Chapter 2: Alternatives

This chapter describes the alternatives that were considered for meeting the purpose of the Mountain View Corridor (MVC) project as described in Chapter 1, Purpose of and Need for Action. This section reviews the alternatives that were eliminated from detailed study, describes the No-Action Alternative and the alternatives that were carried forward for detailed study, and summarizes the advantages and disadvantages of the No-Action and action alternatives.

For this chapter, all discussions of the roadway alternatives refer to the project *without tolls*, except where the discussion specifically says that the alternative is being considered with tolls.

2.1 Alternatives Development Process

The alternatives development process identified and evaluated a full range of alternatives that were brought forward during the National Environmental Policy Act (NEPA) scoping process, identified in previous studies, developed as part of the Envision Utah Growth Choices process (see Chapter 3, Growth Choices), or brought forward during the Environmental Impact Statement (EIS) process. The

Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Utah Department of Transportation (UDOT), and the Utah Transit Authority (UTA) participated in the screening process that evaluated the alternatives. Each alternative was considered and reviewed against the project's purpose and against a set of measures to determine if the alternative would be carried forward for detailed study in the EIS.

In order to be carried forward for detailed study, an alternative needed to meet the purpose of the project (see Table 2.1-1) and be practical or feasible to construct from a technical and economic standpoint. The alternatives development process is summarized below and is detailed in *Technical Memorandum 06, MVC Alternatives Screening Process and Results* (MVC Management Team 2004a), *Mountain View Alternatives Screening Report Addendum* (MVC Management Team 2007a), and *Technical Memorandum 06-7, Evaluation of the Lehi 4800 North Alternative* (MVC Management Team 2008).

Table 2.1-1. Summary of the Project's Purpose

Primary Objectives	Secondary Objectives
Improve regional mobility by reducing roadway congestion	Increase roadway safety
Improve regional mobility by supporting increased transit availability	Support increased bicycle and pedestrian options
	Support local growth objectives

See Section 1.3.1, Purpose of the Project, in Chapter 1 for more details.

Figure 2-1.1, Mountain View Corridor Alternatives Development Process, provides an overview of the MVC alternatives development process. The process took a large number of suggested recommendations and screened and refined them to produce the alternatives that are being studied in detail in this EIS. The alternatives development process described in this chapter consists of the following seven steps:

- Identification of preliminary alternatives
- Level 1 screening
- Level 2 screening
- Alternatives Screening Report (with public and agency input)
- Refinement of the Salt Lake and Utah County alternatives
- Reconsideration of the Utah County alternatives
- Evaluation of alternatives after the release of the Draft EIS

Summary of Alternative Development Travel Demand Modeling

The Wasatch Front Regional Council (WFRC) and the Mountainland Association of Governments (MAG) are designated metropolitan planning organizations that work in partnership with UDOT, UTA, and other stakeholders to develop long-range transportation plans for the communities in their jurisdictions. WFRC and MAG maintain a travel demand model, which is a state-of-the-practice tool that allows transportation analysts to input various land-use and growth scenarios to test road and transit networks with the expected traffic for each scenario.

The WFRC/MAG regional travel demand forecasting model was used to evaluate the transportation effectiveness of the various alternatives. The travel model predicts future travel demand based on land-use, socioeconomic, and transportation system characteristics. The goal of the modeling analysis is to infer from the spatial distribution of population and employment and available transportation facilities the amount, type, and location of travel that residents will undertake.

A single model is maintained for the four-county region covered by WFRC and MAG, with each metropolitan planning organization being responsible for inputs associated with their area. The travel model consists of three elements: the model itself (the scripts, equations, constants, and so on), the input networks (both highway and transit), and the input socioeconomic data.

WFRC and MAG are continually updating and refining the travel model to incorporate new observed data and increased capabilities. For this reason, during the MVC alternatives development process, several versions of the travel demand model were released and used by the MVC project team. Figure 2-1.2, Mountain View Corridor Travel Demand Forecasting Methodology, provides an overview of the travel demand model versions that were used to develop the MVC alternatives and determine whether the alternatives would meet the purpose of the project.

After the release of a new travel demand model version, sensitivity analysis was conducted to determine if the results from the new model version changed the screening results from the previous model version (MVC Management Team 2007b). The sensitivity analysis looked at changes to expected volumes of traffic on the MVC and within the study area. As shown in Figure 2-1.2, the model sensitivity testing was performed for each step in the alternatives development process as a new model version was released.

2.1.1 Identification of Preliminary Alternatives

This section provides an overview of the processes used to identify the following preliminary alternatives:

- Preliminary alternatives identified from previous studies
- Preliminary alternatives identified through public and agency input
- Preliminary alternative identified from development of the Growth Choices "Vision" Scenario (see Chapter 3, Growth Choices)
- Preliminary transit alternatives

2.1.1.1 Preliminary Alternatives Identified from Previous Studies

Early in the alternatives identification process, four recent transportation studies conducted in Salt Lake and Utah Counties within the MVC study area were examined to determine how their conclusions, including recommended and eliminated corridors and alternatives, applied to the MVC project. Table 2.1-2 lists the studies along with the specific recommendations and/or outcomes of each study. The recommendations of these studies were considered in developing the alternatives considered in this EIS.

Table 2.1-2. Recent Transportation Studies

Study	Recommendations and/or Outcomes Related to MVC
Western Transportation Corridor Study, I-80 to Salt Lake/Utah County Line (WFRC 2001)	New freeway from the Utah County line to State Route (SR) 201 running roughly adjacent to the existing utility corridor at 5800 West; widen 5600 West arterial from SR 201 to I-80. Include public transit in the corridor.
North Valley Connectors Study (MAG 2002)	Build three new east-west arterial connections between Redwood Road and I-15: 1900 South, 1000 South, and 2100 North (south, middle, and north connectors, respectively).
Inter-Regional Corridor Alternatives Analysis (Carter-Burgess 2002)	Recommendations are identical to those from the Western Transportation Corridor and North Valley Connectors Studies.
Porter Rockwell Corridor Study (City of Bluffdale 2004)	Build an east-west arterial immediately north of Camp Williams between SR 68 (Redwood Road) and the I-15 frontage road with five lanes and with right-of-way reserved for light rail.

The roadway alternatives considered in these previous studies were evaluated to determine if they would meet the projected traffic in the MVC study area in 2030. For this evaluation, the regional travel demand model (Version 3.2) developed by the metropolitan planning organizations was used. During the

roadway evaluation process, a regional trail system was also considered along with the alternatives.

For the evaluation process, a *freeway* was defined as a high-capacity, high-speed, grade-separated, limited-access facility with interchanges similar to those on Interstate 15 (I-15) and Interstate 215 (I-215). An *arterial* was defined as a surface street with signalized intersections that operates at lower speeds similar to 5600 West and 3500 South in Salt Lake County or State Street in Utah County.

Salt Lake County

Freeway between SR 201 and I-80. Population and employment projections in Salt Lake County have increased since the Western Transportation Corridor Study was completed in 2001. The Western Transportation Corridor Study used data from the 1990 U.S. census, while this EIS used data from the WFRC 2030 projections (WFRC 2003), which were based on the 2000 U.S. census. The use of the more recent demographic data increased the number of expected trips on the proposed Western Transportation Corridor network by an average of 35,000 trips per day (WFRC 2003). Based on these findings, a freeway between State Route (SR) 201 and Interstate 80 (I-80) was considered as a potential alternative. In the Western Transportation Corridor Study, an arterial solution was considered adequate.

7200 West Alignment. During the Western Transportation Corridor Study, an alignment was proposed along 7200 West in Salt Lake County but was rejected. The alignment would have affected property and sensitive facilities owned by the U.S. Navy and ATK Thiokol that were used for national defense and were operated under U.S. Navy regulations.

However, during the EIS alternatives development process, ATK Thiokol staff stated that the sensitive facilities have been moved to other locations and the company no longer opposes further study of a 7200 West alignment. This change resulted in the development of a 7200 West alternative between I-80 and 4700 South.

5800 West/6400 West Corridor Alignment. The Western Transportation Corridor Study proposed a roadway alignment between 4700 South and 7000 South along 5800 West. This alignment was revised during the alternatives development process by moving it about 1 mile west to 6400 West between 4700 South and 7000 South. This revision was made to avoid a power plant and a public golf course (the golf course is a Section 4(f) property; see Chapter 28, Section 4(f) Evaluation). As with the 7200 West alignment, the revised alignment crosses ATK Thiokol property.

Utah County

Revision of Arterials from North Valley Connectors Study. Since the North Valley Connectors Study was completed in 2002, the 2030 population and employment projections for the cities of Eagle Mountain and Saratoga Springs have increased markedly. The North Valley Connectors Study used data from the 1990 U.S. census, which found the northern Utah County population to be 177,250. However, the 2000 U.S. census data indicate that the population in northern Utah County has increased to 265,550, an increase of about 50%.

Further evaluation of the North Valley Connectors Study revealed that the number of lanes projected in the arterial alternatives identified in the study would no longer accommodate the expected increase in traffic volumes. The geographical corridors identified in the study and preserved by Lehi City were still adequate, but the number of lanes proposed for the arterials needed to be increased. This change led to the development of the Utah County alternatives examined in detail in the Level 2 screening process (see Section 2.1.2.2, Alternatives Screening – Level 2).

Extension of Freeway from Salt Lake County into Utah County. The North Valley Connectors Study did not address how a freeway extending from Salt Lake County would transition into Utah County. The regional travel demand model assumed that the freeway being planned in western Salt Lake County would end at the Utah County line. Neither the North Valley Connectors Study nor the Western Transportation Corridor Study discussed whether the proposed freeway in western Salt Lake County would connect to I-15 in Utah County. During the alternatives development process, several alternatives that addressed the need for transportation continuity between Salt Lake County and Utah County were considered.

Preliminary Trail Alternatives

A multi-use trail was included with all freeway alternatives to be consistent with the long-range transportation plans for Salt Lake and Utah Counties. A multi-use trail is consistent with the master plans of local jurisdictions in Salt Lake County, many of which showed a trail system along the Western Transportation Corridor. The multi-use trail would accommodate pedestrians, bicyclists, and equestrians. As part of the EIS process, a trail was also considered in Utah County.

2.1.1.2 Preliminary Alternatives Identified through Public and Agency Input

An extensive outreach program was initiated to receive input from the public and resource agencies on potential issues and alternatives that should be considered during the EIS process. These groups played a major role in identifying the alternatives considered for the MVC project. Chapter 30, Public and Agency Consultation and Coordination, provides an overview of the MVC public and agency involvement program.

The public and resource agencies had many opportunities to provide input during the MVC scoping process. The MVC EIS project team and Envision Utah jointly held a series of scoping meetings and public workshops. FHWA and FTA felt it would be beneficial to conduct the EIS scoping meetings as part of the Growth Choices process (see Section 2.1.1.3, Preliminary Alternative Identified from Development of the Growth Choices "Vision" Scenario) because the process framed the broad growth-related issues facing the region. About 300 people attended a total of six public scoping meetings.

In addition to formal scoping meetings, more than 50 outreach meetings were held with representatives from resource agencies and the municipalities in the MVC study area. During scoping, outreach included minority and low-income (environmental justice) communities such as at the public meeting held at Centro de la Familia in Salt Lake City. A summary of the scoping process and comments received is provided in the *Final MVC EIS Scoping Summary Report* (UDOT 2003).

As a result of the scoping process, about 275 people submitted more than 700 individual comments. These comments were reviewed and combined into more than 300 suggested actions and/or alternatives to be considered in the Level 1 screening process. The following suggested actions and alternatives are representative of the types of comments that were received:

- Extend Bangerter Highway south and to the west of Utah Lake to Nephi.
- Increase bus service in Utah County.
- Extend a new freeway from Salt Lake County into Utah County.
- Build light rail from Utah County to Salt Lake City.
- Make Redwood Road into a freeway.
- Make SR 111 into a freeway.
- Add bicycle and pedestrian trails along the corridor.
- Improve all arterials instead of building new freeways.
- Build commuter rail with bus boulevards connected from Utah County to Salt Lake City.

2.1.1.3 Preliminary Alternative Identified from Development of the Growth Choices "Vision" Scenario

During the scoping phase of the EIS process, UDOT requested that Envision Utah facilitate a process referred to as the Growth Choices Study to help the cities in the MVC study area more fully understand the relationship between land-use policy and transportation choices. The result of the process was the development of a "Vision" scenario which provides a framework for local decisions on growth and development. The Growth Choices process is described in more detail in Chapter 3, Growth Choices.

Growth Choices Vision Scenario

The Growth Choices Vision Scenario incorporated three main elements of local transportation planning: transit, land use, and roadways. Several different transit systems, accompanying land-use types, and roadways were considered, developed, tested, and analyzed as individual alternatives during this process. After comparing these alternatives, the Growth Choices stakeholders (mainly mayors, large land-holders, and several nongovernmental organizations) developed the Vision Scenario which included the following transit elements with supporting land-use changes as part of an overall transit alternative for the Mountain View Corridor:

- A high-capacity transit line on 5600 West from 12600 South to I-80 in Salt Lake County
- A bus rapid transit line on SR 73 in Utah County

The changes in land use developed as part of the Vision Scenario to support transit included many of the same features used in compact developments, such as:

- Larger town centers with employment centers
- Village centers with mixed-use developments
- Transit-oriented development and pedestrian-oriented development principles
- Denser residential development near anticipated transit stations

The Vision Scenario roadway component consisted of a freeway beginning in Utah County at about 2100 North (west of Redwood Road) and continuing north to the Salt Lake County line with a freeway connection to I-15 at Point of the Mountain. South of 2100 North in Utah County, the freeway transitioned to an arterial with three arterial connections to I-15. In Salt Lake County, the freeway continued north along approximately 4800 West, 6400 West, and 5800 West and ended at SR 201.

The Growth Choices process included an agreement in which the signatories agreed to "support the implementation of the Mountain View Vision to coordinate the activities, policies, and investments of state, regional, and local governments." The signatories also agreed that "[the Vision] will provide a flexible and dynamic framework for local decisions on growth and development which in turn support improved mobility and the transportation preferences delineated in the 'Vision Map'" (see Figure 2-2, Growth Choices "Vision" Scenario).

As part of the EIS process, the transit networks developed during the Growth Choices process were optimized to provide better connectivity between some routes as well as to improve general service characteristics. This optimization was intended to complement the modified land-use plans developed as part of the Growth Choices process.

Use of the Growth Choices Process in MVC Alternatives Development

The land-use policies of local jurisdictions can affect the viability of transit. Envision Utah's Growth Choices process encouraged the development of transit alternatives by incorporating the land-use and growth policies that would support transit use and that local jurisdictions were willing to pursue. During the alternatives development phase, the land-use and transit assumptions in the Growth Choices Vision Scenario were included as part of all the alternatives developed. These assumptions are presented in Table 2.1-3.

Table 2.1-3. Regional Model Assumptions

Roadway Alternatives	Roadway Network Used from Other County	Transit Network Background	Demographic (Land Use) Background
All Salt Lake County alternatives	Southern Freeway with 2100 North Alternative	Growth Choices Vision Scenario	Growth Choices Vision Scenario
All Utah County alternatives	5800 West Freeway Alternative	Growth Choices Vision Scenario	Growth Choices Vision Scenario

As shown in Table 2.1-3, the Growth Choices transit network and land-use backgrounds became part of the regional model used to evaluate both the roadway alternatives and the transit alternatives studied in the EIS.

2.1.1.4 Preliminary Transit Alternatives

The following transit types were defined for this EIS:

- **Bus Rapid Transit.** Bus rapid transit refers to a type of bus service that combines the advantages of rail transit with the flexibility of buses. Bus rapid transit can operate on dedicated transit lanes, high-occupancy vehicle lanes, expressways, or ordinary streets. A bus rapid transit system combines Intelligent Transportation Systems technology, signal priority for transit, rapid and convenient fare collection, and integration with land-use policies to substantially upgrade bus system performance.
- **Light-Rail Transit.** Light-rail transit is an urban rail transit system that typically uses a dedicated transit corridor with electrically powered rail cars that run as a single unit or grouped in trains. If light-rail transit runs on city streets using a dedicated transit corridor, pedestrians can easily access light-rail transit stations, and vehicles can easily cross the tracks at intersections.
- **Streetcar.** A streetcar is a rail car that runs on tracks on city streets and is operated as a single unit or grouped in short trains. Streetcars are powered electrically from an overhead electric line by a trolley or pantograph. A streetcar is designed to fit the scale and traffic patterns of the neighborhoods through which it travels and generally operates at lower speeds than light-rail transit due to frequent stops.

The type and location of most transit alternatives, especially high-capacity transit alternatives such as bus rapid transit and rail (light rail or streetcar), depend on the land-use policies of local jurisdictions. The large capital investment needed to construct and operate a high-capacity transit system can be justified only if there are enough residences and/or jobs close to the transit system. In other words, a high-capacity transit system requires dense concentrations of residences and/or jobs.

Envision Utah's Growth Choices process encouraged the development of transit alternatives by incorporating the land-use and growth policies that would support transit use and that local jurisdictions were willing to pursue. Based on these land-use determinations, the transit alternatives developed during the Growth Choices process (a transitway on 5600 West in Salt Lake County and bus rapid transit on SR 73 in Utah County) were further refined to include the potential locations and modes of transit that could reasonably be built.

Preliminary 2030 ridership numbers for the transit alternatives were determined by using the regional travel demand model (Version 3.2). These numbers were

based on daily boarding projections at conceptual (proposed) station locations. The numbers were later used to narrow the number of transit alternatives. In addition, the preliminary transit ridership numbers were used to conceptually determine the beginning and ending points (termini) for the transit improvements included in the Vision Scenario.

During this step in the alternatives identification process, the type of transit on 5600 West in Salt Lake County was not determined. The 5600 West transitway was identified only as a "high-capacity" transit line, or one that could handle large numbers of passengers more efficiently than bus service. For the purpose of obtaining quantifiable ridership data, the transitway was modeled as a streetcar system.

2.1.2 Screening of Alternatives

The alternatives identified during the process described in Section 2.1.1, Identification of Preliminary Alternatives, were evaluated using a two-step screening process that narrowed the many possible alternatives into the alternatives that were studied in detail in this EIS. Level 1 screening examined highway, transit, land use, and geographic alternatives that focused on potential locations within and outside the study area (see Figure 1-1, Mountain View Corridor Study Area Map). Level 1 screening was primarily qualitative. Alternatives that passed Level 1 screening were then evaluated using the Level 2 screening process. Level 2 screening involved an in-depth analysis that was primarily quantitative to identify a range of alternatives to be studied in more detail in the EIS.

Public and Agency Input into the Results of Level 1 and Level 2 Screening. In July and August 2004, the results of Level 1 and Level 2 screening were provided to the public, local officials, and resource agencies. The purpose of informing these groups about the alternatives was to seek input on the alternatives so that they could be refined further. This process included holding nine meetings throughout the study area at which the public could obtain additional information, ask questions, and provide further input into the alternatives development process. In addition, meetings with community councils, local officials, and resource agencies were held to further publicize the screening results and seek input. Information on the screening process and alternatives considered was also made available on the MVC Web site (www.udot.utah.gov/mountainview).

Travel Demand Model Used for the Screening Process. During the alternatives screening process, Version 3.2 of the regional travel demand model was used to evaluate the alternatives. The model was modified to include the transit network

and the land-use, population, and employment forecasts from the Growth Choices Vision Scenario. The countywide population and employment control totals were kept constant, while data for individual traffic analysis zones were shifted to different locations within the study area to support the Growth Choices land use.

2.1.2.1 Alternatives Screening – Level 1

Level 1 Screening Goals

The goal of Level 1 screening was to consistently review the transportation solutions and alternatives from the preliminary identification process and qualitatively assess whether an alternative or portions of an alternative should be eliminated or carried forward to Level 2 screening for further analysis.

Level 1 Screening Process

The transportation solutions and alternatives identified were organized and screened against a broad range of criteria to determine whether each alternative or suggested action should be eliminated. Table 2.1-4 provides the criteria against which solutions and alternatives were screened during Level 1.

Table 2.1-4. Level 1 Screening Criteria

Level 1 Screening Criterion	Description
Demand not warranted (DNW)	The alternative or suggested action does not meet the project's purpose because it is too far from population and employment centers to either meet or support the projected traffic in the study area.
Does not provide sufficient capacity (NSC)	The alternative or suggested action does not provide enough capacity to meet the requirements of the project's purpose.
Separate project in long-range transportation plan (LRTP)	The alternative or suggested action is already a distinct action that is part of a different project listed on either WFRC's or MAG's long-range plan and thus is part of the No-Action Alternative.
Technically or impact prohibitive (TIP)	The alternative or suggested action requires using technology that is not feasible or practical, or the suggestion would clearly cause too many impacts to the natural or built environments.
Does not support local planning policies (NSP)[a]	The alternative or suggested action does not meet the project's purpose because it does not support local economic development and growth objectives as expressed through locally adopted land-use plans, transportation plans, and policies, including the principles reflected in the Growth Choices Vision Scenario.

[a] This criterion was considered in the screening process prior to revising the project's purpose. See Section 2.1.5, Reconsideration of the Utah County Alternatives.

If an alternative or suggested action was not eliminated in Level 1 screening, it was advanced into the Level 2 screening process as a major component of a potential alternative (such as a roadway) or as a secondary detail of a potential alternative (such as transportation demand management strategies).

Level 1 Screening Results

Alternatives or Actions Eliminated. Each suggested action or alternative was assessed during the Level 1 screening process to determine if it (1) was a reasonable alternative, (2) was part of a reasonable alternative, or (3) should be eliminated. Most of the eliminated alternatives were modal concepts, roadway concepts, and transit and technology concepts. Table 2.1-5 summarizes the alternatives or actions that were eliminated.

Table 2.1-5. Level 1 Screening – Alternatives or Actions Eliminated

Modal Concepts Eliminated	Roadway Locations Eliminated	Transit Location and Technology Concepts Eliminated
Land-Use Changes Only – NSC, NSP	Original Western Transportation Corridor (5800 West from 7800 South to 4800 South) – TIP	Bus rapid transit on freeway corridor – NSP
Transit Only – NSC, NSP	North-south freeway along SR 111 – DNW, TIP, NSP	Transitway on 7200 West – NSP[b]
Highway Only – NSP[a]	North-south freeway along Bangerter Highway – DNW, TIP, LRTP, NSP	Transitway on 6400 West – NSP[b]
Transit and Land-Use Changes Only – NSC, NSP	New highway west of Camp Williams to Eagle Mountain – TIP, DNW, NSP	Transitway along SR 111 – NSP[b]
Widen Existing Arterials (No Freeway) – NSC, NSP	New highway west of Utah Lake – DNW	Transitway along Bangerter Highway – NSP, LRTP
Transportation System Management (TSM) and/or Transportation Demand Management (TDM) – NSC, LRTP, NSP	Build causeway/bridge across Utah Lake – DNW, TIP, NSP	Transitway to Magna – LRTP
	Convert Redwood Road to freeway – TIP, NSP	Rail service along I-15 – LRTP
TSM/TDM +Transit + Widen Arterials – NSC, LRTP, NSP	Improve or widen SR 73 – TIP, NSP	Transit service using existing Welby Line from West Jordan to Magna – NSP[b]
TSM/TDM +Transit + Widen Arterials + Land-Use Changes – NSC, LRTP, NSP		East-west light rail in Utah County along SR 73 – DNW, NSP
		Commuter rail – DNW, NSP, LRTP
		Monorail – TIP

DNW = Demand not warranted; NSC = Does not provide sufficient capacity; LRTP = Separate project in long-range transportation plan; TIP = Technically or impact prohibitive; NSP = Does not support local planning policies

[a] Does not support the project purpose of providing a multi-modal solution that includes transit.

[b] The Growth Choices process showed that the optimum location for a transit solution was on 5600 West.

Alternatives or Actions Advanced to Level 2 Screening. As a result of Level 1 screening, 10 roadway alternatives for Utah County and five roadway alternatives for Salt Lake County were advanced to Level 2 screening (see Figure 2-3.1 through Figure 2-3.7, Level 2 Screening Alternatives Considered). In addition, two transit alternatives were carried forward: a bus rapid transit alternative along SR 73 in Utah County and a high-capacity transit system alternative along 5600 West from 12600 South to the Salt Lake City International Airport in Salt Lake County.

2.1.2.2 Alternatives Screening – Level 2

Level 2 Screening Goals

The goal of Level 2 screening was to select a range of alternatives to be studied in detail in the EIS. During Level 2 screening, the alternatives carried forward from Level 1 were analyzed for two purposes: (1) to eliminate alternatives that were unreasonable based on their inability to meet the project's purpose, excessive cost or environmental impacts, or lack of technical feasibility; and (2) to determine whether the large number of potential alternatives could be reduced to a number that would represent the reasonable range of alternatives to be studied in detail.

Level 2 Screening Process

Transit Alternatives. Two transit alternatives from Level 1 screening—the Utah County bus rapid transit alternative on SR 73 and the Salt Lake County transit system along 5600 West—were evaluated in the Level 2 screening process. During Level 2 screening, the 5600 West transit system was further refined through coordination with UTA and FTA. Based on this coordination, two types of transit service are being considered in this EIS for the 5600 West transit system:

- Dedicated right-of-way (transit lane separate from other traffic)
- Mixed traffic (transit lane shared with other traffic)

The 5600 West Transit Alternative is further described in Section 2.1.4.1, Transit Considerations.

The Utah County bus rapid transit alternative on SR 73 was also analyzed in greater detail to evaluate ridership. A demand analysis showed that the ridership numbers for bus rapid transit on SR 73 would be less than 2,000 daily riders in 2030. This analysis included potential ridership from areas west of Lehi including Saratoga Springs and Eagle Mountain. The daily ridership numbers would not support a major transit investment even with the implementation of the

land uses assumed by the Growth Choices Vision Scenario, and therefore the bus rapid transit alternative on SR 73 was eliminated. As a comparison, the threshold for adding a local bus route would be around 1,800 riders per day. In order to support a large capital investment such as bus rapid transit, ridership on a given route needs to be between 5,000 and 6,000 daily riders.

Although a transit line on SR 73 has not been included in the MVC EIS, UDOT in cooperation with UTA and MAG has included bus transit as part of the East-West Connector project. This project is a five-lane, limited-access road in Lehi and Saratoga Springs at about 1000 South that would connect Redwood Road to I-15 at the American Fork interchange and includes accommodation for transit service. Bus transit on the East-West Connector would allow direct access to the proposed UTA commuter rail station (FrontRunner) planned along this road. In addition, the East-West Connector would be designed to accommodate transit, whereas Lehi Main Street has a narrower right-of-way and more traffic signals, which would slow transit service. The proposed FrontRunner would connect Salt Lake City with Provo and would be operational by 2015 (see Section 1.6.4, Transit Network).

Roadway Alternatives. Ten roadway alternatives from Utah County and five roadway alternatives from Salt Lake County were advanced from Level 1 screening to Level 2 screening. The following analysis and refinements for the roadway alternatives in Level 2 screening were used:

- Apply the appropriate background assumptions to all roadway alternatives for the purposes of preliminary traffic modeling and impact assessment (assumptions such as the land-use types in the Growth Choices Vision Scenario and right-of-way dimensions).
- Review additional input from relevant federal, state, and local government agencies, the public, and nongovernmental organizations.
- Compare the alternatives through a quantitative scoring and weighting process, which provides a tool for comparing the alternatives' strengths and weaknesses.
- Conduct modeling to analyze traffic capacity issues on specific segments of some of the roadway alternatives.

To compare the alternatives, a tool called *weighting and scoring* was used. This tool enabled the identification of the following four key screening criteria that were then used to evaluate each alternative:

- **Transportation Performance** – minimize miles of congestion and hours of delay, improve safety and regional freight mobility, and improve level of congestion on other major facilities such as I-15
- **Environmental Impacts** – minimize impacts to the natural environment (wetlands, Agriculture Protection Areas, threatened and endangered species habitat, bald eagle roosts) and the built environment (number of relocations)
- **Compatibility with Local and Regional Plans** – compatibility with existing regional and local land-use plans and transportation plans
- **Cost** – total construction cost based on preliminary estimates

These four key screening criteria were "weighted" so that each criterion's score counted toward a certain percentage of the total score. (For example, the Transportation Performance criterion counted toward 40% of the total score, while the Cost criterion counted toward 10% of the total score.) Similarly, three of the four key criteria were divided into subcriteria, and each subcriterion was weighted so that the subcriterion's score counted toward a certain percentage of the key criterion's score. Table 2.1-6 below shows the relationship between the four key screening criteria and the different subcriteria using the Salt Lake County alternatives as an example. During the weighting and scoring process, the MVC EIS Team was able to answer a number of "what if" questions by adjusting the weighting and scoring numbers. This enabled the MVC EIS Team to determine the most desirable or undesirable aspect of each alternative.

Table 2.1-6. Level 2 Roadway Screening Criteria and Subcriteria Weighting

Key Criteria / Subcriteria		Percent Weighting for Subcriteria	Percent Weighting for Key Criteria
Transportation Performance			**40%**
Minimizes miles of north-south traffic congestion in study area (V/C>1)[a]		30%	
Minimizes miles of east-west traffic congestion in study area (V/C>1)		15%	
Minimizes delay in study area (hours)		15%	
Safety (potential for reducing traffic accidents)		5%	
Regional freight mobility		5%	
Level of congestion on other facilities		30%	
I-15	5%		
Bangerter Highway	5%		
SR 201	25%		
I-215	10%		
SR 111	10%		
5600 West	35%		
4800 West	10%		
Subtotal for level of congestion on other facilities	100%		
Subtotal of Transportation Performance subcriteria		100%	
Environmental Impacts			**30%**
Minimizes wetlands affected (acres)		50%	
Minimizes Agriculture Protection Areas affected (acres)		5%	
Minimizes impact to habitat acres for Ute ladies'-tresses and bald eagle roosting sites		10%	
Minimizes relocations		35%	
Subtotal of Environmental Impacts subcriteria		100%	
Compatibility with Local and Regional Plans			**20%**
Compatible with adopted existing local land-use and transportation plans		25%	
Compatible with (assessed) "vision" of land-use and transportation plans		50%	
Compatible with existing regional (metropolitan planning organization) plans		25%	
Subtotal of Compatibility with Local and Regional Plans subcriteria		100%	
Cost			**10%**
Minimizes total aggregated cost of construction, right-of-way, engineering, and mitigation		100%	
Total weighting for the four key criteria			**100%**

[a] V/C = volume-to-capacity ratio, which is a measurement of traffic congestion levels. A V/C ratio greater than 1 indicates severe congestion. For more information, see Section 8.3.2.1, Roadway Systems.

Level 2 Screening Results

Salt Lake County Level 2 Results. Based on the Level 2 analyses, four Salt Lake County alternatives were carried forward for further refinement. The reasons for selecting these alternatives are explained below in Table 2.1-7 and shown in Figure 2-3.8, Level 2 Screening Results – Salt Lake County.

Utah County Level 2 Results. Utah County travel demand modeling indicates that a north-south freeway combined with one or more east-west freeways and/or arterials would satisfy the projected demand in this part of the MVC study area. Accordingly, the Utah County alternatives all consist of a freeway that extends south from Salt Lake County with one or more east-west freeways or arterials.

The alternatives advanced from Level 1 screening represent 10 potential combinations of different freeway alignments and associated east-west freeway and arterial connections and improvements. Based on the Level 2 analyses, four Utah County alternatives were carried forward for further refinement. The reasons for selecting these alternatives are explained below in Table 2.1-8 and shown in Figure 2-3.9, Level 2 Screening Results – Utah County.

Table 2.1-7. Level 2 Screening Results – Salt Lake County Roadway Alternatives

Alt.	Description	Key Findings in Level 2	Results of Level 2 Screening
SL-1	Arterial on 5600 West from I-80 to SR 201. Freeway on 5800 West between SR 201 and 5400 South. Freeway on 4800/6400 West between 5400 South and Utah County.	Microsimulation modeling showed that this alternative would not provide sufficient capacity to meet the project's purpose. Specifically, the modeling showed that ending the freeway at SR 201 and forcing freeway traffic onto the existing arterial on 5600 West (1) would cause substantial delays on 5600 West north *and* south of SR 201, (2) would cause substantial backups on I-80 as travelers attempted to exit onto 5600 West, and (3) could require widening 5600 West to seven lanes south of SR 201.	Eliminated.
SL-2	Arterial on 7200 West from I-80 to SR 201. Freeway on 7200 West between SR 201 and 5400 South. Freeway on 4800/6400 West between 5400 South and Utah County.	Microsimulation modeling showed that this alternative would provide sufficient capacity to meet the project's purpose. This alternative has a more negative impact on 5600 West than any other Salt Lake County alternative; however, this was not considered a reason to eliminate it from consideration at this point.	Advanced to Draft EIS as part of 7200 West Arterial/Freeway Alternative.
SL-3	Freeway on 5600 West from I-80 to SR 201. Freeway on 5800 West between SR 201 and 5400 South. Freeway on 4800/6400 West between 5400 South and Utah County.	This alternative provided sufficient capacity to meet the project's purpose. However, it involved replacing the existing 5600 West arterial north of SR 201 with a freeway. Converting this existing arterial to a freeway would displace a number of businesses and would be inconsistent with existing Salt Lake City land-use plans.	Advanced to Draft EIS as part of 5600 West Freeway Alternative.
SL-4	Freeway on 5800 West from I-80 to SR 201. Freeway on 5800 West between SR 201 and 5400 South. Freeway on 4800/6400 West between 5400 South and Utah County.	This alternative provided sufficient capacity to meet the project's purpose. There are more wetland impacts from this alternative than from Alternative SL-3.	Advanced to Draft EIS as part of 5800 West Freeway Alternative.
SL-5	Freeway on 7200 West from I-80 to SR 201. Freeway on 7200 West between SR 201 and 5400 South. Freeway on 4800/6400 West between 5400 South and Utah County.	This alternative provided sufficient capacity to meet the project's purpose and has significant advantages over alternatives on 5800 West or 5600 West, including fewer relocations. The primary disadvantage of this alternative is that it has higher wetland impacts than the alternatives that use 5800 West or 5600 West. The agency with permitting authority over wetlands—the U.S. Army Corps of Engineers—has raised concerns about whether this alternative is permittable. The ability to obtain a permit for this alternative will depend on whether there are other practicable alternatives with lower impacts to wetlands and other aquatic resources. Additional engineering and environmental analysis is needed to resolve that issue.	Advanced to Draft EIS as the 7200 West Freeway Alternative.

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Table 2.1-8. Level 2 Screening Results – Utah County Roadway Alternatives

Alt.	Description[a]	Key Findings in Level 2	Results of Level 2 Screening
UT-1	Freeway connection to I-15 at Pleasant Grove; follows 1900 South alignment. East-west arterials: • 2100 North – 6-lane arterial • 1000 South – 4-lane arterial • 1900 South – used for new freeway • Porter Rockwell – 5 lanes per LRTP	This alternative provides sufficient capacity to meet the project's purpose. However, the 1900 South Alignment aspect of this alternative has substantially higher wetland impacts than other similar alternatives, making it unlikely that the Army Corps of Engineers would be able to issue a permit for this alternative.	Eliminated as a stand-alone alternative. Elements carried forward in other alternatives.
UT-1a	Freeway connection to I-15 at Pleasant Grove; follows 1900 South and power corridor alignments. Freeway connection at Porter Rockwell Boulevard (instead of arterial). East-west arterials: • 2100 North – local road per LRTP • 1000 South – local road per LRTP • 1900 South – local road per LRTP • Porter Rockwell – used for freeway	This alternative provides sufficient capacity to meet the project's purpose. It was developed as a hybrid of UT-1, UT-2, and UT-3. It has similar benefits as but much lower wetland impacts than UT-1, UT-2, and UT-3. Among the three alternatives (1a, 1b, and 1c) that use the hybrid alignment to connect to I-15 at Pleasant Grove, this alternative has the worst impact to I-15.	Eliminated as a stand-alone alternative. Elements carried forward in other alternatives.
UT-1b	Freeway connection to I-15 at Pleasant Grove; follows 1900 South and power corridor alignments. East-west arterials: • 2100 North – 7-lane arterial • 1000 South – local road per LRTP • 1900 South – local road per LRTP • Porter Rockwell – 5 lanes per LRTP	This alternative provides sufficient capacity to meet the project's purpose. It was developed as a hybrid of UT-1, UT-2, and UT-3. It has similar benefits as but much lower wetland impacts than UT-1, UT-2, and UT-3.	Advanced as part of the Southern Freeway with 2100 North Arterial Alternative.
UT-1c	Freeway connection to I-15 at Pleasant Grove; follows 1900 South and power corridor alignments. East-west arterials: • 2100 North – local road per LRTP • 1000 South – local road per LRTP • 1900 South – local road per LRTP • Porter Rockwell – 7-lane arterial	This alternative provides sufficient capacity to meet the project's purpose. It was developed as a hybrid of UT-1, UT-2, and UT-3. It has similar benefits as but much lower wetland impacts than UT-1, UT-2 and UT-3.	Advanced as part of the Southern Freeway with Porter Rockwell Alternative.

