Chapter 29: Sequencing

29.1 Introduction

Sequencing refers to the order in which proposed transportation modes are constructed (usually transit versus new roads). For the Mountain View Corridor (MVC) project, the sequencing analysis evaluates a scenario in which a transit alternative is constructed before a freeway alternative to determine whether a transit-first scenario could relieve enough congestion to delay the need for construction of the MVC freeway. This sequencing analysis evaluates constructing the Preferred Transit Alternative before the Preferred Freeway Alternative in Salt Lake County (see Section 2.4.5, Preferred Alternatives, in Chapter 2) and the associated land-use and transportation impacts of this scenario. Specifically, the analysis focuses on an evaluation of alternative timing, or sequencing, of the transit and highway alternatives.

29.1.1 Sequencing Background

As part of the MVC project, Envision Utah facilitated a process referred to as the Growth Choices Study (see Chapter 3, Growth Choices). During the Growth Choices process, the participants discussed the sequencing of transit and roadway improvements and included a statement about sequencing in the Mountain View Vision Voluntary Agreement. The fourth Principle of Agreement states:

> The phasing and implementation of transportation investments over the next decade will affect land-use development patterns, future travel needs, and the availability and effectiveness of other viable transportation choices. The sequencing of transportation investments should be studied to recommend the most cost-efficient way to meet future travel needs, reduce the rate of growth of vehicle-miles traveled, and improve air quality.

To address this Principle of Agreement, the MVC Environmental Impact Statement (EIS) team initiated the sequencing analysis discussed in this chapter.

During the Growth Choices process, three scenarios for transportation and growth were developed: Trend, Expansive, and Compact. The Trend Scenario illustrates what growth and transportation might look like in 2030 if recent land development patterns continue and existing transportation plans are implemented. The Expansive Scenario reflects more-dispersed development patterns and a greater investment in new roadway infrastructure. The Compact Scenario reflects more-dense development patterns and a greater investment in new transit infrastructure and service.

After reviewing the three scenarios, the Growth Choices Stakeholder Committee (representatives from Salt Lake and Utah Counties, 14 cities, four nongovernmental organizations, a school district, two chambers of commerce, and five landowners in the study area) decided to create a composite scenario that blended some ideas from the Compact and Trend Scenarios. This composite scenario was called the "Vision" Scenario. This scenario includes a balanced mix of roadway improvements, transit improvements, and land-use changes that focused development to support transit use along 5600 West.

29.1.2 Objective of the Sequencing Analysis

This chapter examines the transportation impacts of delaying construction of the Preferred Roadway Alternative until after the Preferred Transit Alternative is constructed and allowed to develop a transit ridership base. Specifically, the analysis examines the effects of a transit-first scenario on land use, transit use, and traffic delay and congestion in the MVC study area. These three issues relate to the two main purposes of the MVC project, which are to improve regional mobility by reducing roadway congestion and to improve regional mobility by supporting increased transit availability (see Section 1.3.1, Purpose of the Project).

29.2 Sequencing Analysis

The sequencing analysis used both qualitative and quantitative approaches. The qualitative approach gathered information about changes in land-use patterns due to different sequencing scenarios through interviews with representatives from the cities and counties in the MVC study area. The quantitative approach evaluated different sequencing scenarios using Version 6.0 of the regional travel demand model from the Wasatch Front Regional Council (WFRC) and the Mountainland Association of Governments (MAG) to provide a numeric analysis of the effects of sequencing.

During the preparation of the sequencing analysis for the Draft EIS, the latest version (5.0) of the WFRC/MAG travel demand model was used. 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 asked Resource System Group, Inc. (RSG) to evaluate the population, household, and employment projections used by WFRC for the travel forecasting. RSG determined that the population, household, and employment projections in the Draft EIS more closely reflect the actual growth trends and more closely reflected the stated intentions of major land developers in the area. Therefore, RSG recommended basing Version 6.0 traffic forecasts on population, household, and employment projections 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 traffic forecast for the Final EIS and would be considered in the next update of the travel demand model. Therefore, the Final EIS sequencing analysis uses a "revised" Version 6.0 of the regional travel demand model with the updated population, household, and employment numbers for the WFRC region. The Utah County population, household, and employment numbers and distribution are the same as those developed by MAG in their 2007 Regional Transportation Plan. For a more detailed discussion of the changes to Version 6.0 of the regional travel demand model, see Section 2.1.7.1, Revised Travel Demand Modeling for the Final EIS.

29.2.1 Qualitative, Interview-Based Approach

The qualitative approach gathered information about sequencing from the affected jurisdictions in the MVC study area as well as local developers who have developed projects in the Wasatch Front area. The interviews consisted of asking interviewees how the area would develop differently if transit were implemented first and whether more transit-oriented developments would be built along the proposed transit alternative.

29.2.1.1 Qualitative Analysis Methodology

The qualitative approach involved interviewing 15 municipalities in the MVC study area and 13 developers who own land in the MVC study area. Each person interviewed was asked about the land-use impacts associated with constructing the Preferred Transit Alternative before the Preferred Freeway Alternative. Municipal staff were interviewed because municipalities control local land-use

plans and approve developments. Developers were interviewed because they request land-use changes, build developments, and are more aware of market demands.

