

**West Davis Corridor
Technical Memorandum 3
EIS Transportation Need Study Area**
Initial Draft – December 9, 2009

Revision Dates: December 2, 2009 (Revision 1)
August 15, 2011 (Revision 2)
June 9, 2016 (Revision 3) – See page 6 for Amendment 2

Purposes of this Technical Memorandum

The purposes of this technical memorandum are:

1. To describe the initial transportation need study area that will be used as the West Davis Corridor (WDC) project team develops a project need (called the *need study area* in this memorandum)
2. To seek the acceptance of the Federal Highway Administration (FHWA) (the lead federal agency for the project) of the study area

Once the need study area is developed and accepted by FHWA, the WDC project Management Team will then develop the Notice of Intent (NOI) to complete an Environmental Impact Statement (EIS) for the WDC project, begin developing the project need, and prepare for scoping. After scoping, the team will identify logical termini for the project as well as alternatives that would meet the purpose of and need for the project. Logical termini and alternatives are not discussed in this memorandum.

FHWA and UDOT will undertake refined analyses of what kind of future transportation problems and needs, if any, would be expected within the need study area. This will guide whether and what kind of build alternatives are formulated to address the identified problems and needs. SAFETEA-LU (the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users) requires a clear statement of identified objectives that the proposed project is intended to achieve for improving transportation conditions. The objectives should be derived from needs and can include, but are not limited to, the following needs listed in SAFETEA-LU:

- Achieving a transportation objective identified in an applicable statewide or metropolitan transportation plan
- Supporting land-use, economic development, or growth objectives established in applicable federal, state, local, or tribal plans
- Serving national defense, national security, or other national objectives, as established in federal laws, plans, or policies (FHWA 2006)

This technical memorandum provides a brief overview of the project, describes the issues related to the need study area, and recommends geographical limits for the need study area.

Project Overview

FHWA, in cooperation with UDOT, is getting ready to prepare an EIS for the WDC to address expected transportation demand in 2040 in western Davis and Weber Counties. In general, the project team is focusing on the area west of Interstate 15 (I-15) in Davis and Weber Counties (see Figure 1). Identifying a study area and, eventually, logical termini in the study area is required as part of the National Environmental Policy Act (NEPA) process.

The WDC project was originally envisioned in the 1960s as part of a regional transportation facility. In 2001, the Wasatch Front Regional Council (WFRC) and UDOT completed a corridor study that focused on a north-south corridor in this part of Davis and Weber Counties. That study presented a recommended corridor in Davis County but did not recommend a specific corridor for Weber County (WFRC and UDOT 2001). In 2009, WFRC and UDOT completed a supplement to the 2001 study that makes a recommendation for the Weber County portion of this regional north-south transportation corridor (WFRC and UDOT 2009).

Based on the results of the 2001 study, WFRC included a north-south corridor west of I-15 in the 2007 Regional Transportation Plan (RTP) and accompanying air quality conformity analysis (WFRC 2007a). In the 2007 RTP, the WDC is shown as a Phase 2 (2016–2025) project between Farmington and 1200 South (also called 12th South) in Mariott-Slaterville and a Phase 3 (2026–2030) project between 12th South and I-15 in Willard (Box Elder County). After the WDC project was included in the RTP, UDOT began preparing for an EIS process. The WDC project is in the 2009–2012 Statewide Transportation Improvement Program (STIP).

The WDC project EIS will consider the recommendations made in the 2001 plan, the 2007 RTP, and the 2009 supplemental study report on Weber County but will also consider other options to meet the purpose of and need for the project. General alternatives under consideration will include:

- Taking no action (no-build)
- Transportation system management
- Build alternatives for various modes of transportation

The need study area must be defined before the team can develop alternatives that will be studied in the EIS.

Discussion of the Need Study Area

In general, the need study area must focus on the identified problem area but must be large enough to accommodate reasonable alternatives that show the project's independent utility. Identifying the study area before alternatives have been developed can be challenging because of uncertainty regarding the termini and range of options.