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Alt.	Description[a]	Key Findings in Level 2	Results of Level 2 Screening
UT-2	Freeway connection to I-15 at Pleasant Grove; follows power corridor alignment. East-west arterials: • 2100 North – 6-lane arterial • 1000 South – 4-lane arterial • 1900 South – 6-lane arterial • Porter Rockwell – 5 lanes per LRTP	This alternative provides sufficient capacity to meet the project's purpose. However, it has substantially higher wetlands impacts than other similar alternatives, making it unlikely that the Army Corps of Engineers would be able to issue a permit for this alternative. This alternative also has the highest displacements, by far, of any Utah County alternative.	Eliminated as a stand-alone alternative. Elements carried forward in other alternatives.
UT-3	Freeway connection to I-15 at Main Street interchange in American Fork. East-west arterials: • 2100 North – 6-lane arterial • 1000 South – used for freeway • 1900 South – 4-lane arterial • Porter Rockwell – 5 lanes per LRTP	This alternative provides sufficient capacity to meet the project's purpose. However, it has substantially higher wetland impacts than other similar alternatives, making it unlikely that the Army Corps of Engineers would be able to issue a permit for this alternative. This alternative also has low compatibility with local and regional plans.	Eliminated as a stand-alone alternative. Elements carried forward in other alternatives.
UT-4	Freeway connection to I-15 at 2100 North. East-west arterials: • 2100 North – used for freeway • 1000 South – 6-lane arterial from I-15 to central Lehi, then 4 lanes to SR 73 • 1900 South – 6-lane arterial • Porter Rockwell – 5 lanes per LRTP	This alternative provides sufficient capacity to meet the project's purpose. However, the freeway through Lehi at 2100 North, combined with the widening of 1000 South to six lanes, imposes severe impacts on Lehi and is highly inconsistent with local plans (see Section 2.1.5, Reconsideration of the Utah County Alternatives).	Eliminated as a stand-alone alternative. Elements carried forward in other alternatives.
UT-5	Freeway transitions to expressway between 2100 North and SR 73; no freeway connection provided to I-15. East-west arterials: • 2100 North – 6-lane arterial • 1000 South – 6-lane arterial from I-15 to central Lehi, then 4 lanes to SR 73 • 1900 South – 6-lane arterial • Porter Rockwell – 5 lanes per LRTP	This alternative provides sufficient capacity to meet the project's purpose, although at a lower level than alternatives that provide a direct freeway connection to I-15. Its wetland impacts are comparable to those of other alternatives. Also, this alternative is compatible with the existing long-range transportation plan.	Advanced for detailed study in the Draft EIS as the Arterials Alternative.

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Alt.	Description[a]	Key Findings in Level 2	Results of Level 2 Screening
UT-6	Freeway transitions to expressway between 2100 North and SR 73; freeway connection to I-15 provided at Point of the Mountain. East-west arterials: • 2100 North – 4-lane arterial • 1000 South – 6-lane arterial from I-15 to central Lehi, then 4 lanes to SR 73 • 1900 South – 6-lane arterial • Porter Rockwell – 5 lanes per LRTP	This alternative provides sufficient capacity to meet the project's purpose. However, the Level 2 screening analysis indicated that providing a freeway connection to I-15 at Point of the Mountain would be costly and would present engineering difficulties. In addition, traffic modeling indicated that this alternative would produce the lowest level of congestion relief of any of the Utah County alternatives.	Eliminated as a stand-alone alternative. Elements carried forward in other alternatives.
UT-7	Freeway transitions to expressway between 2100 North and SR 73; freeway connection to I-15 provided at Porter Rockwell Boulevard. East-west arterials: 2100 North – 4-lane arterial 1000 South – 4-lane arterial 1900 South – 6-lane arterial Porter Rockwell – freeway to I-15	This alternative provides sufficient capacity to meet the project's purpose. Its wetland impacts are relatively low. It avoids construction of a freeway through Lehi.	Advanced for detailed study in the Draft EIS as the Northern Freeway Alternative.

[a] The LRTP referred to in this table is MAG's long-range transportation plan (MAG 2003).

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2.1.2.3 Conclusion of Screening

Based on the Level 1 and Level 2 screening analyses, four alternatives in Salt Lake County and four alternatives in Utah County were carried forward for further refinement as summarized in Table 2.1-9 below. All of the Salt Lake County alternatives include a transitway on 5600 West with either a dedicated right-of-way (transit lane separate from other traffic) or a mixed-traffic right-of-way (transit lane shared with other traffic).

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Table 2.1-9. Results of Screening

Alternative	Description of Alternative	
	Transit Component	Roadway Component
Salt Lake County Alternatives		
7200 West Arterial/Freeway with 5600 West Transit Alternative	5600 West transitway with dedicated right-of-way or mixed-use right-of-way	6-lane arterial from I-80 to SR 201; freeway on 7200 West between SR 201 and 5400 South; freeway on 4800/6400 West from 5400 South to Utah County line.
7200 West Freeway with 5600 West Transit Alternative	Same as above	Freeway on 7200 West from I-80 to SR 201; freeway on 7200 West between SR 201 and 5400 South; freeway on 4800/6400 West from 5400 South to Utah County line.
5800 West Freeway with 5600 West Transit Alternative	Same as above	Freeway on 5800 West from I-80 to SR 201; freeway on 5800 West between SR 201 and 5400 South; freeway on 4800/6400 West from 5400 South to Utah County line.
5600 West Freeway with 5600 West Transit Alternative	Same as above	Freeway on 5600 West from I-80 to SR 201; freeway on 5800 West between SR 201 and 5400 South; freeway on 4800/6400 West from 5400 South to Utah County line.
Utah County Alternatives		
Southern Freeway with 2100 North Arterial Alternative	Park-and-pool lots[a]	Freeway from Salt Lake County continues west of Redwood Road and connects to I-15 at Pleasant Grove; follows 1500 South and power corridor alignments. East-west arterials: • 2100 North – 7-lane arterial
Southern Freeway with Porter Rockwell Boulevard Arterial Alternative	Park-and-pool lots[a]	Freeway from Salt Lake County continues west of Redwood Road and connects to I-15 at Pleasant Grove; follows 1500 South and power corridor alignments. East-west arterials: • Porter Rockwell Boulevard – 7-lane arterial
Arterials Alternative	Park-and-pool lots[a]	Freeway from Salt Lake County west of Redwood Road transitions to expressway between 2100 North and SR 73; no freeway connection provided to I-15. East-west arterials: • Porter Rockwell – 7-lane arterial • 2100 North – 6-lane arterial • SR 73 (1000 South) – 7-lane arterial from I-15 to 10400 West, then 7 lanes to MVC • 1900 South – 7-lane arterial
Northern Freeway Alternative	Park-and-pool lots[a]	Freeway from Salt Lake County west of Redwood Road transitions to expressway between 2100 North and SR 73; freeway connection to I-15 provided by Porter Rockwell Boulevard (6 lanes). East-west arterials: • 2100 North – 7-lane arterial • SR 73 (1000 South) – 7-lane arterial from I-15 to 10400 West, then 7 lanes to MVC • 1900 South – 7-lane arterial

[a] Although no transit service is planned as part of the MVC project for the Utah County alternatives other than park-and-pool lots, UTA, UDOT, MAG, and local municipalities would continue to implement transit service as defined in the MAG regional transportation plan (MAG 2007b). This service would include a bus transit line as part of the East-West Connector project (Lehi 1000 South). Park-and-pool lots are typically smaller than park-and-ride lots and are intended exclusively for motorists to form carpools and vanpools.

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2.1.3 Alternatives Screening Report

Following the conclusion of the MVC Level 1 and Level 2 screening processes, the MVC Alternatives Screening Report was released to the public and agencies. The report was released in order to receive early input on the eight alternatives being considered for detailed study. The report provided a summary of the process that was used to identify a comprehensive list of preliminary alternatives, the Level 1 and Level 2 screening processes, the eight alternatives that advanced through the screening process to be considered in more detail, and the No-Action Alternative (see Section 2.2.1, No-Action Alternative).

An overview of the MVC screening process was provided to the resource agencies on April 13, 2004, and the results of screening were reviewed during a meeting on May 6, 2004. The Alternatives Screening Report was provided to key agencies on July 9, 2004, before its release to the public. The general public received this information during the alternatives "roll-out" which began on July 12, 2004. The comment period for the Alternatives Screening Report ended August 31, 2004.

2.1.3.1 Public Involvement Activities

The following strategies were developed to receive input on the Alternatives Screening Report:

- Notify stakeholder groups and the general public of selected conceptual alternatives.
- Give access to information about the development of alternatives.
- Provide feedback opportunities.
- Increase the general public's awareness of the project.

The main method for informing the public about the Level 2 alternatives was a series of meetings held in the neighborhoods that would be most affected by the project. Before each meeting, flyers were hand-delivered in each neighborhood to notify the public of the upcoming meeting. In addition, newspaper stories appeared in regional and local newspapers. The meetings were held in convenient locations, typically supermarket and school parking lots. At the meetings, an overview of the screening process was provided and questions were answered. The public was invited to leave comments in writing, mail them in, or submit them through the MVC Web site. Copies of the Alternatives Screening Report were also made available on the Internet and in local libraries. See Chapter 30, Public and Agency Consultation and Coordination, for a complete description of the activities and tools used to support the four public involvement strategies listed above.

2.1.3.2 Summary of Public Comments

Public input increased when the final eight Level 2 alternatives were presented in July 2004. Nearly 1,000 comments were received during the public comment period. In Salt Lake County, more than one-third of the commenters were concerned about right-of-way issues including property acquisition, neighborhood disruption, and potential relocations. Although an alignment on SR 111 had been eliminated during the MVC screening process, many comments were received that supported building the freeway on this existing state route. The public felt that such an alignment would have less impact on existing communities and would also serve regional travel demand as well as the 7200 West alternatives.

In Utah County, residents were primarily concerned about the amount of time before they would experience relief from traffic congestion. A high percentage indicated support for the Southern Freeway Alternative and did not support the Arterials Alternative.

2.1.3.3 Summary of Agency Comments

The U.S. Environmental Protection Agency (EPA) provided comments on the Alternatives Screening Report in an e-mail in June 2006. The comments asked the MVC EIS Team to clarify which environmental resources were considered in the Growth Choices process (see Chapter 3, Growth Choices), how the screening criteria were used to eliminate alternatives or carry them forward for detailed study, and how consideration for identifying the "Least Environmentally Damaging Practicable Alternative" with regard to wetlands factored into the screening process. EPA also suggested that supporting local growth objectives should not be used as a criterion for screening alternatives. No other agency comments were received.

2.1.3.4 Comment Consideration

Comments received from resource agencies, city staff members, and the general public after Level 2 screening contributed to the further refinement of the eight Level 2 alternatives. Agencies helped identify wetlands that should be avoided as well as other natural resources and historic structures. Alternative alignments were adjusted to minimize impacts to resources identified by the resource agencies.

City staff members participated in a series of workshops to identify interchange locations, park-and-ride lot locations, and other design elements for use in the conceptual design. Individual meetings with city staff were held as needed to resolve interchange functionality, prioritization of historic structures and public

spaces (Section 4(f) properties), and treatment of cross streets. The design team addressed local plans and desires in the conceptual design where possible.

Public comments also played a role in the development and refinement of alternative concepts. A number of comments suggested that the team take another look at SR 111 as an alternative alignment. With an updated model and revised population and employment data from the Governor's Office of Planning and Budget, an alignment on SR 111 was reconsidered.

2.1.3.5 Re-evaluation of the SR 111 Freeway Alternative

Because a high number of public comments recommended that the SR 111 Freeway Alternative (which was eliminated during Level 1 screening) should be re-evaluated, an additional analysis of this alternative was performed.

Travel Demand

To further evaluate the SR 111 Freeway Alternative, a revised travel demand model run (Version 4.2) was conducted to verify the initial analysis conducted under Level 1 screening. The revised travel demand modeling found that the SR 111 Freeway Alternative would attract 18% fewer trips than the 7200 West Freeway Alternative and 25% fewer trips than the 5800 West Freeway Alternative because the SR 111 Freeway Alternative is farther west in the study area and thus out of direction for motorists traveling from the study area northeast toward Salt Lake City. One of the main needs of the MVC project is to reduce congestion on north-south surface streets in the study area. The SR 111 Freeway Alternative would result in 7% more daily traffic on north-south surface streets compared to the 7200 West Freeway Alternative and 12% more than the 5800 West Freeway Alternative.

Relocations, Historic Buildings, and Wetlands

Table 2.1-10 below provides an overview of the impacts from the SR 111 Freeway Alternative compared to other Level 2 alternatives in Salt Lake County.

The SR 111 Freeway Alternative would have the highest number of relocations—25 more than the 7200 West alternatives. An alignment east or west of SR 111 would also go through residential areas and would require about the same number of relocations that would be required for an alignment on existing SR 111 because of the frontage road that would be required to provide local access.

Table 2.1-10. Comparison of Impacts from the SR 111 Alternatives and Other Alternatives

Resource	SR 111 Freeway	SR 111 Arterial[a]	7200 W. Freeway	7200 W. Arterial	5800 W. Freeway	5600 W. Freeway
Relocations[b]	325	323	300	300	227	229
Historic buildings[c]	170	170	15	15	20	20
Wetlands	45	24	44	20	34	35

[a] SR 111 arterial north of SR 201. Right-of-way width of 150 feet.

[b] Includes both residential and business relocations.

[c] Impacts to historic buildings were based on the *SR 111 Cultural Resource Reconnaissance Technical Memorandum* (SWCA 2005).

An alternative on SR 111 would have substantially higher impacts to historic buildings (between 150 and 155 more) compared to the other alternatives. The historic buildings would also be considered Section 4(f) properties under FHWA regulations (see Chapter 28, Section 4(f) Evaluation). Because there are other MVC alternatives that would use fewer 4(f) resources and result in less overall harm from the perspective of preservation of historic properties, the SR 111 Freeway Alternative would not be approved under 4(f) regulations.

In addition to an alignment on SR 111, alignments farther west and east of SR 111 were also investigated. West of SR 111, the town of Magna contains 845 historic buildings and a community park that is a documented historic site. Therefore, an alignment west of SR 111 in Magna would likely result in greater impacts to historic structures. East of SR 111, there is a large number of potentially historic residences (built before 1963) along the east-west corridors of 2700 South, 2820 South, 3100 South, and 3500 South and also along the north-south corridor of 8000 West north of 3500 South. A review of these corridors using maps and aerial photographs indicated that about 140 potential historic properties are present in these areas. Additionally, the review indicated that more historic agricultural properties are intact in the area between 7200 West and 8000 West than are intact either east of 7200 West or west of SR 111. For the above analysis, 1963 was used as the year for defining historic architectural properties because the buildings would likely be about 50 years old at the time the MVC is constructed. Fifty years is the age at which architectural properties are initially considered historic.

The wetland impacts from the SR 111 Freeway Alternative would be similar to the impacts from the other alternatives evaluated.

Planning Considerations

A freeway on SR 111 has been considered in various planning documents since 1997. In the 5600 West/Jordan Narrows Area Transportation Corridor Major Investment Study (WFRC 1997), a freeway on SR 111 was considered but eliminated because it was determined to be too far west to serve north-south demand and would generate too much out-of-direction travel.

The Western Transportation Corridor Study also considered SR 111 as a potential option for addressing north-south travel demand (WFRC 2001). The analysis determined that a freeway on SR 111 would have the least amount of reduction in future traffic on the local network compared to alternatives on 5600 West and 7200 West.

As part of the Western Transportation Corridor study, a freeway spacing analysis was also conducted. The purpose of the analysis was to determine the best location for a freeway west of I-215. The analysis concluded that a new highway should optimally be placed between 5700 West and 6000 West, although a highway within 0.5 mile of this location could also be justified. SR 111 is about 5 miles west of this corridor.

During the Growth Choices process, the local communities did not support a freeway on SR 111 because it did not provide enough reduction in future traffic in the study area compared to the 5800 West Freeway Alternative. However, the local communities did support widening SR 111 from two to four lanes. This potential widening of SR 111 was provided to WFRC to consider in the long-range transportation plan. The WFRC 2030 long-range transportation plan, which was prepared prior to the Growth Choices process, shows SR 111 being widened to between four and six lanes between SR 201 and 11800 South in the period between 2023 and 2030 (WFRC 2003).

Conclusion

After a review of additional data for the SR 111 Freeway Alternative, it was decided to eliminate the alternative from further study. The decision was based on the fact that the alternative would provide the least reduction in north-south traffic in the study area, would require more relocations, and would affect substantially more historic homes (Section 4(f) properties) than the other alternatives evaluated in Table 2.1-10 above, Comparison of Impacts from the SR 111 Alternatives and Other Alternatives. In addition, as a result of the high number of impacts to historic buildings, the alternative is not likely to be approved under Section 4(f) regulations.

Alignments west and east of SR 111 were also reviewed but were eliminated from consideration because of the high number of historic sites in the Magna area and between SR 111 and 7200 West. The evaluation also considered planning studies conducted apart from the MVC EIS process which concluded that SR 111 was too far west to serve the majority of north-south travel demand in western Salt Lake County.

2.1.4 Refinement of Alternatives

This section provides an overview of how the alternatives from the screening process were further refined. The refinement process consisted of performing a more detailed evaluation of each alternative by conducting preliminary engineering. As part of the preliminary engineering process, additional travel demand modeling was conducted, preliminary cost estimates were developed, and environmental resources were considered. The refinement process was completed after screening to ensure that the alternatives that made it through the screening process should be carried forward for detailed study based on cost, design, impacts to the natural and human environments, and travel demand.

During the alternatives refinement process, Version 4.2 of the regional travel demand model was used to further evaluate the alternatives (Version 3.2 had been used during the screening process). The primary difference between Version 3.2 and Version 4.2 is in how the model assigns trips longer than 10 miles to the roadway network. Version 3.2 assigned these long trips based on distance, while Version 4.2 uses both travel time and distance to assign these trips.

Several months after Version 4.2 was released, the Governor's Office of Planning and Budget released a new 2030 population and employment forecast for the state. These new values were divided among the traffic analysis zones, adjusted to reflect the population and employment distribution in the Growth Choices scenario while maintaining the same overall forecast totals, and incorporated into Version 4.2. As with Version 3.2, the model included the transit network that was part of the Growth Choices Vision Scenario. Table 2.1-11 below shows the model versions and the population and employment forecasts that were used during the alternatives development process.

Table 2.1-11. Model Versions and Projections Used for Alternatives Development

Parameter	Screening Process	SR 111 Freeway Alternative Analysis	Alternatives Refinement Process
Model version	3.2	4.2	4.2
Population and employment forecasts	Original Growth Choices forecasts	Original Growth Choices forecasts	February 2005 Growth Choices forecasts

As a result of changes to the model between Version 3.2 and Version 4.2, an additional evaluation (sensitivity testing) was conducted to determine whether the alternatives eliminated during the screening process using model Version 3.2 should be carried forward into the refinement process as a result of the new population numbers in model Version 4.2 (MVC Management Team 2007b). For example, an analysis of bus rapid transit on SR 73 was conducted using the higher population numbers from Version 4.2. The analysis found that the expected number of daily riders in 2030 evaluated during the screening process (less than 2,000 daily riders) would not increase enough to support a typical bus rapid transit route of 5,000 to 6,000 daily riders; therefore, the alternative was (again) not carried forward for detailed study.

The only alternative that warranted further study based on model changes from Version 3.2 to Version 4.2 was the SR 111 Freeway Alternative. This alternative was evaluated in more detail during the refinement process but was (again) eliminated from detailed study (see the section titled Re-evaluation of the SR 111 Freeway Alternative on page 2-27).

2.1.4.1 Transit Considerations

Two transit options for 5600 West in Salt Lake County were carried forward for detailed study: a dedicated right-of-way option and a mixed-traffic option. The following sections summarize the considerations used to refine the transit options.

Type of Transit

Various transit types could be appropriate for use on the 5600 West transit line, including bus rapid transit, light-rail transit, and streetcar (see Section 2.1.1.4, Preliminary Transit Alternatives, for definitions of these transit types). Future technological advances in transit could also be considered. However, UTA anticipates that the alternative would start as bus rapid transit and change to rail transit in the future. For analysis purposes, a right-of-way that could

accommodate a range of transit technologies was used to develop the design. Light-rail transit was assumed for the Dedicated Right-of-Way Transit Alternative, and a streetcar system was assumed for the Mixed-Traffic Transit Alternative.

Transit Alignment

The transit alignment was developed as part of Envision Utah's Growth Choices process. The alignment was further refined to best accommodate the desire of each municipality to incorporate transit into local planning. Through a series of workshops and meetings, the following revisions were made to the transit alignment developed as part of the Growth Choices Vision Scenario:

- The alignment was moved west to connect with a future planned town center in Herriman.
- The alignment was moved into the Kennecott Daybreak development.

The approximately 24-mile alignment would operate from Herriman to the Salt Lake City International Airport. Section 2.2.2.1, 5600 West Transit Alternative, provides the details of the alignment.

For the portion of the transit system that would operate within the 5600 West roadway, the future roadway plan identified in the WFRC long-range plan (2030) was assumed as the proposed alignment (WFRC 2003). The future 5600 West roadway in 2030 would be three lanes from Old Bingham Highway to 9000 South, five lanes from 9000 South to SR 201, and seven lanes from SR 201 to I-80. This future 5600 West roadway was used so that future right-of-way for both transit and the roadway could be acquired at the same time. Because the future widening and new alignment of 5600 West are not part of the MVC project, only the cost of the right-of-way and construction required for transit was included in the MVC project cost.

The posted speed along 5600 West would be reduced from 45 mph (miles per hour) to 35 mph for vehicles. This change would improve pedestrian safety for accessing transit and would accommodate more walkable, transit-oriented developments along 5600 West.

Transit Service Characteristics

As part of the workshops and meetings, the municipalities refined the station locations that were identified during the Growth Choices process. The refinements were made to best meet the needs of the cities regarding future growth and development patterns, provide connectivity with other current and planned bus and light-rail transit routes, minimize environmental impacts to

sensitive resources such as wetlands, and provide distinctions in service characteristics between the two transit options discussed below.

Dedicated Right-of-Way Transit Option. The Dedicated Right-of-Way Transit Option that was evaluated would be separated from traffic by a curb. It would provide faster service than the Mixed-Traffic Transit Option and would have fewer transit stations (17 compared to 25). This type of transit system operates at an average speed of about 30 mph (taking into account stops at transit stations and traffic signals). A plan view and typical section are shown in Figure 2-6.2, Transit Typical Sections – Dedicated Right-of-Way Transit Option. The station spacing for this option was evaluated as that typical of light-rail transit with stations about every 1 mile to 1.5 miles.

The Dedicated Right-of-Way Transit Option was refined using a 16.8-foot-wide station platform in the center of the roadway with a 355-foot-long platform to be consistent with UTA's current light-rail station design. The stations were placed on the north side of the intersection with roadway widening required on the south side to provide right-turn and left-turn lanes for vehicles. The stations were placed at major intersections to allow pedestrians to cross at traffic signals and to provide easy transfers to existing and planned east-west bus and light-rail transit routes. The estimated daily transit boardings for this alternative in 2030 would be about 16,720.

Mixed-Traffic Transit Option. The Mixed-Traffic Transit Option was evaluated with 25 stations to provide more local accessibility and connecting service than the Dedicated Right-of-Way Transit Option. A plan view and typical section are shown in Figure 2-7.2, Transit Typical Sections – Mixed-Traffic Transit Option. The station spacing for this option was evaluated at every 0.5 mile to 1.0 mile. Taking into account the number of stations, this type of transit operates at an average speed of about 15 mph. Mixed-traffic transit has greater local access because it has more stations. The estimated daily transit boardings for this option in 2030 would be about 9,160.

Mixed-traffic transit operates in the outside travel lane of the roadway. The stations are located at the far side of the intersection after the transit crosses through the intersection. The transit operates by pulling out of traffic on the side of the road at stations. The station was evaluated at 90 feet long to accommodate a 66-foot streetcar.

2.1.4.2 Roadway Considerations

Refining the roadway components involved developing the right-of-way, determining interchange locations and types, reviewing existing utilities, and considering local street access and water quality. Figure 2-4, Freeway and

Arterial Definitions and Examples, provides the definitions of freeway and arterials used in this EIS.

Right-of-Way Width

The right-of-way required for the MVC freeway and arterials was based on the total number of lanes required to achieve a level of service of LOS D and the appropriate shoulders, clear zone, median, and maintenance requirements to meet the standards of UDOT and the American Association of State Highway and Transportation Officials (AASHTO). (See Section 1.6.3.1, Level of Service, for more information about level of service.)

Level of Service and Number of Lanes. The number of general travel lanes required for both the MVC freeway and arterials was based on a 2030 level of service of LOS D as modeled in the regional travel demand model. Level of service is a measure of traffic flow efficiency and congestion and is represented by a letter "grade" ranging from A for excellent conditions (free-flowing traffic) to F for failure conditions (extremely congested, stop-and-go traffic). LOS B through LOS E describe progressively worse traffic conditions.

Typically, in urban areas, LOS C is considered acceptable, LOS E and LOS F are considered unacceptable, and LOS D is considered acceptable where funding constraints make it unreasonable to reach LOS C (AASHTO 2001). Both WFRC and MAG use a goal of LOS D for projects in their respective long-range transportation plans when addressing congestion relief. FHWA's regulation that describes how metropolitan planning organizations should address congestion relief is found in 23 Code of Federal Regulations (CFR) 150, Planning Assistance and Standards. Both WFRC and MAG have congestion-management policies (WFRC 2004; MAG 2007a).

In summary, the design objective for the MVC roadway elements is LOS D for general-purpose lanes and LOS C for high-occupancy vehicle (HOV) lanes on freeways. However, LOS E would be accepted between on ramps and off ramps at interchanges. To improve the level of service to LOS D or better in these areas, additional lanes would be required. It was determined that the impacts in terms of additional relocations and more impacts to the natural environment would outweigh the operational benefits from the additional lanes. In addition, other areas close to or at LOS E can be modified during the final design process to obtain LOS D by adjusting features such as turning-lane configurations to handle the proposed volume of traffic at interchanges. A detailed analysis of the level of service goals used for the MVC project is described in *Technical Memorandum 19, Roadway Level of Service Goals and Designation* (MVC Management Team 2004b).

For freeway alignments in Salt Lake County, options tested included six-lane, eight-lane, and 10-lane freeways with all general-purpose lanes in the evening peak period (3 PM to 6 PM), which is the most congested period of the day. Auxiliary lanes between interchanges, along with two-lane off ramps, were included where necessary to maintain a minimum level of service of LOS D. The comparison of the eight-lane and 10-lane freeways found little difference in terms of freeway speeds, reduction in congestion, and delay on parallel routes. It was concluded that the 10-lane freeway provided only marginal improvements over the eight-lane freeway, so the 10-lane freeway was eliminated from further consideration.

Next, the eight-lane and six-lane freeways were compared to determine whether a six-lane freeway could be used in place of an eight-lane freeway in some areas. For some Salt Lake County segments, one lane could be eliminated in each direction from the eight-lane facility, and the resulting six-lane facility maintained a level of service of LOS D. For these segments, the eight-lane facility was eliminated and the six-lane facility was carried forward. However, if the resulting six-lane facility would have a lower level of service (LOS E), then the eight-lane facility was carried forward. The level of service analysis for the six-lane and eight-lane facilities consisted of using projected MVC volumes compared with the roadway capacity. This analysis confirmed that the six-lane and eight-lane configurations would be acceptable for both the Salt Lake and Utah County alternatives (MVC Management Team 2004b).

Travel demand modeling conducted during the refinement process showed that several alternatives required additional lanes to maintain LOS D or required a refinement to the alternative itself from the Level 2 screening results. In order to provide LOS D, the 7200 West Arterial/Freeway Alternative in Salt Lake County had to be refined to change the ending point of the freeway from SR 201 during Level 2 screening to California Avenue (1300 South) during the refinement process. The arterial portion of the alternative would be from California Avenue to I-80 instead of from SR 201 to I-80.

For the Arterials Alternative in Utah County, the number of lanes on Porter Rockwell Boulevard was increased from five lanes during Level 2 screening to seven lanes during the refinement process to meet travel demand requirements. This change was a result of higher forecasted population and employment numbers for Utah County from the Governor's Office and Planning and Budget. These numbers were included in the WFRC model Version 4.2 used during the alternatives refinement process. Additionally, the revised population and employment numbers required the number of lanes to be increased from five to seven on other arterials in Utah County including 2100 North and segments of 1000 South.

Right-of-Way Requirements. UDOT follows the roadway geometric standards in AASHTO's *A Policy on the Geometric Design of Highways and Streets* (AASHTO 2001). Table 2.1-12 provides an overview of the MVC right-of-way requirements for a highway, and Table 2.1-13 below shows the MVC right-of-way requirements for arterials. Both sets of requirements are based on AASHTO standards.

Table 2.1-12. Highway Cross-Section Components and Dimensions

Component	Width	Standard/ Reference[a]	Notes
Side slope to right-of-way line	Varies	UDOT 2004a	• Area required to transition from edge of clear zone to existing grade. • Side slope varies (2:1 maximum) depending on the height of the embankment or the depth of the cut. Slopes would meet AASHTO and UDOT criteria for maintenance and access. • Additional 10 feet minimum width required to provide maintenance access.
Clear zone (includes shoulders)[b]	30 feet	AASHTO 2001, 2002; UDOT 2004a	• *Clear zone* is the unobstructed area beyond the edge of the traveled way that allows drivers to regain control of errant vehicles. • Area includes 12-foot paved (outside) shoulder. • 1:6 maximum slope. • Based on design speed and average daily traffic.
Travel lanes	12 feet	AASHTO 2001, UDOT 2004a	• Average lane width for general-purpose, auxiliary, and HOV lanes.
Median	50 feet	AASHTO 2002	• Provides minimum recommended separation for drivers to regain control of errant vehicles without hitting a barrier or traffic in opposing lanes. AASHTO recommends 50 feet to 100 feet. • Includes 10-foot paved (inside) shoulders. • UDOT's standard follows AASHTO 2001 (50 feet).
Buffer between general-purpose and HOV lane	4 feet	AASHTO 2004	• Based on the AASHTO 2004 guide for HOV facilities. The buffer reinforces safety caused by the speed differential between HOV and slower adjacent general-purpose traffic and the perceptions of different users in the HOV lane and general-purpose lanes.

[a] AASHTO 2001: A Policy on the Geometric Design of Highways and Streets
AASHTO 2002: Roadside Design Guide
AASHTO 2004: Guide for High-Occupancy Vehicle Facilities
UDOT 2004a: Standard Drawing DD 4

[b] A 30-foot clear zone would be required for each side of the roadway for a total of 60 feet.

Table 2.1-13. Arterial Cross-Section Components and Dimensions

Component	Width	Standard/ Reference[a]	Notes
Side slope	Varies	AASHTO 2001	• Area required to transition from back of sidewalk to existing grade. • Side slope varies depending on the height of the embankment and would meet AASHTO and UDOT criteria for maintenance, access, and minimization of impacts.
Clear zone (includes shoulders)[b]	20 feet	AASHTO 2001, 2002	• *Clear zone* is the unobstructed area beyond the edge of the traveled way that allows drivers to regain control of errant vehicles. • Area includes 8-foot paved (outside) shoulder. • 6:1 maximum slope. • Curb and gutter is not considered a barrier. • Based on design speed and average daily traffic.
Travel lanes	12 feet	AASHTO 2001	
Median/center turn lane	14 feet	AASHTO 2001	
Shoulders	8 feet	UDOT 2004b	
Park strip	4 feet	UDOT 2004b	
Sidewalk	6 feet	UDOT 2004b	
Curb and gutter	2.5 feet	UDOT 2004b	• Standard UDOT curb and gutter type B1 used.

[a] AASHTO 2001: A Policy on the Geometric Design of Highways and Streets
AASHTO 2002: Roadside Design Guide
UDOT 2004b: Standard Drawing GW11

[b] The 20-foot clear zone for each side of the roadway includes the shoulder, curb and gutter, and sidewalk.

Interchange Locations

Several guidelines were considered to evaluate the location of interchanges along the freeway alternatives. These guidelines included considering the cross street where the interchange would connect, determining whether the interchange was compatible with local plans and community future land-use plans, and calculating the distance between interchanges. Figure 2-5.1, Interchange Types – Diamond, Single-Point, and System Interchange, provides an overview of the types of interchanges considered for the MVC project.

The cross street at each proposed interchange location was evaluated to determine if the cross street could support the large volume of traffic associated with the interchange. Arterials that handle larger volumes of traffic were considered acceptable, whereas smaller local roads that handle small volumes of traffic were considered unacceptable because the traffic from the interchange would cause high levels of congestion. In addition, before selecting the

interchange locations, community plans were reviewed and meetings held with the local municipalities to ensure that the interchange location was compatible with current and future land-use plans.

Finally, to improve the level of service, maintain safety, and be consistent with the MVC as a regional facility, the interchange spacing was evaluated to provide enough distance between interchanges to meet AASHTO requirements and to minimize conflicts between vehicles entering and exiting the roadway. In order to accommodate vehicle merging and weaving and improve safety, an attempt was made to keep interchanges spaced at every 1.5 miles to 2 miles rather than the minimum allowable 1-mile spacing. The locations of the interchanges developed in this EIS could change based on future growth, land development patterns, and financial considerations. Any changes to the interchange locations would be considered under separate environmental documentation as required. Table 2.1-14 below shows the location of the proposed interchanges.

Other potential interchange locations were examined but were eliminated from detailed study. An interchange at 4700 South was considered but was moved to 4100 South because an interchange at 4700 South would be at two 90-degree curves on the MVC, a configuration that would reduce safety and increase cost. Additionally, an interchange was considered at 7000 South but was eliminated because 7000 South is not an arterial street and is too small to handle the projected traffic volumes. Also, there were steep slopes and railroad tracks adjacent to the interchange location.

A more detailed financial analysis of tolling considerations could also result in a change in the number and locations of interchanges. For analysis purposes, the number and locations of interchanges evaluated in this EIS would be the same for the tolled and non-tolled options (see Section 2.2.4, Tolling Options for the MVC Alternatives).

Table 2.1-14. Proposed Interchange Locations

Interchange Location	Alternative(s)	Interchange Spacing (miles)
Salt Lake County Alternatives		
California Avenue	All Salt Lake County roadway alternatives	2
SR 201		1
Parkway Boulevard		1[a]
3500 South		1
4100 South		1
5400 South		2.5
6200 South		1
7800 South		2
9000 South		1.5
10600 South		2.5
11400 South		1
12600 South		1.25
13400 South		1
14600 South		2
Utah County Alternatives		
Porter Rockwell Blvd.	All Utah County alternatives	3
2100 North	All Utah County alternatives	3.25
SR 73	Southern Freeway Alternative	2
SR 68 (Redwood Rd.)	Southern Freeway Alternative	1.5
2300 West	Southern Freeway and 2100 North Freeway Alternatives[b]	1
10400 West	2100 North Freeway Alternative	1
100 West	Southern Freeway Alternative	2

The location of the interchanges developed in this EIS could change based on future growth, land development patterns, and financial considerations. Any changes to the interchange locations would be considered under separate environmental documentation as required.

[a] A partial interchange is required to provide access to the MVC because of the close proximity of SR 201. A full interchange would require a collector-distributor system.

[b] A partial interchange is required due to the close proximity of I-15 and conflict with the frontage road system to the east.

Utility Line Relocations

Utilities including electric power, natural gas, communication, water, and sewer were considered during the alternatives development process. Each utility provider and local jurisdiction was contacted to determine whether utilities would be relocated or would pass through the right-of-way. Based on this coordination, high-voltage electrical lines, aqueducts, and high-pressure gas lines would need to be relocated outside the right-of-way. This relocation would require the acquisition of additional land beyond what would be required for the roadway. The cost and land required for each utility relocation was included in the overall project cost for each MVC action alternative and in the environmental impact analysis. For additional discussion of utility relocations, see Section 6.4.5, Public Services and Utilities, and Section 6.6.3, Salt Lake County Alternatives.

Permanent Street Closures

As the alternatives were being developed, each existing street that crosses the proposed freeway alternatives was evaluated to determine whether it should form an interchange, go under or over the freeway, or terminate in a cul-de-sac. The determination of the type of crossing was based on travel demand requirements, emergency vehicle access, and consultation with the affected jurisdiction. If a street had low travel demand, appropriate emergency vehicle access could be maintained, and the local jurisdiction agreed with the closure, then the street was terminated in a cul-de-sac. These streets are detailed in Section 2.2, Description of Alternatives Carried Forward for Detailed Study.

Water Runoff Treatment

Stormwater runoff from the Mountain View Corridor would be contained in the project area and treated to minimize pollutants discharged to receiving waters such as the Jordan River. Stormwater would be captured in storm drain systems consisting primarily of ditches. In areas where retaining walls, barriers, or curbs are required, catch basins would be used to capture runoff, which would then be conveyed through pipe systems. These storm drain systems would be routed through detention basins (or in some cases retention basins) before the runoff is discharged into the receiving waters.

Detention basins hold stormwater runoff temporarily before releasing it, while retention basins store runoff and do not release it. Detention basins are preferred over retention basins because they limit discharge to predevelopment levels, allow for sedimentation to occur, and eliminate permanent ponding. Oil and grease skimmers would be included on each detention basin outlet structure to further improve the quality of runoff water before it is discharged into the

receiving waters. In some areas without adequate receiving waters, retention basins might be necessary. Retention basins should be considered only in areas where no feasible receiving waters are available and where the soil properties and groundwater levels help all stored water to be absorbed into the soils and groundwater.

