Southwest Regional Traffic Review

Salt Lake County, Utah

PREPARED FOR:

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PREPARED BY:

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Introduction

The purpose of this study was to review land use data and confirm roadway sizes of the proposed roadways in the southwest area of Salt Lake County and adjacent municipalities. This study also included an estimate as to when and where new roadways needed to be constructed and to confirm roadway project phasing outlined in Wasatch Front Regional Council's (WFRC) Regional Transportation Plan.

At the beginning of this project the 2040 Travel Demand Model was the currently adopted travel model. Though there are versions of the 2050 model now, for continuity, we continued our analysis using the 2040 travel demand model. The number of travel lanes on each roadway were estimated to accommodate future traffic projections. Intersection operations and lane details are not included as part of this study and will be included as a separate study. A separate micro traffic analysis was performed in June 2019 by Hales Engineering to discuss intersection operations.

Study Area

The study area included roadways surrounding the Olympia development in the southwest area of Salt Lake County as shown in **Figure 1**. New roadways were focused in the unincorporated areas of the County. Existing roadways that connect to adjacent municipalities were reviewed for lane needs.

Traffic Analysis Methodology

The land-use planning in the southwest area of the county changes based on the needs of the community. This study used the best-known land-use information available to estimate future traffic volumes. **Figure 2** displays some of the known developments in the southwest area of the County. There are other parcels and areas of land that are planned to be developed that are included in the travel demand model that may not be called out here.

Travel Demand Model

The WFRC maintains the regional travel demand forecasting model for this area. The travel demand model forecasts future travel demand based on projections of land use, socioeconomic patterns, and transportation system characteristics. The model is based on the TP+/CUBE software.

The currently adopted travel demand model represents a 2040 horizon year. WFRC was nearing the completion of the 2050 model but was not yet adopted at the time of this study.

Specific inputs to the model include socioeconomic forecasts and transportation system data. The socioeconomic data includes population, households, employment, and average household income. Household data is further classified by household size (one person to 6+ persons), number of workers (0 to 3+ persons), and income quartiles. Employment data is classified as retail, industrial, and other.

The transportation system data includes both roadway and transit networks. The roadway network includes freeways, arterial routes and some collector routes. The transit network includes commuter rail and light-rail lines, bus rapid transit lines, express bus routes, and many local bus routes.

