North Lakeshore
Area Study

North Lakeshore Area Study
Utah County, Utah
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Mountainland Association of Governments

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1.0 Introduction

The Mountainland Association of Governments (MAG), in conjunction with the Utah Department of Transportation (UDOT), has initiated a study to better understand transportation solutions for the region of northern Utah County, an area which is experiencing rapid population growth but has limited transportation corridors. This study, known as the North Lakeshore Area Study, seeks to identify potential regional transportation solutions and other improvements while taking into account the collective values of area communities. To complete the North Lakeshore Area Study, MAG has partnered with UDOT, and the Utah Transit Authority (UTA).

MAG's goal for the North Lakeshore Area Study is to work with local stakeholders to identify a suite of possible transportation solutions with the potential to address urgent transportation issues in the region, including changes to land use, additional transit options, and traditional highway facilities. The purpose of this report is to describe the process used to identify and evaluate these options to connect the communities in the northern portion of Utah County.

This study utilized the Solutions Development Process which is a planning level effort that takes into account public and stakeholder input at a number of key milestones (Figure 1). The Solutions Development Process is based on a foundation in which the goals and objectives of the transportation study are based on the community values and context. This results in a variety of broad-based solutions, some of which may not be transportation projects. Information developed during the Solutions Development process relating to goals, needs, and potential alternatives may be carried forward into the environmental phase of project development. The Solutions Development Process may also identify meaningful mitigation opportunities.

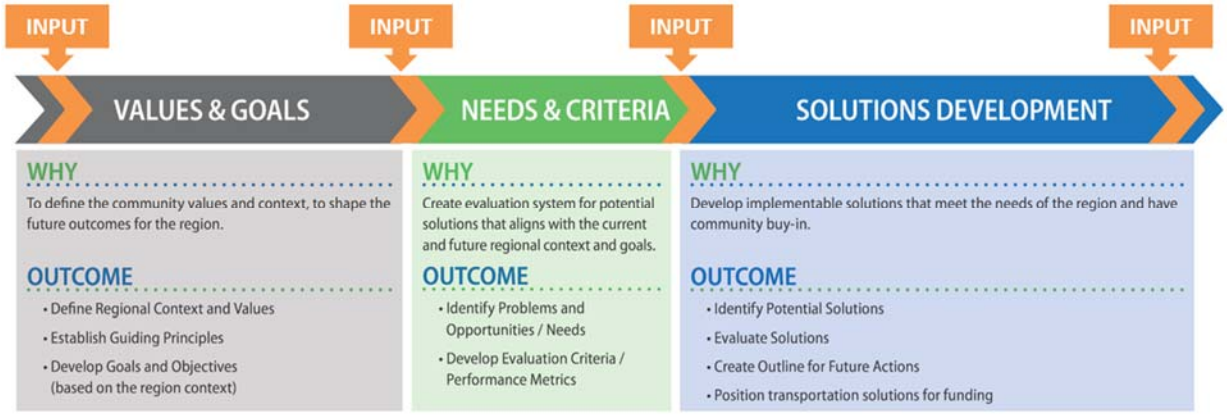


Figure 1. Solutions Development Process

1.1 Public Involvement—Identifying Values and Goals

At the beginning of the study, the public, business community, and civic and elected officials were asked what they valued about the region, what aspects of the region they wished to preserve, and what their vision was for the future of the region, including and beyond transportation. This feedback helped to identify important characteristics of the region and how they fit together. It also enabled the study to evaluate transportation solutions to support the future vision of the residents and stakeholders. Thus, community values are the foundation upon which the North Lake Shore Area Plan was developed. An understanding of what is most important to area residents and stakeholders will allow those values to guide and shape future plans.

The values identified as important by a community survey and vision summit held in the fall of 2019 are presented in Figure 2. Additional results are presented in Appendix A: North Lakeshore Community Values. More than 7,000 survey responses were received during the early phases of the study. From this input, broad themes emerged, which are shown in Figure 2. The size of each circle in the diagram represents the number of times each value was mentioned in the responses received during the 2019 survey and vision summit.

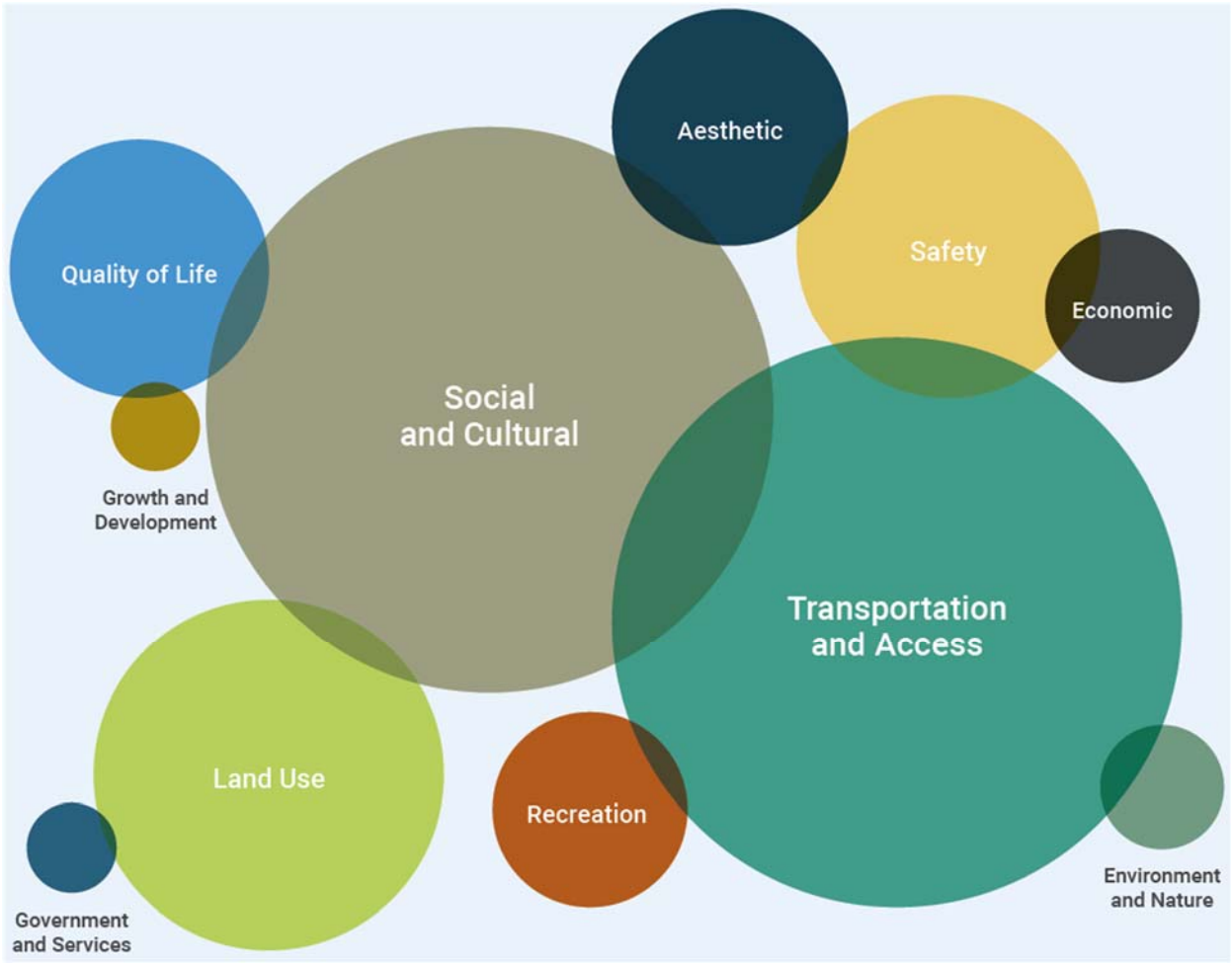


Figure 2. Community Values Identified Through Stakeholder Engagement. Larger Circles Represent Vales Identified Most Often.

Next, the comments received and values identified through stakeholder engagement were used to develop five Guiding Principles, each of which is supported by goals and objectives (Figure 3). These Guiding Principles were used as indicators (also known as performance measures) to evaluate and compare transportation scenarios developed during later stages of the project.

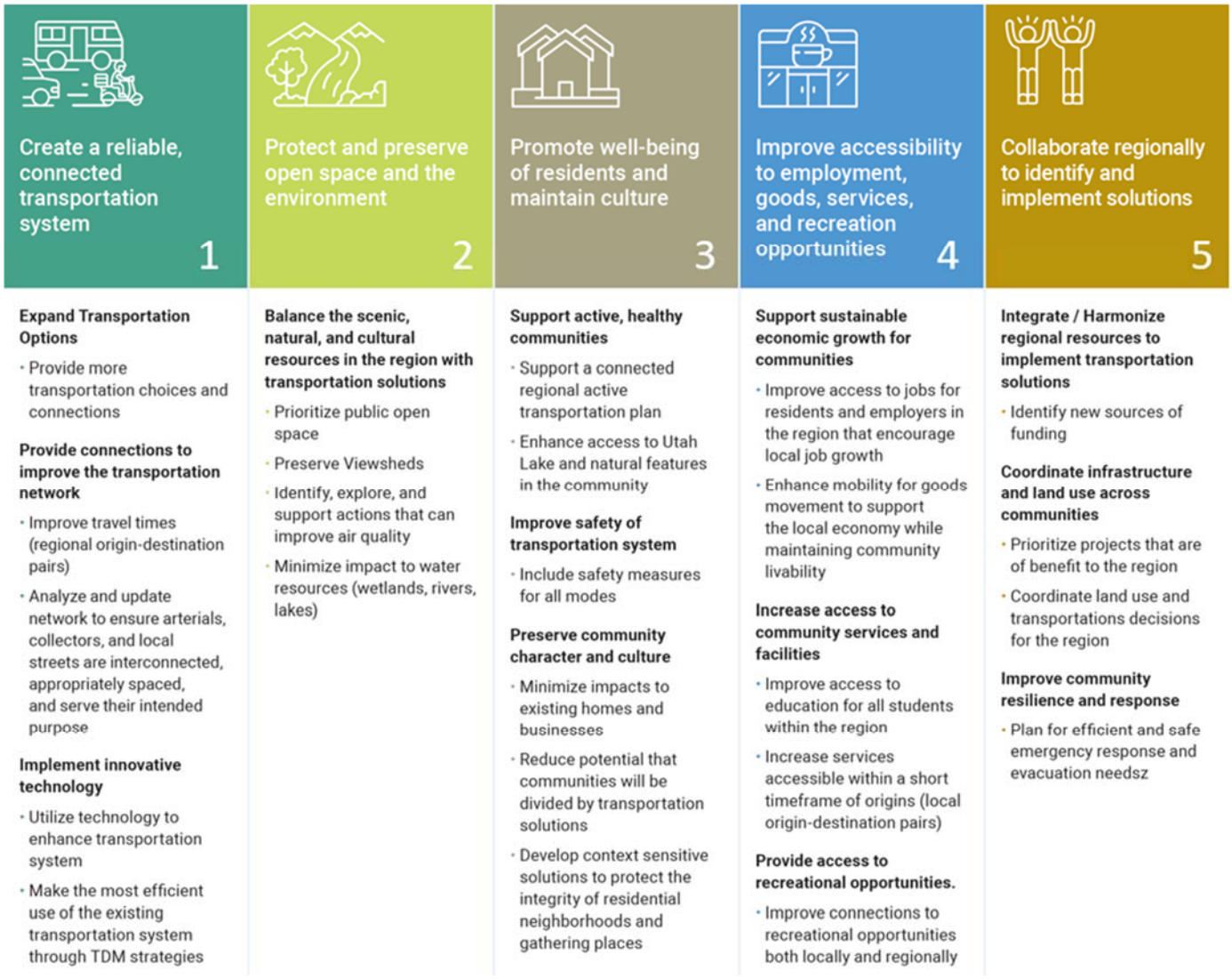


Figure 3. Five Guiding Principles and Supporting Goals and Objectives Used as indicators to evaluate transportation scenarios.

2.0 Needs and Considerations

With the Guiding Principles established, along with their supporting goals and objectives, the next step in the process was to clearly understand how to achieve the desired regional transportation objectives. Based on analysis of the initial stakeholder engagement, a list was compiled of needs and considerations that the study should address (Figure 4). This list was then used to formulate potential transportation solutions for the region.

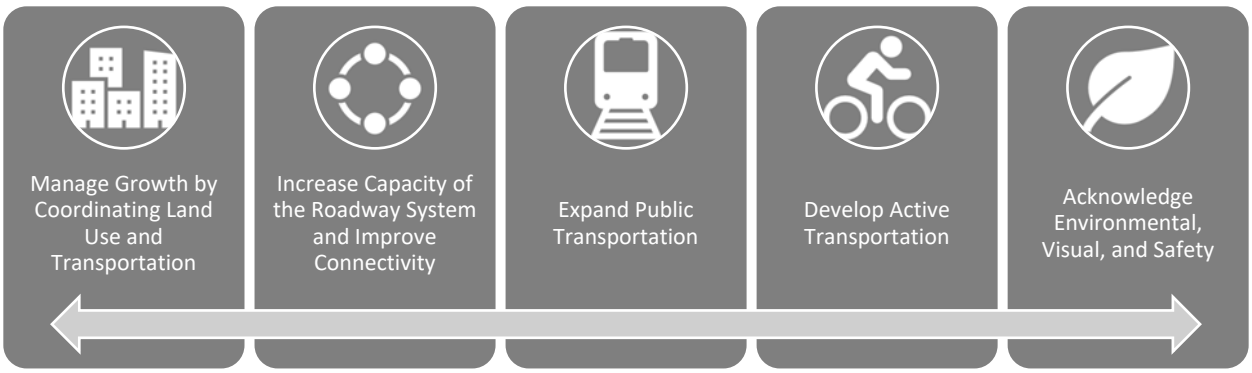


Figure 4. Needs identified.

2.1 Coordinate Land Use and Transportation

Consideration 1—Growth Management

Utah County is a beautiful area, and many of those who live there want to stay. Two-thirds of Utah County's projected growth consists of children, grandchildren, and great-grandchildren. By 2050, Utah County is projected to double in population to 1.3 million people. By 2050, Utah County will add more residents than the other three Wasatch Front urban counties combined (i.e., Davis, Salt Lake, and Weber). This projected growth makes it extremely important to get the transportation planning right.

Consideration 2—Regional Land Use Planning

Creating a close relationship between land use and transportation can result in the outcomes that communities wish to achieve. It is important to develop a cohesive region, where regional transportation connections generally follow the established land use and transportation patterns. Coordinating major assets within an area—such as office centers, health care centers, industrial areas, community centers, and recreation facilities—help to cultivate a region that is thriving, healthy, and safe. Locating dense residential, commercial, and office developments near major transportation corridors, especially public transit, can allow these systems to more efficiently move people and goods.

Consideration 3—Create Centers of Development

The concept of centers development involves the clustering of housing, businesses, and amenities close to one another, thereby creating vibrant community meeting places and strong economic centers. Benefits associated with centers development include the following:

- **Transportation Choice**. Centers development provides real options to get around and increase access to easily reached destinations. To make walking, biking, and public transit attractive and effective, jobs, housing, and amenities must be clustered.
- **Housing Options**. Centers development provides a variety of affordable, low- and high-density housing options.
- **Preservation of Open Space**. Centers development allows certain areas to be left open, which makes communities more appealing, and open areas provide recreational opportunities.
- **Economy, Transportation, and Housing**. Centers development allows synergy between these three key building blocks, which means shorter travel times; less-expensive travel; efficient utilization of infrastructure; and better, more-affordable housing options.

2.2 Increase Capacity of Roadway System and Improve Connectivity

Consideration 1—Understanding Travel Patterns

Clearly understanding how residents travel in and throughout a region is critical to the task of designing that region's transportation system. That is, knowing how the residents and workers travel to and from of the region helps to determine the types of roadways and transit services the residents need. Most trips in northern Utah County are trips within specific areas versus traveling through areas (Figure 5).

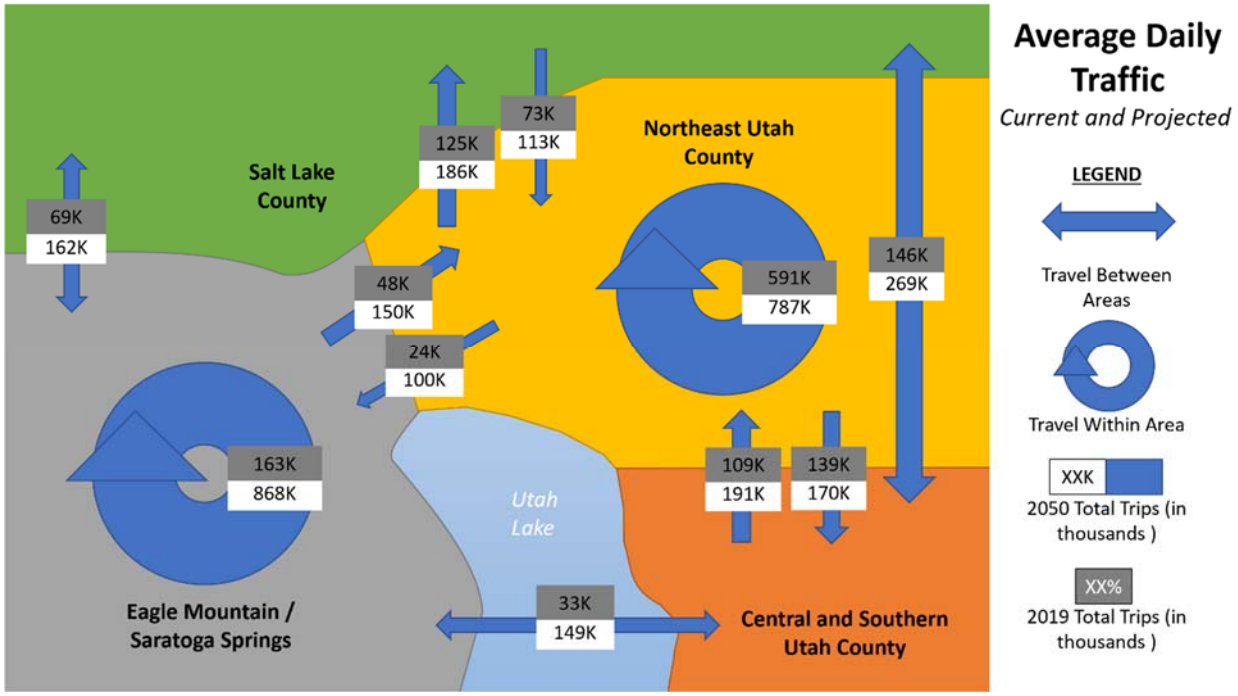


Figure 5 Current (2019) and Future (2050) Travel Patterns.

Consideration 2—Multiple Connected Roadway Types Facilitates Better Traffic Movement

A combination of connected freeways, regional roadways (arterials), and local collector streets is needed to disperse vehicle traffic and furnish access to all areas. It is important to provide connections within the system and between modes of travel to move residents to and from and throughout the region. Without sufficient connections, movement by drivers, pedestrians, and transit will be limited and inefficient.

Consideration 3—Larger Highway Facilities Helps Address the Regional Travel Demand

Many public comments mentioned the need for higher-speed roadways in the area near Pioneer Crossing and the need for a connection further south across Utah Lake. Future growth modeling supports these comments and shows that an increase in freeway traffic volume is anticipated in the south Lehi area and in crossing Utah Lake into the Provo/Orem area. Pioneer Crossing is already rivaling other major Utah limited-access facilities in traffic volume, and at present the observed speeds are similar to US Interstate 15 (I-15). However, major highways also create challenging issues. They require more area, can divide neighborhoods, and are generally not accommodating to pedestrian or bicycle commuters. It is important to plan in advance for these types of facilities so that communities can incorporate them into their future plans and also avoid as much disruption as possible. Many of these existing facilities could be improved over today's conditions by reducing the number of movements at

existing at-grade intersections with grade separation allowing more green time to traverse these areas. There is also the possibility of adding grade separation crossings that have no interplay with the major highway resulting in better active transportation and access for the public and emergency services.

Consideration 4—Manage Travel Demand
To address challenges created by the regional growth, UDOT has developed a series of strategies to help decrease vehicle congestion by reducing single-occupancy vehicle trips. The strategies include the use of public transit, carpooling, working from home, active transportation, and trip chaining to group multiple stops into a single trip. Transportation system users are encouraged to incorporate these strategies into their daily transportation routines to help decrease the need for additional and costly highway capacity. Development may continue to outpace transportation capacity improvements, and strategies such as these can aid in the development of satisfactory transportation solutions.

2.3 Expand Public Transit

Expanded public-transit service was identified among the needs of the North Lakeshore area. There are a number of possible locations for public transit in the study area where it might be expanded. Public transportation in northern Utah County is currently limited to the FrontRunner commuter rail, which parallels I-15 from Lehi to Provo, although efforts are underway to expand transit through studies such as Point of the Mountain, Central Corridor, and the Eagle Mountain/Saratoga Springs Transit Study. The study area also has limited regional bus service, especially between Eagle Mountain and American Fork. To support regional public transit, additional local services are also needed; improvements to local connections may include local collector busses, vanpools, flex routes, dial-a-ride service, bike sharing, and ride sharing.

Consideration 1—Understanding Regional Transit Needs
Clearly understanding the travel needs and patterns of those who live and work in the region is critical to developing public transit that the public considers viable and appealing. Examining travel to and from the region helps to identify the types of service that will encourage the use of public transit. Additionally, a strong public transit system brings workers and visitors to the community to support local spending, rather than having those visitors spending their dollars in areas that are easier to access. It is important that land use plans within a region align with an understanding of how public transit services will address the movement of people throughout the study area.

Consideration 2—Connecting Local Transit Plans to Land Use and to the Regional Service
A solid public transit system should utilize local transit systems to furnish connections between both major and minor transit nodes. In other words, local transit systems should provide ample local connections and connections to regional transit systems. To better understand where people are most likely to use public transit, land use and traffic patterns must be examined from a regional perspective. The denser the population around a transit system, the better that transit system moves people. Developments that incorporate mixed-use, Transit Oriented Design (TOD), and those placed near higher-density housing areas, take into account transit, multi-modal connectivity, and ease of use.

2.4 Develop Active Transportation

Residents of northern Utah County place a high value on existing places to walk, run, and ride to fulfill their recreation, fitness, and transport needs. There is a strong desire among these residents to continue adding to the current network with additional facilities and providing active transportation connectivity as growth and development occurs.

Consideration 1—Working Together to Create Regional Access
Well-connected, active transportation facilities promote livability, community satisfaction, and a healthy population. Connectivity of trails promotes use as part of the multimodal transportation network, which (when strategically planned) benefits an entire region. Enhancement of regional trail networks allows municipalities to tie to a backbone trail system. Regional coordination of the network is essential as development occurs; with a clear understanding of the connections between communities, local governments have a much easier time creating a closely connected environment that serves the entire region.

Consideration 2—Consistently Evaluate Active Transportation Projects
The communities within the region have active transportation plans. If these active transportation plans align with other transportation improvements, alternative modes of travel will be encouraged. The active transportation network should work in concert with all types of road facilities and allow for easy access to public transit. For example, incorporating public transit plans and major destinations in an active transportation plan allows for first-mile and last-mile planning. In other words, active transportation planning creates opportunities for people to leave their vehicles at home, and instead walk or bike to a nearby destination or public transit stop.

2.5 Acknowledge Environmental, Visual, and Safety

Consideration 1—Scenic Vistas and Environmental Factors
During stakeholder engagement, the natural beauty and viewsheds of the region were noted as one of the most critical values. Some comments included suggestions that Utah Lake could be a more-valuable recreational asset if it were cleaned up, and if access to the lake and its natural beauty were improved. Survey results indicate wetlands, waterbodies, and water corridors found throughout the region and should be maintained to the extent practical.

Consideration 2—Safety
Safety is considered in all aspects of transportation improvement and throughout all processes. However, safety is sometimes difficult to evaluate because it is often subjective and often expressed in terms of personal feelings. Safety includes subjective ideas about comfort, individual experiences, and personal preferences. From a transportation perspective, safety also includes how safe a transportation facility is. Safety can be improved by limiting the number of accesses, such as on an access-controlled freeway, or limiting driveway accesses as a way to limit potential sources of vehicle conflict. Increased access control is necessary with increased volume and speed—impacts to businesses can be reduced with planned development that does not require later modification to access. All modes of transportation must be examined often and in combination to create safe environments. This may include greater separation of pedestrian and bicycle avenues from roads that carry greater traffic volumes. It is important to match safety measures to transportation modes and road types.

3.0 Solutions Development - Scenarios and Screening Process

Stakeholder workshops were held in summer 2020 to identify ideas and opportunities to meet the identified transportation needs. These ideas were combined into scenarios by the project team. Ideas and scenarios ranged from changing land use and density to increasing travel-demand management to building and expanding many transit and highway facilities.

The project team developed screening criteria to evaluate scenarios for meeting the objectives of the project. The team developed screening criteria in the following areas: (1) improving/maintaining transportation system reliability; (2) protecting open space and the environment; (3) promoting the wellbeing of residents; (4) improving access to employment, goods services, and recreation opportunities; and (5) regional collaboration. These areas align with the five Guiding Principles (Figure 3) which were developed through the 2019 stakeholder engagement and used as the foundation of the evaluation criteria.

As described in detail in Appendix B North Lakeshore Study Travel Modeling Analysis Memo, a Level 1 screening (initial screening) determined whether the scenarios had any fatal flaw or whether they did not meet the needs of the project. The scenarios that had a fatal flaw or did not meet the needs were dismissed from further consideration. The Level 1 evaluation criteria were associated with transportation system reliability reflecting the primary transportation need, which measures transportation reliability using "measures of effectiveness" (MOE). The MOEs used for this study were vehicle delay, total daily traffic volumes and volume-to-capacity (v/c) ratios, travel times between select locations, transit mode share, and transit boardings. The travel model output of select scenarios described in Appendix B is shown in Appendix C North Lakeshore Study Scenario Travel Model Output. Active Transportation was not specifically used as a screening consideration because all scenarios incorporated similar Active Transportation facilities.

Level 2 screening of the remaining scenarios used additional indicators to evaluate them compared with the Guiding Principles. These indicators were either qualitative or quantitative assessments, depending on the criteria and the availability of data at this stage of project development. The project team concentrated on indicators based on the amount of detail needed to make decisions about the scenarios at each level of screening.

3.1 Level 1 Screening Results

Stakeholder meetings identified the following three primary scenarios to be considered for analysis: (1) increase transit opportunities and connections, (2) increase capacity of Pioneer Crossing, and (3) increase capacity of Pony Express. Scenario development provided for multiple alternatives to each scenario as well as combinations of scenarios. A total of 18 scenarios were evaluated during the Level 1 screening.

All scenarios were assumed to include the transportation projects listed below that are already identified as assumptions in the local master transportation plans (MTPs) of cities in the region.

- **2100 North Freeway.** The local MTP network assumes that the 2100 North Freeway will be completed in addition to the existing frontage roads, as previously identified through the Mountain View Corridor Environmental Impact Statement (September 2008).
- **Mountain View Freeway.** The local MTP network assumes that Mountain View Freeway will be constructed as previously identified through an EIS.
- **State Route 73 (SR-73) Freeway.** The local MTP network assumes that the SR-73 Freeway will be constructed between Eagle Mountain and Saratoga Springs as documented in the S.R. 73 State Environmental Study (December 2018).
- **Foothill Boulevard Freeway**. The local MTP network assumes that the Foothill Boulevard Freeway will be constructed. The Utah State Legislature funded an Environmental Study for this project in the winter of 2021.

- **Local bus system expansion.** The local MTP network assumes expansion of the local bus system as developed in the MAG Regional Transportation Plan.
- **MTP compilation.** The local MTP network assumes the underlying road and highway grid is the compilation of all local MTPs.
- **Active Transportation.** The RTP and City Active Transportation Plans are a component to every scenario.

Many scenarios (but not all) provide for the construction of a bridge across Utah Lake from Saratoga Springs to Provo/Orem which is listed as a Phase III project in the MAG Regional Transportation Plan. The Utah Lake Bridge would add to the freeway grid system, spreading traffic throughout the region. However, even with a bridge, high-volume traffic demand remains in the south Lehi area.

3.1.1 Scenario 1—Travel Demand Management and Transit

Through stakeholder input, eight scenarios were developed to analyze the effectiveness of higher densities of housing and employment, increased working from home through a 20% reduction in work trips, and establishment of several high-frequency and high-capacity transit lines connecting the region to Provo and Salt Lake County. Transit scenarios (Figure 6) include various combinations of the following three transit lines:

- **Red Line Extension.** A light rail extension of the existing Red Line from Daybreak in South Jordan through Saratoga Springs along the Mountain View Corridor/Foothill Boulevard Freeway and into Provo via the Utah Lake Bridge to the FrontRunner station.
- **Lehi to Eagle Mountain.** A light rail line or bus rapid transit (BRT) line that would run between the Lehi FrontRunner Station in Thanksgiving Point and Eagle Mountain.
- **State Street BRT Extension.** A BRT extension of the planned State Street BRT line from its planned terminus at the American Fork FrontRunner Station through Lehi and Saratoga Springs and into Eagle Mountain.

