large enough to capture the effects of peak spreading that may occur in the future. Specifically, both the AM and PM peak periods represent 3 hour periods supported by data from the 1993 Home Interview Survey which reflects the highest level of trip making and the potentially greatest traffic congestion. The PM peak period, used in subsequent peak hour analysis, includes the peak hour and two “shoulder” hours just before and after the highest peak hour.

The traffic volume forecasts for each portion of the day are summed to provide daily traffic volumes on each segment of highway modeled. The data from the AM and PM peak periods were factored to provide AM peak hour and PM peak hour traffic volumes, respectively. This process was completed for each of the alternatives analyzed. The Legacy Parkway Supplemental EIS modeling used the WFRC assignment portion of the travel model, with only the adjustments discussed previously being made to highway network coding to reflect the alternative being analyzed. Actual link impedance functions were recently re-calibrated by WFRC staff based on on-going speed data collection activities and described in the *Wasatch Front Regional Council Speed Study*, completed December 18, 2003 as an internal report by the WFRC staff. Impedance functions of the WFRC model are based on modifications of the original Bureau of Public Roads impedance functions as recommended in the *Highway Capacity Manual* (Transportation Research Board 2000) by functional road classification and as developed by WFRC to achieve base year (2001 and 2002) speed calibration.

### B3.7.1 Average Daily Traffic Volume Forecasts

The Legacy Parkway Final EIS analyzed average daily traffic volumes for the North Corridor on a “screenline” basis. A screenline is an imaginary line through a travel corridor that crosses all generally parallel highways and roadways that carry traffic through that corridor. The screenline used was between 2600 South and 500 South (in Woods Cross). This screenline location was selected for use in the Final EIS because it carried the greatest traffic volume, was central to the Legacy Parkway and I-15 North Corridor study areas, and was considered to indicate the share of traffic that is expected to be carried by each of the roadway facilities for each alternative.

The same approach was used for the Supplemental EIS. Table B-5 (Traffic Volumes at Screenlines [2020]—Average Daily) shows the average daily traffic volumes along the roadway segments within the screenlines, and the total forecast volume across the screenlines for the no-build and build Legacy Parkway alternatives as determined by current forecasting methods. Although only northbound volumes are reported, both northbound and southbound volumes are included in the total.

**Table B-5.** Traffic Volumes At Woods Cross Screenline (2020)—Average Daily

	No Build		Shared Solution	
	Northbound	Total	Northbound	Total
South of 500 South:				
Legacy Parkway	0	0	35,100	71,900
Redwood Road	9,100	18,100	5,900	11,900
1100 West	1,000	1,500	500	600
800 West	4,300	8,400	4,200	8,000
I-15	110,200	221,000	86,300	171,300
U.S. 89	11,300	24,200	9,400	18,800
500 West	2,200	2,700	500	1,100
Orchard Road	5,900	11,600	5,100	10,500
Davis Boulevard	3,700	7,500	3,600	7,200
Bountiful Blvd.	5,200	10,300	4,900	9,700
Screenline Total	152,900	305,300	155,500	311,000

Source: WFRC travel model ver. 3.2 (2004) as modified and run by InterPlan Co. Model data traffic volumes represent number of vehicles not converted to passenger-car equivalents and are rounded to the nearest hundred.

### B3.7.2 Peak-Period Traffic Volumes

To estimate peak-period traffic in the region and within the North Corridor specifically, the peak-period trip tables were assigned to the highway networks for each alternative. The assignment process is consistent with the WFRC PM peak-period assignment, and was used as a basis for determining peak period demand in the Legacy Parkway Supplemental EIS. Analysis of peak-period conditions is important because peak-period travel tends to be more concentrated and, in most urbanized areas, has substantial directional imbalances (e.g., inbound traffic towards activity centers during the morning peak-period, and outbound, from activity centers towards residential areas, during the evening peak-period).

The peak-period assignments in the WFRC travel demand model represent 3-hour durations for the AM and PM peak periods. The screenline traffic volumes for these peak periods are shown in Table B-6a, Traffic Volumes at Screenlines (2020)—AM Peak-Period, and Table B-6b, Traffic Volumes at Screenlines (2020)—PM peak period.

### B3.7.3 Selection of the Woods Cross Screenline

The Woods Cross Screenline was selected for analysis in the Final EIS. The use of this screenline in the Final EIS was developed after a thorough consideration of all sections of the corridor and based on traffic volumes on all facilities in the corridor. After consideration, Woods Cross was chosen as being a representative section where traffic volumes and subsequent demand were the highest.

**Table B-6a.** Traffic Volumes At Screenlines (2020)—AM Peak-Period

South of 500 South:	No-Build		Shared Solution	
	Northbound	Southbound	Northbound	Southbound
Legacy Parkway	0	0	4604	10158
Redwood Road	1331	2953	537	1402
1100 West	63	275	55	34
800 West	554	1122	551	890
I-15	13972	27613	10518	24127
U.S. 89	1554	4583	1572	1524
500 West	88	119	86	60
Orchard Road	532	1823	539	1600
Davis Boulevard	438	909	442	748
Bountiful Boulevard	502	1473	505	1235
Screenline Total	19,034	40,870	19,409	41,778

Source: WFRC travel model ver. 3.2 (Feb. 2004) as modified and run by InterPlan Co. Model data traffic volumes represent number of vehicles not converted to passenger-car equivalents and are shown in table.

**Table B-6b.** Traffic Volumes At Screenlines (2020)—PM Peak-Period

South of 500 South:	No-Build		Shared Solution	
	Northbound	Southbound	Northbound	Southbound
Legacy Parkway	0	0	10155	7721
Redwood Road	3730	2008	1783	1571
1100 West	678	150	194	32
800 West	1446	975	1347	889
I-15	31222	23420	28851	17997
U.S. 89	4556	3066	2606	2508

500 West	1680	179	134	173
Orchard Road	2420	1202	1597	1063
Davis Boulevard	1093	845	1082	808
Bountiful Boulevard	1998	1153	1729	1040
Screenline Total	48,823	33,078	49,478	33,802

Source: WFRC travel model ver. 3.2 (Feb. 2004) as modified and run by InterPlan Co. Model data traffic volumes represent number of vehicles not converted to passenger-car equivalents and are shown in table.

Selection of the Woods Cross Screenline for the Supplemental EIS was chosen primarily for consistency with the Final EIS and because it is representative of the corridor. However, a comparison of volumes at the Woods Cross Screenline was made against the Farmington Screenline, also presented in the Final EIS, to determine that the Woods Cross Screenline remained the point where the highest volumes were projected through the corridor. Table B-7 displays the total PM peak period traffic volume at both the Farmington Screenline and Woods Cross Screenline for existing (2001) conditions, the 2020 No Build, and the 2020 Shared Solution. All other alternatives fall within the range of the Shared Solution and No Build results.

**Table B-7.** PM Peak Period Highway Network Screenline Comparison

	Farmington Screenline		Woods Cross Screenline	
	Northbound	Total	Northbound	Total
Existing (2001)	25,082	40,015	34,933	56,821
No Build	37,725	61,045	48,823	81,821
Shared Solution	38,495	62,419	49,478	83,280

Source: WFRC model ver. 3.2 (Feb. 2004) as modified. Model data traffic volumes have not been adjusted.

### B3.8 Vehicle-Miles and Vehicle-Hours of Travel (VMT and VHT)

Vehicle miles of travel can also be displayed as a result of the modeling analysis. Table B-8 includes the regional vehicle miles of travel for the No-Build and Shared Solution. This table updates a similar table (P-11) included in the Final EIS. It indicates that, even when measured at a regional scale, the Shared Solution reduces miles of travel by providing a more direct route for through traffic, and vehicle hours by reducing congestion. At a regional level average travel speeds improve by about 4% to 5% during peak travel periods.

**Table B-8.** Regional and Study Area Vehicle-Miles of Travel (VMT) and Vehicle-Hours of Travel (VHT) for 2020

Period	Regional		Study Area	
	No-Build	Shared Solution	No-Build	Shared Solution
Daily				
VMT	57,413,217	57,330,753	3,917,840	3,884,047
VHT	1,520,693	1,483,723	99,828	76,504

Period	Regional		Study Area	
	No-Build	Shared Solution	No-Build	Shared Solution
Speed (mph)	37.8	38.6	39.2	50.8
AM Peak Period				
VMT	11,034,276	11,002,139	766,855	764,030
VHT	288,510	277,358	21,619	14,923
Speed (mph)	38.2	39.7	35.5	51.2
PM Peak Period				
VMT	15,469,820	15,449,640	1,053,417	1,043,053
VHT	508,752	484,666	37,358	21,542
Speed (mph)	30.4	31.9	28.2	48.4

Note: WFRC Model (version 3.2) (Feb. 2004) as modified and run by InterPlan Co.

Regional totals included the four county area (Salt Lake, Utah, Davis, and Weber Counties) included in the model, study area is medium district 10 with VMT and VHT totals excluding centroid connectors.

## **B4 Post-Model Adjustments**

Processing of model outputs are more commonly referred to as “post model adjustments.” Post model adjustments can be undertaken to “correct” model results, such as in the case of travel demand behavior that is not adequately addressed by the modeling process, or to allow the model outputs to be in consistent units necessary for capacity analysis. For the purpose of this section, any processing of model results that resulted in numbers that are not directly found as an output of the WFRC travel demand model, including model outputs resulting from the Legacy Parkway Supplemental EIS application of the WFRC travel demand model, as described, shall be termed a “post model adjustment.” The Legacy Parkway Supplemental EIS modeling process employed both types of post model adjustments, those that result in a more accurate answer than those supplied by the travel model and/or those that are necessary to achieve results that can be analyzed using methods identified in the HCM 2000.

### **B4.1 Traffic Capacity Analysis**

Traffic capacity analysis is a separate science than traffic forecasting, despite the fact that traffic forecasting requires some estimate of traffic capacity. On non-freeway road segments, traffic capacity is analyzed based on detailed signal timing and intersection movements at each intersection. This level of precision is unreasonable for 30-year forecasts of traffic as required for application in travel demand modeling. The travel demand model assumes generalized link based capacities to account for the detailed operations at each intersection.

Traffic capacity analysis is used to formalize and quantitatively compare the operation of two facilities. At its most simple level, traffic engineers must analyze even existing traffic counts to determine the various performance measures at each location, since the performance measures are typically not estimated directly from field observations. The HCM provides a standard means for objectively estimating the performance measures based on the collection of data such as traffic counts. The use of micro-simulation as a means of estimating performance measures based on collected (or forecast) traffic

data is gaining popularity as an advanced practice in traffic capacity analysis, but does not replace the need to develop separate traffic forecasts that can then be applied to the traffic capacity analysis simulation model(s). At the national level, much research is being applied to merging the use of econometric travel demand models at the macro (regional) level with micro-simulated capacity analysis, but there are no metropolitan areas that presently use a single model for both macro level forecasting and micro level traffic capacity analysis.

## B4.2 Model Adjustments

The Legacy Parkway Final EIS included an adjustment of demand to account for TSM/TDM/ITS as an after model analysis. A review of the adequacy of the model to capture and include relevant components of TSM/TDM/ITS for the Supplemental EIS was conducted as part of the analysis prepared for the Integration Technical Memo. As a result, primary elements of TSM/TDM/ITS are included in the current analysis through their inclusion in the new versions of WFRC travel demand model, or through in-model assumptions or post-model adjustments to capture the effects of the maximum future transit alternative developed for the Legacy Parkway Supplemental EIS. Several ITS and TSM measures are not included quantitatively in the analysis because they are primarily effective during traffic incidents rather than under the average weekday PM peak hour conditions addressed in the Supplemental EIS capacity and LOS analysis.

Table B-9 displays various TSM, TDM, and ITS components and identifies the manner in which they were addressed in the Legacy Parkway Supplemental EIS analysis, indicating those included in the travel model application, post model adjustments, or non-quantitative assessment of incident scenarios.

TSM is the acronym for Transportation Systems Management and generally refers to highway infrastructure optimization activities that do not require significant new infrastructure. Examples include ramp metering and reversible lanes. Since Legacy Parkway represents a new construction and I-15 is proposed to be reconstructed, the primary capacity enhancements associated with these facilities have been coded into the WFRC travel demand model by WFRC. The Supplemental EIS post-model analysis further refined the capacity analysis to incorporate relevant optimization associated with TSM operational improvements.

TDM is the acronym for travel demand management and includes a wide range of driver behavior related to avoiding peak travel periods or changing modes. Examples include parking pricing, carpool promotion and flex-time work hours. Most TDM elements are now incorporated in the utility functions of the WFRC mode choice model or captured in the calibration of the mode choice model to existing behavior. For example, the models reflect traveler response to parking prices and employer adoption and employee participation levels in telecommuting and variable work hours. The model extrapolates current trends associated with these factors into the future, allowing that any higher levels of adoption at large employers would be off-set by the overall trend towards smaller, more dispersed employment centers. ITS is the acronym for Intelligent Transportation Systems and includes a host of advancing technologies related to “smart cars” and “smart systems.” While it is difficult to predict future technologies, the primary focus of these technologies has been to provide better real time information to motorists in order to reduce the impacts of incidents and better utilize the available capacity. These applications are especially effective when capacity-reducing incidents occur, and when reasonable alternate travel routes are available. The quantitative capacity and Level of Service analysis performed for this Supplemental EIS addresses peak period conditions on a typical 2020 weekday, not conditions during major incidents. The benefits of information-based ITS elements are addressed through discussion of incident management issues in the corridor.

Because regional travel models such as the WFRC model do not focus in detail on neighborhood conditions, post-model adjustments are used to capture the TDM effects of land use clustering around transit stations, and localized density and land use mixing and associated with transit-oriented development (TOD). Therefore, the analysis of maximum future transit in the Supplemental EIS Integration analysis used post-model adjustments to increase transit, walk and bike shares and reduce automobile passenger car equivalents in the roadway capacity and LOS analysis. This accounted for sub-traffic zone level changes in land use to reflect TOD. For comparability, the increase in transit ridership was converted to transit “passenger car equivalents”, a calculated number of passenger cars that would otherwise be occupied by a number of transit riders.

### **B4.3 Model Adjustment for HCM Analysis**

Various model adjustments were performed to allow the volume results reported in the travel model to be directly compared with methods included in the *Highway Capacity Manual*. These necessary adjustments include the following:

- Conversion of the 3-hour peak period to a peak hour,
- Heavy vehicle factor adjustments, and
- Peak-hour factor adjustments.

Each of the adjustments made were discussed amongst the Integration Analysis Technical Group upon review of data gathered locally. The Integration Analysis Technical Group included representation from FHWA, the Corps, UDOT, UTA, WFRC, and the consultant team.