Some of the information in the sequencing analysis is also discussed in Chapter 24, Indirect Effects. The two chapters are similar in that both evaluate impacts to land uses. The interviews for both chapters were conducted concurrently.

Table 29.2-1 and Table 29.2-2 below list the municipalities and developers that were interviewed during this process.

Table 29.2-1. Municipality Interviews

Municipality	Date	Persons Interviewed
Salt Lake County	1/14/05	David White (County Planner), Andrea Pullos (County Transportation Manager), Jena Walker (County Transportation Engineer)
Salt Lake City	1/11/05	D.J. Baxter (Mayor's Office), Doug Wheelwright (City Planner), Kevin Young (Transportation Engineer)
West Valley City	1/20/05	Joseph Moore (Community Economic Development Director), Jeff Hawker (Planner), Kevin Hooper (Planner), John Janson (Planner), Bob Buchanon (Economic Development)
City of West Jordan	1/11/05	David Murphy (Capitol Facilities Manager), Bill Baranowski (Traffic Engineer), Rick Lewis (City Planner), Tom Burdett (Community Development Director)
City of South Jordan	1/12/05	Greg Schindler (City Planner), Shane Greenwood (City Engineer), Don Bruey (City Public Services), Cliff Strachen (City Public Services Engineer)
Riverton City	1/13//05	Frederick Lutze (City Engineer), Mike Hutchinson (Public Works Director), Brian Maxfield (City Planner)
City of Herriman	1/12/05	Glenn Graham (City Planner)
City of Bluffdale	1/13/05	Shane Jones (City Engineer), Blaine Gehring (City Planner), Brent Bluth (City Administrator)
Utah County	1/10/05	Paul Hawker (Associate County Engineer), Clyde Naylor (County Engineer), John McMullin (Engineering Manager), Michael Leifson (Engineering Technician), Bryce Armstrong (County Planner)
Lehi City	1/25/05	Loren Powell (City Engineer), Diana Webb (City Planner)
City of Saratoga Springs	1/18/05	Larry Gilson (City Engineer), Justin Jones (Gilson Engineering), Mark Edwards (Public Works Director), Dave Anderson (Planner), Ken Leetham (City Administrator)
City of Eagle Mountain	1/18/05	Kelvin Bailey (Mayor), Chris Hillman (City Administrator), Mark Sovine (Public Works Director), Chris Trusty (City Engineer), Mike Jensen (Epic Engineering), Shawn Warnke (Planner), Adam Lenhard (Planner), Jeff Weber (Public Works)
City of American Fork	1/19/05	Howard Denny (Public Works Director), J.H. Hadfield (Engineer), Wendelin Knobloch (Planner), Rod Despain (Planning Director)
City of Pleasant Grove	1/20/05	Frank Mills (City Administrator), Gary Fry (Planner)
City of Lindon	1/13/05	Kevin Smith (City Planner), Mark Christensen (JUB Engineers)

Table 29.2-2. Developer Interviews

Development	Date	Location	Company and Persons Interviewed
Daybreak	2/23/05	11400 South and Bangerter Highway, South Jordan	Kennecott Land – Jim Schulte (Planning Manager), Vicki Varella (Vice President)
Independence at Bluffdale	2/24/05	14600 South and I-15, Bluffdale	IBI Group – Ray Whitchurch (Planner)
Thanksgiving Point	2/24/05	West SR 92 and I-15, Lehi	Thanksgiving Point – Greg Gagon (Development Director)
Rosecrest	2/22/05	West 12600 South, Bluffdale/ Herriman	Sorenson Development – Mike Bradshaw (Vice President)
Mosida Orchards	2/23/05	West Utah Lake, Utah County	Gardner and Associates – Dave Gardner (President)
Eagle Mountain Properties	2/23/05	Eagle Mountain	Eagle Mountain Properties – John Walton (President), Eric Jones (Attorney)
Peterson Development	2/23/05	West Jordan	Peterson Development
The Ranches	2/22/05	Eagle Mountain	Eagle Mountain Links – Monte Kingston (Planning)
Patterson Construction	2/22/05	Eagle Mountain	Patterson Construction – Wayne Patterson (Planning)
Ivory Homes	2/22/05	West Valley City and Lehi	Ivory Homes – Colin Wright (Planning)
Traverse Mountain	2/24/05	East SR 92 and I-15, Lehi	Mountain Home Development Group – McKay Christensen (Planning), Tyson Thorpe (Planning), Mark Walker (Vice President)
Station Park	2/24/05	Farmington, Davis County	Stonehenge Development – Michael Haws (Coldwell Banker), John Shirley (Architect)
Property Reserve Inc.	2/22/05	Salt Lake and Utah Counties	PRI – Richard Wangsgard (Real Estate), Glen Girsberger (Real Estate)

29.2.1.2 Qualitative Analysis Results

Municipalities

Most of the municipal representatives interviewed said that, in general, their municipalities would not make land-use decisions based on the timing of the MVC alternatives, but instead would make decisions based on previously adopted land-use plans and political agendas. Most representatives stated that, if the transit alternative is constructed first, their municipality is likely to change the land uses around the transit line to commercial or industrial (to create economic support) or higher-density residential (to increase transit ridership). However, the representatives did not expect land uses to be changed throughout their entire municipality. In other words, if municipalities increase densities around the transit alternative and the transit-oriented development land uses are allowed to establish without competition from the MVC freeway alternative, the developable areas located away from the transit line will continue to develop out

as currently planned because the population and employment projections are large.