The need for detention basins along the proposed alternatives has been coordinated closely with cities and major land developers, and, wherever circumstances allow, detention basins have been combined with those planned by developers or municipalities. Using the same detention basin for multiple projects allows drainage issues to be addressed on a regional basis and should put less strain on receiving waters downstream. UDOT will continue to coordinate with the cities to identify opportunities to combine detention facilities through the design phase of the project.

2.1.4.3 Tolling Considerations

As travel on Utah's highways continues to increase, federal and state highway funding cannot keep up with the cost of transportation operations and road maintenance in Utah. Facing a funding short-fall, UDOT is exploring tolling to address the state's transportation needs. In the 2005 general legislative session, the Utah state legislature authorized under Utah law (Utah Administrative Code Sections 72-6-118 and 72-20-120) the establishment and operation of tollways. This legislation allows UDOT to establish and operate tollways and related facilities for the purpose of funding, in whole or in part, the acquisition of right-of-way and the design, construction, reconstruction, operation, enforcement, and maintenance of tollways for use by the public. UDOT can also enter into contracts, agreements, licenses, franchises, or other arrangements to implement tollways.

Based on the legislation, on July 14, 2006, the Utah Transportation Commission asked UDOT to consider tolling as an option for the MVC project. Therefore, this EIS analyzes the expected impacts of tolling the proposed alternatives in Salt Lake and Utah Counties along with the expected impacts of the non-tolled alternatives. This EIS assumes that the right-of-way required for both the non-tolled and tolled alternatives would be the same (see Section 2.2.4.1, Right-of-Way Considerations for the Tolling Options).

The travel demand modeling in this EIS considered both the non-tolled and tolled options separately so that the impacts of each option could be evaluated. Each tolling option considered in detail in this EIS meets the project purpose identified in Section 1.3.1, Purpose of the Project.

2.1.4.4 Other Considerations

Coordination with the I-15 Project in Utah County

This section provides an overview of how sponsors of the MVC and I-15 projects are evaluating actions that would affect both projects. FHWA and UDOT are preparing an EIS for widening I-15 in Utah County and southern Salt Lake County to meet the growing travel demand. As part of both the MVC and I-15 projects, the project sponsors need to consider where and how the MVC project would connect to I-15 in Utah County.

Travel Demand. For the MVC project, the travel demand modeling for the MVC alternatives included a reconstructed I-15 with 12 lanes. This configuration, which is being evaluated in the I-15 EIS, is different than the 10 lanes shown in the 2003 WFRC and 2005 MAG long-range transportation plans that were used during the screening process. The 10-lane I-15 was used to evaluate the need for the MVC project and to screen the MVC alternatives; both of these evaluations were conducted before the 12-lane option was considered in the I-15 EIS. A sensitivity analysis was conducted to determine whether modeling a 12-lane I-15 would have affected the need for the MVC project or the results of the MVC alternatives screening. The sensitivity analysis found that a 12-lane I-15 would not have affected the need for the MVC project or the results of the alternatives screening (MVC Management Team 2007b).

Interchanges. Each MVC alternative in Utah County connects to I-15 through either existing or new interchanges. This MVC EIS analyzes the modifications that would be required to the existing or new I-15 interchanges in order to handle the increased traffic at these interchanges due to the MVC project. In addition, for the interchange analysis, I-15 is assumed to be widened to 12 lanes. This ensures that the expected environmental impacts from the MVC project are captured if the MVC is implemented before I-15 is reconstructed.

Trail

A secondary component of the project's purpose is to increase the number of bicycle and pedestrian options consistent with the adopted regional transportation plans. Trail locations were considered that would complement existing trail systems while taking into account environmental factors (such as relocations and impacts to wetlands).

To help develop a trail system, meetings were held with the Salt Lake County Trails Advisory Board that addressed trail master plans, potential uses, and goals for the trail facility. The Trails Advisory Board, which was established by the County to assist in long-range trail planning, includes members from local

municipalities as well as UDOT, WFRC, and MAG. Citizens can also join the Board by requesting to participate in the planning process.

Trails Advisory Board. The Trails Advisory Board provided input about how the MVC trail could meet the needs of the affected cities. Input from the advisory board included the following:

- Information on master-planned trails in the affected cities
- Types of trail uses that might be appropriate for the MVC multi-use trail:
  - Pedestrian recreational travel
  - Bicycle recreational travel
  - Bicycle commuter travel
  - Equestrian recreational travel
- Goals for the MVC multi-use trail:
  - Integrate the trail with the proposed freeway system to provide a continuous trail throughout the length of the freeway corridor
  - Provide access for existing and planned east-west trails that would cross the freeway system

Trail Location. To develop a trail alignment, many factors were considered including options for connecting to existing trails as well as ways to avoid homes, businesses, and wetlands. The trail would require between 12 feet and 50 feet of right-of-way, but the actual width has not been determined. The actual right-of-way required at each specific location would be evaluated on a case-by-case basis during the final design phase of the project by taking into account local conditions. Additionally, the type of trail access across arterials or other cross streets would be considered during final design and could consist of crossing at the nearest signalized intersection, tunnel, or overpass to maintain the continuity of the trail.

Based on input from the Trails Advisory Board, a continuous multi-use trail running within the freeway corridor for the entire 35-mile length of the project was evaluated. However, the additional right-of-way required for such a trail would cause wetland impacts as well as impacts to existing and planned residential developments. For the MVC project, a trail with various segments along the corridor that would connect to existing and planned community trails and provide north-south travel was carried forward for detailed study. Section 2.2.2.2, 5800 West Freeway Alternative, provides an overview of the trail developed for the MVC project.

Community and Environmental Considerations

Alternatives were refined based on existing environmental data as well as input from the public and resource agencies. During the alternatives development process, the alignments were modified to minimize or avoid relocations, Section 4(f) uses, impacts to minority and low-income communities, and impacts to cultural sites. The alignments were also modified to avoid or minimize impacts to wetlands, farmland, and habitat for threatened and endangered species.

In addition, meetings were held with the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the Utah Division of Wildlife Resources to develop alternatives that would minimize environmental impacts. During these meetings, the resource agencies reviewed the alternatives and made recommendations to avoid sensitive resources such as wetlands and wildlife habitat.

Park-and-Ride and Park-and-Pool Lots

Representatives from UDOT, UTA, WFRC, and MAG met to evaluate possible locations for park-and-ride lots along the 5600 West transit corridor and park-and-pool lots in Utah County. The specific transit technology for the 5600 West transit corridor had not yet been defined, so the group identified lots that would work regardless of the technology selected. The preliminary list of park-and-ride lot locations was developed using input from the local jurisdictions and was based primarily on the location of proposed transit stations. Once the preliminary list was developed, it was then compared to the travel demand model to determine how much each lot would be used.

Park-and-pool lots are typically smaller than park-and-ride lots and are intended exclusively for motorists to form carpools and vanpools. This type of lot is often developed as a joint-use facility (for example, shared with a church or shopping center) and can be a part of a development mitigation plan whereby a developer dedicates a number of spaces within a larger development for these purposes.

In order to identify feasible locations for the lots, locations near the most heavily traveled routes were considered. These locations consisted of major intersecting roads. Another consideration in the location of these lots was lot spacing. It was determined that lots would need to be spaced closely enough to accommodate as many patrons as possible.

2.1.4.5 Alternatives Eliminated or Revised During the Refinement Process

As part of the alternatives refinement process, two alternatives carried forward from Level 2 screening were eliminated. These alternatives were the 5600 West

Freeway Alternative and the 7200 West Arterial/Freeway Alternative in Salt Lake County. The MVC Alternatives Screening Report Addendum (MVC Management Team 2007a) provides the detailed analysis that resulted in eliminating these alternatives. In addition, the final connection point of the proposed Porter Rockwell alignment to I-15 was refined.

Elimination of the 5600 West Freeway Alternative in Salt Lake County

The 5600 West Freeway Alternative is identical to the 5800 West Freeway Alternative except for the segment north of California Avenue, where the alternative would be placed on the existing 5600 West alignment and would connect to the diamond interchange at I-80. The 5800 West Freeway Alternative would be placed two to three blocks to the west of the existing 5600 West alignment on undeveloped land and would connect to I-80 at a new interchange.

The 5600 West Freeway Alternative would require the use of a frontage road system in order to provide access to adjacent businesses. Although this frontage road would provide access for motorists traveling on the frontage road itself, it would restrict access between businesses on either side of the freeway. Also, the frontage road would be incompatible with the 5600 West Transit Alternative because pedestrian access would be difficult if a frontage road and freeway separated transit and adjacent businesses. In addition, the 5600 West Freeway Alternative would be inconsistent with Salt Lake City's transportation master plan for the area. This plan maintains the current configuration of 5600 West as an arterial to allow continued unimpeded access to existing and future businesses.

Both the 5600 West Freeway and 5800 West Freeway Alternatives would service the same area, accommodate the same traffic volume, and affect the same amount of wetlands (about 7.4 acres between SR 201 and I-80). Because the 5600 West Freeway Alternative would restrict business and pedestrian access and would also be incompatible with the 5600 West Transit Alternative and Salt Lake City's transportation master plan, it was eliminated from detailed study.

Elimination of the 7200 West Arterial/Freeway Alternative in Salt Lake County

The 7200 West Arterial/Freeway Alternative was proposed by Salt Lake City during the EIS scoping phase based on the City's desire to have the MVC be an arterial within the city limits. An arterial from SR 201 north to I-80 was evaluated during the Level 1 and Level 2 screening processes using Version 3.2 of the WFRC travel demand model. This evaluation demonstrated that the arterial would meet the WFRC level of service goal of LOS D. Under the 7200 West

Arterial/Freeway Alternative, the MVC would transition from a freeway to a seven-lane arterial at SR 201 and this arterial would extend to I-80, a distance of about 3.5 miles. The arterial was intended to be a limited-access facility (similar to Bangerter Highway in Salt Lake County) with signalized intersections at California Avenue and 700 South and a diamond interchange with signals at I-80.

Following Level 2 screening, Version 4.2 of the WFRC travel demand model was used to further refine and evaluate the alternatives. This analysis determined that the 7200 West Arterial/Freeway Alternative would have to be modified to provide the appropriate capacity because both of the signalized interchanges (at California Avenue and 700 South) would operate at LOS F. To provide the appropriate capacity, the freeway was extended from SR 201 to just past California Avenue with the signalized intersections provided at 700 South and I-80. The length of the arterial segment would be about 2 miles, 1.5 miles shorter than the original alternative that was evaluated during the screening process. This modified alternative is referred to as the Modified 7200 West Arterial/Freeway Alternative.

Driver Expectations and Safety. Driver expectations are an important consideration in roadway design, because a design that contradicts driver expectations can result in safety problems. In general, drivers on a freeway expect to be able to continue traveling at freeway speeds and do not anticipate having to stop at traffic signals. For that reason, an abrupt transition from a freeway to a surface street (arterial) with traffic signals can result in increased accident rates.

In order to explain the concept of driver expectations, it is helpful to compare the Modified 7200 West Arterial/Freeway Alternative to the Arterials Alternative in Utah County, where the MVC freeway from Salt Lake County ends at SR 73 (an arterial) in Lehi. In the case of the Arterials Alternative, there are about 5 miles of arterial roads between the end of the MVC freeway and I-15. In the case of the Modified 7200 West Arterial/Freeway Alternative, there are about 2 miles of arterial roads between the MVC freeway and I-80.

The Arterials Alternative in Utah County would have 5 miles between freeways and would also include a change in direction (south to east). Therefore this alternative is considered to be a sound, practical transportation option because driver expectations would not be undermined. Southbound drivers on the MVC freeway in Utah County would see several large overhead signs informing them that the freeway is ending. At the freeway end, drivers would have to turn left onto SR 73, which would cause them to slow down. In addition, drivers would be able to see that they are transitioning to surface streets, and the associated access for commercial and residential development would be visible along the entire

distance of the freeway through Lehi. All of these visual cues would encourage drivers to slow down as they approach the end of the freeway.

In the case of the Modified 7200 West Arterial/Freeway Alternative, driver expectations would be undermined due to two reasons. The first reason is that drivers would not be required to stop and turn at the freeway end, so they would not expect to have to slow down on the remaining 2 miles of arterial road before connecting with I-80. The second reason relates to the short distance between the end of the MVC freeway and its connection with I-80. Before the freeway transitions to an arterial, northbound drivers would be traveling on a bridge over California Avenue with an elevated line of sight relative to the surrounding terrain. During daylight hours, drivers on this bridge would be able to see I-80 in the distance in front of them. Though the bridge would have a posted speed limit of 35 mph or 40 mph, drivers on the bridge would not expect to have to slow down from one freeway to another freeway that is visible a short distance away. As a result, some drivers would slow down to the posted speed limit while others would likely continue at freeway speeds. This difference in vehicle speeds would create a safety hazard, and accidents—especially severe rear-end collisions—would likely increase.

Although ending a freeway at a signalized intersection is not uncommon in the United States, local experience with the intersection of SR 201 and 7200 West indicates that a freeway ending at a signalized intersection can result in a high accident rate. SR 201 west of 5600 West has an interchange that is similar to what is proposed on the MVC for the Modified 7200 West Arterial/Freeway Alternative. SR 201 is a freeway from I-15 to 5600 West, a distance of about 6 miles. West of 5600 West, SR 201 becomes an expressway with a divided median and signalized intersections. The first signalized intersection on SR 201 as an expressway is at 7200 West.

Accident data were obtained from UDOT for a half-mile segment of SR 201 for the 3-year period of 2001–2003. The data showed an accident rate of 8.07 accidents per million vehicle-miles traveled (VMT) in this segment of SR 201. According to state averages, an expressway in Utah with similar traffic volumes can be expected to have an accident rate of 2.48 accidents per million VMT. This means that the accident rate on SR 201 at 7200 West is more than triple the expected rate. UDOT has recently installed an advance warning and signalization system to reduce the accident rate at that intersection.

There is no reason to expect that the accident rate on the arterial segment of the Modified 7200 West Arterial/Freeway Alternative would be different from the accident rate for SR 201 at 7200 West. Therefore, the intersection at 700 South on the arterial segment can be expected to have an accident rate of more than

8 accidents per million VMT. As a freeway, the MVC in this area can be expected to have an accident rate of less than 2 accidents per million VMT according to state averages.

Access Benefit. For the Modified 7200 West Arterial/Freeway Alternative, the arterial segment between 700 South and I-80 would be a limited-access arterial similar to Bangerter Highway. The limited-access facility is required to meet LOS D. Therefore, the Modified 7200 West Arterial/Freeway Alternative provides little additional access benefit compared to the 7200 West Freeway Alternative north of California Avenue except for the intersection at 700 South. Overall, the Modified 7200 West Arterial/Freeway Alternative provides only one additional access point in the 3.5 miles between California Avenue and I-80 and therefore provides little additional access benefit.

Travel Demand. Travel demand modeling showed that, with the Modified 7200 West Arterial/Freeway Alternative, a substantial amount of traffic would use SR 201 instead of heading north to I-80. The difference in the types of interchanges at I-80 and SR 201 (I-80 has a signalized diamond interchange and SR 201 has a system interchange) leads to unequal distribution of traffic between I-80 and SR 201. Under the 7200 West Freeway Alternative, between 5600 West and 7200 West the PM peak-hour traffic would be nearly evenly distributed between I-80 and SR 201, while under the Modified 7200 West Arterial/Freeway Alternative, SR 201 would carry about 25% more traffic than I-80. This would place an extra burden on SR 201 and would lead to traffic volumes that exceed capacity on SR 201 west of 7200 West.

Conclusion. Based on the above analysis, the Modified 7200 West Arterial/Freeway Alternative has been eliminated from further consideration for the following reasons:

- The reduced speeds on the arterial segment would not meet driver expectations, which would undermine safety and likely result in more accidents, especially severe rear-end collisions.
- Accident rates at the 700 South intersection would likely be high.
- The alternative would provide little additional access benefit compared to the 7200 West Freeway Alternative (there would be one additional access point north of California Avenue at 700 South).
- The alternative would place an extra travel demand burden on SR 201, which would lead to traffic volumes that exceed capacity west of 7200 West.

Reconsideration of the Porter Rockwell Boulevard Connection to I-15 in Salt Lake County

During the MVC screening process, the initial alignment for the proposed Porter Rockwell Boulevard arterial included a new connection to I-15 at about 16000 South. During the screening process, it was understood that there was a difference in the vertical grade between I-15 and the Porter Rockwell connection at 16000 South. However, because project surveying and mapping had not yet been conducted, the extent of this grade difference was underestimated. During the alternatives refinement process, detailed mapping of the area was conducted, and it was determined that the grade difference was more than 100 feet. Because of this grade difference, and because of impacts to a frontage road, Geneva rock and gravel facilities, an aqueduct, and a railroad line, developing a new connection to I-15 at 16000 South is not feasible unless major revisions are made to the design of I-15.

To make an interchange work at 16000 South, either I-15 would need to be realigned and lowered (to reduce the 100-foot grade difference) or Porter Rockwell Boulevard would need to be routed under I-15, which would require relocation of a railroad line, a canal, the frontage road, and businesses. After further consideration, an interchange at 14600 South was evaluated. A connection to I-15 at the existing 14600 South interchange would not require I-15 to be realigned and lowered and would cost about $338 million less than a connection at 16000 South. For these reasons, a new interchange connection at 16000 South was eliminated.

Reconsideration of the 1900 South Freeway Alignment in Utah County

During the Level 2 screening process, Utah County alternative UT-1 was eliminated because the proposed freeway alignment along 1900 South had substantially higher wetland impacts than a “hybrid” alignment that followed 1500 South. However, later discussions with Lehi City determined that an alignment on 1900 South could be built with fewer wetland impacts.

It was originally thought that, under the UT-1 alternative, cross streets would need to be routed either over or under the freeway, which would require a high embankment to support the raised roadway. This embankment would require a larger right-of-way width, which would result in greater wetland impacts. However, during the discussions with Lehi City, city officials stated that they would restrict development south of the freeway alignment, so most cross streets would end north of the proposed freeway at the existing arterial at 1900 South. Because cross streets did not need to be routed under or over the freeway, the

freeway profile was lowered, which reduced the cross-section by 60 feet and therefore reduced wetland impacts.

As a result of the reduced wetland impacts along the 1900 South alignment, both the 1500 South and 1900 South alignment options were being considered for the Southern Freeway Alternative and as part of the arterial alignments proposed under the Northern Freeway Alternative and the Arterials Alternative. However, further evaluation determined that only the 1900 South option would be carried forward with the Utah County alternatives (see the following section).

2.1.5 Reconsideration of the Utah County Alternatives

The results of the alternative screening analysis identified four MVC roadway alternatives in Utah County: the Southern Freeway with 2100 North Arterial Alternative, the Southern Freeway with Porter Rockwell Boulevard Arterial Alternative, the Arterials Alternative, and the Northern Freeway Alternative. All of the alternatives considered alignment options along 1500 South and 1900 South near Utah Lake. After the screening process, numerous meetings were held with the public, municipalities, and resource agencies from July 2006 through February 2007 regarding the Utah County alternatives. These meetings resulted in a decision in February 2007 to revise the Utah County alternatives due to the following reasons:

- Resource agencies commented that alignments south of 1500 South were too close to Utah Lake and would result in wetland and habitat fragmentation impacts. The resource agencies asked that alternatives with alignments farther north of Utah Lake be considered.
- EPA was concerned that the initial project purpose element of supporting local growth objectives might have eliminated reasonable alternatives.
- In January 2007, UDOT decided to undertake a project with an arterial on about 1000 South in Lehi, which was one of the MVC arterial alignments for the Arterials and Northern Freeway Alternatives.

2.1.5.1 Resource Agencies' Review of the Utah County Alternatives

To address comments from the resource agencies regarding potential wetland and wildlife habitat fragmentation impacts from the MVC alternatives along 1500 South and 1900 South, an alternatives refinement process was initiated in cooperation with the resource agencies, cities, and several non-governmental organizations in July 2006. This process focused on the 1500 South and 1900 South options of the Southern Freeway Alternative. As a result of this alternatives refinement process, a concept was developed north of 1500 South.

Initially, this concept was developed such that the alignment of the Southern Freeway Alternative was at 1000 South in Lehi and connected to I-15 near the Main Street interchange in American Fork. However, this concept was eliminated for technical reasons because (1) the freeway connection at I-15 was too close to the adjacent interchanges and would have violated AASHTO and FHWA requirements for interchange spacing, and (2) the freeway connection would have required the construction of a 3-mile-long collector-distributor system along I-15.

Therefore, the alignment on about 1000 South near I-15 was moved south to align with the 1500 South option and connect to the Pleasant Grove/Lindon interchange on I-15. In addition, the Southern Freeway Alternative options on 1500 South and 1900 South were merged together at 1900 South in American Fork to further avoid wetland impacts. The 1900 South option was then further modified by moving it farther north toward the 1500 South option so that the overall wetland impacts of the 1500 South and 1900 South options would be similar.

Several meetings and workshops were held in 2006 and early 2007 to refine this alignment. The outcome was that the cities generally were in favor of the modified 1900 South option instead of an option on 1500 South for the following reasons:

- An alignment on 1900 South would not divide the city of Lehi as much as an alignment on 1500 South would.
- An alignment on 1900 South would have fewer impacts on development (particularly in American Fork) than an alignment on 1500 South would.
- An alignment on 1900 South would provide a buffer to development between the roadway and Utah Lake and would effectively prohibit development in the wetlands near the lake. The 1900 South alignment was also consistent with Lehi's and American Fork's planning documents.

In contrast, the resource agencies favored an alignment on 1500 South for the following reasons:

- An alignment on 1500 South would fragment less habitat than the 1900 South option would.
- An alignment on 1500 South would affect fewer wetlands near Utah Lake that the resource agencies considered to be more important, although the total acreage of wetland impacts from the 1900 South and 1500 South options would be similar.
- To provide a range of reasonable alternatives and to address the concerns of the cities and resource agencies, the alternatives identified in Table 2.1-15 below were developed. To keep the intent of the alignment preferred by the resource agencies (less habitat fragmentation and fewer impacts to important wetlands near Utah Lake), an alternative along 2100 North was developed. This alternative (2100 North Freeway Alternative) has no roadway alignments near Utah Lake. To accommodate the concerns of Lehi and American Fork, both a freeway alignment (Southern Freeway Alternative) and an arterial alignment (Arterials Alternative) on 1900 South were included in the Utah County alternatives. An alignment on 1500 South was not considered because it did not address the cities' concerns and had similar wetland impacts as an alignment on the modified 1900 South alignment.

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Table 2.1-15. Reconsideration of the Utah County Alternatives

After Screening Process	After Utah County Evaluation	Comments
Southern Freeway with 2100 North Arterial Alternative. Freeway from Salt Lake County continues west of Redwood Road and connects to I-15 at Pleasant Grove; follows 1500 South and power corridor alignments. East-west arterials: • 2100 North – 7-lane arterial	*Southern Freeway Alternative.* Freeway from Salt Lake County continues west of Redwood Road and connects to I-15 at Pleasant Grove; follows 1900 South.	The 2100 North arterial alignment was retained as part of the Arterials Alternative. The alignment along 1900 South instead of 1500 South was developed in coordination with the cities.
Southern Freeway with Porter Rockwell Boulevard Arterial Alternative. Freeway from Salt Lake County continues west of Redwood Road and connects to I-15 at Pleasant Grove; follows 1500 South and power corridor alignments. East-west arterials: • Porter Rockwell Boulevard – 7-lane arterial	*Southern Freeway Alternative.* Freeway from Salt Lake County continues west of Redwood Road and connects to I-15 at Pleasant Grove; follows 1900 South.	The Porter Rockwell Boulevard portion is being evaluated under the Arterials Alternative.
Arterials Alternative. Freeway from Salt Lake County west of Redwood Road transitions to expressway between 2100 North and SR 73; no freeway connection provided to I-15. East-west arterials: • Porter Rockwell – 7-lane arterial • 2100 North – 7-lane arterial • SR 73 (1000 South) – 7-lane arterial from I-15 to 10400 West, then 5 lanes to MVC • 1900 South – 7-lane arterial	*Arterials Alternative.* Freeway from Salt Lake County west of Redwood Road to SR 73; no freeway connection provided to I-15. East-west arterials: • Porter Rockwell – 7-lane arterial • 2100 North – 7-lane arterial • 1900 South – 7-lane arterial	The only change made to the alternative was the elimination of the 1000 South option, which UDOT is evaluating under an independent study begun in 2007 (see Section 2.1.5.4, UDOT's Consideration of the 1000 South Alignment).
Northern Freeway Alternative. Freeway from Salt Lake County west of Redwood Road transitions to expressway between 2100 North and SR 73; freeway connection to I-15 provided by Porter Rockwell Boulevard (6 lanes). East-west arterials: • 2100 North – 7-lane arterial • SR 73 (1000 South) – 7-lane arterial from I-15 to 10400 West, then 5 lanes to MVC • 1900 South – 7-lane arterial	Eliminated. *2100 North Freeway Alternative* developed in its place. Freeway from Salt Lake County west of Redwood Road to SR 73; freeway connection along 2100 North connecting to I-15.	This alternative was developed to meet the intent of the resource agencies' request for an alternative farther north of Utah Lake. Porter Rockwell Boulevard and the 1900 South arterial are still considered under the Arterials Alternative. The 1000 South option is being evaluated by UDOT under an independent study begun in 2007 (see Section 2.1.5.4, UDOT's Consideration of the 1000 South Alignment). This alternative was also brought back because the project purpose of meeting local growth objectives was changed to a secondary project objective.

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2.1.5.2 Lehi Point of the Mountain Concept (4800 North Alternative)

After the Southern Freeway, Arterials, and 2100 North Freeway Alternatives were shown to the cities and the public, Lehi City raised some concerns regarding the 2100 North Freeway Alternative. Lehi City was concerned that a freeway on 2100 North could divide the community and limit the potential for commercial development in the area. In February 2007, Lehi City provided UDOT with an alternative alignment farther north at Point of the Mountain. This alignment would require a bridge 2,000 feet to 2,500 feet long and from 200 feet to 300 feet high.

In 2005, the MVC team studied a similar alignment at Point of the Mountain. The team found that connections between the MVC and I-15 in this area would require a lengthy elevated structure crossing the Jordan River, as well as extensive walls or bridges at locations already constrained by the future widening of I-15. Due to the terrain and loose soils, these structures would have substantial issues with regard to cost and constructability. In addition, weather and icing factors in the area would result in serious concerns about winter safety and ongoing maintenance and a considerable increase in associated maintenance costs. For these reasons, an alignment at or near the Point of the Mountain was not considered further at that time.

At the end of August 2007, Lehi City presented FHWA and UDOT with a revised version of a Point of the Mountain alignment in the *4800 North Connector; I-15 to Mountain View Corridor Freeway Junction Alternative Preliminary Design and Alternative Analysis Report* (Lehi City 2007), which detailed Lehi City's proposed alternative. The Lehi City alternative (4800 North Freeway Connector) would be a freeway segment connecting I-15 and the MVC near the Salt Lake County–Utah County line. This alternative would be about 1.4 miles long with an 1,800-foot bridge spanning the Jordan Narrows.

The Lehi City alternative was received just prior to release of the MVC Draft EIS and therefore was not evaluated in detail in that document. UDOT and FHWA worked with Lehi City after release of the Draft EIS regarding the details of the 4800 North Freeway Alternative. See Section 2.1.7, Evaluation of Alternatives after the Release of the Draft EIS, for detailed information on the evaluation of the Lehi City alternative. Based on this evaluation, FHWA determined that the 4800 North Freeway Alternative is not a reasonable alternative and thus did not warrant preparation of a supplemental EIS.

2.1.5.3 EPA's Concern about the Project Purpose

An alternative (UT-4) was initially considered with a freeway on 2100 North in Lehi during Level 2 screening (see Table 2.1-8 above, Level 2 Screening Results – Utah County Roadway Alternatives). UT-4 was initially eliminated because it was not compatible with Lehi City's growth objectives. Supporting local growth objectives was a primary project purpose for considering the MVC alternatives. EPA provided comments on a draft version of Chapter 1, Purpose of and Need for Action, on October 11, 2004. In its comments, EPA was concerned about including the goal of "supporting local growth objectives" as a primary purpose of the project. EPA expressed the concern that this goal could result in the elimination of alternatives that otherwise would be considered reasonable and practicable alternatives for avoiding or minimizing impacts to wetlands. Based on those comments and further discussion with EPA, FHWA and UDOT agreed to include "supporting local growth objectives" as a secondary objective of the project, which means that this goal was not used as a basis for screening alternatives. Because "supporting local growth objectives" was changed to a secondary objective, the 2100 North Freeway Alternative was determined to be a reasonable alternative. Therefore, the 2100 North Freeway Alternative is now being considered as one of the Utah County alternatives.

2.1.5.4 UDOT's Consideration of the 1000 South Alignment

During early 2007, UDOT decided to undertake a project for an arterial on about 1000 South in Lehi, which was one of the MVC arterial alignments for the Arterials and Northern Freeway Alternatives. Therefore, 1000 South was removed from consideration from the MVC alternatives and was included as part of the No-Action Alternative.

2.1.5.5 Public Involvement during the Reconsideration of the Utah County Alternatives

As a result of coordination and consultation with the resource agencies, the alternatives in Utah County were further refined and revised to reduce impacts to communities and wetlands. Two open houses, which were held in December 2006 and March 2007, provided an opportunity for the MVC EIS Team to update the public and answer questions about the revised alternatives and make the public aware of wetland and habitat fragmentation issues near Utah Lake. The March 2007 meeting presented the new 2100 North Freeway Alternative. The meetings were announced using the project e-mail update list, direct mail, and residential flyers. More than 500 people attended the two open houses to discuss the updated Utah County alternatives.

2.1.6 Conclusion of the Alternatives Refinement and Reconsideration Processes

Four roadway alternatives and a transit alternative in Salt Lake County and four roadway alternatives in Utah County were carried forward from Level 2 screening into the alternatives refinement process. During the refinement process, preliminary engineering and additional travel demand modeling were conducted to determine the exact characteristics of the alternatives including interchanges and transit stations, the width of the cross-section (number of lanes, overall width, and transit station sizing), and potential locations for the multi-use trail.

In addition, further environmental screening was conducted on these alternatives to minimize wetland impacts, habitat fragmentation, and relocations, and additional meetings were held with resource agencies, cities, and the public. As a result of the refinement and reconsideration processes, two Salt Lake County alternatives (the 5600 West Freeway and 7200 West Arterial/Freeway Alternatives) were eliminated and the four Utah County alternatives were refined into three alternatives. Table 2.1-16 below provides a summary of the alternatives that are being carried forward for detailed study in this EIS.

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Table 2.1-16. Results of Alternatives Refinement and Reconsideration Processes

Level 2 Screening Results	Alternatives Considered after the Refinement Process	Alternatives Considered after Reconsideration of the Utah County Alternatives
	Salt Lake County Alternatives	
5600 West Freeway Alternative 5800 West Freeway Alternative	5800 West Freeway Alternative	5800 West Freeway Alternative
7200 West Freeway Alternative 7200 West Arterial/Freeway Alternative	7200 West Freeway Alternative	7200 West Freeway Alternative
5600 West Transit Alternative with Dedicated Right-of-Way Transit Option or Mixed-Traffic Transit Option	5600 West Transit Alternative with Dedicated Right-of-Way Transit Option or Mixed-Traffic Transit Option	5600 West Transit Alternative with Dedicated Right-of-Way Transit Option or Mixed-Traffic Transit Option
	Utah County Alternatives	
Southern Freeway with 2100 North Arterial Alternative. Freeway from Salt Lake County continues west of Redwood Road and connects to I-15 at Pleasant Grove; follows 1500 South and power corridor alignments. East-west arterials: • 2100 North arterial *Southern Freeway with Porter Rockwell Boulevard Arterial Alternative.* Freeway from Salt Lake County continues west of Redwood Road and connects to I-15 at Pleasant Grove; follows 1500 South and power corridor alignments. East-west arterials: • Porter Rockwell Boulevard arterial	*Southern Freeway with 2100 North Arterial Alternative.* Freeway from Salt Lake County continues west of Redwood Road and connects to I-15 at Pleasant Grove; follows 1500 South or 1900 South alignments. East-west arterials: • 2100 North arterial *Southern Freeway with Porter Rockwell Boulevard Arterial Alternative.* Freeway from Salt Lake County continues west of Redwood Road and connects to I-15 at Pleasant Grove; follows 1500 South or 1900 South alignments. East-west arterials: • Porter Rockwell Boulevard arterial	*Southern Freeway Alternative.* Freeway from Salt Lake County continues west of Redwood Road and connects to I-15 at Pleasant Grove; follows 1900 South.
Arterials Alternative. Freeway from Salt Lake County west of Redwood Road transitions to expressway between 2100 North and SR 73; no freeway connection provided to I-15. East-west arterials: • Porter Rockwell arterial • 2100 North arterial • 1000 South arterial • 1900 South arterial	*Arterials Alternative.* Freeway from Salt Lake County west of Redwood Road transitions to expressway between 2100 North and SR 73; no freeway connection provided to I-15. East-west arterials: • Porter Rockwell arterial • 2100 North arterial • 1000 South arterial • 1500 or 1900 South arterial	*Arterials Alternative.* Freeway from Salt Lake County west of Redwood Road to SR 73; no freeway connection provided to I-15. East-west arterials: • Porter Rockwell arterial • 2100 North arterial • 1900 South arterial
Northern Freeway Alternative. Freeway from Salt Lake County west of Redwood Road transitions to expressway between 2100 North and SR 73; freeway connection to I-15 provided by Porter Rockwell Boulevard (6 lanes). East-west arterials: • 2100 North arterial • 1000 South arterial • 1900 South arterial	*Northern Freeway Alternative.* Freeway from Salt Lake County west of Redwood Road transitions to expressway between 2100 North and SR 73; freeway connection to I-15 provided by Porter Rockwell Boulevard (6 lanes). East-west arterials • 2100 North arterial • 1000 South arterial • 1500 or 1900 South arterial	*2100 North Freeway Alternative.* Freeway from Salt Lake County west of Redwood Road to SR 73; freeway connection along 2100 North connecting to I-15.

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2.1.7 Evaluation of Alternatives after the Release of the Draft EIS

2.1.7.1 Revised Travel Demand Modeling for the Final EIS

Land Use Assumptions in the Travel Demand Model

During the preparation of the Draft EIS, the latest version (5.0) of the WFRC/MAG travel demand model was used to evaluate transit and roadway alternatives. Version 6.0 was not available until after the analysis had been completed for the Draft EIS, so UDOT and FHWA decided to publish the Draft EIS and update the Final EIS using Version 6.0. Before using Version 6.0 of the model, UDOT and FHWA performed an evaluation of the population, household, and employment projections used by WFRC for the travel forecasting. This evaluation, which was conducted by Resource System Group, Inc. (RSG), in March 2008, included an evaluation of the following factors that affect future growth:

- Historic growth trends
- Vacant land and land-use plans
- Current development densities in Salt Lake County
- The likely build-out of current vacant and developable land

The RSG evaluation of the WFRC population, household, and employment projections in Version 6.0 found that the WFRC projections on the west side of Salt Lake County did not match the actual growth in this area. RSG determined that the population, household, and employment projections used in the MVC Draft EIS more closely reflect the actual growth trends and more closely reflect the stated intentions of major land developers in the area. Therefore, RSG recommended basing Version 6.0 traffic forecasts on population, household, and employment protections that closely reflect those used in the Draft EIS.

The RSG evaluation was given to WFRC for review and comment in April 2008, and WFRC concurred with the evaluation. WFRC agreed that the population, household, and employment projections should be used in developing the traffic forecast for the Final EIS and would be considered in the next update of the travel demand model. Because WFRC's travel demand model will not be updated until 2009, UDOT ran Version 6.0 of the travel demand model in April 2008 with the population, household, and employment projections recommended by RSG for both the non-tolled and tolled options. WFRC concurred with this approach. The population, household, and employment projects for Utah County were not changed from the 2007 MAG Regional Transportation Plan. Appendix 2A, Revised Travel Demand Modeling Information, contains the RSG report and the letter from WFRC concurring with the report.

Sensitivity analysis using Version 6.0 with the updated population, household, and employment projections was conducted to ensure that the alternatives screened out in the Draft EIS would not be considered reasonable using the updated regional travel demand model. Using Version 6.0 of the regional travel demand model did not change the result of the alternatives screening analysis conducted for the Draft EIS. For the travel demand modeling, the 5800 West Freeway Alternative (Salt Lake County Preferred Alternative) was used with each of the Utah County alternatives, and the 2100 North Freeway Alternative (Utah County Preferred Alternative) was used with each of the Salt Lake County alternatives.