#### **B4.3.1 Peak Hour Conversion**

Conversion from the PM peak period to the PM peak hour was made by applying a 0.36 factor. Since the PM peak period encompasses the peak three hours in the afternoon, the conversion from the peak period to the peak hour must be greater than 0.333. The review of traffic counts (Fehr & Peers 2004) indicated that the existing peak hour was 36% of the peak three hours. The Final EIS used a factor of 0.34 for the peak hour based on conditions at that time and assumptions regarding traffic leveling strategies for 2020. Discussions with WFRC model developers indicated that a 36% peak hour conversion from the peak period is now common through the model area. Further, assuming a 0.36 peak hour, the hours on either side of the peak would average 32% of the peak period. The hours on either side of the peak hour, within the modeled peak period were termed “the peak shoulder.” The peak-period factors shown in Table B-4 are used to relate the peak-period to the daily volumes based on trip purposes, and thus do not directly correlate to the peak hour conversion. Although peak hour traffic volumes are reported in the Supplemental EIS based on the best available data of 36% of the peak period occurring in the peak hour, analysis of the project is based on the entire three-hour peak period. This methodology eliminates the range of peak hour percentages in the future from consideration in the project purpose and need or alternatives analysis.

**Table B-9. TSM/TDM/ITS Review**

Category	Technique	Analysis Considerations	Method of Incorporation in Modeling
TSM	Ramp Metering	Effects on highway segments between interchanges accounted for in lane capacity assumptions.	Reflected in post-model capacity analysis, by assuming dense uniform flow downstream of on-ramps.
ITS	Variable Message Signs	SEIS capacity analysis represents conditions on days when no incidents occur. Variable message signs would help mitigate incident effects on days when they do occur, but would not make conditions better than incident-free days.	Addressed in discussion of need for alternate route to respond to incident and emergency needs, not in quantitative analysis of average-day conditions.
ITS	On-Board Navigation	SEIS capacity analysis represents conditions on days when no incidents occur. On board navigation would help mitigate incident effects on days when they do occur, but would not make conditions better than incident-free days.	Addressed in discussion of need for alternate route to respond to incident and emergency needs, not in quantitative analysis of average-day conditions.
TSM	Incident Management	SEIS capacity analysis represents conditions on days when no incidents occur. Incident management would help mitigate incident effects on days when they do occur, but would not make conditions better than incident-free days.	Addressed in discussion of need for alternate route to respond to incident and emergency needs, not in quantitative analysis of average-day conditions.
TSM	Auxiliary Lanes	Auxiliary lanes specifically accounted for in highway segment capacity analysis.	Accounted for in model highway networks and in post-model capacity analysis
TDM	Transit Promotion	Transit fare discounts and other TDM accounted for in modeling and off-model adjustments.	Accounted for in model transit networks and operating parameters, including fare structure and transit frequencies.
TDM	Carpool Promotion	Current levels of promotion, along with parking pricing and carpool lanes accounted for in modeling.	Accounted for in model networks and operating characteristics, including presence of HOV lanes and parking pricing.
TDM	Variable Work Hours	Existing rate captured in model calibration.	Variable work arrival/departure times accounted for in post-model analysis of demand spread over three-hour peak period.
TDM	Telecommuting	Existing rate captured in model calibration.	Existing levels of telecommute adoption accounted for in model trip generation rates for different employment types and trip purposes.
TSM	Signal Coordination	Arterial capacity assumptions used in analysis assume reasonable levels of signal coordination.	Accounted for in model network capacities and post-model capacity analysis.
TSM	Dynamic Signal Systems	Arterial capacity assumptions used in analysis assume reasonable achievable levels of dynamic traffic signal management.	Accounted for in model network capacities and post-model capacity analysis.
TDM	Truck Restrictions	Effects of trucks included in capacity analysis through heavy vehicle factor.	Included in post-model capacity analysis.

Category	Technique	Analysis Considerations	Method of Incorporation in Modeling
TDM	Van Pool Incentives	Current levels of promotion, along with parking pricing and new HOV lanes accounted for in modeling.	Accounted for in model networks and operating characteristics, including presence of HOV lanes and parking pricing.
TDM	Transit Financial Incentives	Transit fare discounts included in modeling of Maximum Future Transit.	Modeling included reduction of premium transit fares.
TDM	Parking Costs	Potential for increased parking cost included in modeling analysis.	Modeling included increased parking costs by 50% to 100% above inflation-based increase.
TDM	HOV Lanes	HOV lanes accounted for in modeling and in post-model analysis of assigning traffic to each lane.	Accounted for in modeling and in post-model analysis of lane utilization and capacity.
TSM	HOT Lanes*	Strategy not considered.	Not assumed in modeling.
TDM	Park and Ride Construction	Included in modeling.	Included in transit access mode coding within model.
TSM	Peak Spreading	Accounted for through averaging of peak-period demand over three-hour period.	Model estimates peak-period demand as a percentage of daily. Post-model capacity analysis addressed traffic spread over the three-hour peak period rather than concentrated in a single peak hour.
TSM	Reversible Lanes	Included in modeling (as appropriate to the alternative).	Accounted for in model networks and in post-model analysis of lane utilization and capacity.
TDM	Non-Motorized Travel	Post-model adjustments applied for scenarios that include higher levels of accommodation for bike and walk modes than presently found in similar areas of the region.	Empirical evidence on the reduction in auto travel resulting from increased development density, land use mix and urban design used to factor vehicle trips to lower levels than standard model trip generation rates.

\* HOT lanes are high-occupancy toll lanes. Under this strategy, high-occupancy vehicle (HOV) lanes are made available to single-occupancy vehicles (SOV) at a price. Tolls are charged to SOV's based on time-of-day and level of congestion, so that the value of travel time savings correlates with the cost of toll.

Concern was raised about the accuracy of the peak hour considering the issues surrounding peak spreading. The WFRC model relies on a 3-hour peak period and the factoring of this period to a constrained hour would be arbitrary. This concern was expressed in the initial Supplemental EIS scoping meetings related to the greater ability of transit to serve a significant mode percentage in the peak hour and peak direction than in daily or peak period conditions. Transit and highways are estimated based on consistent factors from the peak hour to the peak period and presents a useful comparison of the maximum reasonable transit use over the peak period.

Capacity estimates expressed throughout this report, and used in the Supplemental EIS, based on peak period values are based on screening level capacities. These capacity estimates are supported by procedures in the *Highway Capacity Manual* but reflect average conditions over a peak period. Micro simulation capacity analysis is rapidly gaining acceptance in the traffic engineering community and represents a preferred method of detailed capacity analysis after screening. Micro simulation results will

not vary from the screening results over the peak period, but will allow for a more meaningful display of the actual peaks based on the abilities traffic queues to build and dissipate over time based on a simulation of the true variation of traffic flow.

### **B4.3.2 Heavy Vehicle Factor**

Capacity analysis for freeways as per the methods of the *Highway Capacity Manual* (HCM) (Transportation Research Board 2000, Chapter 23, page 23-7) recommends the division of hourly volumes by a peak hour factor, a heavy vehicle factor, and a driver population factor to account for the percentage of large (heavy) vehicles using a freeway. These heavy vehicles affect traffic flow. These factors assume “level terrain” as defined by the HCM and do not apply to arterial streets. Table B-10 presents the truck data (Fehr & Peers 2004) that supports the use of a 0.99 Heavy Vehicle Factor.

**Table B-10.** Heavy Vehicle Adjustment Factor

Period	Percentage Heavy Vehicles	Heavy Vehicle Factor
Peak Hour	Average Over Hour	0.99
Peak Hour	Highest Percent in Hour	0.99
Peak 3 Hour Period	Average Over Period	0.98
Peak 3 Hour Period	Highest Percent In Period	0.98
Recommended 2020 Peak Hour		0.99

### **B4.3.3 Peak Hour Factor**

Capacity and LOS analysis in the HCM normally addresses conditions in the peak 15-minutes of the peak hour of a typical or “design” day. UDOT’s objectives for the north corridor are to provide acceptable traffic LOS on average through the peak hour or three-hour peak period on a typical weekday. Other State Departments of Transportation, including Florida, Arizona, Colorado, and Oregon also suggest that LOS goals should apply over average extended periods of time rather than to all traffic over all time periods as short as 15 minutes. Based on scoping for the Supplemental EIS, UDOT has not utilized the most congested 15 minutes of the peak hour for the Legacy Parkway. Therefore, Level of Service Analysis presented for the Legacy Parkway reflects an average peak hour and average peak period condition.

### **B4.3.4 Driver Population Factor**

A driver population factor of 1.0 was used to reflect the commuter nature of the area, as suggested in the HCM, 2000.

### **B4.3.5 HOV Analysis**

Limited analysis of HOV lanes is presently supported by the WFRC travel demand model. Through both the distribution and assignment step of the WFRC travel model, the presence of HOV lanes is recognized by a decrease in available capacity necessary to ensure that the HOV lane operates at an improved level as compared to the general purpose lanes. A manual step is required to ensure that the assumed capacity of the HOV lane can be efficiently utilized with 2 or 3 person carpools. The HOV lane was coded to achieve a maximum capacity without congestion coded as 1680 passenger car equivalents per hour. The full use of this HOV lane was assumed to reduce the demand of other general purpose lanes, thereby allowing the HOV lane to achieve its desired policy affect of reducing anticipated congestion in the general purpose lanes by encouraging shifts in driver behavior.

## **B5 Supporting Results**

Significant analysis was developed which aided in the understanding of each alternative to the Legacy Parkway. Some of the alternatives included in this write-up were addressed but not advanced in the Supplemental EIS. Although these alternatives were not advanced, it was the opinion of the lead federal agencies that full disclosure of all analysis was appropriate.

### **B5.1 Possible Land Use Shifts under No-Build Alternative**

As discussed in land use topic in the Supplemental EIS Section 4.1.3.3 (*Impacts on Growth within and beyond the North Corridor*), approximately 800 acres of developable land would become available for development in North Salt Lake, Centerville, Farmington, Woods Cross, Bountiful, and West Bountiful if Legacy Parkway were not built. The land is located within the protected right-of-way for the Legacy Parkway, and within the proposed project-sponsored nature Preserve, generally west of existing and developing areas. Under the No-Build Alternative, UDOT would lack authority to keep the right-of-way or the Preserve; thus the land would be available for development. Based on a review of historic zoning and on interviews with planning staff with each City, an estimated 100 to 200 acres would be developed under residential uses at approximately five units per acre. The remainder of the 800 acres would develop under retail, commercial, business-park, warehouse and manufacturing use. City planning representatives also state that real estate market activity within their communities and the properties' strategic location within the region, near the airport and regional CBD suggest that the land would develop in the relatively near term, prior to 2020. The planners also believe that the development would represent net additional development within their communities rather than spreading the same amount of development that would otherwise occur at lower densities over larger areas.

There are no official assessments of the degree to which these changes in land availability might effect the officially adopted regional land use projections and city-by-city allocations prepared by the Utah Governor's Office of Planning and Budget and Wasatch Front Regional Council. The 800 additional acres represents a very small percentage of county wide and regional development over the study period. It is equivalent to less than 6% of the projected 2000 to 2020 regional growth within the Study Area (a 20-year total of about 14,000 acres at the rates projected by local planners in Section 4.1.2.1 *Current Land Use and Development Trends in the Study Area*), and about less than 1% of Wasatch Front four-county population growth. Considering the regional land supply, variations in economic conditions and land values and variable demand for specific types of use at specific locations, it is uncertain the extent to which the additional land will:

- reduce development densities within the corridor
- delay market absorption of certain corridor lands until beyond 2020
- slow some development in cities north of the North Corridor until beyond 2020
- shift development into the additional corridor lands from other parts of the region

It is unlikely that the small percentage increase in available land within the region will affect the amount of population or employment within the region. Therefore, the change will result in changes in development within the North Corridor cities ranging from:

- Negligible - if the consequences are primarily reduced development densities within the corridor and/or no increase in market absorption rates for corridor lands.
- Additional 800 acres of residential, commercial and industrial development – if densities remain unchanged and absorption rates increase. The additional development could amount to up to 500 additional dwelling units and up to 8,700 commercial and industrial employees within the developable areas of the right-of-way and Preserve.

If additional 800 acres do develop within the corridor by 2020, there would be an equivalent reduction in development elsewhere in the region. While no official projections have been performed, it is possible that some of the development shifted into the corridor would come from areas north of the corridor, including north Davis and Weber Counties. About 20% of the region's growth is predicted to occur in these areas; so on a simple proportional basis, about 20% of the development shifted into the corridor would be shifted from north Davis and Weber Counties. This would translate to 100 fewer dwelling units and 1,500 fewer employees in north Davis and Weber Counties than under the build alternatives. At the other extreme, 100% of the shift could come from north Davis and Weber Counties. In that case, reductions of 500 dwelling units and up to 8,700 commercial and industrial employees could occur in north Davis County, Ogden and Weber County, with the development instead shifted to the Legacy Parkway right-of-way and nature Preserve.

Under this assumption, the development shifted into south Davis County would generate about 9,500 additional peak period trips in south Davis (based on WFRC model trip generation rates) and reduce trip generation in north Davis and Weber Counties by a similar amount: up to 9,500 peak period trips. If the development were to remain located in north Davis and Weber Counties, the majority of the generated traffic would remain local and would not be traversed I-15 through the North Corridor. WFRC model trip distribution and directional percentages indicate that removing 800 acres or 9,500 peak-period trips from north Davis and Weber Counties translates to a reduction of roughly 600 peak-period, peak-direction passenger-car equivalents (pces) on I-15 at the Woods Cross screenline. However, these pces would be more than fully replaced by pces added to I-15 by the new trips generated by the additional 800 acres of development within the Legacy Parkway right-of-way and preserve.

Based on the WFRC model, the additional 800 acres of development in the Legacy Parkway right-of-way and preserve would generate an additional 9,500 peak period trips in the western portions of the North Corridor communities. This traffic would circulate on new local streets built within the Legacy Parkway right-of-way and Preserve and on existing surface streets such as Redwood Road, 500 South and Parrish Lane, resulting in higher impacts on those streets than under the Build Alternative. According to WFRC model trip distribution and directional percentages, approximately 30% of the additional generated traffic would use I-15 in peak direction in the southern part of the North Corridor. This would more than off-set the reduced traffic from north Davis and Weber Counties. The net increase in pces in the peak period, peak direction at the Woods Cross screenline would be approximately 1,100 pces or about 4 to 5% of the total pces that I-15 is projected to carry in 2020. This increase would worsen the LOS, which even without the land use shift would be LOS F in 2020 under the No-Build Alternative.

Consequently, by not assuming development in the land occupied by the right of way and the Preserve, the land use assumptions used in this Supplemental EIS for the No-Build Alternative represent the low end of the range of the potential 2020 conditions on I-15 and a potentially favorable assessment of the potential traffic conditions on surface streets in western areas of North Corridor communities. On I-15 at the Woods Cross screenline, the land use shifts resulting from the additional 800 acres of developable North Corridor land in the No-Build Alternative would range from:

- An increase of 1,100 PM peak period peak direction pces (or 4%) above the traffic projected for the land use case analyzed in this Supplemental EIS, if the 800 acres of new corridor land use is drawn from development potential further north of the North Corridor.
- An increase of 1,500 PM peak period peak direction pces (or 5%) above the traffic projected for the land use case analyzed in this Supplemental EIS, if the new North Corridor land use is drawn from other parts of the region.