Salt Lake City. The representatives from Salt Lake City said that constructing the MVC transit alternative first was crucial to minimize sprawl on the west side of the Salt Lake Valley and to establish the ridership that would support the transit alternative. Salt Lake City is concerned that building the MVC freeway will hinder use of the MVC transit alternative. The city said that, if the MVC freeway is constructed before the MVC transit alternative, the transit line would be unable to sustain itself. Development would occur near the freeway and other areas away from the transit line, so transit-oriented developments would never be able to take hold. Salt Lake City wants the transit line to establish itself and let the land uses develop around the transit system. Salt Lake City wants transit-dependent communities that minimize reliance on the automobile. The City is considering having transit-oriented light industrial/manufacturing land uses along the transit alternative between State Route (SR 201) and Interstate 80 (I-80) (Parsons Brinckerhoff 2005a).

West Valley City. West Valley City stated that both the freeway and the transit line are needed. With regard to the order of constructing these facilities, the City said that, if the transit line is constructed first, it would need to be more aggressive and move greater volumes of people to compensate for not having the MVC freeway. The city representatives said that West Valley City would change the land uses around the transit alternative to allow transit-oriented developments. They also stated that, if the transit alternative is constructed first, land uses and development densities away from the transit alternative would not change (Parsons Brinckerhoff 2005a).

West Jordan, South Jordan, and Riverton. Representatives from West Jordan, South Jordan, and Riverton said that, if the transit alternative is constructed first, their municipalities might change land uses around the transit line, but large-scale land-use changes away from the transit line are not expected. Areas away from the transit line are expected to develop as traditional, low-density residential and neighborhood commercial nodes (Parsons Brinckerhoff 2005a).

Before the transit alternative would be constructed, the Mid-Jordan light-rail transit line (a separate project) is proposed to be constructed. Because this transit line would provide a shorter travel time to downtown Salt Lake City, it is likely to be the primary transit line for West Jordan, South Jordan, and Riverton riders. Both West Jordan and South Jordan already have plans for transit-oriented developments along the Mid-Jordan light-rail transit line. These municipalities currently do not have plans for transit-oriented developments along the proposed MVC transit alternative. Representatives from West Jordan said that the City

would consider adopting a transit-oriented development plan for the MVC transit alternative after evaluating the performance of the transit-oriented developments along the Mid-Jordan light-rail transit line. The West Jordan representatives said that they would possibly consider a 24 unit/acre transit-oriented development along the proposed MVC transit alternative (Parsons Brinckerhoff 2005a).

Herriman and Bluffdale. Representatives from Herriman and Bluffdale said that the overall development patterns and land uses in Herriman and Bluffdale are not expected to change if the transit alternative is constructed first. If the transit alternative is extended in Herriman, the City might consider a transit-oriented development around the transit stop. Land uses away from the transit line would not change as a result of constructing the transit line before the MVC freeway. The city representatives said that, even if the transit alternative is constructed first, the City will continue to develop plans around the MVC freeway. Due to political reasons, Bluffdale wants to remain rural and plans to accomplish this by maintaining the historical lot size of at least 1 acre in the city. Land uses in the city are not expected to change, since the transit alternative does not extend into Bluffdale (Parsons Brinckerhoff 2005a).

Lehi, Saratoga Springs, Eagle Mountain, American Fork, and Lindon. Representatives from Lehi, Saratoga Springs, Eagle Mountain, American Fork, and Lindon in Utah County said that, if the transit alternative is constructed first, this would not change any land-use plans or development patterns. The transit alternative would not extend into Utah County (Parsons Brinckerhoff 2005a).

Developers

Most developers and landowners who were interviewed said that their development plans did not depend on the timing of constructing the transit alternative. Their plans were mostly dependent on the housing market and the surrounding municipality's general land-use plans. Developers said that the freeway alternative was long overdue and was needed to address existing and future growth regardless of whether the transit alternative is built before the freeway alternative.

Kennecott Land Company. Kennecott Land Company is the largest developer in the MVC study area. Kennecott Land's holdings include over 90,000 acres of the western Salt Lake Valley. Kennecott Land is currently working to develop 4,000 acres in South Jordan as a development called Daybreak. This development will be served by both the MVC freeway and transit alternatives and the Mid-Jordan light-rail transit line (a separate project). Daybreak is a New Urbanism development that focuses land-use planning around the Mid-Jordan transit line and the MVC transit alternative. Representatives from Kennecott Land said that,

since transit-oriented planning has always been part of their development process, constructing the transit alternative before the freeway alternative is not likely to substantially change Daybreak's development densities or Kennecott Land's land-planning decisions. The representatives said that the proposed 13,000 housing units in Daybreak would likely be constructed regardless of when the transit alternative is constructed. One change that might occur would involve the construction of the 9 million square feet of commercial space. The representatives said that constructing the transit alternative first might result in less commercial area. The commercial area that was planned with the MVC freeway alternative would most likely be rezoned to residential (Parsons Brinckerhoff 2005b).