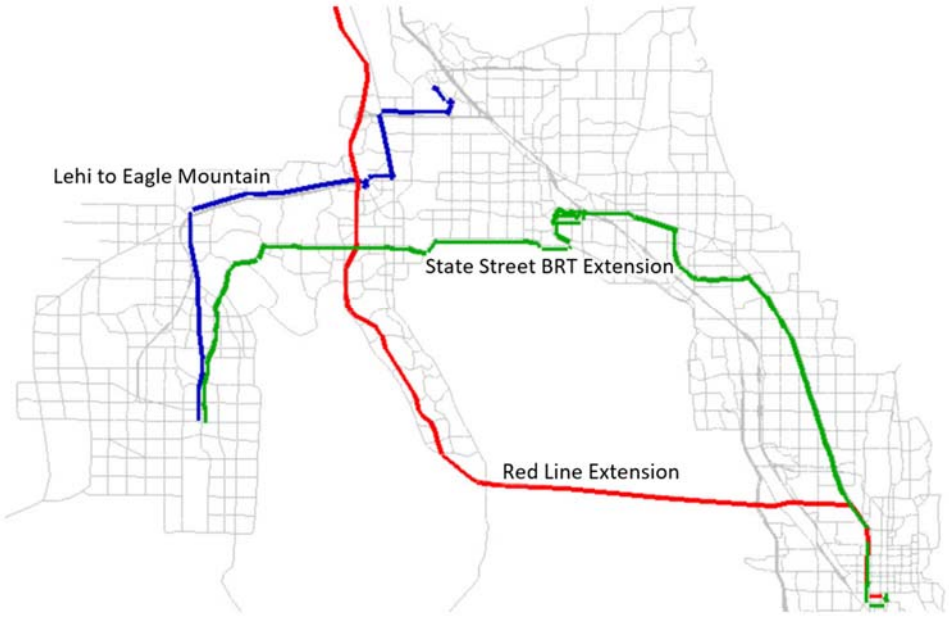


Figure 6. High-capacity transit options analyzed for Scenario 1.

Detailed results for Level 1 screening of Scenario 1 options can be found in Appendix B: North Lakeshore Study Travel Modeling Analysis Memo.

The work from home scenarios were eliminated from further analysis. While the scenarios performed well from a traffic standpoint, the goal of increasing work from home to 20% is aspirational and would likely be difficult to achieve. Data from 2019 show the Wasatch Front averages a rate of 7 percent work-at-home, while the national average is only 3 percent. Therefore, they were determined to be infeasible stand-alone scenarios.

Based on the travel demand analysis, high-frequency transit, which is only possible with much higher housing density than currently found in the area, will not be practical before 2050. An increase to land use at station locations in order to facilitate transit were considered, but the overall lower densities that currently exist in developed areas did not support high frequency transit. Instead, *core bus and local transit should be implemented according to the MAG Regional Transportation Plan, with a transition to high-frequency transit after 2050.* All Scenario 1 high-capacity transit options were eliminated from further analysis based on this screening step.

Several non-transportation solutions from these scenarios should be carried forward by the cities participating in this study to support future transit. These include (1) *planning for transit-supportive land uses* (e.g., cluster and mixed-use developments, which help to connect people to services) and (2) *minimizing regional trips*. Parking supply should be managed to reduce large parking lots because they discourage walking and transit trips. Finally, local opportunities for shopping, health care, recreation, and employment should be provided locally to minimize the need to travel out of the local area.

3.1.2 Scenario 2—Pioneer Crossing Freeway

Six scenarios included options for transitioning Pioneer Crossing to a freeway system that connects to the Mountain View Freeway system in the west and various roadway connections and configurations in the east. Assumptions on connecting Vineyard Connector to Pony Express as a four-lane arterial are also evaluated. These scenarios also include a bridge across Utah Lake to the Provo/Orem area and the incorporation of a major transit option that includes Eagle Mountain to the American Fork Frontrunner Station. Though transit was modeled with this scenario, it does not carry sufficient ridership. Detailed results for Level 1 screening of Scenario 2 options can be found in Appendix B: North Lakeshore Study Travel Modeling Analysis Memo.

Scenario 2.3, (Figure 7) Pioneer Crossing Freeway, performed the best at moving traffic due to its central location. Connections to Mountain View Corridor and I-15 had multiple options. And tying into Vineyard Connector as a freeway reduced I-15 congestion by providing a parallel facility. This option was carried forward to Level 2 analysis.

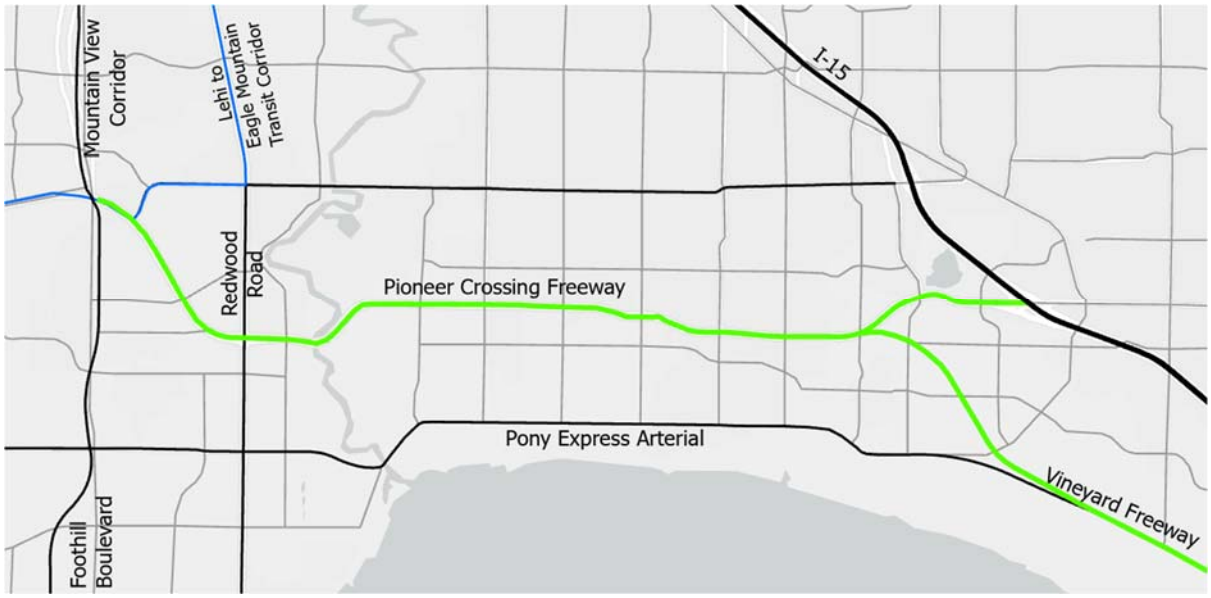


Figure 7. Scenario Option 2.3 Pioneer Crossing Freeway and Supporting Roadway Network.

3.1.3 Scenario 3—Pony Express Freeway

Five scenarios were created with Pony Express developed as a freeway from the Vineyard Connector/I-15 to the Mountain View Corridor. Variations of the scenario included Vineyard Connector as an arterial or freeway, which also connects as an arterial to Pioneer Crossing. Placement of scenarios varied, from alignments across Utah Lake to development in its current location. All scenarios included the widening of Pioneer Crossing to a six-lane arterial and a transit line from Eagle Mountain to American Fork Front Runner Station along Pony Express Corridor. Detailed results for Level 1 screening of Scenario 3 options can be found in Appendix B: North Lakeshore Study Travel Modeling Analysis Memo.

The Pony Express Freeway (Figure 8) alternatives scenarios that create an additional major corridor in the area less than a mile south of Pioneer Crossing performed nearly as well in the Level 1 traffic analysis as the Pioneer Crossing scenario based on overall regional traffic congestion. However, only one Pony Express option was carried forward for further evaluation in Level 2 analysis while the others were not carried forward because other options carried less traffic than other Pony Express options since they lacked connectivity to the arterial and collector roadway network.

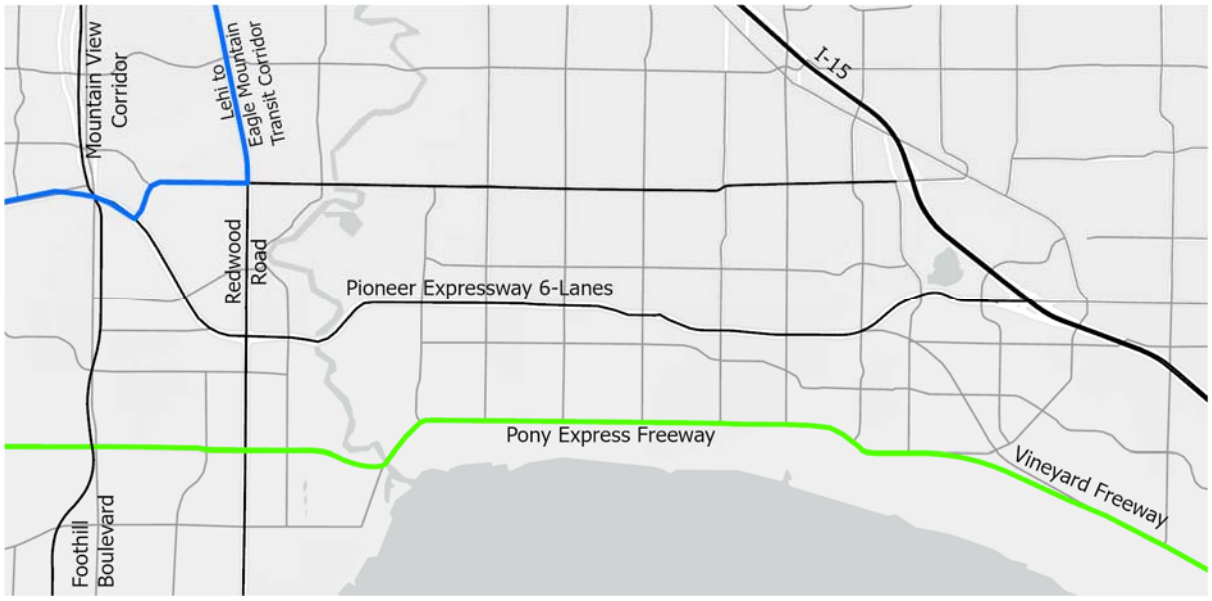


Figure 8. Scenario Option 3.4, Pony Express Freeway and supporting Roadway Network.

3.1.4 Level 1 Screening Results

Level 1 evaluated the performance of each scenario using MOE factors comprised of daily study area vehicle delay, total daily traffic volumes and volume-to-capacity (v/c) ratios, evening travel times between select locations, transit mode share, and transit boardings. The following table presents the MOE factors for the top-performing option for each scenario from the North Lakeshore Study Travel Modeling Analysis Memo (Appendix B). Note that only Scenario 2.3 (Pioneer Crossing Freeway) and Scenario 3.4 (Pony Express Freeway) were carried forward for level 2 Screening. The local Master Transportation Plan represents a No Action comparison and the high-capacity transit scenario was deemed infeasible until after the year 2050 when land use densities increase to a level necessary to support transit.

Measure of Effectiveness Factors	Local Master Transportation Plan with Lake Bridge	Scenario 1.2 Travel Demand Management (Work from Home)	Scenario 2.3 Pioneer Crossing Freeway	Scenario 3.4 Pony Express Freeway
Study Area Delay (hours)	88,800	32,500	32,300	32,500
Total Daily Volume	398,365	379,257	399,527	400,556
Average PM v/c ratio	0.84	0.76	0.67	0.63
PM Travel Times	202	186	171	180
Transit Share (% work trips)	2.67	2.94	2.69	2.69
Total Transit Boarding	29,765	30,810	29,380	29,170

3.2 Level 2 Screening

Level 2 screening provided additional analysis of the scenarios carried forward from the Level 1 screening process. Level 2 analysis compared scenarios 2.3 and 3.4 (Figure 9) with the metrics supporting the five Guiding Principles identified during the initial stakeholder engagement.

Scenario 2.3 develops Pioneer Crossing into an eight-lane freeway between an interchange with Mountain View Corridor and I-15. Pony Express is developed as a four-lane arterial and a new major transit line connects Eagle Mountain to the American Fork Frontrunner station. In scenario 2.3, other local MTP area projects, including the 2100 North Freeway, Foothill Boulevard Freeway, and SR-73 Freeway are also assumed to be completed.

Scenario 3.4 creates a new freeway generally along the Pony Express Parkway corridor from Saratoga Springs through Lehi and connecting to Vineyard Connector in American Fork. Pioneer Crossing is increased to a six-lane arterial road and a new major transit line connects Eagle Mountain to American Fork Frontrunner station. In scenario 3.4, other local MTP area projects, including the 2100 North Freeway, Mountain View Corridor, Foothill Boulevard Freeway, and SR-73 Freeway, are also assumed to be completed by 2050.

Solution Element	Scenario 2.3 Pioneer Crossing Freeway	Scenario 3.4 Pony Express Freeway
Travel Demand Management	No Change	No Change
Land Use	Regional Transportation Plan	Regional Transportation Plan
Transit Lines	State St. BRT Extension	State St. BRT Extension
Pioneer Crossing	Freeway to Vineyard	6-Lane Expressway
Pony Express Parkway	4- Lane Arterial end at Vineyard	Freeway to Vineyard
Vineyard Connector	Freeway	Freeway
Utah Lake Bridge to Provo/Orem	Bridge	Bridge

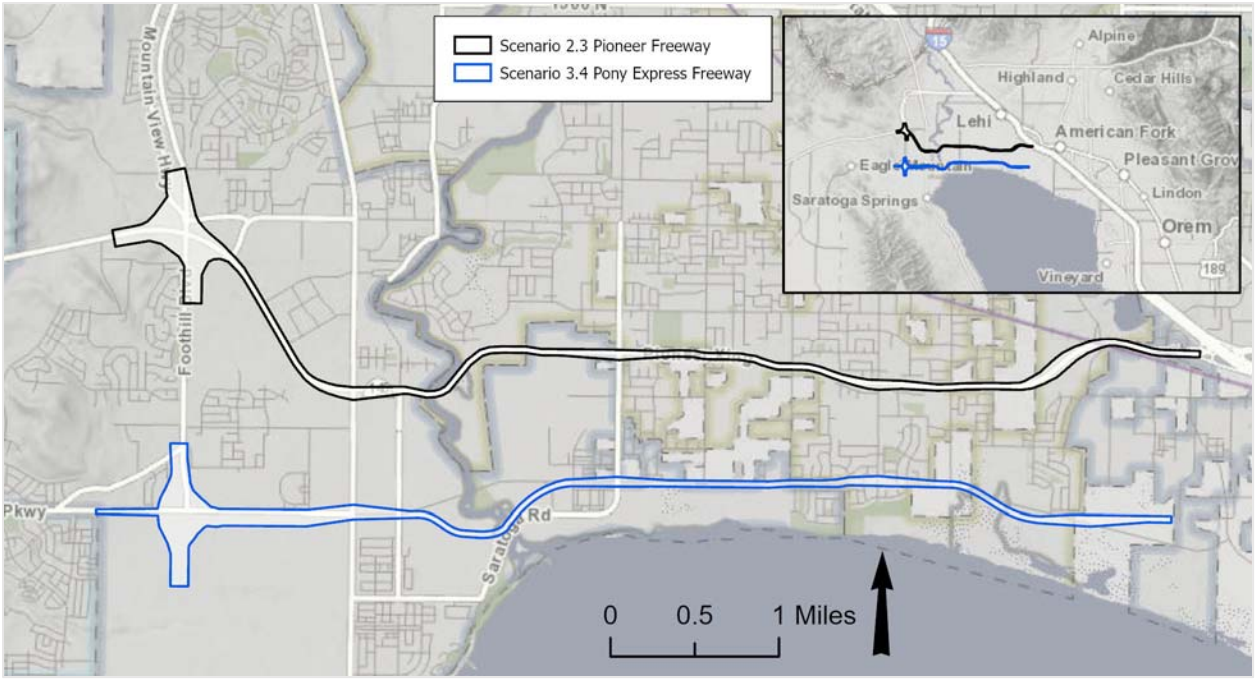


Figure 9. Approximate Roadway Alignment for Scenarios 2.3 and 3.4.

Comparative indictors were developed through stakeholder engagement to assess the ability of scenarios to support Guiding Principles 1 through 4. Four indicators assess the ability of each scenario to help create a reliable, connected transportation system (Principle 1) and to improve accessibility to employment, goods, services, and recreation opportunities (Principle 4). Scenario footprints generated based on estimated facility construction widths displayed in Figure 9 were used to assess the indicators, two of which are quantitative indictors and two are qualitative, as shown below:

- **Regional origin-destination pairs travel time.** This is a quantitative metric to determine how long it would take to get from either Eagle Mountain or Saratoga Springs to centers of regional significance, namely Thanksgiving Point, American Fork, and Provo. It is expressed as a ratio of peak travel time divided by free flow travel time. This was assessed in the travel-modeling analysis.
- **Overall regional delay from the travel model.** This is a quantitative measure of the sum of all the congestion in the study area, which was also assessed in the travel-modeling analysis.
- **Connectivity.** This is a qualitative assessment based on inclusion of grid component.
- **Single-occupancy vehicle trip reduction.** This is a qualitative assessment based on the components included in the scenario.

Principle 1: Create a reliable, connected transportation system			
Principle 4: Improve accessibility to employment, goods, services, and recreation opportunities			
Indicators	**Scenario 2.3 Pioneer Crossing Freeway**	**Scenario 3.4 Pony Express Freeway**	**Reference**
Regional origin-destination pairs travel time	Travel Time Index: 1.5	Travel Time Index: 1.5	Travel Modeling Analysis
Overall regional delay from the travel model	Daily study area delay hours: 31,800	Daily study area delay hours: 32,500	Travel Modeling Analysis
Connectivity (qualitative based on grid)	Options common to both scenarios	Options common to both scenarios	-
SOV trip reduction	No change	No change	-

Four indicators of Principle 2, protect and preserve open space and environment, were developed:

- **Open space.** Intersections of parks and other locally defined open space as quantified using land use data.
- **Visual.** Qualitatively assessed through a change in foreground visual setting in comparison to existing development, facilities, etc.
- **Air quality.** Change in vehicle miles traveled and daily study area delay.
- **Water resources.** Intersection area with open water, streams, canals, wetlands, and unique Peteeneet soil wetlands (high-functioning).

Principle 2: Protect and preserve open space and environment			
Indicators	**Scenario 2.3 Pioneer Crossing Freeway**	**Scenario 3.4 Pony Express Freeway**	**Reference**
Open Space	Parks: 0.0 acres Agriculture: ~80.0 acres Other Undeveloped: ~13 acres Total: 93 acres	Parks: 0.0 acres Agriculture: ~195 acres Other Undeveloped: ~44 acres Total: ~198 acres	Parks: AGRC Utah Parks Local Open Space: Utah Water Related Land Use, updated in 2019
Visual	Minor change in visual setting	Change in foreground visual setting for undeveloped land	Aerial Photography
Air Quality: Change in Vehicle Miles Traveled	14,130,000 miles	14,110,000 miles	Travel Modeling Analysis
Air Quality: Daily Study Area Delay	31,800 hours	32,500 hours	Travel Modeling Analysis
Water Resources	Wetlands: ~15–19 acres Peteeneet Soils: 0.0 acres Open Water: ~1-2 acres Stream: ~1,000 linear feet Canal: ~3,400 linear feet	Wetlands: ~23–29 acres Peteeneet Soils: ~4 acres Open Water: ~4 acres Stream: ~1,500 linear feet Canal: ~8,400 linear feet	See note for data sources.*

**Wetlands:* The boundaries of potential wetlands were digitized through desktop GIS using current and past aerial imagery and infrared aerial imagery, and cross-referenced with the U.S. Department of Agricultural Natural Resources Conservation Service Soil Survey data, the U.S. Fish and Wildlife Service National Wetlands Inventory data, available topographic data, the U.S. Geological Survey National Hydrography Dataset, and official aquatic resources delineations. *Peteeneet Soils:* Soil Survey Geographic Data Set (SSURGO), U.S. Department of Agriculture, 2020. *Open Water:* Related Land Use, Utah Department of Water Resources, 2019. *Stream/Canal:* National Hydrography Dataset, U.S. Geological Survey, 2020.

Principle 3, promote wellbeing of residents and maintain culture, was evaluated in terms of the following:

- **Active transportation.** The number of trail accesses added, trail miles added, and trail-park connections added; and the length of facilities consistent with the regional active transportation plan.
- **Recreation access.** Ability to provide access points to recreation.
- **Safety.** Ability to provide required protection levels for active transportation and transit, and appropriate cross sections and access control for roadways.
- **Community and land use.** Existing and planned residential and commercial property overlaps.

Principle 3: Promote well-being of residents and maintain culture			
Indicators	**Scenario 2.3 Pioneer Crossing Freeway**	**Scenario 3.4 Pony Express Freeway**	**Reference**
Active Transportation (AT)			
Trail Accesses Added	Options common to both scenarios	Options common to both scenarios	
Trail Miles Added	Options common to both scenarios	Options common to both scenarios	
Trail-Park Connections Added	Options common to both scenarios	Options common to both scenarios	
Length of AT Facilities Consistent with Plans	Options common to both scenarios	Options common to both scenarios	
Recreation access			
Ability to Provide Access Points	Options common to both scenarios	Options common to both scenarios	
Safety			
AT: Plan Consistency or Required Protection level	One major facility crossing	More division with two major facility crossings	
Roads: Appropriate Cross Section and Access Control	Options common to both scenarios	Options common to both scenarios	
Community and Land Use Impacts			
Existing residential overlaps *	Residential homes: ~31–39 Commercial structures: ~0–2	Residential homes: ~60–72 Commercial structures: ~3–5	AGRC Hexagon Imagery Fall 2019 and Utah County Tax Parcels (Feb. 2021) based on structure overlap
Planned land use overlaps	Mixed Use: ~65 acres Business Park: ~64 acres Commercial: ~84 acres Industrial: ~5 acres Open Space: ~23 acres Residential: ~84 acres	Mixed Use: ~144 acres Business Park: ~5 acres Commercial: ~3 acres Open Space: ~41 acres Public: ~11 acres Residential: ~106 acres Sensitive: ~0.2 acres	Combined land use/zoning from municipalities
Planned development overlaps*	Residential: ~142–173 parcels Commercial: ~30–37 parcels Industrial: ~2–4 parcels	Residential: ~204–247 parcels Commercial: ~1–3 parcels Industrial: 0 parcels	AGRC Hexagon Imagery Fall 2019 and Utah County Tax Parcels (Feb. 2021) based on any empty parcel intersection of more than 10 square-feet

*Spatial overlaps of alignment footprints with any resource, including structures or parcels, is preliminary and for comparison purposes only. A future environmental study would analyze actual impacts with the formal alignment footprint.

Level 2 analysis for the two scenarios revealed that both have several key benefits and challenges, which are outlined in the following tables.

Scenario 2.3—Pioneer Crossing Freeway

Key Benefits	Challenges
• Leverages the use of an already existing facility • Supports anticipated future growth • Access to further destinations through a direct route • Allows for proper spacing of regional facilities (5 miles) • Less potential for impact to open space • Less potential for water resource impacts • Less potential impacts to existing and planning residential development • Less potential impacts to *existing* commercial and industrial land uses and development • Best overall traffic performance	• Can be a barrier for pedestrians and may divide neighborhoods—need to address active transportation and connections along and across the corridor • Higher potential for impacts to *planned* commercial and industrial land uses and development

Scenario 3.4—Pony Express Freeway

Key Benefits	Challenges
• Supports anticipated future growth • Access to further destinations through a direct route (including additional direct access to the American Fork TOD) • Least congested between the two scenarios • Less potential for impacts to *planned* commercial and industrial land uses and development	• Proximity to Pioneer Crossing makes Pioneer Crossing obsolete • Higher potential for impact to open space • Higher potential for impacts to water resources, including wetlands contributing to higher function and value associated with unique Peteetneet soils that are very difficult to replace • Other corridor options will need to be exhausted first (other practicable options with fewer wetland impacts) in order for this option to be permitted by the US Army Corps of Engineers • Additional high-speed facility near Pioneer Crossing (less than 1 mile away), further divides neighborhoods • Higher potential for impacts to existing and planned residential development • Higher potential for impacts to *existing* commercial and industrial land uses and development

Scenario 2.3 has more benefits and less challenges than scenario 3.4 based on the evaluation related to the Guiding Principles.

4.0 Conclusions—Moving Forward

A key guiding principle that was identified by the participants in the study was to collaborate regionally to identify and implement solutions. Each of the organizations involved in this study have a responsibility in implementing these recommended components based on jurisdiction and authority with the opportunity to collaborate.

Freeway projects previously identified in the local Master Transportation Plans should be implemented because these projects are critical components of the region's future transportation system. They include:

- **2100 North Freeway,**
- **Mountain View Freeway,**
- **SR-73 Freeway, and**
- **Foothill Boulevard Freeway**.

In addition to these, scenario 2.3 **Pioneer Crossing Freeway** is recommended for implementation based on the Level 2 analysis.

Additional components of the regional transportation system that should also be implemented include the following:

- The **underlying highway grid** which is a compilation of all local transportation master plans.
- Expansion of the **local bus system** as developed in the MAG Regional Transportation Plan.
- **Utah Lake Bridge** from Saratoga Springs to Provo/Orem, although potential environmental impacts may require that other options are exhausted before the bridge may be considered.
- Expansion of the **active transportation networks** as identified in the local and regional transportation plans.

Travel-demand management strategies should be implemented. These strategies include the following:

- Plan for **transit supportive land uses (cluster and mixed-use developments)** to connect people to services and minimize regional trips.
- **Manage parking supply** (spread-out parking designs make walking and transit less appealing).
- Encourage **a strong regional behavior change program** to support trip reductions and encourage transit.
- **Provide needed and desired services, such as shopping, goods services, recreation, and employment within the local area** to minimize trips out of the region.
- Develop a **regional bus system with grid connectivity**.

Appendix A

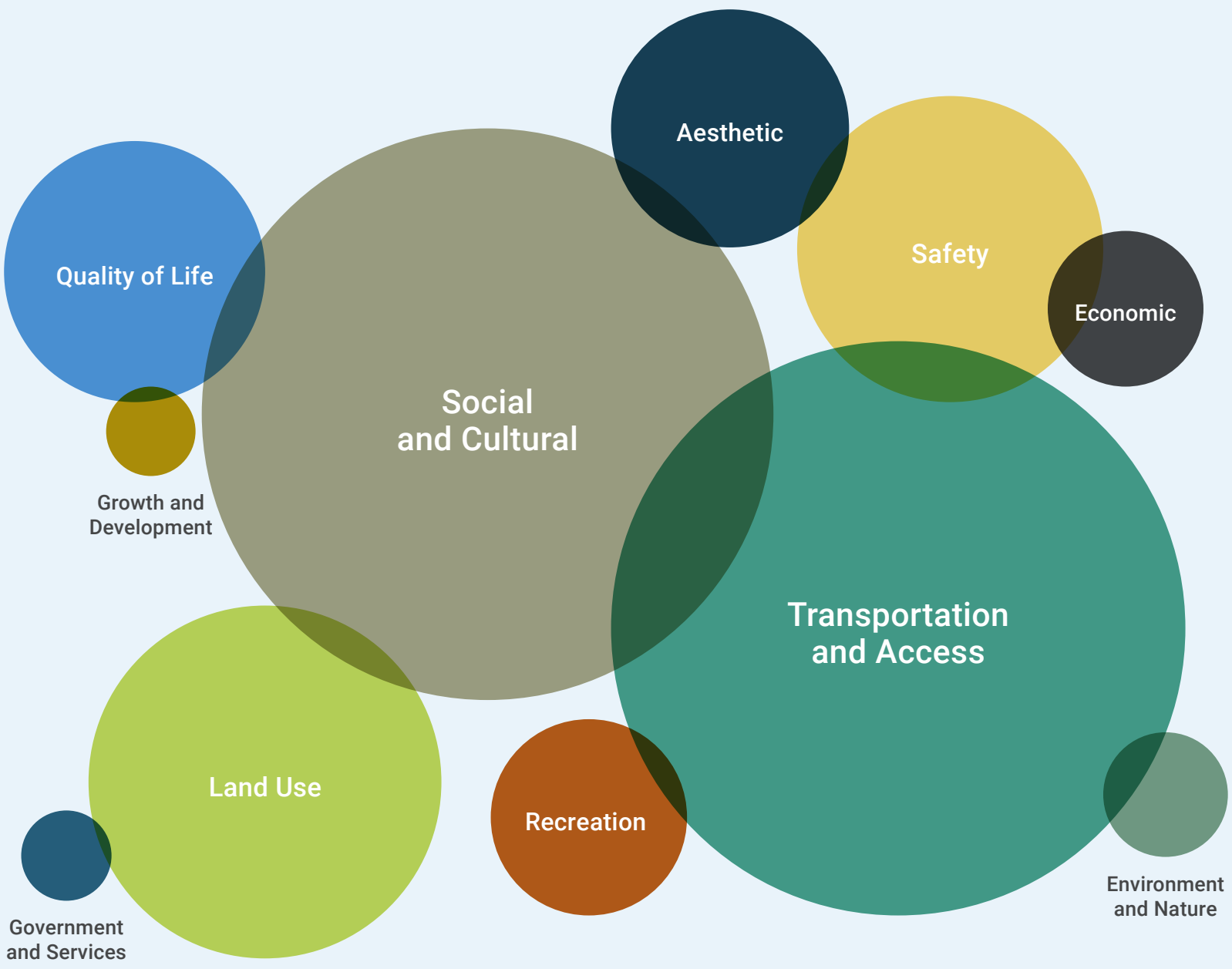
North Lakeshore Community Values

North Lakeshore Community Values

Community values are the foundation for developing the North Lake Shore Area plan. An understanding of what is most important to area residents allows those values to guide and shape future plans. Input on values for area communities was solicited through a Vision summit held in November 2019 and a community survey made available online from June through November 2019. Community values that were identified as important themes are presented below.