Figure 1: Study Area

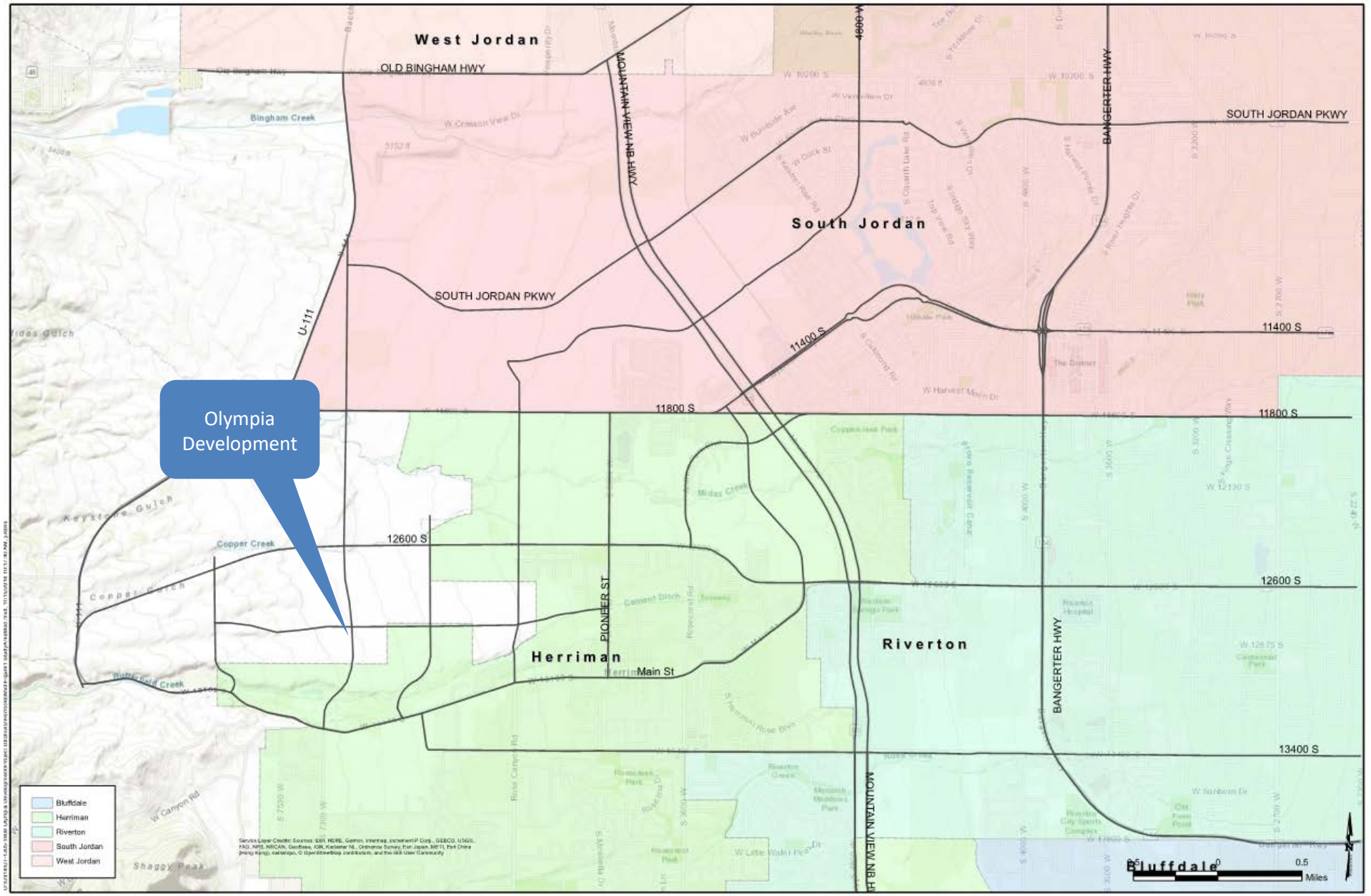
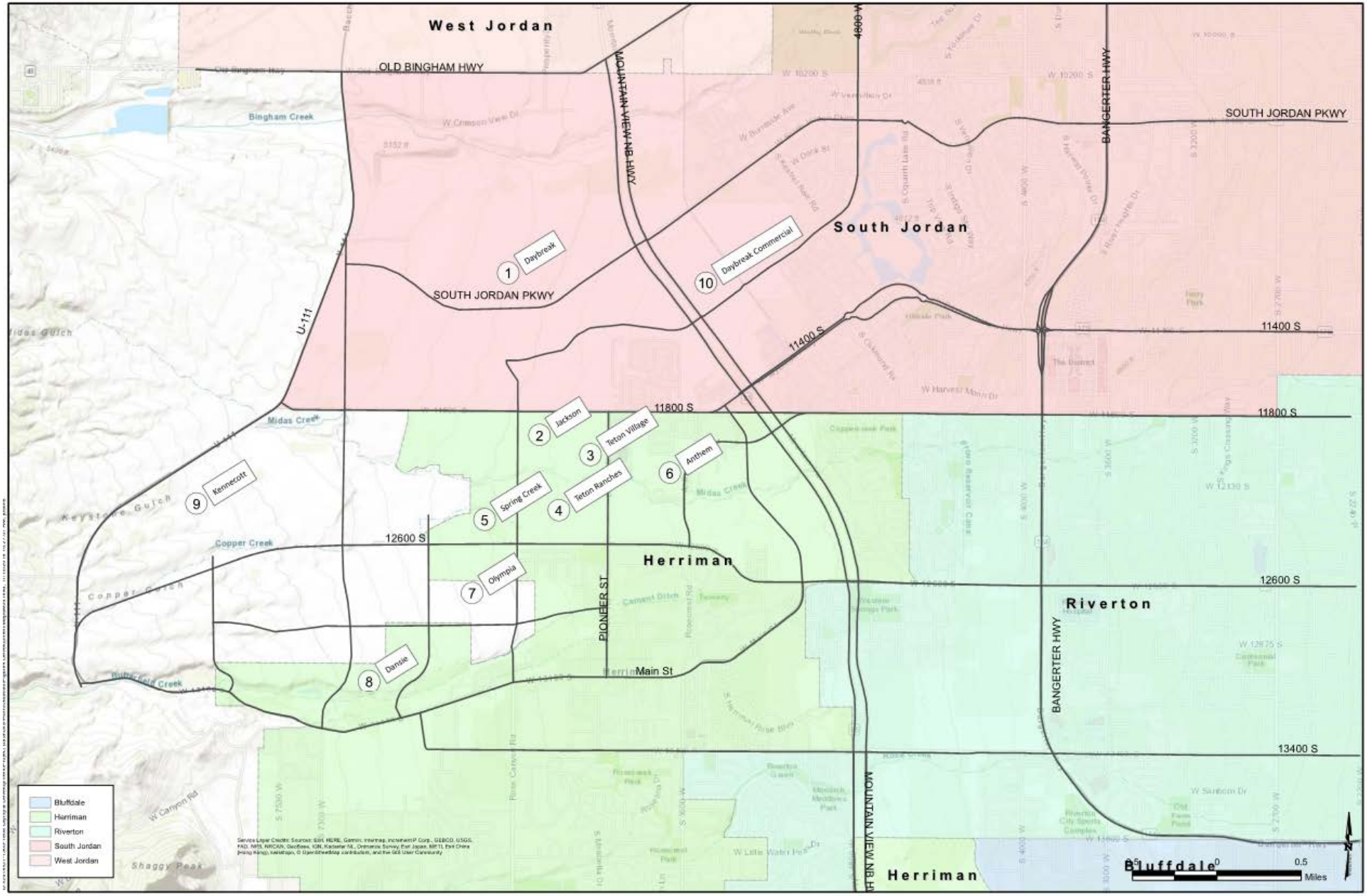