Sorenson Development Company. Another major development in the MVC study area is the Rosecrest development by Sorenson Development Company. Rosecrest is approximately 2,300 acres and is partially located in Herriman and partially in Bluffdale. The Preferred Freeway Alternative alignment bisects the development. The transit alternative would not be located on the Rosecrest development. Representatives from Sorenson Development Company said that constructing the transit alternative first could delay the proposed commercial densities adjacent to the proposed MVC freeway interchanges. The residential densities for the remaining development areas are not likely to change, since half of the development is already built out and the development pressure for the housing is high in the area (Parsons Brinckerhoff 2005b).

IBI Group. The Independence development in Bluffdale is a separate development from Rosecrest that is proposed by another private developer and IBI Group. The development, which encompasses 580 acres, is located south of the Utah State Prison and next to I-15. Representatives from IBI Group said that the Independence development plans would not change if the transit alternative is constructed before the freeway alternative. IBI Group's development plans are based on access to I-15 and the potential commuter rail along I-15 (a separate project from the MVC) and on market trends. Representatives from IBI Group said that the current market trends are for larger-lot, single-family, detached developments. The IBI Group representatives said, as did other developers, that market trends might change in the future to smaller-lot, higher-density developments. These development changes could be due to population growth, increased property values, and changing market pressures in the MVC study area over the next 30 years (Parsons Brinckerhoff 2005b).

Mountain Home Development Group. Farther south from the Independence development and on the east side of I-15 is the Traverse Mountain development. Traverse Mountain is similar to the Independence development in that the development plans are based on access to I-15 or the commuter rail project along

I-15 (a separate project from the MVC). The developer said that their development plans will not change if the transit alternative is constructed before the freeway alternative (Parsons Brinckerhoff 2005b).

Other Developers. Developments in Lehi, Eagle Mountain, and Saratoga Springs will not change if the transit alternative is constructed before the freeway alternative, according to developers in these cities (Parsons Brinckerhoff 2005b). For example, representatives from Eagle Mountain Links LLC in Eagle Mountain said that their development decisions are not based on the MVC alternatives but instead on market trends.

29.2.2 Quantitative, Numbers-Based Approach

The quantitative approach involved using the WFRC/MAG regional travel demand model to quantitatively measure the effects of different sequencing scenarios. Two scenarios were evaluated based on forecast years of 2015 and 2030. For each scenario, the following data were calculated for 2015 and 2030:

- Regional person-trips by purpose and mode
- Number of daily transit trips with one or both ends in the MVC study area
- Daily boardings for the 5600 West Transit Alternative, Dedicated Right-of-Way Transit Option (see Section 2.2.2.1, 5600 West Transit Alternative)
- Peak-period transit share for trips with one or both ends in the MVC study area
- Peak-hour transit share for trips with one or both ends in the MVC study area
- Daily highway system vehicle-miles traveled (VMT) in the MVC study area and in the region. Note that air emissions generated by vehicles can be correlated to VMT. Generally, higher VMT results in overall greater vehicle emissions.
- Daily highway system hours of delay in the MVC study area

The scenarios are discussed below and are shown in Figure 29-1 through Figure 29-5, Sequencing Analysis.

29.2.2.1 Quantitative Scenarios Evaluated – Forecast Year 2015

Scenario 1 – No-Action

Purpose. The 2015 No-Action scenario serves as a baseline for comparing the other sequencing scenarios. For this scenario, the MVC EIS team assumed that past development trends in the MVC study area would continue and that neither an MVC roadway nor a transit alternative would be operational before 2015.

Approach. For socioeconomic data, the 2015 forecast households and employment data were used for all transportation analysis zones based on the revised Version 6.0 of the regional travel demand model. The roadway network used for the No-Action scenario included all elements in the WFRC/MAG regional transportation plans without the MVC roadway and transit alternatives.

Transportation System Management (TSM) and Transportation Demand Management (TDM) measures are already accounted for in the No-Action Alternative and in the scenarios below because they are in WFRC's and MAG's 2030 regional transportation plans and travel demand model.

Scenario 2 – Transit-First Scenario with Growth Choices Land Use Proportionate throughout the MVC Study Area

Purpose. Under this scenario, the Dedicated Right-of-Way Transit Option would be opened before 2015, and the land uses developed under the Growth Choices process would be implemented. With this scenario, the development and growth pattern is distributed throughout the MVC study area and is not concentrated along the proposed 5600 West transit corridor.

Approach. For socioeconomic data, the MVC EIS team calculated the amount of growth in households and employment projected for transportation analysis zones in the MVC study area during the period from 2005 to 2015. This growth was then allocated to the MVC study area transportation analysis zones in proportion to their forecasted growth from 2005 to the 2030 Growth Choices level of development. For the remainder of the region, the 2015 forecast households and employment data were used from the revised Version 6.0 of the regional travel demand model.

This scenario includes implementing the Dedicated Right-of-Way Transit Option before 2015 along with the elements in the WFRC/MAG regional plans minus an MVC roadway alternative.