Southern Boundary of the Need Study Area

Several major roads currently connect in the city of Farmington, which is in Davis County. Legacy Parkway (State Route 67, or SR 67), I-15, and U.S. 89 (U.S. 89) all connect in Farmington (see Figure 2). From Farmington, I-15 continues northwest, U.S. 89 continues north-northeast, and Legacy Parkway ends. The Utah Transit Authority's FrontRunner commuter train also parallels I-15 in this area.

With the exception of the FrontRunner commuter line, the area between I-15 and the Great Salt Lake north of the Legacy Parkway is not served by any other major north-south transportation facility, but previously completed modeling shows that the area could benefit from transportation improvements (Horrocks 2008; WFRC and UDOT 2009). A review of preliminary 2040 travel demand modeling conducted for the WDC shows that average daily traffic (ADT) on I-15 and on several minor north-south roads in Farmington and elsewhere in northwestern Davis County would exceed the available capacity in 2040. This preliminarily demonstrates the need for a transportation improvement in the Farmington area

in 2040. Establishing a southern boundary for the WDC south of Farmington would allow UDOT to completely include and focus on these problem areas. Furthermore, the RTP does not show any additional future contiguous major north-south transportation facilities that could connect to a corridor north of Centerville. To ensure that all rational southern endpoints for a transportation improvement are considered in the EIS, this memorandum recommends that the southern end of the study area be at about Parrish Lane in Centerville so that Farmington can be included in its entirety.

Northern Boundary of the Need Study Area

Traffic modeling results from other projects in the region show that additional areas west of I-15 might experience traffic congestion and a resulting reduction in mobility (Horrocks 2008; WFRC and UDOT 2009). These results for a design year of 2040 show that:

- ADT on the previously defined WDC transportation corridor would drop considerably north of 12th South in Marriott-Slaterville.
- The area between Parrish Lane (about 400 North in Centerville) and 12th South shows potential transportation problems that could be addressed through the WDC project.
- 4700 West fails between 4000 South and 12th South

The 2040 traffic modeling results led the team to focus on a logical northern study area boundary of 12th South, but the team also considered a northern boundary of the Weber County–Box Elder County line (about I-15 in Willard, which is the RTP Phase 3 [2026–2030] northern terminus of the WDC as it is presented in the RTP; see Figure 1). In comparing these two possibilities for a northern boundary, the team reached the following conclusions:

- Although the undeveloped areas north of about 12th South and west of I-15 have the potential for extensive development, no major developments are currently planned. Because land-use projections for this area are uncertain, inclusion of the area north of 12th South in the need study area would introduce considerable uncertainty, which might make the results from the WDC modeling inaccurate.
- Results from previously completed modeling do not show a substantial transportation need in the area north of about 12th South, which indicates that, even in 2030, development in the area north of 12th South will not result in ADT that would cause or contribute to congestion problems farther south. This 2040 modeling shows that most roads north of 12th South would operate at acceptable levels of service .
- Results from previously completed modeling show that demand for travel with an origin north of 12th South and west of I-15 tends more toward Ogden than Salt Lake County, indicating that most traffic appears to be east-west trending and would have little affect on roads to the south.
- Historic population growth in the area west of I-15 has been to the north and west of the Salt Lake County–Davis County line. This is evident by review of the population centers in western Davis and western Weber Counties. For example, the cities west of I-15 in Davis County (such as Centerville, Farmington, and Syracuse) are much larger than the Weber County cities west of I-15 (such as Farr West and Plain City). While WFRC expects the 2009 to 2030 percentage growth of cities like Farr West and Plain City to exceed the percentage growth of cities like Farmington and

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Syracuse (WFRC 2007b), it is also expected that the majority of people will continue to choose to live in larger cities west of I-15 in Davis County because of their proximity to the major metropolitan area of Salt Lake City. These cities would also experience greater overall population increases than the cities north of 12th South.