In both cases, the land use shift would worsen the 2020 LOS on I-15 at Woods Cross screenline to a worse LOS F than reported in Table 1-2 and Table 3-2 for the No-Build Alternative.

Also, in both cases, relinquishment of the land within the Legacy Parkway right-of-way and Preserve would increase traffic generation and local street construction in the western portions of North Salt Lake, Woods Cross, Centerville, Bountiful, West Bountiful and Farmington.

## B5.2 Through Traffic on Local Streets

The travel model can identify traffic from various geographic origins and destinations. A useful analysis was to identify the component of traffic that had neither an origin nor a destination in the south Davis Study area. Traffic that passed through the study area but had neither an origin nor a destination in the area was termed “through” traffic. According to the AASHTO Green Book, traffic traveling distances of ten miles or more (i.e., through traffic) should be afforded high-speed facilities with some degree of access control. Accident rates collected by UDOT reveal that limited access facilities, those facilities which do not have traffic signals, have accident rates that are less than one third those of signalized streets. However, like travel times, there is no binary threshold which is readily accepted as a pass-fail criteria to screen alternatives. Figure B-2 displays that the Shared Solution can eliminate through traffic on signalized streets, representing a measure of safety of the North Corridor transportation system.

**Figure B-2.** Peak Period Peak Direction Through Traffic on Signalized Streets.



## B.5.3 Geographic Travel Markets

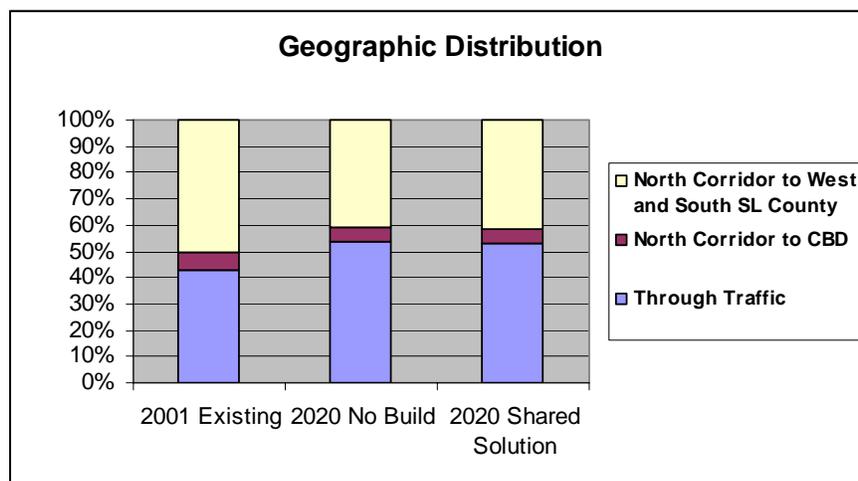
The geographic market of travel across the Woods Cross screenline was examined in order to gain a deeper understanding of the travel demand in the North Corridor. The geographic markets were examined

using the WFRC “City-X” script, which allows for the origin and destination traffic zone pairs of each trip to be identified. Three origin-destination pairs were identified as follows:

- Through traffic including all traffic with neither an origin nor destination in the North Corridor,
- CBD to and from North Corridor traffic, and
- Utah County and all of Salt Lake County outside of the CBD to and from the North Corridor.

The geographic distribution of total traffic generally follows the observed socio-economic trends of the area represented by a decline in the share of travel to and from the Salt Lake CBD and a corresponding growth of travel to and from north Davis and Weber County as well as south and west Salt Lake County. According to Figure B-3, travel from the CBD to the North Corridor is almost 7% of the total travel across the Woods Cross Screenline in 2001 but declines to approximately 5% in the year 2020. Through travel grows from less than 45% of the total travel across the Woods Cross screenline in 2001 to over 50% of the total travel in the year 2020. This 50% relates to all travel crossing the Woods Cross screenline on I-15 as well as surface streets. On I-15 itself, the through traffic percentage is higher: 65%. In the year 2020, changes in geographic travel markets can be observed between alternatives, but are generally very small such that each alternative in the year 2020 basically serves the same geographic market regardless of the construction of various facilities.

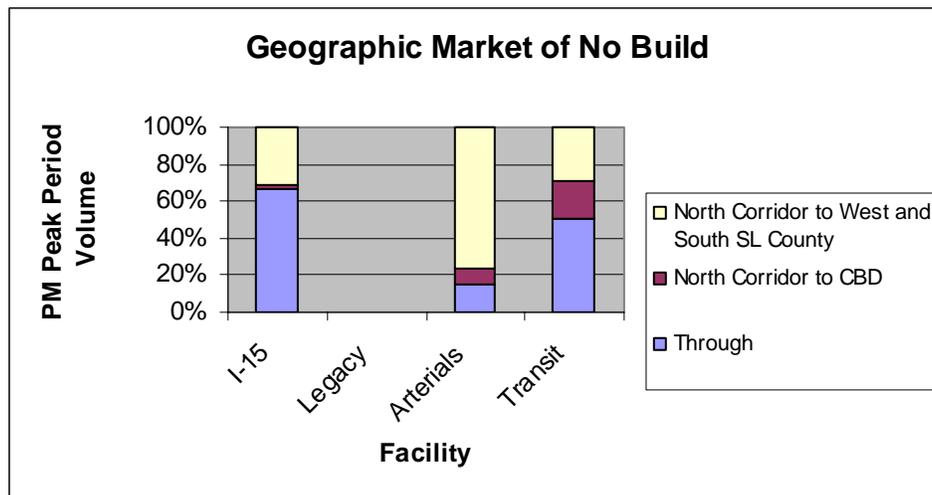
**Figure B-3.** Geographic Distribution of Total Travel across the Woods Cross Screenline.



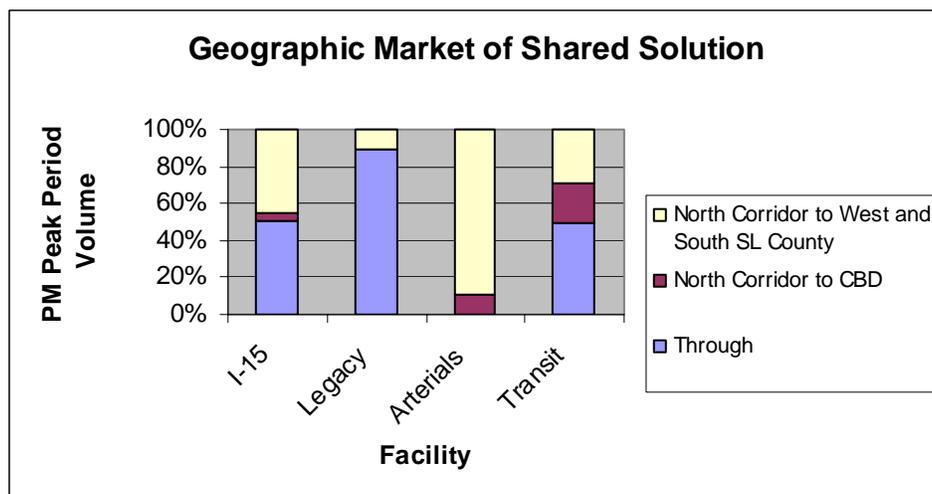
In addition to the shift in the geographic markets over time from 2001 to 2020, another observation about the geographic travel markets is related to the use of each component of the Shared Solution in the year 2020, compared with facility-by-facility use under the No-Build Alternative. As shown in Figures B-4a and B-4b, each component of the Shared Solution serves a different set of travel markets. Under the Shared Solution, traffic on Legacy Parkway is made up almost entirely of through traffic and traffic to and from the North Corridor to western and southern Salt Lake County. By contrast, almost one quarter of travel demand using mass transit across the Woods Cross screenline is represented by the CBD to North Corridor geographic demand. The No-Build Alternative results in approximately 65% of the screenline demand on I-15 as through traffic, whose trips neither begin nor end in south Davis County. Due to the resulting congestion on I-15, the No-Build Alternative also produces approximately 15% of the travel on signalized arterial and collector streets as through traffic. This compares to the Shared Solution for which

the additional capacity on the Legacy Parkway results in only 50% of the I-15 traffic to be through traffic, and no through traffic is served by signalized arterial and collector streets at the Woods Cross screenline. Figures B-4a and B-4b display the relative geographic demand of each facility type in the peak period and peak direction based on passenger car equivalents in the year 2020 under the No-Build and Shared Solution, respectively.

**Figure B-4a.** Geographic Distribution of Each Facility in the 2020 No Build



**Figure B-4b.** Geographic Distribution of Each Facility in the 2020 Shared Solution.



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Appendix C  
**Noise**

**RESULTS: SOUND LEVELS**

**Legacy Reevaluation**

<Organization?>  
Curt Overcast

7 May 2004  
TNM 2.1  
Calculated with TNM 2.1

**RESULTS: SOUND LEVELS**

**PROJECT/CONTRACT:**

Legacy Reevaluation  
Pref.Alt - Revised Run (4/14/04)

**RUN:**

INPUT HEIGHTS

Average pavement type shall be used unless  
a State highway agency substantiates the use  
of a different type with approval of FHWA.

**BARRIER DESIGN:**

**ATMOSPHERICS:**

20 deg C, 50% RH

Receiver	No.	#DUs	Existing LAeq1h dBA	No Barrier		Increase over existing			Type Impact	With Barrier		Calculated minus Goal dB
				LAeq1h dBA	Crit'n	Calculated	Crit'n	Sub'l Inc		Calculated LAeq1h dBA	Noise Reduction Calculated Goal dB	
ML-1 (6 residences)	5	6	67.0	68.8	65	1.8	10	Snd Lvl	68.8	0.0	5	-5.0
ML-2 (7 residences)	6	7	53.0	54.4	65	1.4	10	----	54.4	0.0	5	-5.0
ML-3 (2 residences)	7	2	56.0	57.8	65	1.8	10	----	57.8	0.0	5	-5.0
ML-4 (Industrial/Commercial)	8	1	57.0	72.9	72	15.9	10	Both	72.9	0.0	5	-5.0
ML-5 (Vacant)	10	1	50.0	75.8	65	25.8	10	Both	75.8	0.0	5	-5.0
ML-6 (1 residence)	11	1	50.0	69.1	65	19.1	10	Both	69.1	0.0	5	-5.0
ML-7 (5 residences)	12	5	44.0	77.8	65	33.8	10	Both	77.8	0.0	5	-5.0
ML-8 (Bountiful Pond - Recreation)	13	1	46.0	78.2	65	32.2	10	Both	78.2	0.0	5	-5.0
ML-9 (6 residences)	14	6	41.0	74.0	65	33.0	10	Both	74.0	0.0	5	-5.0
ML-10 (3 residences)	15	3	48.0	74.6	65	26.6	10	Both	74.6	0.0	5	-5.0
ML-12 (3 residences)	16	3	60.0	72.4	65	12.4	10	Both	72.4	0.0	5	-5.0
ML-11 (Undeveloped)	17	1	57.0	69.2	65	12.2	10	Both	69.2	0.0	5	-5.0
ML-13 (Glovers Park - Recreation)	18	1	56.0	64.7	65	8.7	10	----	64.7	0.0	5	-5.0
ML-14 (6 residences)	19	6	62.0	70.6	65	8.6	10	Snd Lvl	70.6	0.0	5	-5.0
ML-15 (12 residences)	20	12	44.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
ML-16 (6 residences)	21	6	58.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
ML-17 (8 residences)	22	8	49.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
R-1 (7 residences)	23	7	54.0	53.6	65	-0.4	10	----	53.6	0.0	5	-5.0
R-2 (3 residences)	24	3	54.0	52.8	65	-1.2	10	----	52.8	0.0	5	-5.0
R-3 (3 residences - Foxboro Dev.)	25	3	47.0	73.2	65	26.2	10	Both	73.2	0.0	5	-5.0
R-4 (3 residences - Foxboro Dev.)	26	3	48.0	72.6	65	24.6	10	Both	72.6	0.0	5	-5.0
R-5 (3 residences - Foxboro Dev.)	27	3	52.0	72.3	65	20.3	10	Both	72.3	0.0	5	-5.0
R-6 (3 residences - Foxboro Dev.)	28	3	43.0	67.7	65	24.7	10	Both	67.7	0.0	5	-5.0

**RESULTS: SOUND LEVELS**

**Legacy Reevaluation**

Dwelling Units	# DUs	Noise Reduction			65	24.5	10	Both	67.5	0.0	5	-5.0
		Min dB	Avg dB	Max dB								
R-7 (3 residences - Foxboro Dev.)	29	3	43.0	67.5	65	24.5	10	Both	67.5	0.0	5	-5.0
R-8 (3 residences - Foxboro Dev.)	30	3	44.0	67.2	65	23.2	10	Both	67.2	0.0	5	-5.0
R-9 (2 residences)	31	2	45.0	66.9	65	21.9	10	Both	66.9	0.0	5	-5.0
R-10 (3 residences)	32	3	40.0	65.9	65	25.9	10	Both	65.9	0.0	5	-5.0
R-11 (2 residences)	33	2	40.0	64.9	65	24.9	10	Sub'l Inc	64.9	0.0	5	-5.0
R-12 (2 residences)	34	2	39.0	64.0	65	25.0	10	Sub'l Inc	64.0	0.0	5	-5.0
R-13 (3 residences)	35	3	40.0	64.8	65	24.8	10	Sub'l Inc	64.8	0.0	5	-5.0
R-14 (2 residences)	36	2	40.0	65.6	65	25.6	10	Both	65.6	0.0	5	-5.0
R-15 (3 residences)	37	3	38.0	63.1	65	25.1	10	Sub'l Inc	63.1	0.0	5	-5.0
R-16 (2 residences)	38	2	39.0	64.0	65	25.0	10	Sub'l Inc	64.0	0.0	5	-5.0
R-17 (2 residences)	39	2	41.0	65.6	65	24.6	10	Both	65.6	0.0	5	-5.0
R-18 (2 residences)	40	2	41.0	66.9	65	25.9	10	Both	66.9	0.0	5	-5.0
R-19 (1 residence)	41	1	53.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
R-20 (1 residence)	42	1	50.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
R-1 (Raceway at I-215)	43	1	50.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
R-2 (Raceway at Parking Lot)	44	1	45.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
R-3 (FBWMA - W. of Lake Bountiful)	45	1	40.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
R-4 (FBWMA - Isolated Parcel)	46	1	61.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
Receiver47	47	1	44.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
Receiver48	48	1	44.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
Receiver49	49	1	44.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
Receiver50	50	1	44.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0
Receiver51	51	1	44.0	0.0	65	0.0	10	inactive	0.0	0.0	5	0.0