North Lakeshore
Area Study

Community Values:



What We've Heard From You:

Aesthetic

- Scenic/ Natural Beauty/ Viewshed
- Attractive Built Environment

Government and Services

- Local Leadership and Public Employees
- Infrastructure, Facilities, and Utilities
- Property and Individual Rights
- Fiscal Policies
- Transparency and Communications
- Efficiency

Safety

- Safe/ Low Crime
- Safe Roads/ Transportation

Land Use

- Rural/ Small Town Character
- Open/ Green Space
- Low Density
- Agriculture
- Housing/ Commercial uses mixed appropriately

Growth and Development

- Continued Growth and Improvement
- Well-planned/ Sustainable/ Responsible Development
- Managed Growth
- Opportunity for Growth and Development
- Transit-Oriented Development

Social and Cultural

- Sense of Community/ Belonging
- Friendly/ Kind/ Personal Values and Attitudes
- Family-oriented
- People and Demographics
- Religion/ Faith
- Culture
- Lifestyle
- Education

Environment and Nature

- Natural Environment
- Wildlife and Habitats
- Clean Air and Water/Lack of Pollution
- Climate Conditions
- General Environmental Concerns and Conservation

Quality of Life

- Quiet/ Serene/ Peaceful
- Clean/ Well-maintained
- Overall Quality of Life/ Livability
- Low Light Pollution
- Health
- Sustainability

Transportation and Access

- Access to services and amenities
- Transportation network access and performance
- Location and access to cities
- Traffic
- Active transportation
- Access to nature and recreational opportunities
- Access
- Access to employment
- Public transportation
- Multimodal transportation
- Well-maintained transportation network
- Transportation

Economic

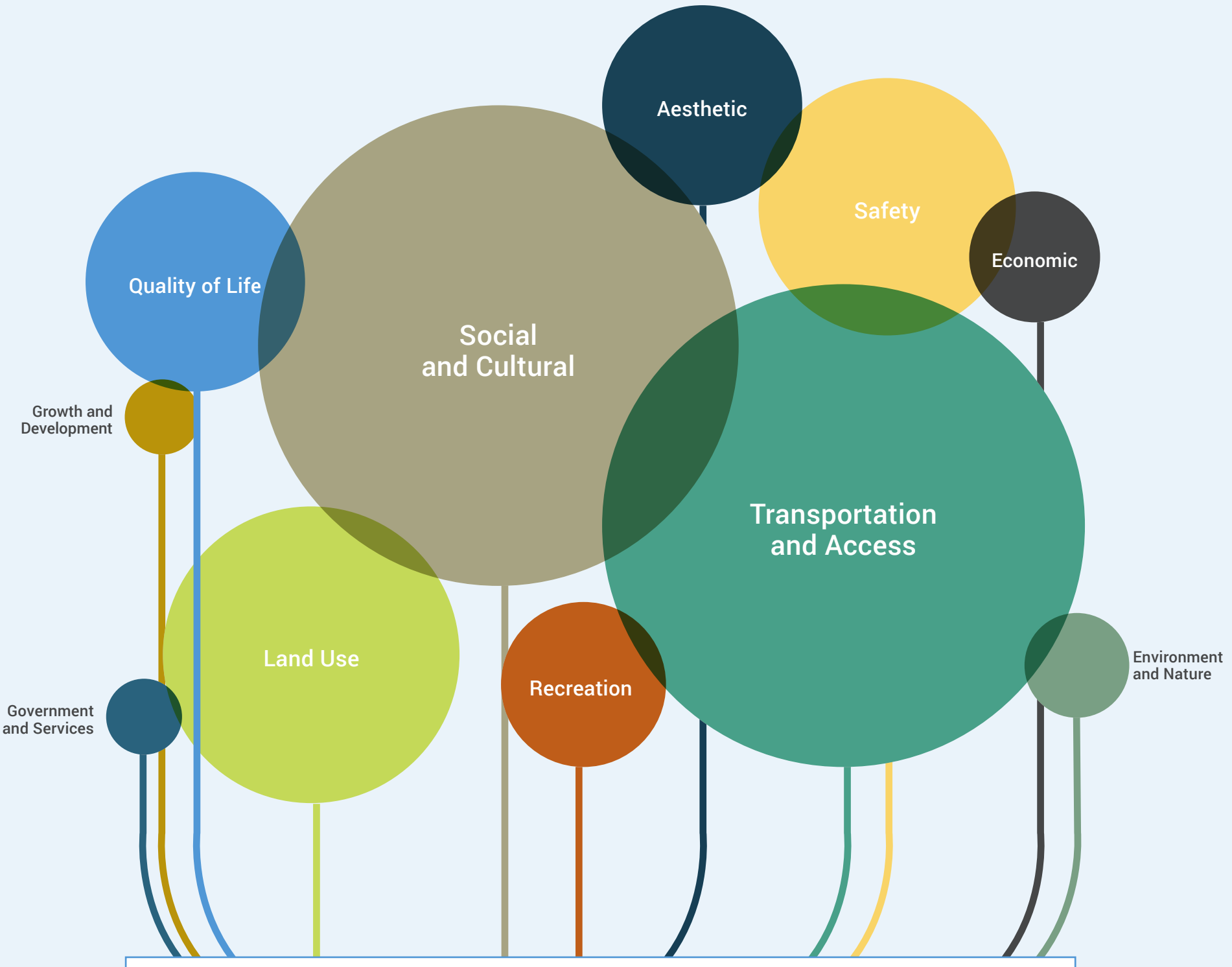
- Affordability and Value
- Local businesses/ business mix
- Employment Opportunity
- Economic Opportunity
- Appropriate taxation
- Strong Economy
- Resource Availability

Recreation

- Outdoor Activities/ Parks/ Athletics
- Recreation, Entertainment, and Activities
- Community Activities and Events

North Lakeshore
Area Study

Community Values
Guiding Principles & Goals



The values voiced by North Lakeshore communities were used to create five guiding principles to lead the study and define goals. By integrating this input early in the process, it can help decision-makers in finding regional transportation solutions.

Create a reliable, connected transportation system

Expand Transportation Options

- Provide more transportation choices and connections

Provide connections to improve the transportation network

- Improve travel times (regional origin-destination pairs)
- Update the transportation sytem to connect all road types and ensure they are appropriately spaced,and serve their intended purpose

Implement innovative technology

- Utilize technology to enhance transportation system
- Make the most efficient use of the existing transportation system through reducing single occupancy vehicle trips

Protect and preserve open space and the environment

Balance the scenic, natural, and cultural resources in the region with transportation solutions

- Prioritize public open space
- Preserve scenic views
- Identify, explore, and support actions that can improve air quality
- Minimize impact to water resources (wetlands, rivers, lakes)

Promote well-being of residents and maintain culture

Support active, healthy communities

- Support a connected regional active transportation plan
- Enhance access to Utah Lake and other natural highlights (or areas, or recreational locations) in the community

Improve safety of transportation system

- Include safety measures for all modes

Preserve community character and culture

- Minimize impacts to existing homes and businesses
- Reduce potential that communities will be divided by transportation solutions
- Develop context sensitive solutions to protect the integrity of residential neighborhoods and gathering places

Improve accessibility to employment, goods, services, and recreation opportunities

Support sustainable economic growth for communities

- Improve access to jobs for residents and employers in the region that encourage local job growth
- Enhance mobility for goods movement to support the local economy while maintaining community livability

Increase access to community services and facilities

- Improve access to education for all students within the region
- Increase services accessible within a short timeframe / distance from community members starting point

Provide access to recreational opportunities.

- Improve connections to recreational opportunities both locally and regionally

Collaborate regionally to identify and implement solutions

Integrate / Harmonize regional resources to implement transportation solutions

- Identify new sources of funding

Coordinate infrastructure and land use across communities

- Prioritize projects that are of benefit to the region
- Coordinate land use and transportations decisions for the region

Improve community resilience and response

- Plan for efficient and safe emergency response and evacuation needsz

Appendix B

North Lakeshore Study Travel Modeling Analysis Memo

MEMORANDUM

To: Mountainland Association of Governments (MAG)

From: Avenue Consultants

Date: March 18, 2021

Subject: North Lakeshore Study Travel Modeling Analysis

This memo describes the travel modeling analysis conducted for the MAG North Lakeshore Study covering north Utah County. The analysis evaluated a number of potential transportation projects in the study area for the transportation benefit they would provide. The following memo describes the methodology, assumptions, scenarios analyzed, and results of the modeling analysis.

1 METHODOLOGY

The following section discusses the methodology and measures of effectiveness used to analyze each of the scenarios.

1.1 Travel Demand Model

The WFRC/MAG travel demand model (TDM) was used to analyze transportation performance within the study area. Version 8.31 of the travel demand model was used for this study.

The travel demand model has two primary inputs: land use data and transportation system data. The land use data consists of residential and employment data for the entire region. This data is prepared in geographic blocks called Traffic Analysis Zones (TAZs). The travel model inputs are prepared for a base year, which in this case was 2019, and for a future year, which in this case was 2050. Some calibration efforts were involved in the study area of the TDM to verify and match recorded AADT volumes to 2019 TDM volumes and to match land use data to existing developments.

1.2 Districts

The North Lake Shore study area was divided into six districts, generally representing Eagle Mountain, Saratoga Springs, Lehi, Alpine-Highland, American Fork-Pleasant Grove, and Vineyard. These districts are used to present study area results in a more granular fashion. A map of the districts is included in the appendix.

1.3 Measures of Effectiveness

To evaluate the scenarios analyzed, measures of effectiveness (MOE) were developed to demonstrate which combination of improvements would provide the most benefit to the study area. The MOEs used for this study were vehicle delay, Jordan River screenline volumes and volume-to-capacity (v/c) ratios, travel times between select locations, transit mode share, and transit boardings.

Vehicle delay is obtained for each roadway link in the model by taking the difference between the modeled congested speed and the free-flow speed and multiplying it by the number of vehicles on that link. The delay values for each link in each district and the study area are added together to get a total delay that is useful measures of relative congestion between improvement scenarios. This MOE is reported by study area district.

A north-south screenline was established at the Jordan River and used to see how many vehicles would be using each road that crosses the screenline and the performance of that road at the screenline. The screenline included all east-west roads in north Utah County from the Salt Lake County line to the proposed Utah Lake bridge. Daily volume and PM v/c ratios are reported.

Travel time was used as a metric to determine how long it would take to get from either Eagle Mountain or Saratoga Springs to centers of regional significance, namely Thanksgiving Point, American Fork, and Provo. PM travel times are reported in minutes and are also divided by free-flow travel times to obtain the travel time index. A map of the travel time origins and destinations assumed for the analysis is included in the appendix.

Transit mode share and transit boardings were also used as MOEs to understand the relative transit performance of the various improvement scenarios. Transit mode share is presented as the percentage of both work trips and all trips that would be made using transit. Transit boardings show how many individuals used transit by mode. This data is presented by district and for the overall study area.

2 SCENARIO VARIABLES

The various scenarios were analyzed by changing key variables from model run to model run allowing for a systematic analysis. The variables considered in the analysis were: travel demand management strategies, land uses, transit routes, and roadway network modifications. This section describes the assumptions associated with each of the scenario variables. All scenarios were analyzed for 2050, which is the horizon year for the MAG Regional Transportation Plan (RTP)

2.1 Travel Demand Management

The study team desired to evaluate scenario options where approximately 20% of jobs were performed from home. The model currently assumes that approximately 7% of jobs are home-based. For this analysis approximately 13% of home-based work trips were removed from the model trip tables after the distribution step using custom model scripts. By removing the trips at this stage of the model process, the "work from home" factor affects both transit usage and roadway volumes. Because not all jobs can be readily performed from home, adjustments were only made to TAZs with office, government/education, health, and other job categories.

2.2 Land Use

The primary future land use assumptions for this study were those from the MAG 2050 RTP (aka TransPlan50); however, the study team desired to test a couple of transit supportive land use options. New land use model inputs were created for the following two options:

- **Clustered** – This land use option identified major transit stops in the study area for a potential high-capacity transit system and increased household and employment densities within approximately a quarter mile of the transit stop.
- **Increased Jobs/Housing Balance** – This land use option increased the number of 2050 jobs in Utah County by approximately 35% so that the county would have the same jobs-to-housing balance as Salt Lake County, which is 2.2 jobs per households.

2.3 Transit Routes

Three new high-capacity transit routes were considered as part of the scenario options in addition to those included in the MAG 2050 RTP. The new routes are shown in Figure 1 and are described below.

- **Red Line Extension** – A light rail extension of the existing Red Line from Daybreak in South Jordan through Saratoga Springs along the Mountain View Corridor / Foothill Boulevard Freeway and into Provo via the Utah Lake Bridge to the FrontRunner station.
- **Lehi-Eagle Mountain** – A LRT or BRT line that would run between the Lehi FrontRunner Station in Thanksgiving Point and Eagle Mountain.
- **State Street BRT Extension** – A BRT extension of the planned State Street BRT line from its planned terminus at the American Fork FrontRunner Station through Lehi and Saratoga Springs and into Eagle Mountain. This configuration is inconsistent with the recommendations from the Central Corridor Transit Study, which shows the State Street BRT route continuing north into Lehi, terminating in the Silicon Slopes area. Unless State Street services were duplicated south of American Fork Main Street, such a scenario would require a transfer to the route serving south Lehi, Saratoga Springs, and Eagle Mountain, which would reduce the ridership on the route.

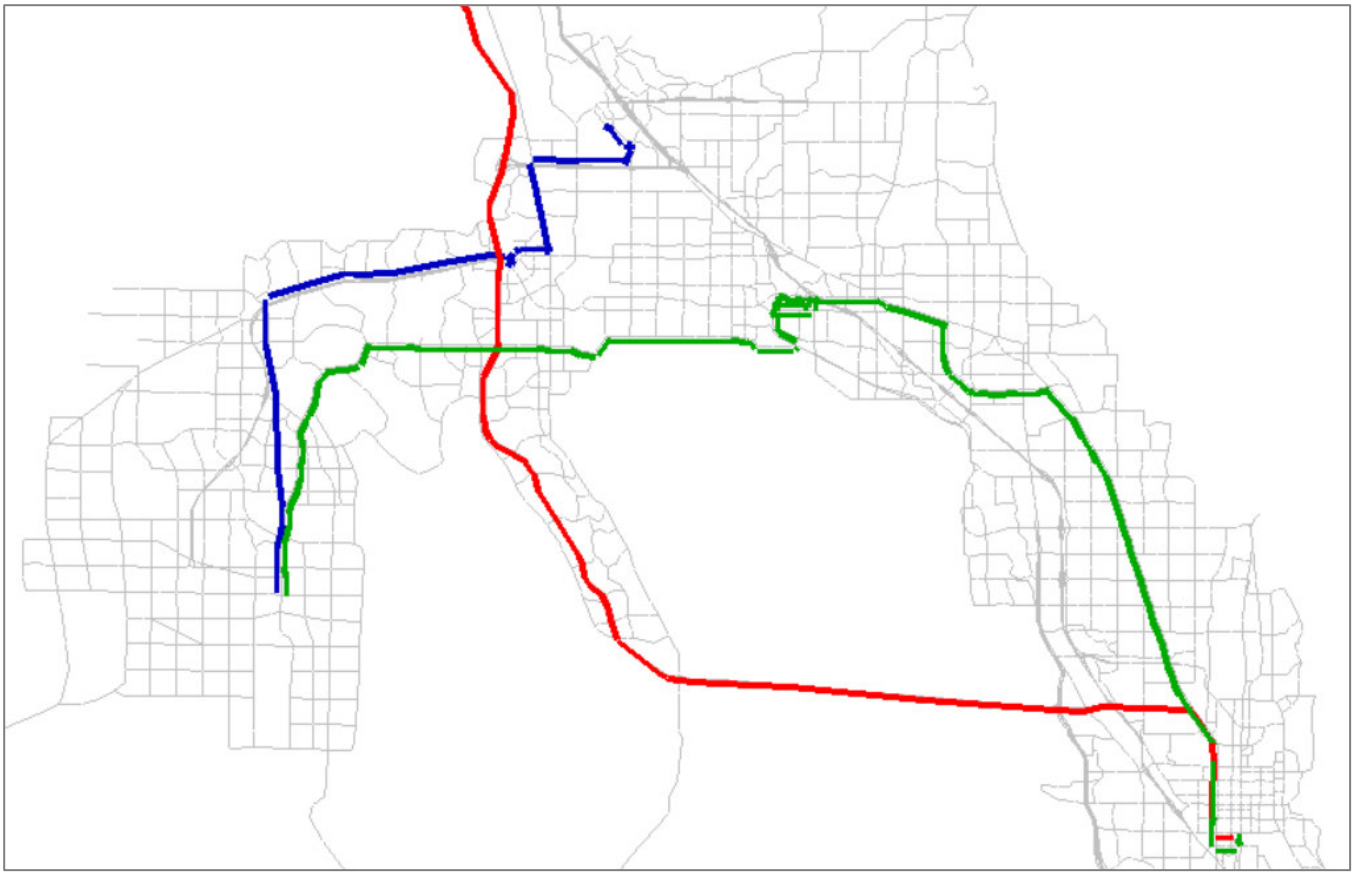


Figure 1. New High-Capacity Transit Routes

2.4 Roadway Network

A large number of roadway network modification options were evaluated during the course of the study. Those options were focused around major study area corridors, namely: Pioneer Crossing, Pony Express Parkway, Vineyard Connector, and the Utah Lake Bridge. The options associated with each of these corridors are described in the following sub-sections. The major corridor modifications were added to a base network referred to as the Master Transportation Plan (MTP) network.

As its name suggest, the MTP network is based on the transportation master plans of the study area cities. The roadway element of each plan was coded into the travel model with minor allowances for TAZ boundaries. In addition to the community plans, several RTP freeway projects that have completed or planned environmental documents were included as part of the MTP network. Those freeway projects are the Mountain View Corridor, 2100 North Freeway, SR-73 Freeway, and Foothill Boulevard Freeway.

The RTP roadway network was assumed outside of the study area, which included another important new freeway facility: the north-south parallel freeway that would run west of I-15 from the Payson area to American Fork. For the purposes of this study, the parallel freeway was assumed to have its northern terminus in the Orem 800 North & Geneva Road area.

Figure 2 shows the roadway system assumed in the MTP network. The following list describes the MTP network assumptions for the four corridors that are the primary focus of the study scenario options:

- **Pioneer Crossing** – The MTP network assumes that Pioneer Crossing is widened to have a continuous six-lane expressway from the Mountain View Corridor to I-15.
- **Pony Express Parkway** – The MTP network assumes that Pony Express Parkway will be a four-lane arterial that will connect directly into the Vineyard Connector.
- **Vineyard Connector** – The MTP network assumes that the Vineyard Connector will be a four-lane arterial from Orem 800 North to Pony Express Parkway. No direct connection to Pioneer Crossing is assumed, instead connectivity would be via the grid network, which is inconsistent with the Vineyard Connector environmental study, but consistent with the community transportation plans.
- **Utah Lake Bridge** – The MTP network does not include the Utah Lake Bridge.

Unlike the rest of the MTP network, the assumptions for these four corridors change based on the scenario and option being analyzed.

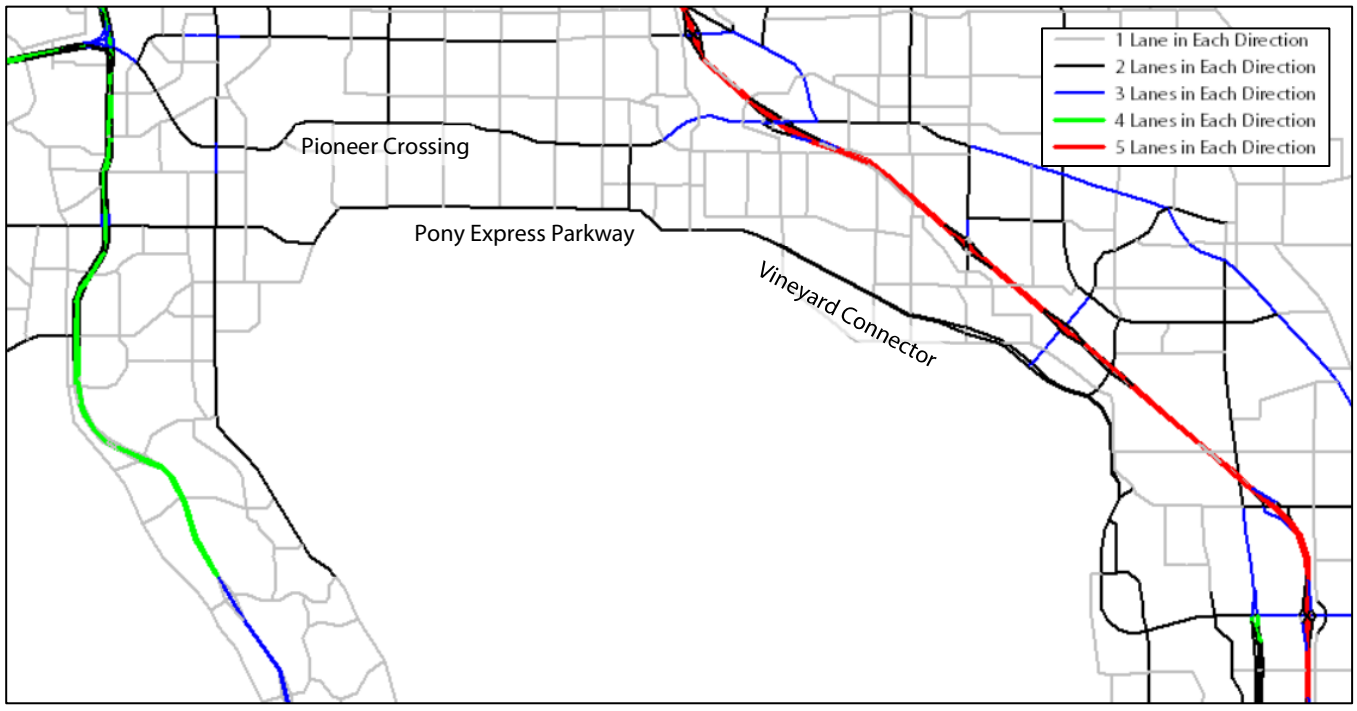


Figure 2. MTP Roadway Network

2.4.1 Pioneer Crossing

Pioneer Crossing has two primary options: six-lane expressway and eight-lane freeway. A couple of the scenario options keep Pioneer Crossing in its current four-lane expressway configuration. All of the freeway scenario options include a freeway-to-freeway connection to I-15. For some of the scenario options when both Pioneer Crossing and Vineyard Connector are freeways, freeway-to-freeway connections are assumed between the two facilities. On the west end of the Pioneer Crossing corridor some of the freeway scenarios assume that the freeway continues due west and intersects the Foothill Boulevard Freeway at a system-to-system interchange. This would place the new system-to-system interchange less than one mile south of the planned Mountain View Corridor/Foothill Boulevard Freeway & SR-73 Freeway interchange, which could result in operational challenges due to the less-than-desired spacing between interchanges. Other scenario options assume that the Pioneer Crossing freeway continues northwest on the existing Pioneer Crossing alignment and connects to the Mountain View Corridor / SR-73 system-to-system interchange.

2.4.2 Pony Express Parkway

Pony Express Parkway has two primary options: four-lane arterial and eight-lane freeway. A couple of the scenario options assume that the corridor essentially remains in its existing + funded condition with a two-lane arterial from Redwood Road to Lehi 2300 West and as a two-lane collector to Lehi Center Street with no connection to Vineyard Connector.

The four-lane arterial options either connect directly into Vineyard Connector such that they function as the same road or Pony Express Parkway ends at Vineyard Connector in scenario options where Vineyard Connector connects directly into Pioneer Crossing.

There are several alignment options for the Pony Express Parkway freeway options. Some have both Pony Express Parkway and Vineyard Connector as freeways where they connect directly into each other. In other options the freeway leaves dry ground to travel across the north side of Utah Lake, thus minimizing property impacts, before ultimately connecting to I-15 in the Pleasant Grove Boulevard interchange area.

2.4.3 Vineyard Connector

Vineyard Connector has two primary options: four-lane arterial and six-lane freeway. As described in previous sections, regardless of Vineyard Connector facility type there are scenario options where the corridor connects directly to Pony Express Parkway or continues north to connect to Pioneer Crossing. The freeway options all connect to the north-south parallel freeway at Orem 800 North. They also bypass the sharp curve at the west end of 800 North in favor of a larger curve that would leave the Geneva Road corridor north of 800 North and connect back to the planned Vineyard Connector alignment north of Orem 1600 North. Finally, there are a couple of scenario options that do not modify the Vineyard Connector beyond its current environmentally-cleared configuration.

2.4.4 Utah Lake Bridge

There are only two options for the Utah Lake Bridge: with it or without it. For all the scenario options that include the bridge, it is assumed that the bridge would be a six-lane freeway extension of the Foothill Boulevard Freeway from Redwood Road across the lake to connect with I-15 near the Orem/Provo boundary. It would also have a system interchange with the north-south parallel freeway.

3 SCENARIO DESCRIPTIONS

This section describes the three major scenarios used to analyze transportation performance in the North Lakeshore study area. Scenario 1 primarily includes modifications to travel demand management, land use, and transit, but also includes some modifications to the roadway network. Scenario 2 focuses on Pioneer Crossing as a freeway, while Scenario 3 focuses on Pony Express Parkway as a freeway. Each of these three scenarios have multiple options where different combinations of scenario variables were applied to understand the implications or benefits of the different variables. Tables and screenshot images of the TDM are used to describe the various scenarios that were analyzed.

3.1 Scenario 1 – Travel Demand Management & Transit

The eight scenario options analyzed in Scenario 1 consisted of testing the increased work from home factors, transit supportive land uses, new transit routes, and the need for additional major roadways in the study area. Table 1 presents the variations analyzed under Scenario 1 with a description of how each solution option was applied.

Table 1. Scenario 1 Options

Solution Options	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8
Travel Demand Management	20% WFH	No Change	No Change	No Change	20% WFH	20% WFH	No Change	20% WFH
Land Use	RTP	RTP	Clustered	Increase Jobs/HH Balance	RTP	RTP	RTP	RTP
Transit Lines	All Three	All Three	All Three	All Three	RTP	All Three	All Three	Lehi-EM
Pioneer Crossing	6-Lane Expressway	6-Lane Expressway	6-Lane Expressway	6-Lane Expressway	6-Lane Expressway	Existing	Existing	6-Lane Expressway
Pony Express Parkway	4-Ln Arterial to Vnyd Con	4-Ln Arterial to Vnyd Con	4-Ln Arterial to Vnyd Con	4-Ln Arterial to Vnyd Con	4-Ln Arterial to Vnyd Con	Existing	Existing	4-Ln Arterial to Vnyd Con
Vineyard Connector	4-Ln Arterial	4-Ln Arterial	4-Ln Arterial	4-Ln Arterial	4-Ln Arterial	Existing	Existing	4-Ln Arterial
UT Lake Bridge	Bridge	Bridge	Bridge	Bridge	Bridge	No Bridge	No Bridge	Bridge

For scenario options 1.2, 1.4, 1.6, and 1.8, work from home jobs were increased to 20%. This adjustment was applied to observe how a decrease in work trips for certain types of employment would affect the transportation network. The scenarios with "no change" to the work from home percent assumed the 7% home-based jobs included in the RTP.

Scenario options 1.3 and 1.3a were those that adjusted land use. Scenario 1.3 analyzed the study area using a modified SE dataset which showed a higher density of employment and households around major transit stops. Scenario 1.3a analyzed increased 2050 employment in Utah County by approximately 35% such that the county's jobs-to-housing balance matches that of Salt Lake County.

The scenarios that analyzed three new transit lines included an LRT extension of the Red Line from Daybreak, an LRT line from Thanksgiving Point to Eagle Mountain (Lehi-EM) and a BRT extension of the planned State Street line from American Fork along Pony Express Parkway to Eagle Mountain. These three lines were all in addition to the routes assumed in the RTP. Scenario option 1.4 assumed just the RTP transit and scenario option 1.8 assumed that the only additional transit service would be the Lehi-EM line.

For Scenario 1, the roadway network was generally assumed to be consistent between options with Pioneer Crossing Blvd as a 6-lane expressway, both Pony Express Parkway and Vineyard Connector as 4-lane arterials, and with the Utah Lake Bridge. Figure 3 shows the travel model roadway network with these assumptions.

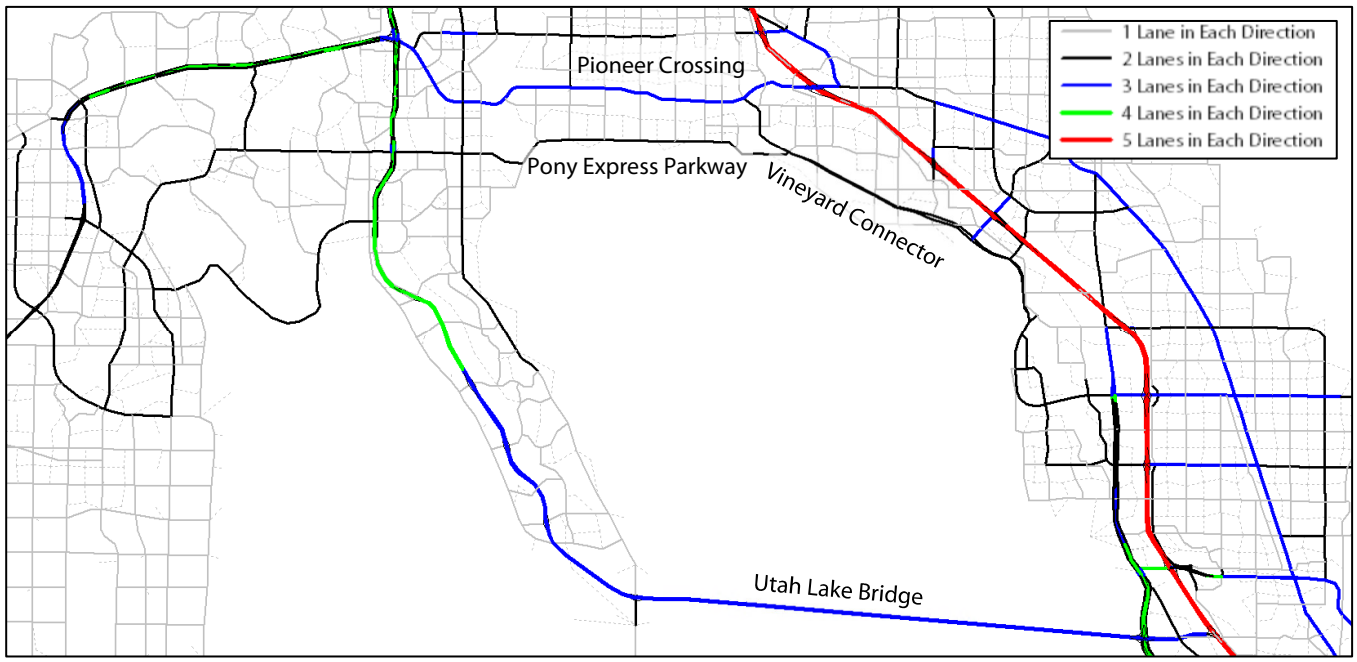


Figure 3. Scenario 1 General Roadway Network

Scenario options 1.6 and 1.7 are the exception to the general roadway configuration in that Pioneer Crossing, Pony Express Parkway, and Vineyard Connector are all assumed to be in their existing condition and it was assumed that there would not be a Utah Lake Bridge. The roadway network for these scenario options is shown in Figure 4.