Scenario 3 – Transit-First Scenario with Growth Choices Land Use Concentrated along 5600 West

Purpose. Under this scenario, the Dedicated Right-of-Way Transit Option would be opened before 2015, and the land uses developed under the Growth Choices process would be implemented. With this scenario, the development and growth pattern is concentrated along the 5600 West corridor.

Approach. For socioeconomic data, the MVC EIS team calculated the amount of growth in households and employment projected for transportation analysis zones in the MVC study area during the period from 2005 to 2015. The area adjacent to the Dedicated Right-of-Way Transit Option would grow according to the 2030 Growth Choices household and employment levels. This level of growth was taken from the overall MVC study area projections. The remainder of the household and employment levels not allocated to Growth Choices land uses along 5600 West was allocated to the MVC study area outside the 5600 West corridor. For this area outside the 5600 West corridor, the growth rates identified in the 2015 revised Version 6.0 of the regional travel demand model were used.

This scenario includes implementing the Dedicated Right-of-Way Transit Option before 2015 along with the elements in the WFRC/MAG regional plans minus an MVC roadway alternative.

Scenario 4 – Transit-First Scenario with Growth Choices Land Use Concentrated along 5600 West and a Non-tolled MVC Roadway

2015 Scenario 4 would be the same as 2015 Scenario 3 except that the non-tolled MVC freeway components would be implemented.

Scenario 5 – Transit-First Scenario with Growth Choices Land Use Concentrated along 5600 West and a Tolled MVC Roadway

2015 Scenario 5 would be the same as 2015 Scenario 3 except that the tolled MVC freeway components would be implemented.

29.2.2.2 Quantitative Analysis Results – Forecast Year 2015

Table 29.2-3 below provides a summary of the daily regional trips by purpose (home, work, or college) and mode (non-motorized, auto, or transit) for each of the five scenarios evaluated in the 2015 sequencing analysis. The results were developed using the revised Version 6.0 of the regional travel demand model. The data show that there is less than a 1% difference in regional auto trips between building transit in 2015 without an MVC roadway compared to building transit in 2015 with an MVC roadway (either tolled or non-tolled).

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Table 29.2-3. 2015 Daily Regional Trips by Purpose and Mode

Travel Mode	Home-Based Work	Home-Based College	Home-Based Other	Non-Home-Based	Total	Percent over No-Action
Scenario 1 – No-Action						
Non-motorized	39,000	20,400	624,200	174,800	858,400	
Auto	1,226,700	110,500	4,578,000	2,961,600	8,876,800	NA
Transit	84,200	21,400	38,700	25,800	170,100	NA
Total	1,349,900	152,300	5,240,900	3,162,200	9,905,300	
Scenario 2 – Transit-First Scenario with Growth Choices Land Use Proportionate throughout the MVC Study Area						
Non-motorized	38,600	20,400	620,500	173,700	853,200	
Auto	1,223,500	111,000	4,570,300	2,956,900	8,861,700	–0.2%
Transit	85,800	21,000	39,800	26,200	172,800	1.6%
Total	1,347,900	152,400	5,230,600	3,156,800	9,887,700	
Scenario 3 – Transit-First Scenario with Growth Choices Land Use Concentrated along 5600 West						
Non-motorized	39,100	20,400	622,600	174,000	856,100	
Auto	1,219,600	110,700	4,568,700	2,956,000	8,855,000	–0.2%
Transit	89,000	21,200	41,700	27,000	178,900	5.2%
Total	1,347,700	152,300	5,233,000	3,157,000	9,890,000	
Scenario 4 – Transit-First Scenario with Growth Choices Land Use Concentrated along 5600 West and a Non-tolled MVC Roadway						
Non-motorized	39,000	20,400	614,800	172,200	846,400	
Auto	1,220,500	110,900	4,575,900	2,957,700	8,865,000	–0.1%
Transit	88,200	21,000	42,300	27,100	178,600	5.0%
Total	1,347,700	152,300	5,233,000	3,157,000	9,890,000	
Scenario 5 – Transit-First Scenario with Growth Choices Land Use Concentrated along 5600 West and a Tolled MVC Roadway						
Non-motorized	38,800	20,400	618,800	173,500	851,500	
Auto	1,221,200	110,800	4,572,600	2,956,700	8,861,300	–0.2%
Transit	87,600	21,100	41,600	26,800	177,100	4.1%
Total	1,347,600	152,300	5,233,000	3,157,000	9,889,900	

NA = not applicable

This table shows daily regional trips within the WFRC and MAG planning area.

Shaded cells highlight the expected auto and transit trips under the various sequencing scenarios. The shaded percentages indicate the percent change in auto and transit trips compared to the No-Action scenario.

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The data show that, with an MVC toll roadway, about 1,500 fewer transit trips per day would be generated compared to a non-tolled roadway, which is still less than 1% of the total transit trips. In addition, the best-performing transit-only scenario (Scenario 3) would generate 5.2% more transit trips than the No-Action scenario (Scenario 1), compared to 5.0% more transit trips for the scenario that includes both the Dedicated Right-of-Way Transit Option and a non-tolled MVC roadway (Scenario 4).