Figure 2: Planned Developments



Socioeconomic Data

Existing socioeconomic and transportation system data was used to create a base-year model, which has been calibrated to observed roadway volumes. Future year forecasts are prepared by running the calibrated model using future year socioeconomic and transportation system data. The WFRC model uses the traditional four-step modeling process, consisting of trip generation, trip distribution, mode split, and trip assignment.

Future year socioeconomic data is prepared by the Metropolitan Planning Organizations (MPO) in conjunction with the Governor's Office of Planning and Budget (GOPB). The GOPB prepares county-level population and employment totals. The MPOs work with the cities to allocate the population to city-level totals. Finally, the population and employment forecasts are further divided among each Traffic Analysis Zone (TAZ). The individual TAZs are the blocks that comprise the model. The future transportation network is prepared by each MPO based on the Metropolitan Transportation Plans of each organization.

Following the estimation of travel demand (defined as the number of trips between specified origins and destinations, by mode, and by time of day) a final set of scripts are used to assign these trips to highway and transit networks. The model is used to generate future traffic projections and to evaluate air quality and noise impacts.

Travel Model Methodology

The travel demand model is meant to estimate traffic on a regional basis between communities. Detailed intersection analyses are performed using micro-simulation models and provide intersection geometries such as turn pockets, tapers, queue lengths, and operations. This study used the travel model to estimate regional transportation based on the number of road lanes needed to move traffic.

The travel demand model connects origins and destinations. For example; a trip may originate from a home and travel to work and back during a 24-hour period. The travel demand model tries to match jobs and housing and estimate what route that vehicle trip would use. Therefore, a "bedroom" community will require a transportation system that can bring them to jobs away from where they live. If homes and jobs are close by each other, there would be shorter commuting distances. The same goes for commercial/retail; if people have access to services near their homes less distance is traveled to access these services.

There are estimates as to the number of vehicles per day a roadway can accommodate based on the driving habits and thresholds specific to the Wasatch Front. These values estimate when a 2-lane road needs to be widened to a 4-lane road or what capacity can a 6-lane road accommodate. These volume parameters are shown in **Table 1** and represent the Wasatch Front specific maximum daily traffic volumes to maintain a given level of service. Level of service (LOS) D is considered an acceptable service level. The values shown in **Table 1** represent an estimation. There are other items that can change the overall capacity. Some of these are on-street parking, the number and frequency of driveways and business accesses, frequency of signalized intersections or cross-walks, and other items that create roadway "friction" for drivers.

Table 1: Utah/Wasatch Front Specific Maximum Daily Traffic

Suburban			
2 Lane			
	Freeway	Arterial	Collector
LOS A	NA	5,800	5,300
LOS B	NA	7,900	7,400
LOS C	NA	10,800	9,700
LOS D	NA	13,400	12,100
LOS E	NA	16,100	14,500

Rural			
2 Lane			
	Freeway	Arterial	Collector
LOS A	NA	5,300	3,700
LOS B	NA	8,900	5,800
LOS C	NA	12,900	8,100
LOS D	NA	17,000	10,500
LOS E	NA	21,000	12,900

Urban/CBD			
2 Lane			
	Freeway	Arterial	Collector
LOS A	NA	6,800	5,800
LOS B	NA	7,900	6,800
LOS C	NA	9,100	8,100
LOS D	NA	10,200	9,100
LOS E	NA	11,300	10,200

3 Lane			
	Freeway	Arterial	Collector
LOS A	NA	7,400	5,800
LOS B	NA	9,500	7,900
LOS C	NA	12,400	10,800
LOS D	NA	15,100	13,400
LOS E	NA	17,700	16,100

3 Lane			
	Freeway	Arterial	Collector
LOS A	NA	5,800	4,200
LOS B	NA	9,500	6,300
LOS C	NA	14,000	9,100
LOS D	NA	18,300	11,800
LOS E	NA	22,600	14,500

3 Lane			
	Freeway	Arterial	Collector
LOS A	NA	7,900	6,800
LOS B	NA	10,000	8,900
LOS C	NA	12,900	11,300
LOS D	NA	15,600	13,800
LOS E	NA	18,300	16,100