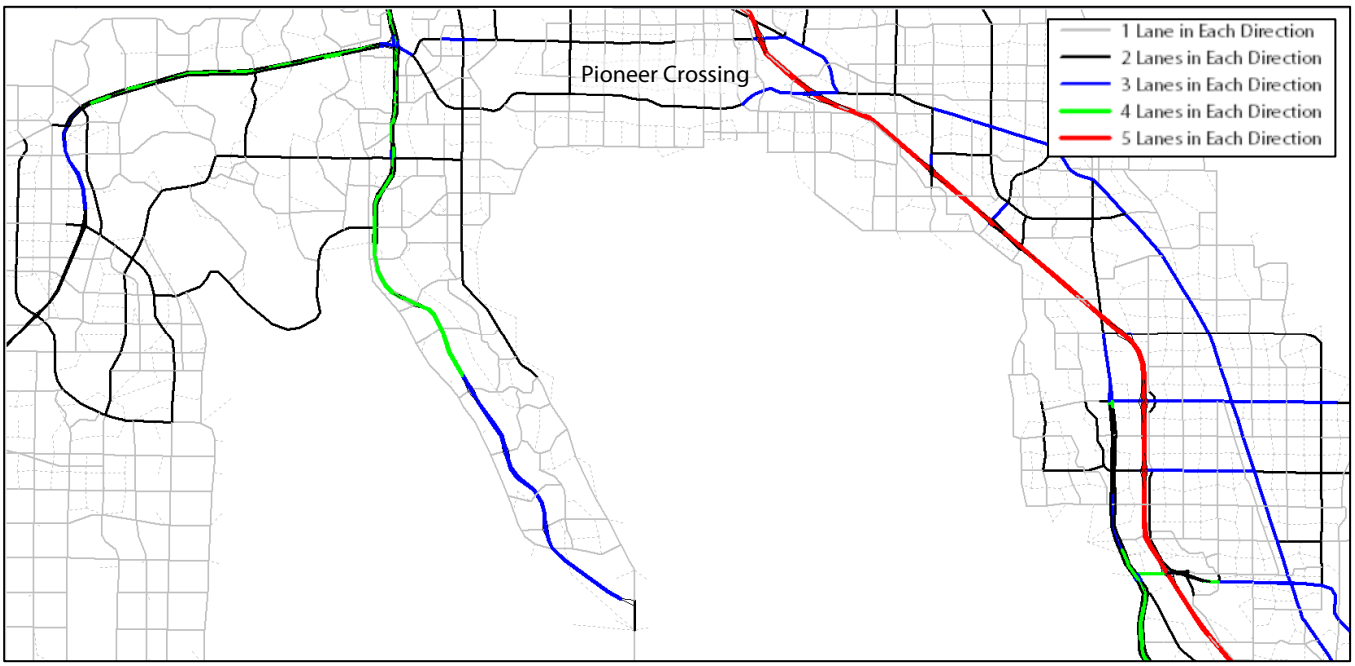


Figure 4. Scenario Options 1.6 and 1.7 Roadway Network

3.2 Scenario 2 – Pioneer Crossing Freeway

The six scenario options analyzed in Scenario 2 tested different freeway alignments, assumptions regarding the presence of Pony Express Parkway and the Utah Lake Bridge, and the facility type for Vineyard Connector. Table 2 shows the list of options associated with Scenario 2.

Table 2. Scenario 2 Options

Solution Options	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6
Travel Demand Management	No Change	No Change	No Change	No Change	No Change	No Change
Land Use	RTP	RTP	RTP	RTP	RTP	RTP
Transit Lines	Lehi-EM	State St BRT Ext	State St BRT Ext	State St BRT Ext	State St BRT Ext	State St BRT Ext
Pioneer Crossing	Freeway	Freeway	Fwy to Vineyard	Fwy Straight Rdwd/ MVC	Fwy Straight Rdwd/ MVC	Fwy Straight Rdwd/ MVC
Pony Express Parkway	4-Ln Arterial Con to Vnyd	4-Ln Arterial Con to Vnyd	4-Ln Arterial End at Vnyd	4-Ln Arterial End at Vnyd	Existing	Existing
Vineyard Connector	4-Ln Arterial	4-Ln Arterial	Freeway	Freeway	Freeway	Freeway
UT Lake Bridge	Bridge	Bridge	Bridge	Bridge	Bridge	No Bridge

There were no adjustments made to the travel demand management or land use in this scenario. Scenario options 2.1 included a Lehi-EM BRT transit line while all the other assumed the State Street BRT extension. Scenario options 2.1 and 2.2 directly compare these two transit options. Both lines were assumed to be BRT routes. The State Street BRT extension performed better, as will be described in the evaluation section, and was assumed to be the transit route for the remaining scenario options.

In scenario options 2.1 and 2.2, Pioneer Crossing is a freeway along the existing alignment with system-to-system ramps located at both I-15 and Mountain View Corridor/SR-73 Freeway. Pony Express Parkway is a 4-lane arterial that terminates at Vineyard Connector. Vineyard Connector is a 4-lane arterial running parallel to I-15 and connecting to Pioneer Crossing on the north. These alignments, as coded in the TDM, are shown in Figure 5. All the Scenario 2 options include the Utah Lake Bridge, except for 2.6.

Scenario option 2.3 assumes Vineyard Connector as a freeway, as shown in Figure 6. Scenario options 2.4, 2.5, and 2.6 have a modified alignment where west of Redwood Road where the Pioneer Crossing Freeway continues straight to the Foothill Boulevard Freeway to intersect it perpendicularly. This straight alignment is shown in Figure 7, along with the scenario option 2.4 Pony Express Parkway arterial and Vineyard Connector freeway. As mentioned previously, there are concerns that the new system-to-system interchange with the Foothill Boulevard Freeway would be too close to the planned Mountain View Corridor/Foothill Boulevard Freeway & SR-73 Freeway system-to-system interchange leading to operational challenges.

Scenario options 2.5 and 2.6 include the straight freeway connection at Pioneer Crossing, a freeway at Vineyard Crossing but existing conditions for Pony Express Parkway. The difference between the two options is that 2.5 assumes the Utah Lake Bridge, while 2.6 does not include the bridge.

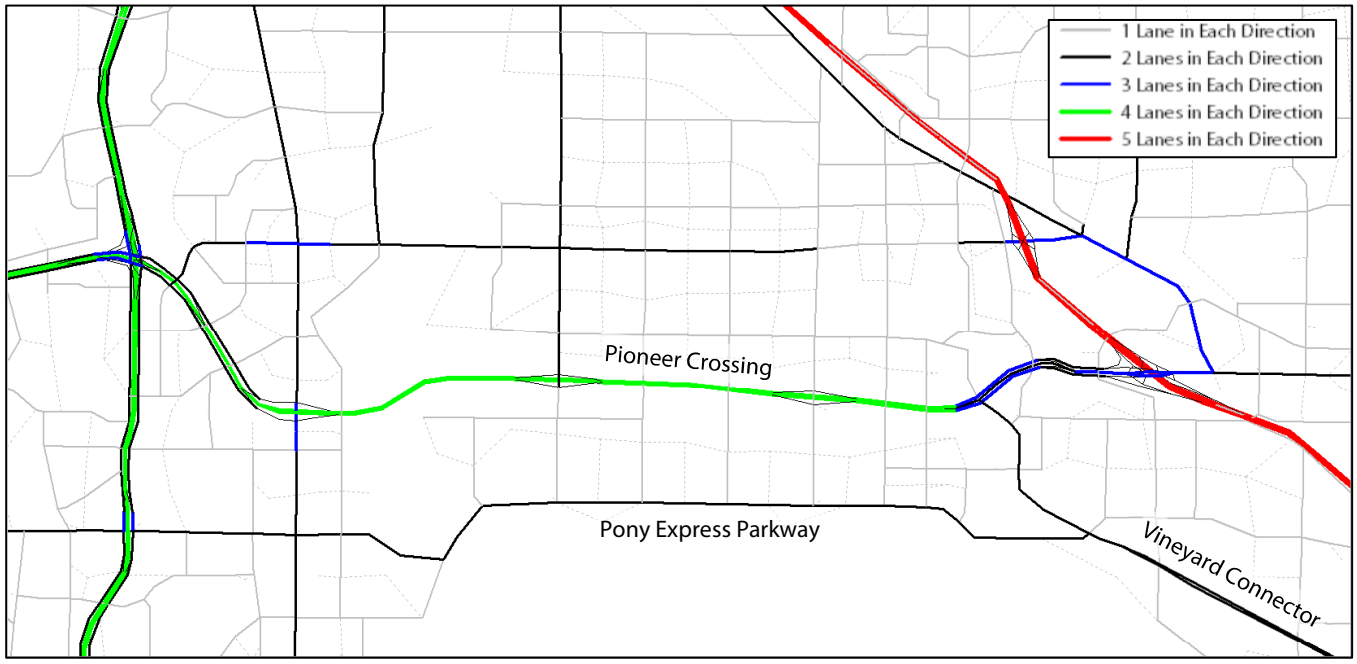


Figure 5. Scenario Options 2.1 and 2.2 Roadway Network

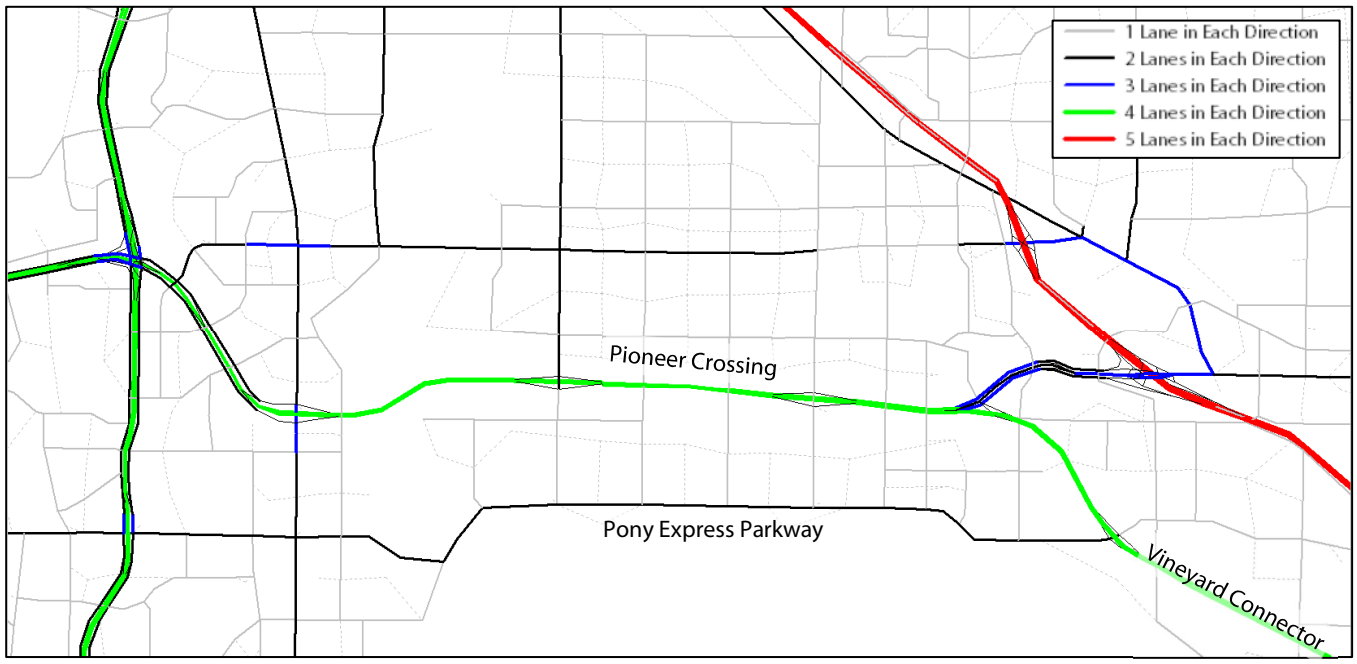


Figure 6. Scenario Option 2.3 Roadway Network – Assumes Vineyard Connector Freeway

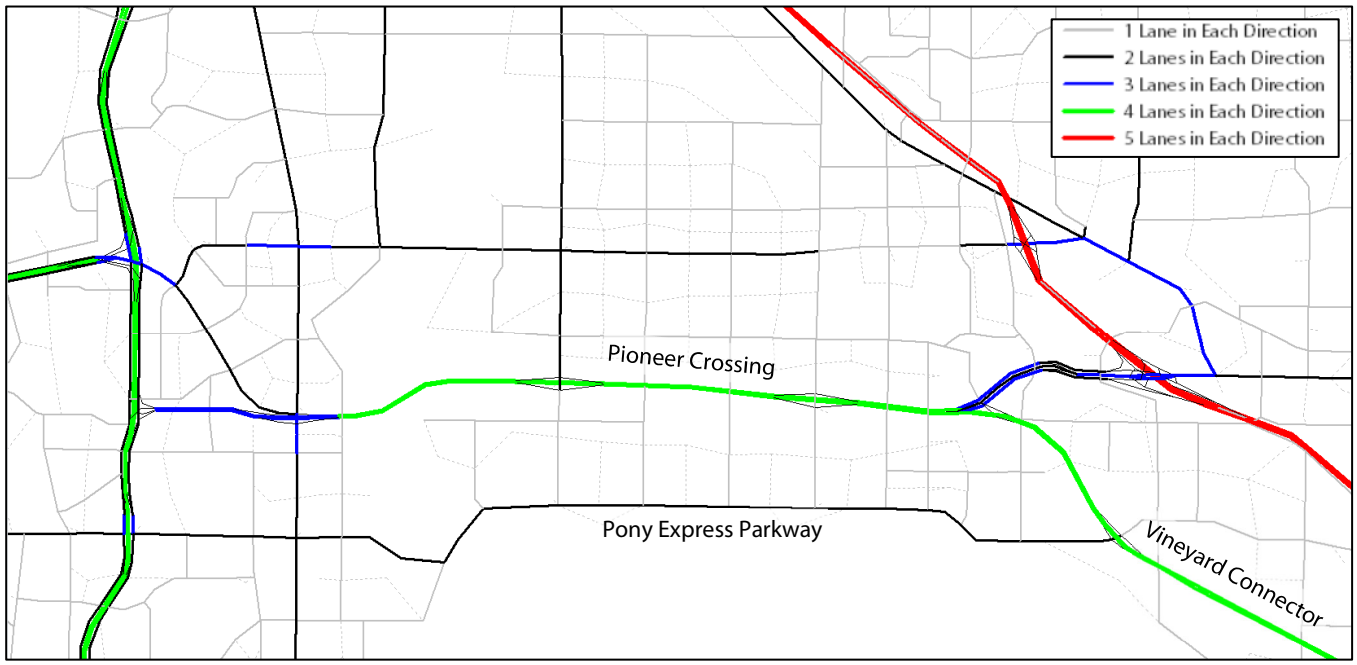


Figure 7. Scenario Option 2.4 Roadway Network – Assumes Straight Connection to Foothill Boulevard Freeway

3.3 Scenario 3 – Pony Express Freeway

The five Scenario 3 options evaluated Pony Express Parkway as a freeway and tested assumptions regarding the freeway alignment and connections to other freeways, the Vineyard Connector facility type, and the presence of the Utah Lake Bridge. No changes were made to the travel demand management, land use, and transit assumptions. Table 3 shows the list of options associated with Scenario 3.

Table 3. Scenario 3 Options

Solution Options	S3.1	S3.2	S3.3	S3.4	S3.5
Travel Demand Management	No Change	No Change	No Change	No Change	No Change
Land Use	RTP	RTP	RTP	RTP	RTP
Transit Lines	State St BRT Ext	State St BRT Ext	State St BRT Ext	State St BRT Ext	State St BRT Ext
Pioneer Crossing	6-Lane Expressway	6-Lane Expressway	6-Lane Expressway	6-Lane Expressway	6-Lane Expressway
Pony Express Parkway	Fwy to PG Int	Fwy to PG Int 400 N Bridge	Fwy to PG Int Lehi Bridge	Fwy to Vnyd	Fwy to Vnyd
Vineyard Connector	4-Ln Arterial	4-Ln Arterial	Fwy	Fwy	Fwy
UT Lake Bridge	Bridge	Bridge	Bridge	Bridge	No Bridge

Scenario option 3.1 assumes the Pony Express Freeway would connect to I-15 via system-to system ramps at the Pleasant Grove Boulevard interchange. Vineyard Connector would intersect with the Pony Express Freeway and would not extend north of the freeway due to the Pony Express Freeway alignment interfering with where it would otherwise be built, as shown in Figure 8. The option includes Pioneer Crossing as a 6-lane expressway and the Utah Lake Bridge.

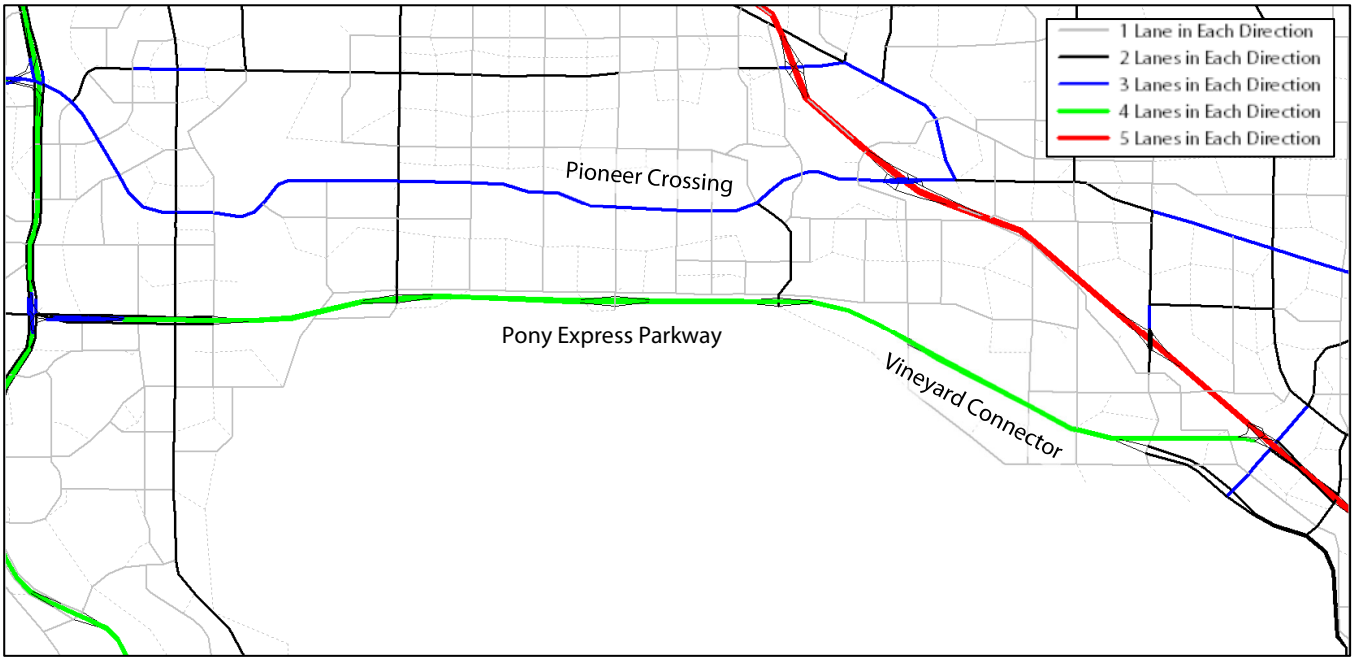


Figure 8. Scenario Option 3.1 Roadway Network

Scenario option 3.2 includes the same roadway network as 3.1, but with the Pony Express freeway connecting to the Pleasant Grove Blvd interchange via a bridge over Utah Lake beginning at 400 North in Saratoga Springs.

This bridge is in addition to the Utah Lake Bridge farther south. Figure 9 shows the alignment of the 400 North Utah Lake Bridge. The Pony Express Freeway would intersect Vineyard Connector perpendicularly and connect to Pleasant Grove Boulevard and I-15.

Scenario option 3.3 has the same roadway alignments as 3.2 except the Pony Express Freeway bridge would start farther east after an interchange with Lehi 2300 West, as shown in Figure 10.

Scenario option 3.4 has the Pony Express freeway along its current alignment north of Utah Lake to connect into the Vineyard Connector, as shown in Figure 11. This essentially combines both freeways into a continuous facility running parallel to I-15 and then parallel to Pioneer Crossing. Scenario option 3.5 is the same as 3.4 but without the Utah Lake Bridge.

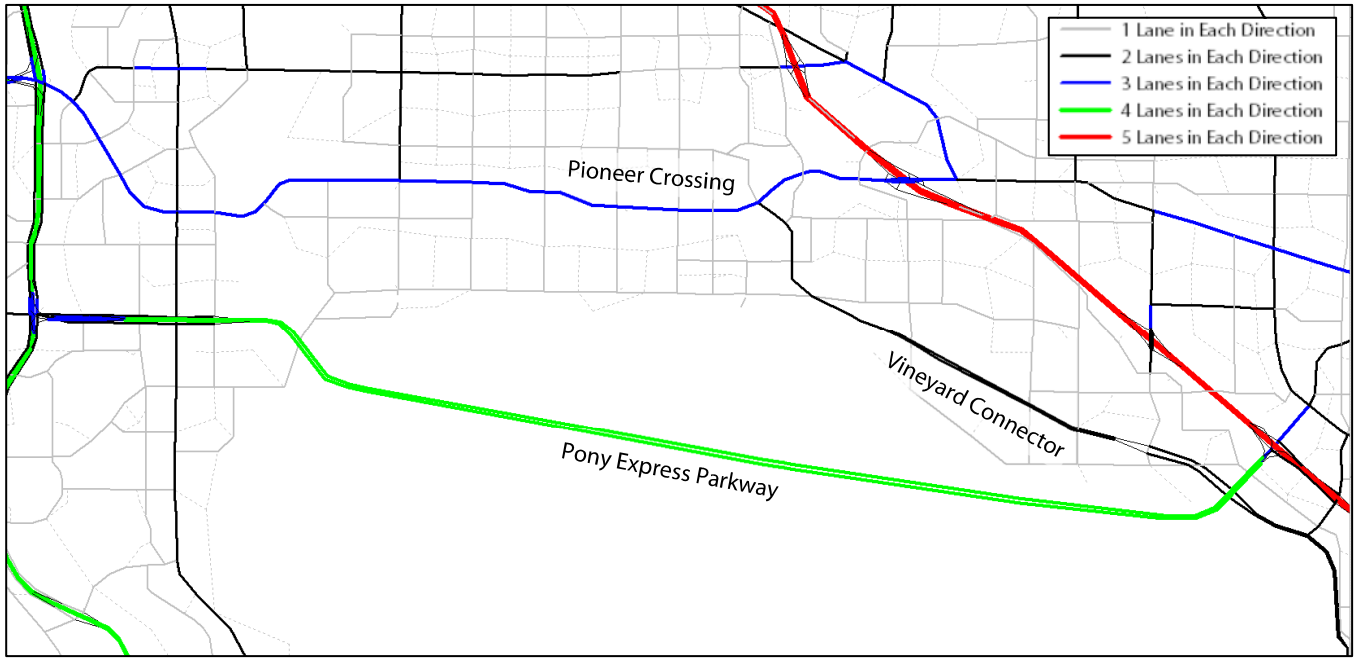


Figure 9. Scenario Option 3.2 Roadway Network – Assumes 400 North Bridge

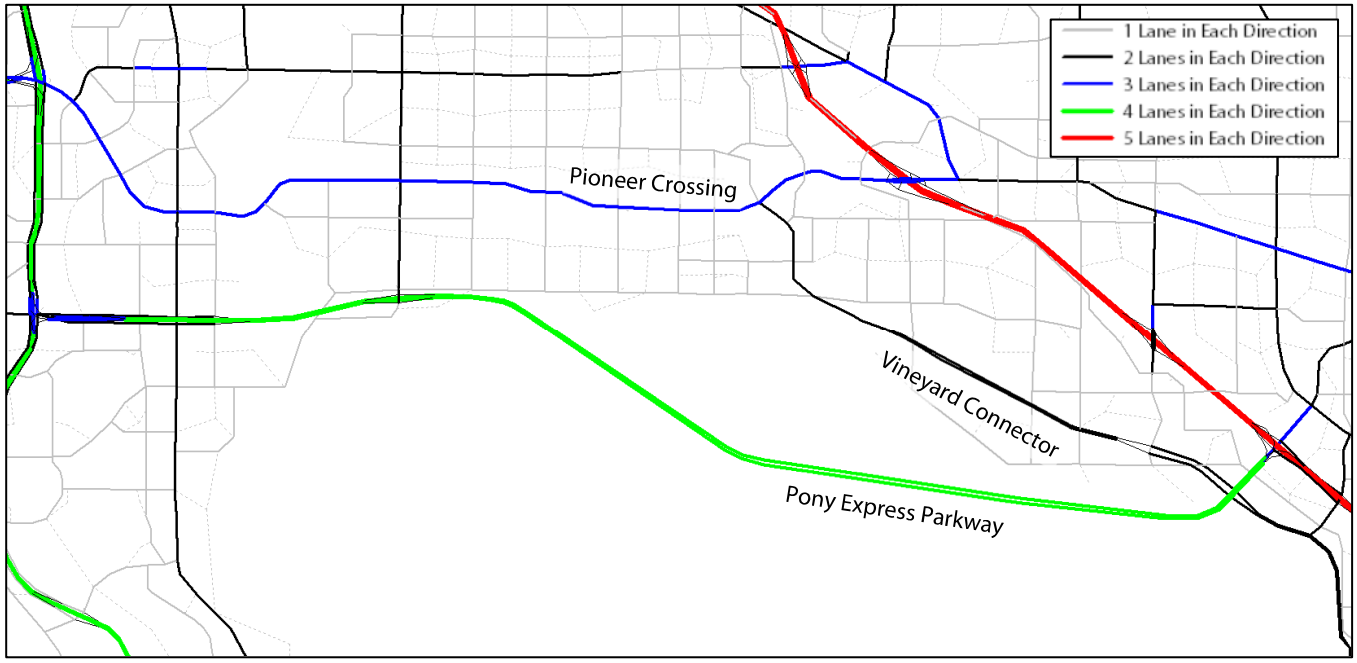


Figure 10. Scenario Option 3.3 Roadway Network – Assumes Lehi 2300 West Bridge

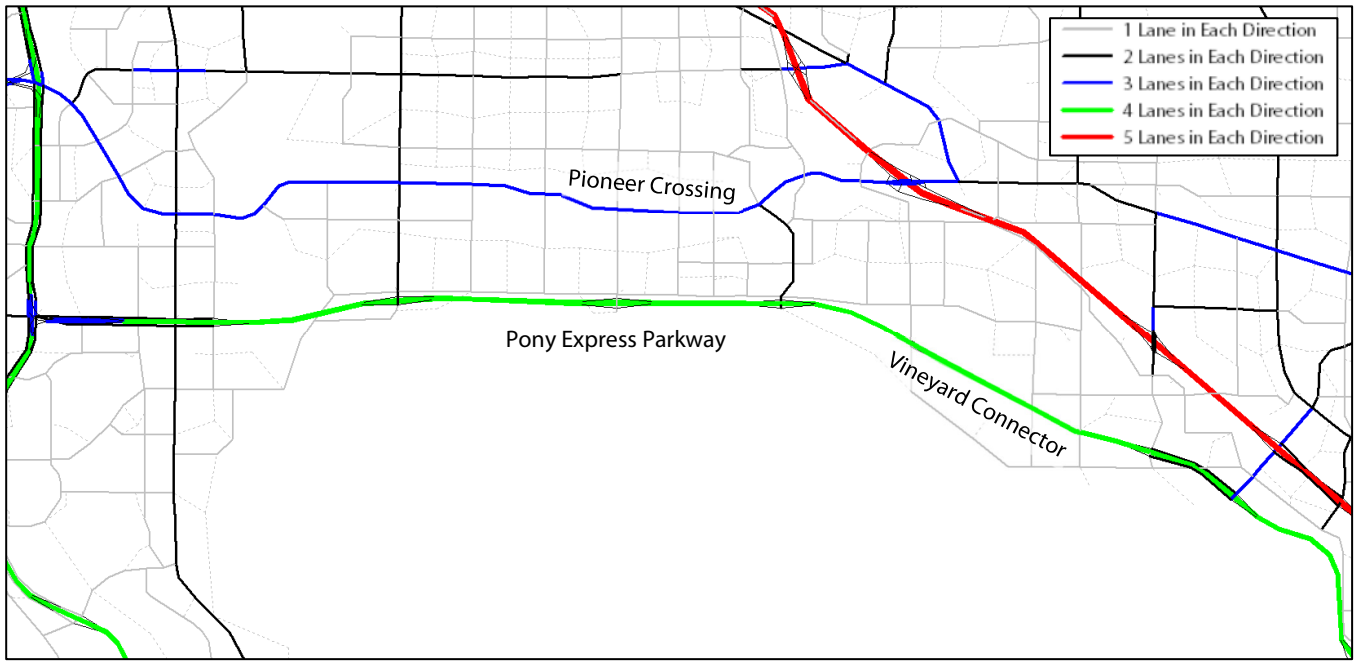


Figure 11. Scenario Options 3.4 and 3.5 Roadway Network – Assumes Freeway to Vineyard Connector

4 SCENARIOS EVALUATION

This section presents the analysis results for all the scenarios, describing how the various solutions would affect transportation within the study area. Portions of the MOE results are presented in each section. A complete report of each MOE for all the scenarios is included in the appendix.