**# DUs Noise Reduction**

	Min dB	Avg dB	Max dB
All Selected	132	0.0	0.0
All Impacted	75	0.0	0.0
All that meet NR Goal	0	0.0	0.0

Legacy Reevaluation

7 May 2004  
TNM 2.1

Legacy Reevaluation  
Pref.Alt - Revised Run (4/14/04)

INPUT: RECEIVERS

<Organization?>  
Curt Overcast

INPUT: RECEIVERS  
PROJECT/CONTRACT:  
RUN:

Receiver Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	
			m	m	m	m	dBA	dBA	dBA	dB	dB
ML-1 (6 residences)	5	6	15,187.2	106,385.7	1,287.60	1.50	67.00	65	10.0	5.0	Y
ML-2 (7 residences)	6	7	14,914.1	107,383.9	1,289.52	1.50	53.00	65	10.0	5.0	Y
ML-3 (2 residences)	7	2	15,081.0	106,895.5	1,288.70	1.50	56.00	65	10.0	5.0	Y
ML-4 (Industrial/Commercial)	8	1	15,848.6	108,103.0	1,287.04	1.50	57.00	72	10.0	5.0	Y
ML-5 (Vacant)	10	1	15,675.7	109,805.1	1,289.57	1.50	50.00	65	10.0	5.0	Y
ML-6 (1 residence)	11	1	16,476.7	112,754.1	1,288.91	1.50	50.00	65	10.0	5.0	Y
ML-7 (5 residences)	12	5	17,053.1	114,665.5	1,288.78	1.50	44.00	65	10.0	5.0	Y
ML-8 (Bountiful Pond - Recreation)	13	1	17,538.6	115,078.1	1,287.20	1.50	46.00	65	10.0	5.0	Y
ML-9 (6 residences)	14	6	19,058.6	116,288.7	1,287.34	1.50	41.00	65	10.0	5.0	Y
ML-10 (3 residences)	15	3	18,562.1	115,993.6	1,287.85	1.50	48.00	65	10.0	5.0	Y
ML-12 (3 residences)	16	3	19,674.5	121,713.5	1,294.49	1.50	60.00	65	10.0	5.0	Y
ML-11(Undeveloped)	17	1	19,544.0	119,577.6	1,292.57	1.50	57.00	65	10.0	5.0	Y
ML-13 (Glovers Park - Recreation)	18	1	19,249.7	121,844.0	1,294.49	1.50	56.00	65	10.0	5.0	Y
ML-14 (6 residences)	19	6	19,358.9	122,784.5	1,296.52	1.50	62.00	65	10.0	5.0	Y
ML-15 (12 residences)	20	12	16,780.1	123,294.2	1,288.35	1.50	44.00	65	10.0	5.0	Y
ML-16 (6 residences)	21	6	16,819.5	124,884.0	1,290.13	1.50	58.00	65	10.0	5.0	Y
ML-17 (8 residences)	22	8	16,555.5	125,827.6	1,297.07	1.50	49.00	65	10.0	5.0	Y
R-1 (7 residences)	23	7	14,788.4	106,266.9	1,286.32	1.50	54.00	65	10.0	5.0	Y
R-2 (3 residences)	24	3	14,812.7	106,715.9	1,288.77	1.50	54.00	65	10.0	5.0	Y
R-3 (3 residences - Foxboro Dev.)	25	3	15,793.0	108,966.5	1,288.11	1.50	47.00	65	10.0	5.0	Y
R-4 (3 residences - Foxboro Dev.)	26	3	15,798.6	109,243.4	1,288.11	1.50	48.00	65	10.0	5.0	Y
R-5 (3 residences - Foxboro Dev.)	27	3	15,794.9	109,497.8	1,288.11	1.50	52.00	65	10.0	5.0	Y

**INPUT: RECEIVERS**

**Legacy Reevaluation**

R-6 (3 residences - Foxboro Dev.)	28	3	16,054.9	108,953.4	1,288.11	1.50	43.00	65	10.0	5.0	Y
R-7 (3 residences - Foxboro Dev.)	29	3	16,045.6	109,245.3	1,288.11	1.50	43.00	65	10.0	5.0	Y
R-8 (3 residences - Foxboro Dev.)	30	3	16,047.4	109,507.2	1,288.11	1.50	44.00	65	10.0	5.0	Y
R-9 (2 residences)	31	2	18,604.5	115,540.3	1,288.77	1.50	45.00	65	10.0	5.0	Y
R-10 (3 residences)	32	3	18,702.1	115,536.6	1,288.77	1.50	40.00	65	10.0	5.0	Y
R-11 (2 residences)	33	2	18,813.1	115,539.0	1,288.77	1.50	39.00	65	10.0	5.0	Y
R-12 (2 residences)	34	2	18,805.7	115,409.8	1,288.77	1.50	40.00	65	10.0	5.0	Y
R-13 (3 residences)	35	3	18,727.7	115,441.5	1,288.77	1.50	40.00	65	10.0	5.0	Y
R-14 (2 residences)	36	2	18,689.9	115,491.5	1,288.77	1.50	38.00	65	10.0	5.0	Y
R-15 (3 residences)	37	3	18,832.6	115,306.1	1,288.77	1.50	39.00	65	10.0	5.0	Y
R-16 (2 residences)	38	2	18,726.5	115,336.6	1,288.77	1.50	41.00	65	10.0	5.0	Y
R-17 (2 residences)	39	2	18,627.7	115,417.1	1,288.77	1.50	41.00	65	10.0	5.0	Y
R-18 (2 residences)	40	2	18,572.8	115,493.9	1,288.77	1.50	53.00	65	10.0	5.0	Y
R-19 (1 residence)	41	1	18,272.8	121,767.5	1,288.94	1.50	50.00	65	10.0	5.0	Y
R-20 (1 residence)	42	1	17,536.3	121,784.4	1,288.35	1.50	50.00	65	10.0	5.0	Y
R-1 (Raceway at I-215)	43	1	15,410.0	106,527.6	1,287.60	1.50	45.00	65	10.0	5.0	Y
R-2 (Raceway at Parking Lot)	44	1	15,508.2	106,390.2	1,287.60	1.50	40.00	65	10.0	5.0	Y
R-3 (FBWMA - W. of Lake Bountiful)	45	1	16,715.7	115,338.9	1,288.78	1.50	61.00	65	10.0	5.0	Y
R-4 (FBWMA - Isolated Parcel)	46	1	19,057.2	120,331.1	1,292.57	1.50	44.00	65	10.0	5.0	Y
Receiver47	47	1	16,928.5	114,667.5	1,288.00	1.50	44.00	65	10.0	5.0	Y
Receiver48	48	1	16,886.8	114,664.7	1,288.00	1.50	44.00	65	10.0	5.0	Y
Receiver49	49	1	16,851.9	114,665.8	1,288.00	1.50	44.00	65	10.0	5.0	Y
Receiver50	50	1	16,821.1	114,663.7	1,288.00	1.50	44.00	65	10.0	5.0	Y
Receiver51	51	1	16,966.3	114,668.5	1,288.00	1.50	44.00	65	10.0	5.0	Y

INPUT: ROADWAYS

Legacy Reevaluation

<Organization?>  
Curt Overcast

7 May 2004  
TNM 2.1

INPUT: ROADWAYS  
PROJECT/CONTRACT:  
RUN:

Average pavement type shall be used unless  
a State highway agency substantiates the use  
of a different type with the approval of FHWA

Legacy Reevaluation  
Pref.Alt - Revised Run (4/14/04)

Roadway		Points										Flow Control			Segment	
Name	Width	Name	No.	X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	m			m	m	m		km/h	%				km/h	%		
Roadway 1 - Northbound	7.3	0	121	15,121.1	104,777.7	1,286.40				Average					Average	
		1	122	15,105.7	105,653.9	1,288.60				Average					Average	
		2	123	15,118.5	105,852.3	1,287.60				Average					Average	
		3	124	15,172.7	106,080.4	1,286.30				Average					Average	
		4	125	15,317.0	106,567.4	1,287.60				Average					Average	
		5	126	15,398.1	106,736.2	1,288.20				Average					Average	
		6	127	15,508.9	106,876.6	1,288.70				Average					Average	
		7	128	15,608.2	106,999.0	1,289.20				Average					Average	
		8	129	15,707.4	107,140.8	1,289.60				Average					Average	
		9	130	15,766.6	107,294.1	1,289.50				Average					Average	
		10	131	15,783.4	107,489.9	1,288.80				Average					Average	
		11	132	15,703.5	107,876.5	1,287.20				Average					Average	
		12	133	15,668.7	108,113.5	1,287.00				Average					Average	
		13	134	15,551.5	110,166.1	1,289.60				Average					Average	
		14	135	15,559.2	110,305.2	1,289.90				Average					Average	
		15	136	15,612.0	110,467.6	1,289.70				Average					Average	
		16	137	15,984.4	111,171.1	1,289.40				Average					Average	
		17	138	16,037.2	111,305.1	1,289.70				Average					Average	
		18	139	16,059.1	111,433.9	1,289.60				Average					Average	
		19	140	16,136.4	112,928.5	1,288.90				Average					Average	
		20	141	16,176.4	113,136.0	1,288.20				Average					Average	
		21	142	16,347.7	113,647.5	1,287.40				Average					Average	
		22	143	16,401.8	113,762.2	1,257.70				Average					Average	
		23	144	16,474.0	113,866.5	1,287.70				Average					Average	
		24	145	17,202.0	114,718.2	1,288.80				Average					Average	



INPUT: ROADWAYS

Legacy Reevaluation

			3	184	15,164.6	106,083.5	1,286.20			Average
			4	185	15,309.3	106,567.3	1,287.60			Average
			5	186	15,385.5	106,740.7	1,288.10			Average
			6	187	15,492.2	106,891.2	1,288.70			Average
			7	188	15,589.4	107,001.7	1,289.10			Average
			8	189	15,694.1	107,148.3	1,289.60			Average
			9	190	15,749.4	107,295.0	1,289.50			Average
			10	191	15,768.4	107,489.3	1,288.80			Average
			11	192	15,690.3	107,877.9	1,287.20			Average
			12	193	15,656.0	108,114.1	1,287.00			Average
			13	194	15,537.9	110,160.0	1,289.60			Average
			14	195	15,547.5	110,304.7	1,289.80			Average
			15	196	15,598.9	110,472.4	1,289.70			Average
			16	197	15,968.4	111,163.8	1,289.40			Average
			17	198	16,023.7	111,304.8	1,289.70			Average
			18	199	16,046.5	111,440.0	1,289.60			Average
			19	200	16,122.7	112,935.4	1,288.90			Average
			20	201	16,164.6	113,143.0	1,288.20			Average
			21	202	16,330.4	113,636.4	1,287.40			Average
			22	203	16,389.4	113,765.9	1,287.70			Average
			23	204	16,486.6	113,903.1	1,287.60			Average
			24	205	17,193.3	114,726.0	1,288.80			Average
			25	206	17,341.9	114,851.7	1,288.40			Average
			26	207	17,488.5	114,960.3	1,287.90			Average
			27	208	17,663.8	115,118.4	1,287.10			Average
			28	209	18,058.1	115,569.8	1,288.60			Average
			29	210	18,206.7	115,762.2	1,288.90			Average
			30	211	18,399.1	116,044.1	1,287.90			Average
			31	212	18,532.4	116,173.7	1,287.30			Average
			32	213	18,625.7	116,230.8	1,287.00			Average
			33	214	18,902.0	116,368.0	1,287.10			Average
			34	215	19,006.7	116,427.0	1,287.70			Average
			35	216	19,115.3	116,529.9	1,288.40			Average
			36	217	19,214.4	116,684.2	1,288.20			Average
			37	218	19,265.8	116,876.6	1,287.10			Average
			38	219	19,343.9	117,381.4	1,287.70			Average
			39	220	19,383.9	117,509.0	1,287.70			Average
			40	221	19,446.7	117,627.1	1,287.30			Average

INPUT: ROADWAYS

Legacy Reevaluation

41	19,721.1	117,966.2	1,287.30	Average
42	19,795.3	118,078.6	1,288.00	Average
43	19,839.2	118,202.4	1,288.50	Average
44	19,852.5	118,326.2	1,288.00	Average
45	19,873.4	121,612.1	1,292.70	Average
46	19,850.6	121,777.8	1,294.50	Average
53	19,182.0	123,726.5	1,303.00	Average
54	19,138.2	123,819.9	1,307.60	Average
55	19,121.0	123,909.4	1,310.00	Average
56	19,096.2	124,073.2	1,310.10	Average
57	19,048.6	124,174.2	1,307.10	Average
58	18,970.5	124,258.0	1,301.70	Average
59	18,597.2	124,534.2	1,296.90	Average
60	18,000.9	125,008.5	1,297.70	Average
61	17,452.3	125,490.5	1,303.50	Average

INPUT: TRAFFIC FOR LAeq1h Volumes

Legacy Reevaluation

<Organization?>  
Curt Overcast

7 May 2004  
TNM 2.1

INPUT: TRAFFIC FOR LAeq1h Volumes  
PROJECT/CONTRACT:  
RUN:

Legacy Reevaluation  
Pref.Alt - Revised Run (4/14/04)

Roadway Name	Points	No.	Segment	Autos			MTrucks			HTrucks			Buses			Motorcycles		
				V	S	km/h	V	S	km/h	V	S	km/h	V	S	km/h	V	S	km/h
				veh/hr	km/h	veh/hr	veh/hr	km/h	veh/hr	veh/hr	km/h	veh/hr	veh/hr	km/h	veh/hr	veh/hr	km/h	veh/hr
Roadway 1 - Northbound	0	121		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	1	122		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	2	123		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	3	124		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	4	125		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	5	126		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	6	127		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	7	128		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	8	129		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	9	130		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	10	131		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	11	132		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	12	133		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	13	134		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	14	135		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	15	136		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	16	137		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	17	138		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	18	139		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	19	140		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	20	141		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	21	142		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	
	22	143		3024	110	168	110	168	110	168	110	0	0	0	0	0	0	