4 Lane			
	Freeway	Arterial	Collector
LOS A	31,500	14,700	10,500
LOS B	45,500	20,500	15,200
LOS C	60,000	26,900	20,400
LOS D	70,000	31,200	24,200
LOS E	89,000	39,200	30,600

4 Lane			
	Freeway	Arterial	Collector
LOS A	20,500	8,900	7,400
LOS B	35,000	15,200	12,100
LOS C	50,000	22,000	17,200
LOS D	63,000	28,000	22,000
LOS E	80,000	35,500	27,400

4 Lane			
	Freeway	Arterial	Collector
LOS A	36,500	13,700	10,000
LOS B	49,500	18,400	13,100
LOS C	63,000	23,700	17,200
LOS D	73,000	28,000	20,400
LOS E	90,000	33,900	24,700

5 Lane			
	Freeway	Arterial	Collector
LOS A	NA	15,200	12,600
LOS B	NA	21,500	17,300
LOS C	NA	28,500	23,100
LOS D	NA	32,800	26,900
LOS E	NA	40,300	33,900

5 Lane			
	Freeway	Arterial	Collector
LOS A	NA	10,000	8,400
LOS B	NA	16,300	13,700
LOS C	NA	23,700	19,400
LOS D	NA	30,100	24,200
LOS E	NA	37,600	30,600

5 Lane			
	Freeway	Arterial	Collector
LOS A	NA	17,900	14,200
LOS B	NA	23,600	18,900
LOS C	NA	30,100	24,200
LOS D	NA	34,900	28,000
LOS E	NA	42,500	34,400

6 Lane			
	Freeway	Arterial	Collector
LOS A	51,000	19,400	NA
LOS B	72,500	27,800	NA
LOS C	95,000	37,600	NA
LOS D	110,000	43,500	NA
LOS E	140,000	55,900	NA

6 Lane			
	Freeway	Arterial	Collector
LOS A	29,500	13,100	NA
LOS B	50,500	22,600	NA
LOS C	72,000	32,800	NA
LOS D	91,000	41,900	NA
LOS E	115,000	52,700	NA

6 Lane			
	Freeway	Arterial	Collector
LOS A	58,500	21,500	NA
LOS B	79,000	28,900	NA
LOS C	100,000	37,600	NA
LOS D	116,000	43,500	NA
LOS E	142,000	53,800	NA

7 Lane			
	Freeway	Arterial	Collector
LOS A	NA	22,600	NA
LOS B	NA	32,000	NA
LOS C	NA	43,000	NA
LOS D	NA	50,500	NA
LOS E	NA	63,400	NA

7 Lane			
	Freeway	Arterial	Collector
LOS A	NA	14,200	NA
LOS B	NA	24,200	NA
LOS C	NA	35,500	NA
LOS D	NA	45,200	NA
LOS E	NA	57,000	NA

7 Lane			
	Freeway	Arterial	Collector
LOS A	NA	26,300	NA
LOS B	NA	35,200	NA
LOS C	NA	45,200	NA
LOS D	NA	52,700	NA
LOS E	NA	64,000	NA

8 Lane			
	Freeway	Arterial	Collector
LOS A	66,500	NA	NA
LOS B	95,500	NA	NA
LOS C	126,000	NA	NA
LOS D	146,000	NA	NA
LOS E	187,000	NA	NA

8 Lane			
	Freeway	Arterial	Collector
LOS A	NA	NA	NA
LOS B	NA	NA	NA
LOS C	NA	NA	NA
LOS D	NA	NA	NA
LOS E	NA	NA	NA

8 Lane			
	Freeway	Arterial	Collector
LOS A	78,000	NA	NA
LOS B	105,000	NA	NA
LOS C	133,000	NA	NA
LOS D	154,000	NA	NA
LOS E	189,000	NA	NA

Assumes phf between 8% and 12%, higher for better LOS and less urban conditions;
*No Right turn lanes will decrease capacity approximately 5% to 10%;
Use with caution based on signal spacing, access management and other issues.

Existing Regional Transportation Plan

The adopted regional transportation plan provides a regional roadway plan that includes new roads, widening's, transit improvements, trails, or major transportation improvements. **Figure 3** displays the 2040 Regional Transportation Plan phasing along with other project-specific roadways.

Planned Projects

The socioeconomic data in the existing 2040 travel demand model was updated as part of this study to reflect the current development approvals. One development shown in **Figure 4** in the area south of Herriman Boulevard is the Olympia Development. A traffic impact study was completed by Hales Engineering to evaluate individual intersections. Other developments shown in **Figure 4** are either partially complete, approved, or pending.