4.1 MTP Results

The MTP scenario serves as a baseline against which the other scenarios can be compared. Because the MTP scenario represents the communities' master plans, it reflects what would happen if nothing else were done for the transportation system. The primary measure of effectiveness for this study was study area delay, which is essentially the sum of all the congestion in the study area. Table 4 presents the total study area delay as well as the delay for east-west and north-south roads. Because large area delay values like this are difficult to interpret since drivers are aware of their individual delay but not necessarily the aggregate delay for an entire area, study area delay values are most useful when compared to other scenarios. Existing delay is always a good starting point since people are generally familiar with existing traffic conditions and then may understand how much more delay the future will have than the present. As such, the table also presents 2019 delay values, which show that the 2050 MTP delay is expected to be five times greater than the existing delay. This suggests that the MTP scenario will not be sufficient to accommodate all the 2050 transportation demand and that additional transportation infrastructure will be needed to keep delay at tolerable levels.

Another version of the MTP scenario that was considered is one that included the Utah Lake Bridge. The table shows that adding the bridge would reduce the study area delay by nearly 50% compared to the MTP scenario. However, this does not mean that the Utah Lake Bridge is the most valuable project. Because there is so much congestion in the MTP scenario, any high-capacity project would provide substantial delay benefit.

Table 4. MTP Scenario Study Area Delay (hours)

Delay Category	2019	MTP	MTP w/ Bridge
East-West Roads	10,300	55,700	24,600
North-South Roads	7,300	33,100	23,100
Study Area Total	**17,600**	**88,800**	**47,700**

Another important consideration for the study is the performance of the transit system. Table 5 shows the share of work trips being made by transit and number of daily boardings by district for the study area. It shows with the transit service assumed in the RTP that transit usage is expected to increase substantially by 2050. The highest future transit shares and boardings are expected to be in the Vineyard area where there will soon be a FrontRunner station, and the lowest transit shares are expected to be in the Cedar Valley where transit service would still be quite limited. A transit analysis was not performed for the MTP with Bridge scenario.

Table 5. MTP Scenario Transit Share (% of trips) and Boardings

District Name	Work Trips Transit Share		Transit Boardings	
	2019	MTP	2019	MTP
Cedar Valley	0.42	0.36	30	470
Saratoga Springs	0.50	1.27	70	2,320
Lehi	1.35	3.44	1,490	8,860
Alpine-Highland	0.36	0.77	70	170
AF-PG	0.80	3.07	1,570	8,100
Vineyard	1.84	6.86	2,120	9,850
Study Area Total	**1.05**	**2.67**	**5,340**	**29,770**

4.2 Scenario 1 – Travel Demand Management & Transit Results

Scenario 1 primarily focused on modifications to travel demand management, land use, and new transit lines beyond those included in the RTP. The variations in the roadway network consisted of whether Pioneer Crossing was widened and Pony Express Parkway and Vineyard Connector were constructed at all. Table 6 presents the study area vehicle delay for the scenario options. Options 1.3 and 1.3a are land use options to evaluate how they would affect transit usage. Because households and employment were not controlled to countywide control totals, they have more trips than the other options and are not suitable for delay comparisons.

Table 6. Scenario 1 2050 Daily Study Area Delay (hours)

Delay Category	S1.2	S1.2a	S1.4	S1.6	S1.7	S1.8
East-West Roads	17,100	20,700	17,100	42,400	47,200	17,000
North-South Roads	15,400	19,800	15,500	24,100	30,000	15,400
Study Area Total	**32,500**	**40,500**	**32,500**	**66,500**	**77,300**	**32,400**

Scenario options 1.2, 1.4, and 1.8 have delay values that are virtually identical. The only differences between these options are the transit assumptions ranging from no additional transit beyond the RTP to three new transit lines. The similarity in delay suggests that increased transit service does not appreciably affect vehicle delay.

Scenario options 1.2 and 1.2a differ only in their travel demand management strategies with 1.2 having an increased work from home factor of 20% while 1.2a has no additional work from home factor. Scenario option 1.2 has 8,000 hours fewer hours of delay, which is about 20% less delay than 1.2a. This shows that reducing work trips can be very effective at reducing vehicle delay, which is something that was observed in Spring 2020 when the Covid-19 pandemic resulted in dramatic reductions travel and congestion. However, since then traffic has continually increased and nearly a year later is nearly back to pre-pandemic condition, which illustrates the difficulty in sustaining the type of major "work from home" program that would provide the benefits shown in the analysis.

Scenario options 1.6 and 1.7 do not assume any improvements to the major roadway facilities and show substantially higher delays than any other of the scenario options. Not surprisingly, this shows that doing nothing for the roadway network will lead to large vehicle delays.

Table 7 shows the Jordan River screenline PM v/c ratio for the direction with the highest value. It shows that Pony Express Parkway would be near or over a v/c ratio of one for all the scenario options and well over two for options 1.6 and 1.7, thus further illustrating the need for additional transportation infrastructure. Daily volume corresponding to the v/c ratios can be found in the appendix.

Table 7. Scenario 1 Jordan River Screenline PM V/C Ratios

Screenline Roadway	S1.2	S1.2a	S1.4	S1.6	S1.7	S1.8
Lehi Main Street	0.83	0.87	0.84	1.01	1.27	0.85
Pioneer Crossing	0.88	0.93	0.89	1.25	1.25	0.89
Pony Express Parkway	0.96	1.02	0.97	2.64	2.43	0.97
Utah Lake Bridge	0.80	0.84	0.80	--	--	0.80

The transit mode share analysis results for work trips going to or from the study are is shown in Table 8 and the transit boardings are shown in Table 9. Scenario options 1.3, 1.6, and 1.7 have the highest share of transit work trips, each over 3.3%. Scenario option 1.3 does well because it includes additional density around major transit stops. It is likely that 1.6 and 1.7 do well because of the extreme congestion on the roadway network in these options draws more people to transit. A similar pattern can be seen the transit boardings, but with 1.3 have over 10% more boardings than 1.6 and 1.7. This is due to the increased density in option 1.3 that results in more overall trips than the other two, so more boardings are needed to achieve the same transit mode share. Generally speaking, the increase in transit usage does not seem to be proportionate to the number of houses and jobs that were added near key transit stops.

Table 8. Scenario 1 Work Trips Transit Shares (% of trips)

District Name	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8
Cedar Valley	1.01	0.99	1.58	0.88	0.16	1.14	1.14	0.56
Saratoga Springs	2.29	2.24	3.13	1.98	0.97	2.68	2.66	1.22
Lehi	3.53	3.48	3.63	3.64	3.31	3.79	3.78	3.40
Alpine-Highland	0.80	0.79	0.82	0.54	0.79	0.82	0.82	0.79
AF-PG	3.29	3.26	4.27	3.08	3.10	3.56	3.54	3.12
Vineyard	6.35	6.41	6.63	5.56	6.29	7.98	8.07	6.32
Total	**2.94**	**2.92**	**3.31**	**2.74**	**2.53**	**3.34**	**3.33**	**2.62**

Table 9. Scenario 1 Total Transit Boardings

District Name	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8
Cedar Valley	1,120	1,140	2,130	1,260	310	1,210	1,250	740
Saratoga Springs	4,060	4,180	8,000	4,430	1,900	4,710	4,870	2,360
Lehi	8,640	8,970	9,930	9,970	8,130	9,150	9,540	8,670
Alpine-Highland	170	170	170	190	170	170	180	170
AF-PG	7,280	7,520	8,920	8,190	7,040	7,570	7,870	7,050
Vineyard	9,540	9,840	10,130	10,360	9,450	10,410	10,800	9,490
Total	**30,810**	**31,830**	**39,280**	**34,400**	**27,000**	**33,230**	**34,510**	**28,480**

Scenario options 1.2, 1.4, and 1.8 compare the three transit scenarios with 1.2 having three new services, 1.8 with one new service, and 1.4 with no new services. The difference in 2050 daily study area transit boardings between these three options is less than 4,000. This suggests that ridership on these new services is low and that high-capacity transit services such as exclusive guideway BRT or light rail are likely not warranted in the short and medium term. Better value can be obtained by providing frequent local bus service and mixed-flow BRT with 15-minute headways. Nevertheless, growth will still occur beyond the horizon year of this study and the time will come when high-capacity transit will be important. It is still important to plan for the long-term future when high-capacity transit will be warranted.

Scenario 1 performs well in options that assume a 20% work from home factor, which reduces study area delays by 20%. The best performing options also include the Utah Lake Bridge, which appears to be an important part of the future transportation system. Achieving 20% of non-retail, non-industrial jobs working from home is a very aspirational target that would likely be difficult to achieve. It would be a worthwhile goal, but the region probably should not bet the future performance of the transportation system on it. If anything, it can help the region with what comes after 2050.

4.3 Scenario 2 – Pioneer Crossing Freeway Results

Scenario 2 assumed a Pioneer Crossing freeway with the differences between options focusing on assumptions for other corridors and how the freeway would connect to the Foothill Freeway. Table 10 shows the total delay in the study area by direction. It shows that the lowest delays are in scenario options 2.3, 2.4 and 2.5. The common characteristic of these three options is that they all assume that Vineyard Connector is a freeway that connects to the Pioneer Crossing freeway and the Utah Lake Bridge. Removing one or the other of these assumptions increases the delay by approximately 20%. Assuming Vineyard Connector as a freeway connects the parallel freeway from Pioneer Crossing down to the Payson area, which provides a substantial reduction in delay within the study area.

Table 10. Scenario 2 2050 Daily Study Area Delay (hours)

Delay Category	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6
East-West Roads	18,900	19,000	14,100	14,100	14,600	20,400
North-South Roads	19,400	19,400	18,200	17,700	17,900	19,900
Study Area Total	**38,300**	**38,300**	**32,300**	**31,800**	**32,500**	**40,300**

The alignment of the Pioneer Crossing freeway on the west end seems to not impact delay significantly. Scenario options 2.3 and 2.4 have the same roadway network except for the Pioneer Crossing freeway alignment. There is no change in north-south delay between these scenarios and a slight reduction by 500 hours with the straight freeway alignment in scenario 2.4. Because the delay differences are so minor between the scenario options and due to system-to-system interchange spacing concerns on the Foothill Boulevard with the potential for two interchanges in less than one mile, the study team felt that scenario option 2.3 with the freeway remaining on the Pioneer Crossing alignment would be the better option.

Table 11 shows the Jordan River screenline volumes for each of the Scenario 2 options. The direct freeway-to-freeway connection to Vineyard Connector increases the volumes on Pioneer Crossing Freeway by about 20,000 vehicles per day and reduces volumes on the Utah Lake Bridge by 9,000 to 13,000 vehicles. Without the Utah Lake Bridge or Pony Express Parkway improvements, Pioneer Crossing Freeway volumes increase by 40,000 vehicles per day, which would require an additional lane in each direction. Daily volumes on Pony Express Parkway are relatively consistent between scenario options ranging from 16,000 to 23,000 vehicles.

Table 11. Scenario 2 Jordan River Screenline Daily 2050 Volumes

Screenline Roadway	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6
Lehi Main Street	23,000	23,000	24,000	24,000	25,000	26,000
Pioneer Crossing Freeway	104,000	104,000	125,000	124,000	125,000	167,000
Pony Express Parkway	23,000	23,000	19,000	17,000	16,000	18,000
Utah Lake Bridge	75,000	75,000	62,000	65,000	66,000	--

Table 12 shows the Jordan River screenline v/c ratios for each of the Scenario 2 options. The analysis shows that most the key east-west roads in the study area would operate effectively. Pony Express Parkway would exceed its capacity in options 2.5 and 2.6, both of which assume no Pony Express Parkway improvements beyond existing + funded conditions. Pioneer Crossing Freeway would be approaching a v/c ratio of 1.0 in scenario option 2.6, which assumes no Utah Lake Bridge or Pony Express Parkway improvements. Scenario options 2.1 through 2.4 all include four lanes on Pony Express Parkway and all have v/c ratios greater than 0.5. This means that even with a freeway on Pioneer Crossing that there would be sufficient demand to justify four lanes on Pony Express Parkway.

Table 12. Scenario 3 Jordan River Screenline PM V/C Ratios

Screenline Roadway	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6
Lehi Main Street	0.66	0.66	0.72	0.76	0.78	0.84
Pioneer Crossing Freeway	0.66	0.66	0.77	0.80	0.82	0.97
Pony Express Parkway	0.75	0.75	0.61	0.54	1.01	1.30
Utah Lake Bridge	0.81	0.81	0.63	0.65	0.65	--

There were no changes to the transit or land use for any of the scenario options, so the transit performance is virtually identical for all the Scenario 2 options and are most like scenario option 1.8.

The analysis of Scenario 2 shows that Pioneer Crossing as a freeway is very effective at reducing study area vehicle delay, particularly when paired with a Vineyard Connector freeway and Utah Lake Bridge. Eliminating either of those supporting corridors would increase the study area delay by approximately 20%. Overall, scenario option 2.4 has the lowest study area delay of any of the options evaluated in this study.

4.4 Scenario 3 – Pony Express Freeway Results

Scenario 3 assumed a Pony Express Freeway with the difference between the scenario options focusing on the alignment of the freeway and assumptions for other corridors. All the scenarios analyzed in Scenario 3 have Pioneer Crossing as a 6-lane expressway. It is assumed that Pioneer Crossing will be widened to six lanes within the next 10 years to serve as an interim improvement before a larger long-term solution can be implemented. Table 13 shows the total delay in the study area. Scenario option 3.4 has the lowest delay of the options analyzed and is comparable to lowest delay options from the other scenarios. The total delay for this scenario shows 32,500 hours compared to an average of 37,850 hours from the other scenarios. The difference between 3.4 and the other options is that the Pony Express Freeway is assumed to connect directly into the Vineyard Connector freeway creating a continuous freeway and connection to the I-15 parallel freeway and it includes the Utah Lake Bridge. The other freeway alignment options connect to I-15 at the Pleasant Grove Parkway interchange, which means it doesn't connect to the I-15 parallel freeway. It may be that if an I-15 C-D system was assumed instead of a parallel freeway that scenario options 3.1, 3.2, and 3.3 would operate more efficiently. It was beyond the scope of this study to evaluate an I-15 C-D system. Another factor in the performance of scenario options 3.2 and 3.3 is that because they go out over the lake, they do not provide as much connectivity to the arterial and collector roadway network.

Table 13. Scenario 3 2050 Daily Study Area Delay (hours)

Delay Category	S3.1	S3.2	S3.3	S3.4	S3.5
East-West Roads	17,200	17,900	16,800	14,300	18,900
North-South Roads	19,900	21,500	19,800	18,200	19,400
Study Area Total	**37,100**	**39,400**	**36,600**	**32,500**	**38,300**

Table 14 shows the Jordan River screenline volumes for each of the Scenario 3 options. The table includes Pony Express as both an arterial and a freeway. As shown in Figures 10-12, all the Pony Express freeway options also include the existing Pony Express Parkway segments that would be used for local circulation serving relatively

low volumes. The table shows large differences in volumes on the Pony Express Freeway based on the option, which also affects the volumes on the other corridors. It is particularly interesting to see how low the Pioneer Crossing volumes are in most the scenario options.

Table 14. Scenario 3 Jordan River Screenline Daily 2050 Volumes

Screenline Roadway	S3.1	S3.2	S3.3	S3.4	S3.5
Lehi Main Street	28,700	30,500	29,700	29,100	30,100
Pioneer Crossing	13,600	31,500	19,200	14,000	17,000
Pony Express Parkway (Arterial)	9,500	17,100	12,800	9,600	10,400
Pony Express Freeway	105,500	73,500	91,200	106,000	153,000
Utah Lake Bridge	67,300	69,000	69,300	66,700	--

Table 15 presents the v/c ratios for the Jordan River screenline for select corridors. The low values for Pony Express Freeway in some of the options suggest that eight freeway lanes might not be needed for all the options, particularly 3.2 which is over the lake for most of its length. Pioneer Crossing has some very low v/c values for most of the options, which means that it would be overbuilt for those scenario options. However, it is not practical to have a smaller Pioneer Crossing cross-section because all six lanes will be needed for the years before the any of the freeway facilities from this study would ever be built. This is an issue with having two major corridors separated by less than a mile. The Pony Express Freeway draws most of the east-west traffic in the area onto it due to its higher speed and capacity leaving Pioneer Crossing overbuilt and underutilized.

Table 15. Scenario 3 Jordan River Screenline PM V/C Ratios

Screenline Roadway	S3.1	S3.2	S3.3	S3.4	S3.5
Lehi Main Street	0.82	0.80	0.81	0.84	0.83
Pioneer Crossing	0.31	0.74	0.45	0.34	0.51
Pony Express Parkway (Arterial)	0.57	0.91	0.66	0.57	0.73
Pony Express Freeway	0.68	0.48	0.62	0.73	0.91
Utah Lake Bridge	0.68	0.68	0.67	0.61	--

There were no changes to the transit or land use for any of the scenario options, so the transit performance is virtually identical for all the Scenario 3 options and are most like scenario option 1.8.

The analysis of Scenario 3 shows that Pony Express as a freeway can be very effective at reducing study area vehicle delay when it connects directly to a Vineyard Connector freeway and in conjunction with a Utah Lake Bridge. Eliminating either of those features would increase by delay by 10-20%. However, this scenario would also result in a six-lane Pioneer Crossing express that would carry less than 20,000 vehicles per day in 2050, severely underutilizing the investment in that corridor.

5 CONCLUSION

The North Lakeshore Study evaluated nearly 20 options to accommodate the estimated 2050 travel demand. The list below highlights the key findings of the analyses.

- Scenario option 2.3 (shown below in Figure 12), which is the Pioneer Crossing freeway with Pony Express Parkway as a four-lane arterial, Vineyard Connector as a freeway, and the Utah Lake Bridge, provides the best overall performance with the fewest ancillary issues.
    - This option assumes that at the west end the Pioneer Crossing freeway will continue on the existing Pioneer Crossing alignment northwest to the Mountain View Corridor/Foothill Boulevard Freeway & SR-73 Freeway system-to-system interchange, which eliminates the closely spaced interchanges issue on the Footehill Boulevard Freeway associated with option 2.4.
    - Scenario option 2.5 also performs very well and is only slightly behind scenario options 2.4 and 2.3. This scenario is identical to 2.4 except that 2.5 does not include the four-lane Pony Express Parkway, but instead assumes that no other improvements are made to Pony Express Parkway beyond what is currently built or funded. However, this option does cause the two-lane Pony Express Parkway to be over capacity at the Jordan River screenline, indicating that four lanes are indeed warranted.

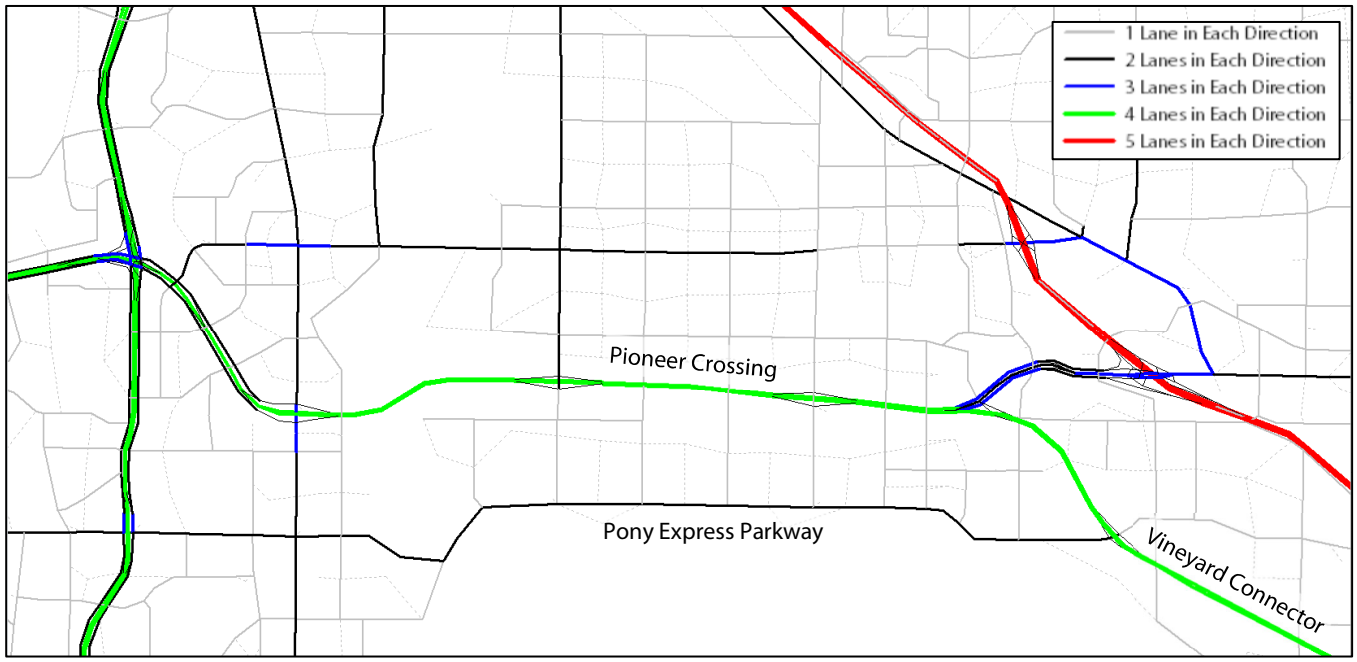


Figure 12. Scenario Option 2.3 Roadway Network – Assumes Vineyard Connector Freeway

- Scenario option 3.4 (shown in Figure 13) is the best performing of the Scenario 2 – Pony Express Freeway options with performance that is nearly as good as scenario option 2.3. This option assumes that Pioneer Crossing would be a six-lane expressway, the Pony Express Freeway would connect directly into Vineyard Connector as a freeway, and the Utah Lake Bridge.
    - An issue associated with most of the Scenario 2 options, including 3.4, is that the Pony Express Freeway pulls a lot of traffic off Pioneer Crossing, so much so that it becomes very underutilized

with a 2050 Jordan River screenline volume of 14,000 vehicles per day (less than half of the existing volume) and a volume-to-capacity ratio of 0.34. This means that even though there would be six lanes of capacity, barely two lanes capacity would actually be needed. In financial terms, it would result in a poor return on the Pioneer Crossing investment. (Pioneer Crossing was assumed as a six-lane facility because adding a lane in each direction would be a relatively easy short-term project to increase capacity and address existing traffic congestion before a larger, long-term project could be built.)

- Scenario options 3.1, 3.2, and 3.3 are all assumed to connect to I-15 near the Pleasant Grove Boulevard interchange. Vineyard Connector would be four-lane arterial in each of these options, which configuration would disconnect the parallel freeway and increase delay. If an I-15 C-D system was ultimately built instead of a parallel freeway then these could be more competitive in their traffic performance.

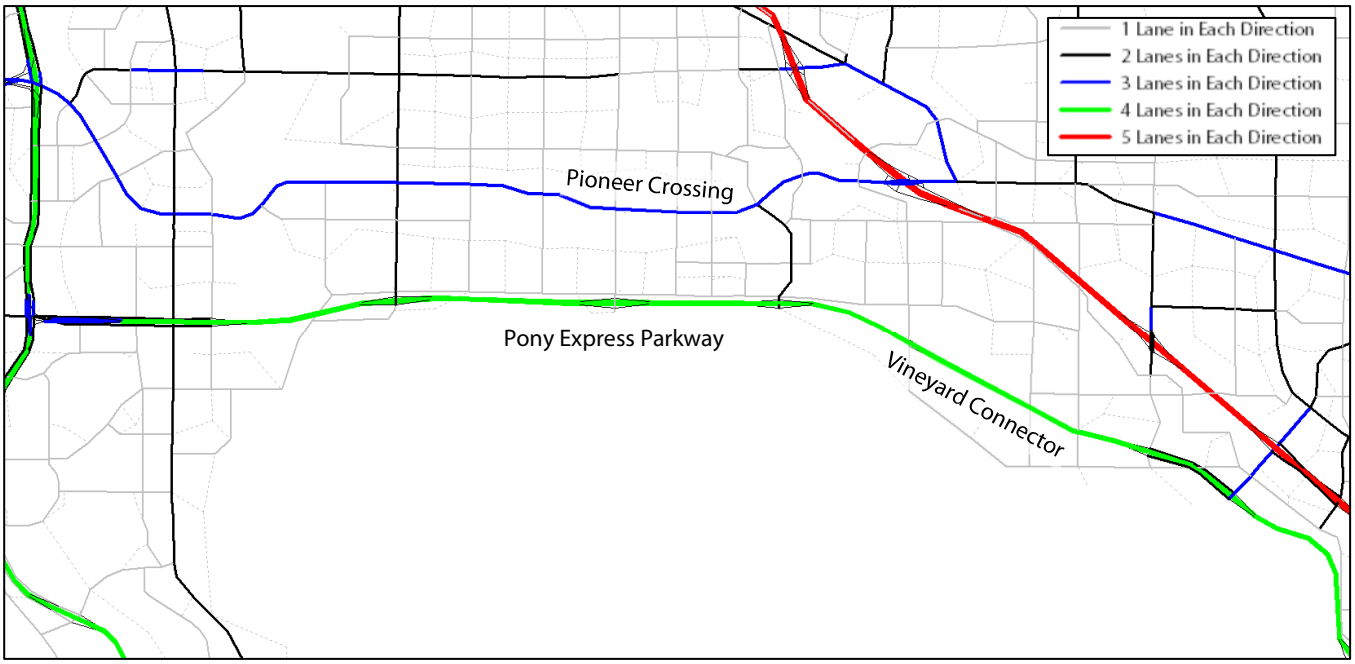


Figure 13. Scenario Options 3.4 Roadway Network – Assumes Freeway to Vineyard Connector

- Scenario options 1.2, 1.4, and 1.8 are the best performing of the Scenario 1 – Travel Demand Management and Transit options with performance that is nearly as good as scenario option 2.4 and equivalent to scenario option 3.4. Each option has identical roadway network assumptions, including Pioneer Crossing as a six-lane expressway, Pony Express Parkway and Vineyard Connector as four-lane arterials, and the Utah Lake Bridge. These options also include the assumption of the 20% work-from-home factor, which is why they are all so competitive in their traffic performance. Their delay would increase by approximately 20% without this factor. Because this work-from-factor is so speculative and largely out of the control of the transportation agencies, it is not recommended that these options be advanced for further study. However, it is important that the region to emphasize and promote travel demand management strategies. They may ultimately be what creates acceptable congestion levels beyond 2050.
- Scenario evaluated three different transit options, one with three additional transit services beyond the RTP, one with one additional serve, and another with no additional transit service. The difference in 2050

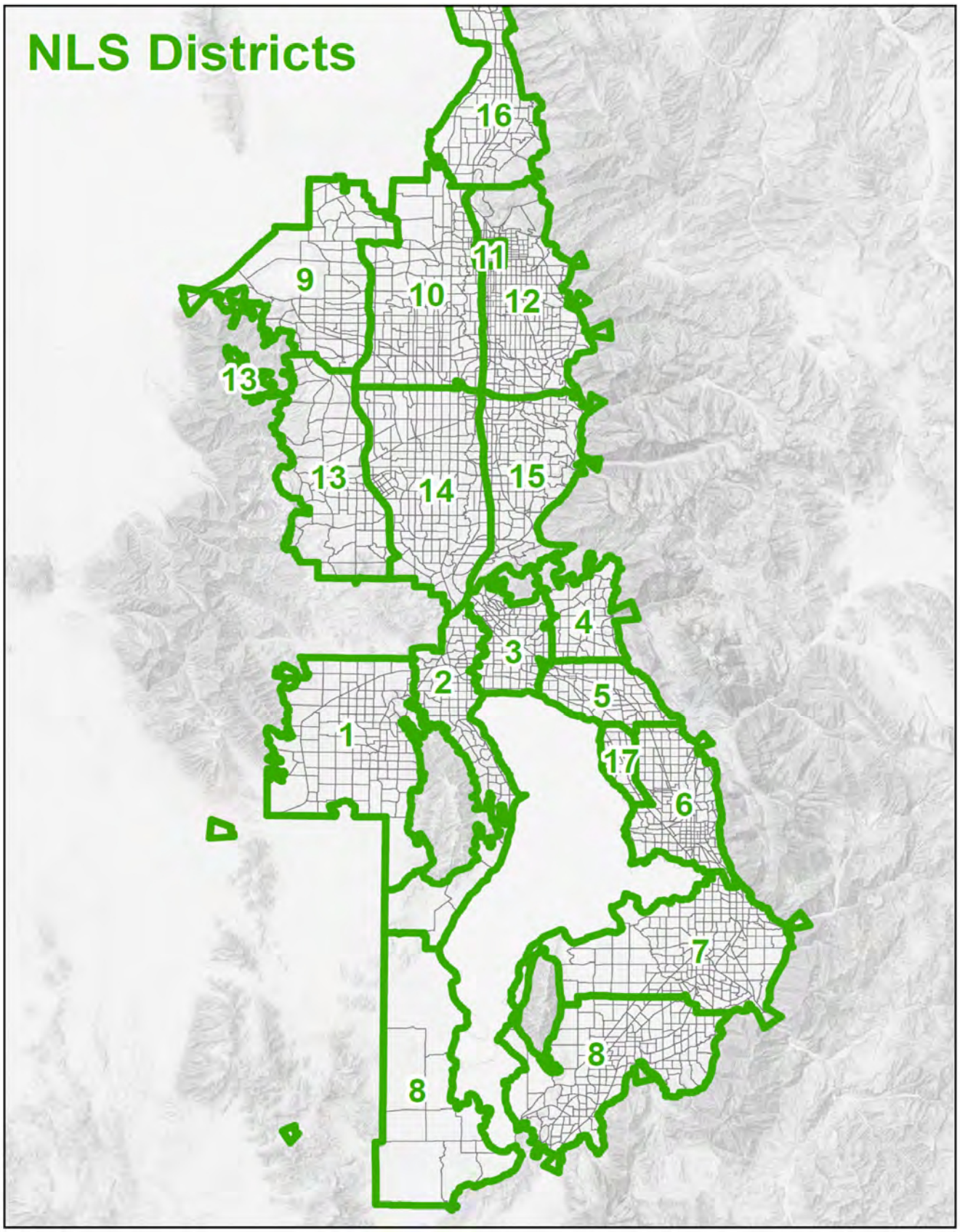
daily study area transit boardings between those three options is less than 4,000. Having three new services result in so few new boardings suggests that high-capacity transit services such as exclusive guideway BRT or light rail are likely not warranted in the short and medium term. Better value can be obtained by providing frequent local bus service and mixed-flow BRT with 15-minute headways. Nevertheless, growth will still occur beyond the horizon year of this study and the time when come when high-capacity transit will be important. It is important to continue plan for the long-term future when high-capacity transit will be warranted.