- Review of the results of previously completed travel demand modeling and preliminary 2040 modeling for the WDC shows that the transportation need is mainly south of 12th South and west of I-15. In this area, north-south and east-west roads would operate at unacceptable levels of service in 2040, resulting in poor regional mobility. North-south roads that would be affected include SR 108, 1000 West (in Clinton), 4500 West (SR 110 in West Point and Syracuse), and segments of I-15. East-west roads operating at above capacity include 12th South (SR 39), 4000 South (SR 37 in West Haven), 1800 North (also called SR 37 in Sunset and Clinton), 300 North (SR 107 in Clearfield and West Point), and Antelope Drive (SR 108 east of 2000 West and SR 127 west of 2000 West).
- Terminating the WDC near the Davis County-Weber County line would not only allow the EIS to focus on an area that is expected to experience more capacity and mobility challenges than areas to the north but would also accommodate connection to an existing road network without affecting the construction of Phase 3 of the North Legacy project at some later date. The future Phase 3 project could tie in to any number of existing or potential future area roadways, including a WDC project, but could also be constructed independent of the WDC.

Selecting 12th South as the northern end of the study area would provide a large enough area to encompass logical termini for build alternatives, would provide independent utility, and would not restrict the consideration of potential alternatives during the NEPA process.

Western and Eastern Boundaries of the Need Study Area

The Great Salt Lake serves as a logical western boundary of the study area. The team is aware of the need to consider sensitive habitats associated with the lake shore and will focus on practicable avoidance of these resources.

The three major roads that accommodate north-south travel in between the proposed northern and southern study area boundaries include Legacy Parkway, U.S. 89, and I-15. The northern end of Legacy Parkway is in Centerville, merging with I-15 and U.S. 89 in Farmington. From this point, U.S. 89 travels on the east side of I-15 and provides access to south Ogden and, eventually, Ogden. U.S. 89 does not provide access to the area that, according to the previously completed modeling results, needs transportation improvements. Because U.S. 89 provides access to the east side of I-15 and has little to no effect on traffic west of I-15, U.S. 89 is not considered a suitable eastern study area boundary.

I-15 is currently the only major north-south road that serves the area north and west of Centerville. The Utah Transit Authority's FrontRunner commuter rail parallels I-15 and provides stops along the rail line but does not extend rail service to any areas east and west of the I-15 corridor. I-15 would serve as a logical eastern study area boundary.

Recommendation for the Need Study Area

Based on information provided through previous modeling results, the RTP, information about future land use in Davis and Weber counties, and the configuration of the expected 2040 road network without the WDC, the WDC Management Team recommends that the need study area boundaries be established as shown in Figure 2. As shown in the figure, the need study area boundaries would be as follows:

- Northern boundary: 12th South in Mariott-Slaterville/Weber County
- Southern boundary: about Parrish Lane in Centerville
- Western boundary: east of the Great Salt Lake
- Eastern boundary: I-15

TM 3 Amendment #1 – June 2011

The initial north boundary for the WDC EIS study area (12th South) was developed based on version 6.0 of the WFRC travel demand model. In June 2011, WFRC released version 7.0 of the travel demand model. UDOT used version 7.0 to conduct a sensitivity analysis to confirm that the study area and purpose and need decisions, which were made with version 6.0, were still valid with version 7.0. Results of the analysis showed that two of the key reasons for selecting 12th South as the north limit of the study area were no longer valid (WFRC 2011).

One of the reasons that 12th South was selected as the northern boundary for the WDC study area boundary was that 4700 West operated at an unacceptable level of service (above LOS E and F) between 4000 South and 12th South in 2040. Therefore, there was a need to improve the level of service on this arterial. In version 6.0 of the model (2007 RTP) 4700 West was a two-lane roadway. In version 7.0 of the model (2011 RTP) 4700 West was widened to a five-lane arterial from 4000 South to 12th South (WFRC 2011). As a five-lane arterial in version 7.0, 4700 West would operate at an acceptable level of service (LOS D or better), so there is not a need for additional improvements north of 4000 South.

The other reason for selecting 12th South as the northern boundary was that version 6.0 of the travel demand model showed 12th South operating at LOS E between 3500 West and 4300 West. In version 7.0, all segments of 12th South operate at LOS D or better west of I-15. Overall, version 7.0 of the model shows that no roads operate at an unacceptable level of service west of 2700 West and north of 4000 South. The version 6 and version 7 No-Build 2040 V/C maps are attached.