The approved Olympia Development has been modified multiple times in the travel demand model by to reduce the number of ***households*** and increasing ***employment/employees***. Changes to these two sectors allows for drivers to have shorter commutes by living closer to work. The information below details the original WFRC travel model data, the approved Olympia project data, and our recommended modified Olympia project data. It was recommended to increase employment opportunities to reduce the need for out-of-area commuting. The result was doubling the number of employees

Description	Households	Population	Employees
Original WFRC	6,316	15,443	48
Original Olympia	10,335	25,488	990
Modified Olympia (Nov 2018)	8,336	20,548	2,029
Modified Olympia (Jun 2019)	6,330	15,603	2,029

Figure 3: WFRC Regional Transportation Plan

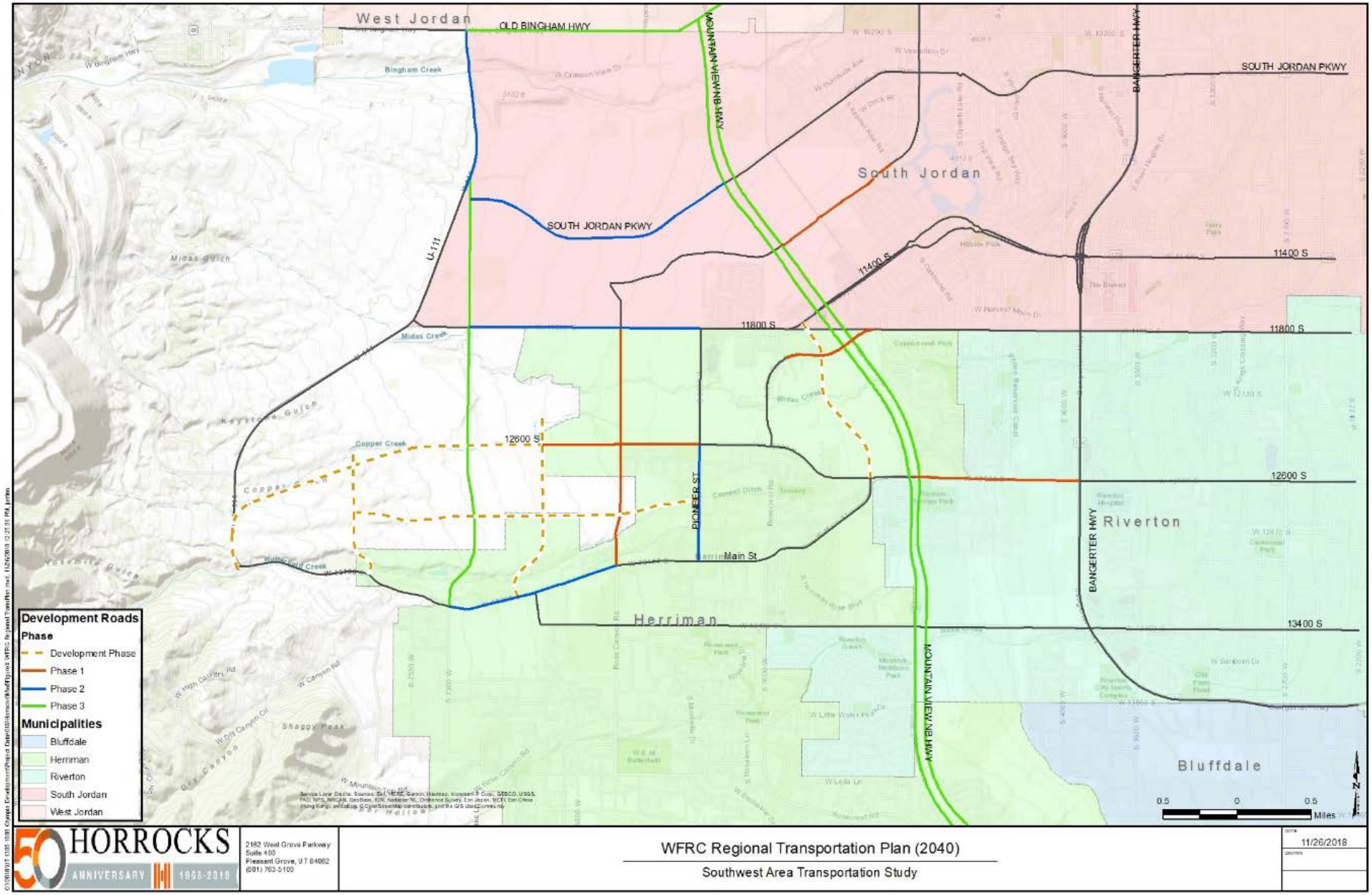
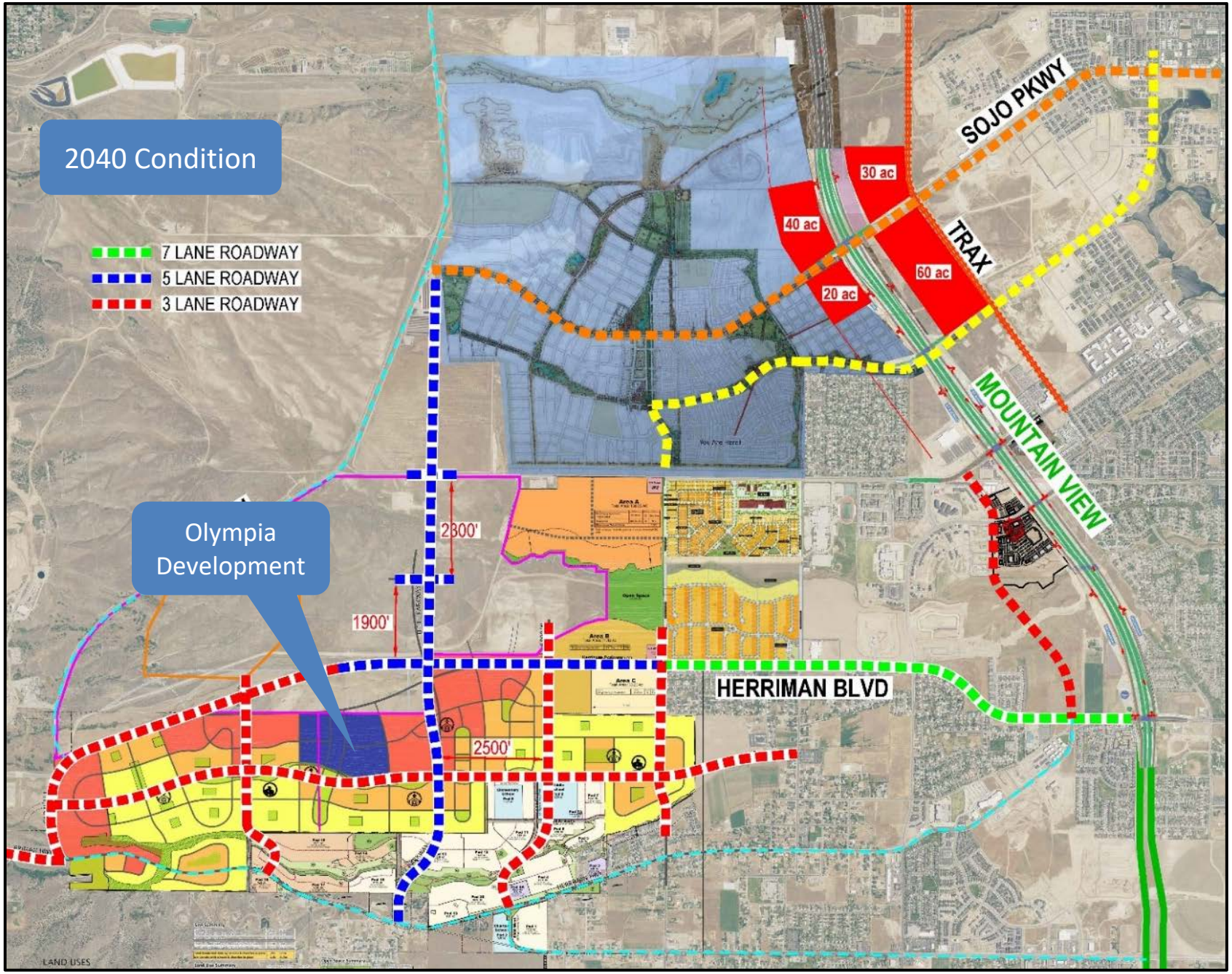