APPENDIX

Study Districts Map

Travel Time Locations

Detailed Analysis Results


NLS Districts
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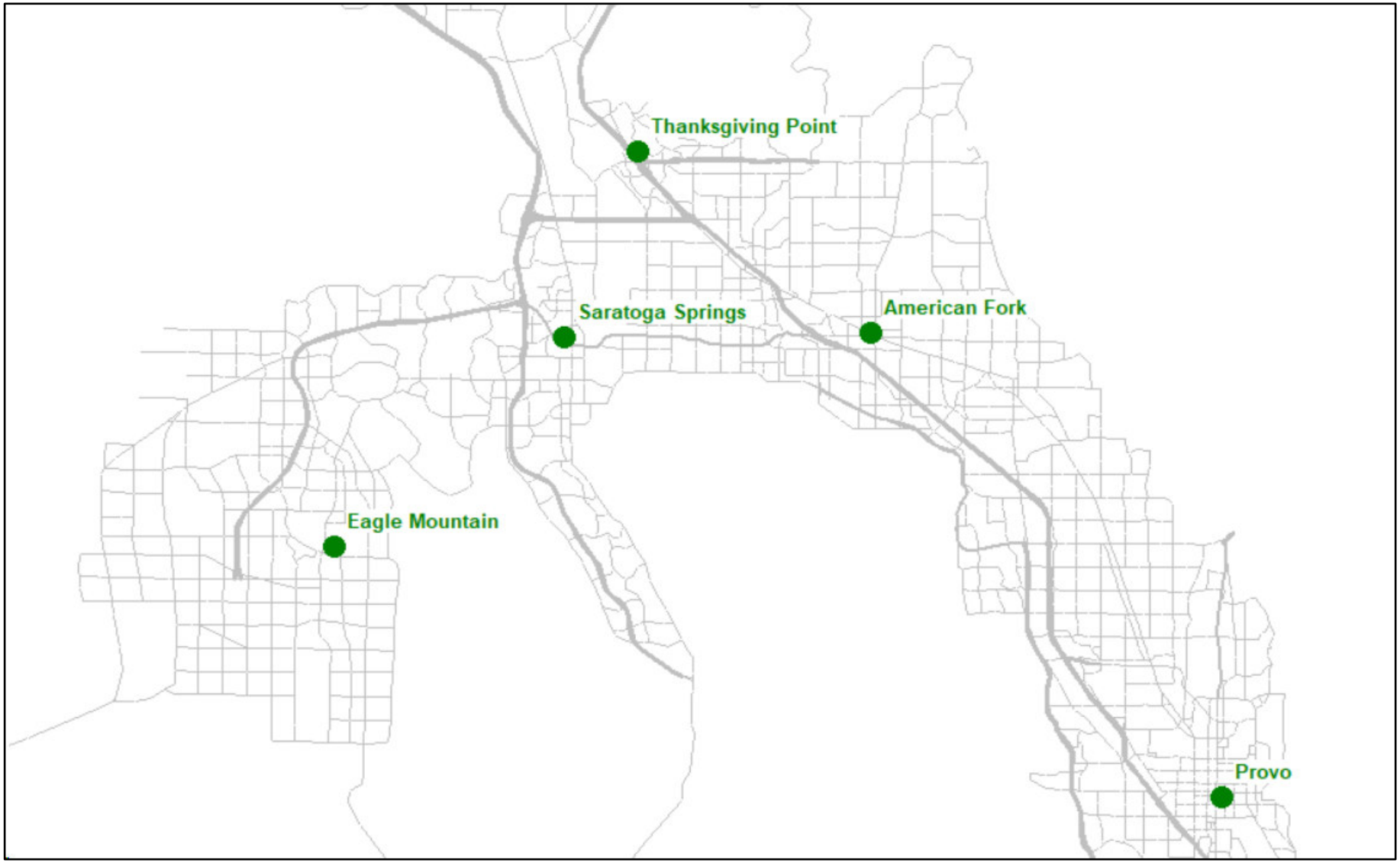
Travel Time Locations



Daily Study Area Delay

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	302	2,167	2,152	1,734	2,030	2,700	2,449	1,757	1,666	1,900	1,744	2,078	2,067	2,074	2,092	2,097	2,126	2,094	2,150	2,108	2,124	2,149
2	Saratoga Springs	2,478	20,567	14,223	9,772	12,332	29,253	14,771	9,802	15,590	19,119	10,109	11,143	11,113	10,791	10,319	10,742	11,914	11,454	11,927	10,942	11,264	11,019
3	Lehi	8,806	26,403	13,217	9,640	11,947	15,863	13,311	9,747	20,228	22,256	9,332	9,849	9,870	10,183	10,279	10,517	13,102	9,623	10,035	10,003	9,959	11,831
4	Alpine-Highland	205	2,312	1,519	904	1,285	1,466	1,395	903	1,155	1,482	895	1,234	1,252	1,137	1,169	1,150	1,240	1,139	1,209	1,221	1,182	1,247
5	AF-PG	4,998	29,347	10,172	7,609	9,325	9,572	13,099	7,552	21,739	25,621	7,547	10,407	10,488	5,658	5,572	5,636	8,300	8,695	8,510	8,301	5,568	8,057
17	Vineyard	832	8,001	6,445	2,815	3,606	5,212	5,607	2,786	6,141	6,878	2,797	3,569	3,539	2,472	2,379	2,368	3,658	4,124	5,571	4,030	2,430	3,971
Total		**17,600**	**88,800**	**47,700**	**32,500**	**40,500**	**64,100**	**50,600**	**32,500**	**66,500**	**77,300**	**32,400**	**38,300**	**38,300**	**32,300**	**31,800**	**32,500**	**40,300**	**37,100**	**39,400**	**36,600**	**32,500**	**38,300**
		Rank	21	16	4	15	18	17	4	19	20	3	10	10	2	1	4	14	9	13	8	4	10

Daily Study Area East-West Delay

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	154	1,513	1,548	1,244	1,457	1,700	1,793	1,262	1,176	1,332	1,250	1,486	1,476	1,474	1,503	1,507	1,514	1,510	1,543	1,512	1,529	1,531
2	Saratoga Springs	1,034	7,478	5,336	3,300	4,019	10,593	7,409	3,367	6,543	6,755	3,663	3,235	3,233	2,769	2,761	2,877	3,669	3,069	3,230	2,997	2,989	3,331
3	Lehi	4,493	18,887	6,971	5,222	6,229	7,838	7,784	5,205	14,475	15,535	4,891	4,196	4,208	4,341	4,323	4,663	7,017	4,043	4,471	4,243	4,346	5,845
4	Alpine-Highland	87	1,385	860	511	728	824	670	509	716	911	506	684	697	597	615	601	667	632	665	669	627	679
5	AF-PG	4,216	23,669	7,918	5,970	7,176	7,410	9,471	5,869	17,135	19,975	5,871	8,175	8,256	4,229	4,166	4,191	6,408	6,446	6,025	5,934	4,040	6,187
17	Vineyard	313	2,774	1,953	872	1,098	1,671	1,980	851	2,362	2,716	855	1,106	1,087	730	723	738	1,135	1,544	1,956	1,436	758	1,284
Total		**10,300**	**55,700**	**24,600**	**17,100**	**20,700**	**30,000**	**29,100**	**17,100**	**42,400**	**47,200**	**17,000**	**18,900**	**19,000**	**14,100**	**14,100**	**14,600**	**20,400**	**17,200**	**17,900**	**16,800**	**14,300**	**18,900**
		Rank	21	16	7	15	18	17	7	19	20	6	11	13	1	1	4	14	9	10	5	3	11

Daily Study Area North-South Delay

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	148	654	603	489	572	1,000	656	495	489	568	494	592	591	599	589	590	611	584	607	596	595	617
2	Saratoga Springs	1,444	13,088	8,887	6,472	8,313	18,660	7,362	6,436	9,048	12,365	6,445	7,907	7,880	8,023	7,559	7,866	8,245	8,385	8,697	7,945	8,275	7,688
3	Lehi	4,313	7,517	6,246	4,418	5,718	8,025	5,526	4,542	5,753	6,721	4,441	5,653	5,662	5,842	5,956	5,854	6,085	5,580	5,563	5,760	5,613	5,985
4	Alpine-Highland	118	927	659	393	557	642	725	393	439	571	389	550	555	540	554	549	572	507	544	552	555	568
5	AF-PG	782	5,678	2,254	1,640	2,149	2,162	3,629	1,683	4,603	5,645	1,676	2,233	2,232	1,429	1,406	1,445	1,892	2,248	2,484	2,367	1,527	1,870
17	Vineyard	520	5,227	4,492	1,943	2,507	3,541	3,627	1,935	3,779	4,162	1,941	2,463	2,452	1,743	1,656	1,630	2,523	2,580	3,615	2,594	1,673	2,688
Total		**7,300**	**33,100**	**23,100**	**15,400**	**19,800**	**34,000**	**21,500**	**15,500**	**24,100**	**30,000**	**15,400**	**19,400**	**19,400**	**18,200**	**17,700**	**17,900**	**19,900**	**19,900**	**21,500**	**19,800**	**18,200**	**19,400**
		Rank	20	17	1	11	21	15	3	18	19	1	8	8	6	4	5	13	13	15	11	6	8

Daily Study Area Surface Street Delay

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	300	1,535	1,564	1,322	1,500	2,224	1,782	1,334	1,224	1,378	1,330	1,451	1,447	1,435	1,504	1,503	1,480	1,546	1,585	1,570	1,567	1,574
2	Saratoga Springs	2,478	10,375	6,532	3,832	4,864	14,277	5,965	4,091	8,997	9,228	4,541	3,739	3,733	3,815	4,119	4,184	4,059	4,630	4,806	4,657	5,513	4,323
3	Lehi	2,139	15,708	5,893	3,690	4,510	7,123	6,471	3,807	13,150	13,450	3,776	3,073	3,080	3,187	3,444	3,390	3,841	3,370	3,509	3,594	3,499	3,691
4	Alpine-Highland	205	2,306	1,514	903	1,282	1,462	1,393	902	1,152	1,479	894	1,232	1,250	1,134	1,166	1,147	1,237	1,137	1,206	1,218	1,179	1,244
5	AF-PG	1,885	14,697	5,357	3,602	4,754	5,116	7,661	3,775	11,070	13,078	3,766	5,236	5,330	2,332	2,342	2,508	2,891	3,825	3,939	3,777	2,339	2,813
17	Vineyard	97	3,716	2,322	1,302	1,790	1,997	2,739	1,337	2,866	3,092	1,342	1,688	1,682	863	859	893	1,199	1,684	1,936	1,798	894	1,407
Total		**7,100**	**48,300**	**23,200**	**14,700**	**18,700**	**32,200**	**26,000**	**15,200**	**38,500**	**41,700**	**15,600**	**16,400**	**16,500**	**12,800**	**13,400**	**13,600**	**14,700**	**16,200**	**17,000**	**16,600**	**15,000**	**15,100**
		Rank	21	16	4	15	18	17	8	19	20	9	11	12	1	2	3	4	10	14	13	6	7

Daily Study Area Freeway Delay

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	2	632	588	412	529	477	667	423	441	522	414	627	620	639	588	595	646	548	565	538	557	574
2	Saratoga Springs	0	10,192	7,691	5,940	7,468	14,976	8,806	5,711	6,593	9,892	5,568	7,404	7,381	6,976	6,200	6,559	7,855	6,824	7,120	6,284	5,751	6,696
3	Lehi	6,667	10,696	7,324	5,951	7,437	8,740	6,840	5,940	7,078	8,806	5,557	6,777	6,789	6,996	6,834	7,127	9,261	6,253	6,526	6,409	6,461	8,140
4	Alpine-Highland	0	7	5	1	3	4	2	1	3	3	1	2	2	3	3	3	2	2	3	3	3	3
5	AF-PG	3,113	14,651	4,815	4,007	4,571	4,456	5,438	3,777	10,669	12,543	3,781	5,171	5,159	3,326	3,230	3,128	5,409	4,869	4,571	4,524	3,229	5,244
17	Vineyard	735	4,285	4,122	1,513	1,816	3,215	2,869	1,449	3,275	3,786	1,455	1,881	1,857	1,609	1,519	1,475	2,459	2,440	3,635	2,233	1,536	2,565
Total		**10,500**	**40,500**	**24,500**	**17,800**	**21,800**	**31,900**	**24,600**	**17,300**	**28,100**	**35,600**	**16,800**	**21,900**	**21,800**	**19,500**	**18,400**	**18,900**	**25,600**	**20,900**	**22,400**	**20,000**	**17,500**	**23,200**
		Rank	21	15	4	10	19	16	2	18	20	1	12	10	7	5	6	17	9	13	8	3	14

Daily Study Area VMT

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	202,613	1,611,656	1,591,931	1,526,538	1,575,227	1,290,621	1,699,003	1,528,690	1,534,641	1,579,958	1,527,484	1,593,951	1,593,823	1,597,894	1,578,328	1,578,248	1,583,611	1,571,226	1,581,188	1,573,255	1,574,161	1,576,004
2	Saratoga Springs	694,470	3,457,938	4,049,179	3,637,894	3,773,604	4,989,245	4,272,687	3,650,258	3,264,425	3,365,997	3,903,701	3,924,814	3,925,605	3,747,889	3,808,603	3,820,147	3,417,389	3,847,707	4,140,812	3,869,255	3,836,426	3,397,074
3	Lehi	1,866,554	3,667,588	3,362,103	3,463,993	3,571,746	3,471,813	3,444,569	3,465,393	3,407,343	3,498,487	3,209,852	3,366,607	3,366,267	3,437,272	3,432,365	3,433,596	3,613,873	3,410,064	3,127,063	3,404,411	3,430,287	3,628,668
4	Alpine-Highland	346,262	525,607	497,038	462,122	485,842	492,386	526,298	465,657	480,731	498,196	465,463	485,357	485,582	477,131	480,221	480,542	482,527	481,594	480,479	481,757	478,152	483,887
5	AF-PG	1,969,472	3,444,433	2,889,604	2,842,160	2,925,120	2,845,339	2,984,389	2,842,830	3,127,561	3,207,713	2,842,162	3,007,825	3,008,021	3,092,763	3,072,271	3,075,231	3,346,824	3,055,190	2,990,957	3,060,666	3,028,508	3,280,353
17	Vineyard	743,481	1,791,767	2,077,361	1,576,917	1,629,678	2,103,728	2,176,963	1,576,808	1,622,516	1,660,660	1,576,739	1,638,746	1,637,747	1,784,356	1,758,689	1,753,317	1,881,659	1,645,612	2,112,347	1,639,183	1,760,687	1,930,134
Total		**5,820,000**	**14,500,000**	**14,470,000**	**13,510,000**	**13,960,000**	**15,190,000**	**15,100,000**	**13,530,000**	**13,440,000**	**13,810,000**	**13,530,000**	**14,020,000**	**14,020,000**	**14,140,000**	**14,130,000**	**14,140,000**	**14,330,000**	**14,010,000**	**14,430,000**	**14,030,000**	**14,110,000**	**14,300,000**
		Rank	19	18	2	6	21	20	3	1	5	3	8	8	13	12	13	16	7	17	10	11	15

Daily Study Area East-West VMT

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	85,697	854,391	853,880	818,338	844,903	683,090	918,291	819,601	813,992	837,832	818,939	852,176	852,021	853,382	845,311	844,974	843,636	842,518	847,652	843,123	844,243	841,441
2	Saratoga Springs	313,373	1,381,347	1,964,497	1,627,082	1,686,223	2,360,842	2,094,178	1,632,999	1,286,567	1,325,638	1,886,810	1,873,249	1,873,078	1,758,915	1,809,532	1,816,113	1,383,955	1,840,207	2,079,737	1,850,999	1,834,007	1,403,593
3	Lehi	1,056,390	2,236,338	1,957,917	2,119,901	2,186,230	2,003,408	2,001,629	2,118,032	2,055,533	2,105,153	1,863,086	2,001,666	2,001,057	2,064,906	2,053,326	2,055,154	2,235,553	2,021,810	1,754,717	2,014,305	2,038,573	2,235,338
4	Alpine-Highland	141,057	247,691	229,753	212,814	224,095	227,761	233,964	214,795	226,634	235,232	214,675	220,816	220,905	214,372	215,612	216,019	218,221	219,265	219,931	220,298	216,482	220,072
5	AF-PG	1,565,064	2,787,369	2,299,755	2,280,757	2,340,955	2,254,606	2,331,760	2,276,380	2,538,884	2,599,856	2,276,066	2,421,445	2,420,919	2,444,432	2,427,414	2,423,167	2,648,560	2,448,741	2,372,274	2,442,724	2,402,686	2,616,947
17	Vineyard	171,280	375,002	485,054	353,856	363,350	539,395	552,964	353,823	342,092	348,309	353,849	363,994	363,771	427,105	424,021	422,909	433,001	365,492	529,652	366,342	431,786	458,614
Total		**3,330,000**	**7,880,000**	**7,790,000**	**7,410,000**	**7,650,000**	**8,070,000**	**8,130,000**	**7,420,000**	**7,260,000**	**7,450,000**	**7,410,000**	**7,730,000**	**7,730,000**	**7,760,000**	**7,780,000**	**7,780,000**	**7,760,000**	**7,740,000**	**7,800,000**	**7,740,000**	**7,770,000**	**7,780,000**
		Rank	19	17	2	6	20	21	4	1	5	2	7	7	11	14	14	11	9	18	9	13	14

Daily Study Area North-South VMT

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	116,916	757,265	738,052	708,200	730,324	607,531	780,712	709,089	720,649	742,126	708,544	741,775	741,803	744,513	733,017	733,275	739,975	728,708	733,536	730,132	729,918	734,563
2	Saratoga Springs	381,097	2,076,591	2,084,681	2,010,812	2,087,382	2,628,403	2,178,509	2,017,259	1,977,858	2,040,359	2,016,891	2,051,565	2,052,527	1,988,974	1,999,071	2,004,034	2,033,434	2,007,500	2,061,075	2,018,256	2,002,419	1,993,481
3	Lehi	810,163	1,431,250	1,404,186	1,344,092	1,385,515	1,468,405	1,442,940	1,347,361	1,351,810	1,393,334	1,346,767	1,364,941	1,365,210	1,372,366	1,379,039	1,378,442	1,378,320	1,388,254	1,372,346	1,390,106	1,391,714	1,393,330
4	Alpine-Highland	205,205	277,916	267,285	249,308	261,746	264,625	292,333	250,862	254,097	262,964	250,789	264,541	264,677	262,758	264,609	264,523	264,306	262,329	260,549	261,459	261,670	263,815
5	AF-PG	404,408	657,064	589,850	561,404	584,165	590,733	652,630	566,450	588,677	607,857	566,096	586,380	587,102	648,331	644,857	652,064	698,265	606,449	618,683	617,942	625,822	663,406
17	Vineyard	572,201	1,416,765	1,592,307	1,223,061	1,266,327	1,564,333	1,624,000	1,222,985	1,280,424	1,312,351	1,222,891	1,274,752	1,273,976	1,357,251	1,334,667	1,330,409	1,448,658	1,280,120	1,582,696	1,272,841	1,328,901	1,471,520
Total		**2,490,000**	**6,620,000**	**6,680,000**	**6,100,000**	**6,320,000**	**7,120,000**	**6,970,000**	**6,110,000**	**6,170,000**	**6,360,000**	**6,110,000**	**6,280,000**	**6,290,000**	**6,370,000**	**6,360,000**	**6,360,000**	**6,560,000**	**6,270,000**	**6,630,000**	**6,290,000**	**6,340,000**	**6,520,000**
		Rank	17	19	1	9	21	20	2	4	11	2	6	7	14	11	11	16	5	18	7	10	15

Daily Study Area Surface Street VMT

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	201,797	1,028,119	1,030,964	997,118	1,024,629	794,722	1,092,504	998,630	985,882	1,013,360	998,151	1,021,372	1,021,481	1,020,127	1,019,277	1,019,661	1,012,275	1,026,874	1,030,132	1,027,898	1,028,139	1,023,267
2	Saratoga Springs	694,470	1,475,456	1,293,904	1,205,287	1,253,721	1,626,753	1,338,809	1,216,395	1,348,802	1,387,905	1,218,875	1,098,726	1,100,744	1,090,303	1,129,572	1,136,234	1,151,996	1,164,482	1,216,364	1,172,787	1,164,574	1,184,720
3	Lehi	705,183	1,450,829	1,262,271	1,143,210	1,192,493	1,316,624	1,282,662	1,162,791	1,276,220	1,314,314	1,163,179	929,770	930,154	910,793	921,338	913,886	926,086	979,259	1,055,522	1,055,296	981,321	1,009,128
4	Alpine-Highland	344,954	523,571	495,120	460,339	483,968	490,484	524,419	463,875	478,802	496,237	463,691	483,562	483,780	475,337	478,413	478,697	480,733	479,778	478,630	479,906	476,328	482,062
5	AF-PG	729,102	1,465,072	1,234,328	1,145,903	1,196,102	1,225,977	1,318,964	1,166,290	1,184,420	1,225,611	1,165,854	1,182,533	1,183,869	960,582	963,571	968,707	987,318	1,092,629	1,101,236	1,095,204	981,404	1,005,665
17	Vineyard	136,313	453,847	424,777	365,718	385,177	406,763	445,732	371,425	360,618	370,923	371,367	380,842	380,836	333,674	333,589	334,514	345,830	383,142	404,119	387,458	337,475	363,268
Total		**2,810,000**	**6,400,000**	**5,740,000**	**5,320,000**	**5,540,000**	**5,860,000**	**6,000,000**	**5,380,000**	**5,630,000**	**5,810,000**	**5,380,000**	**5,100,000**	**5,100,000**	**4,790,000**	**4,850,000**	**4,850,000**	**4,900,000**	**5,130,000**	**5,290,000**	**5,220,000**	**4,970,000**	**5,070,000**
		Rank	21	17	12	15	19	20	13	16	18	13	7	7	1	2	2	4	9	11	10	5	6

Daily Study Area Freeway VMT

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	816	583,537	560,967	529,420	550,597	495,899	606,499	530,060	548,759	566,597	529,333	572,579	572,343	577,767	559,050	558,587	571,336	544,352	551,056	545,357	546,022	552,737
2	Saratoga Springs	0	1,982,482	2,755,275	2,432,607	2,519,884	3,362,492	2,933,878	2,433,862	1,915,624	1,978,092	2,684,826	2,826,088	2,824,861	2,657,586	2,679,031	2,683,913	2,265,393	2,683,225	2,924,447	2,696,468	2,671,852	2,212,354
3	Lehi	1,161,370	2,216,759	2,099,832	2,320,782	2,379,252	2,155,189	2,161,907	2,302,602	2,131,123	2,184,173	2,046,674	2,436,837	2,436,113	2,526,479	2,511,027	2,519,710	2,687,787	2,430,805	2,071,541	2,349,115	2,448,966	2,619,540
4	Alpine-Highland	1,308	2,036	1,918	1,784	1,873	1,902	1,879	1,782	1,929	1,958	1,773	1,795	1,802	1,794	1,808	1,846	1,794	1,816	1,849	1,851	1,824	1,825
5	AF-PG	1,240,370	1,979,361	1,655,276	1,696,258	1,729,018	1,619,362	1,665,426	1,676,540	1,943,141	1,982,102	1,676,308	1,825,292	1,824,153	2,132,182	2,108,700	2,106,523	2,359,506	1,962,562	1,889,721	1,965,463	2,047,104	2,274,688
17	Vineyard	607,168	1,337,919	1,652,584	1,211,199	1,244,501	1,696,964	1,731,232	1,205,383	1,261,898	1,289,737	1,205,372	1,257,904	1,256,911	1,450,682	1,425,099	1,418,803	1,535,829	1,262,471	1,708,228	1,251,724	1,423,212	1,566,865
Total		**3,010,000**	**8,100,000**	**8,730,000**	**8,190,000**	**8,430,000**	**9,330,000**	**9,100,000**	**8,150,000**	**7,800,000**	**8,000,000**	**8,140,000**	**8,920,000**	**8,920,000**	**9,350,000**	**9,280,000**	**9,290,000**	**9,420,000**	**8,890,000**	**9,150,000**	**8,810,000**	**9,140,000**	**9,230,000**
		Rank	3	8	6	7	19	13	5	1	2	4	11	11	20	17	18	21	10	15	9	14	16

Daily Jordan River Screenline Volume

District	District Name	Direction	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Clubhouse Drive	WB	--	13,500	12,860	12,818	13,033	14,353	14,073	12,652	13,141	13,312	12,666	12,807	12,755	12,782	12,721	12,646	12,951	12,726	12,878	12,712	12,782	12,869
2	Clubhouse Drive	EB	--	12,519	12,297	11,865	12,055	13,396	13,388	11,978	12,244	12,563	11,980	11,888	11,885	11,912	11,926	12,066	12,017	12,005	11,990	11,994	12,093	11,969
3	2100 North FR	WB	21,021	8,993	7,115	6,711	7,043	9,735	6,356	6,788	8,572	8,849	6,732	6,514	6,577	6,627	6,738	6,896	6,913	6,965	6,793	6,879	6,962	6,877
4	2100 North FR	EB	20,940	12,694	10,793	10,367	10,425	11,714	11,630	10,841	12,211	12,406	10,706	9,798	9,784	10,015	9,810	10,172	10,376	10,061	10,127	10,102	10,126	10,394
5	2100 North Fwy	WB	--	80,317	68,853	70,040	71,503	77,800	76,010	68,620	78,638	81,588	68,566	63,560	63,567	62,453	61,440	61,463	63,510	64,260	66,789	64,741	64,876	65,502
6	2100 North Fwy	EB	--	78,333	65,436	65,724	66,740	76,176	68,789	64,117	77,318	80,193	64,138	58,366	58,251	55,842	56,524	56,469	59,899	59,275	60,049	59,516	58,680	61,060
7	1500 North	WB	1,675	7,128	5,649	5,049	5,363	7,776	6,325	5,107	7,036	6,822	5,153	4,636	4,673	4,721	4,691	4,824	5,021	4,810	5,052	4,955	4,802	5,076
8	1500 North	EB	828	6,438	5,175	4,822	4,888	6,708	5,916	4,831	5,838	6,315	5,040	4,405	4,399	4,482	4,522	4,498	4,538	4,683	4,777	4,721	4,776	4,681
9	900 North	WB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10	900 North	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11	Lehi Main Street	WB	8,323	20,215	17,124	16,869	17,628	20,737	18,521	17,328	18,521	20,182	17,286	11,782	11,771	12,310	12,002	12,218	13,073	14,391	15,401	15,029	14,531	15,119
12	Lehi Main Street	EB	8,453	19,964	16,454	16,438	16,867	19,811	18,151	16,933	20,154	18,801	17,011	11,505	11,479	12,128	12,066	12,235	13,043	14,291	15,086	14,665	14,578	14,944
13	Pioneer Crossing - Arterial	WB	21,872	37,609	28,686	20,573	21,557	26,522	22,410	20,955	35,907	35,979	20,939	--	--	--	--	--	--	6,684	16,246	9,725	6,832	8,640
14	Pioneer Crossing - Arterial	EB	21,173	35,902	28,221	21,132	21,764	26,725	23,569	21,455	35,660	35,349	21,467	--	--	--	--	--	--	6,939	15,288	9,502	7,183	8,340
15	Pioneer Crossing - Fwy	WB	--	--	--	--	--	--	--	--	--	--	--	52,260	52,102	61,615	62,943	63,512	82,716	--	--	--	--	--
16	Pioneer Crossing - Fwy	EB	--	--	--	--	--	--	--	--	--	--	--	51,691	51,623	63,443	61,448	61,712	83,991	--	--	--	--	--
17	Pony Express - Arterial	WB	4,017	26,139	17,339	17,908	18,444	19,542	18,707	18,115	14,007	13,396	18,093	11,845	11,842	10,004	8,830	7,944	8,965	4,829	8,771	6,461	4,846	5,281
18	Pony Express - Arterial	EB	4,373	25,993	17,064	17,470	17,923	18,645	18,464	17,757	12,288	14,782	17,707	10,901	10,909	9,310	8,538	7,842	8,782	4,621	8,361	6,343	4,758	5,132
19	Pony Express - Fwy	WB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50,709	--	43,962	52,568	75,157
20	Pony Express - Fwy	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	54,834	--	47,256	53,458	77,862
21	Pony Express - Fwy (Lake)	WB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	34,270	--	--	--
22	Pony Express - Fwy (Lake)	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	39,197	--	--	--
23	Utah Lake Bridge	WB	--	--	41,251	39,425	41,538	50,988	45,963	39,425	--	--	39,417	35,577	35,529	29,562	30,383	30,480	--	33,593	34,471	34,266	32,079	--
24	Utah Lake Bridge	EB	--	--	44,048	42,046	43,970	52,613	49,217	42,732	--	--	42,699	39,768	39,728	32,321	34,858	35,066	--	33,670	34,506	35,081	34,626	--
Total			**112,675**	**385,744**	**398,365**	**379,257**	**390,741**	**453,241**	**417,489**	**379,634**	**351,535**	**360,537**	**379,600**	**397,303**	**396,874**	**399,527**	**399,440**	**400,043**	**385,795**	**399,346**	**400,052**	**397,910**	**400,556**	**388,903**