Based on the information above, the study area northern boundary was changed from 12th South to 4000 South based on results from version 7.0 of the WFRC travel demand model. The east, west, and south boundaries of the study area remain valid and did not change based on version 7.0 of the model since they were based on major geographic features (Great Salt Lake –west boundary) and transportation facilities (I-15, Legacy Parkway, and US 89 – east and south boundaries).

TM 3 Amendment #2 – June 2016

The initial northern boundary for the WDC EIS study area (12th South) was developed based on version 6.0 of the WFRC travel demand model. In June 2011, WFRC released version 7.0 of the travel demand model. UDOT used version 7.0 to conduct a sensitivity analysis to confirm that the study area and purpose and need decisions, which were made with version 6.0, were still valid with version 7.0. The version 7.0 analysis showed that the northern boundary of the study area should be moved south to 4000 South in Weber County.

In May 2016, WFRC released a new version of the travel demand model. To verify the study boundary used in the Draft EIS, the WDC team conducted a sensitivity analysis using version 8.1 of the WFRC model (see the attached figures). The results of the analysis showed that the study area boundary at 4000 South in Weber County as identified in the Draft EIS was still valid. This conclusion was based on the fact that SR 108 would operate at LOS D north of 5500 South. The reasons for the east, west, and south study area boundaries remained the same as described under TM Amendment 1.

One of the comments on the Draft EIS was that the study area boundary should have included the area east of I-15 and that UDOT should have evaluated a north-south improvement east of I-15. To evaluate how roadway improvements would benefit east-west congestion west of I-15, the WDC team conducted a sensitivity analysis. To demonstrate this point, a four-lane freeway was hypothetically proposed and modeled on the east side of I-15 midway between I-15 and US 89. Despite the size and scale of this improvement, it had minor benefits to traffic conditions west of I-15, as shown in Table 1.

Table 1. Projected Benefits in the WDC Study Area from Transportation Improvements West and East of I-15 in 2040

Traffic Parameter	No Action	Improvements West of I-15	Improvements East of I-15
Daily delay (hours)	10,760	7,797 (-27.6%)	10,000 (-7.1%)
VMT in congestion	245,500	98,880 (-59%)	239,800 (-2.3%)
VHT in congestion	9,490	4,980 (-47%)	8,980 (-5.4%)
East-west miles in congestion	26.9	16 (-37%)	24.6 (-8.6%)
North-south miles in congestion	43.5	19 (-57%)	42.8 (-1.6%)

I-15 is still the primary north-south transportation facility in Davis and Weber Counties, and any improvements east of I-15 would not affect travel demand on the west side of I-15. No changes were made to the eastern boundary of the study area.

References

[FHWA] Federal Highway Administration

- 2006 SAFETEA-LU Environmental Review Process (Public Law 109-59). Final guidance issued November 15.
- 2008 Final Environmental Impact Statement and Section 4(f) Evaluation for S.R. 108 in Davis and Weber Counties. August.

[Horrocks] Horrocks Engineers

- 2008 Farmington City Transportation Master Plan Update.

[WFRC] Wasatch Front Regional Council

- 2007a 2007–2030 Regional Transportation Plan.
- 2007b 2030 Socioeconomic projections data. February.
- 2011 2011-2040 Regional Transportation Plan.

[WFRC and UDOT] Wasatch Front Regional Council and Utah Department of Transportation

- 2001 North Legacy Corridor Transportation Study.
- 2009 North Legacy Transportation Corridor Supplemental Study.