Table 29.2-4 provides the results for the number of transit trips, transit boardings, transit share, roadway VMT, and delay results in the MVC study area. This table shows that the most important factor in determining transit use is land use, not whether the MVC freeway (either tolled or non-tolled) is built first. This is demonstrated by the lower transit use in Scenario 2 compared to the other action scenarios (3, 4, and 5), all of which include transit-oriented development concentrated along 5600 West.

When transit-oriented land use is concentrated along 5600 West, there is little difference in transit use (about -6% to 0.4%) whether the MVC freeway is operating at the same time as or after the transit line. However, the number of transit trips would still be about 51% to 61% more than if no transit line were constructed. In addition, the transit-only scenarios resulted in substantially greater roadway delay (about 70% for the non-tolled roadway and 23% for the tolled roadway) compared to the scenarios in which the roadway and transit were operating at the same time in 2015.

Table 29.2-4. 2015 Sequencing Scenario Transit Trips, Transit Boardings, Transit Share, VMT, and Delay Results in the MVC Study Area

Evaluation Method	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
2015 daily transit trips[a]	16,000	19,800	25,700	25,800	24,200
2015 daily transit boardings	800[b]	5,920[c]	11,870[c]	11,970[c]	10,810[c]
2015 peak-period transit share[a]	1.46%	1.74%	2.22%	2.14%	2.03%
2015 peak-hour transit share[a]	1.98%	2.36%	3.01%	2.90%	2.75%
2015 daily highway VMT in the MVC study area	8,670,000	8,719,000	8,632,000	10,117,000	9,470,000
2015 daily highway system hours of delay in the MVC study area	33,700	30,700	33,300	19,600	27,100

[a] Transit trips with one or both ends in the MVC study area

[b] 5600 West bus route

[c] 5600 West Transit Alternative with Dedicated Right-of-Way Transit Option

29.2.2.3 Quantitative Scenarios Evaluated – Forecast Year 2030

For the evaluation of sequencing in 2030, a range of seven scenarios was analyzed that included transit only and a combination of transit and roadway. For each of the action scenarios (2 through 7), two different land-use scenarios were used from the Growth Choices process: the Vision Scenario and the Compact Scenario. The Vision Scenario was the agreed-to outcome of the Growth Choices process by the Stakeholder Committee, and the Compact Scenario was eliminated by the committee because the denser development patterns under this scenario did not fit with long-term planning in the study area. Although the Compact Scenario was eliminated, it is included in this analysis to enable a comparison to the less-compact land uses in the Vision Scenario. Figure 29-6, Sequencing Analysis – 2030 Population Change – 2005 Based "Compact" Scenario, and Figure 29-7, Sequencing Analysis – 2030 Employment Change – 2005 Based "Compact" Scenario, show the population and employment assumptions used to develop the Compact Scenario.

Scenario 1 – No-Action

Purpose. The No-Action scenario serves as a baseline for comparing the other sequencing scenarios. For this scenario, the MVC EIS team assumed that past development trends in the MVC study area would continue and that neither an MVC roadway nor a transit alternative would be operating before 2030. This scenario corresponds to 2015 Scenario 1.

Approach. For socioeconomic data, the household and employment data from the revised Version 6.0 of the regional travel demand model were used for all transportation analysis zones. The roadway network used for the 2030 No-Action scenario included all elements in the WFRC/MAG regional transportation plans without the MVC roadway and transit alternatives.

Scenario 2 – MVC Transit with Growth Choices Land Use with No Roadway Alternatives

Purpose. Under this scenario, the Dedicated Right-of-Way Transit Option would be operating before 2030, and the land uses developed under the Growth Choices process would be implemented. With this scenario, the development and growth pattern is distributed throughout the MVC study area and is not concentrated along the proposed 5600 West transit corridor. This scenario corresponds to 2015 Scenario 2.

Approach. For socioeconomic data, the 2030 Growth Choices level of development in the MVC study area was used. For the region outside the MVC study area, the household and employment data from the revised Version 6.0 of

the regional travel demand model were used. This scenario includes implementing the Dedicated Right-of-Way Transit Option before 2030 along with the elements in the WFRC/MAG regional plans without an MVC roadway alternative.

Scenario 3 – MVC Transit with Growth Choices Land Use with MVC Roadway Alternative Non-tolled

Purpose. Under this scenario, the Dedicated Right-of-Way Transit Option along with MVC roadway alternative would be opened before 2030, and the land uses developed under the Growth Choices process would be implemented. This scenario does not correspond to any 2015 scenarios.

Approach. For socioeconomic data, the 2030 Growth Choices level of development in the MVC study area was used. For the region outside the MVC study area, the household and employment data from the revised Version 6.0 of the regional travel demand model were used. This scenario includes implementing an MVC roadway alternative along with a Dedicated Right-of-Way Transit Option before 2030 along with the elements in the WFRC/MAG regional plans.