INPUT: TRAFFIC FOR LAeq1h Volumes

Legacy Reevaluation

23	144	3024	110	168	110	168	110	168	110	0	0	0	0
24	145	3024	110	168	110	168	110	168	110	0	0	0	0
25	146	3024	110	168	110	168	110	168	110	0	0	0	0
26	147	3024	110	168	110	168	110	168	110	0	0	0	0
27	148	3024	110	168	110	168	110	168	110	0	0	0	0
28	149	3024	110	168	110	168	110	168	110	0	0	0	0
29	150	3024	110	168	110	168	110	168	110	0	0	0	0
30	151	3024	110	168	110	168	110	168	110	0	0	0	0
31	152	3024	110	168	110	168	110	168	110	0	0	0	0
32	153	3024	110	168	110	168	110	168	110	0	0	0	0
33	154	3024	110	168	110	168	110	168	110	0	0	0	0
34	155	3024	110	168	110	168	110	168	110	0	0	0	0
35	156	3024	110	168	110	168	110	168	110	0	0	0	0
36	157	3024	110	168	110	168	110	168	110	0	0	0	0
37	158	3024	110	168	110	168	110	168	110	0	0	0	0
38	159	3024	110	168	110	168	110	168	110	0	0	0	0
39	160	3024	110	168	110	168	110	168	110	0	0	0	0
40	161	3024	110	168	110	168	110	168	110	0	0	0	0
41	162	3024	110	168	110	168	110	168	110	0	0	0	0
42	163	3024	110	168	110	168	110	168	110	0	0	0	0
43	164	3024	110	168	110	168	110	168	110	0	0	0	0
44	165	3024	110	168	110	168	110	168	110	0	0	0	0
45	166	3024	110	168	110	168	110	168	110	0	0	0	0
46	167	3024	110	168	110	168	110	168	110	0	0	0	0
53	168	3024	110	168	110	168	110	168	110	0	0	0	0
54	169	3024	110	168	110	168	110	168	110	0	0	0	0
55	170	3024	110	168	110	168	110	168	110	0	0	0	0
56	171	3024	110	168	110	168	110	168	110	0	0	0	0
57	172	3024	110	168	110	168	110	168	110	0	0	0	0
58	173	3024	110	168	110	168	110	168	110	0	0	0	0
59	174	3024	110	168	110	168	110	168	110	0	0	0	0
60	175	3024	110	168	110	168	110	168	110	0	0	0	0
61	176	3024	110	168	110	168	110	168	110	0	0	0	0
62	177	3024	110	168	110	168	110	168	110	0	0	0	0
63	178	3024	110	168	110	168	110	168	110	0	0	0	0

INPUT: TRAFFIC FOR LAeqTh Volumes

Legacy Reevaluation

	64	179	3024	110	168	110	168	110	168	110	0	0	0	0
	65	180												
Roadway 2 - Southbound	0	181	3024	110	168	110	168	110	168	110	0	0	0	0
	1	182	3024	110	168	110	168	110	168	110	0	0	0	0
	2	183	3024	110	168	110	168	110	168	110	0	0	0	0
	3	184	3024	110	168	110	168	110	168	110	0	0	0	0
	4	185	3024	110	168	110	168	110	168	110	0	0	0	0
	5	186	3024	110	168	110	168	110	168	110	0	0	0	0
	6	187	3024	110	168	110	168	110	168	110	0	0	0	0
	7	188	3024	110	168	110	168	110	168	110	0	0	0	0
	8	189	3024	110	168	110	168	110	168	110	0	0	0	0
	9	190	3024	110	168	110	168	110	168	110	0	0	0	0
	10	191	3024	110	168	110	168	110	168	110	0	0	0	0
	11	192	3024	110	168	110	168	110	168	110	0	0	0	0
	12	193	3024	110	168	110	168	110	168	110	0	0	0	0
	13	194	3024	110	168	110	168	110	168	110	0	0	0	0
	14	195	3024	110	168	110	168	110	168	110	0	0	0	0
	15	196	3024	110	168	110	168	110	168	110	0	0	0	0
	16	197	3024	110	168	110	168	110	168	110	0	0	0	0
	17	198	3024	110	168	110	168	110	168	110	0	0	0	0
	18	199	3024	110	168	110	168	110	168	110	0	0	0	0
	19	200	3024	110	168	110	168	110	168	110	0	0	0	0
	20	201	3024	110	168	110	168	110	168	110	0	0	0	0
	21	202	3024	110	168	110	168	110	168	110	0	0	0	0
	22	203	3024	110	168	110	168	110	168	110	0	0	0	0
	23	204	3024	110	168	110	168	110	168	110	0	0	0	0
	24	205	3024	110	168	110	168	110	168	110	0	0	0	0
	25	206	3024	110	168	110	168	110	168	110	0	0	0	0
	26	207	3024	110	168	110	168	110	168	110	0	0	0	0
	27	208	3024	110	168	110	168	110	168	110	0	0	0	0
	28	209	3024	110	168	110	168	110	168	110	0	0	0	0
	29	210	3024	110	168	110	168	110	168	110	0	0	0	0
	30	211	3024	110	168	110	168	110	168	110	0	0	0	0
	31	212	3024	110	168	110	168	110	168	110	0	0	0	0
	32	213	3024	110	168	110	168	110	168	110	0	0	0	0

INPUT: TRAFFIC FOR LAeq1h Volumes

Legacy Reevaluation

33		214	3024	110	168	110	168	110	168	0	0	0	0
34		215	3024	110	168	110	168	110	168	0	0	0	0
35		216	3024	110	168	110	168	110	168	0	0	0	0
36		217	3024	110	168	110	168	110	168	0	0	0	0
37		218	3024	110	168	110	168	110	168	0	0	0	0
38		219	3024	110	168	110	168	110	168	0	0	0	0
39		220	3024	110	168	110	168	110	168	0	0	0	0
40		221	3024	110	168	110	168	110	168	0	0	0	0
41		222	3024	110	168	110	168	110	168	0	0	0	0
42		223	3024	110	168	110	168	110	168	0	0	0	0
43		224	3024	110	168	110	168	110	168	0	0	0	0
44		225	3024	110	168	110	168	110	168	0	0	0	0
45		226	3024	110	168	110	168	110	168	0	0	0	0
46		227	3024	110	168	110	168	110	168	0	0	0	0
53		228	3024	110	168	110	168	110	168	0	0	0	0
54		229	3024	110	168	110	168	110	168	0	0	0	0
55		230	3024	110	168	110	168	110	168	0	0	0	0
56		231	3024	110	168	110	168	110	168	0	0	0	0
57		232	3024	110	168	110	168	110	168	0	0	0	0
58		233	3024	110	168	110	168	110	168	0	0	0	0
59		234	3024	110	168	110	168	110	168	0	0	0	0
60		235	3024	110	168	110	168	110	168	0	0	0	0
61		236											

Appendix D

# **Wetlands Functional Assessment**

## Appendix D

# Wetlands Functional Assessment

This appendix presents supplemental information about wetland types in the study area and provides further clarification about how the wetlands functional assessment was performed, including the type of data used, the rationale for the approach to assessing indirect impacts on wetland functions, and the method for scaling the variables used in the assessment models. As a result, this section reiterates some of the information presented in the Final EIS to provide context for the supplemental information.

In addition, this appendix presents a series of tables illustrating indirect impacts on wetlands in the study area by hydrogeomorphic (HGM) wetland class and wetland cover type, as well as impacts on wetland functions for each wetland class and cover type.

### **D.1 Wetland Classes and Cover Types**

The area of wetlands within the proposed build alternative rights-of-way and proposed Legacy Nature Preserve (Preserve) that would be subject to direct and indirect effects encompasses 987 ha (2,439 ac) of wetlands in three HGM wetland classes (depressional, groundwater slope, lacustrine fringe) and seven wetland cover types (forested wetland, shrub-scrub, marsh, wet meadow, playa, unconsolidated shore, and open water).

The Final EIS based all discussion of wetland functions, impacts, and mitigation on the three wetland classes. This document, however, separates wetland functions, impacts, and mitigation according to wetland cover types to provide additional ecological context by which to interpret the analysis. Table D-1, which updates and supplements Table 3-30 in the Final EIS, summarizes the quantities and functional ratings that make up these wetland classes and cover types.

**Table D-1** Wetland Cover Types, Quantities, and Functional Ratings for Study Area

HGM Class	Wetland Cover Type	Quantity in Hectares (acres)*											
		Total		High		High-to-Medium		Medium		Medium-to-Low		Low	
Depressional	Forested Wetland	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Groundwater Slope		0.2	(0.4)	0.0	(0.0)	0.0	(0.0)	0.2	(0.4)	0.0	(0.0)	0.0	(0.0)
Lacustrine Fringe		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Depressional	Shrub-Scrub	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Groundwater Slope		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Lacustrine Fringe		1.4	(3.6)	0.0	(0.0)	1.4	(3.6)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Depressional	Marsh	14.5	(35.8)	0.7	(1.7)	5.5	(13.6)	8.0	(19.7)	0.3	(0.8)	0.0	(0.0)
Groundwater Slope		42.3	(104.5)	6.4	(15.8)	2.1	(5.3)	26.3	(64.9)	7.5	(18.5)	0.0	(0.0)
Lacustrine Fringe		233.2	(576.1)	0.0	(0.0)	206.3	(509.7)	26.9	(66.4)	0.0	(0.0)	0.0	(0.0)
Depressional	Wet Meadow	115.3	(284.9)	2.6	(6.5)	84.0	(207.6)	26.7	(66.0)	1.9	(4.8)	0.0	(0.0)
Groundwater Slope		152.4	(376.6)	80.8	(199.6)	18.2	(45.1)	48.9	(120.9)	4.5	(11.1)	0.0	(0.0)
Lacustrine Fringe		148.1	366.0	0.0	(0.0)	98.9	(244.5)	49.2	(121.5)	0.0	(0.0)	0.0	(0.0)
Depressional	Playa	46.4	(114.6)	3.5	(8.6)	31.3	(77.3)	10.5	(26.0)	0.0	(0.0)	1.1	(2.6)
Groundwater Slope		18.1	(44.7)	15.2	(37.6)	0.0	(0.0)	2.7	(6.6)	0.2	(0.4)	0.0	(0.0)
Lacustrine Fringe		124.5	(307.6)	0.0	(0.0)	99.7	(246.3)	24.8	(61.3)	0.0	(0.0)	0.0	(0.0)

HGM Class	Wetland Cover Type	Quantity in Hectares (acres)*											
		Total	High	High-to-Medium	Medium	Medium-to-Low	Low						
Depressional	Unconsolidated Shore	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Groundwater Slope		0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Lacustrine Fringe		38.9	(96.2)	0.0	(0.0)	36.5	(90.1)	2.5	(6.1)	0.0	(0.0)	0.0	(0.0)
Depressional	Open Water	2.5	(6.2)	0.0	(0.0)	1.4	(3.5)	1.1	(2.7)	0.0	(0.0)	0.0	(0.0)
Groundwater Slope		0.1	(0.2)	0.0	(0.0)	0.0	(0.0)	0.1	(0.2)	0.0	(0.0)	0.0	(0.0)
Lacustrine Fringe		49.4	(122.1)	0.0	(0.0)	25.1	(62.0)	24.3	(60.1)	0.0	(0.0)	0.0	(0.0)
Total		987.2	(2439.3)	109.2	(269.8)	610.5	(1508.5)	252.1	(622.9)	14.4	(35.5)	1.1	(2.6)

\*Definitions defined below

Functional Rating	Average Functional Value
High	0.88 to 1.0
High-to-Medium	0.63 to 0.87
Medium	0.38 to 0.62
Medium-to-Low	0.18 to 0.37
Low	0.00 to 0.17

The following section presents information on the seven wetland cover types found in these wetland classed in the study area—forested wetland, shrub-scrub, marsh, wet meadow, playa, unconsolidated shore, and open water.

### D.1.1 Marsh

Marsh is a wetland plant community characterized by tall, emergent, perennial, herbaceous monocots. Plant species most commonly observed in marsh within the study area include hard stem bulrush (*Scirpus acutus*), alkali bulrush (*Scirpus maritimus*), three square bulrush (*Scirpus americanus* and *Scirpus pungens*), cattail (*Typha latifolia*), creeping spikerush (*Eleocharis palustris*), reed canary grass (*Phalaris arundinacea*), common reed (*Phragmites australis*), blister buttercup (*Ranunculus sceleratus*), water buttercup (*Ranunculus aquatilis*), and Nebraska sedge (*Carex nebrascensis*). Marsh is the second most abundant wetland type in the study area. There are 290 ha (716 ac) of marsh in the study area, most of which is associated with the lacustrine fringe of Great Salt Lake.

The hydrology of the marsh cover type is provided by groundwater and/or surface water. Water covers the ground surface for long periods of time during the growing season. Depths can range from a few centimeters to almost a meter, but they are not deep enough to restrict the growth of emergent plant species. Areas where marsh is supported primarily by groundwater are typically located in depressions where the ground surface drops below the level of the water table. During the spring months, when the water table is high due to snowmelt and precipitation, these areas are inundated. As the level of the water table drops in the summer months, the marsh areas may no longer be inundated, although the soils remain saturated.

### D.1.2 Wet Meadow

Wet meadow is a wetland plant community characterized by grasses and other low-growing, perennial monocots. Although the soil may be saturated for long durations, the vegetation is generally not emergent. Plant species most commonly observed in wet meadows in the study area include Baltic rush (*Juncus balticus*), creeping spikerush, clustered field sedge (*Carex praegracilis*), Nebraska sedge, rabbitfoot grass (*Polypogon monspeliensis*), foxtail barley (*Hordeum jubatum*), little barley (*Hordeum pusillum*), curly dock (*Rumex crispus*), and saltgrass (*Distichlis spicata*). Wet meadow is the most common wetland type in the study area. There are 416 ha (1028 ac) of wet meadow in the study area, distributed more or less evenly throughout all three HGM wetland classes.

The hydrology of the wet meadow cover type is provided primarily by groundwater, although surface water plays an important role in many of the areas. Wet meadow typically occurs in areas that are in close proximity to the water table. Early in the growing season the level of the water table may be higher than the ground surface, causing inundation. However, this inundation occurs less frequently and for a shorter duration than in marsh. Like marsh, wet meadows found in the study area typically occur in depressional wetlands, but unlike marsh, the water table level is just below to only slightly above the depression bottom. Because of this difference, wet meadows may be inundated only for brief periods, although the soils may be saturated at the surface for extended periods. As the water table drops in the summer months, the wet meadows become drier, and upland species may begin to grow by late summer.

### D.1.3 Playa

Vegetation in the playa cover type is usually sparse, typically between 5 and 30 percent aerial cover. The vegetation is not uniformly distributed across the playas but tends to be concentrated around the margins. Typical species include western seepweed (*Suaeda occidentalis*), slender seepweed (*Suaeda depressa*), pickleweed (*Salicornia europaea*), saltgrass, iodinebush (*Allenrolfea occidentalis*), fat-hen saltbush (*Atriplex patula*), and Nuttall alkali grass (*Puccinellia nuttalliana*). Playa soils are extremely saline/alkaline, which suppresses the growth of most plant species. There are 189 ha (467 ac) of playa in the study area. About 66 percent of the playa habitat is associated with the lacustrine fringe of Great Salt Lake, and about 25 percent occurs in depressional wetlands.

The hydrology of playas in the study area is provided primarily by surface water. Playas are typically located in the lowest topographic positions of areas with internal drainage. They collect much of the runoff from adjacent areas following a precipitation event, and because of the high clay content of the soils, the water will pond. Following a precipitation event, playas may be inundated with several centimeters of water. Most of the standing water in playas is removed through evaporation, which deposits salts from the soils on the surface.