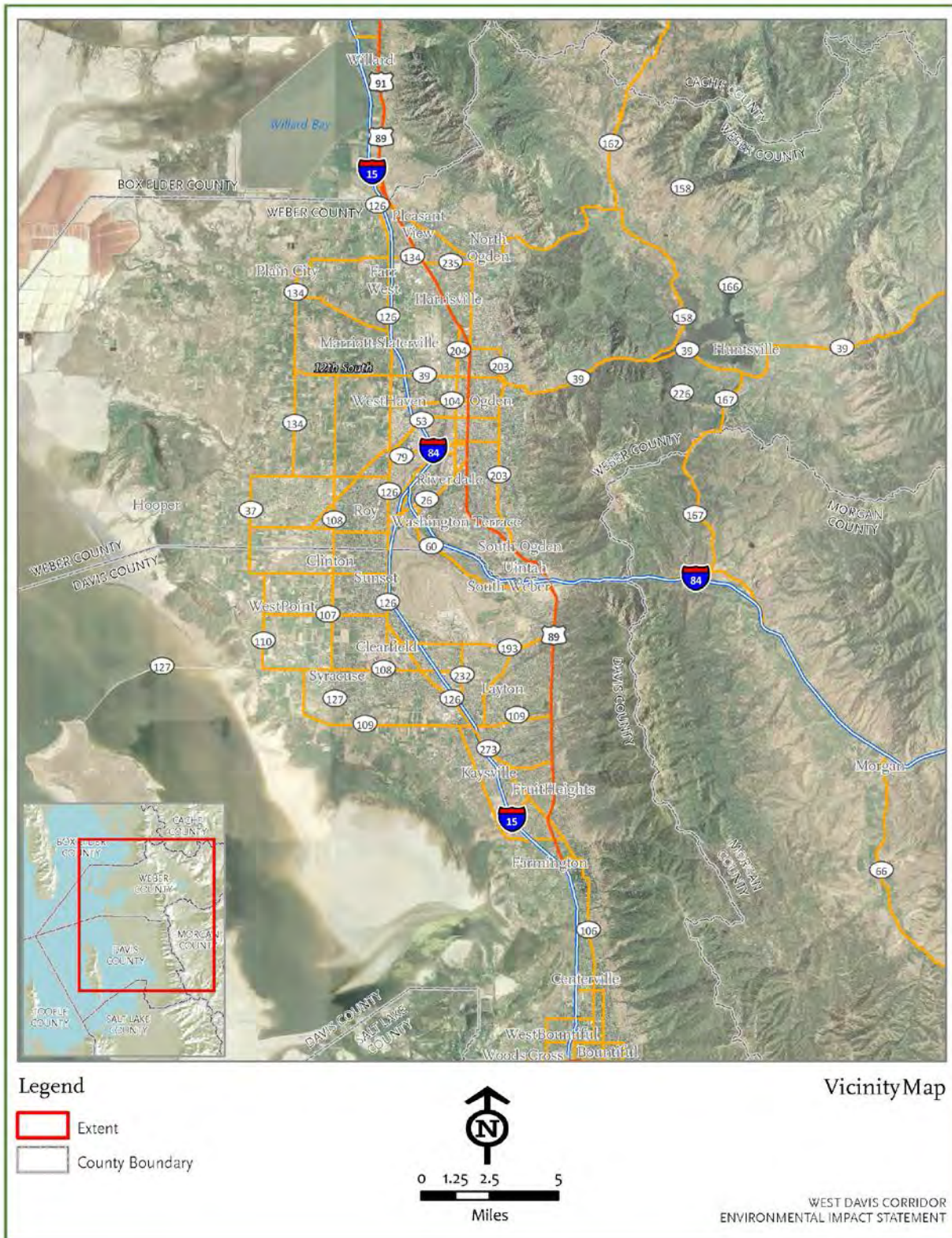
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Figure 1. West Davis Corridor Project Vicinity



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Figure 2. West Davis Corridor Study Area