Increased Transit Ridership

Transit ridership in the Draft EIS was based on Version 5.0 of the regional travel demand model. For the Final EIS, Version 6.0 was used, which resulted in a substantial increase in transit ridership for the 5600 West Transit Alternative. For the Dedicated Right-of-Way Transit Option, daily transit boardings increased from 6,800 to 16,720, and daily transit boardings for the Mixed-Transit Option increased from 3,700 to 9,160. The main increase in transit ridership resulted from the incorporation of new on-board transit survey data that reflected higher rail ridership than what was previously used in calibrating the model. A secondary cause of increased transit ridership was changes made to the transit network. In response to comments received on the Draft EIS, the transit network was modified to reflect projected increases in station accessibility due to assumed transit-oriented development along the MVC transit corridor. Specifically, where land uses were intensified around proposed transit stations, it was assumed that all of the additional growth would be within walking distance of the station (within 4/10 of a mile). Similarly, the average walking distance to the station was reduced to better reflect the increased density around the station.

2.1.7.2 Lehi Point of the Mountain Concept (4800 North Freeway Alternative)

Methodology

In August 2007, UDOT and FHWA received a report from Lehi City recommending consideration of a new alternative along 4800 North in Utah County. This report included engineering drawings and impact estimates for a 4800 North alternative. As proposed by Lehi City, this alternative included the following key elements:

- An eight-lane freeway-to-freeway connection between the MVC roadway and I-15 with system-to-system interchanges at each end.
- Service interchanges on the MVC roadway at Redwood Road and 4800 North. The local interchange at Redwood Road would be a partial interchange.
- An 1,800-foot-long bridge with a maximum height of 240 feet spanning the Jordan Narrows area.

Lehi City estimated the cost of its alternative at $437 million in 2007 dollars. This estimate included only the east-west freeway at 4800 North. The estimate did not include the cost of the north-south section of the MVC from the Utah County line to SR 73. It also did not include the cost of the 2100 North arterial. For consistency with the analysis of all other Utah County alternatives, these two elements must be included as part of the 4800 North alternative for the purpose of the MVC study. Including these elements allows an "apples to apples" comparison of the 4800 North alternative with the other Utah County alternatives considered in the Draft EIS.

In October 2007, FHWA and UDOT shared with Lehi City a work plan that outlined in detail the agencies' approach to evaluating the reasonableness of the 4800 North alternative and to determining whether this alternative should be further evaluated in a Supplemental EIS. The work plan outlined the following key points:

- The 4800 North alternative will be evaluated initially as proposed by Lehi City in its August 2007 report.
- If the alternative as proposed by Lehi City is not a reasonable alternative, FHWA and UDOT will consider modifications that could help make it a reasonable alternative. For example, these modifications could include additional capacity if needed to accommodate forecasted traffic volumes.

- If there is a reasonable alternative at 4800 North, it will be evaluated in a Supplemental EIS. If it is not possible to develop a reasonable alternative at this location, a Supplemental EIS will not be prepared; instead, FHWA and UDOT will document the basis for determining that a Supplemental EIS is not required.
- The proposed 4800 North alternative will be evaluated in a manner consistent with the alternatives screening and refinement process used for other alternatives in the Draft EIS. The work plan noted that this would include "consideration of purpose and need, environmental impacts, and cost, as well as compatibility with the applicable operational and design standards for freeway connections to the interstate system."
- The assessment of the 4800 North alternative will include a "concept-level Interstate Justification Report." The purpose of this report is to determine whether an interchange connecting the 4800 North alternative to I-15 could meet FHWA's standards for connections to the interstate system.

The review process was conducted by a multidisciplinary team of specialists from the FHWA Utah Division office, the FHWA Resource Center, and FHWA headquarters.

Refinement of the 4800 North Freeway Alternative

In accordance with the work plan, UDOT and FHWA initially reviewed the 4800 North Freeway Alternative as proposed by Lehi City and concluded that it was not reasonable. In the course of this review, FHWA identified several key drawbacks with the City's version of this alternative, including left-hand exits, capacity and weave concerns associated with the lack of braided ramps, and insufficient lane-drop distances. Therefore, FHWA and UDOT developed modifications to the 4800 North Freeway Alternative to meet minimum AASTHO and federal requirements. These changes resulted in a revised set of engineering plans for a 4800 North Freeway Alternative. The revised version of the 4800 North Freeway Alternative included the following major elements:

- A 12-lane freeway section between MVC and I-15 with system-to-system interchanges at each end. The number of lanes is dictated by ramp capacity, since there is not enough distance between system interchanges to taper the lanes.
- Service interchanges at Redwood Road (partial interchange) and 4800 North (full interchange).

- Additional lanes on ramps as needed to accommodate 2030 traffic volumes. This includes the need for four three-lane ramps.
- Addition of several bridges and retaining walls to facilitate crossing of the Jordan Narrows and to minimize the footprint required to widen I-15.
- Braided ramps to address the weave issues identified during micro-simulation.
- Addition of auxiliary lanes both north and south of the 4800 North connection along I-15.
- A five-lane 2100 North arterial.
- A six-lane freeway extending from Salt Lake County to SR 73.

After developing the engineering plans based on Version 5.0 of the regional travel demand model, the MVC study team developed additional traffic forecasts based on Version 6.0 of the regional travel demand model and then updated the engineering for the 4800 North Freeway Alternative based on the revised (lower) traffic forecasts. Based on the Version 6.0 traffic forecasts, the 4800 North Freeway Alternative still includes all of the elements described above *except* there would be no three-lane ramps and the roadway would have a 10-lane mainline cross-section rather than 12 lanes.

Evaluation Results

This section compares the cost and environmental impacts of the 4800 North Freeway Alternative and the 2100 North Freeway Alternative. As explained above, the 4800 North Freeway Alternative was first evaluated based on Version 5.0 of the regional travel demand model, which was consistent with the assumptions used for evaluating alternatives in detail in the Draft EIS. Then, an additional assessment was completed using traffic forecasts based on Version 6.0 of the travel demand model, which was used for evaluating alternatives in the Final EIS. The results of both analyses are summarized in Table 2.1-17 on page 2-64.

For this analysis, the 4800 North Freeway Alternative was compared to the 2100 North alternative as proposed in the Draft EIS and was also compared to a modified version of the 2100 North alternative that includes relocating detention ponds and adding retaining walls near the Jordan River to minimize wetland impacts. The minimized version of the 2100 North alternative is used in the Final EIS. Minimization of wetland impacts is required, where practicable, in accordance with the wetlands permitting requirements under Section 404 of the Clean Water Act. The Southern Freeway and Arterials Alternatives have also

been included in Table 2.1-17 below for comparison to the 2100 North Freeway and 4800 North Freeway Alternatives.

Based on these data, UDOT and FHWA reached the following conclusions:

- **Ability To Meet Purpose and Need.** The 4800 North Freeway Alternative (including the 2100 North arterial) would be similar to the 2100 North Freeway Alternative in terms of its ability to reduce roadway congestion in Utah County. (See the "Reduction in travel delay" item in Table 2.1-17 below.) This includes congestion relief on east-west roads in Utah County (such as Lehi Main Street and 1000 South). Therefore, the 4800 North Freeway Alternative meets the project's purpose and need.

- **Environmental Impacts, Including Wetlands.** With regard to environmental impacts, the 4800 North Freeway Alternative would have lower impacts on wetlands—about 3 acres less—than the 2100 North Freeway Alternative. However, Section 404 of the Clean Water Act does not automatically require selection of the alternative with the least impact to wetlands. Regulations issued under Section 404, known as the Section 404(b)(1) guidelines, require selection of the "practicable" alternative that has the least impact to the aquatic ecosystem, including wetlands. The term "practicable" means "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes" (40 CFR 230.3(q)). In this instance, the extreme additional cost of the 4800 North Freeway Alternative makes it "impracticable" for the purpose of Section 404 permitting.

- **Relocations and Community Disruption.** The 4800 North Freeway Alternative also would have somewhat lower relocations: 20 relocations would be needed under the 4800 North Freeway Alternative compared to 33 relocations under the 2100 North Freeway Alternative. In addition, the 4800 North Freeway Alternative would cause less community disruption in Lehi. The 4800 North Freeway Alternative includes a five-lane arterial on 2100 North, while the 2100 North Freeway Alternative includes a six-lane freeway at that location. A five-lane arterial on 2100 North would cause less community disruption than a six-lane freeway at the same location and would be more consistent with Lehi City's land-use plans.

- **Cost.** Although the 4800 North Freeway Alternative does have several advantages, it would be far more costly than the 2100 North Freeway Alternative and the other Utah County alternatives. The cost of the 2100 North Freeway Alternative would be about $950 million, while the

4800 North Freeway Alternative would cost about $1,473 million ($1.47 billion). Therefore, the additional cost of the 4800 North Freeway Alternative would be about $523 million. If the Version 6.0 traffic forecasts are used, the cost of the 4800 North Freeway Alternative would be $1.39 billion; the additional cost would be $440 million.

Table 2.1-17 provides a more comprehensive comparison of the costs and impacts of the Utah County alternatives.

Table 2.1-17. Summary of Costs and Impacts of the Utah County Alternatives

Parameter[d]	Southern Freeway	2100 North Freeway	Arterials	4800 North Freeway (with 2100 Arterial)	
				Version 5.0	Version 6.0
Reduction in travel delay	60%	47%	60%	49%	47%
Home/business relocations	136	33	74	20	20
Section 4(f) impacts					
Public parks					
Not *de minimis*	1	0	0	0	0
De minimis	1	1	1	1	1
Historic properties					
Not *de minimis*	2	4	5	4	4
De minimis	4	6	12	8	8
2007 cost (in millions)[c]	$1,126	$950	$984	$1,473	$1,390
Wetland impacts (acres)					
Primary	78.3	14.7[a]/10.4[b]	52.9	7.4	7.4
Peteetneet soil	12.4	0	5.5	0	0

[a] Original wetland impacts from the Draft EIS.

[b] Reduced wetland impacts for the 2100 North Freeway Alternative are due to relocating the detention pond outside the floodplain and adding retaining walls inside the floodplain. This methodology was applied to Lehi City's 4800 North Freeway Alternative and to the 2100 North Freeway Alternative.

[c] The estimated cost has been updated since the documentation submitted to FHWA in March 17, 2008 to be consistent with the cost estimates developed for the MVC action alternatives. The cost initially submitted to FHWA was based on 2004 unit prices projected forward to 2007. The revised costs shown in this Final EIS are based on most recent available 2006 and 2007 unit costs. The revised cost estimates are higher for all alternatives. The relative differences in costs are similar or have increased from those initially presented in March 2008.

[d] The impacts in this table were based on analysis conducted in January 2008. Slight revisions to the MVC action alternatives since that time have changed the numbers presented in the table but do not change the result of the analysis.

Operational Considerations

The 4800 North Freeway Alternative would require numerous merging and weaving movements of traffic within a short distance. To accommodate all of these movements, this alternative would include braided ramps. The braided ramps could be designed to meet minimum AASHTO requirements, but they conflict with drivers' expectations (a driver must exit to the south in order to go north). In this type of situation, freeway signs are critical for helping drivers find their way. However, the short distance between the MVC and I-15—about 1 mile—allows only a short time for a driver to see the signs, react to the message on the signs, and move into the correct lane if needed. This challenge is complicated by freeway-to-freeway and local-access interchanges because the combination of those movements requires more information on the freeway signs and thus requires the driver to absorb more information over the 1-mile distance. This roadway configuration is not prohibited, but it does raise safety and operational concerns.

The length and height of the bridge required with the 4800 North Freeway Alternative would involve greater long-term operational and maintenance issues than an at-grade freeway section such as 2100 North. For example, in severe weather, the elevated roadway would be more likely to become hazardous due to ice, wind, and snow. In addition, maintenance of this lengthy structure would have higher costs than an at-grade freeway section over the long term.

There are also serious challenges related to the construction of the 4800 North freeway connector, including relocation of a railroad track east of I-15, relocation of major aqueducts and associated infrastructure near the I-15 system interchange, and the construction of a 12-lane bridge nearly 230 feet above the sensitive Jordan Narrows area. These challenges raise serious constructability questions for the 4800 North freeway compared to the relative simplicity of constructing the 2100 North freeway.

Conclusion

The 4800 North Freeway Alternative has been thoroughly analyzed and compared to the 2100 North Freeway Alternative. In some respects, the 4800 North Freeway Alternative is preferable. For example, it would have fewer relocations, would cause less community disruption, would have lower wetland impacts, and would be more consistent with Lehi City's desired future land use. In addition, the 4800 North Freeway Alternative appears to be roughly equal to the 2100 North Freeway alternative in terms of its ability to meet the project's purpose.

However, there are two significant drawbacks to the 4800 North Freeway Alternative. The first is cost; the 4800 North Freeway Alternative would involve an additional expenditure of about $523 million. The *additional* cost of this alternative is equivalent to the *entire* cost of many large transportation projects in the Salt Lake City area and elsewhere. Secondly, although this alternative could be designed to meet minimum design requirements, FHWA has determined that it is less desirable from an operational and safety standpoint. Given the many competing priorities for transportation funds in Utah, FHWA and UDOT have concluded that it would not be prudent to spend an additional $523 million to construct the 4800 North alternative. It is highly unlikely that UDOT would seek to move a 4800 North Freeway Alternative forward under any circumstances.

Based on all of these considerations, the 4800 North Freeway Alternative is not a reasonable alternative for the purpose of NEPA analysis and also, in FHWA and UDOT's judgment, should not be considered a practicable alternative as that term is used under Section 404 of the Clean Water Act. Therefore, FHWA and UDOT concluded that the 4800 North Freeway Alternative should not be advanced for detailed study in the MVC EIS process. UDOT held a public meeting at Willow Creek Middle School on March 19, 2008, to go over the results of the findings. About 40 people attended the meeting.

2.1.7.3 Design Options Incorporated in the Final EIS

Section 2.2.4, Design Options for the MVC Alternatives, of the Draft EIS noted that, after the Salt Lake County and Utah County alternatives were developed, potential options to the design of the alternatives were evaluated in coordination with cities, land owners, utility companies, and FHWA and that the options were not incorporated into the alternatives evaluated in the Draft EIS. The design options mostly involve minor shifts to the alternatives evaluated in detail in the Draft EIS. The design options in Table 2.1-18 below from the Draft EIS have been included as part of the alternatives evaluated in detail in this Final EIS. The options involve minor changes, and they did not substantially change the analysis in the Draft EIS or affect the selection of the Preferred Alternatives.

Table 2.1-18. Design Options for the MVC Alternatives

Design Option	Alternative	Description of Alignment and Design Option
Salt Lake County Alternatives		
13400 South	5800 West and 7200 West Freeway Alternatives	Alignment, including interchange at 13400 South, would be shifted to the east to avoid affecting radio towers.
7800 South	5800 West and 7200 West Freeway Alternatives	Alignment would be shifted to the west to allow the City of West Jordan to place an access road on the west side of the existing power corridor. This would be necessary to allow access to the property.
2700 South to 3500 South	5800 West Freeway Alternative	Alignment would be shifted to the east to avoid impacts to a Questar Gas tap station, Kern River gas lines, and Rocky Mountain Power high-voltage electrical lines.
SR 201 frontage road	5800 West Freeway Alternative	Frontage road would be reconnected to allow better traffic circulation.
I-80 interchange	5800 West Freeway Alternative	The interchange with I-80 would be changed to a trumpet interchange to reduce the length of the collector-distributor system and allow connectivity north of I-80.
Utah County Alternatives		
Connection to existing Lindon/ Pleasant Grove interchange	Southern Freeway Alternative	Interchange connection would be modified to connect the existing Lindon/Pleasant Grove interchange to the MVC ramps at I-15.
2100 North frontage roads	2100 North Freeway Alternative	One-way frontage roads on both sides of 2100 North in Lehi would be included on the west side of the Jordan River from 10400 West to SR 68. The MVC north-south freeway component would be shifted to the east at the 2100 North connection.
2100 North SPUI	Arterials Alternative	Interchange with 2100 North and I-15 would be changed from a diamond interchange to a single-point urban interchange (SPUI) to match the type of interchange planned in the I-15 EIS and adopted in the Lehi City transportation master plan.

2.1.7.4 Additional Changes to the Alternatives between the Draft EIS and Final EIS

In addition to the design options described above, two major refinements were considered for the Salt Lake County action alternatives: avoidance of the ATK property and a westerly shift of the alignment south of Herriman (Herriman Shift). Several minor refinements were incorporated for the Salt Lake and Utah County alternatives.

Avoidance of ATK Property

During the Draft EIS alternative development process, ATK staff stated during several discussions that they did not oppose the MVC project crossing parts of their property. This allowed the development of the 7200 West Freeway Alternative and the avoidance of a public golf course (a Section 4(f) property) by

the 5800 West Freeway Alternative. After the Draft EIS was released, ATK stated that several of their facilities have explosive safety zones that include both the 7200 West Freeway and 5800 West Freeway Alternatives, which would prohibit the alternatives near these facilities.

Based on this information, UDOT revised the 7200 West Freeway and 5800 West Freeway Alternatives to avoid the ATK property (see Figure 2-5.2, ATK Alignment Shift). The revisions to the alignments also avoid impacts to Hexcel Corporation. The revised 7200 West Freeway Alternative alignment was moved farther east, which increased residential relocations and impacts to the West Valley City public golf course (West Ridge Golf Course), and the revised 5800 West Freeway Alternative was also moved east through the West Ridge Golf Course. Discussions with West Valley City determined that the part of the golf course that would be affected could be replaced and that this replacement would not affect the overall operation of the golf course. The revised alignments for each alternative are evaluated in this Final EIS.

Herriman Shift

During the Draft EIS comment period, the City of Herriman commented that they would like the MVC alignment moved farther away from Redwood Road to the west next to and onto the Camp Williams property. The City of Herriman noted that the shift to the west would provide a buffer for Camp Williams from future development. Based on this comment, UDOT met with Camp Williams and determined that an alignment on the east edge of their property was acceptable (see Figure 2-5.3, Herriman Alignment Shift). This alignment shift would not cause any additional home relocations and would move the alignment farther from the Rocky Mountain Power substation. It would also eliminate the need to relocate several thousand feet of aqueduct owned by the Jordan Valley Water Conservancy District.

2100 North Freeway Alternative

During the Draft EIS comment period, Lehi City raised concerns regarding community cohesion, economic development, local access, and the width of the corridor. UDOT met with city officials, staff, and property owners for several months to revise the alternative to be more compatible with local growth objectives and reduce impacts. UDOT agreed to adopt the design option for this alternative that included one-way frontage roads on each side of the roadway, with several modifications. The corridor was narrowed through the use of walls and modification of cross streets. Slip ramps were located to facilitate local access. The footprint of the system interchange of 2100 North at I-15 has been modified to reduce right-of-way impacts to the adjacent property. UDOT also

agreed to adopt a phased approach to project implementation. See Section 36.2.2, Implementation Phases in Utah County.

Additional Alignment Modifications

Several alignment modifications were made between the Draft EIS and Final EIS to minimize impacts as listed below and as shown in Figure 2-5.4, Additional Alignment Modifications:

- The Southern Freeway Alternative was revised to miss a historic property at 7364 North 9550 West. Cross-street access was also modified to eliminate impacts to North Lake Park.
- For the 2100 North Freeway Alternative, the northbound off ramp with I-15 was revised to minimize an impact to historic properties at 959 West 2100 North and 951 West 2100 North.
- For the Arterials Alternative, the Porter Rockwell alignment was revised to minimize impacts to a historic property at approximately 15400 South and the Draper Irrigation Canal.
- For the 5800 West Freeway Alternative, the utility corridor alignment was modified at SR 201 to better accommodate the Rocky Mountain Power transmission line crossing.
- For the 5800 West Freeway Alternative, the alignment was shifted to the east from Cilma Drive to 4100 South to address conflicts with the utility corridor.
- For the 7200 West Freeway Alternative, the I-80 interchange connection with the MVC was adjusted to better accommodate access between the facilities.

2.2 Description of Alternatives Carried Forward for Detailed Study

In Salt Lake County, two roadway alternatives were evaluated in detail: the 5800 West Freeway Alternative and the 7200 West Freeway Alternative. Both of these roadway alternatives include the 5600 West Transit Alternative. In addition, the 5600 West Transit Alternative includes a dedicated right-of-way option and a mixed-traffic option.

In Utah County, three final roadway alternatives are under consideration: the Southern Freeway Alternative, the 2100 North Freeway Alternative, and the Arterials Alternative. In addition, a tolling option was evaluated for each of the Salt Lake County and Utah County roadway alternatives.

For this Final EIS, the travel demand modeling was updated for both the non-tolled and tolled options using Version 6.0 of the regional travel demand model to ensure that the design of the alternatives considered in the EIS was appropriate (see Section 2.1.7.1, Revised Travel Demand Modeling for the Final EIS). For the travel demand modeling, the 5800 West Freeway Alternative (Salt Lake County Preferred Alternative) was used with each of the Utah County alternatives, and the 2100 North Freeway Alternative (Utah County Preferred Alternative) was used with each of the Salt Lake County alternatives.

2.2.1 No-Action Alternative

NEPA requires an analysis of the No-Action Alternative. This alternative serves as a baseline so that decision-makers can compare the environmental effects of the action alternatives. An analysis of the No-Action Alternative used for the MVC project is described in *Technical Memorandum 2, EIS No-Build (No-Action) Alternative* (MVC Management Team 2004c).

Under the No-Action Alternative, the MVC roadway and transit components would not be built. However, the projects identified in the WFRC and MAG regional transportation plans would likely continue to be implemented. The projects in the regional transportation plans are used in the regional travel demand model to determine future transportation needs. These transportation needs are based on projected and planned socioeconomic growth and land-use growth within a region by 2030; this projected and planned growth provides future baseline conditions. Therefore the No-Action Alternative for the MVC project includes projects, socioeconomic projections, and land-use projections identified in the 2007 WFRC and MAG regional transportation plans except as noted below:

- In the Salt Lake County portion of the study area, the No-Action conditions assume revised population and employment projections from the 2007 WFRC regional transportation plan (see Section 2.1.7.1, Revised Travel Demand Modeling for the Final EIS) and all of the roadway and transit improvements in the regional transportation plan except for a recommended north-south freeway with four to six lanes plus high-occupancy-vehicle lanes in the 5600 West area.
- In the Utah County portion of the study area, the No-Action conditions assume the same demographics as the MAG regional transportation plan (2007) and all of the roadway and transit improvements in the plan except for the east-west arterials of Porter Rockwell Boulevard (Bluffdale), 2100 North (Lehi), and 1900 South (Saratoga Springs, Lehi, and American Fork). The 2100 North and 1900 South east-west arterials

were considered in the *North Valley Connectors Study* (MAG 2002) (see Section 1.5.5, Corridor Planning Studies).

Figure 1-2 through Figure 1-5, Future (2030) No-Action Transportation Network, show planned expansion of the roadway and transit networks in the MVC study area as identified in the WFRC and MAG regional transportation plans.

The background land-use and transit assumptions described above for the No-Action Alternative are different from those used for the action alternatives, which use the land-use and 5600 West transit assumptions from the Growth Choices Vision Scenario. The Growth Choices land uses were modified from those in the WFRC and MAG regional transportation plans in order to facilitate the action alternatives' use of transit by having more transit-oriented developments along 5600 West.

In early 2007, after the EIS process was initiated, UDOT announced that it would evaluate 1000 South in Lehi (Utah County) as an independent project from the MVC. An alignment on 1000 South was initially part of the Arterials Alternative, but now that it is an independent project, it is part of the No-Action Alternative. Provided below are some key projects in Salt Lake and Utah Counties in the MVC study area that are part of the No-Action Alternative:

- Salt Lake County
  - Widen 5600 West.
  - Widen Redwood Road.
  - Widen SR 111.
  - Widen 3500 South.
  - Widen 4700 South.
  - Widen and construct a new alignment on 7800 South.
  - Widen 9000 South.
  - Widen and construct a new alignment on 11400 South.
  - Widen and construct a new alignment on 12600 South.
  - Construct the Mid-Jordan Transit Corridor.
  - Construct the West Valley Transit Corridor.
  - Construct the Airport TRAX Line.
  - Construct 3500 South Bus Rapid Transit.

- Utah County
  - Widen I-15.
  - Widen Redwood Road.
  - Widen SR 73.
  - Construct a new roadway on 1000 South.
  - Widen Pony Express Parkway.
  - Widen Geneva Road.
  - Construct a new north-south roadway west of I-15 in Orem. Vineyard, Lindon, and American Fork.
  - Construct FrontRunner commuter rail.

2.2.2 Salt Lake County Alternatives

The Salt Lake County alternatives consist of two freeway alternatives and a transit alternative which would be implemented as part of the roadway alternatives. For both of the Salt Lake County freeway alternatives (5800 West Freeway Alternative and 7200 West Freeway Alternative), the freeway configuration would be the same from 5400 South to the Utah County line. The transit and trail components are also the same for both of these alternatives. Appendix A, Roadway Plans, provides detailed engineering drawings of the proposed alignments.

Each roadway alternative in Salt Lake County can be matched with any alternative in Utah County to provide a complete MVC transportation solution. All of the action alternatives use the land-use and 5600 West transit assumptions from the Growth Choices Vision Scenario as the basis for the alternative. For analysis purposes, a preliminary cost estimate for the Salt Lake County alternatives was developed and is shown in Table 2.2-1. The estimates below have been revised from the Draft EIS based on the latest available (2006 and 2007) unit cost. They are not projections from the 2004 cost shown in the Draft EIS using an inflation factor. For more information, see Section 2.4.3, Cost.

Table 2.2-1. Preliminary MVC Cost Estimate (in 2007 Dollars) – Salt Lake County Alternatives

Cost Element	5600 West Transit Alternative		5800 West Freeway Alternative	7200 West Freeway Alternative
	Dedicated Right-of-Way Option[a]	Mixed-Traffic Option[a]		
2007 total cost[b]	$672,000,000[c]	$571,000,000[c]	$2,157,000,000	$2,152,000,000

[a] The Dedicated Right-of-Way Option assumes a light-rail system and the Mixed-Traffic Option assumes a streetcar system.

[b] Costs include utility relocation and proposed trail.

[c] Transit construction costs include construction, right-of-way, and transit vehicles.

2.2.2.1 5600 West Transit Alternative

The 5600 West Transit Alternative would be part of both of the Salt Lake County roadway alternatives. The 5600 West Transit Alternative has two options: a Dedicated Right-of-Way Transit Option and a Mixed-Traffic Transit Option. This transit project is listed as a separate project in the WFRC long-range plan.

Dedicated Right-of-Way Transit Option (Preferred Transit Alternative)

The Dedicated Right-of-Way Transit Option would consist of an area in the center of the roadway dedicated solely for the use of transit vehicles, with street traffic using general-purpose lanes on the outside of the roadway. Transit stations would be located in the roadway median.

Transit Alignment. Figure 2-6.1, Transit Alignment – Dedicated Right-of-Way Transit Option, shows the proposed 24-mile transit alignment, and Figure 2-6.2, Transit Typical Sections – Dedicated Right-of-Way Transit Option, show the cross-section of the Dedicated Right-of-Way Transit Option. The proposed transit alignment begins south of Herriman Parkway in the future Herriman City Center. The alignment would operate within the future street networks and would continue north to 11800 South. The transit line turns east to follow 11800 South and crosses the proposed MVC alignment on a structure that would be shared with the vehicle traffic on 11800 South.

The transit line follows the main street of the planned Daybreak development. From this location northward to Old Bingham Highway, the transit for the MVC would operate within the same right-of-way as the Mid-Jordan light-rail transit line. The Mid-Jordan light-rail line is included in the WFRC regional transportation plan and is part of the MVC No-Action Alternative. An EIS was completed in 2007 for the Mid-Jordan light-rail project, so the portion of the MVC line shared with that project is not analyzed in this EIS except for potential cumulative impacts from both projects.

From Old Bingham Highway, the MVC transit alignment would run in the existing right-of-way for 5600 West from Old Bingham Highway to about 700 South. Additional right-of-way would be required at station locations and where left-turn and right-turn lanes would be needed.

The alignment leaves 5600 West at the existing railroad crossing north of 700 South and crosses under I-80 at the existing railroad crossing. After crossing under I-80, the alignment turns east along Amelia Earhart Drive just beyond its intersection with Wright Brothers Drive. From here, the transitway follows I-80 and connects to the proposed light-rail line from Salt Lake City to the Salt Lake

City International Airport. If there is a need to change the layout of the Salt Lake City International Airport in the future because of an increase in air travel, to improve airport facilities, or for other reasons, the connection shown in this EIS could be modified. Any modification would be evaluated for environmental impacts.

Station Locations and Park-and-Ride Lots. Table 2.2-2 below shows the proposed station locations based on the traditional spacing guidance discussed in Section 2.1.4.1, Transit Considerations. Park-and-ride lots would be provided at those stations with expected high demand and available vacant land. The number of parking spaces at each park-and-ride lot was based on the estimated number of boardings, which was developed using the regional travel demand model. *Technical Memorandum 24, Park-and-Ride Lot Workshop and Recommendation Summary* (MVC Management Team 2004d) explains how park-and-ride lots were developed. For all park-and-ride lots, appropriate water detention basins would be designed to detain stormwater runoff.

Table 2.2-2. Proposed Station Locations and 2030 Daily Boardings for the 5600 West Transit Alternative

Station Location	2030 Daily Boardings by Station		
	Mixed-Traffic Transit Option (Mixed Traffic)	Dedicated Right-of-Way Transit Option (Center-Running)	Park-and-Ride Lots (Parking Spaces)
Herriman City Center	670	820	1,100[b]
11400 South & 5200 West	380	880[a]	None[a,b]
10400 South & 5200 West	120	130[a]	None[a,b]
Old Bingham Highway & 5600 West	740	2,180[a]	250[b,c]
9000 South & 5600 West	100	170	None
New Bingham Highway & 5600 West	20	None	None
8200 South & 5600 West	460	None	None
7800 South & 5600 West	680	1,820	350
7000 South & 5600 West	60	None	None
6600 South & 5600 West	360	None	None
6200 South & 5600 West	230	990	180
5400 South & 5600 West	100	1,070	320
5200 South & 5600 West	340	None	None
4700 South & 5600 West	810	950	None
4100 South & 5600 West	190	None	None
3500 South & 5600 West	760	1,720	400
3100 South & 5600 West	250	None	None
2700 South & 5600 West	410	680	50
2100 South & 5600 West	100	120	None
California Avenue & 5600 West	230	320	None
700 South & 5600 West	20	None	None
Salt Lake City Development Area	540	750	None
Amelia Earhart Drive & 5600 West	260	170	None
Amelia Earhart Drive & Wright Brothers Drive	110	320	None
Salt Lake City International Airport	1,220	3,630	None
Total Station Boardings[d]	**9,160**	**16,720**	
Total Station Stops	**25**	**17**	

[a] To be constructed as part of the Mid-Jordan light-rail line.

[b] Shared with riders from the Mid-Jordan light-rail line.

[c] In addition to parking spaces provided as part of the Mid-Jordan light-rail line.

[d] Boardings assume implementation of the Growth Choices Vision Scenario land use by the local municipalities (see Chapter 3, Growth Choices).

Mixed-Traffic Transit Option

The Mixed-Traffic Transit Option would consist of transit vehicles sharing the outside lanes of 5600 West with street traffic in each direction of travel. At station locations, transit vehicles would exit the shared lane to the right, then merge back into the shared lane after leaving the station. Figure 2-7.1, Transit Alignment – Mixed-Traffic Transit Option, shows the proposed 24-mile Mixed-Traffic Transit Option alignment along with station locations. Figure 2-7.2, Transit Typical Sections – Mixed-Traffic Transit Option, shows the cross-section of the Mixed-Traffic Transit Option.

The alignment for this option would be the same as that for the Dedicated Right-of-Way Transit Option except that the mixed-traffic option would have more station locations (25 stations) and the transit would be mixed with traffic operating within the right vehicle travel lane along 5600 West in both directions. Table 2.2-2 above, Proposed Station Locations and 2030 Daily Boardings for the 5600 West Transit Alternative, shows the proposed station locations based on the traditional spacing guidance discussed in Section 2.1.4.1, Transit Considerations.

2.2.2.2 5800 West Freeway Alternative (Preferred Roadway Alternative – Salt Lake County)

One of the two freeway alternatives in Salt Lake County is the 5800 West Freeway Alternative. The 5800 West freeway would begin with a collector-distributor system and a freeway-to-freeway interchange at I-80 and would consist of a freeway for the entire length of the alternative in Salt Lake County. This alternative would also include the 5600 West Transit Alternative.

Figure 2-8.1, 5800 West Freeway Alternative – Salt Lake County, through Figure 2-8.3, Freeway Typical Sections for Salt Lake County – Eight-Lane Freeway, show the alignment of the 5800 West Freeway Alternative along with the proposed transitway and the proposed freeway cross-sections. Appendix A, Roadway Plans, provides detailed engineering drawings of the proposed freeway alternative alignment.

Alternative Lane Configuration

The 5800 West Freeway Alternative would have varying lane configurations at different locations based on the expected travel demand. Table 2.2-3 below and Figure 2-8.1 show the lane configuration for the 5800 West Freeway Alternative.

Table 2.2-3. Salt Lake County Lane Configuration – 5800 West Freeway Alternative

Freeway Segment	Lanes in Each Direction		Total Lanes[a]
	General-Purpose	HOV	
I-80 to SR 201	2	1	6
SR 201 to 13400 South	3	1	8
13400 South to Utah County line	3	0	6

[a] Auxiliary lanes would be required at certain locations to allow traffic to merge on and off the freeway. Between 4100 South and 6200 South, an additional lane would be required in the south direction for a total of nine lanes plus auxiliary lanes. The additional lane functions primarily as an auxiliary lane in this area. A detailed analysis of the auxiliary lanes is provided in *Technical Memorandum 19*, *Roadway Level of Service Goals and Designation* (MVC Management Team 2004b).

Freeway Elevation

Under this alternative, the freeway would be depressed (below grade) or above ground depending on the location. Figure 2-8.4, Above-Grade and Below-Grade Freeway Examples, shows a typical depressed and above-ground freeway segment. The 5800 West freeway is expected to be constructed above ground except from 5200 South in West Valley City to 7400 South in West Jordan and from 10500 South in South Jordan to 15400 South in Herriman, where it would be depressed. Figure 2-8.5, 5800 West Freeway Alternative – Depressed and Elevated Sections, provides the location of the depressed sections for this alternative.

Structures and Cross-Street Configurations

This alternative would cross numerous streets in Salt Lake County and would require various cross-street configurations: interchanges, overpasses, underpasses, and cul-de-sacs. Table 2.2-4 below provides an overview of the cross-street configurations for the 5800 West Freeway Alternative. Interchanges on the freeway would be either a single-point urban interchange (SPUI) or a diamond interchange. An example of a SPUI is along I-15 at the 3300 South exit in Salt Lake City, and an example of a diamond interchange is at 800 North in Orem.

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Table 2.2-4. Salt Lake County Cross Streets – 5800 West Freeway Alternative

Cross Street	Road Jurisdiction[a]	MVC Cross-Street Treatment			
		Interchange[b]	Cross Street Over	Cross Street Under	Cul-de-Sac
North Temple Street	Salt Lake City				X
I-80	Salt Lake City	Freeway to freeway		X	
700 South	Salt Lake City			X	
California Avenue/1300 South	Salt Lake City	Diamond		X	
2100 South (north frontage road)	Salt Lake City/West Valley City Line			X[c]	
SR 201	Salt Lake City/West Valley City Line	Freeway to freeway		X	
2100 South (south frontage road)	West Valley City		X[d]		
Parkway Boulevard/2700 South	West Valley City	Partial diamond		X	
Brud Drive/3100 South	West Valley City			X	
3500 South	West Valley City	SPUI		X	
Darle Avenue	West Valley City				X[e]
Cilma Drive	West Valley City			X	
Dixie Drive	West Valley City				X
4100 South	West Valley City	Diamond		X	
4300 South	West Valley City			X	
Cape Cod Drive	West Valley City			X	
4700 South	West Valley City			X	
Westridge Boulevard	West Valley City				X
6055 West	West Valley City			X	
6400 West	West Valley City		X		
5400 South	West Valley City	Diamond	X		
6200 South	West Valley City	Diamond	X		
7000 South	West Jordan		X		
7400 South	West Jordan		X		
7800 South	West Jordan	Diamond		X	
8200 South	West Jordan			X	
8600 South	West Jordan			X	
9000 South	West Jordan	Diamond		X	
9400 South (Dannon Way)	West Jordan			X	
9800 South (Wells Park Road)	West Jordan			X	
Old Bingham Highway	West Jordan			X	
10200 South	West Jordan			X	
10600 South	South Jordan			X	
11000 South	South Jordan	Diamond	X		
11400 South	South Jordan	Diamond	X		
12600 South	Herriman/Riverton	Diamond	X		

▼▼

Cross Street	Road Jurisdiction[a]	MVC Cross-Street Treatment			
		Interchange[b]	Cross Street Over	Cross Street Under	Cul-de-Sac
11800 South	Herriman		X[f]		
12800 South	Riverton				X
13200 South	Riverton		X		
13400 South	Riverton	Diamond	X		
Juniper Crest Road	Riverton		X		
Rosecrest Road	Riverton		X		
14600 South	Herriman	Diamond		X	
3600 West	Herriman		X		

[a] Indicates the jurisdiction where the road crosses the MVC alignment.

[b] Interchange types are provided for reference, but might be modified during the final design phase of the project to take specific conditions into account.

[c] The 2100 South north frontage road would be realigned to 1730 South.

[d] The 2100 South frontage road on the south side of the MVC would be a cul-de-sac on the west side and would tie into 5600 West on the east side.