Scenario 4 – MVC Transit with Growth Choices Land Use with MVC Roadway Alternative with Tolling Option

2030 Scenario 4 would be the same as 2030 Scenario 3 except that the MVC freeway components would be tolled.

Scenario 5 – MVC Transit with Compact Growth Land Use with No Roadway Alternatives

Purpose. Under this scenario, the Dedicated Right-of-Way Transit Option would be operating before 2030, and land uses would be developed that would follow a compact growth pattern concentrated along 5600 West to support transit use. There would be no MVC roadway alternatives implemented with Scenario 5. This scenario corresponds to 2015 Scenario 3.

Approach. For socioeconomic data, the amount of growth in households and employment that is projected for traffic analysis zones in the MVC study area from 2005 to 2030 was calculated. These data were applied to the traffic analysis zones adjacent to the 5600 West transit line so that development would grow beyond that predicted for the 2030 Growth Choices level of development (households and employment) to something that better reflected the Compact Scenario developed during the Growth Choices phase. Finally, the remainder of the household and employment growth projected for the MVC study area was

allocated to those MVC study area traffic analysis zones that are not adjacent to the 5600 West transit line in proportion to their forecasted growth from 2005 to 2030. For the remainder of the region, the household and employment data from the revised Version 6.0 of the regional travel demand model were used.

Scenario 6 – MVC Transit with Compact Growth Land Use with MVC Roadway Alternative Non-tolled

2030 Scenario 6 is the same as 2030 Scenario 5 except that it would include implementing an MVC roadway non-tolled alternative prior to 2030.

Scenario 7 – MVC Transit with Compact Growth Land Use with MVC Roadway Alternative with Tolling Option

2030 Scenario 7 is the same as 2030 Scenario 5 except that it would include implementing an MVC roadway tolled alternative prior to 2030.

29.2.2.4 Quantitative Analysis Results – Forecast Year 2030

Table 29.2-5 below provides a summary of the daily regional trips by purpose (home, work, or college) and mode (non-motorized, auto, or transit) for each of the seven scenarios evaluated in the 2030 sequencing analysis. The results were developed using the revised Version 6.0 of the regional travel demand model.

The data show that 2030 Scenario 5, MVC Transit with Compact Land Use with No Roadway Alternatives, would result in the most transit trips with an increase of 11.4% over the 2030 No-Action Scenario (2030 Scenario 1). 2030 Scenario 5 would result in 100 additional daily transit trips in the region compared to 2030 Scenario 6, which includes implementation of the MVC roadway alternatives in addition to compact land uses along 5600 West to support transit use. 2030 Scenario 5 would result in 23,000 additional daily transit trips compared to 2030 Scenario 3 (MVC Transit with Growth Choices Land Use with MVC Roadway Alternative Non-tolled). The 2030 action scenarios tested resulted in an increased use of daily transit trips of 1.6% to 11.4% over the 2030 No-Action Scenario.

Table 29.2-5. 2030 Daily Regional Trips by Purpose and Mode

Travel Mode	Home-Based Work	Home-Based College	Home-Based Other	Non-Home-Based	Total	Percent over No-Action
Scenario 1 – No-Action						
Non-motorized	45,600	23,900	747,100	210,100	1,026,700	
Auto	1,528,400	138,600	5,642,000	3,698,500	11,007,500	NA
Transit	123,300	29,900	63,300	38,100	254,600	NA
Total	1,697,300	192,400	6,452,400	3,946,700	12,288,800	
Scenario 2 – MVC Transit with Growth Choices Land Use with No Roadway Alternatives						
Non-motorized	45,600	23,900	745,900	209,500	1,024,900	
Auto	1,523,800	138,700	5,633,600	3,695,600	10,991,700	–0.1%
Transit	126,500	29,800	65,600	38,700	260,600	2.4%
Total	1,695,900	192,400	6,445,100	3,943,800	12,277,200	
Scenario 3 – MVC Transit with Growth Choices Land Use with MVC Roadway Alternative Non-tolled						
Non-motorized	45,400	23,800	731,500	206,600	1,007,300	
Auto	1,525,200	139,200	5,646,700	3,698,200	11,009,300	0.0%
Transit	125,300	29,400	66,800	39,000	260,500	2.3%
Total	1,695,900	192,400	6,445,000	3,943,800	12,277,100	
Scenario 4 – MVC Transit with Growth Choices Land Use with MVC Roadway Alternative with Tolling Option						
Non-motorized	45,300	23,900	740,800	208,800	1,018,800	
Auto	1,525,700	138,900	5,638,700	3,696,500	10,999,800	–0.1%
Transit	124,900	29,700	65,600	38,500	258,700	1.6%
Total	1,695,900	192,500	6,445,100	3,943,800	12,277,300	
Scenario 5 – MVC Transit with Compact Growth Land Use with No Roadway Alternatives						
Non-motorized	46,400	23,900	753,700	211,900	1,035,900	
Auto	1,507,000	138,400	5,620,900	3,687,300	10,953,600	–0.5%
Transit	139,700	30,100	72,200	41,500	283,500	11.4%
Total	1,693,100	192,400	6,446,800	3,940,700	12,273,000	
Scenario 6 – MVC Transit with Compact Growth Land Use with MVC Roadway Alternative Non-tolled						
Non-Motorized	46,300	23,900	738,400	208,600	1,017,200	
Auto	1,509,200	138,500	5,634,600	3,690,100	10,972,400	–0.3%
Transit	137,600	30,000	73,900	41,900	283,400	11.3%
Total	1,693,100	192,400	6,446,900	3,940,600	12,273,000	
Scenario 7 – MVC Transit with Compact Growth Land Use with MVC Roadway Alternative with Tolling Option						
Non-motorized	46,200	23,900	748,100	210,900	1,029,100	
Auto	1,509,600	138,500	5,626,500	3,688,600	10,963,200	–0.4%
Transit	137,300	30,100	72,300	41,300	281,000	10.4%
Total	1,693,100	192,500	6,446,900	3,940,800	12,273,300	

The table shows daily regional trips within the WFRC and MAG planning area.