PM Jordan River Screenline V/C Ratio

District	District Name	Direction	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Clubhouse Drive	WB	--	1.49	1.27	1.24	1.27	1.24	1.48	1.19	1.38	1.41	1.20	1.19	1.16	1.18	1.16	1.15	1.25	1.18	1.21	1.16	1.18	1.23
2	Clubhouse Drive	EB	--	1.17	1.16	1.04	1.06	1.19	1.11	1.06	1.12	1.13	1.07	1.03	1.04	1.04	1.03	1.08	1.06	1.06	1.05	1.05	1.13	1.04
3	2100 North FR	WB	1.03	0.65	0.41	0.37	0.40	0.50	0.41	0.38	0.62	0.63	0.37	0.33	0.34	0.35	0.36	0.38	0.39	0.40	0.37	0.39	0.41	0.38
4	2100 North FR	EB	0.69	0.67	0.55	0.54	0.52	0.62	0.62	0.55	0.63	0.63	0.53	0.44	0.44	0.48	0.47	0.51	0.56	0.47	0.48	0.47	0.50	0.51
5	2100 North Fwy	WB	--	1.02	0.90	0.87	0.90	0.94	0.92	0.87	0.95	1.02	0.87	0.85	0.85	0.85	0.83	0.84	0.90	0.85	0.86	0.84	0.84	0.88
6	2100 North Fwy	EB	--	0.85	0.66	0.59	0.64	0.79	0.51	0.60	0.80	0.81	0.59	0.58	0.58	0.53	0.54	0.56	0.63	0.55	0.53	0.54	0.53	0.61
7	1500 North	WB	0.59	1.27	0.88	0.79	0.82	0.98	1.03	0.74	1.38	1.18	0.77	0.60	0.61	0.62	0.61	0.65	0.76	0.62	0.70	0.66	0.62	0.72
8	1500 North	EB	0.13	0.89	0.78	0.76	0.71	0.98	0.74	0.67	0.85	0.76	0.76	0.63	0.62	0.67	0.69	0.68	0.69	0.71	0.73	0.70	0.77	0.69
9	900 North	WB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10	900 North	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11	Lehi Main Street	WB	0.90	1.24	0.94	0.81	0.87	1.01	0.99	0.84	1.01	1.27	0.83	0.60	0.60	0.64	0.59	0.64	0.79	0.68	0.74	0.70	0.67	0.72
12	Lehi Main Street	EB	0.64	1.10	0.89	0.83	0.87	1.04	0.88	0.84	0.97	0.88	0.85	0.66	0.66	0.72	0.76	0.78	0.84	0.82	0.80	0.81	0.84	0.83
13	Pioneer Crossing - Arterial	WB	0.97	1.49	1.11	0.88	0.93	1.06	1.02	0.89	1.25	1.25	0.89	--	--	--	--	--	--	0.27	0.74	0.45	0.29	0.51
14	Pioneer Crossing - Arterial	EB	0.66	1.26	0.98	0.75	0.77	1.01	0.81	0.75	1.22	1.14	0.75	--	--	--	--	--	--	0.31	0.57	0.41	0.34	0.44
15	Pioneer Crossing - Fwy	WB	--	--	--	--	--	--	--	--	--	--	--	0.66	0.66	0.77	0.80	0.82	0.97	--	--	--	--	--
16	Pioneer Crossing - Fwy	EB	--	--	--	--	--	--	--	--	--	--	--	0.51	0.51	0.71	0.69	0.70	0.86	--	--	--	--	--
17	Pony Express - Arterial	WB	1.06	1.48	1.14	0.96	1.02	1.16	1.09	0.97	2.64	2.04	0.97	0.75	0.75	0.61	0.54	1.01	1.30	0.57	0.91	0.66	0.57	0.73
18	Pony Express - Arterial	EB	0.37	1.28	0.85	0.77	0.78	0.93	0.83	0.77	1.61	2.43	0.76	0.55	0.54	0.46	0.43	0.87	1.04	0.42	0.63	0.50	0.43	0.53
19	Pony Express - Fwy	WB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.68	--	0.62	0.73	0.91
20	Pony Express - Fwy	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.57	--	0.53	0.63	0.82
21	Pony Express - Fwy (Lake)	WB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.48	--	--	--
22	Pony Express - Fwy (Lake)	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.48	--	--	--
23	Utah Lake Bridge	WB	--	--	0.87	0.79	0.84	0.96	0.99	0.80	--	--	0.80	0.75	0.74	0.63	0.65	0.65	--	0.67	0.68	0.66	0.62	--
24	Utah Lake Bridge	EB	--	--	0.85	0.80	0.82	0.85	0.79	0.80	--	--	0.80	0.81	0.81	0.61	0.61	0.60	--	0.69	0.67	0.67	0.59	--
Total			**0.76**	**1.05**	**0.84**	**0.76**	**0.80**	**0.91**	**0.82**	**0.76**	**0.99**	**1.02**	**0.76**	**0.66**	**0.66**	**0.67**	**0.67**	**0.70**	**0.82**	**0.63**	**0.63**	**0.62**	**0.63**	**0.74**
			Rank	21	17	11	14	18	15	11	19	20	11	5	5	7	7	9	15	2	2	1	2	10

Travel Time Index (Peak Travel Time Divided by Free Flow Travel Time)

#	Between	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	EM-Thnksgvg Pt	1.3	1.8	1.5	1.4	1.5	1.6	1.6	1.4	1.5	1.8	1.4	1.5	1.5	1.5	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5
2	EM-Am Fork	1.4	2.0	1.5	1.4	1.5	1.6	1.6	1.4	1.7	2.0	1.4	1.3	1.3	1.2	1.2	1.3	1.4	1.2	1.5	1.3	1.3	1.3
3	EM-Provo	1.4	1.9	1.3	1.2	1.2	1.3	1.4	1.2	1.6	1.8	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.1	1.1	1.3
4	SS-Thnksgvg Pt	1.3	1.6	1.4	1.3	1.4	1.6	1.5	1.3	1.4	1.6	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.3	1.4	1.4	1.4	1.3
5	SS-Am Fork	1.4	2.3	1.5	1.2	1.3	1.4	1.4	1.2	1.9	2.2	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.1	1.3	1.1	1.1	1.1
6	SS-Provo	1.4	2.1	1.4	1.2	1.3	1.5	1.4	1.2	1.8	1.8	1.2	1.4	1.4	1.2	1.2	1.2	1.5	1.2	1.3	1.2	1.2	1.3
Total		**1.7**	**2.4**	**1.7**	**1.6**	**1.7**	**1.8**	**1.8**	**1.6**	**2.0**	**2.3**	**1.6**	**1.6**	**1.6**	**1.5**	**1.5**	**1.5**	**1.7**	**1.5**	**1.7**	**1.5**	**1.5**	**1.6**
		Rank	21	16	9	13	17	18	11	19	20	7	8	10	6	2	3	15	1	14	4	4	12

PM Travel Times

#	Between	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	EM-Thnksgvg Pt	34	43	35	33	35	40	38	34	35	41	33	34	34	35	34	35	35	35	36	34	34	35
2	EM-Am Fork	36	51	38	36	38	43	42	36	43	50	36	30	30	29	29	30	34	31	39	34	34	33
3	EM-Provo	56	70	47	41	43	49	55	41	59	66	41	42	42	41	41	41	48	41	43	41	41	48
4	SS-Thnksgvg Pt	18	25	22	20	22	25	23	21	22	25	21	20	20	21	21	21	22	21	22	22	22	21
5	SS-Am Fork	19	33	22	20	21	23	22	20	27	32	20	16	16	16	16	16	19	17	22	18	18	18
6	SS-Provo	39	57	38	34	36	41	43	34	50	51	34	34	34	31	30	30	36	32	36	32	32	37
Total		**201**	**280**	**202**	**186**	**194**	**221**	**222**	**186**	**235**	**265**	**184**	**177**	**177**	**171**	**170**	**172**	**193**	**177**	**197**	**180**	**180**	**192**
		Rank	21	16	10	14	17	18	11	19	20	9	4	6	2	1	3	13	5	15	7	7	12

Free Flow Travel Times

#	Between	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	EM-Thnksgvg Pt	26	23	23	23	23	25	25	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
2	EM-Am Fork	26	26	26	26	26	27	27	26	26	26	26	24	24	24	24	24	24	26	26	26	26	26
3	EM-Provo	39	37	37	35	35	37	38	35	37	37	35	35	35	35	35	35	36	35	35	35	35	37
4	SS-Thnksgvg Pt	14	16	16	16	16	16	16	16	16	16	16	15	15	15	16	16	16	16	16	16	16	16
5	SS-Am Fork	14	15	15	16	16	17	16	16	15	15	16	13	13	13	13	13	13	16	16	16	16	16
6	SS-Provo	27	28	28	28	28	28	30	28	28	28	28	25	25	25	25	25	25	26	28	26	27	28
Total		**117**	**116**	**116**	**116**	**116**	**121**	**121**	**116**	**116**	**116**	**116**	**111**	**111**	**111**	**112**	**112**	**112**	**116**	**116**	**116**	**116**	**118**

Work Trips Transit Shares

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	0.42	0.36	0.36	1.01	0.99	1.58	0.88	0.16	1.14	1.14	0.56	0.48	0.50	0.55	0.52	0.52	0.48	0.49	0.45	0.43	0.46	0.46
2	Saratoga Springs	0.50	1.27	1.27	2.29	2.24	3.13	1.98	0.97	2.68	2.66	1.22	1.08	1.15	1.19	1.20	1.20	1.19	1.20	1.12	1.17	1.22	1.24
3	Lehi	1.35	3.44	3.44	3.53	3.48	3.63	3.64	3.31	3.79	3.78	3.40	3.33	3.35	3.36	3.36	3.36	3.36	3.34	3.35	3.34	3.35	3.36
4	Alpine-Highland	0.36	0.77	0.77	0.80	0.79	0.82	0.54	0.79	0.82	0.82	0.79	0.78	0.78	0.78	0.78	0.78	0.79	0.78	0.78	0.78	0.78	0.78
5	AF-PG	0.80	3.07	3.07	3.29	3.26	4.27	3.08	3.10	3.56	3.54	3.12	3.05	3.22	3.20	3.20	3.20	3.24	3.21	3.22	3.23	3.21	3.23
17	Vineyard	1.84	6.86	6.86	6.35	6.41	6.63	5.56	6.29	7.98	8.07	6.32	6.33	6.35	6.78	6.79	6.79	6.94	6.30	6.26	6.30	6.79	6.95
Study Area Total		**1.05**	**2.67**	**2.67**	**2.94**	**2.92**	**3.31**	**2.74**	**2.53**	**3.34**	**3.33**	**2.62**	**2.58**	**2.63**	**2.69**	**2.69**	**2.69**	**2.72**	**2.62**	**2.60**	**2.61**	**2.69**	**2.73**
		Rank	13	13	4	5	3	6	23	1	2	18	22	17	9	9	9	8	18	21	20	9	7

All Trips Transit Shares

District	District Name	2019	MTP	MTPb	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	0.18	0.16	0.16	0.48	0.50	0.83	0.48	0.06	0.54	0.56	0.27	0.26	0.26	0.29	0.27	0.27	0.27	0.27	0.24	0.24	0.26	0.26
2	Saratoga Springs	0.20	0.60	0.60	1.01	1.02	1.39	0.99	0.42	1.25	1.29	0.56	0.51	0.53	0.55	0.56	0.56	0.58	0.55	0.51	0.53	0.55	0.60
3	Lehi	0.59	1.57	1.57	1.52	1.56	1.59	1.68	1.41	1.61	1.66	1.46	1.47	1.50	1.50	1.50	1.50	1.50	1.48	1.50	1.48	1.48	1.50
4	Alpine-Highland	0.26	0.43	0.43	0.43	0.44	0.43	0.39	0.42	0.45	0.45	0.43	0.44	0.43	0.43	0.43	0.43	0.43	0.43	0.44	0.44	0.43	0.43
5	AF-PG	0.40	1.39	1.39	1.40	1.43	1.73	1.43	1.33	1.48	1.52	1.33	1.36	1.42	1.41	1.41	1.41	1.42	1.41	1.42	1.42	1.41	1.42
17	Vineyard	1.22	2.94	2.94	2.69	2.80	2.87	2.63	2.67	3.18	3.31	2.68	2.77	2.78	2.91	2.92	2.92	2.96	2.76	2.75	2.76	2.92	2.97
Study Area Total		**0.52**	**1.14**	**1.14**	**1.22**	**1.26**	**1.38**	**1.25**	**1.05**	**1.36**	**1.40**	**1.09**	**1.10**	**1.13**	**1.15**	**1.15**	**1.15**	**1.16**	**1.13**	**1.12**	**1.12**	**1.14**	**1.16**
		Rank	12	12	6	4	2	5	23	3	1	21	20	16	9	9	9	7	16	18	18	12	7

Total Transit Boardings

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	30	471	471	1,120	1,140	2,130	1,260	310	1,210	1,250	740	690	680	770	760	760	770	760	750	750	760	760
2	Saratoga Springs	73	2,320	2,320	4,060	4,180	8,000	4,430	1,900	4,710	4,870	2,360	2,050	2,150	2,230	2,240	2,240	2,250	2,210	2,290	2,270	2,280	2,270
3	Lehi	1,489	8,861	8,861	8,640	8,970	9,930	9,970	8,130	9,150	9,540	8,670	8,530	8,540	8,570	8,590	8,580	8,690	8,450	8,470	8,480	8,490	8,580
4	Alpine-Highland	65	168	168	170	170	170	190	170	170	180	170	170	170	170	170	170	170	170	170	170	170	170
5	AF-PG	1,566	8,095	8,095	7,280	7,520	8,920	8,190	7,040	7,570	7,870	7,050	7,390	7,760	7,800	7,800	7,800	7,780	7,790	7,760	7,710	7,720	7,850
17	Vineyard	2,115	9,850	9,850	9,540	9,840	10,130	10,360	9,450	10,410	10,800	9,490	9,760	9,820	9,830	9,840	9,840	10,000	9,780	9,720	9,730	9,770	10,020
Study Area Total		**5,338**	**29,765**	**29,765**	**30,810**	**31,830**	**39,280**	**34,400**	**27,000**	**33,230**	**34,510**	**28,480**	**28,590**	**29,110**	**29,380**	**29,400**	**29,390**	**29,650**	**29,160**	**29,150**	**29,110**	**29,170**	**29,650**
		Rank	7	7	6	5	1	3	23	4	2	22	21	19	14	12	13	10	17	18	19	16	10

Local Bus Boardings

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	30	299	299	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
2	Saratoga Springs	73	1,473	1,473	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470	1,470
3	Lehi	564	3,214	3,214	3,230	3,280	3,330	3,470	3,180	3,320	3,360	3,230	3,250	3,230	3,230	3,230	3,230	3,240	3,220	3,230	3,230	3,230	3,240
4	Alpine-Highland	65	168	168	170	170	170	190	170	170	180	170	170	170	170	170	170	170	170	170	170	170	170
5	AF-PG	990	1,888	1,888	1,950	1,990	2,030	2,170	1,920	1,970	2,010	1,930	1,960	1,990	1,980	1,980	1,980	1,980	1,950	1,990	1,990	1,980	1,980
17	Vineyard	143	1,307	1,307	1,410	1,450	1,480	1,750	1,410	1,350	1,400	1,410	1,450	1,460	1,320	1,320	1,320	1,330	1,450	1,450	1,450	1,320	1,330
Study Area Total		**1,865**	**8,350**	**8,350**	**8,530**	**8,660**	**8,790**	**9,350**	**8,450**	**8,590**	**8,720**	**8,500**	**8,600**	**8,610**	**8,470**	**8,470**	**8,470**	**8,500**	**8,570**	**8,610**	**8,620**	**8,470**	**8,490**

BRT Boardings

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	0	159	159	300	310	620	360	0	350	360	0	380	360	460	450	450	460	450	440	450	450	440
2	Saratoga Springs	0	1,041	1,041	1,050	1,090	2,220	1,300	620	1,120	1,160	670	770	870	950	960	960	970	930	1,010	930	930	1,000
3	Lehi	0	1,234	1,234	940	1,000	1,320	1,300	830	1,060	1,140	860	970	980	1,020	1,020	1,010	1,010	950	1,010	950	950	960
4	Alpine-Highland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	AF-PG	0	2,555	2,555	1,990	2,070	2,230	2,650	1,880	2,090	2,190	1,880	1,910	2,070	2,120	2,110	2,120	2,140	2,120	2,160	2,120	2,120	2,120
17	Vineyard	410	747	747	740	750	770	890	740	750	760	740	750	750	750	750	750	760	750	750	750	750	760
Study Area Total		**410**	**5,735**	**5,735**	**5,020**	**5,220**	**7,170**	**6,500**	**4,070**	**5,370**	**5,610**	**4,150**	**4,780**	**5,030**	**5,300**	**5,300**	**5,290**	**5,340**	**5,200**	**5,360**	**5,200**	**5,200**	**5,280**

Light Rail Boardings

District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	0	0	0	510	520	1,200	590	0	550	580	430	0	0	0	0	0	0	0	0	0	0	0
2	Saratoga Springs	0	0	0	1,730	1,820	4,500	1,850	0	2,310	2,430	420	0	0	0	0	0	0	0	0	0	0	0
3	Lehi	0	2,300	2,300	2,270	2,360	2,590	2,740	2,020	2,310	2,420	2,330	2,190	2,190	2,170	2,180	2,170	2,130	2,140	2,090	2,150	2,150	2,140
4	Alpine-Highland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	AF-PG	0	1,377	1,377	1,310	1,370	1,400	1,310	1,320	1,350	1,420	1,320	1,380	1,400	1,400	1,400	1,400	1,400	1,380	1,400	1,380	1,410	1,400
17	Vineyard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Study Area Total		**0**	**3,677**	**3,677**	**5,810**	**6,070**	**9,680**	**6,480**	**3,340**	**6,520**	**6,840**	**4,490**	**3,570**	**3,590**	**3,570**	**3,580**	**3,580**	**3,530**	**3,520**	**3,490**	**3,530**	**3,560**	**3,540**

Commuter Rail Boardings

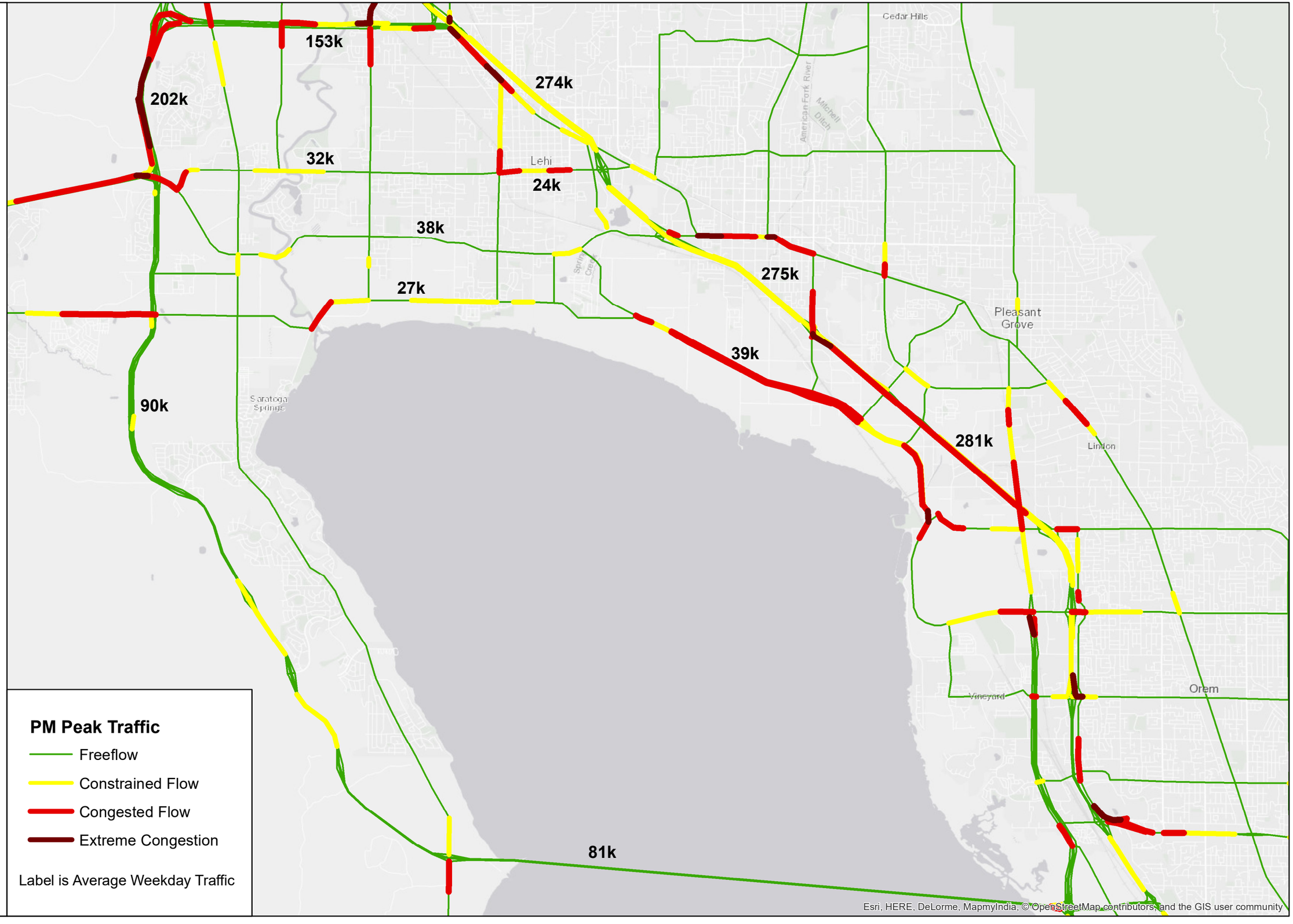
District	District Name	2019	MTP	MTP BR	S1.2	S1.2a	S1.3	S1.3a	S1.4	S1.6	S1.7	S1.8	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S3.1	S3.2	S3.3	S3.4	S3.5
1	Cedar Valley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Saratoga Springs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Lehi	926	2,682	2,682	2,770	2,900	3,260	3,030	2,670	3,040	3,190	2,830	2,690	2,710	2,720	2,720	2,730	2,870	2,710	2,720	2,710	2,720	2,800
4	Alpine-Highland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	AF-PG	575	2,475	2,475	2,230	2,290	3,460	2,270	2,120	2,350	2,460	2,120	2,340	2,510	2,500	2,510	2,500	2,450	2,530	2,410	2,410	2,420	2,560
17	Vineyard	1,562	7,796	7,796	7,400	7,640	7,880	7,720	7,300	8,310	8,640	7,340	7,560	7,610	7,770	7,770	7,770	7,920	7,580	7,520	7,530	7,700	7,940
Study Area Total		**3,063**	**12,952**	**12,952**	**12,400**	**12,830**	**14,600**	**13,020**	**12,090**	**13,690**	**14,280**	**12,280**	**12,590**	**12,830**	**12,990**	**13,000**	**13,000**	**13,240**	**12,810**	**12,640**	**12,650**	**12,840**	**13,290**

Appendix C

North Lakeshore Study Scenario Travel Model Output

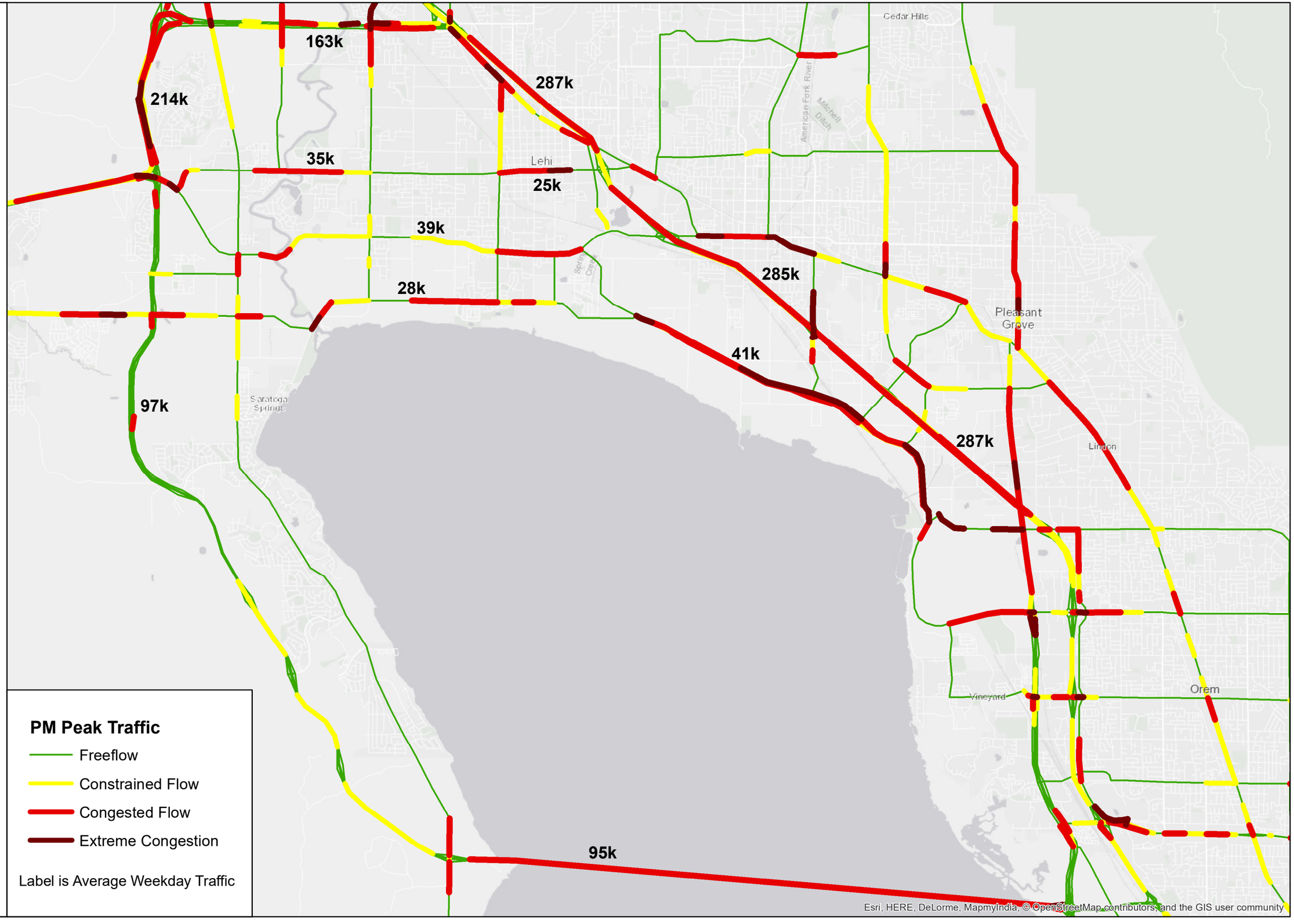
North Lakeshore Area Study - Scenario 1.2