### D.1.4 Scrub-Shrub

The scrub-shrub cover type is characterized by an overstory of woody shrubs, typically less than three meters in height. In some instances, this cover type is successional to forested wetlands. In the study area, the overstory of scrub-shrub wetlands is composed of tamarisk (*Tamarix ramosissima*), box-elder (*Acer negundo*), and/or coyote willow (*Salix exigua*). Understory plant species are similar to those found in wet meadow, including saltgrass, Baltic rush, common reed, reed canary grass, foxtail barley, and little barley. Only four small areas of scrub-shrub wetland are present in the study area, comprising 1.4 ha (3.6 ac).

The hydrology of scrub-shrub wetlands is provided by both surface and groundwater sources. Some of the scrub-shrub wetlands are adjacent to small streams, and their wetland hydrology is derived from the stream. Others are located in areas that are close to the water table and receive their moisture from groundwater.

### D.1.5 Forested Wetland

The forested wetland cover type is characterized by an overstory of large trees. The overstory of this forested wetland is composed of narrow-leaf cottonwood (*Populus angustifolia*) and Russian olive (*Elaeagnus angustifolia*). The understory plant species is reed canary grass. Forested wetland is found at only one location in the study area, comprising 0.2 ha (0.4 ac). Wetland hydrology for this wetland is provided by a nearby stream.

### D.1.6 Unconsolidated Shore

Within the study area, unconsolidated shore areas represent areas that have (1) unconsolidated substrates with less than 75 percent aerial cover of stones, boulder, or bedrock, and (2) less than 30 percent aerial cover of vegetation, other than pioneering plants. This is primarily an aquatic habitat but is included here because a small amount of vegetation may be present when water levels are low. This habitat is found along the fringe of depressional open water and/or lacustrine systems. There are 39 ha (96 ac) of unconsolidated shore in the study area.

## **D.1.7 Open Water**

Open water includes areas of surface water where the depth to bottom is unknown or there is standing water with no emergent vegetation present. These areas are less than 8.2 ha (20 ac) in size. This is an aquatic habitat but is included here because submerged aquatic vegetation may be present. These areas sometimes become dry during the summer, which allows emergent vegetation to grow for a short period. There are 52 ha (128 ac) of open water in the study area, most of which is associated with the lacustrine fringe of Great Salt Lake.

## **D.2 Wetland Functions**

### **D.2.1 Wetlands Functional Assessment**

As presented in the Final EIS, the wetlands functional assessment for the Legacy Parkway wetlands was a modification of the hydrogeomorphic (HGM) method for evaluating wetland functions initially developed by the Corps (Brinson 1993). The HGM method categorizes wetlands by their water sources, hydrodynamics, and geomorphic setting, and then evaluates wetland functions based on physical and biological attributes.

Under the HGM method, wetland functions are assessed by comparing the wetlands under investigation with a set of reference wetlands (Brinson and Rheinhardt 1996). Reference wetlands are sites within a specified geographic region chosen to encompass the range of variation within a group or class of wetlands. The sites with the highest level of wetland function are selected as the reference standards. Based on these reference wetlands, regional guidebooks are created, which provide protocols for collecting data and scaling the variables and mathematical models for determining numerical ratings for each wetland function.

No regional guidebooks have been created yet for wetlands in the Legacy Parkway study area. However, an interdisciplinary assessment team (A-Team) was developing draft regional HGM models for the State of Utah at the time the Final EIS was published. The A-Team developed low-resolution wetlands assessment models for the Legacy Parkway project. Low-resolution models require few variables and rely on indirect measures and indicators, which makes them more efficient, quicker, and less expensive to prepare than higher resolution models but somewhat reduces their accuracy and precision (Smith and Wakely 2001). At the time this Supplemental EIS was prepared, the state regional HGM model was not complete enough to offer the accuracy or precision needed to update the HGM model information presented in the Final EIS. As a result, the updated wetlands functional assessment analysis presented in this document continues to be based on the wetlands functional assessment conducted for the Final EIS. Information on this model is summarized below.

### ***Application of Hydrogeomorphic Method***

The variables used for the Legacy Parkway wetlands assessment were based on indicators that correlate with wetland functions rather than measured wetland characteristics. The indicators were based on land use within and adjacent to the wetlands and on the presence of roads and other barriers; this information was determined from aerial photographs and field observations. Under the HGM approach, land use in the wetland watershed is an important variable in many wetland function indices. Because the wetland watershed is not always easily determined, some models use the adjacent land within a specific distance of the wetland as a surrogate for the watershed. For the Legacy Parkway project, adjacent land was

defined as the land within 305 m (1,000 ft) of the wetland perimeter (see Section D.3 below for discussion of the 305-m [1,000-ft] distance).

The wetland function indicators were assigned numerical values using best professional judgment guided by data developed for a draft HGM regional guidebook for depressional wetlands in peninsular Florida (Trott et al. 1997). Although regional guidebooks are developed for specific regions and wetland classes (Clairain 2002), the A-Team judged that, based on the low resolution of the wetlands assessment models, the numerical values from the Florida model would be similar to those that would be expected for depressional wetlands in the Legacy Parkway study area. Also, broad wetland classes were used rather than the more specific wetland cover types because the models were too general to capture the differences between cover types.

Study area wetlands judged to have the highest level of wetland function were selected as the reference standards against which all wetland indicators were scaled. Under the HGM approach, reference standards are based on wetlands that have not been subject to long-term anthropogenic disturbance (Smith et al. 1995). However, because wetlands in the Legacy Parkway study area have been subject to long-term disturbance, selection of reference standards was limited to available wetlands (Findlay et al. 2002).

For each wetland in the study area, indicators were assigned and then entered into the models to calculate a functional capacity index (FCI) for five wetland functions. An FCI is a numerical estimate of the ability of a wetland to carry out a specific function. The FCI is not an assessment of the actual level at which the wetland performs the function but an assessment of the relative level of function compared to the reference standards. The FCI is scaled from 0 (no function) to 1 (highest function). Wetland functions were quantified as functional capacity units (FCUs), a measure that incorporates both the size of a wetland and its ability to carry out wetland functions. The FCUs for each wetland function were calculated by multiplying the area of each wetland by each FCI.

In June 2000, the Corps approved the results of the wetlands functional assessment. A discussion of the development and use of indicators and models for the wetlands functional assessment is presented in the *Legacy Parkway Wetland Final HGM Technical Report* (Baseline Data Inc. 2000) and in Appendix B2 of the Final EIS.

## D.2.2 Wetland Functions

For this Supplemental EIS, the lead agencies reviewed the wetlands functional assessment conducted for the Final EIS and all available information pertinent to the nature and function of the wetlands in the study area. This section summarizes information from the Final EIS and provides, as appropriate, general information clarifying the particular functions being described. As described in Section 4.12, *Wetlands*, the Final EIS based all discussion of wetland functions on the three HGM wetland classes listed above (depressional, slope, and lacustrine fringe). The wetland functions were separated according to wetland cover types to provide additional ecological context by which to interpret the analysis.

Wetlands in the study area perform functions in the following three basic categories.

- Hydrology.
- Biogeochemistry.
- Flora and fauna habitat support.

Each of these categories includes specific functions, which are described below. Table D-2, which updates Table 3-29 in the Final EIS, lists specific functions that wetlands perform in the study area and shows how these functions pertain to the three HGM wetland classes. It was not feasible to assess all possible functions that wetlands perform in the study area. Therefore, the analysis in the Final EIS and in this document focuses on those functions that directly or indirectly affect the ecosystem. Other functions, such as the visual enjoyment and recreational value of wetlands are not discussed in this section.

**Table D-2** Wetland Functions

Function	Groundwater Slope	Depressional	Lacustrine Fringe
<u>Hydrology</u>			
Surface Water Detention and Storage	–	+	+
Maintain Wetland Hydrology	+	+	+
Energy Dissipation	–	–	+
<u>Biogeochemistry</u>			
Particulate Retention	–	+	–
Elements/Compounds Retention, Conversion, and Release	+	+	+
Net Organic Compound Accumulation and Element Cycling	+	+	+
Organic Carbon Export	+	–	+
<u>Flora and Fauna Habitat Support</u>			
Maintain Characteristic Vegetation	+	+	+
Maintain Characteristic Invertebrate Food Webs	+	+	+
Maintain Characteristic Vertebrate Habitats	+	+	+
Maintain Landscape-Scale Biodiversity	+	+	+
Maintain Habitat Interspersion and Connectivity	+	+	+
Notes:			
+ carries out function			
– does not carry out function to a substantial degree			

Table D-3 lists the wetland functional capacity units for each HGM wetland class and cover type under existing conditions according to five different functions.

- Function 1: Wetland hydrology maintenance.
- Function 2: Dissolved elements and compounds removal.
- Function 3: Particulate retention.
- Function 4: Habitat structure.
- Function 5: Habitat connectivity, fragmentation, and patchiness.

The FCUs in Table D-3 are numerical representations of the capacity for wetlands in the study area to carry out wetland functions. FCUs provide little information, however, about how wetlands in the study area may function. Therefore, general information describing the five functions listed above and in Table D-3 is presented in the following sections.

This table provides the information on FCUs in this format for convenience only. Because functional capacity measures the degree to which a wetland performs a specific function, the functional capacities of different wetland functions are not equivalent or additive (Smith et al. 1995). FCUs do not represent a “common currency” that can be used to compare functions and impacts between different wetland categories or wetland types (Smith et al. 1995, Brinson and Rheinhardt 1996).

**Table D-3** Wetlands Functional Capacity Units—Existing Conditions

HGM Wetland Class	Wetland Cover Type	Functional Capacity Units				
		Function 1	Function 2	Function 3	Function 4	Function 5
Depressional		0	0	0	0	0
Groundwater Slope	Forested Wetland	0	0	0	0	0
Lacustrine Fringe		0	0	0	0	0
Depressional		0	0	0	0	0
Groundwater Slope	Shrub-Scrub	0	0	0	0	0
Lacustrine Fringe		3	3	3	2	2
Depressional		24	25	27	18	22
Groundwater Slope	Marsh	56	59	55	62	57
Lacustrine Fringe		410	516	410	345	355
Depressional		217	203	229	154	188
Groundwater Slope	Wet Meadow	302	253	277	279	283
Lacustrine Fringe		236	283	236	199	204
Depressional		87	85	95	66	75
Groundwater Slope	Playa	41	32	34	37	39
Lacustrine Fringe		226	231	204	159	183
Depressional		0	0	0	0	0
Groundwater Slope	Unconsolidated Shore	0	0	0	0	0
Lacustrine Fringe		68	83	62	49	53
Depressional	Open Water	4	4	5	3	4

HGM Wetland Class	Wetland Cover Type	Functional Capacity Units				
		Function 1	Function 2	Function 3	Function 4	Function 5
Groundwater Slope		0	0	0	0	0
Lacustrine Fringe		56	93	64	63	57

The occurrence and distribution of wetlands in the study area have been affected by grazing, drainage, irrigation, cropping, and/or urban and industrial development, and wetland functions have been degraded in many of the wetlands. The capacity of these wetlands to carry out wetland functions varies greatly, depending on the land use and proximity to existing large wetland complexes associated with Great Salt Lake, FBWMA, duck clubs, and other naturally occurring wetlands. The majority of wetlands found in agricultural areas are grazed and/or cropped. The more intensely these wetlands are subjected to agricultural activities, the lower their ability to perform their natural functions, including wildlife support. The presence of other development also reduces the ability of wetlands to perform their natural functions.

### **Hydrology**

Wetland hydrology comprises “all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season” (Environmental Laboratory 1987). Hydrology is regarded as the most important category of wetland functions because wetland hydrology is the basis for all wetland functions. Although not all wetland categories provide the same functions or level of function, wetlands in the study area carry out three general hydrologic functions.

- Short- and long-term surface storage.
- Maintenance of wetland hydrology.
- Dissipation of the energy in moving water.

Depressional wetlands provide both short- and long-term surface water storage. This short-term water storage decreases the amount and velocity of runoff, reducing peak floods and distributing storm flows over longer periods. The stored water provides habitat for aquatic organisms and helps maintain the physical and biogeochemical processes. Water stored in wetland basins percolates into the soil or into the groundwater table, which helps maintain the wetland hydrology of both the depressional wetlands and other adjacent wetlands. The surface water storage function of lacustrine fringe wetlands varies with the rise and fall of the water level in Great Salt Lake. Because they are part of a larger lacustrine system, lacustrine fringe wetlands primarily provide long-term surface water storage. However, when lake levels are low, lacustrine fringe wetlands possessing a basin also provide short-term water storage. Because groundwater slope wetlands lack a basin, they have little or no surface water storage function.

Maintenance of wetland hydrology depends on the ability of wetlands to intercept groundwater and surface water. Groundwater slope wetlands are dependent primarily on groundwater. Groundwater recharge in the study area results from precipitation that percolates into the soil. Processes that either reduce the amount of precipitation, such as drought, or increase the tendency for water to run off rather than percolate lower the groundwater table and adversely affect the ability of wetlands to intercept groundwater. Depressional wetlands depend primarily on surface runoff. The amount of precipitation is important, but processes that reduce the amount of runoff or divert the runoff to other locations also affect

the ability of depressional wetlands to intercept surface flows. Lacustrine fringe wetlands are dependent on floodwater from Great Salt Lake, and so maintenance of wetland hydrology is subject to the annual rise and fall of the lake level more than to short-term events. However, during an extended period of drought, when lake levels fall below a level capable of maintaining the wetland hydrology, the ability to intercept groundwater or surface runoff becomes important.

The dissipation of energy in moving water lessens its erosive impact and contributes to reducing downstream particulate loading. This function is provided primarily by vegetated wetlands associated with riverine, lacustrine, and tidal ecosystems. In the study area, lacustrine fringe wetlands vegetated by marsh or wet meadow provide this function, although the ability to carry out this function has been negatively affected by grazing, which removes the vegetation.

### **Function 1: Wetland Hydrology Maintenance**

The FCI for hydrologic functions is an estimate of the ability of the wetlands in the study area to maintain their characteristic wetland hydrology. This function was modeled on two indicators, land use adjacent to the wetlands and the presence of roads and other barriers within the wetlands. Land use affects both the amount of surface runoff that occurs and the amount of groundwater recharge. Decreases or increases in surface runoff attributable to changes in land use can degrade this wetland function. Barriers can prevent the movement of water into, through, or out of a wetland, which can also degrade wetland function by making all or part of the wetland drier or wetter.