[e] A pedestrian undercrossing would be built in this area to maintain a connection to Hunter Park.

[f] 11800 South would be realigned and would cross the MVC on a structure to the south of the current alignment.

Collector-Distributor System

For this alternative, one collector-distributor system would be required at the connection of the alternative and I-80. Collector-distributor systems are required in freeway design when cross streets or freeway access points at interchanges are too close together (typically less than 1 mile). A collector-distributor system separates higher-speed freeway traffic from the "side" traffic entering and exiting the freeway. This separation eliminates unsafe merging while still allowing traffic to access the closely spaced cross streets or interchanges. With the collector-distributor system, freeway traffic would operate at 65 mph and the side traffic would operate at 50 mph, and the side traffic would not merge with the main freeway traffic except at the four freeway access points.

The collector-distributor system would be required at the connection of the 5800 West Freeway Alternative and I-80 because of the close proximity of the existing diamond interchange at 5600 West. Figure 2-8.6, 5800 West Freeway Alternative – Collector-Distributor System, shows the collector-distributor system at I-80.

Utility Relocations

This alternative would encroach on an existing utility corridor from just south of California Avenue to 4700 South, from 7800 South to New Bingham Highway, and at about 11000 South. The utility corridor contains two underground high-pressure gas lines, a feeder gas line, and two overhead high-power electrical lines. These utilities would have to be relocated outside the MVC right-of-way

along the freeway. The relocation of these lines has been included in the MVC right-of-way requirements and cost estimates considered in this EIS. However, the actual relocation of these utilities could be revised during the final design phase of the project. For more information about utility relocations, see Chapter 6, Community Impacts.

Trail

Three separate trail segments have been identified as feasible trail locations in Salt Lake County and have been developed to connect to other proposed or existing trails. These locations are shown in Figure 2-8.7, 5800 West and 7200 West Salt Lake County Alternatives – Trail Locations. The MVC trail locations identified in Salt Lake County would be part of all action alternatives in Salt Lake County. Where the MVC trail crosses major arterials, the continuity of the trail would be provided at the nearest signalized intersection or by a tunnel or structure under or over the arterial. The method by which each trail crosses each arterial would be decided during the final design phase of the project.

The underpass and overpass structures for the MVC would provide continuity for existing and planned east-west trails by routing them over or under the MVC freeway.

The trail would require between 12 feet and 50 feet of right-of-way, but the actual width has not been determined. The actual right-of-way would be evaluated on a case-by-case basis taking into account local conditions and the trail master plan during the final design. For analysis purposes, the right-of-way for the trail was designed to take into account specific conditions and varied from 12 feet and 50 feet. No other design parameters are considered in this EIS. Specific design parameters would be determined at a later date as a part of the project's final design. The final design would address the following parameters:

- Cross-section of the trail, including final width and accommodation of uses (pedestrians, bicycles, and/or horses)
- How the trail would cross at interchange locations, including whether crossings are grade separated or at-grade
- Associated landscaping or trail treatments

Congestion Management

Several congestion-management strategies are included as part of the 5800 West Freeway Alternative. These strategies include high-occupancy vehicle (HOV, or carpool) lanes, ramp metering, and Intelligent Transportation Systems and incident management.

HOV Lanes. If the MVC project is not tolled, an HOV lane would be provided in each direction in certain freeway segments (see Figure 2-8.1, 5800 West Freeway Alternative – Salt Lake County). Locations where vehicles could enter or leave the HOV lane would be provided at frequent intervals because of the prevalence of short trips in the corridor, the numerous on and off ramps, and the mixed residential and employment land uses along the corridor. Initially, HOV lanes would be defined as lanes that allow vehicles with two or more people. This definition could be changed later. For details, see *Technical Memorandum TM-20, Application of HOV Lanes to Freeway Alternatives* (MVC Management Team 2004e).

Ramp Metering. Ramp-control systems regulate the flow of vehicles onto a freeway to maintain the operation of the freeway at an acceptable level of service. The ramp design would accommodate ramp metering if UDOT decides to implement it in the future.

Intelligent Transportation Systems and Incident Management. Intelligent Transportation Systems include integrated surveillance, monitoring, and communications technologies that are designed to manage the flow of traffic in a freeway corridor so that maximum use of the freeway can be achieved. Such systems can be used to create incident-management strategies, which are designed to mitigate congestion caused by traffic accidents, disabled vehicles, roadway maintenance, or other situations. For the 5800 West Freeway Alternative, an incident detection and management system would be operated after the MVC is constructed. The specific elements of this system would be determined during future studies. As on existing freeways such as I-15, I-215, and I-80, the system would most likely include methods such as:

- Use of the UDOT Traffic Operations Center to receive information from the various incident-detection systems, dispense information, and coordinate the incident-response teams
- Variable message signs to alert motorists of traffic or roadway conditions and to provide detour instructions and other information
- Highway advisories consisting of recorded messages broadcast over a designated radio frequency
- Cameras at selected locations to observe traffic conditions

2.2.2.3 7200 West Freeway Alternative

The second of the two freeway alternatives in Salt Lake County is the 7200 West Freeway Alternative. This alternative begins with a freeway-to-freeway interchange with I-80 at 7200 West and runs along the existing 7200 West

roadway to 4100 South, where the alignment heads slightly east to 5400 South. After 5400 South, the alignment would be the same as for the 5800 West Freeway Alternative. This alternative would also include the 5600 West Transit Alternative.

Figure 2-9.1, 7200 West Freeway Alternative – Salt Lake County, through Figure 2-9.3, Freeway Typical Sections for Salt Lake County – Eight-Lane Freeway, show the alignment of the 7200 West Freeway Alternative along with the proposed transitway and the proposed freeway cross-sections. Appendix A, Roadway Plans, provides detailed engineering drawings of the proposed freeway alternative alignment.

Alternative Lane Configuration

Under this alternative, the freeway would have varying lane configurations based on the expected travel demand. Table 2.2-5 and Figure 2-9.1 show the lane configuration for the 7200 West Freeway Alternative.

Table 2.2-5. Salt Lake County Lane Configuration – 7200 West Freeway Alternative

Freeway Segment	Lanes in Each Direction		Total Lanes[a]
	General-Purpose	HOV	
I-80 to SR 201	2	1	6
SR 201 to 13400 South	3	1	8
13400 South to Utah County line	3	0	6

[a] Auxiliary lanes would be required at certain locations to allow traffic to merge on and off the freeway. A detailed analysis of the auxiliary lanes is provided in *Technical Memorandum 19*, *Roadway Level of Service Goals and Designation* (MVC Management Team 2004b).

Freeway Elevation

The depressed and above-ground segments of the 7200 West Freeway Alternative would be the same as those for the 5800 West Freeway Alternative.

Structures and Cross-Street Configurations

This alternative would cross numerous streets in Salt Lake County and would require various cross-street configurations: interchanges, overpasses, underpasses, and cul-de-sacs. Table 2.2-6 below provides an overview of the cross-street configurations for the 7200 West Freeway Alternative.

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Table 2.2-6. Salt Lake County Cross Streets – 7200 West Freeway Alternative

Cross Street	Road Jurisdiction[a]	MVC Cross-Street Treatment			
		Interchange[b]	Cross Street Over	Cross Street Under	Cul-de-Sac
I-80	Salt Lake City	Freeway to freeway		X	
700 South	Salt Lake City			X	
California Avenue/1300 South	Salt Lake City	Diamond		X	
2100 South (north frontage road)	Salt Lake City/West Valley City Line			X	
SR 201	West Valley City	Freeway to freeway			
2100 South (south frontage road)	Salt Lake City/West Valley City Line				X[d]
Southbound frontage road	West Valley City			X	
Parkway Boulevard/2700 South	West Valley City			X[c]	
3100 South	West Valley City			X[c]	
Fairfield Drive	West Valley City				X[e]
Tenway Drive	West Valley City				X[e]
3500 South	West Valley City	Slip ramps[c]		X[c]	
Jefferson Road/Cimarron Drive	West Valley City				X[e]
Northbound Frontage Road	West Valley City			X	
Majestic Way/3800 South	West Valley City				X[e]
Copper Hill Drive	West Valley City				X
King Estate Drive	West Valley City				X
3980 South	West Valley City				X
4100 South	West Valley City	Partial diamond		X	
5400 South	West Valley City	Diamond	X		
6200 South	West Valley City	Diamond	X		
7000 South	West Jordan		X		
7400 South	West Jordan		X		
7800 South	West Jordan	Diamond		X	
8200 South	West Jordan		X		
8600 South	West Jordan			X	
9000 South	West Jordan	Diamond		X	
9400 South (Dannon Way)	West Jordan			X	
9800 South (Wells Park Road)	West Jordan			X	
Old Bingham Highway	West Jordan			X	
10200 South	West Jordan			X	
10600 South	South Jordan			X	
11000 South	South Jordan	Diamond	X		
11400 South	South Jordan	Diamond	X		
11800 South	Herriman		X[f]		
12600 South	Herriman/Riverton	Diamond	X		

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Cross Street	Road Jurisdiction[a]	MVC Cross-Street Treatment			
		Interchange[b]	Cross Street Over	Cross Street Under	Cul-de-Sac
12800 South	Riverton				X
13200 South	Riverton		X		
13400 South	Riverton	Diamond	X		
Juniper Crest Road	Herriman		X		
Rosecrest Road	Herriman		X		
14600 South	Herriman	Diamond		X	
3600 West	Herriman		X		

[a] Indicates the jurisdiction where the road crosses the MVC alignment. Information on other nearby jurisdictions is included in the table if they are within 2 miles of the cross street listed.

[b] Interchange types are provided for reference, but might be modified during the final design phase of the project to take specific conditions into account.

[c] A freeway on/off ramp would be used to connect the freeway to a parallel roadway such as a frontage road. On and off ramps are typically used to connect to one-way roads such as the proposed 7200 West frontage road.

[d] The 2100 South frontage road would be aligned to 7200 West.

[e] The roads would not be a cul-de-sac but would tie into a frontage road system to allow access.

[f] 1800 South would be realigned and would cross the MVC on a structure to the south of the current alignment.

Frontage Roads

Under this alternative, a frontage road system would replace the existing 7200 West roadway from SR 201 to 4100 South. Because the MVC freeway alignment would be placed on 7200 West, the frontage road is needed to maintain local residential and business access along 7200 West through West Valley City. The frontage road would require 60.5 feet of right-of-way on each side of the freeway. The posted speed on the frontage road would be 35 mph. Figure 2-9.4, 7200 West Freeway Alternative – Frontage Road System, shows the proposed frontage road system along 7200 West.

Trail

The trail for this alternative would be the same as that for the 5800 West Freeway Alternative except that it would not include a trail component from 2700 South to 4700 South.

Congestion Management

Congestion management for this alternative would be the same as that for the 5800 West Freeway Alternative. The potential locations of HOV lanes are shown in Figure 2-9.1, 7200 West Freeway Alternative – Salt Lake County).

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2.2.3 Utah County Alternatives

Three roadway alternatives are being considered in Utah County: two freeway alternatives and an arterials alternative. Appendix A, Roadway Plans, provides detailed engineering drawings of the proposed alignments. The MVC trail would connect to the existing Jordan River trail near the Salt Lake County–Utah County line and would also be placed along the MVC from the county line down to SR 73 in Saratoga Springs. To minimize wetland impacts near Utah Lake, no other trail facility is planned.

Each roadway alternative in Utah County can be matched with any roadway alternative in Salt Lake County to provide a complete MVC transportation solution. All of the action alternatives use the land-use assumptions from the Growth Choices Vision Scenario as the basis for the alternative. For analysis purposes, a preliminary cost estimate for the Utah County alternatives was developed and is shown in Table 2.2-7. The estimates below have been revised from the Draft EIS based on current unit cost. They are not projections from the 2004 cost shown in the Draft EIS using an inflation factor. For more information, see Section 2.4.3, Cost.

Table 2.2-7. Preliminary MVC Cost Estimate (in 2007 Dollars) – Utah County Alternatives

Cost Element	Southern Freeway Alternative	2100 North Freeway Alternative	Arterials Alternative
2007 total cost[a]	$1,126,000,000	$950,000,000	$984,000,000

[a] Costs include utility relocation and proposed trail.

2.2.3.1 Southern Freeway Alternative

This alternative consists of a freeway from the Utah County line that extends south toward Utah Lake and then heads east. The eastern leg would roughly follow 1900 South in Lehi and then continue east, north of Utah Lake, to join I-15 at the existing Pleasant Grove/Lindon interchange.

Figure 2-10.1, Southern Freeway Alternative, shows the proposed alignment of the Southern Freeway Alternative and the cross-section of the proposed freeway. Appendix A, Roadway Plans, provides detailed engineering drawings of the proposed alternative alignment.

Alternative Lane Configuration

Table 2.2-8 and Figure 2-10.1 show the lane configuration for the Southern Freeway Alternative.

Table 2.2-8. Utah County Lane Configuration – Southern Freeway Alternative

Roadway Segment	Lanes in Each Direction: General-Purpose	Lanes in Each Direction: HOV	Total Lanes[a]
Southern Freeway Lane Configuration			
Utah County line to Pleasant Grove interchange	3	0	6

[a] Auxiliary lanes would be required at certain locations to allow traffic to merge on and off the freeway. A detailed analysis of the auxiliary lanes is provided in *Technical Memorandum 19*, *Roadway Level of Service Goals and Designation* (MVC Management Team 2004b).

Freeway Elevation

Under this alternative, the freeway would be depressed (below grade) or above ground depending on the location. The freeway would be above ground except from the southern boundary of Camp Williams to the Harvest Hills subdivision (Saratoga Springs), where it would be depressed (see Figure 2-10.2, Southern Freeway Alternative – Depressed and Elevated Sections).

Structures and Cross-Street Configurations

This alternative would cross numerous streets in Utah County and would require various cross-street configurations: interchanges, overpasses, underpasses, at-grade signalized intersections, and cul-de-sacs. Table 2.2-9 below provides an overview of the cross-street configurations for the Southern Freeway Alternative.

Trail

The trail for this alternative would extend from the Utah County line south to SR 73 (see Figure 2-10.3, Southern Freeway Alternative – Trail Locations).

Congestion Management

Congestion management for this alternative would be the same as for the 5800 West Freeway Alternative. See Figure 2-10.1, Southern Freeway Alternative, for the location of potential HOV lanes.

Table 2.2-9. Utah County Cross Streets – Southern Freeway Alternative

Cross Street	Road Jurisdiction[a]	MVC Cross-Street Treatment				
		Interchange[b]	Cross Street Over	Cross Street Under	Cul-de-Sac	At-Grade Intersection
Porter Rockwell Blvd.	Herriman	Diamond		X		
Local access road	Camp Williams			X		
2100 North	Saratoga Springs	Diamond	X			
Local access road	Saratoga Springs			X		
11600 West	Saratoga Springs				X	
SR 73	Saratoga Springs	Diamond		X		
1200 North	Saratoga Springs				X	
SR 68	Saratoga Springs	Diamond		X		
2300 West	Lehi	Diamond		X		
1700 West	Lehi			X		
1900 South	Saratoga Springs			X		
570 West	American Fork	Modified diamond		X		
100 West	American Fork			X		
500 East	American Fork			X		
5050 West	American Fork			X		
4640 West	Lindon			X		
1300 West	Lindon/Pleasant Grove			X		
I-15	Pleasant Grove	Freeway to freeway		X		

[a] Indicates the jurisdiction where the road crosses the MVC alignment. Information on other nearby jurisdictions is included in the table if they are within 2 miles of the cross street listed.

[b] Interchange types are provided for reference, but might be modified during the final design phase of the project to take specific conditions into account.

Park-and-Pool Lots

Park-and-pool lots are typically smaller than park-and-ride lots and are intended exclusively for motorists to form carpools and vanpools. This type of lot is often developed as a joint-use facility (for example, shared with a church or shopping center) and can be a part of a development mitigation plan whereby a developer dedicates a number of spaces within a larger development for park-and-pool purposes. For this alternative, park-and-pool lots would be about 1 acre and would be placed at the following locations (see Figure 2-10.1, Southern Freeway Alternative):

- 2100 North and MVC
- SR 73 and MVC
- SR 68 and MVC

2.2.3.2 2100 North Freeway Alternative (Preferred Roadway Alternative – Utah County)

This alternative consists of a freeway that extends from the Utah County line south to SR 73 in Lehi, plus a freeway along 2100 North from the MVC to the 1200 West interchange at I-15. In addition to the two freeway components of this alternative, two one-way frontage roads would extend from SR 68 to just past the commuter rail tracks west of I-15. At the connection of the MVC roadway and SR 73, southbound lanes would connect with SR 73 at a signalized intersection, and SR 73 would connect with the northbound lanes of the MVC roadway using either a direct-access ramp with a bridge over SR 73 (westbound SR 73 to northbound MVC) or a signal (eastbound SR 73 to northbound MVC). The connection at I-15 on the 2100 North segment would provide both a local-access interchange and a direct freeway-to-freeway interchange (MVC to I-15).

Figure 2-11.1, 2100 North Freeway Alternative, shows the proposed alignment of the 2100 North Freeway Alternative and the cross-section of the proposed freeway. Appendix A, Roadway Plans, provides detailed engineering drawings of the proposed alternative alignment.

Alternative Lane Configuration

Under this alternative, the freeway would have varying lane configurations based on the expected travel demand. Table 2.2-10 and Figure 2-11.1 show the lane configuration for the 2100 North Freeway Alternative.

Table 2.2-10. Utah County Lane Configuration – 2100 North Freeway Alternative

Freeway Segment	Lanes in Each Direction		Total Lanes[a]
	General-Purpose	HOV	
Utah County line to SR 73 (1000 South)	3	0	6
2100 North Freeway MVC to I-15	3	0	6

[a] Auxiliary lanes would be required at certain locations to allow traffic to merge on and off the freeway. A detailed analysis of the auxiliary lanes is provided in *Technical Memorandum 19*, *Roadway Level of Service Goals and Designation* (MVC Management Team 2004b).

Freeway Elevation

Under this alternative, the freeway elevation would be depressed (below grade) in the same areas as the Southern Freeway Alternative for the north-south component. The east-west component along 2100 North would be depressed

from the connection with the MVC to just east of SR 68 and from the Jordan River to just past the railroad tracks west of I-15 (see Figure 2-11.2, 2100 North Freeway Alternative – Depressed and Elevated Sections).

Structures and Cross-Street Configurations

This alternative would cross numerous streets in Utah County and would require various cross-street configurations: interchanges, overpasses, underpasses, at-grade signalized intersections, and cul-de-sacs. Table 2.2-11 provides an overview of the cross-street configurations for the 2100 North Freeway Alternative.

Table 2.2-11. Utah County Cross Streets – 2100 North Freeway Alternative

		MVC Cross-Street Treatment				
Cross Street	Road Jurisdiction[a]	Interchange[b]	Cross Street Over	Cross Street Under	Cul-de-Sac	At-Grade Intersection
MVC Freeway						
Porter Rockwell Blvd.	Herriman	Diamond		X		
Local access road	Camp Williams			X		
2100 North	Saratoga Springs	System	X	X		
Local access road	Saratoga Springs			X		
11600 West	Saratoga Springs				X	
SR 73	Lehi					X
MVC 2100 North Freeway						
MVC	Saratoga Springs	System				
SR 68 (Redwood Road)	Utah County		X			
10400 West	Utah County	Service		X[d]		
2300 West	Lehi	Diamond	X[c]			
I-15	Lehi	SPUI		X		
I-15	Lehi	System	X			

[a] Indicates the jurisdiction where the road crosses the MVC alignment. Information on other nearby jurisdictions is included in the table if they are within 2 miles of the cross street listed.

[b] Interchange types are provided for reference, but might be modified during the final design phase of the project to take specific conditions into account.

[c] The 2100 North freeway segment of the MVC would connect to 2300 West with a partial interchange due to the conflict with the frontage roads and the close proximity of I-15.

[d] The ramps in and around 10400 West do not connect by a traditional diamond interchange but are slip ramps onto the one-way frontage road system.

Trail

The trail for this alternative would be the same as that for the Southern Freeway Alternative.

Congestion Management

Congestion management for this alternative would be the same as that for the 5800 West Freeway Alternative. See Figure 2-11.1, 2100 North Freeway Alternative, for the location of potential HOV lanes.

Park-and-Pool Lots

The park-and-pool lots for this alternative would be near the interchange of I-15 and 1200 West and at the interchange of the MVC and SR 73 (see Figure 2-11.1, 2100 North Freeway Alternative).

2.2.3.3 Arterials Alternative

This alternative consists of a freeway from the Utah County line that extends south to SR 73 in Lehi and connects with SR 73, plus three arterials: Porter Rockwell Boulevard, 2100 North, and 1900 South. At the connection with the MVC and SR 73, southbound lanes would connect with SR 73 at a signalized intersection, and SR 73 would connect with the northbound lanes of the MVC using either a direct-access ramp with a bridge over SR 73 (westbound SR 73 to northbound MVC) or a signal (eastbound SR 73 to northbound MVC). The 1900 South arterial would follow the east-west section of the Southern Freeway Alternative and would connect to the existing Pleasant Grove/Lindon interchange at I-15. The Porter Rockwell arterial would connect to I-15 at the existing 14600 South interchange just west of Redwood Road. The 2100 North arterial would follow the same alignment as the 2100 North Freeway Alternative alignment and would connect the MVC to I-15 at 2100 North/1200 West in Lehi.

Figure 2-12.1, Arterials Alternative, shows the Arterials Alternative. Appendix A, Roadway Plans, provides detailed engineering drawings of the proposed alternative alignment.

Alternative Lane Configuration

Under this alternative, the arterials and freeway would both have varying lane configurations based on the travel demand. Figure 2-12.1, Arterials Alternative, and Table 2.2-12 below show the lane configuration for the Arterials Alternative.

Table 2.2-12. Utah County Lane Configuration – Arterials Alternative

Roadway Segment	Lanes in Each Direction		Total Lanes[a]
	General-Purpose	HOV	
MVC Freeway Lane Configuration			
Utah County line to SR 73 (1000 South)	3	0	6

Roadway Segment	Lanes in Each Direction	Center Turn Lanes[b]	Total Lanes
Arterials Lane Configuration			
Porter Rockwell Blvd.	3	1	7
2100 North (MVC to I-15)	3	1	7
1900 South (Redwood Road to I-15)	3	1	7

[a] Auxiliary lanes would be required at certain locations to allow traffic to merge on and off the freeway. A detailed analysis of the auxiliary lanes is provided in *Technical Memorandum 19*, *Roadway Level of Service Goals and Designation* (MVC Management Team 2004b).

[b] The center median would be landscaped except at cross streets and some commercial centers where left-turn lanes would be provided.

Freeway Elevation

Under this alternative, the freeway elevation would be depressed (below grade) in the same location as the Southern Freeway Alternative (see Figure 2-12.2, Arterials Alternative – Depressed and Elevated Sections).

Structures and Cross-Street Configurations

This alternative would cross numerous streets in Utah County and would require various cross-street configurations: interchanges, overpasses, underpasses, at-grade signalized intersections, and cul-de-sacs. Table 2.2-13 below provides an overview of the cross-street configurations for the Arterials Alternative. The connection of Porter Rockwell Boulevard at 14600 South and I-15 would consist of a flyover from westbound Porter Rockwell Boulevard to northbound I-15.

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Table 2.2-13. Utah County Cross Streets – Arterials Alternative

Cross Street	Road Jurisdiction[a]	MVC Cross-Street Treatment				
		Interchange[b]	MVC Under	MVC Over	Cul-de-Sac	At-Grade Intersection
MVC Freeway						
Porter Rockwell Boulevard	Herriman	Diamond		X		
Local access road	Camp Williams			X		
2100 North	Saratoga Springs	Diamond		X		
Local access road	Saratoga Springs			X		
11600 West	Saratoga Springs				X	
Porter Rockwell Boulevard						
MVC	Herriman	Diamond		X		
SR 68 (Redwood Road)	Herriman/Bluffdale					X
1000 West	Bluffdale					X
Pony Express Road	Bluffdale					X
I-15	Bluffdale	Interchange with directional ramps	X			
2100 North						
MVC	Saratoga Springs	Diamond		X		
SR 68 (Redwood Road)	Saratoga Springs					X
10400 West	Utah County					X
2300 West	Lehi					X
I-15	Lehi	SPUI	X			
1900 South						
SR 68 (Redwood Road)	Saratoga Springs					X
2300 West	Lehi					X
1700 West	Lehi					X
1100 West	Lehi					X
500 West	Lehi					X
Center Street	Lehi					X
570 West	American Fork					X
100 West	American Fork					X
100 East	American Fork					X
500 East	American Fork					X
4850 South	Utah County					X

[a] Indicates the jurisdiction where the road crosses the MVC alignment. Information on other nearby jurisdictions is included in the table if they are within 2 miles of the cross street listed.

[b] Interchange types are provided for reference, but might be modified during the final design phase of the project to take specific conditions into account.

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Trail

The trail for this alternative would be the same as that for the Southern Freeway Alternative.

Congestion Management

Congestion management for this alternative would be the same as that for the 5800 West Freeway Alternative. See Figure 2-12.1, Arterials Alternative, for the location of potential HOV lanes.

Park-and-Pool Lots

The park-and-pool lots for this alternative would be in the following locations (see Figure 2-12.1, Arterials Alternative):

- 1900 South and SR 68
- SR 79 and MVC
- MVC and 2100 North
- Porter Rockwell Boulevard and 1000 West

2.2.4 Tolling Options for the MVC Alternatives

This EIS analyzes tolling of the Salt Lake and Utah County roadway alternatives in order to address different options for funding the MVC. The tolling analysis included in this EIS was performed to disclose the expected impacts of tolling that would differ from the impacts of the non-tolled alternatives.

Version 6.0 of the travel demand modeling was used to analyze the tolled options. The results show that there would be less travel on the MVC as a tolled facility because some users would use surface streets instead of paying a toll. However, even with less use, the MVC tolled options would meet the project purpose. See Chapter 8, Transportation, for an analysis of traffic use on the MVC as a tolled facility. For the purpose of air quality conformity, the MVC project was analyzed as a non-tolled facility. If a tolled option is selected, the air quality conformity determination in this EIS would be revised based on the reduced amount of travel on the MVC.

Funding for non-tolled roads comes from taxes, and funding for tolled roads comes from the toll applied to the facility. Major future construction projects could require increases in taxes to pay for new non-tolled roads, whereas toll roads might not require tax increases. A tolled road would allow the State to build the MVC project sooner because bonds could be issued against the projected toll revenues in order to offset some or all of the initial capital construction

cost of the project. Alternately, another method of financing such as private or federal funding could be used. The future stream of toll revenues would be used to pay back the bonds over a period of years (usually 30 to 40 years).

The Utah state legislature passed Senate Bill 125 in the 2005 general session that allowed UDOT to toll roads under its jurisdiction. The final decision on whether to implement one of the MVC toll options would be made by the Utah Transportation Commission.

All of the previously defined freeway portions of the Salt Lake and Utah County alternatives were analyzed as tolled facilities as shown in Table 2.2-14.

Table 2.2-14. MVC Roadway Alternatives Analyzed as Tolled Option

Roadway Alternative	Portion of Alternative Analyzed as Tolled	Portion of Alternative *Not* Analyzed as Tolled
Salt Lake County Alternatives		
5800 West Freeway Alternative	All	None
7200 West Freeway Alternative	All	None
Utah County Alternatives		
Southern Freeway Alternative	All	None
2100 North Freeway Alternative	All	None
Arterials Alternative	Freeway from Salt Lake County–Utah County line south to SR 73	Porter Rockwell Boulevard, 2100 North, 1900 South (all arterial connectors)

2.2.4.1 Right-of-Way Considerations for the Tolling Options

For the tolling analysis, it was assumed that the right-of-way required would be the same as that for the non-tolled alternatives. Table 2.2-15 below and Figure 2-13.1, 5800 West Toll Road Alternative – Salt Lake County, through Figure 2-17, Arterials Alternative with Toll Road – Utah County, provide an overview of the total number of lanes required for the tolling options in 2030. The number of lanes required under the tolling options is based on the cost of the toll, which is assumed to be 20¢ (cents) per mile during peak travel times (morning and evening commutes) and 10¢ per mile the rest of the time. Higher toll rates would require fewer lanes because fewer people would be willing to pay the toll, while lower toll rates would require more lanes because more people would be willing to pay the toll. The toll rates are based on year 2000 dollars since that is the year of the U.S. census to which the travel demand model is calibrated.

Because the final toll structure has not been established, more lanes than those shown in Table 2.2-15 below could be required by 2030. The actual toll structure and number of lanes would not be established until the final design phase of the project. Therefore, the analysis in this EIS assumes that, for each alternative, the right-of-way needed for the tolled option is the same as the right-of-way needed for the non-tolled option.

Another consideration for a tolled road is the ability to widen the road in the future to reduce congestion. If the tolled road is operated under a public/private partnership, the partners could sign a long-term contract, extending well beyond the 2030 planning horizon of this EIS, that allows the road to be widened in the future. If this condition is not in the contract, the toll road might not be considered financially feasible by private firms who would be willing to operate the facility. The right-of-way width used in this EIS allows a tolled MVC to be expanded in the future. If the right-of-way needed for future expansion is not acquired when the project is first built, this could limit the ability to add more lanes because the land around the road would likely be developed, and this would increase the financial and social impacts of acquiring the right-of-way in the future.

Table 2.2-15. Number of Lanes for Non-tolled and Tolled Options in 2030

Roadway Alternative	Non-tolled Option		Tolled Option	
	Segment	Number of Lanes	Segment	Number of Lanes
Salt Lake County Alternatives				
5800 West Freeway Alternative	I-80 to SR 201	6	I-80 to SR 201	4
	SR 201 to 13400 South	8	SR 201 to 11400 South	6
	13400 South to Utah County line	6	11400 South to Utah County line	4
7200 West Freeway Alternative	I-80 to SR 201	6	I-80 to SR 201	4
	SR 201 to 13400 South	8	SR 201 to 11400 South	6
	13400 South to Utah County line	6	11400 South to Utah County line	4
Utah County Alternatives				
Southern Freeway Alternative	Utah County line to I-15	6	Utah County line to I-15	4
2100 North Freeway Alternative	Utah County line to SR 73	6	Utah County line to SR 73	4
	Utah County line to I-15 along 2100 North	6	Utah County line to I-15 along 2100 North	4
Arterials Alternative	Utah County line to SR 73	6	Utah County line to SR 73	4

2.2.4.2 Financing of Toll Options

It has not been determined how a tolled MVC would be financed. Possible methods of project financing include:

- A traditional method, in which the State of Utah takes the responsibility and risk for the toll traffic and associated revenue.
- A concession (or franchise) method, in which a private developer has a long-term concession contract with the State of Utah over a specific length of time (usually ranging from 35 to 99 years). With this contract, the developer takes the responsibility and risk for the toll traffic and associated revenue.
- A combination of traditional and concession methods, in which the State of Utah and a private developer share the responsibility and risk for the toll traffic and associated revenue.

This EIS does not include a recommendation regarding how the project should or would be financed. However, since drivers would pay a toll under any of these financing methods, the differences between the finance types would likely be unnoticeable to the driving public. Regardless of the project financing method, the toll could remain after the initial construction cost are paid. Future revenue from tolls could be used for maintaining and reconstructing the highway.

2.2.4.3 Methods of Collecting Tolls

If the tolling option is selected, the MVC would use electronic toll collection (ETC). ETC minimizes environmental impacts by eliminating the need for the additional area required for toll plazas. ETC is also more convenient for drivers than paying with cash, which would require drivers to stop at a toll plaza to pay the toll. Since cash collection would not be used for the MVC, the costs and impacts related to cash collection, such as additional pavement, right-of-way acquisition, and potential delays for drivers, would be avoided.

The following two ETC methods could be used either together or separately to charge drivers for the use of the tolled road:

- Transponder method
- Video tolling method

Either of these methods allows drivers to be charged for the use of the road while traveling at normal highway speeds.

Transponder Method

With this method, drivers set up a prepaid debit account and then have a transponder mounted on or within their vehicle. Drivers using the tolled road pass under an overhead structure, called a gantry. The gantry uses an antenna that sends out a signal to communicate with the vehicle-mounted transponder. The customer's account is then debited according to the current toll rate. Customers receive a monthly statement showing the details of all of transactions during that month (date, time, charge, and so on). This statement includes the current toll account balance and any deposits made to replenish the account.

The toll account would not require a credit card or bank account. Customers could establish and maintain a toll account using any of the following methods:

- Through a Web site for those with Internet access (using a credit card or debit card)
- By telephone (using a credit card or debit card)
- In person at various convenient locations (using cash, check, or a credit card)

Customers who set up a toll account with a credit card could have their account balance replenished automatically. Once a certain amount of charges in the toll account is reached, the customer's credit card would be charged a set fee in order to replenish the account.

Several tolling agencies throughout the U.S. have implemented partnerships with frequently visited stores (such as grocery or drug stores) where people can establish toll accounts and pick up transponders. Typically, the cost of the transponder is borne by the person setting up the account. This cost is in the range of $10 to $30, depending on the type of technology used. It is not known at this time what transponder technology would be used for the MVC, nor has it been determined who would bear the cost of the transponder. See Figure 2-18, Toll Road Transponders and Entry Gantries – Examples, for typical transponders that are currently used on toll roads in the U.S.

Video Tolling Method

The video tolling method is used with most ETC systems and does not require the use of a transponder. Instead, a camera takes a photo of each vehicle's license plate as the vehicle passes under the gantry. The license plate information is then electronically processed to determine if the vehicle has an established video toll account. If a video toll account has been established, the account is debited for the cost of the trip. A video toll account could be established prior to, or

immediately after, the toll road is used and could be arranged by phone, by Internet, or in person as with the transponder method. The toll rate for drivers who use this method would be slightly higher than for the transponder method because there are additional processing costs with a video toll-collection system.

2.2.4.4 Locations for Collecting Tolling Fees

Overhead gantries that read transponders and/or take photographs of vehicle license plates could be located in the following places:

- Over the mainline lanes of traffic (an open system)
- Over on and off ramps (a closed system)
- In a combination of these two places

In an open system, drivers are charged a fee at various locations along the toll road at a general rate that represents the average per-mile cost over the length of the toll road. For example, a set of overhead gantries might be located on the freeway mainline between 9000 South and 7800 South that charges vehicles $2.75, while the next set of gantries might be between 2700 South and SR 201 that charges cars another $2.75. If a driver entered the toll road northbound at 9000 South and exited at 7800 South (therefore passing under only the first set of gantries), the driver would pay the same charge as someone who traveled from 9000 South to 3300 South, but if the driver exited at SR 201 (therefore passing under both sets of gantries), the driver would be charged $2.75 two times, or a total of $5.50.

In a closed system, drivers are charged for the exact number of miles they travel on the toll road. The transponder is read, or the license plate is photographed, when a vehicle enters the toll road at an on ramp and then again when the vehicle exits the toll road at an off ramp. The toll collection system determines the toll charge by multiplying the number of miles traveled by the toll rate per mile.

It is not known at this time whether an open or closed system would be used for the MVC, although both systems (and combinations of the two) are currently used throughout the U.S. and internationally. See Figure 2-18, Toll Road Transponders and Entry Gantries – Examples, for examples of these different types of overhead gantry structures.

2.2.4.5 Toll Rates

If the tolling option is selected, toll rates would be established initially and could be revised in the future in order to achieve the following goals:

- Generating revenue
  - Generate enough revenue to cover the operating and maintenance costs of the toll road
  - Make payments on debts incurred to cover the initial capital costs of the toll road
  - Make payments on debts incurred to cover the capital costs of constructing subsequent phases of the toll road, reconstructing the toll road, and making necessary improvements to maintain an acceptable level of service
- Managing congestion
  - Manage traffic demand and congestion on the MVC

This EIS does not include a recommendation regarding toll rates. However, assumptions about toll rates had to be made in order to conduct the analyses in this EIS. These assumptions were based on preliminary financial and travel forecasts. Specifically, for planning purposes, this EIS assumed a rate of 20¢ per mile during peak travel times (morning and evening commutes) and 10¢ per mile the rest of the time (expressed in 2005 dollars).

Additionally, this EIS included a sensitivity analysis to determine whether the projected travel demand in 2030 would change if the toll rates were higher or lower (MVC Management Team 2007b). The following toll rates were used for the sensitivity analysis:

- 30¢ per mile peak rate, 10¢ per mile off-peak rate (expressed in 2005 dollars)
- 10¢ per mile peak rate, 5¢ per mile off-peak rate (expressed in 2005 dollars)

The actual toll rates that are ultimately set for the MVC would likely be different from those studied. The toll rates would not be determined until the year before the MVC opens to traffic. After the MVC opens, toll rates could be revised periodically to meet funding requirements and/or to manage traffic volumes and congestion.

Use of Tolls To Generate Revenue

Current traffic forecasts and traffic analysis indicate that, at least during the MVC's initial years of operation, each of the toll rates studied for planning purposes would adequately manage travel demand and congestion on the MVC. Therefore, during the MVC's initial years of operation, the toll rates would likely be based on the need to generate adequate revenue rather than the need to regulate travel demand. Note that, to generate adequate revenue, the rates selected for the MVC's initial years of operation could be higher than the 30¢-per-mile rate.