High Frequency Transit and 20% Work from Home



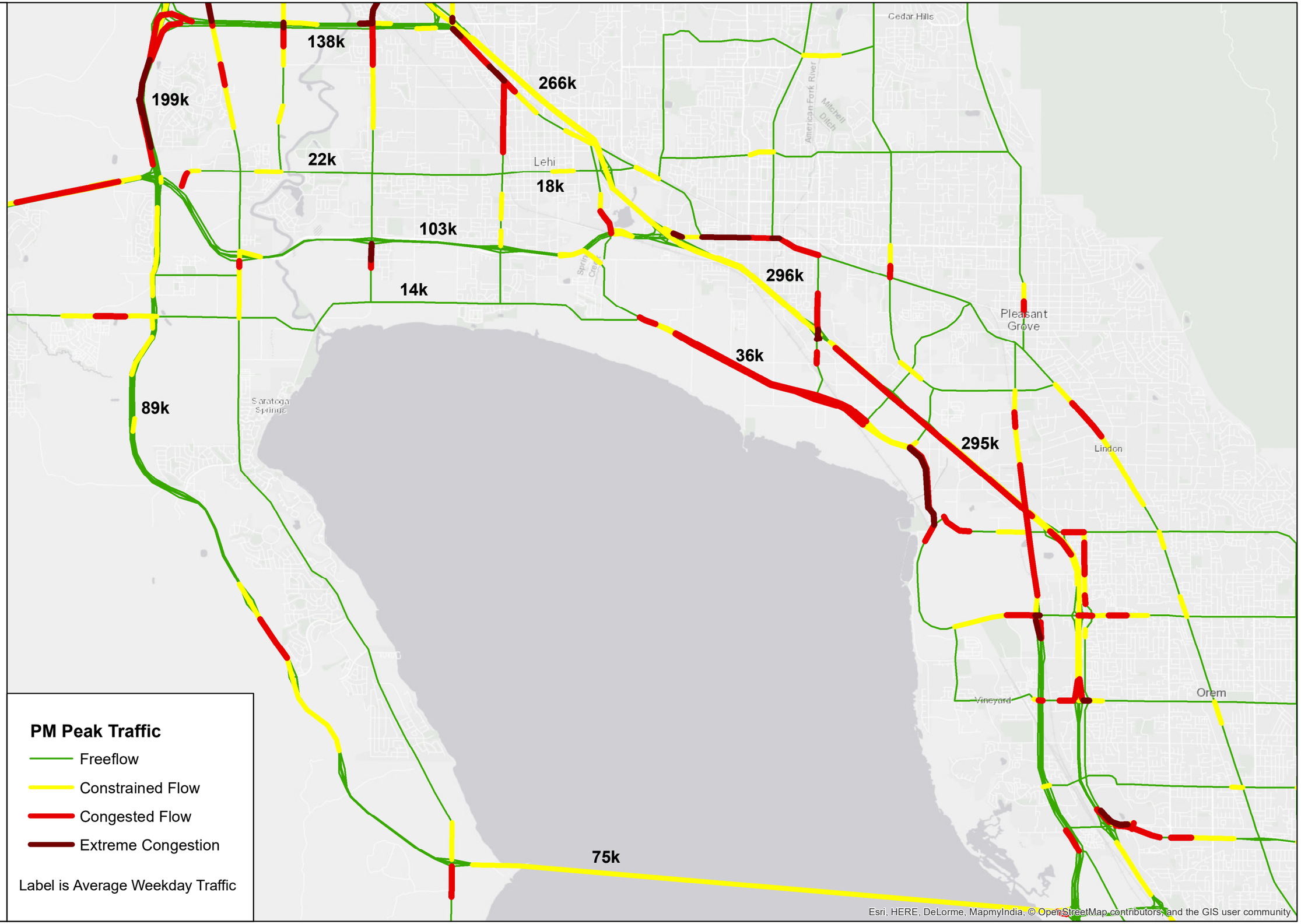
North Lakeshore Area Study - Scenario 1.3a

High Frequency Transit



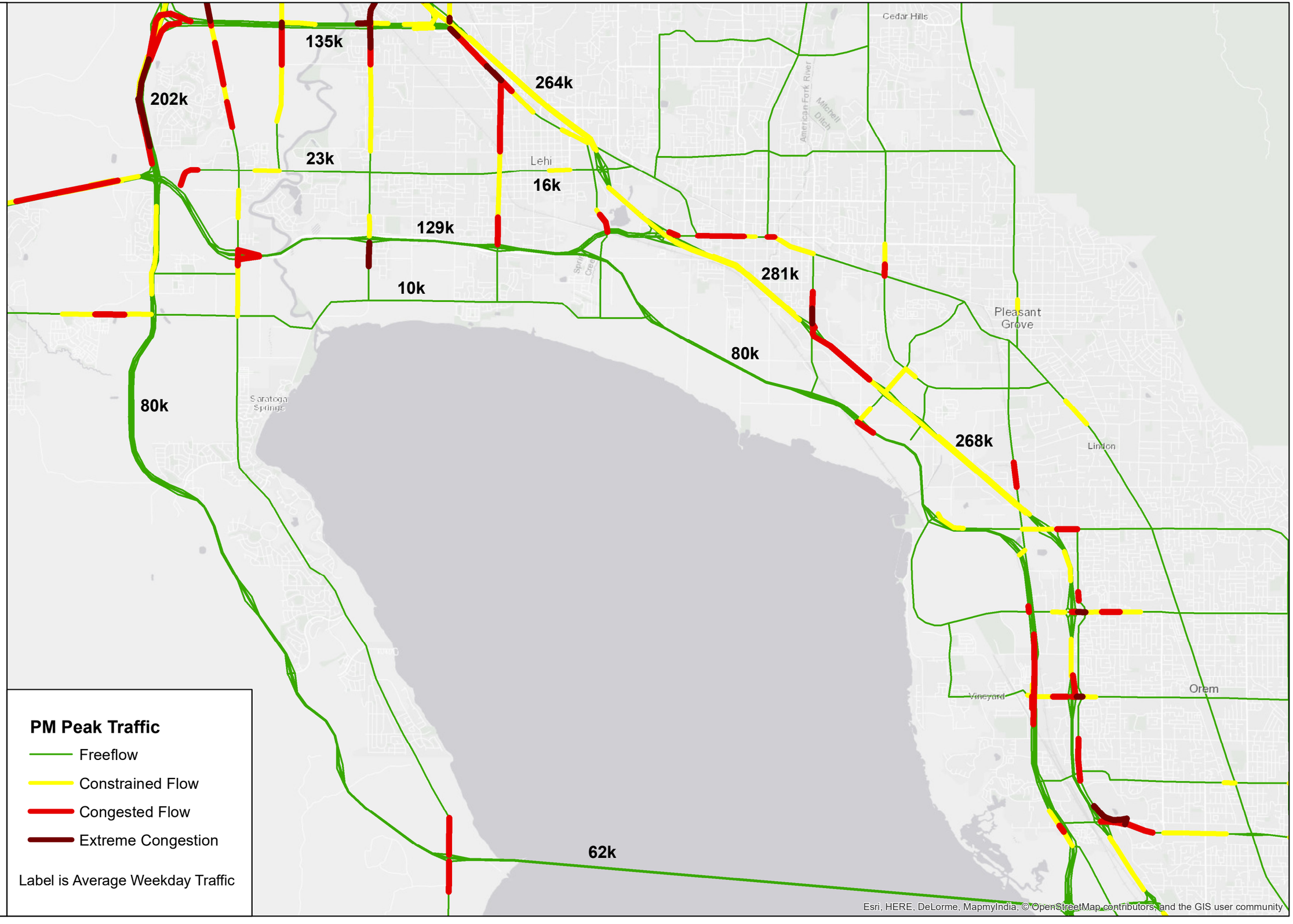
North Lakeshore Area Study - Scenario 2.2

Pioneer Crossing FWY Only



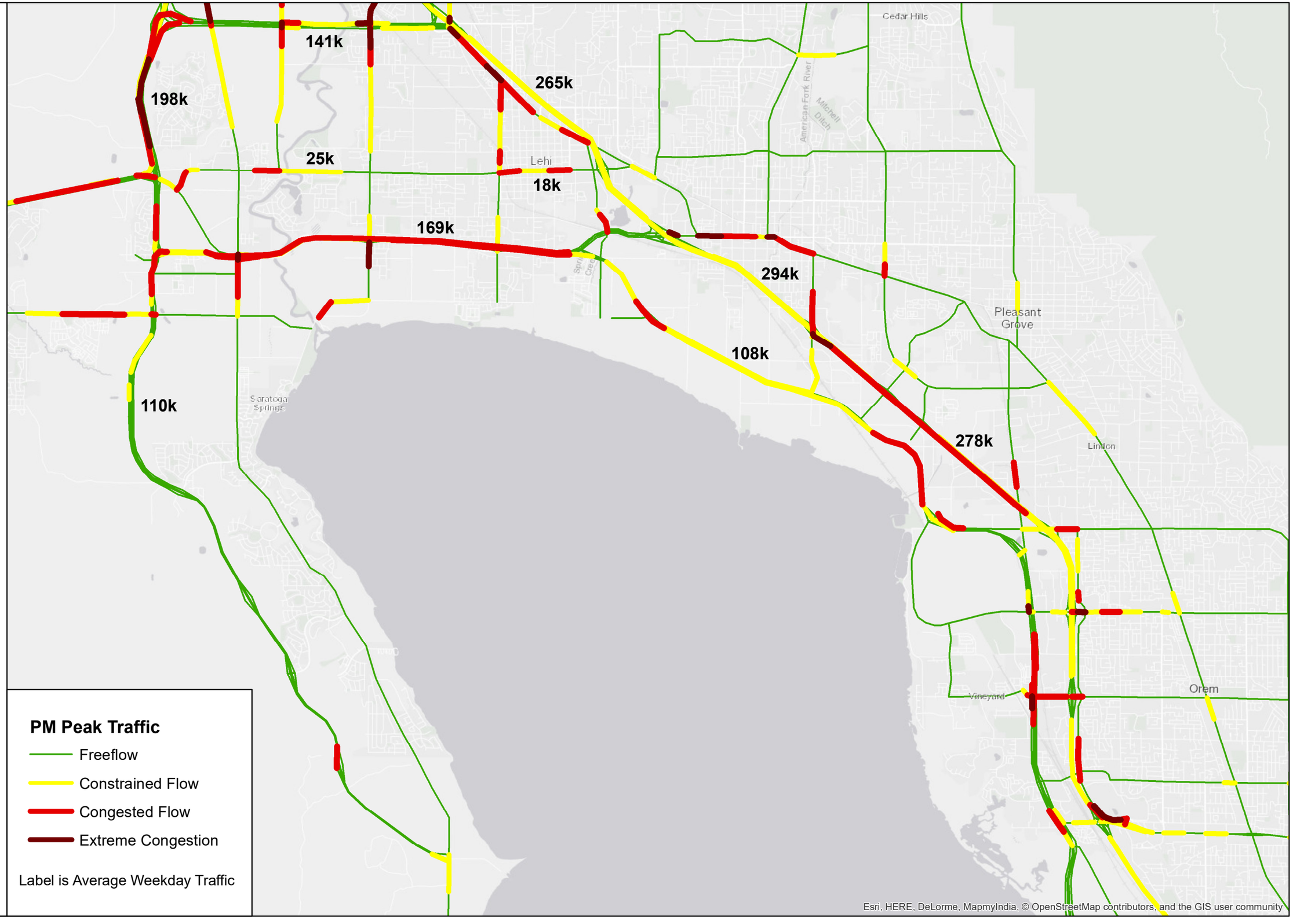
North Lakeshore Area Study - Scenario 2.3

Pioneer Crossing / Vineyard FWY



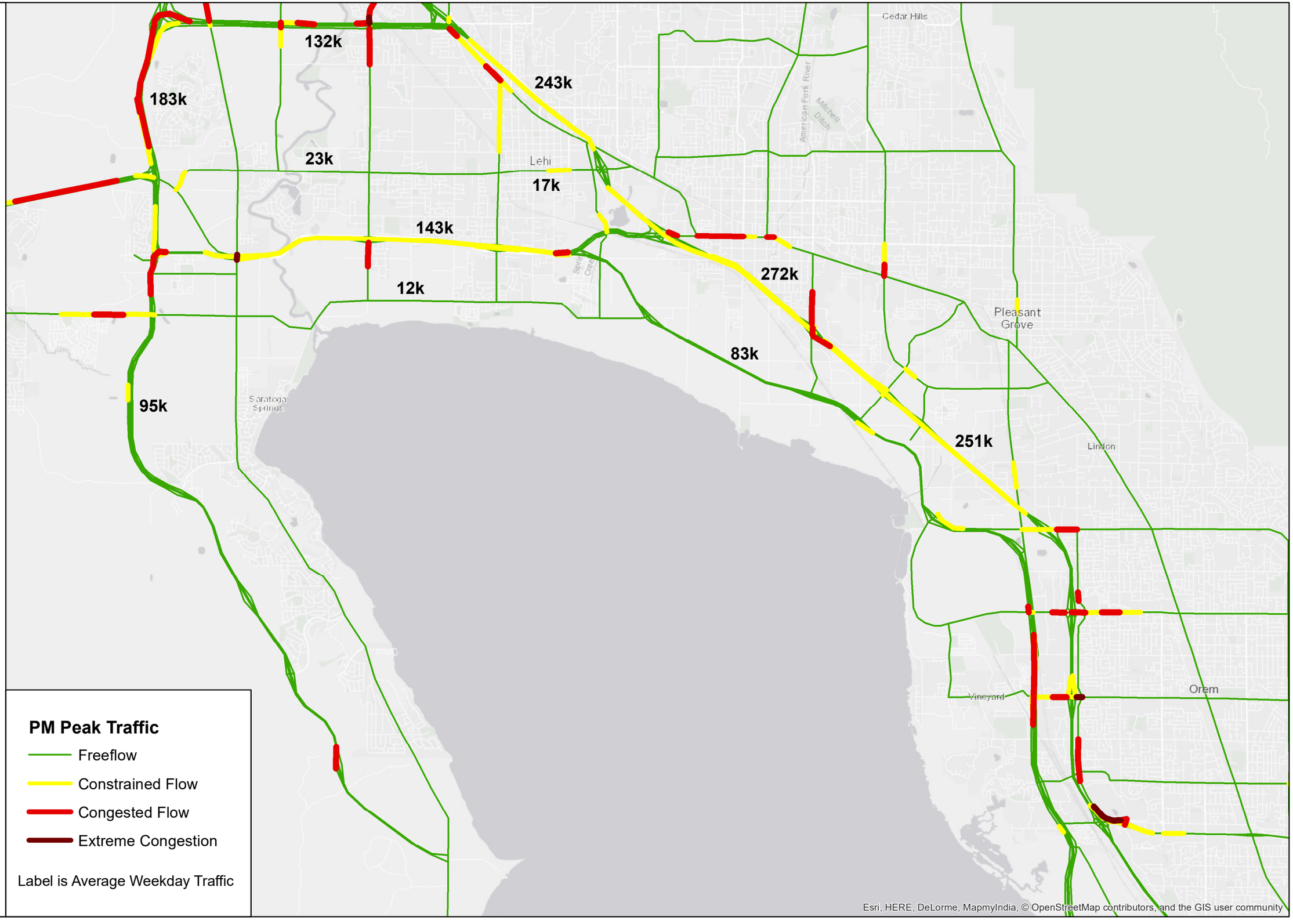
North Lakeshore Area Study - Scenario 2.6

Pioneer / Vineyard FWY, No Utah Lake Bridge



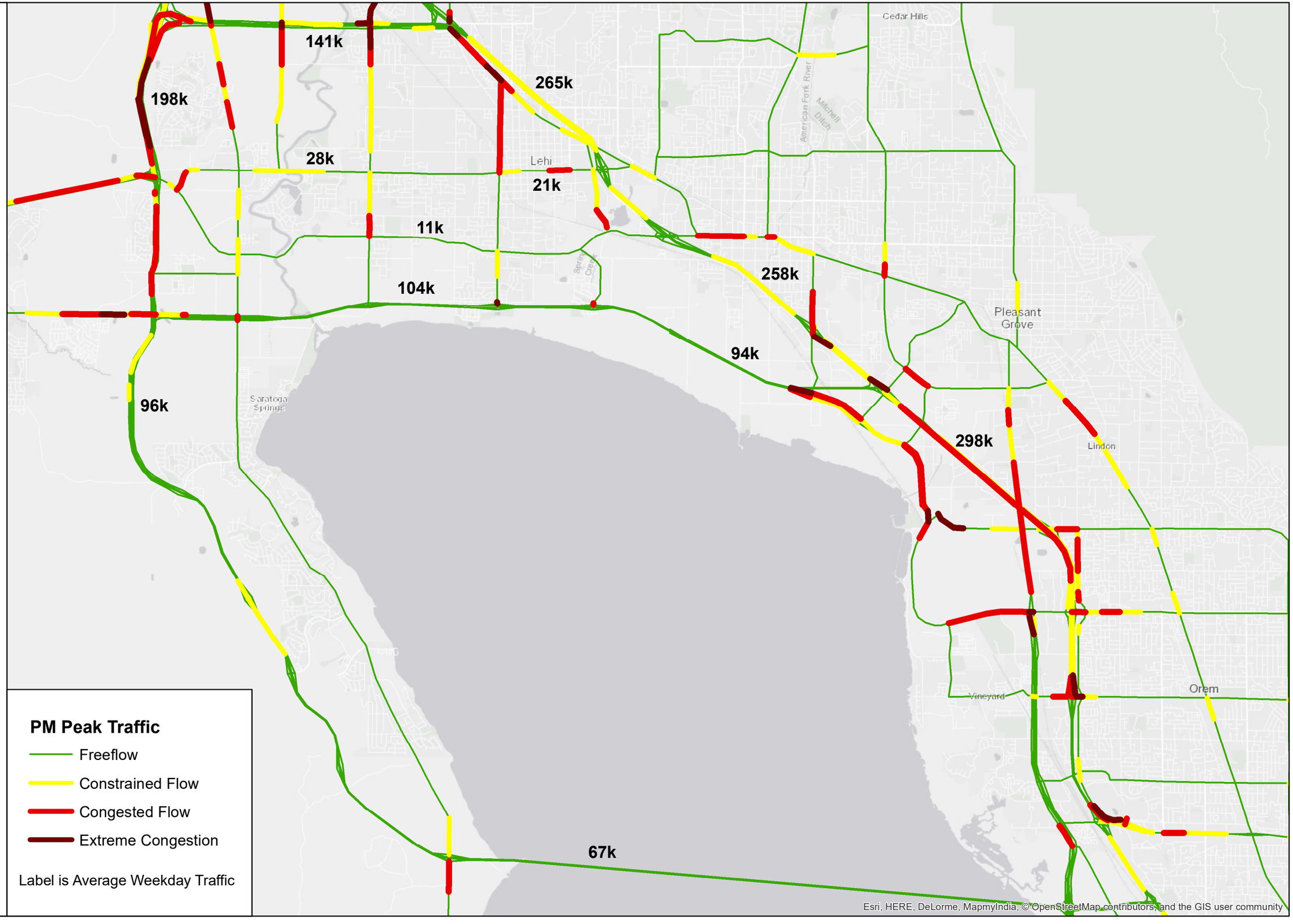
North Lakeshore Area Study - Scenario 2.6a

Pioneer / Vineyard FWY , No Utah Lake Bridge, with Pony Express Arterial



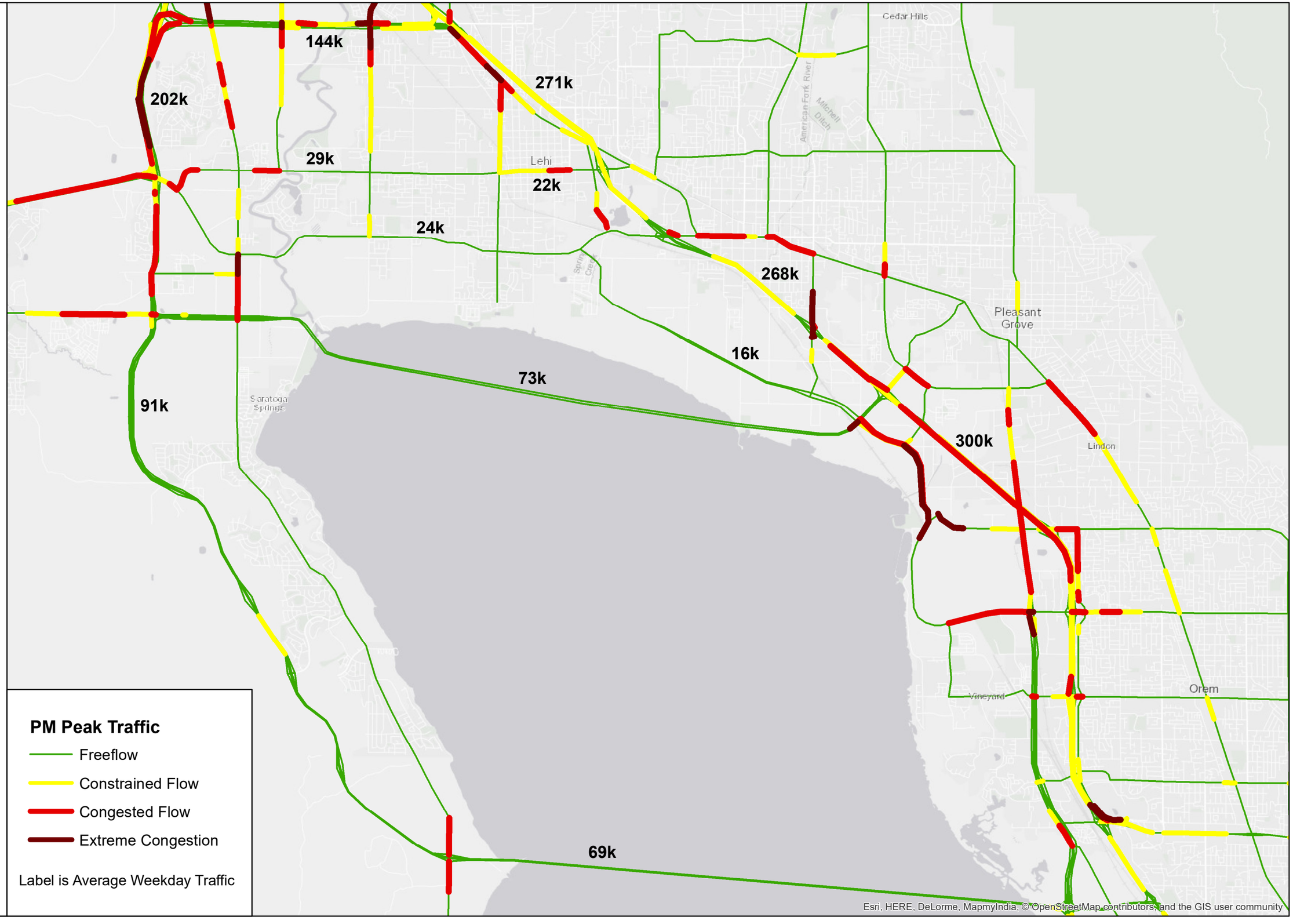
North Lakeshore Area Study - Scenario 3.1

Pony Express FWY, Vineyard FWY to PG then Arterial



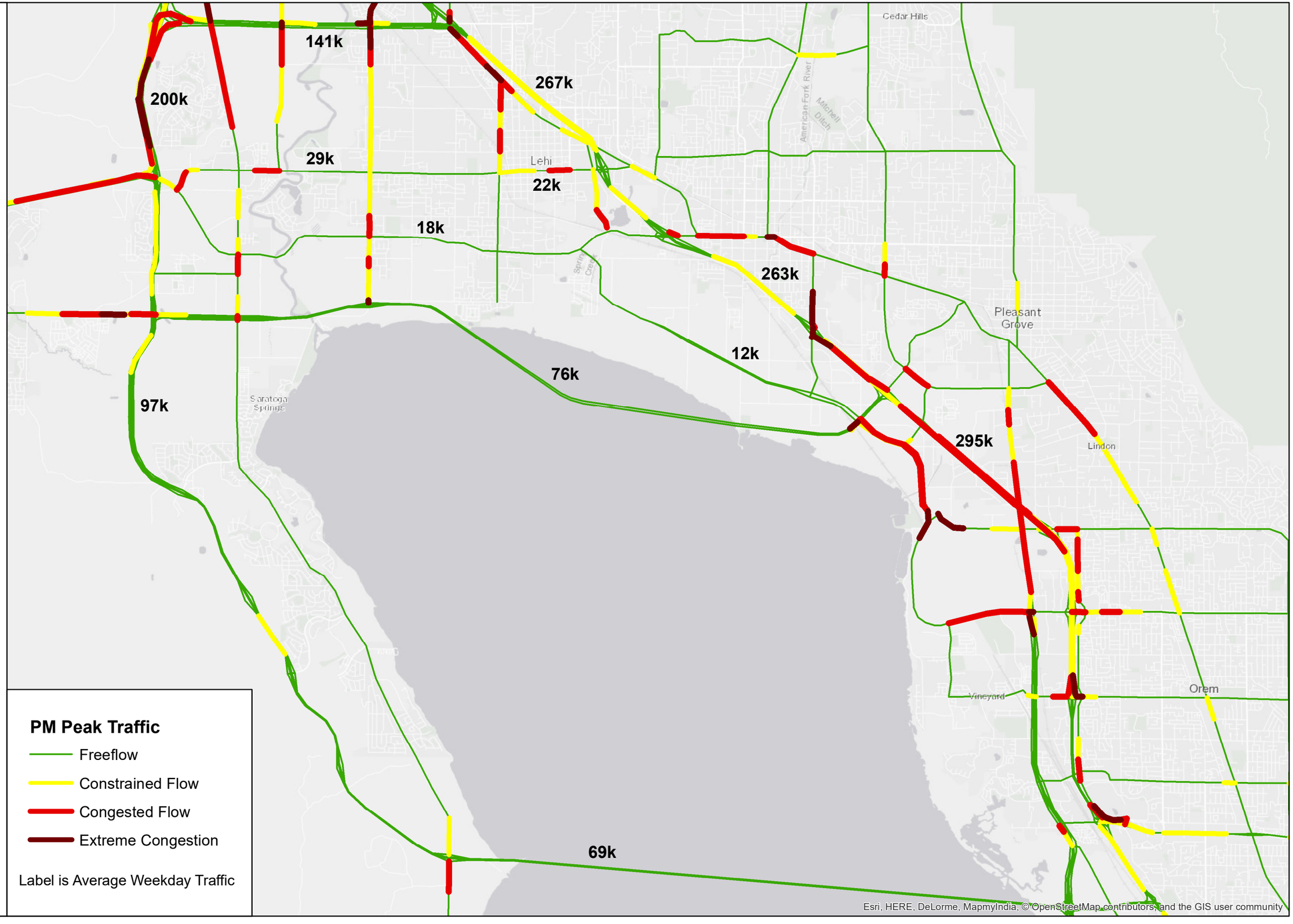
North Lakeshore Area Study - Scenario 3.2

Saratoga Springs Bridge FWY, Vineyard Arterial



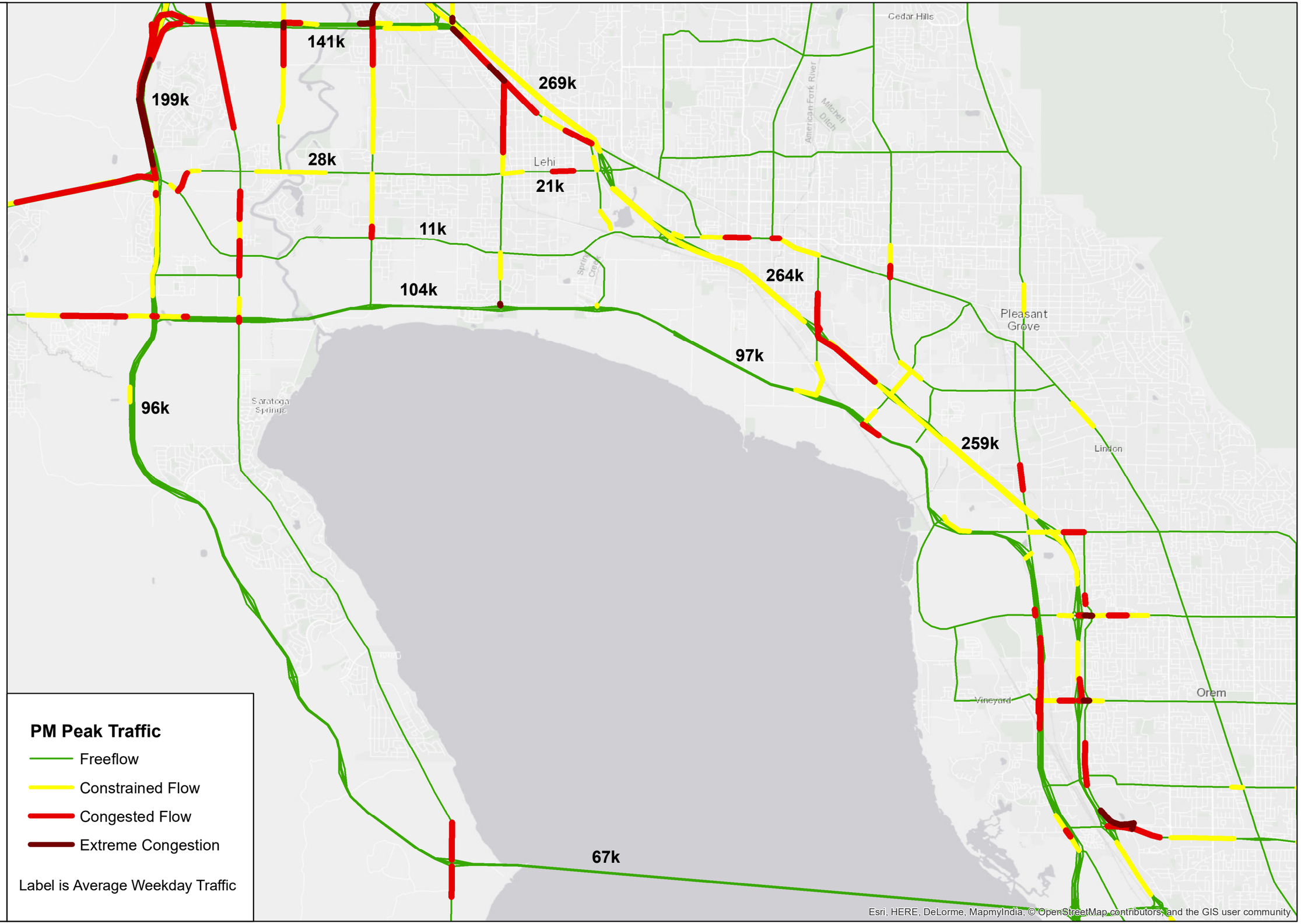
North Lakeshore Area Study - Scenario 3.3

Lehi Bridge / Vineyard FWY



North Lakeshore Area Study - Scenario 3.4

Pony Express / Vineyard FWY



North Lakeshore Area Study - Scenario 3.5

Pony Express / Vineyard FWY, No Utah Lake Bridge