In the study area, highly functional wetlands are surrounded by ungrazed rangeland, which has low runoff potential. Other land uses with low runoff potential, such as field crops or improved pasture with rotational grazing, are not expected to substantially alter the amount of surface runoff or groundwater recharge. In contrast, paved roadways and developed areas have high runoff potential, which have adverse effects on both surface runoff and groundwater recharge. Increased runoff adversely affects slope wetlands because it decreases groundwater recharge. In contrast, increased runoff may increase the depth or duration of inundation in depressional wetlands, altering the characteristic vegetation.

Highly functional wetlands also have no barriers to prevent groundwater or surface water from moving freely between all portions of the wetlands. Small modifications to the hydrology, such as unpaved roads or utility easements, are expected to lower the hydrologic functions to a moderate level, whereas extreme modifications, such as four-lane paved roads, large dikes, or large drainage channels, are expected to reduce the hydrologic functions to a low level.

The FCUs that represent how wetlands in the study area maintain wetland hydrology under existing conditions are provided above in Table D-2, and the functional ratings are shown in Figure 3-24a of the Final EIS.

### ***Biogeochemistry***

The biogeochemistry function addresses the ability of wetland ecosystems to transport and transform chemicals. Wetlands remove dissolved substances from water through various mechanisms such as absorption, adsorption, solubilization, oxidation, biological transformation, and precipitation. Wetlands, by definition, are vegetated, and it is the vegetation that is responsible for a wide range of physical and biochemical processes. Vegetation slows the velocity of water, reducing the ability to hold particles in suspension. Growing vegetation removes dissolved nutrients and compounds from the water and soil, often metabolizing them and sometimes sequestering them within plant tissues. Bacteria growing in the soil or in plant roots also break down or alter these substances so that they are removed from the water, either by plants or as a gas. The nutrients and carbon fixed by the plants are cycled through the wetlands

when the plants are eaten by herbivores or when the plants die and decompose. The flow of water through wetlands provides for the efficient movement and distribution of nutrients and energy throughout the entire ecosystem.

Watershed basins that have more wetlands tend to have lower specific conductance (a measure of the total concentration of dissolved substances) and lower concentrations of chloride, lead, inorganic nitrogen, suspended solids, and total and dissolved phosphorus than do watershed basins with fewer wetlands. Also, certain wetland vegetation is adept at removing heavy metals. Wetlands, therefore, improve water quality by removing both dissolved substances and suspended particulates. Two FCIs were generated for biogeochemical functions, one for removal of dissolved elements and compounds, and one for particulate retention.

## **Function 2: Dissolved Elements and Compounds Removal**

The FCI for removal of dissolved elements and compounds is an estimate of the ability of a wetland to removed dissolved substances from water. This function was modeled on two indicators, land use within the wetland and land use adjacent to the wetland. An individual wetland can process only a finite amount of dissolved elements and compounds before the functional capacity is degraded. Existing land use affects both the type and amount of dissolved elements and compounds released into wetlands, and land uses that increase the amount of dissolved elements and compounds are expected to adversely affect wetland function.

In the study area, highly functional wetlands are unaltered and ungrazed. Grazed wetlands have reduced functional capacity due to increased nutrient loading from animal waste and soil disturbance. Farmed wetlands have increased loading of dissolved substances due to use of farm chemicals and from soil disturbance. Both of these activities also change or remove the vegetation, which reduces the wetlands' ability to remove dissolved substances.

In the study area, highly functional wetlands are also surrounded by ungrazed rangeland. As land becomes developed or placed into agriculture, the amount of dissolved materials increases, as does the amount of runoff conveying the dissolved materials. Therefore, wetlands with a greater proportion of the surrounding land under development or agriculture are expected to have a correspondingly lower ability to remove dissolved substances. Different land use types have varying degrees of impact on this functional indicator; for example agriculture and low density development are expected have less effect than high density development or highways.

The FCUs for removal of dissolved elements and compounds by wetlands in the study area under existing conditions are provided in Table D-3, and the functional ratings are shown in Figure 3-24b in the Final EIS.

## **Function 3: Particulate Retention**

The FCI for particulate retention is an estimate of the ability of a wetland to remove particulates from the water column. The presence of vegetation is critical to this function, since it is the reduction in water flow velocity that causes particulates to drop out of suspension. By removing particulates from surface water flows, wetlands function as filters that improve water quality.

Wetlands generally have limited capacity to remove sediments. Unless inflow of particulates, such as sediment, is balanced by outflow, a wetland will eventually lose all wetland functions, including the ability to retain particulates, and become upland. As a result, for this function to be sustainable, a wetland must function in a way that slows the movement of particles through the ecosystem, changing a pulse of particulates (such as follows a rain storm) to a lower level of particulates released gradually over a longer

period of time. In the study area, this function is carried out primarily in marsh and wet meadow in groundwater slope wetlands. Other wetland cover types are less able to carry out this function. Playa wetlands have low vegetation cover and do not have much capacity to carry out this function. In depressional wetlands, water flow is primarily one-way, flowing into the wetland. As a result, they can continue to function as wetlands only under very low levels of particulate inflow.

The models for depressional wetlands and groundwater slope wetlands used two indicators, land use adjacent to the wetland and the presence of roads and other barriers within the wetland. For lacustrine fringe wetlands, where water flows both into and out of the wetland, this function was modeled on three indicators, land use within the wetland, land use adjacent to the wetland, and the presence of roads and other barriers within the wetlands.

Existing land use affects both the type and amount of particulates released into wetlands, and land uses that increase or decrease the amount of particulates are expected to adversely affect wetland function. In the study area, highly functional wetlands are surrounded by ungrazed rangeland. As land becomes developed or placed into agriculture, the amount of particulates suspended in runoff increases, as does the amount of runoff conveying the particulates. Therefore, wetlands with a greater proportion of the surrounding land under development or agriculture are expected to have a correspondingly lower ability to remove particulates. Different land use types have varying degrees of impact on this functional indicator; for example, agriculture and residential development are expected to have less effect than commercial or industrial development.

In the study area, highly functional wetlands are unaltered and ungrazed. Grazed and farmed wetlands have increased loading of particulates due to soil disturbance and vegetation removal. Soil disturbance, in conjunction with vegetation removal, increases the potential for particulate export and erosion. Similarly, in the study area, highly functional wetlands lack internal barriers to water flow. The presence of barriers within a wetland affects the ability for particulates to circulate within a wetland. For example, a barrier within a wetland may cause part of the wetland to infill, and part to erode.

The FCUs for particulate retention by wetlands in the study area under existing conditions are provided in Table D-3, and the functional ratings are shown in Figure 3-24b in the Final EIS.

### ***Flora and Fauna Habitat Support***

Wetlands within the Legacy Parkway study area are located along the eastern edge of the GSLE (See Section 4.0.2, *Great Salt Lake Ecosystem*). This ecosystem is noteworthy because it is the largest inland saline lake in the nation. The wetlands around Great Salt Lake support millions of animals, including more than 250 species of birds, 64 species of mammals, 16 species of reptiles and amphibians, 23 species or subspecies of fish, and a host of diverse invertebrates including flies, mosquitoes, and brine shrimp. Great Salt Lake wetlands are a funneling point for migratory birds using the western half of the continent. Wetlands of Great Salt Lake have been identified in the Western Hemisphere Shorebird Reserve Network as a migratory habitat of hemispheric significance. These wetlands provide not only resting and staging areas for migratory birds, but also breeding and nesting areas for many waterfowl, shorebirds, and amphibians that stay in the area. Section 4.13, *Wildlife*, provides a more detailed discussion of wildlife habitat in the study area.

Wetlands are productive environments that provide diversity in the landscape. The flux of nutrients and energy in wetlands is relatively high because of the high growth rate and rapid turnover of the wetland vegetation. Nutrients and compounds in wetlands are broken down into organic compounds by bacterial action, which provides food for invertebrates. These invertebrates are the foundation of the food web that

supports vast and varied numbers of wildlife species, from shorebirds to amphibians. Wetlands provide habitat where many plants and animals can fulfill one or more life cycle stages.

The ecotone along the eastern shore of Great Salt Lake is a mosaic of slope and depression wetlands and upland habitats. This ecotone provides a large number of niches and habitats for organisms. These characteristics allow wetlands in the study area to provide a diverse array of trophic levels (i.e., feeding levels) within both the wetland and surrounding upland environments. Many species utilize the wetlands for feeding and uplands for nesting. The wetlands are also important to wildlife by virtue of their abundance and the combined functions they serve. Small isolated wetlands also provide value to different species during certain times of the year, such as resting places for migratory shorebirds and waterfowl. Connectivity between the wetlands and surrounding uplands is an important component of the habitat support function of wetlands.

Two FCIs were generated for flora and fauna habitat support functions, one for habitat structure and one for habitat connectivity, fragmentation, and patchiness. The models do not assess the extent to which the wetlands provide habitat or whether the habitat is even utilized by wildlife. Instead, the ability of wetlands to provide habitat for wildlife is assumed, and the models are intended solely to assess the quality of wetland habitat support that presently exists and to evaluate changes over time that can be predicted from landscape-level changes.

#### **Function 4: Habitat Structure**

The FCI for habitat structure is an estimate of the ability of a wetland to maintain characteristic vegetation, invertebrate food webs, and vertebrate habitat. This function was modeled on two indicators, land use within the wetland and land use within the adjacent habitat. The more intensely land use disturbs the landscape, the more the characteristic vegetation can change. In the study area, wetlands that provide the highest level of habitat structure are unaltered and ungrazed. With disturbance from grazing, plowing, or grading, the characteristic vegetation can also be susceptible to invasive species (both native and exotic). When wetlands are farmed or overgrazed so that the existing wetland vegetation is removed from the soil surface, wildlife usage changes. Habitat for some species is diminished because there is insufficient vegetation to provide food, shelter or nesting opportunities. However, in some instances, the removal of vegetation results in open areas used by certain shore birds that frequent Great Salt Lake.

Many of the wetlands in the study area are surrounded by ungrazed rangeland. Life cycles of many wildlife species require both wetlands and uplands for feeding, loafing, nesting, and reproduction. Most of the species that utilize both wetlands and adjacent upland habitats fulfill much of their life cycles within 300 meters (1,000 feet) of the wetland perimeter. Changing land uses adjacent to wetlands alters their function as upland habitat.

The FCUs for habitat structure by wetlands in the study area under existing conditions are provided in Table D-3, and the functional ratings are shown in Figure 3-24c in the Final EIS.

#### **Function 5: Habitat Connectivity, Fragmentation, and Patchiness**

The FCI for habitat connectivity, fragmentation, and patchiness is an estimate of the capability for wildlife movement within a wetland, and between the wetland and adjacent upland habitat. This function was modeled on four indicators, the presence of roads and other barriers within the wetland, land use adjacent to the wetland, the ability of the study area wetlands to maintain their characteristic wetland hydrology (Function 1), and land use within the wetland.

Wetlands in the study area that provide the highest level of capability for wildlife movement within a wetland, and between the wetland and adjacent upland habitat, are unaltered, ungrazed, and surrounded

by ungrazed rangeland. Barriers between the wetlands and the adjacent uplands prevent some species from moving into or out of the wetlands, making them unable to reproduce or compete their life cycle. Animal species such as large mammals, birds, fish and flying insects are less affected by these barriers. Changing land uses adjacent to wetlands, in addition to altering their function as upland habitat, limit the ability of wildlife to move throughout that habitat. Maintaining the characteristic wetland hydrology is important to this function because many of the wetlands in the study area are part of larger wetland complexes that have hydrologic connections. Altering the wetland hydrology of part of a wetland complex may create a barrier that prevents some species from moving between the wetlands. Changing land uses within wetlands, in addition to altering their function as wetland habitat, limits the ability of wildlife to move throughout that habitat.

The FCUs for habitat connectivity, fragmentation, and patchiness by wetlands in the study area under existing conditions are provided in Table D-3, and the functional ratings are shown in Figure 3-24c in the Final EIS.

## **D.3 Environmental Consequences**

As described in the Final EIS, all the build alternatives would affect wetland resources in the study area. Two categories of wetland impacts would take place, direct and indirect, characterized according to which wetland functions are being affected. The Final EIS based all discussion of wetland impacts on the three HGM wetland classes described in Section 4.12.2.1. This section separates wetland impacts according to wetland cover types to provide additional ecological context by which to interpret the analysis.

### **D.3.1 Direct Impacts**

For the initial impact analysis calculations made for the Final EIS, it was assumed that direct impacts associated with the build alternatives would be limited to the area within the proposed action right-of-way and that all the area within the project right-of-way would be directly affected. The impact analysis was carried out by assuming that all wetlands within the project right-of-way would be filled, based on the preliminary design. A separate analysis was carried out for each proposed build alternative.

Fifty-eight wetlands were entirely or partially filled by the initial clearing and grading for the Legacy Parkway or by Legacy-related construction activities associated with the I-15/US-89 interchange in Farmington; the total extent of project-related fill was 19.4 ha (47.9 ac). Five other wetlands were partially filled by construction of temporary access roads in the Legacy Nature Preserve; the total extent of project-related fill in the Preserve was 0.1 ha (0.3 ac). Because these wetlands were filled in conjunction with the Legacy Parkway project, their condition prior to the construction activities was used for assessing baseline conditions.

Table D-4, which updates Table 4-20 in the Final EIS, summarizes the potential direct impacts in terms of the total area affected by each proposed build alternative. Figures 4-14a through 4-14d in the Final EIS show the wetland polygons that would be directly affected by the right-of-way of each build alternative, assuming a 100-m (328-ft) right-of-way.

**Table D-4** Direct Impacts on Wetlands by Wetland Class and Wetland Cover Type (for 100-m [328-ft] Right-of-Way)

Wetland Class	Wetland Cover Type	Area in Hectares (Acres)							
		Alternative A	Alternative B	Alternative C	Alternative D	Alternative A	Alternative B	Alternative C	Alternative D
Depressional		0	(0)	0	(0)	0	(0)	0	(0)
Groundwater Slope	Forested Wetland	0	(0)	0	(0)	0	(0)	0	(0)
Lacustrine Fringe		0	(0)	0	(0)	0	(0)	0	(0)
Depressional		0	(0)	0	(0)	0	(0)	0	(0)
Groundwater Slope	Shrub-Scrub	0	(0)	0	(0)	0	(0)	0	(0)
Lacustrine Fringe		0	(0)	1	(3)	0	(0)	0	(0)
Depressional		1	(2)	2	(4)	1	(2)	1	(3)
Groundwater Slope	Marsh	1	(2)	4	(10)	1	(4)	1	(3)
Lacustrine Fringe		8	(19)	16	(38)	7	(17)	7	(18)
Depressional		17	(43)	15	(38)	17	(42)	17	(42)
Groundwater Slope	Wet Meadow	8	(19)	11	(26)	7	(16)	6	(14)
Lacustrine Fringe		4	(9)	7	(16)	9	(23)	4	(9)
Depressional		2	(5)	4	(10)	6	(14)	5	(12)
Groundwater Slope	Playa	0	(0)	2	(5)	1	(4)	1	(2)
Lacustrine Fringe		1	(2)	2	(5)	6	(14)	2	(4)
Depressional		0	(0)	0	(0)	0	(0)	0	(0)
Groundwater Slope	Unconsolidated Shore	0	(0)	0	(0)	0	(0)	0	(0)
Lacustrine Fringe		0	(0)	6	(15)	5	(13)	0	(0)
Depressional		0	(0)	0	(0)	0	(0)	0	(0)
Groundwater Slope	Open Water	0	(0)	0	(0)	0	(0)	0	(0)
Lacustrine Fringe		3	(7)	7	(16)	0	(0)	3	(7)
Totals*		44	(108)	76	(187)	60	(148)	46	(114)

Note:

\* Includes acreage of wetlands already filled during previous construction activities.