Shaded cells highlight the expected auto and transit trips under the various sequencing scenarios. The shaded percentages indicate the percent change in auto and transit trips compared to the No-Action scenario.

Table 29.2-6 below provides the results for the number of transit trips, transit boardings, transit share, roadway VMT, and delay results in the MVC study area. This table shows that the most important factor in determining transit use is land use, not whether the MVC freeway (either tolled or non-tolled) is built first. This is demonstrated by the lower transit use in Scenarios 2, 3, and 4 compared to Scenarios 5, 6, and 7, all of which include a compact growth pattern with associated transit-oriented development concentrated along 5600 West.

With implementation of either the Growth Choices land use or a more compact development land use along 5600 West, there would be a substantial increase in daily transit trips compared to a scenario in which no transit line is constructed (an increase of between 15% and 67%). However, the transit-only scenarios resulted in substantially greater roadway delay (about 65% for the non-tolled roadway and about 25% for the tolled roadway) compared to the scenarios in which the roadway and transit were operating at the same time in 2030.

Table 29.2-6. 2030 Sequencing Scenario Transit Trips, Transit Boardings, Transit Share, VMT, and Delay Results in the MVC Study Area

Evaluation Method	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7
2030 daily transit trips[a]	38,300	46,000	45,600	44,000	64,100	62,800	60,900
2030 daily transit boardings	980[b]	16,940[c]	16,710[c]	15,790[c]	33,890[c]	32,370[c]	31,170[c]
2030 peak-period transit share[a]	2.01%	2.66%	2.53%	2.50%	3.70%	3.44%	3.44%
2030 peak-hour transit share[a]	2.73%	3.61%	3.43%	3.39%	5.02%	4.66%	4.66%
2030 daily highway VMT in the MVC study area	13,820,000	13,780,000	16,366,000	15,025,000	13,439,000	16,007,000	14,696,000
2030 daily highway system hours of delay in the MVC study area	82,200	76,300	46,900	57,700	82,200	49,100	62,300

[a] Transit trips with one or both ends in the MVC study area

[b] 5600 West bus route

[c] 5600 West Transit Alternative with Dedicated Right-of-Way Transit Option

29.3 Conclusion

For the sequencing analysis, both qualitative and quantitative analyses were conducted. The qualitative analysis concluded that that the municipalities and developers felt that land-use decisions in general were not based on the timing of the MVC alternatives but instead were based on previously adopted land-use plans, political agendas, and the housing markets. Most of the municipal representatives interviewed stated that, if the transit alternative is constructed first, their municipality is likely to change the land uses around the transit line to commercial or industrial or higher-density residential (to increase transit ridership).

However, the representatives did not expect land uses to be changed throughout their entire municipality. In other words, if municipalities increase densities around the transit alternative and the transit-oriented development land uses are allowed to establish without competition from the MVC freeway alternative, the developable areas located away from the transit line will continue to develop as currently planned to support the anticipated growth in the area.

The quantitative analysis evaluated five sequencing scenarios for the MVC project in 2015 and seven sequencing scenarios for 2030, including the compact-growth scenario that the local governments considered and decided not to adopt during the Growth Choices process. This analysis demonstrated that there was little difference in regional daily transit use whether transit operated without an MVC roadway or whether transit operated with an MVC roadway in place in 2015 or in 2030. In most cases, there was little difference in daily transit trips between the transit-only scenarios and the scenarios in which transit operated with an MVC roadway. The transit-only scenarios resulted in substantially greater roadway delay compared to the roadway and transit operating at the same time in 2015 and in 2030 and therefore would not meet the MVC project purpose of improving regional mobility by reducing roadway congestion.

The greatest factor that affected transit use was land-use densities, not whether the MVC freeway was operating with transit in 2015 or in 2030. As demonstrated by 2015 Scenario 2, when there was no transit-oriented land use concentrated along 5600 West, the amount of transit use was the lowest compared to the other 2015 action scenarios. In the 2030 scenarios, the transit use was also the highest when there was more compact land use along 5600 West. In summary, there would be little effect on transit use if the MVC freeway was operating at the same time as transit in 2015 or in 2030, but there would be a substantially greater amount of hours of highway system delay if transit is implemented without the MVC freeway.

29.4 References

Parsons Brinckerhoff

2005a Summaries of Municipal Interviews with Salt Lake County and Utah County Jurisdictions for Use in Secondary Land Use Impacts Analysis. February.

2005b Summaries of Developer Interviews for Use in Secondary Land Use Impacts Analysis. March.

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