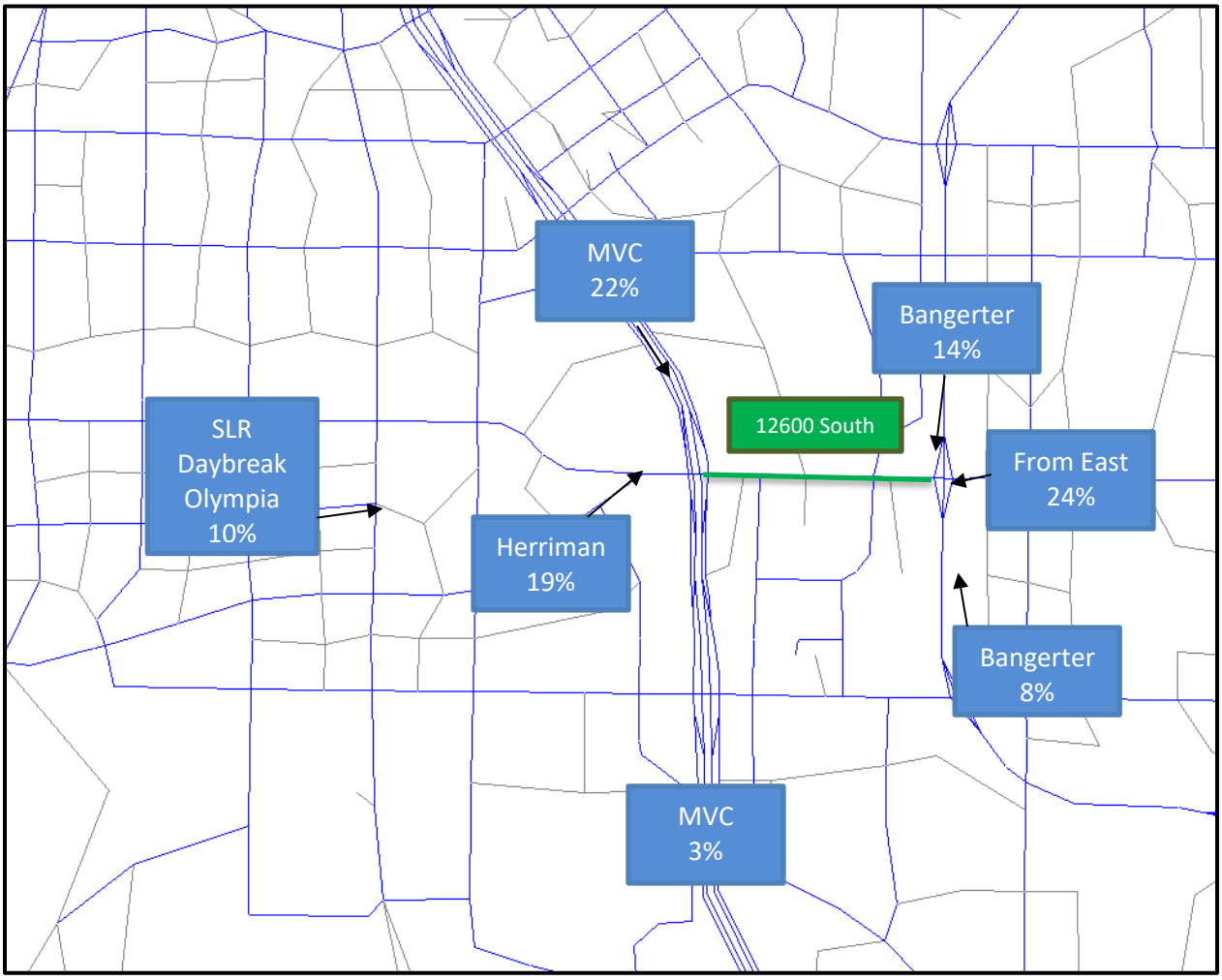
Figure 4: Developments and Road System



Select Link Analysis

A select link analysis isolates a specific link and shows where traffic along that link comes from and goes to. At 12600 South, between the Mountain View Corridor and Bangerter Highway, a select link analysis was performed using the travel demand model. The traffic along this section of 12600 South is shown in red bands in **Figure 5**. The thicker the red band the more volume is represented to access that specific section of 12600 South. Traffic along that segment largely comes from Mountain View Corridor and Bangerter Highway. The percentage of traffic accessing 12600 South between Bangerter Highway and Mountain View Corridor is shown on major corridors below.

Figure 5: Select Link Analysis of 12600 South (2040 Build Condition)



Findings

12600 South Traffic

The regional roadway analysis shows that 12600 South between, Mountain View Corridor and Bangerter Highway, will draw highway-level traffic volumes between the two highways before the build-out of the southwest area. The difference in traffic on 12600 South at this location between the previously approved plan and current plan is approximately 3,000 vehicles per day. Our findings include:

A. This section of road will not accommodate 2040 base traffic without mitigation
B. Mitigation will be required on a regional level
C. Multiple mitigation options currently being considered include:
    - Frontage roads along Bangerter Highway
    - System to system network
    - Increased alternative mode use; bringing TRAX into the heart of southwest Salt Lake County
    - Increase employment and services in the southwest area to alleviate the need to travel outside the area

Figure 6: 12600 South

U-111/Bacchus Highway Realignment/Widening

The existing regional transportation plan shows that U-111/Bacchus Highway will need to be realigned and widened by 2040 (see **Figure 7**). Based on the new land use data this roadway will neede to be at least a two-lane road by 2020 and a four-lane road by 2040. These timeframes are diretly linked to the pace of development and the four-lane road could be needed sooner. Other findings include:

- A two-lane road is needed from 11800 South (South Jordan Parkway) to 12300 South immediately upon the development of adjacent property.
- If property develops north of 11800 South sooner then that section of U-111/Bacchus Highway will be needed sooner.
- The realignment and widening of U-111/Bacchus Highway project will move traffic to the north and improve congestion on 12600 South, but not elimnate the need for regional improvements at 12600 South.
- U-111/Bacchus Highway will carry an estiamted 30,000 trips per day that would normally have to use other roadway corridors.