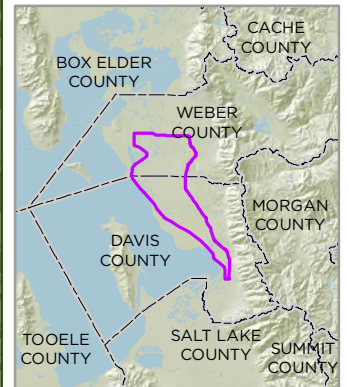
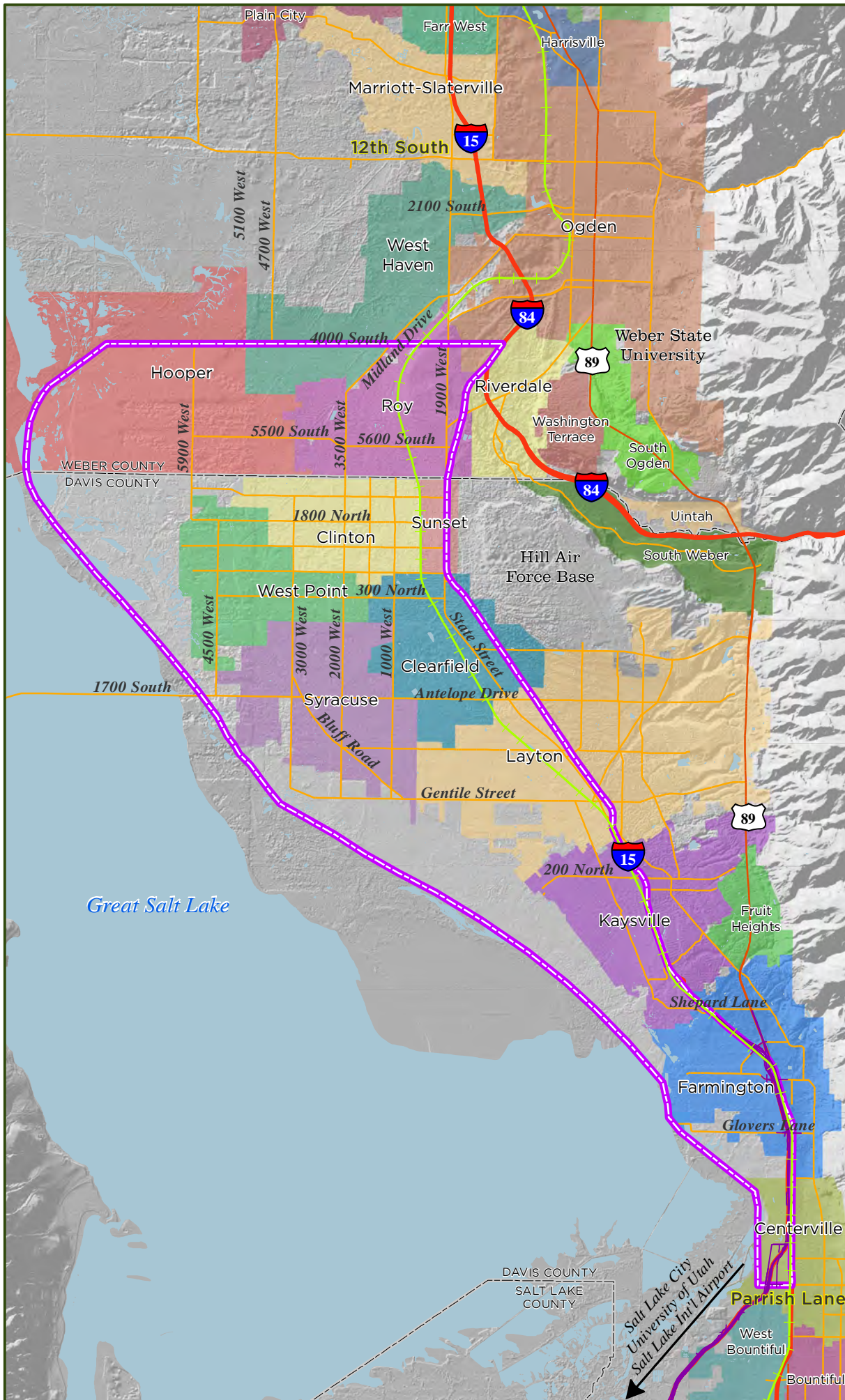


WEST DAVIS CORRIDOR

ENVIRONMENTAL IMPACT STATEMENT

Legend

- FrontRunner
- Legacy Parkway
- Highway/Interstate
- US Highway
- State Road
- Study Area
- County Boundary