### D.3.2 Indirect Impacts

Indirect impacts are impacts that occur later and impacts that could affect the function of wetlands located outside the project footprint. The impact analysis determined the area of indirect effects on wetlands by assuming that all wetlands within 305 m (1,000 ft) of the right-of-way would be indirectly affected by a proposed build alternative. For the Legacy Parkway project, the distance of 305 m (1,000 ft) was selected based on the draft *Peninsular Florida Herbaceous Depressional Wetlands Hydrogeomorphic (HGM) Regional Guidebook* (Trott et al. 1997) and on other studies (Anderson and Ohmart 1986). The severity of each indirect impact would vary according to the type of effect and the distance from the road (Forman et al. 2003). In general, indirect impacts are greatest adjacent to the road and attenuate with distance. Some impacts, such as the effects of dissolved substances and suspended particles, may be manifested primarily within a few tens of meters of the road in uplands but up to 100 to 300 m (328 to 984 ft) in wetlands. Other indirect impacts may extend for thousands of meters, such as the introduction of invasive exotics or effects on wildlife use and movement through the wetland habitat. Although the effects of some indirect impacts may spread well beyond 305 m (1,000 ft), the strength of indirect effects, on average, was assumed to drop to undetectable levels at 305 m (1,000 ft). A separate analysis was carried out for each alternative. Table D-5 summarizes quantitatively the potential indirect impacts in relation to the total area affected under each proposed alternative.

**Table D-5** Area of Wetlands Indirectly Affected by Legacy Parkway

Wetland Class	Wetland Cover Type	Area in Hectares (Acres)							
		Alternative A		Alternative B		Alternative C		Alternative D	
Depressional		0	(0)	0	(0)	0	(0)	0	(0)
Groundwater Slope	Forested Wetland	0	(0)	0	(0)	0	(0)	0	(0)
Lacustrine Fringe		0	(0)	0	(0)	0	(0)	0	(0)
Depressional		0	(0)	0	(0)	0	(0)	0	(0)
Groundwater Slope	Shrub-Scrub	0	(0)	0	(0)	0	(0)	0	(0)
Lacustrine Fringe		0	(0)	0	(1)	0	(0)	0	(0)
Depressional		5	(12)	6	(14)	4	(10)	8	(20)
Groundwater Slope	Marsh	14	(34)	13	(31)	14	(35)	13	(33)
Lacustrine Fringe		31	(76)	83	(205)	75	(185)	26	(63)
Depressional		43	(106)	66	(163)	51	(126)	45	(112)
Groundwater Slope	Wet Meadow	45	(112)	78	(193)	61	(150)	45	(111)
Lacustrine Fringe		24	(60)	64	(159)	58	(143)	31	(78)
Depressional		17	(42)	22	(55)	17	(41)	13	(32)
Groundwater Slope	Playa	2	(5)	12	(29)	15	(37)	2	(5)
Lacustrine Fringe		5	(12)	21	(52)	28	(70)	9	(23)

Wetland Class	Wetland Cover Type	Area in Hectares (Acres)							
		Alternative A		Alternative B		Alternative C		Alternative D	
Depressional		0	(0)	0	(0)	0	(0)	0	(0)
Groundwater Slope	Unconsolidated Shore	0	(0)	0	(0)	0	(0)	0	(0)
Lacustrine Fringe		11	(27)	24	(60)	25	(61)	19	(47)
Depressional		1	(3)	2	(5)	1	(3)	1	(3)
Groundwater Slope	Open Water	0	(0)	0	(0)	0	(0)	0	(0)
Lacustrine Fringe		20	(48)	18	(44)	18	(46)	19	(47)
Totals		218	(539)	409	(1011)	367	(907)	233	(575)

### D.3.3 Impacts on Wetland Functions

Impacts on wetland functions were quantified using the wetlands functional assessment models developed for the Final EIS (discussed in Section 4.12.1.2). These impacts were determined by using the wetlands functional assessment to calculate the changes in functional capacity index (FCI) for each wetland under both existing and post-build conditions. The change in wetland function was calculated as the difference between pre-build and post-build FCIs. The impact was calculated as the change in wetland function multiplied by the affected area of wetland. All wetland functions would be reduced to zero for wetlands or portions of wetlands that would be directly affected within the right-of-way. For indirect impacts, each wetland function would be reduced in proportion to the distance from the wetland to the right-of-way. This is because the wetlands functional assessment was based on land use change in the area adjacent to the wetland, and the closer the wetland is to the right-of-way, the greater the area that would be affected.

Because wetlands in the study area are connected hydrologically and are functionally integrated as part of a larger wetland ecosystem, adverse effects on one part of a wetland are expected to spread throughout each wetland complex. The wetlands functional assessment models, therefore, determined the change in each function for an entire wetland. Because the indirect impacts were assumed to drop to undetectable levels at 305 m (1,000 ft), only the area within 305 m (1,000 ft) of the right-of-way was included in the impact calculation. The indirect impact was calculated as the change in wetland function multiplied by the area of the wetland within 305 m (1,000 ft) of the project right-of-way.

Impacts on wetland functions were prepared for each wetland category and each wetland cover type and are summarized below by alternative. Tables D-6 to D-10, which update and supplement Tables 4-20 and 4-22 in the Final EIS, present these impacts quantitatively by wetland function. As noted in Section D.2.2, the information on indirect impacts is presented in this format for convenience only. The functional capacities of different wetland functions are not equivalent or additive.

It should be noted that the wetlands functional assessment models did not incorporate proposed measures for project design features to minimize or avoid project impacts, such as placement of culverts to allow surface flows between the east and west sides of the proposed highway. Because the location and efficacy of these features are not known, the models could not account for any reduction in the expected adverse project effects. Therefore, the results of the wetlands functional assessment represent a worst-case

scenario. Additional details of the wetlands functional assessment are presented in the *Legacy Parkway Wetland Final HGM Technical Report* (Baseline Data Inc. 2000) and in Appendix B2 of the Legacy Parkway Final EIS.

**Table D-6** Impacts on Function 1—Maintain Wetland Hydrology

Wetland Classes	Wetland Cover Type	Loss in Functional Capacity Units (FCUs) (Direct/Indirect Impact)			
		Alternative A	Alternative B	Alternative C	Alternative D
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Forested Wetland	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/0	0/0	0/0	0/0
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Shrub-Scrub	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/0	2/1	0/0	0/0
Depressional		1/0	3/1	1/0	1/1
Groundwater Slope	Marsh	0/6	6/5	2/5	1/4
Lacustrine Fringe		6/19	23/63	13/54	5/16
Depressional		32/12	29/19	31/11	30/11
Groundwater Slope	Wet Meadow	11/19	19/50	10/28	8/14
Lacustrine Fringe		3/12	12/53	16/37	4/13
Depressional		2/3	8/7	8/4	6/3
Groundwater Slope	Playa	0/1	4/7	3/9	1/1
Lacustrine Fringe		0/2	3/14	10/16	2/3
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Unconsolidated Shore	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/7	13/15	12/23	0/18
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Open Water	0/0	0/0	0/0	0/0
Lacustrine Fringe		2/4	5/4	0/4	2/4

**Table D-7** Impacts on Function 2—Removal of Dissolved Elements and Compounds

Wetland Class	Wetland Cover Type	Loss in Functional Capacity Units (FCUs) (Direct/Indirect Impact)			
		Alternative A	Alternative B	Alternative C	Alternative D
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Forested Wetland	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/0	0/0	0/0	0/0
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Shrub-Scrub	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/0	2/0	0/0	0/0
Depressional		2/1	3/1	1/1	2/2
Groundwater Slope	Marsh	1/5	6/5	2/3	2/2
Lacustrine Fringe		11/5	30/28	14/28	10/6
Depressional		28/9	26/3	27/12	30/13
Groundwater Slope	Wet Meadow	11/19	18/39	10/12	8/16
Lacustrine Fringe		6/2	14/17	20/9	4/3
Depressional		3/2	7/1	8/3	6/2
Groundwater Slope	Playa	0/1	3/4	2/5	1/1
Lacustrine Fringe		1/0	4/4	13/2	2/1
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Unconsolidated Shore	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/3	13/7	12/15	0/12
Depressional		0/0	0/-1	0/0	0/0
Groundwater Slope	Open Water	0/0	0/0	0/0	0/0
Lacustrine Fringe		4/0	9/0	0/1	4/0

**Table D-8** Impacts on Function 3—Particulate Retention

Wetland Class	Wetland Cover Type	Loss in Functional Capacity Units (FCUs) (Direct/Indirect Impact)			
		Alternative A	Alternative B	Alternative C	Alternative D
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Forested Wetland	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/0	0/0	0/0	0/0
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Shrub-Scrub	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/0	2/0	0/0	0/0
Depressional		1/1	3/0	1/0	1/2
Groundwater Slope	Marsh	0/6	5/4	2/3	1/3
Lacustrine Fringe		8/13	24/47	12/32	7/9
Depressional		31/15	29/6	30/15	30/12
Groundwater Slope	Wet Meadow	10/20	19/43	9/13	8/10
Lacustrine Fringe		4/6	12/36	17/18	5/6
Depressional		2/7	8/4	8/6	6/5
Groundwater Slope	Playa	0/2	3/5	2/4	1/1
Lacustrine Fringe		1/1	3/10	11/7	2/1
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Unconsolidated Shore	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/7	11/10	10/15	0/14
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Open Water	0/0	0/0	0/0	0/0
Lacustrine Fringe		3/0	7/4	0/1	2/0

**Table D-9** Impacts on Function 4—Habitat Structure

Wetland Class	Wetland Cover Type	Loss in Functional Capacity Units (FCUs) (Direct/Indirect Impact)			
		Alternative A	Alternative B	Alternative C	Alternative D
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Forested Wetland	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/0	0/0	0/0	0/0
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Shrub-Scrub	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/0	2/0	0/0	0/0
Depressional		1/1	2/1	1/0	1/2
Groundwater Slope	Marsh	1/5	7/5	2/4	2/3
Lacustrine Fringe		8/-1	21/39	9/27	8/8
Depressional		19/6	19/11	19/7	18/7
Groundwater Slope	Wet Meadow	12/15	19/37	11/18	9/10
Lacustrine Fringe		4/-2	10/27	13/17	4/5
Depressional		2/2	5/2	5/2	4/1
Groundwater Slope	Playa	0/1	3/4	3/5	1/1
Lacustrine Fringe		1/-1	3/8	9/8	2/1
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Unconsolidated Shore	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/0	7/12	7/12	0/9
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Open Water	0/0	0/0	0/0	0/0
Lacustrine Fringe		3/-4	7/1	0/1	3/0

**Table D-10** Impacts on Function 5—Habitat Connectivity, Fragmentation, and Patchiness

Wetland Class	Wetland Cover Type	Loss in Functional Capacity Units (FCUs) (Direct/Indirect Impact)			
		Alternative A	Alternative B	Alternative C	Alternative D
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Forested Wetland	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/0	0/0	0/0	0/0
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Shrub-Scrub	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/0	2/0	0/0	0/0
Depressional		1/2	2/2	1/0	1/2
Groundwater Slope	Marsh	1/6	6/4	2/5	2/4
Lacustrine Fringe		7/7	20/44	10/29	7/9
Depressional		26/15	24/22	25/15	24/15
Groundwater Slope	Wet Meadow	11/20	19/44	10/34	8/16
Lacustrine Fringe		4/2	10/34	14/23	4/8
Depressional		2/4	6/5	6/3	5/3
Groundwater Slope	Playa	0/1	4/7	3/11	1/1
Lacustrine Fringe		1/0	3/9	9/12	2/2
Depressional		0/0	0/0	0/0	0/0
Groundwater Slope	Unconsolidated Shore	0/0	0/0	0/0	0/0
Lacustrine Fringe		0/3	9/10	8/12	0/12
Depressional		0/0	0/1	0/0	0/0
Groundwater Slope	Open Water	0/0	0/0	0/0	0/0
Lacustrine Fringe		2/-1	6/1	0/2	2/1

## **D.4 Mitigation Measures**

Note: In the Final SEIS, the Wetland Technical Appendix will include a discussion of the adequacy of mitigation measures. This discussion is being developed in consultation with the Corps.

### **D.4.1 Credit For Preservation**

To determine the benefits of preservation on wetland functions, the Final EIS calculated preservation credits for each of the alternative preserve concepts by calculating the difference between FCUs under existing conditions and FCUs under the No-Build Alternative (future 2020 conditions). The future conditions No-Build Alternative described in the Final EIS made the assumption that future development could proceed without filling wetlands, but that there would be a substantial loss of wetland functions resulting from development of adjacent uplands. The wetlands functional assessment models were used to predict the level of loss of wetland functions, based on the assumption that at the current rate of development, all the developable uplands in the study area would be developed by 2020. Under the No-Build Alternative, most wetland functions in the preserve areas would be reduced from 30 to 50 percent by indirect impacts by 2020, even if no wetlands were filled. The prevention of this loss of wetland functions represents the preservation benefit offered by the Legacy Nature Preserve.

In the Final EIS, the number of preservation credits counted for mitigation was discounted by one-half because future development would not be expected to occur all at once and would be spread out between the present and the expected 2020 build-out. The net benefit of preservation would be proportional to the pace of development, i.e., the sooner that development would occur, the greater the benefit would be provided by preservation. Assuming that development would proceed at a linear pace, the benefit at any given time would average one-half that which would be expected if all the development were to occur immediately.

### **D.4.2 Credit For Restoration**

As described in the Final EIS, the wetlands functional assessment models were used to analyze the restoration potential of wetlands in the Preserve. Restoration credits were determined by calculating the difference between FCUs under restored conditions and FCUs under existing conditions. The analysis determined that the amount of restoration possible within the mitigation preserve varied among the build alternatives, ranging from an average increase in wetland function of 34 percent for Alternative B to an average increase of 59 percent for Alternative D. The Final EIS recognized that, because some wetlands in the mitigation preserve were within 305 m (1,000 ft) of Legacy Parkway, there would be indirect impacts from the parkway that would reduce the effectiveness of the mitigation measures. Accordingly, the mitigation credits were debited by the amount of FCUs that would be lost due to the influence of the parkway, as determined from the wetlands functional assessment.