Use of Toll Rates To Manage Congestion

In the future, when travel demand on the MVC increases and congestion worsens, the toll rates could be adjusted to manage traffic flow, reduce congestion, and provide predictable travel times. The benefits of effectively managing congestion are:

- Drivers would travel at relatively rapid and predictable speeds without the delays that might be encountered on non-tolled roads.
- Traffic would experience less stop-and-go driving conditions.
- The environmental and social impacts associated with congestion would be reduced.

For planning purposes, this EIS assumed a rate of 20¢ per mile during peak periods and 10¢ per mile during off-peak periods. The EIS also examined the effects of higher and lower toll rates on expected traffic volumes. The toll rates required to effectively manage traffic to acceptable congestion levels could be different depending on different factors. Over time, increased travel demand on the MVC could require higher toll rates for specific times of day, types of vehicles, and/or levels of congestion.

The sensitivity analysis to determine the effects of higher and lower toll rates showed that toll rates higher than 20¢ per mile could effectively manage congestion levels on the MVC without substantially increasing traffic volumes on other roads in the MVC study area.

Variation in Toll Rates by Time of Day and Congestion Level

Toll rates can be semi-static, with pre-established rates during the defined morning and afternoon peak commuting periods and non-peak periods, or dynamic, with rates that change more frequently—even within a single commuting period—in response to real-time, measured traffic volumes. In

general, dynamic pricing works best where there is a free alternate route immediately available to drivers, which lets drivers decide which route to take based on the observed toll rates and the levels of congestion on the two routes. Both semi-static and dynamic rate structures would be considered for the MVC, but it is not known which type of rate structure would be used.

Variation in Toll Rates by Road Segment

Toll rates can be set at a consistent rate along the entire toll road or can vary by location if higher traffic demand in particular segments requires higher toll rates to manage traffic. Variation in toll rates by road segment would be considered for the MVC when needed to manage congestion, but it is not known which segments would have different rates.

Variation in Toll Rates by Collection Method and Payment Type

Toll rates would likely vary by collection method and payment type. Vehicles with transponders could pay a base toll rate. The toll rate for drivers who use the video tolling method would be slightly higher because there are additional processing costs for a video toll-collection system. Drivers who do not have a transponder or a video toll account would be billed by mail, and they could be subject to administrative fees and higher charges as toll violators.

Variation in Toll Rates by Vehicle Class

Toll rates normally vary by vehicle class; for example, trucks typically pay more than automobiles. It is anticipated that all vehicles using the MVC would be charged a toll. The specific details of toll rates, policies, and practices for the MVC would be determined by UDOT. These details could include discounts for car pools and other high-occupancy vehicles and a waiver of toll charges for emergency vehicles that are responding to an emergency and school buses that are transporting students.

Minimum and Maximum Toll Rates

Use of minimum and maximum toll rates in combination with a per-mile rate structure would be considered. For example, a minimum toll rate of 50¢ or $1.00 might apply even to very short trips, and a maximum toll rate could cap the toll at a specified amount, even for longer trips. Minimum and maximum toll rates help control the number of shorter and longer trips. This rate structure can be useful for managing congestion in specific locations where many short trips cause congestion.

2.2.4.6 Tolling Violations

Toll violators would be detected by video equipment on the overhead gantry, which would record each driver's license plate. Drivers who do not have a transponder or a video toll account would be billed by mail. After a grace period, typically 30 days from the time a video toll is reported, drivers who have not paid the toll would be considered toll violators and could be subject to administrative fees and higher charges. Strict penalties would be established and enforced for repeat violators who refuse to either use a transponder or set up a video toll account. These penalties could be high fines, impoundment of the driver's vehicle, the inability to renew the vehicle registration with the Utah Division of Motor Vehicles, or a combination of these penalties.

2.2.5 Implementation of the MVC Alternatives

The Preferred Transit Alternative (5600 West Transit Alternative with Dedicated Right-of-Way Option) would be built in phases as funding becomes available consistent with the phasing timeframes identified in WFRC's regional transportation plan. The Preferred Roadway Alternatives (5800 West Freeway Alternative and 2100 North Freeway Alternative) also would be built in phases. The Utah Transportation Commission has identified partial funding for the north-south portions of the MVC in Salt Lake County and the east-west portions in Utah County. For more information on construction phasing, see Chapter 36, Project Implementation.

2.3 Land Acquired to Date

UDOT has purchased several parcels of land since the initiation of this EIS. These purchases were made in cases where (1) owners said that they couldn't sell their property because of the proposed project, and this was causing them economic hardship, or (2) a property was about to be developed, which would increase the number of residential or business relocations due to the project. In addition to properties purchased by UDOT, in South Jordan and Herriman three developers have provided UDOT with a letter of intent to donate property if an MVC roadway is in place by 2015.

Salt Lake County has a local transportation corridor preservation fund that is financed by a $10 vehicle registration fee. In the 2007 general session of the Utah state legislature, House Bill 158 assigned 70% of that money to preserving land for the MVC. Using that revenue stream and some local sales tax revenue from Salt Lake County, the legislature authorized UDOT to issue bonds up to $100 million for the purchase of right-of-way for the MVC.

To reflect comparable and complete right-of-way costs and mitigation requirements, the estimated costs of each alternative include the costs of acquiring these parcels. The acquisitions have not influenced the selection of alternatives conducted under the NEPA process. Table 2.3-1 and Table 2.3-2 below and Figure 2-19.1 through Figure 2-19.4, Land Acquired by UDOT, show the number of properties purchased by UDOT along each alternative in Salt Lake and Utah Counties.

Table 2.3-1. Land Acquired by UDOT for the Salt Lake County Alternatives

Map Number	Location	Parcel Size (acres)	Alternative(s)
1	5901 West 2100 South	31.94	5800 West Freeway
2	2905 South Burdock Dr.	0.20	5800 West Freeway
3	2915 South Burdock Dr.	0.20	5800 West Freeway
6	5765 West 3500 South	0.37	5800 West Freeway
7	3531 South 5750 West	0.22	5800 West Freeway
8	5794 W. Darle Ave.	0.25	5800 West Freeway
9	3828 South Bills Dr.	0.21	5800 West Freeway
10	4153 S. Timber Oaks Ln.	0.24	5800 West Freeway
11	4358 South 5780 West	0.16	5800 West Freeway
12	4364 South 5780 West	0.25	5800 West Freeway
13	5767 West 4360 South	0.17	5800 West Freeway
14	5801 West 4395 South (approx.)	0.31	5800 West Freeway
15	5799 West Cape Cod Dr.	0.18	5800 West Freeway
16–31	4466–4520, 4526, and 4530 South 5763 West, Cape Visa Way (16 lots)	3.25	5800 West Freeway
32–42	Vista Development, Phase 1, West Valley City (11 lots)	2.76	5800 West Freeway
43	5950 West 4700 South	0.43	5800 West Freeway
44	5926 West 4700 South	0.44	5800 West Freeway
45	5950 West 4700 South	1.79	5800 West Freeway
46	5884 West 4700 South	3.56	5800 West Freeway
47	5950 West 4700 South	8.99	5800 West Freeway
48–67	Vista Development, Phase 2, West Valley City (20 lots)	3.08	5800 West Freeway
68	5926 West 4700 South	0.98	5800 West Freeway
69	5950 West 4700 South	1.61	5800 West Freeway
70	5950 West 4700 South	3.20	5800 West Freeway
71	5882 West 4700 South	1.76	5800 West Freeway
72	5808 West 4700 South	2.77	5800 West Freeway
73	5950 West 4700 South	0.93	5800 West Freeway

Map Number	Location	Parcel Size (acres)	Alternative(s)
74	5702 West New Bingham Hwy.	0.94	5800 West Freeway, 7200 West Freeway
75	5812 West New Bingham Hwy.	4.62	5800 West Freeway, 7200 West Freeway
76	5702 West New Bingham Hwy.	1.51	5800 West Freeway, 7200 West Freeway
77	5812 West New Bingham Hwy.	5.39	5800 West Freeway, 7200 West Freeway
78	9859 South 6045 West	1.00	5800 West Freeway, 7200 West Freeway
79	9883 South 6045 West	1.00	5800 West Freeway, 7200 West Freeway
80	12000 South 4895 West	3.26	5800 West Freeway, 7200 West Freeway
81	12000 South 4895 West	12.27	5800 West Freeway, 7200 West Freeway
82	4754 West 12600 South	3.37	5800 West Freeway, 7200 West Freeway
83	4782 West 12600 South	1.16	5800 West Freeway, 7200 West Freeway

This table shows property acquired by UDOT as of April 2008.

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Table 2.3-2. Land Acquired by UDOT for the Utah County Alternatives

Map Number	Location	Parcel Size (acres)	Alternative(s)
92	Near 2100 North and Redwood Road, Utah County	38.80	2100 North, Arterials
93	Near 2100 North and I-15, Utah County	0.58	2100 North, Arterials
94	Near 2100 North and I-15, Utah County	0.76	2100 North, Arterials
95	Near 2100 North and Redwood Road, Utah County	1.33	2100 North, Arterials
96	Near 2100 North and Redwood Road, Utah County	0.33	2100 North, Arterials
97	Near 2100 North and I-15, Utah County	0.07	2100 North, Arterials
98	Near 2100 North and I-15, Utah County	0.39	2100 North, Arterials
99	1051 West 2100 North, Lehi	0.28	2100 North, Arterials
100	Near 2100 North and I-15, Utah County	1.75	2100 North, Arterials
101	1201 West 2100 North, Lehi	1.12	2100 North, Arterials
102	Near 2100 N. Pointe Meadow Dr., Lehi	0.87	2100 North, Arterials
103	Near 2100 N. Pointe Meadow Dr., Lehi	0.85	2100 North, Arterials
104	2100 N. Frontage Rd., Lehi	1.71	2100 North, Arterials
105	Near 2100 N. Pointe Meadow Dr., Lehi	1.07	2100 North, Arterials
106	Near 2100 North and I-15, Utah County	1.63	2100 North, Arterials
107	Near 1051 West 2100 North, Lehi	4.19	2100 North, Arterials
108	Near 2100 North and I-15, Utah County	0.74	2100 North, Arterials
109	Near 2100 North and I-15, Utah County	1.00	2100 North, Arterials
110	Near 2100 North and I-15, Utah County	1.20	2100 North, Arterials
111	2012 N. Pointe Meadow Dr., Lehi	3.00	2100 North
112	Near 2100 North and I-15, Utah County	1.13	2100 North, Arterials
113	Near 2100 North and I-15, Utah County	0.93	2100 North, Arterials
114	Near 2100 North and I-15, Utah County	0.17	2100 North, Arterials
115	Near 2100 North and I-15, Utah County	0.88	2100 North, Arterials
116	1025 W. State St., Lehi	0.57	2100 North, Arterials
117	Near 2100 North and I-15, Utah County	1.34	2100 North, Arterials
118	Near 2100 North and I-15, Utah County	0.61	2100 North, Arterials
119	Near 2100 North and I-15, Utah County	0.11	2100 North, Arterials
120	1147 W. State St., Lehi	0.42	2100 North, Arterials
121–127	1893–1905 North Hollow Ct., Lehi (7 lots)	0.16	2100 North
128	1891 North Hollow Ct., Lehi	0.03	2100 North, Arterials
129	7775 N. Redwood Rd., Saratoga Springs	11.14	Southern Freeway
130	Near N. 7774 Redwood Rd., Saratoga Springs	12.41	Southern Freeway
131	10100 West 7750 North, Saratoga Springs	10.98	Southern Freeway
132	7745 N. Redwood Rd., Saratoga Springs	3.02	Southern Freeway
133	7722 North 1080 West, Saratoga Springs	1.49	Southern Freeway
134	7700 N. Redwood Rd., Saratoga Springs	6.99	Southern Freeway
135	7675 N. Redwood Rd., Saratoga Springs	10.78	Southern Freeway

This table shows property acquired by UDOT as of April 2008.

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2.4 Summary Comparison of Alternatives

2.4.1 Daily Delay

Table 2.4-1 provides an overview of the hours of daily delay for the Salt Lake County and Utah County non-tolled roadway alternatives within the MVC study area. The Salt Lake County freeway alternatives include operation of the 5600 West Transit Alternative. Table 2.4-2 below provides data for the Salt Lake County and Utah County tolled alternatives within the MVC study area.

Table 2.4-1. Comparison of Hours of Daily Delay for the Non-tolled Alternatives

Alternative	East-West Arterials	North-South Arterials	All Arterial Streets	Freeways	All Roads
Salt Lake County Alternatives					
No-Action					
Hours	18,500	37,800	56,300	6,800	63,100
5800 West Freeway					
Hours	8,000	10,100	18,100	18,700	36,800
Change vs. No-Action	–57%	–73%	–68%	175%	–42%
7200 West Freeway					
Hours	7,800	10,800	18,600	17,600	36,200
Change vs. No-Action	–58%	–71%	–67%	159%	–43%
Utah County Alternatives					
No-Action					
Hours	5,800	2,400	8,200	10,900	19,100
Southern Freeway					
Hours	2,000	800	2,800	6,300	9,000
Change vs. No-Action	–65%	–68%	–66%	–43%	–53%
2100 North Freeway					
Hours	2,300	1,600	3,900	6,200	10,200
Change vs. No-Action	–61%	–30%	–52%	–43%	–47%
Arterials					
Hours	1,800	900	2,700	6,200	8,900
Change vs. No-Action	–69%	–61%	–67%	–43%	–53%

Table 2.4-2. Comparison of Hours of Daily Delay for the Tolled Alternatives

Alternative	East-West Arterials	North-South Arterials	All Arterial Streets	Freeways	All Roads
Salt Lake County Alternatives					
No-Action					
Hours	18,500	37,800	56,300	6,800	63,100
5800 West Freeway					
Hours	12,800	23,700	36,500	8,900	45,400
Change vs. No-Action	–31%	–37%	–35%	30%	–28%
7200 West Freeway					
Hours	13,800	24,900	38,700	8,400	47,100
Change vs. No-Action	–25%	–34%	–31%	24%	–25%
Utah County Alternatives					
No-Action					
Hours	5,800	2,400	8,200	10,900	19,100
Southern Freeway					
Hours	3,700	1,400	5,100	7,800	12,900
Change vs. No-Action	–36%	–42%	–37%	–28%	–32%
2100 North Freeway					
Hours	3,100	1,400	4,500	7,800	12,400
Change vs. No-Action	–46%	–42%	–44%	–28%	–35%
Arterials					
Hours	1,900	1,000	2,800	7,500	10,300
Change vs. No-Action	–68%	–59%	–65%	–31%	–46%

2.4.2 Travel Time

Table 2.4-3 and Table 2.4-4 below show the PM peak period (3:00 PM to 6:00 PM) travel time for specific segments of the Salt Lake County and Utah County non-tolled alternatives compared to the No-Action Alternative. Table 2.4-5 and Table 2.4-6 below provide travel time and speed for the Salt Lake County and Utah County tolled alternatives. The PM travel speeds in the tables are an average for the entire trip length.

Table 2.4-3. Comparison of PM (3 PM to 6 PM) Travel Time and Speed – Salt Lake County Non-tolled Alternatives

		PM Travel Time (minutes)						PM Speed (mph)			
		Current (2005)	No-Action	5800 West		7200 West					
From	To	Travel Time	Travel Time	Travel Time	Change vs. No-Action	Travel Time	Change vs. No-Action	Current (2005)	No-Action	5800 West	7200 West
Downtown SLC	Riverton/Herriman	41	71	53	–25%	51	–27%	37	23	31	31
Riverton/Herriman	Downtown SLC	33	43	38	–12%	37	–12%	45	38	43	43
SLC Int'l. Airport	Riverton/Herriman	36	75	45	–39%	46	–38%	33	24	30	31
Riverton/Herriman	SLC Int'l. Airport	29	44	30	–32%	30	–31%	41	27	49	50
West Valley City	Lehi	49	81	49	–40%	50	–38%	37	23	37	38
Lehi	West Valley City	44	52	37	–29%	40	–24%	42	36	47	47

SLC = Salt Lake City; Int'l = International

Table 2.4-4. Comparison of PM (3 PM to 6 PM) Travel Time and Speed – Salt Lake County Tolled Alternatives

		PM Travel Time (minutes)						PM Speed (mph)			
		Current (2005)	No-Action	5800 West		7200 West					
From	To	Travel Time	Travel Time	Travel Time	Change vs. No-Action	Travel Time	Change vs. No-Action	Current (2005)	No-Action	5800 West	7200 West
Downtown SLC	Riverton/Herriman	41	71	40	–44%	40	–44%	37	23	43	45
Riverton/Herriman	Downtown SLC	33	43	32	–26%	32	–25%	45	38	53	55
SLC Int'l. Airport	Riverton/Herriman	36	75	32	–57%	32	–57%	33	24	44	46
Riverton/Herriman	SLC Int'l. Airport	29	44	24	–45%	25	–44%	41	27	61	62
West Valley City	Lehi	49	81	36	–56%	37	–54%	37	23	49	50
Lehi	West Valley City	44	52	31	–41%	33	–37%	42	36	58	57

SLC = Salt Lake City; Int'l = International

Table 2.4-5. Comparison of PM (3 PM to 6 PM) Travel Time and Speed – Utah County Non-tolled Alternatives

		PM Travel Time (minutes)								PM Speed (mph)				
		Current (2005)	No-Action	Southern Freeway		2100 North Freeway		Arterials						
From	To	Travel Time	Travel Time	Travel Time	Change vs. No-Action	Travel Time	Change vs. No-Action	Travel Time	Change vs. No-Action	Current (2005)	No-Action	Southern Freeway	2100 North Freeway	Arterials
UVSC	Eagle Mountain	37	46	36	–22%	40	–12%	37	–20%	33	26	35	30	30
Eagle Mountain	UVSC	32	33	29	–13%	32	–4%	30	–8%	38	38	44	37	36
Riverton/ Herriman	Lehi	27	43	20	–52%	23	–47%	22	–48%	35	26	46	39	41
Lehi	Riverton/ Herriman	24	39	20	–48%	23	–42%	22	–45%	40	29	46	40	42

UVSC = Utah Valley State College

Table 2.4-6. Comparison of PM (3 PM to 6 PM) Travel Time and Speed – Utah County Tolled Alternatives

		PM Travel Time (minutes)								PM Speed (mph)				
		Current (2005)	No-Action	Southern Freeway		2100 North Freeway		Arterials						
From	To	Travel Time	Travel Time	Travel Time	Change vs. No-Action	Travel Time	Change vs. No-Action	Travel Time	Change vs. No-Action	Current (2005)	No-Action	Southern Freeway	2100 North Freeway	Arterials
UVSC	Eagle Mountain	37	46	34	–25%	40	–12%	37	–20%	33	26	37	35	31
Eagle Mountain	UVSC	32	33	26	–20%	31	–6%	30	–8%	38	38	46	46	36
Riverton/ Herriman	Lehi	27	43	19	–56%	20	–53%	19	–55%	35	26	50	44	48
Lehi	Riverton/ Herriman	24	39	21	–46%	21	–46%	20	–48%	40	29	44	42	46

UVSC = Utah Valley State College

2.4.3 Cost

Table 2.4-7 compares the costs of the action alternatives. The cost estimate below includes design, right-of-way, construction, utility relocations, and environmental mitigation. The cost estimate in the Draft EIS was based on 2004 unit prices that were escalated to develop the 2010 cost. For the Final EIS, the cost estimates were updated based on the most recent available unit prices and are expressed in 2007 dollars. The actual cost of construction will likely be higher due to inflation. The project would be constructed in phases as described in Chapter 36, Project Implementation (Phasing). For more information, see Technical Memorandum 12, Capital Cost Estimates. For information regarding utility relocations, see Chapter 6, Community Impacts.

Table 2.4-7. Comparison of the Costs of the Action Alternatives (in 2007 Dollars)

Alternative	2007 Cost
Salt Lake County Alternatives	
5600 West Transit Alternative	
Dedicated Right-of-Way Option	$672,000,000
Mixed-Traffic Option	$571,000,000
5800 West Freeway Alternative	$2,157,000,000
7200 West Freeway Alternative	$2,152,000,000
Utah County Alternatives	
Southern Freeway Alternative	$1,126,000,000
2100 North Freeway Alternative	$950,000,000
Arterials Alternative	$984,000,000

2.4.4 Environmental Impacts

Table 2.4-8 and Table 2.4-9 below provide a comparison of the environmental impacts of the MVC action alternatives for Salt Lake and Utah Counties.

Table 2.4-8. Environmental Impacts from the Salt Lake County Alternatives[a]

Impact Category	Unit	5600 West Transit Alternative[b]		5800 West Freeway Alternative	7200 West Freeway Alternative
		Dedicated Transit	Mixed Transit		
Land converted to roadway use	Acres	140	151	1,708	1,505
Prime farmland	Acres	0	0	23	30
Agriculture Protection Areas	Number	0	0	0	0
Relocations	Number	8	2	175	280
Potential relocations[c]	Number	22	15	10	16
Recreation areas	Number	2	2	5	3
Community facilities	Number	3	3	3	2
Existing trails	Number	3	3	1	2
Proposed trails	Number	21	20	37	35
Noise receptors above criteria	Number	0	0	379	763
Stream/canal crossings	Number	7	7	12	12
Primary impacts to wetlands	Acres	Combined with freeway alternative	Combined with freeway alternative	30.19	30.60
Secondary impacts to wetlands	Acres	Combined with freeway alternative	Combined with freeway alternative	89.18	163.52
Primary and secondary loss of wetland quality or function	FCU[d]	Combined with freeway alternative	Combined with freeway alternative	38.99	50.26
Threatened and endangered species habitat	Number	0	0	0	0
Adverse impacts to cultural resources	Number	0	0	13	7
Hazardous waste sites	Number	13	15	12	15
Visual change	Category	Weak to moderate	Weak to moderate	Moderate	Weak to moderate
Section 4(f) use	Number	0	0	14	6

[a] The impacts in this table would be the same for the non-tolled and tolled options.

[b] Dedicated Transit = Dedicated Right-of-Way Transit Option; Mixed Transit = Mixed-Traffic Transit Option

[c] A potential relocation occurs when the right-of-way required for the project affects the property and is between 1 foot and 15 feet away from the structure.

[d] FCU = functional capacity units, which is a measure for assessing impacts to the loss of the wetland function or quality.

Table 2.4-9. Environmental Impacts from the Utah County Alternatives[a]

Impact Category	Unit	Southern Freeway Alternative	2100 North Freeway Alternative	Arterials Alternative
Land converted to roadway use	Acres	909	717	957
Prime farmland	Acres	180	120	139
Agriculture Protection Areas	Number	6	0	4
Relocations	Number	137	15	66
Potential relocations[b]	Number	17	2	9
Recreation areas	Number	2	0	2
Community facilities	Number	0	1	2
Existing trails	Number	1	1	4
Proposed trails	Number	11	5	21
Noise receptors above criteria	Number	135	134	218
Stream/canal crossings	Number	4	1	6
Primary impacts to wetlands	Acres	93.43	12.87	55.71
Secondary impacts to wetlands	Acres	218.24	18.84	191.63
Primary and secondary loss of wetland quality or function	FCU[c]	141.67	18.41	91.65
Threatened and endangered species habitat	Number	1	0	1
Adverse impacts to cultural resources	Number	1	1	2
Hazardous waste sites	Number	3	2	4
Visual change	Category	Moderate	Moderate	Moderate
Section 4(f) use	Number	0	0	0

[a] The impacts in this table would be the same for the non-tolled and tolled options.

[b] A potential relocation occurs when the right-of-way required for the project affects the property and is between 1 foot and 15 feet away from the structure.

[c] FCU = functional capacity units, which is a measure for assessing impacts to the loss of the wetland function or quality.

2.4.5 Preferred Alternatives

The final selection of an alternative will be made in the Record of Decision, which will be prepared after the Final EIS is completed. For the MVC project, roadway decisions will be made by FHWA in cooperation with UDOT. The transit decision will be made by UTA in cooperation with UDOT and in consultation with FTA. The decision to have a non-tolled or tolled MVC will be made by the Utah Transportation Commission.

The following sections provide the basis for identifying the Preferred Alternatives in Salt Lake and Utah Counties. The identification was made by FHWA and UDOT for the roadway alternatives and UTA for the transit alternative. The Preferred Alternatives were identified based on public and agency input during the scoping process and the Draft EIS comment period.

2.4.5.1 Salt Lake County Alternatives

Preferred Transit Alternative

The **5600 West Transit Alternative with Dedicated Right-of-Way Option** was identified by UTA as the Preferred Transit Alternative based on operational characteristics, environmental impacts, and the alternative's ability to meet the project's purpose. Public input during the scoping process and subsequent public meetings were also considered in identifying the Preferred Transit Alternative. The Preferred Transit Alternative would be part of the identified roadway alternative (5800 West or 7200 West) in Salt Lake County.

UTA, which helped evaluate the MVC transit alternatives, is a co-project sponsor and is responsible for developing and operating public transit in the region. During the evaluation of the transit alternative, UTA recommended that the 5600 West Transit Alternative with Dedicated Right-of-Way Transit Option should be the Preferred Transit Alternative based on the following considerations:

- The Dedicated Right-of-Way Transit Option would generate more daily transit trips (45,600) in 2030 than the Mixed-Traffic Transit Option (40,400). In addition, the Dedicated Right-of-Way Transit Option would generate more total station boardings (16,720) in 2030 than the Mixed-Traffic Transit Option (9,160).

- The Dedicated Right-of-Way Transit Option would have fewer safety conflicts. Both pedestrian and automobile safety are greatly increased with a dedicated transitway located in the center of the right-of-way. This increased safety is due to the following factors:
  - Pedestrians would be better able to see approaching transit vehicles and regular street traffic.
  - A dedicated transitway is more consistent with drivers' expectations about traffic flow, especially at intersections and turn lanes.
  - There would be fewer conflicts involving transit vehicles and regular street traffic at intersections.
- A mixed-traffic or side-running transit system along a major arterial would greatly reduce or limit access to the homes and businesses along the arterial.
- Because the transit would have fewer conflicts with pedestrians and vehicles, there would be less congestion along 5600 West than the Mixed-Traffic Transit Option.

Because the Dedicated Right-of-Way Transit Option and the Mixed-Traffic Transit Option would follow the same alignment, the environmental impacts to the resources evaluated in this EIS would be similar. The main difference between these two options is that the Dedicated Right-of-Way Transit Option is expected to cause one more residential and five more commercial relocations.

Although the cost of Dedicated Right-of-Way Transit Option at $672,000,000 would be higher than that of the Mixed-Traffic Transit Option at $571,000,000, UTA decided that the Dedicated Right-of-Way Transit Option should be the Preferred Transit Alternative based on the operational benefits discussed above and because the environmental impacts were similar between the two options.

Preferred Roadway Alternatives

The **5800 West Freeway Alternative** was identified by FHWA and UDOT as their Preferred Roadway Alternative in Salt Lake County. The discussion below explains the factors considered by FHWA and UDOT and summarizes the reasons that the 5800 West Freeway Alternative has been identified as the Preferred Roadway Alternative for Salt Lake County (see Table 2.4-8 above, Environmental Impacts from the Salt Lake County Alternatives).

Wetlands. To evaluate the expected impacts to wetlands, numerous meetings were held with the U.S. Army Corps of Engineers (USACE), the U.S. Fish and Wildlife Service (USFWS), and the Utah Division of Wildlife Resources.

Through these meetings, a functional assessment methodology was developed to determine the wetland impacts of each alternative. In addition to the functional assessment, these resource agencies recommended focusing on rare or irreplaceable wetlands based on these wetlands' low frequency of occurrence and/or the inability to compensate for impacts to them through creating new wetlands, restoring existing wetlands, or enhancing existing wetlands.

For Salt Lake County, the playa wetlands immediately south of I-80 were determined by the resource agencies to be of particular importance, given the difficulty of mitigating these wetlands. Attempts to re-create the wetland hydrology and soil chemistry fundamental to these systems have met with limited success. Therefore, the proposed alignments in Salt Lake County were assessed according to their impacts to these wetlands. Table 2.4-10 and Table 2.4-11 compare the impacts to wetlands based on the functional assessment and the impacts to playa wetlands.

Table 2.4-10. Comparison of Total Wetland Impacts from the Salt Lake County Freeway Alternatives

Alternative	Functional Units Lost (FCU)	Primary and Secondary Impacts to Wetlands (acres)
5800 West Freeway	38.99	119.37
7200 West Freeway	50.26	194.12

FCU = functional capacity units, which is a measure for assessing impacts to the loss of the wetland function or quality.

Table 2.4-11. Comparison of Impacts to Playa Wetlands in Salt Lake County

Alternative	Primary Impacts (acres)	Secondary Impacts (acres)	Total (acres)
5800 West Freeway	13.12	42.02	**55.14**
7200 West Freeway	24.37	116.71	**141.08**

As these tables show, the 7200 West Freeway Alternative would have greater overall impacts to wetlands and would have more than double the impacts to those wetlands that USACE and USFWS consider rare and irreplaceable. The large difference in wetlands impacts was given substantial weight in FHWA's decision-making because of Section 404 of the Clean Water Act. Under the Clean Water Act and through the Section 404 permitting process, USACE has been given responsibility and authority to regulate fill materials into waters of the

U.S., including wetlands. Section 404 of the Clean Water Act requires selection of the practicable alternative that causes the least impact to the aquatic ecosystem, unless that alternative has other substantial adverse environmental impacts. This is known as the least environmentally damaging practicable alternative (LEDPA) requirement. An alternative is practicable if it is available and capable of being implemented after taking into consideration cost, existing technology, and logistics in light of overall project purposes. For actions subject to NEPA, where USACE is the permitting agency or, as in this case, a cooperating agency, the analysis of alternatives required for NEPA documents must provide the information necessary for Section 404 permitting, the evaluation of alternatives, and selection of the LEDPA. Given its much lower wetland impacts, it is likely that the 5800 West Freeway Alternative would be considered the LEDPA.

Relocations and Impacts on Community Cohesion. Both of the Salt Lake County roadway alternatives would require the relocation of homes and businesses and would cause impacts to community cohesion. The 5800 West Freeway Alternative would have 94 fewer home relocations and 11 fewer business relocations than the 7200 West Freeway Alternative, for a total of 105 fewer relocations. The main reason for the difference in impacts between these two alternatives is that the 5800 West Freeway Alternative runs adjacent to a utility corridor, which optimizes this area and minimizes the overall footprint of these two facilities (the freeway and the utility corridor). The 7200 West Freeway Alternative would also isolate about 45 residential homes between 7200 West, 4100 South, and about 3700 South. This alterative would create an “island” of residential houses in West Valley City that would be isolated from other subdivisions and areas in West Valley City. Overall, because of both the lower number of relocations and the fact that it follows an existing utility corridor, the 5800 West Freeway Alternative would cause less disruption to community cohesion than would the 7200 West Freeway Alternative.

Farmland. The 7200 West Freeway Alternative would affect more prime and unique farmland than would the 5800 West Freeway Alternative. The 5800 West Freeway Alternative would affect 23 acres of prime and unique farmland, while the 7200 West Freeway Alternative would affect 30 acres of prime and unique farmland.

Floodplains. The 7200 West Freeway Alternative would affect more floodplains than would the 5800 West Freeway Alternative. The 5800 West Freeway Alternative would affect 23 acres of floodplains, while the 7200 West Freeway Alternative would affect 27 acres of floodplains.

Noise. The 7200 West Freeway Alternative would have greater noise impacts as discussed Chapter 13, Noise. A noise impact is defined by the federal noise-abatement criteria (NAC) and other state guidelines. The 5800 West Freeway Alternative would have 379 residential noise impacts, while the 7200 West Freeway Alternative would have 763 residential noise impacts.

Section 4(f). Both of the Salt Lake County roadway alternatives would require the use of Section 4(f) resources. Overall, the 7200 West Freeway Alternative would use fewer Section 4(f) resources than would the 5800 West Freeway Alternative. See Table 28.5-1, Total Number of Section 4(f) Uses from the Salt Lake County Freeway Alternatives. However, on balance, FHWA determined that identification of the 5800 West Freeway Alternative is consistent with Section 4(f) regulations after taking into account the overall harm associated with each alternative (including the disparity in wetland impacts, which strongly favors the 5800 West Freeway Alternative). See Section 28.5.6.2, Least Overall Harm Analysis. The U.S. Department of the Interior, in its comments on the Draft EIS, concurred with this determination. The Department stated:

> Following our review of the Section 4(f) evaluation, we concur that there is no feasible or prudent alternative to the Preferred Alternative selected in the document and that all measures have been taken to minimize harm to these resources. We acknowledge that you have consulted with the Utah State Historic Preservation Office and other agencies regarding the use of Section 4(f) properties.

Air Quality. Both of the roadway alternatives in Salt Lake County would comply with federal and state air quality standards for carbon monoxide (CO) and particulate matter (PM_{10}). The air conformity analysis for these alternatives was conducted for the non-tolled option only. The mobile-source air toxic (MSAT) emissions from these alternatives would be similar. For both alternatives, MSAT emissions in the study area would decline relative to current conditions (due to improved vehicle emission technologies over time) but would be somewhat higher with the project than without the project. See Chapter 12, Air Quality. During the public comment period on the Draft EIS, several public comments were received opposing the 5800 West Freeway Alternative specifically because of air quality impacts on schools along that corridor. FHWA and UDOT have carefully considered those concerns while also taking into account the uncertainties associated with any assessment of localized air impacts and the fact that, overall, emissions of MSATs are declining over time due to improved vehicle emission technologies. On balance, the difference in air quality impacts does not outweigh the other benefits of the 5800 West Freeway Alternative, including the fact that it will have much lower impacts on playa wetlands.

Utilities. Both the 5800 West Freeway and 7200 West Freeway Alternatives would affect existing utilities. The 5800 West Freeway Alternative would affect a greater number of existing utilities because it is located in a utility corridor. During the Draft EIS comment period, comments from the major utilities in the corridor expressed concern about the impacts of the 5800 West Freeway Alternative. Since the release of the Draft EIS, UDOT has met with each company, and many of their concerns have been addressed. UDOT will continue to coordinate with the utility companies regarding the relocation of their infrastructure and obtain necessary approvals from the Federal Energy Regulatory Commission on the relocation of interstate gas pipelines. The costs of utility relocations have been included in the construction cost of each alternative and have been fully considered in comparing the alternatives.

Local Jurisdiction Preference. West Valley City, the Magna Community Council, and the Magna Town Council have passed resolutions supporting the 5800 West Freeway Alternative. These represent all of the local jurisdictions where the 5800 West Freeway and 7200 West Freeway Alternatives follow separate corridors. No local governments recommended adoption of the 7200 West Freeway Alternative over the 5800 West Freeway Alternative.

Resource Agency Comments. The resource agencies generally favored 5800 West Freeway Alternative over the 7200 West Freeway Alternative. The resource agencies favored the 5800 West Freeway Alternative primarily because it would have fewer impacts to wetlands and wildlife resources. EPA, in its comment letter on the Draft EIS, stated their belief that the 5800 West Freeway Alternative is the LEDPA because it would have the least impacts to waters of the U.S., would affect the least amount of wildlife habitat and prime farmland, and would have the fewest noise impacts and relocations. In the letter, EPA stated:

> Although EPA has rated each of the alternatives as EC-1, we have also commented on the Least Environmentally Damaging Practicable Alternative (LEDPA). We believe the LEDPA is 5800 West in Salt Lake County for the northern half of the project and 2100 North in Utah County for the southern half of the project (the UDOT preferred alternative). This combination of alternatives provides the least impacts to waters of the U.S. while meeting the primary objectives of the project. In addition, this alternative has been determined to have the least impacts to wildlife habitat (fragmentation), Agriculture Protection Areas, prime farmland affected, least amount of noise impacts to residential areas, and least amount of residential and business relocations.

In the letter from the U.S. Department of the Interior dated January 29, 2008, commenting on the Draft EIS, USFWS indicated its support for the 5800 West Freeway Alternative, stating:

> The Fish and Wildlife Service (FWS) has been a cooperating agency on this project and appreciates the extensive coordination with the Utah Department of Transportation (UDOT) and the Federal Highway Administration (FHWA). The Department acknowledges the effort that the UDOT and FHWA have made to maintain the flow of information and dialog throughout the planning process and support UDOT's selection of the 5800 West alternative in Salt Lake County and the 2100 North alternative in Utah County. As indicated by the wetland functional assessment and the wildlife habitat assessments, these alternatives will have the least impact on fish and wildlife resources. We support the incorporation of transit into this project and encourage further development of transit options on the Wasatch Front.

Public Comments. The public expressed a wide range of views regarding these alternatives. In general, those who would be affected by the 7200 West alignment favored the 5800 West alignment, and those who would be affected by the 5800 West alignment favored the 7200 West alignment. In addition, a number of groups and individuals expressed strong concern about the impacts of the 5800 West alignment on schools in that corridor, in terms of that route's direct impacts on some school playing fields, its potential to limit pedestrian access to schools, and its potential air quality impacts. These groups and individuals tended to favor the 7200 West alignment in their comments on the Draft EIS and also tended to favor alternatives that did not include a new freeway or that postponed the construction of a freeway. Utilities that would be affected by the 5800 West alignment (which would require relocation of power lines and natural gas pipelines) also expressed a preference for the 7200 West alignment. FHWA and UDOT have taken steps, following the publication of the Draft EIS, to address many of the concerns raised about the 5800 West alignment (see Chapter S, Summary).