Roadway Project Phasing

Figure 8 displays the suggested roadway project phasing based on land use planning and the rate at which development is likely to occur. The immediate needs are shown in yellow to be needed in 2020. These are immediate needs that are suggested to be planned for. Other future roadway segment phasing will be directly tied to the location and rate of growth in the area.

Other Results/Recommendations

A. It is recommended that right-of-way be preserved for the U-111/Bacchus Highway realignment before development occurs along its corridor.
B. Also preserve right-of-away along all other approved roadway corridors.
C. Confirm with local jurisdictions the intersection improvements that will be needed in conjunction with new and widened roadways.
D. Pursue bringing transit such as TRAX or express systems to the heart of the southwest SL County area.
E. The select link analysis shows that the 12600 South corridor between Mountain View Corridor and Bangerter Highway will need Federal or State resources to accommodate 2040 traffic.
F. The reduction to 6.8 units per acre at the Olympia project brings traffic to at or below the approved 2040 WFRC traffic model.

Figure 7: U-111/Bacchus Highway

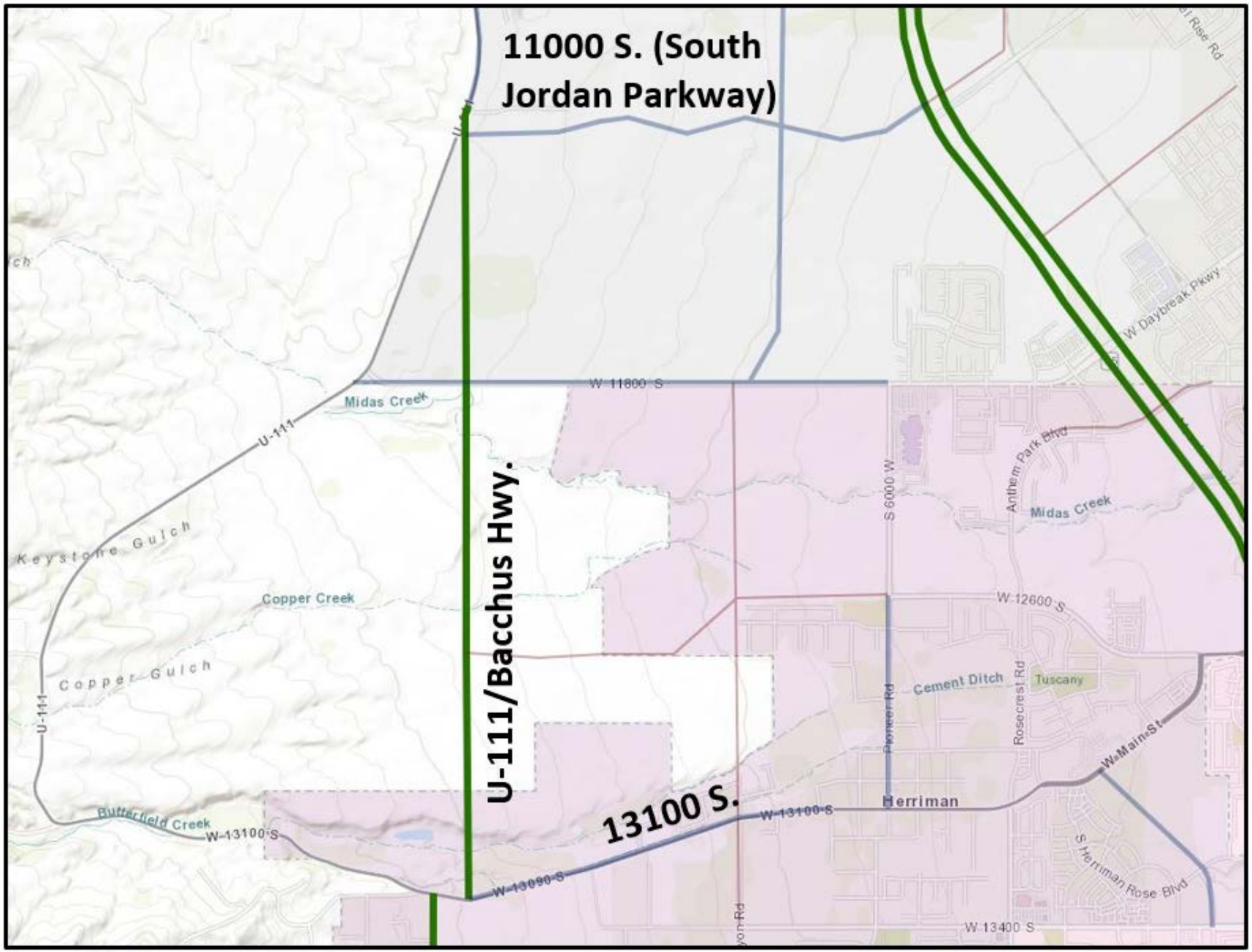


Figure 8: Proposed Roadway Phasing