Conclusion. On balance, after taking into account all of these factors, FHWA has identified the 5800 West Freeway Alternative as the Preferred Roadway Alternative in Salt Lake County. This alternative better meets the purpose of the project; is favored by resource agencies, local governments, and many public commenters; and would have much lower impacts on rare and irreplaceable wetlands. FHWA acknowledges that the 5800 West Freeway Alternative would have a greater impact on Section 4(f) resources, would have greater impacts on utilities and schools, and is opposed by some public commenters. FHWA has carefully considered these concerns. However, FHWA also notes that UDOT has taken steps between the Draft EIS and Final EIS to address those concerns, and appropriate mitigation commitments are included in this Final EIS. Based on the

full record developed through the NEPA process, the 5800 West Freeway Alternative is the Preferred Roadway Alternative in Salt Lake County.

2.4.5.2 Utah County Alternatives

The **2100 North Freeway Alternative** was identified by FHWA and UDOT as their Preferred Roadway Alternative in Utah County. FHWA and UDOT considered input from the affected cities and the public and consultation with resource agencies. Provided below are some of the key reasons why FHWA and UDOT identified the 2100 North Freeway Alternative as the Preferred Roadway Alternative for Utah County (see Table 2.4-9 above, Environmental Impacts from the Utah County Alternatives[a]).

Wetland Impacts. The 2100 North Freeway Alternative would have at least 43 fewer acres of primary wetland impacts than the Arterials Alternative and almost 80 fewer acres of primary wetland impacts than the Southern Freeway Alternative. The 2100 North Freeway Alternative also would have over 173 fewer acres of secondary wetland impacts than both the Arterials Alternative and the Southern Freeway Alternative. USACE, EPA, and USFWS stated a particular concern for Peteetneet wetlands. The 2100 North Freeway Alternative would not affect any Peteetneet wetlands, while the Arterials Alternative and Southern Freeway Alternative would affect 5 acres and 12 acres, respectively. Based on this information, it is likely that the 2100 North Freeway Alternative would be selected as the LEDPA. EPA and USFWS supported the identification of this alternative as the Preferred Roadway Alternative in Utah County because of the lower wetland impacts.

Wildlife Habitat Fragmentation and Threatened and Endangered Species. USFWS, in the U.S. Department of the Interior letter referenced on page 2-122, stated that the 2100 North Freeway Alternative would result in the least amount of habitat fragmentation and overall impact to fish and wildlife resources. In addition, the 2100 North Freeway Alternative is the only alternative in Utah County that would not affect the threatened Ute ladies'-tresses. EPA also supported the 2100 North Freeway Alternative because of the lower amount of habitat fragmentation.

Relocations. The 2100 North Freeway Alternative would have a total of 17 relocations. This is 58 fewer relocations than the Arterials Alternative and 137 fewer than the Southern Freeway Alternative.

Farmland. The 2100 North Freeway Alternative would affect 111 acres of prime farmland. This is 28 fewer acres of prime farmland than the Arterials Alternative and 69 fewer acres than the Southern Freeway Alternative. The 2100 North Freeway

Alternative would not affect any Agriculture Protection Areas, while the Arterials Alternative would affect four and the Southern Freeway would affect six.

Floodplains. The 2100 North Freeway Alternative would affect 10 acres of floodplains. This is 82 fewer acres of floodplain impacts than the Arterials Alternative and 85 fewer acres than the Southern Freeway Alternative.

Noise. Under the 2100 North Freeway Alternative, 134 residences would experience noise levels above the NAC. This is one fewer residence above the NAC than the Southern Freeway Alternative and 84 fewer than the Arterials Alternative.

Construction Costs. The 2100 North Freeway Alternative is estimated to cost $34 million less than the Arterials Alternative and $176 million less than the Southern Freeway Alternative (in 2007 dollars).

Agency Comments. As with the 5800 West Freeway Alternative mentioned above, EPA believes that the 2100 North Freeway Alternative is the LEDPA, and USFWS stated their support for this alternative because it would have the least impact to fish and wildlife resources.

Local Jurisdiction Preference. The cities of Saratoga Springs and Eagle Mountain both passed resolutions supporting the 2100 North Freeway Alternative. The Mayor and City Council of Lehi expressed strong opposition to the 2100 North Freeway Alternative during the preparation of the Draft EIS and in their comments on the Draft EIS, as did many residents of Lehi. However, UDOT worked with Lehi City during and after the Draft EIS comment period to address the City's concerns. In April 2008, the City passed a resolution endorsing, in concept, the construction of the 2100 North Freeway Alternative as a phased transportation corridor to I-15 that can function for both local and expressway purposes. See Chapter 36, Project Implementation.

Conclusion. On balance, after taking into account all of these factors, FHWA has identified the 2100 North Freeway Alternative as the Preferred Roadway Alternative in Utah County. This alternative would have, by far, the lowest wetland impacts of the Utah County alternatives. It also would cause the least habitat fragmentation, lowest impacts to farmlands, fewest relocations, lowest noise impacts, and lowest impacts to floodplains. This alternative also has the lowest construction cost of any of the Utah County alternatives. The resource agency comments all favor selection of the 2100 North Freeway Alternative. Lehi City expressed strong opposition to the 2100 North Freeway Alternative during this study, but its concerns have been addressed by the adoption of a phased approach to project implementation, and the city council recently passed a resolution endorsing this phased approach. Based on the full record developed

through the NEPA process, the 2100 North Freeway Alternative (with the phased approach described in this Final EIS) is the Preferred Roadway Alternative In Utah County.

2.4.5.3 Public Input on Final Alternative Design

One common concern with transportation projects is how the final alternative will look in the community when it is built. Residents often wonder if they will have an opportunity to comment on design elements such as lighting, noise walls, and landscaping. These types of design elements are typically evaluated during the final design phase of the project after an alternative is selected in the Record of Decision and funding has been allocated to construct the project.

To ensure that the public has the opportunity to be involved in final design elements, UDOT uses an approach called Context-Sensitive Solutions, or CSS. The CSS philosophy seeks to understand the larger context of a transportation project such as its physical, social, economic, community, political, and cultural impacts. The intent of CSS is to offer transportation solutions that help connect communities and improve residents' quality of life. During the final design process when decisions are made regarding specific design elements, UDOT will maintain continuous stakeholder involvement to ensure that the public has the opportunity to provide input on the portion of the project that would be located in their community.

2.5 References

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MVC Management Team

2004a Technical Memorandum 06, MVC Alternatives Screening Process and Results.

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[WFRC] Wasatch Front Regional Council

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2001 Western Transportation Corridor Study, I-80 to Salt Lake/Utah County Line.

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APPENDIX 2A

Revised Travel Demand Modeling Information

State of Utah

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

JOHN R. NJORD, P.E.
Executive Director

CARLOS M. BRACERAS, P.E.
Deputy Director

June 18, 2008

Chuck Chappell
Executive Director
Wasatch Front Regional Council
295 North Jimmy Doolittle Road
Salt Lake City, UT 84116

SUBJECT: Travel Model Use for Mountain View Corridor

Dear Chuck:

As you are aware, the Mountain View Corridor (MVC) Environmental Impact Statement (EIS) has been underway since 2003. During that time, the travel model and its population and employment inputs have been updated several times. As a result, different versions of the model and different population and employment inputs have been used at different stages of the study. The model versions and inputs used at each stage of the study are shown in Figure 2-1.2 in the Draft EIS.

As shown in Figure 2-1.2, the analysis of detailed-study alternatives in the MVC Draft EIS utilized version 5.0 of the travel demand model. Version 5.0 of the model was the officially adopted WFRC model at the time the MVC traffic forecasts were prepared.

For purposes of all traffic forecasts generated with version 5.0, the MVC team used the "March 2005 Growth Choices land use" forecasts, rather than the officially adopted WFRC land use forecasts. The March 2005 Growth Choices land use forecasts were consistent with the WFRC's approved land use forecasts in terms of the county-wide population and employment totals, but differed from WFRC's forecasts in the way the population and employment totals were distributed. In essence, the Growth Choices land use concentrated more of the future development along 5600 West, in a series of higher-density, mixed-use residential and commercial centers. The MVC team decided to use the Growth Choices land use as the basis for all traffic forecasts in order to take into account the potential transit ridership benefits of a more high-density, transit-oriented land use along 5600 West.

Version 6.0 of the model became available just prior to release of the Draft EIS. At that time, UDOT and FHWA determined that MVC should update to this model version in the Final EIS, rather than delaying issuance of the Draft EIS.

When WFRC adopted version 6.0 of the model, WFRC also adopted new land use assumptions (population and employment forecasts) for use in developing the 2007-2030 Regional Transportation Plan. (For ease of reference, we will refer to these new land use assumptions as "version 6.0 land use.") The new land use assumptions included a substantial shift in population and employment growth out of the MVC project study area and into the east side of the Salt Lake valley. However, the County and Regional control totals for population and employment remained the same for both the Growth Choices and the version 6.0 land use.

As the MVC study team began the updating process for the Final EIS, it became apparent that the version 6.0 land use assumptions were substantially different from the land use assumptions used in the traffic forecasts for the Draft EIS (i.e., the March 2005 Growth Choices land use). In order to ensure the most accurate information is used, the MVC team, in consultation with WFRC, determined that an independent evaluation of the land use assumptions should be performed. This independent evaluation was conducted by Resource Systems Group, Inc. and was completed with the assistance of WFRC staff. The evaluation considered many factors that affect future growth including historic growth trends, vacant land and land-use plans, current development densities in Salt Lake County, and the likely build-out of current vacant and developable land.

The evaluation resulted in a finding that the rate of infill development assumed in the version 6.0 land use forecast is unrealistically high. The consultant gave two primary reasons for this conclusion. The first is that version 6.0 land use assumed a rate of in-fill development that is higher than has been seen with past growth and is unlikely to occur. Based upon historic trends, it is more likely that a greater proportion of growth will occur in undeveloped areas, as was assumed in the March 2005 Growth Choices land use. Secondly, the evaluation included consideration of the development plans of Kennecott Land Corporation, which owns about 50% of the undeveloped land in Salt Lake County. The version 6.0 land use forecasts assumed that much of the Kennecott land would remain undeveloped during the forecast period. The consultant concluded, based in part on input from Kennecott, that a substantial amount of the Kennecott land would be developed. Based on these findings, the consultant recommended that the MVC team use a modified version of the March 2005 MVC Growth Choices land use instead of the version 6.0 land use. The consultant also recommended that WFRC consider shifting the land use forecasts back toward those that were used with model version 5.0 (the version on which the March 2005 Growth Choices land use was based).

After completing its review of the model, the consultant presented its findings and recommendations in a meeting on April 4, 2008 with UDOT, WFRC, and FHWA. The consultant subsequently provided additional information directly to WFRC as further explanation of its analysis. Based on our discussions with you and your staff, we understand that WFRC is in general agreement with the consultant's findings and recommendations.

The MVC team is now requesting that WFRC concur with the recommendation to utilize model version 6.0 with its associated transportation network in combination with a modified version of the March 2005 MVC Growth Choices land use assumptions. We also are requesting confirmation that WFRC will be initiating an update to its officially adopted land use forecasts, to be implemented as part of the next update cycle for the WFRC's long-range transportation plan.

Respectfully,

TeriAnne S. Newell, P.E.
MVC Project Manager
Utah Department of Transportation

State of Utah

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Wasatch Front Regional Council
295 North Jimmy Doolittle Road
Salt Lake City, UT 84116

SUBJECT: Travel Model Use for Mountain View Corridor -- Revised

Dear Chuck:

Attached is a revised copy of the RSG report *Review of the WFRC's Latest Land-Use Projections June 25, 2008.*

This report has been modified based on WRFC's comments and supersedes the previous version sent to WFRC on June 18, 2008.

Should you have any questions, please do not hesitate to contact me.

Respectfully,

TeriAnne S. Newell, P.E.
MVC Project Manager
Utah Department of Transportation

Review of the Wasatch Front Regional Council's Latest Land-Use Projections

June 25, 2008

Prepared for:

Utah Department of Transportation

Prepared by:

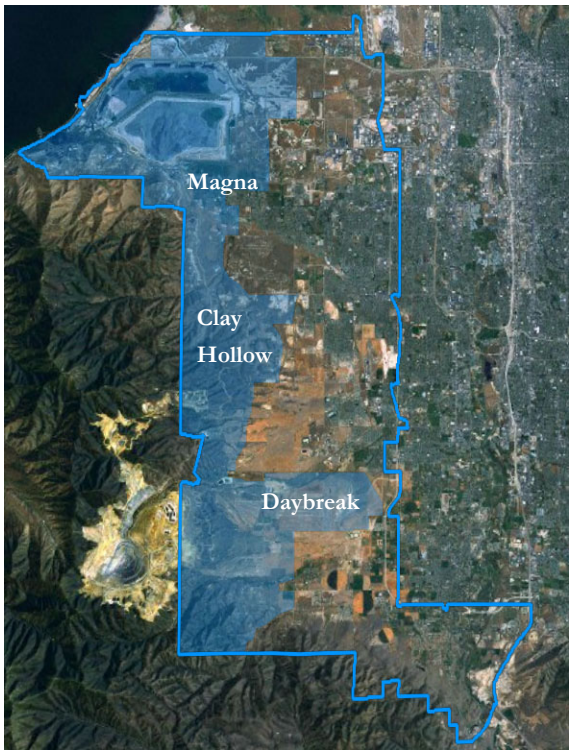
Resource Systems Group, Inc.

INTRODUCTION

The Utah Department of Transportation (UDOT) requested from RSG a review of the Wasatch Front Regional Council's long-range land-use forecasts in and around the Mountain View Corridor (MVC) study area, focusing on Salt Lake County. This review was deemed necessary due to substantial changes made in 2007 to WFRC's official 2030 land-use projections (2007 WFRC projections). These changes to the WFRC's land-use projections resulted in substantial changes to travel demand in the MVC study area.

UDOT and its consultant team have worked since the beginning of 2003 to produce travel forecasts in the MVC study area, which were published in a Draft EIS in October 2007. The travel forecasts for the MVC DEIS used long-range growth projections based on land-use projections from WFRC in 2005. During the preparation of the Final EIS, UDOT requested that RSG undertake a review of the reasonableness of WFRC's 2007 land-use forecasts. This summary presents the findings of RSG's review.

Figure 1: MVC Study Area (outlined in blue) & Kennecott Land (shaded) in Salt Lake County



BACKGROUND

The Mountain View Corridor EIS has been on-going since 2002. During that time, the Wasatch Front Regional Council has released 3 different long-range land-use projections out to the year 2030. The first land-use projections were available when the study began. The second set of projections was released in 2005, following changes to the Utah Governor's Office of Planning and Budget (GOPB) county-level growth projections. The 2005 WFRC projections in Salt Lake County were quite similar to the previous projections in terms of the allocation of anticipated growth, with differences mainly due to a revised set of macro-economic assumptions about the overall magnitude of population and employment growth by county. The third set of projections was released by WFRC in 2007. The 2007 WFRC projections are very different from prior long-range growth forecasts produced by WFRC, and that difference is the reason for this study.

Comparison of WFRC's 2005 and 2007 Growth Projections

WFRC's 2007 land-use forecast assumes much more redevelopment and infill of built-out neighborhoods on the east-side of Salt Lake County compared to the projections produced in previous years. Generally speaking, WFRC's 2007 forecast assumes that more development will be concentrated along established transportation corridors, with less growth placed in emerging growth areas. The 2007 WFRC forecast assumes much higher growth east of Bangerter Highway than the 2005 forecast, and conversely, the 2007 forecast for the west-side of Salt Lake County went down substantially relative to prior forecasts. Table 1 compares the 2005 and 2007 WFRC land-use forecasts inside the MVC study area. Residential growth on the land inside the MVC study area decreases by over 20% and non-residential growth decreases by nearly 50%.

Table 1: Comparison of WFRC Land-use Growth Projections inside the MVC Study Area[1]

Difference in Growth Projections in the MVC Study Area	Household Growth (2005 – 2030)		Employment Growth (2005 – 2030)	
	2005 WFRC Forecast	2007 WFRC Forecast	2005 WFRC Forecast	2007 WFRC Forecast
Total Growth	86,200	67,600	182,000	101,000
% Change (2005 to 2007 forecast)		*-22%*		*-45%*

The Land-use Growth Projections used in the MVC DEIS

The land-use projections used in the transportation modeling for the MVC DEIS were based off of the 2005 WFRC forecast; however some adjustments were made to reflect land-use goals and plans identified in through the corridor-wide Growth Choices visioning effort. The project team met extensively[2] with

[1] From 2005 to 2007 the WFRC changed the definition of total employment used in the transportation model. The most significant change in the employment data is that non-farm proprietors (business owners) are now accounted for in the employment database, whereas they weren't prior to 2007. To account for this and compare these different projections, the 2005 employment data had to be scaled to the same total as the 2007 data.

[2] At the beginning of the MVC EIS process, Envision Utah facilitated what was known as the Growth Choices Study. The Growth Choices process was intended to help the cities in the MVC study area understand the relationship between land use policy changes and transportation choices and to facilitate agreement on a vision of future development with unified land use and transportation policies. More information on the Growth Choices process can be found in Chapter 3: Growth Choices in the DEIS.

developers, planners, mayors and other stakeholders in the corridor to develop a transportation and land-use vision based on a careful review of growth patterns, land-use policies and development plans. The project team compared the 2005 WFRC projections to inputs from these stakeholders and refined WFRC's growth estimates in the MVC study area. This land-use review was an outcome of the Growth Choices Visioning effort.

For the traffic forecasts used in the MVC DEIS, the 2030 land-use and socioeconomic inputs were developed from the Growth Choices Vision Scenario, which was subsequently referred to as the Growth Choices land use scenario. In developing Growth Choices land use data projections, ***study area population and employment control totals remained unchanged from the 2005 WFRC land-use forecast***. Therefore, data was shifted throughout the study area with some TAZs experiencing increases and other decreases, but with the overall study area remaining unchanged. No changes were made outside of the MVC study area. The intent of this effort was to refine the allocation of growth based on land-use plans and developer intentions, focusing only on land inside the corridor. In general, the Growth Choices land-use forecasts reflected a greater concentration of future development along the 5600 West corridor, in keeping with the Growth Choices Vision, which calls for a transit line in that corridor.

Differences in Travel Demand due to Land-use Changes

Land-use forecasts are the most critical input to a transportation model. People and jobs generate the need for travel, and the spatial separation of people and jobs largely explains the travel patterns from one place to another. The recent changes to WFRC's 2030 land-use forecasts in Salt Lake County resulted in a 25% decrease in VMT on the proposed Mountain View Corridor Preferred Alternative. Table 2 compares daily southbound modeled traffic volumes on the preferred freeway alternative in the corridor from the 2007 WFRC Regional Transportation Plan (RTP) and the MVC DEIS modeling.

Table 2: Comparison of Modeled Traffic Volumes on the MVC Freeway with WFRC's 2007 Land-use Forecasts and the MVC DEIS Land-use Forecasts

MVC Segments		Daily South Bound Volumes		
From	To	MVC DEIS	2007 WFRC	WFRC/MVC ratio
I-80	California	23,000	15,000	64%
California	SR 201	31,000	21,000	66%
SR 201	3500 S	87,000	66,000	77%
3500 S	4100 S	93,000	70,000	75%
4100 S	5400 S	93,000	70,000	76%
5400 S	7800 S	88,000	68,000	78%
7800 S	9000 S	82,000	62,000	76%
9000 S	11400 S	78,000	51,000	65%
11400 S	13400 S	67,000	41,000	61%
13400 S	14400 S	71,000	42,000	60%
14400 S	Porter RD	64,000	40,000	62%
Porter RD	2100 N	57,000	36,000	63%
2100 N	Cedar Valley	57,000	41,000	71%
Cedar Valley	Redwood	69,000	54,000	78%
Redwood	I-15	47,000	42,000	89%

The above differences underscore the need for a review of the different land-use projections.

PROJECT APPROACH

RSG's approach to this review consisted of four phases, which are:

1. Review the methodological differences that led to differences in land-use projections
2. Examine recent and long-term growth trends in Salt Lake County to understand existing development patterns and emerging trends
3. Produce an independent forecast of growth for Salt Lake County, relying on available data on vacant land, environmental constraints and land-use plans.
4. Compare the different forecasts and trends and make an informed recommendation to the project team and WFRC regarding reasonable forecasts for land-use growth in the study area

We briefly discuss each of these in turn.

Differences in Land-use Forecasting Methods

The WFRC traditionally developed a land-use forecast that was generally consistent with city master plans and development trends, as was the case in 2005 and earlier forecasts. In 2007 the WFRC tried a new approach which led to different forecasts. For the 2007 land-use forecast, the WFRC modified its approach to land-use forecasting in two important ways – (1) by assuming a set of land-use policies that concentrated mixed-use development at relatively high densities, and (2) by using the UrbanSim land-use model to produce preliminary projections based on this land-use plan.

First, the WFRC considered a future land-use plan that concentrates development at growth centers along established transportation corridors in developed areas and in emerging growth areas served by multiple transportation modes. Along with the policy of promoting higher densities in developed areas, the land-use plans assumed lower densities than are currently allowed in the rapidly growing suburbs farthest from the urban core. This land-use plan was not necessarily consistent with adopted city master plans or development trends. Assumptions were made regarding allowable use on a piece of land, and in many cases the allowable future land-use was either inconsistent with the current development on the land, or implied much higher densities. The intent on the part of WFRC was to understand the benefits of more concentrated development patterns in general and to discuss the inter-relationships between land-use and transportation. The land-use planning exercise was ultimately translated into a growth forecast, but does not necessarily represent the most reasonable forecast for how land will develop.

Related to this, the WFRC used the UrbanSim land-use modeling system to produce a preliminary projection of growth based on the land-use policies. The WFRC has been working since 1999 to develop and refine the UrbanSim model. Prior to using UrbanSim to assist with the development of the 2007 land-use forecasts, WFRC had never used output from UrbanSim in any way for any published forecasting effort. UrbanSim is an extremely complicated model that must be used with caution, especially when analyzing certain events such as redevelopment. When a land-use scenario was fed into UrbanSim that "allowed" large density increases in already developed areas, UrbanSim reacted by

forecasting growth on this land. The fact that existing land-uses would have to be torn down is not recognized as a constraint by WFRC's UrbanSim model. There is currently no mechanism in place in WFRC's UrbanSim model to account for real-world constraints affecting redevelopment, and as a result the model is not necessarily an accurate predictor of future redevelopment events.

The land use forecasting procedure previously used by the WFRC is based on a trend-based model to allocate households, population and jobs to traffic analysis zones (TAZs). It is implemented in a spreadsheet, and has enhancements to account for capacity constraints and planned developments. The land use forecasting process also relies on considerable review and adjustment based on planner review and feedback from the cities in the region. WFRC's previous land-use forecasting method has been used and refined since the early 1990s, whereas the WFRC has just begun to use and understand how to use UrbanSim in a real forecasting setting.

Review of Development Trends

The second step in RSG's review consisted of a study of the historical development patterns in Salt Lake County. This study was useful for understanding long-range development trends so that judgments could be made regarding projections over the next 30 years.

RSG analyzed parcel data from the County tax assessor and recent data on building permits to understand observed development patterns. Both data sets illustrated clearly the development pressure moving towards the MVC study area. Figure 2 contains a dot density map that illustrates the residential development patterns in Salt Lake County prior to 1970 (in green), from 1970-1990 (in yellow) and since 1990 (in red). The historical data clearly show a wave of development moving towards the MVC study area. In the 1990s, over 20,000 units were built in the MVC study area, and in the last decade, over half the residential growth in Salt Lake County has occurred inside the MVC study area. Figure 2 also includes a chart that shows the proportion of the development in the County by distance from downtown. This chart shows that most development since 1990 has occurred >10 miles from downtown Salt Lake.

Figure 3 maps the residential building permits in SL County from 2000 to 2006, graying out the land owned by Kennecott[1]. The vast majority of residential development in Salt Lake County during this decade has occurred in and near the MVC study area. In fact, 17,500 residential units were permitted in the MVC study area between 2000 and 2006, which is 53% of all permitted units in the County. Only 12% of permitted residential units were north of 6200 South and east of Bangerter Highway (i.e. the more developed areas closer to and including Salt Lake City).

From 1970 to 2000, 185,000 residential units were built in Salt Lake County. The GOPB is estimating that from 2005 to 2030 there will be an additional 170,000 to 210,000 new households in Salt Lake

[1] The majority of Kennecott's land shown in Figure 3 is currently in use for Kennecott's mining operation and is planned for future development after mining operation end. Kennecott is currently developing its land in Daybreak, which is located in South Jordan, and has near-term plans (before 2030) to develop lands in Magna and in Clay Hollow.

County, based on their two most recent growth projections for the County (the 210,000 estimate is newer). The 2005 and 2007 WFRC projections both assumed 170,000 new households in the County and these county-level growth projections are consistent with past trends.

Figure 2: Historical Residential Development in Salt Lake County by Time Period

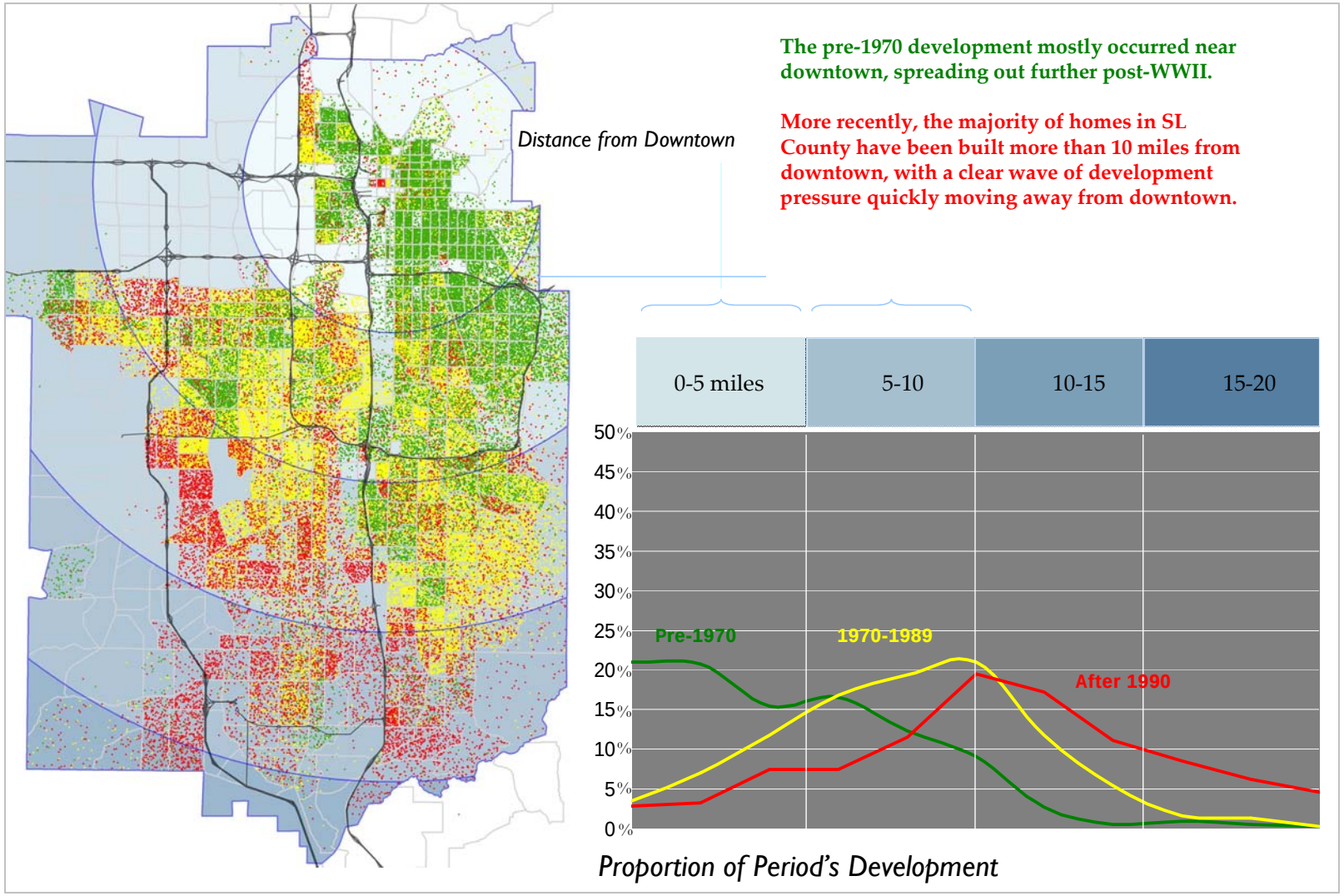
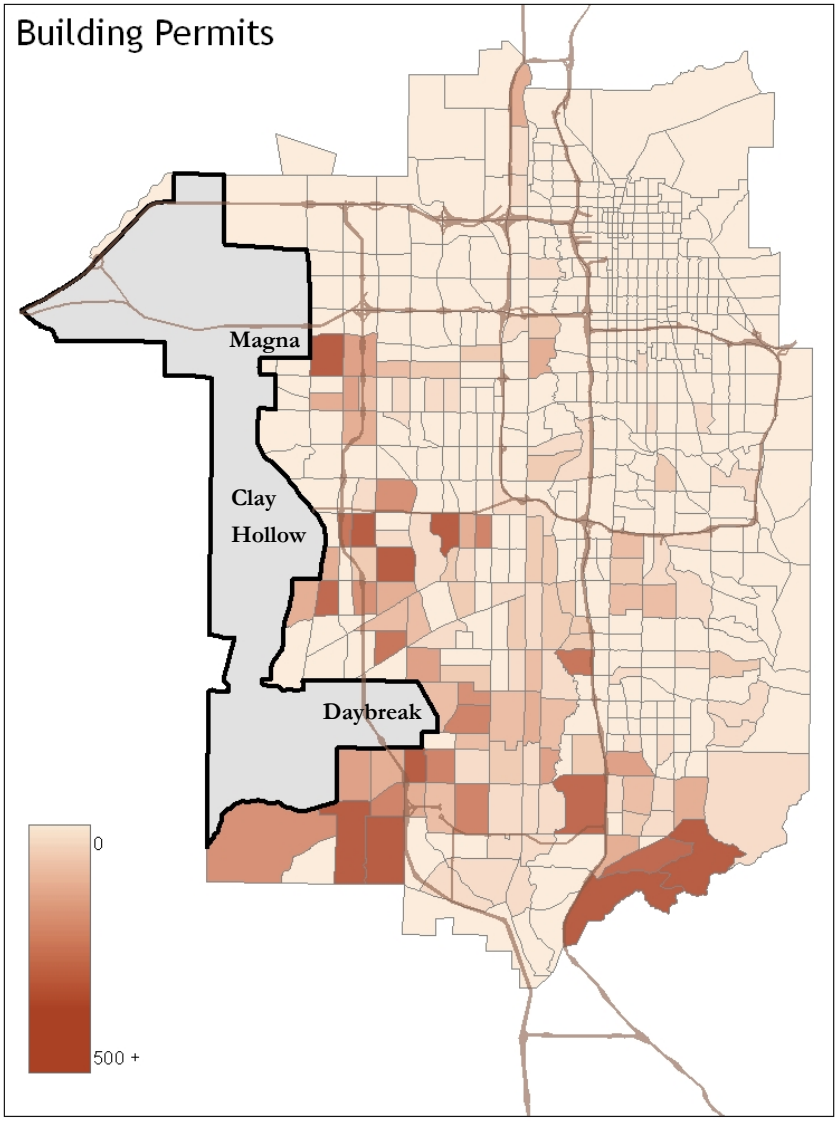


Figure 3: Residential Building Permits by TAZ since 2000 (SL County)[1]



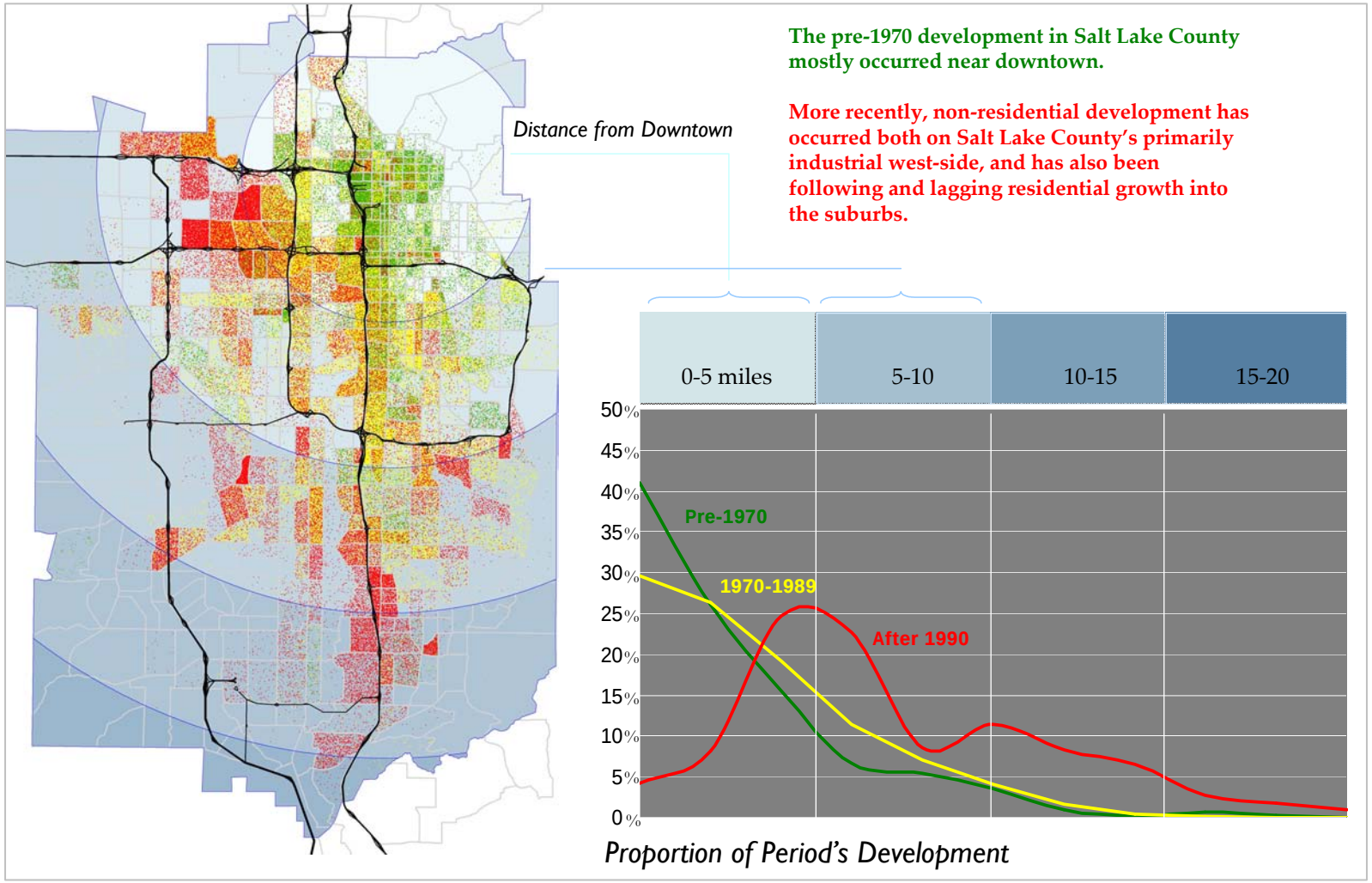
[1] Kennecott Land in the study area is grayed out in this figure, and in figures on subsequent pages. This was done because RSG's analysis primarily focused on land not owned by Kennecott.

Figure 4 shows the historical non-residential development patterns. Historical non-residential development patterns in Salt Lake County have been less dispersed than residential development patterns, although non-residential development generally seems to be following residential growth away from the core business district. For example, a large amount of non-residential development has occurred in the I-15 corridor south of Midvale. Still, since 1990, 33% of the non-residential development in Salt Lake County has occurred within the MVC study area, occurring to a large degree at the north-end of the corridor and along the Bangerter corridor.

From 1970 to 2000, approximately 300,000 jobs were created in Salt Lake County. The GOPB is estimating that from 2005 to 2030 there will be an additional 280,000 to 340,000 new jobs in Salt Lake County based on their two most recent growth projections for the County produced in 2005 and 2008. The 2005 GOPB county-level projections estimated 340,000 jobs, while the 2008 projections estimated 280,000 new jobs by 2030. The 2005 and 2007 WFRC forecasts and the MVC DEIS land-use forecast all assumed 340,000 new jobs in the County, consistent with the 2005 GOPB forecast. Staff from WFRC and MAG have been working with GOPB staff to understand differences in county-level growth totals. Questions have arisen regarding differences between the 2008 and 2005 GOPB forecasts, and at this time both MPOs are continuing to use GOPB's 2005 forecast[1].

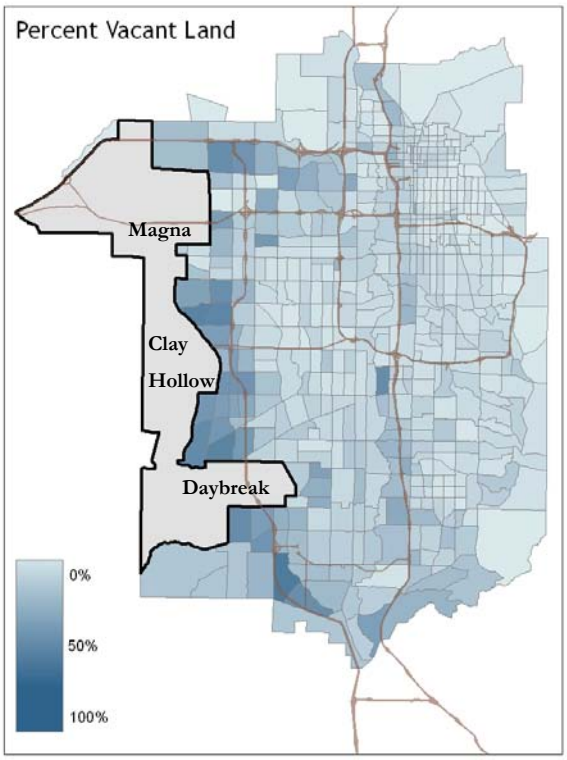
[1] Specific questions addressed GOPB's assumptions about decreasing average household size, and about changes in the labor force that result in households going up at a higher rate than employment. Scott Festin at WFRC or Shawn Eliot at MAG can speak further to these questions.

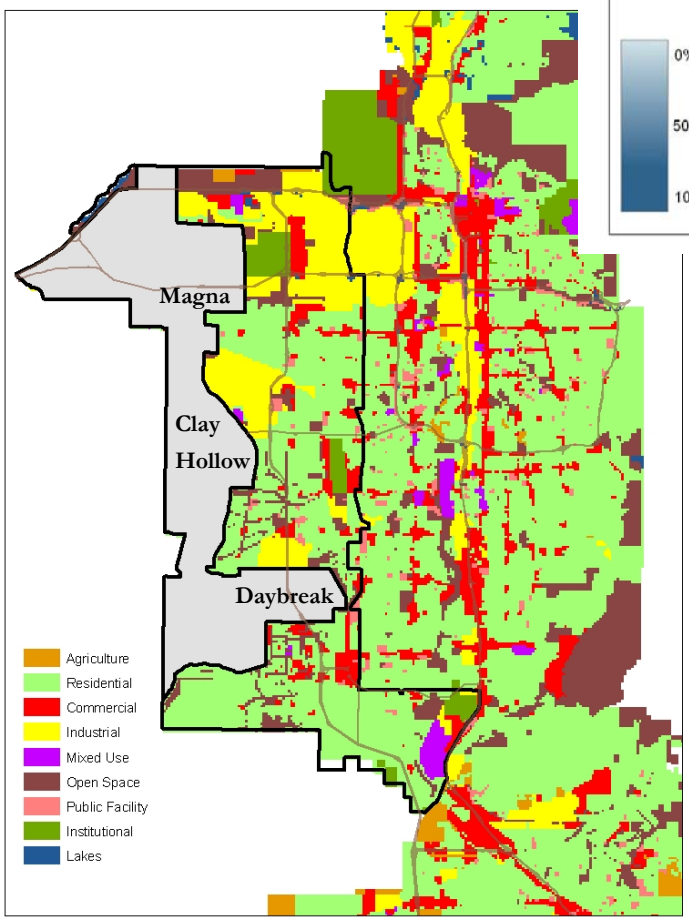
Figure 4: Historical Non-Residential Development in Salt Lake County



RSG's Independent Forecast

The third phase of RSG's review consisted of producing a forecast, relying on data on vacant land and allowable land-use based on city master plans. RSG produced a "build-out" forecast of Salt Lake County, assuming that vacant land in the county would develop at similar densities to the land around it. In addition, RSG compiled and incorporated Kennecott Land Corporation's latest development plans for its land holdings and Daybreak. RSG's forecast is based on the availability of vacant land, observed densities and developer intentions.

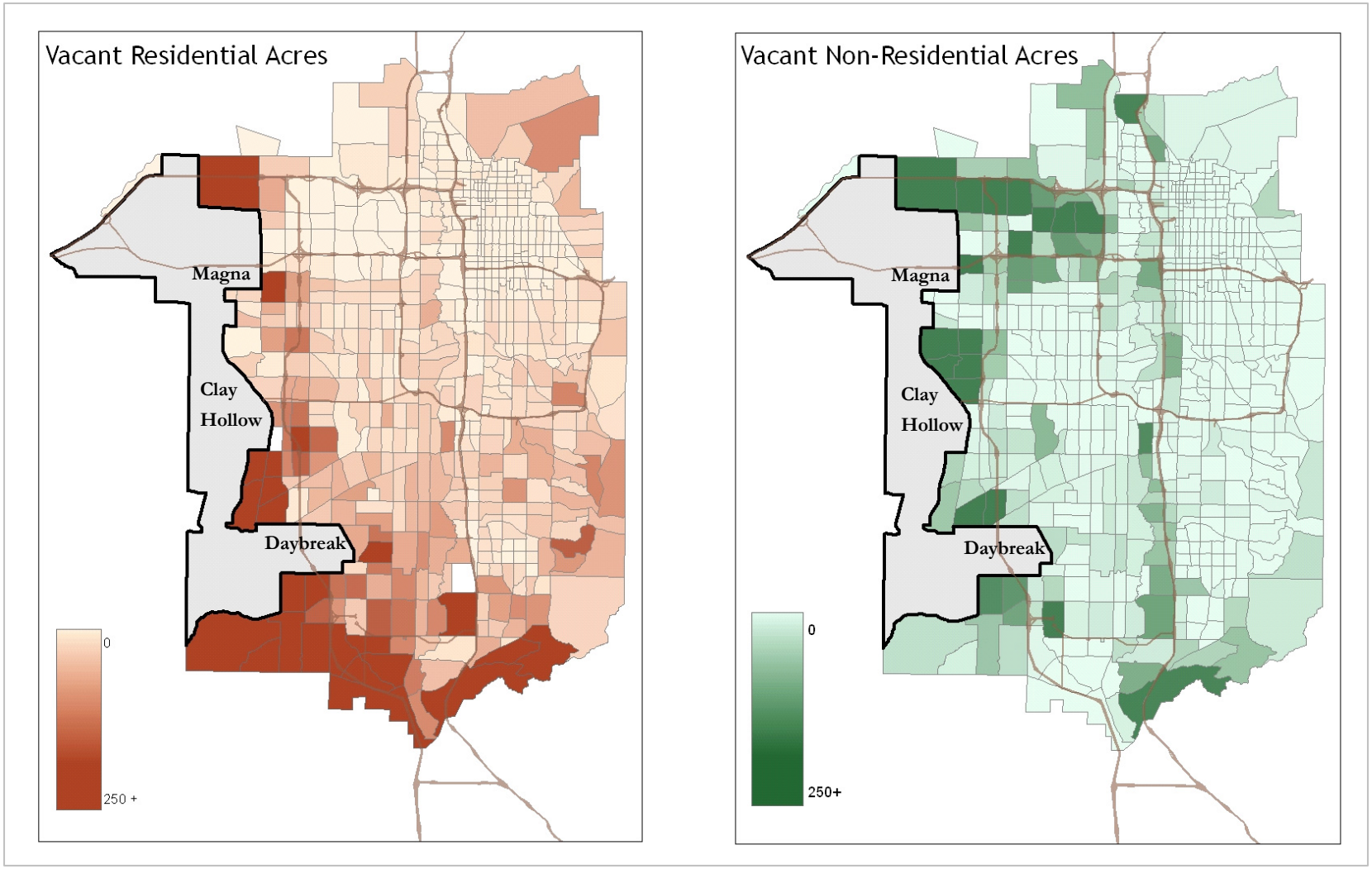




RSG estimated vacant, developable land on land not owned by Kennecott using parcel data from the County tax assessor. Over 70% of the vacant land in Salt Lake County is within the MVC study area. This percentage goes up if all of Kennecott's land holdings are included in the analysis, since the study area does not include all of Kennecott's land.

RSG then intersected the vacant land data with information on adopted land-use plans from the cities. This analysis produced an estimate of vacant residential land and vacant non-residential land that was developable.

Figure 5: Vacant Residential and Non-Residential Acres by TAZ in SL County (Excluding Kennecott's Land)



The densities estimated and used in the analysis tended to be low relative to observed densities, erring on the low-end of the range of densities so as to produce a conservative forecast of build-out. One other reason the densities in the analysis seem low is that land is accounted for in the densities to accommodate infrastructure to support the development. RSG assumed residential densities in the corridor that were typically less than 4 housing units per acre in each TAZ, whereas today the average density in the study area is approximately 4.5 households per developed residential acre. RSG assumed non-residential densities that were typically less than 20 employees per acre, which equates to 650 square feet per employee at average floor-to-area ratios. By way of comparison, the average density in the study area today is over 30 employees per acre.

Figure 7: Assumed Employees per Acre

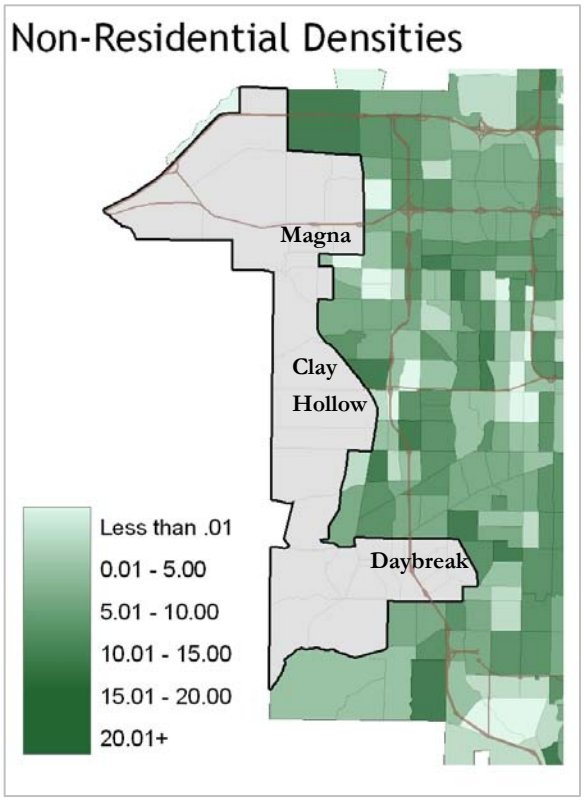
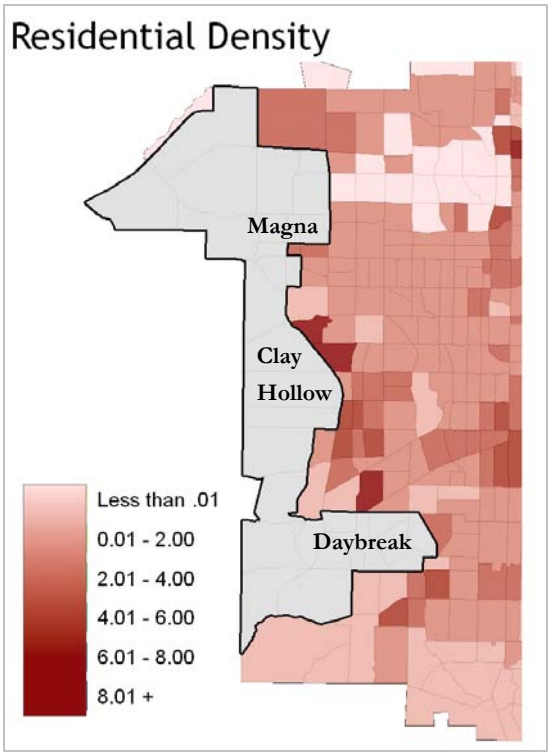


Figure 6: Assumed Residential Units per Acre



Having estimated vacant residential and non-residential land, the next step in the forecasting process is to multiply the vacant land by the observed densities of nearby developments. The final step in developing the forecast for Salt Lake County was to insert Kennecott's development plans into the TAZs on Kennecott's land holdings. By 2030, Kennecott anticipates developing its land holdings to hold 55,000 households and 28,000 jobs. This development is anticipated in Magna, Clay Hollow and South Jordan. The Daybreak development is in South Jordan.

Once RSG's forecast was produced, the total estimated growth in the county and in the corridor was compared to 2030 total growth projections from the GOPB, and to historical trends, to assess the

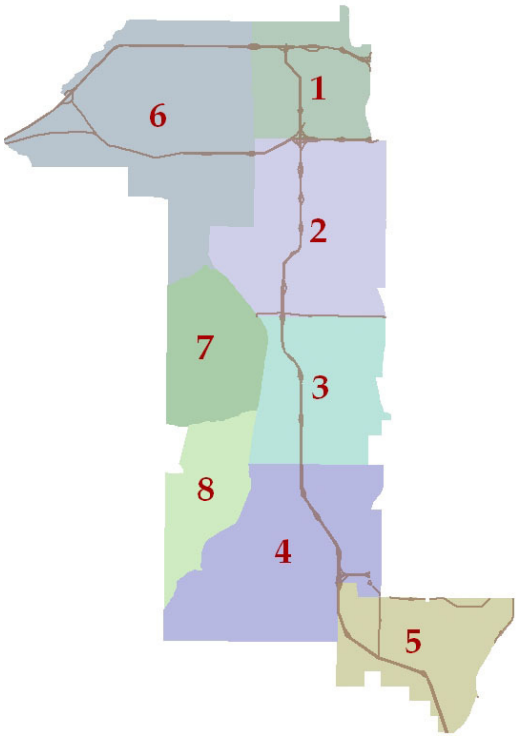
reasonableness of the forecast in the corridor being realized by 2030. Finally, RSG's rule-based forecast was compared to the WFRC projections and those used in the MVC DEIS to assess the reasonableness of the different projections.

Comparison of the Forecasts

RSG's land-use forecast was compared to the MVC DEIS forecast and to the WFRC's 2007 forecast. This comparison was made at both an aggregate district-level, as well as at the detailed TAZ-level. The districts used in this analysis are shown in Figure 8.

The district-level comparisons presented below focus on growth estimated on the land inside the MVC study area. The comparison at the district-level and at the TAZ-scale both highlighted the same things, just in different detail. The district-level analysis is useful to see the big picture similarities and differences in the forecasts.

Figure 8: Districts in the MVC Study Area



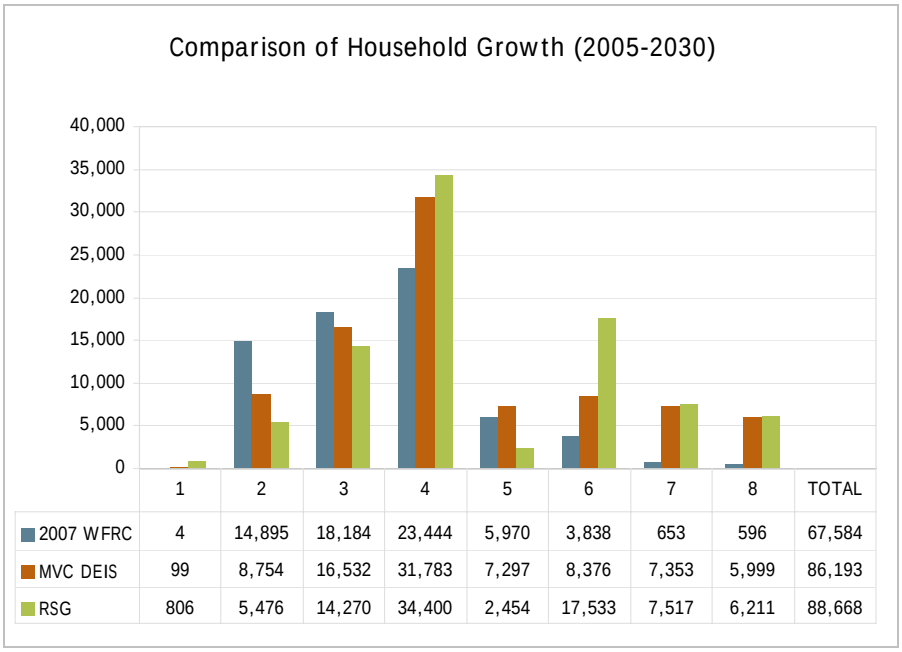
Residential Growth Projections

Figure 9 shows the differences at the district level of aggregation and Figure 10 shows the difference in the three forecasts at the TAZ level. Both comparisons focus on the MVC study area. When reviewing these maps it is useful to focus on the general patterns rather than individual TAZs.

The household growth comparison below shows that the MVC DEIS land-use forecast (referred to as "GC 2030" in the table) was generally very similar to the RSG forecast, and that in all districts but one (District 5 - Bluffdale[1]), WFRC's 2007 forecast was quite different from the other two forecasts. In total, the RSG household growth forecast is close to the MVC DEIS household growth forecast. More specific observations follow after the graphics.

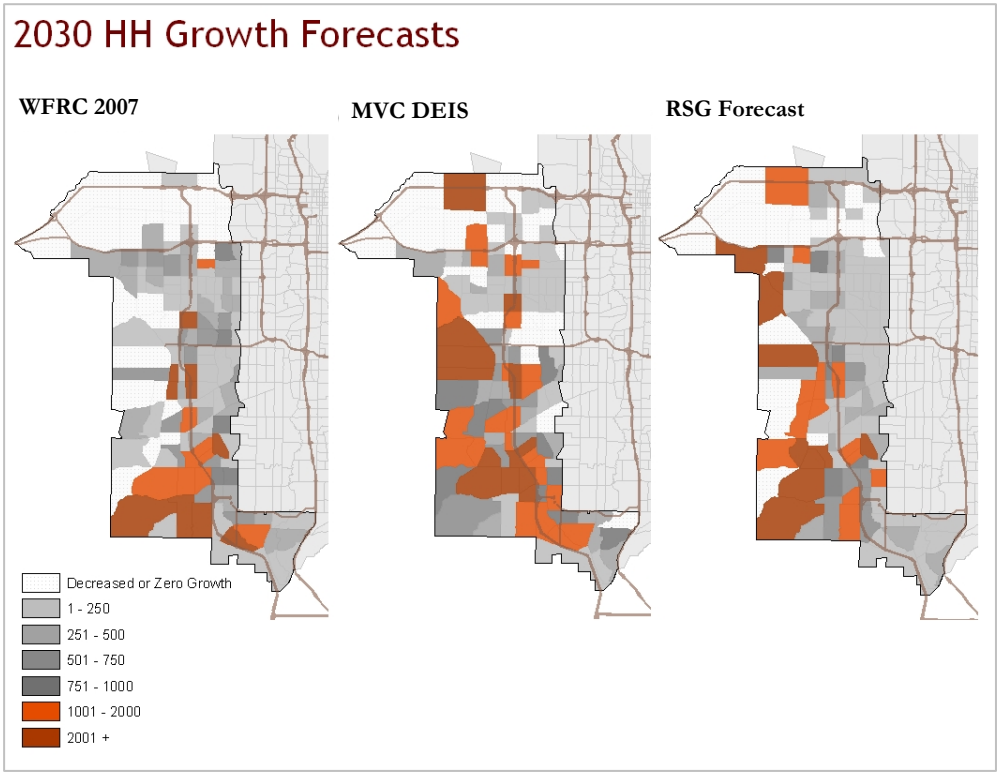
[1] RSG's forecast in Bluffdale is dependent on assumptions about the density of future development. RSG assumed very low densities –from 2 to 5 acre lots – which leads to a low forecast. Assuming higher densities would bring RSG's forecast in line with the WFRC and MVC DEIS forecasts in Bluffdale, and would be consistent with recent development in Bluffdale.

Figure 9: Comparison of Household Growth in the MVC Study Area (District Level)



	1	2	3	4	5	6	7	8	TOTAL
2007 WFRC	4	14,895	18,184	23,444	5,970	3,838	653	596	67,584
MVC DEIS	99	8,754	16,532	31,783	7,297	8,376	7,353	5,999	86,193
RSG	806	5,476	14,270	34,400	2,454	17,533	7,517	6,211	88,668

Figure 10: Comparison of Household Growth in the MVC Study Area (TAZ level)



Here are some key observations about the residential projections:

- The Utah Governor's Office of Planning and Budget estimates that between 170,000 and 210,000 households will be added to Salt Lake County from 2005 to 2030. The 2007 WFRC land-use forecast assumed approximately 67,500 new households would be added to the MVC study area by 2030, which is only about 1/3 of the total growth anticipated in the county. However, over the last decade over 50% of the housing growth in Salt Lake has occurred in the corridor, and this trend appears as though it will continue for the near future, suggesting the 2007 WFRC projections are low.
- The first thing that jumps out of the comparison is the differences in growth on land in the western part of the study area owned by Kennecott, on the West Bench. It is clear that the WFRC did not incorporate Kennecott's development plans in the 2007 forecast, while the MVC DEIS forecast (referred to as GC Forecast) and the RSG Forecast (which incorporates Kennecott's plans directly) are similar in terms of the growth that was allocated to the west bench TAZs. These differences also extend into South Jordan, where Kennecott's Daybreak development is already expanding and has been incorporated.
- Another key similarity between the MVC DEIS forecast and the RSG forecast is the growth estimate at the north-end of the corridor, in Magna and west of the International Center in Salt Lake City. In both of these areas there is not only enough land to accommodate substantial growth, but also specific plans in the works for developing these lands, which WFRC did not incorporate in its 2007 forecast. The land to the west and northwest of the International Center is referred to as the Northwest Quadrant and the planning for this major mixed-use development is anticipated to be complete this year, with construction taking place within 5 years.
- The 2007 WFRC forecast assumes measurable residential growth in West Valley City and Taylorsville on land adjacent to the Bangerter Highway, which is the eastern boundary of the study area. The RSG and MVC DEIS forecasts do not assume much growth along the northern half of Bangerter Highway due to the scarcity of open land adjacent to Bangerter north of 6200 South. This is one example of the difference in the 2007 WFRC forecast, which reflected a policy goal of promoting a concentration of growth in established neighborhoods and along key transportation corridors. While highly concentrated infill development represents a desired outcome, it would be a major departure from observed trends. In addition, there is little room to grow in this area.
- Lastly, besides Bluffdale, there is another area where the RSG forecast is somewhat dissimilar from the other two forecasts, which is along 5600 West, in the northern half of the corridor. One outcome of the Growth Choices Vision was a proposed transit-way and plans for denser development along 5600 West; these plans were not incorporated in RSG's analysis but were considered in the other two forecasts.

It is important to restate that RSG assumed Kennecott's latest projections for the phased development of their land, including Daybreak. By 2030[1] approximately 55,000 households are anticipated on Kennecott's holdings, mostly in Daybreak, Clay Hollow and Magna. This development has already started in Daybreak. This was an assumption that seemed reasonable in terms of the magnitude of growth being achievable, but is predicated on Kennecott starting to phase out their mining operations to some degree. That said, Kennecott intends for this development to happen and has already spent millions laying out plans for the conversion of their land from mining and is already building the Daybreak communities. The development they anticipate in the next 25 years is on the easiest land they have to develop (including land in Daybreak, Clay Hollow and Magna). These lands could be developed without shutting down or cleaning up their mining operations. There are no active mining operations on the Daybreak site, and development of that site is underway.

Additionally, RSG assumed that the land in the corridor not owned by Kennecott would essentially build-out and look similar to developed land in the corridor, resulting in around 35,000 new households by 2030. This appears to be very reasonable, and conservative given the low average densities. Additionally, as discussed earlier, in the 1990s over 20,000 residential units were built in the corridor, from 2000-2006 over 17,500 residential units were permitted in the corridor, and since 1990 one-third of the total residential growth in Salt Lake County has occurred in the MVC study area, increasing to one-half in recent years. There will likely have been more than 35,000 homes built in the corridor from 1990 to 2010, and options for developable land are dwindling elsewhere in Salt Lake County. It is estimated that the county will see an influx of 200,000 or so more households in the next 25 years, and the vast majority of available land lies west of Bangerter Highway. Considering both the proposed development on Kennecott's land and in Daybreak, and the development potential generally within the corridor, it is not difficult to imagine 90,000 new households in the MVC study area by 2030 given the relative availability of land in Salt Lake County, the proximity to the urban areas and observed trends over the last 15 years where now over half the development in Salt Lake County occurs in the MVC study area. As Kennecott makes available more land on and at the base of the West Bench for development, a large constraint on developable land in SL County will be lifted.

Finally, RSG's forecast was done for all of Salt Lake County, not just for the MVC study area. RSG's forecast estimated that approximately 42,000 new residential units can be accommodated on vacant land in Salt Lake County that is outside the MVC study area. This is interesting for two reasons. First, it is only 20% of the total residential growth anticipated in Salt Lake County by 2030, according to the latest GOPB projections. Secondly, added to RSG's forecast for the study area and compared to the GOPB's forecast for growth, approximately 75,000 new residential units are unaccounted for in RSG's forecast. The sum total of RSG's residential growth estimate did not add up to the GOPB estimate for total growth in Salt Lake County by 2030, implying that the densities assumed in RSG's analysis may be conservative and that the market for land on the West Bench and in the Northwest Quadrant will be

[1] Kennecott is planning enough development to accommodate 55,000 households by 2030 and over 90,000 households by 2040. RSG's analysis assumes that Kennecott's development plans for 2030 will be achieved.

strong. Additionally, this finding seems to suggest that there is a very real need for the type of land-use planning that the WFRC is promoting regarding the re-use and intensification of uses on existing developed land. However, it is important not to overstate the potential for redevelopment while the housing market has a bountiful supply of relatively cheap and developable land. The best indication of this is that only 12% of the building permits in Salt Lake County from 2000 to 2006 were for homes north of 6200 South and east of Bangerter Highway. By way of comparison, Daybreak developers acquired 12% of the county building permits in 2006.

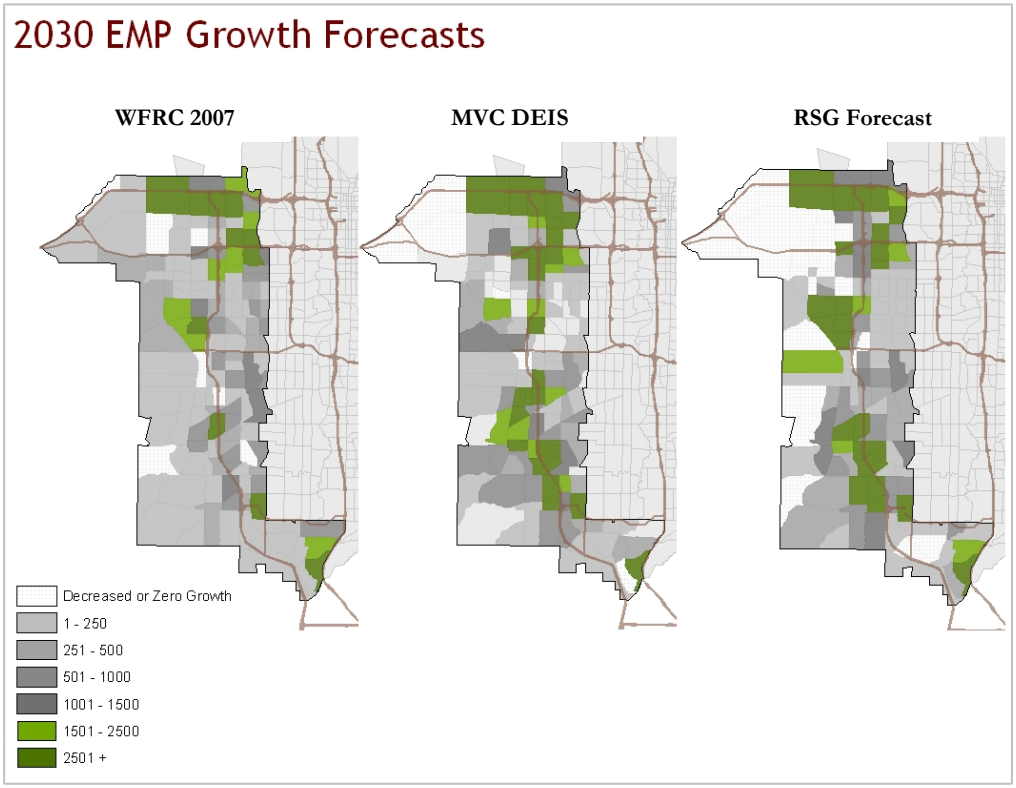
Non-Residential Growth Projections

Figure 11 shows the differences in employment projections at the district level of aggregation and Figure 12 shows the difference in the three forecasts at the TAZ level. Again, both comparisons focus on the MVC study area and when reviewing these maps it is useful to focus on the general patterns rather than individual TAZs. The consistency between the RSG forecast and the MVC DEIS forecast (GC Forecast) is even more striking in the case of employment projections.

Figure 11: Comparison of Employment Growth in the MVC Study Area (District Level)

	1	2	3	4	5	6	7	8	TOTAL
2007 WFRC	22,253	37,217	12,084	13,018	7,764	7,309	818	499	100,962
MVC DEIS	38,215	40,495	32,439	47,819	4,661	12,018	3,490	2,896	182,032
RSG	44,641	57,978	24,448	37,602	6,353	9,929	2,514	2,957	186,421

Figure 12: Comparison of Employment Growth in the MVC Study Area (TAZ Level)



Here are some key observations about the different employment forecasts:

- Overall, the RSG forecast and MVC DEIS forecast assume a similar amount of non-residential growth in the corridor and almost twice as much development as WFRC's 2007 forecast.
- The 2005 GOPB forecasts estimated that there will be 340,000 new jobs in Salt Lake County from 2005 to 2030. These forecasts have since been lowered to 280,000 new jobs in the 2008 GOPB forecast, and are being revised again. Using these numbers as a range, this trend is consistent with the fact that approximately 300,000 new jobs were added from 1970 to 2000. The WFRC's 2007 forecast assumes less than one-third of this total employment growth occurs in the corridor, while the RSG and MVC DEIS forecasts assume a little more than half of the growth occurs in the corridor. Since 1990, one-third of the non-residential growth in Salt Lake County has occurred in the MVC study area, and given the investment in infrastructure proposed for the west-side of Salt Lake County and the availability of land it seems reasonable that this trend will increase.
- All three forecasts assume substantial development on the west side of Salt Lake City and northern West Valley City (north of 3500 South).

- Just as with the residential growth projections, WFRC's 2007 forecast does not account for plans that Kennecott has for its land, either in Daybreak or the West Bench. Kennecott is anticipating development to accommodate 28,000 jobs, mostly in Daybreak, and WFRC's projections do not recognize this. Similarly, WFRC's 2007 forecasts do not assume development in the Northwest Quadrant.
- In general, the largest differences between WFRC's 2007 forecast and the other two forecasts are in the southern end of the corridor, south of 6200 South. There is a substantial amount of land zoned for non-residential use in the city master plans, consistent with the Growth Choices process, which WFRC does not account for in the 2007 forecast.
- One key difference between the RSG and MVC DEIS forecasts are the assumptions for the ATK property. Each forecast assumes this property will redevelop from its current use at some point in the next 25 years and RSG's analysis assumed another large-scale non-residential use. However, that decision is still yet to be determined and the MVC DEIS forecast assumes a mix of development types, consistent with the Growth Choices process.
- Taken together with the household projections, the 2030 land-use projections used in the MVC DEIS would result in approximately 1.7 jobs for every household in the MVC study area. This is consistent with the average jobs-to-housing ratio in the 4-county region. What this means is that the residential and non-residential growth projected for the MVC study area assumes a place not unlike the rest of the region in general.

Here again it is important to remember that the RSG forecast assumes that Kennecott will develop their land according to their latest plans and the phasing of those plans[1], and that the other land in the corridor not owned or developed by Kennecott develops at modest densities that are equal to or lower than densities in the corridor today. Over 60% of the vacant non-residential land in Salt Lake County lies within the MVC study area and RSG's forecast largely reflects that fact. RSG's jobs forecast for land outside the MVC study area suggested enough land to accommodate 120,000 jobs at current densities. Combined with the jobs forecast for inside the MVC study area, this results in approximately 300,000 jobs in Salt Lake County, which is similar to the total county-level projections from the GOPB.

Recommendation

RSG produced a conservative projection of growth in the MVC study area that turned out to be quite similar to the MVC DEIS land-use forecast both in total and in terms of the TAZ-level allocation of growth. The RSG forecast estimated approximately 90,000 new households and 185,000 new jobs in the MVC study area by 2030. These forecasts are consistent with development trends, with the availability of vacant land in the county, with specific plans of developers, and with the adopted land-use plans in the

[1] Kennecott is planning enough development to accommodate 27,500 jobs by 2030 and 34,000 jobs by 2040. Over half of the job growth is envisioned to occur in Daybreak. RSG's analysis assumes that Kennecott's development plans for 2030 will be achieved.

corridor. RSG's forecasting methodology was not unlike the type of forecast done by many MPOs, and happens to be similar to the MVC DEIS forecast which originally came from the WFRC's 2005 forecast.

RSG recommends that the MVC project team continue to base their forecasts off of the same growth projections used in the DEIS, with two modifications:

1. Incorporate Kennecott's latest development plans, including plans for the West Bench and Daybreak. This action will refine the land-use growth projections to be consistent with Kennecott's plans, a move that is very similar to the spirit of the Growth Choices process.
2. Rescale the employment to be consistent with WFRC's new definition of employment, which include proprietors. This step is necessary in order to use the latest version of the WFRC/MAG model, version 6.

Given that the UrbanSim land-use model was used to help develop the 2007 WFRC forecasts, but not the 2005 WFRC forecast, the above recommendations are also consistent with WFRC's official resolution regarding the use of UrbanSim. Since 2004, WFRC's perspective has been that UrbanSim is not ready for use as part of a corridor study and that output from UrbanSim needs to be carefully reviewed when used for MPO planning purposes. The Council made this decision in large part because UrbanSim had not been proven to be useful for detailed applications. Given the Council's policy, WFRC staff adjusted land-use output before using their 2007 land-use forecasts. However, the WFRC staff recognize that their post-model assumptions were not at the level of detail necessary for a corridor or sub-area analysis. Some of the questions that have arisen about the 2007 WFRC forecasts do seem to validate those initial concerns and suggest the need for more refinement of UrbanSim.

RSG also recommends that UDOT work with the WFRC to update their land-use forecast based on the findings of this review. The WFRC is currently working on refinements to their forecasting methods and forecasts to address the concerns listed in this document and UDOT should participate in this work as appropriate. The Utah Transit Authority shares the concerns outlined in this memo and has chosen to continue using the 2005 WFRC forecasts as a basis for their forecasting work. UDOT should work with WFRC, MAG, UTA and the GOPB to review land-use forecasts more closely prior to the forecasts being released to consultants and the general public.

The projections used in the MVC DEIS were largely similar to those independently produced by RSG. Long-range forecasting is full of uncertainties and the project team should have confidence moving forward with the afore-mentioned minor modifications to the MVC DEIS land-use forecasts given the findings from this review. RSG's analysis and independent forecast confirms not only that the magnitude of growth assumed for the study area in the MVC DEIS forecast seemed reasonable, but that the allocation of growth in the DEIS forecast was similar to current land-use plans and available land.

Lastly, this review was undertaken only for Salt Lake County due to time constraints and relative importance to the MVC EIS. It is important to note that the findings and recommendations above don't necessarily translate to the other counties in the regional travel model (Weber, Davis and Utah counties).

WASATCH FRONT REGIONAL COUNCIL
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July 9, 2008

TeriAnne S. Newell, P.E
MVC Project Manager
UDOT Region 2
2010 S. 2760 W.
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RE: Travel Model Use for Mountain View Corridor

Dear Ms Newell:

Thank you for your letters dated June 18 and 30, 2008 regarding the land-use projections used in developing the traffic forecasts for the Final Environmental Impact Statement (Final EIS) for the Mountain View Corridor (MVC) project. Your latest letter included a report prepared by Resources Systems Group, Inc. (RSG), Review of the Wasatch Front Regional Council's Latest Land-Use Projections, dated June 25, 2008. We understand that the June 25 report supersedes the prior version.

RSG, with cooperation from WFRC staff, evaluated the demographics produced for the 2007 Regional Transportation Plan (2007 RTP growth projections) and evaluated the demographics used in the Draft EIS for the MVC project (DEIS growth projections). The RSG report concluded that "the magnitude of growth assumed for the study area in the MVC DEIS seemed reasonable, and that the allocation of growth in the DEIS forecast was similar to current land-use plans and available land." We concur that the DEIS growth projections with the minor modifications suggested by the RSG report, are reasonable and appropriate to use in your Final EIS given the uncertainty of using our region-wide growth projections in a specific, more finite study area such as MVC.

Every four years WFRC updates our land use projections in support of the next RTP. The next RTP update is tentatively scheduled for adoption in the month of May 2011. To begin we use the latest available county-wide population and employment growth control totals established by the Governor's Office of Planning and Budget (GOPB). For the 2011 RTP update, we will also extend the horizon year to 2040 and make adjustments based on the recommendations provided in the RSG report, and in particular the information on the relative balance between infill development and construction in outlying areas. WFRC will take formal action to adopt the new forecasts for each municipality within the WFRC region around December 2009.

We commend your extensive efforts in developing the MVC EIS and look forward to our continued work with you and the Utah Department of Transportation.

Sincerely,

Charles W. Chappell, PE
Executive Director