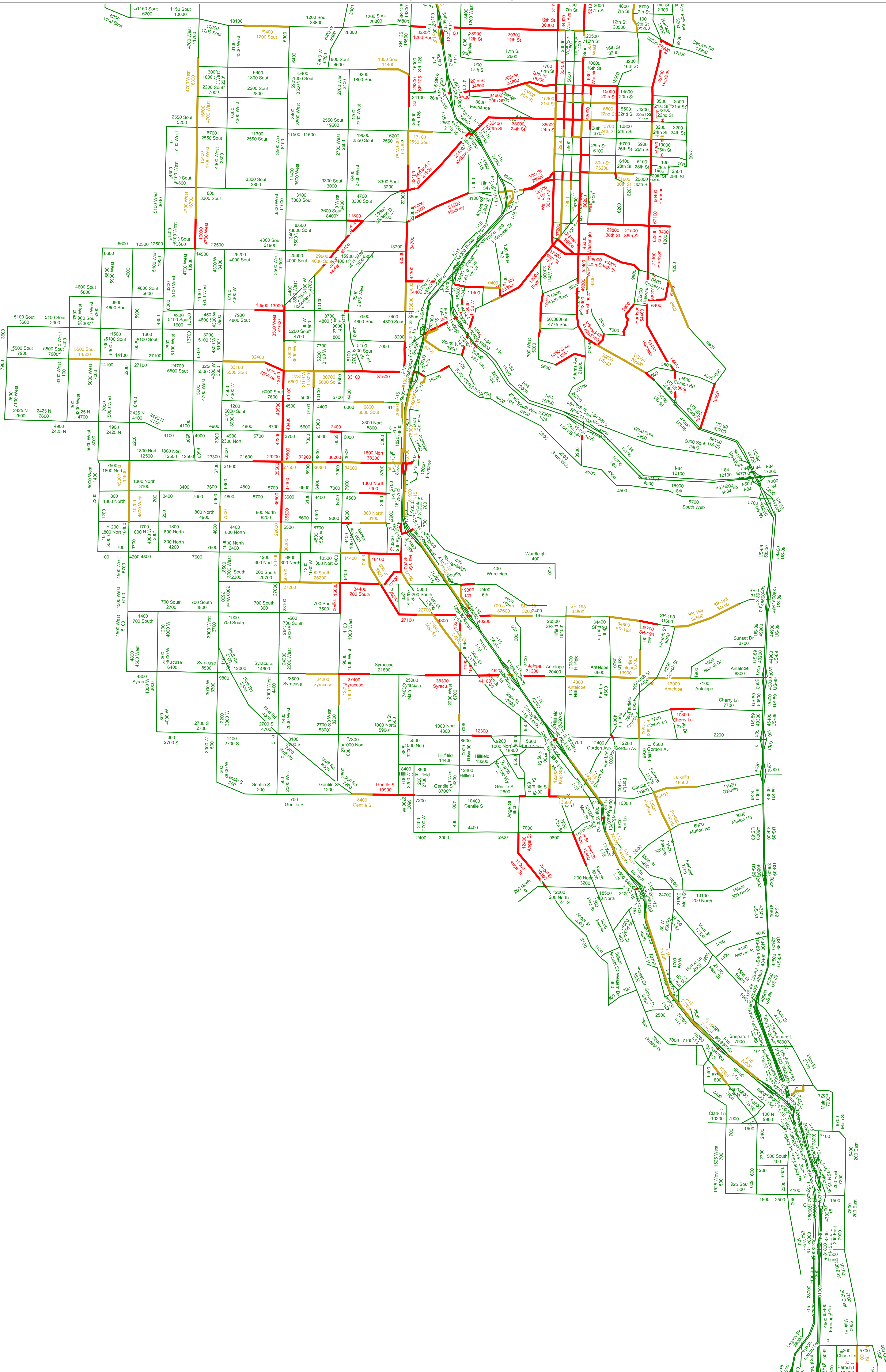


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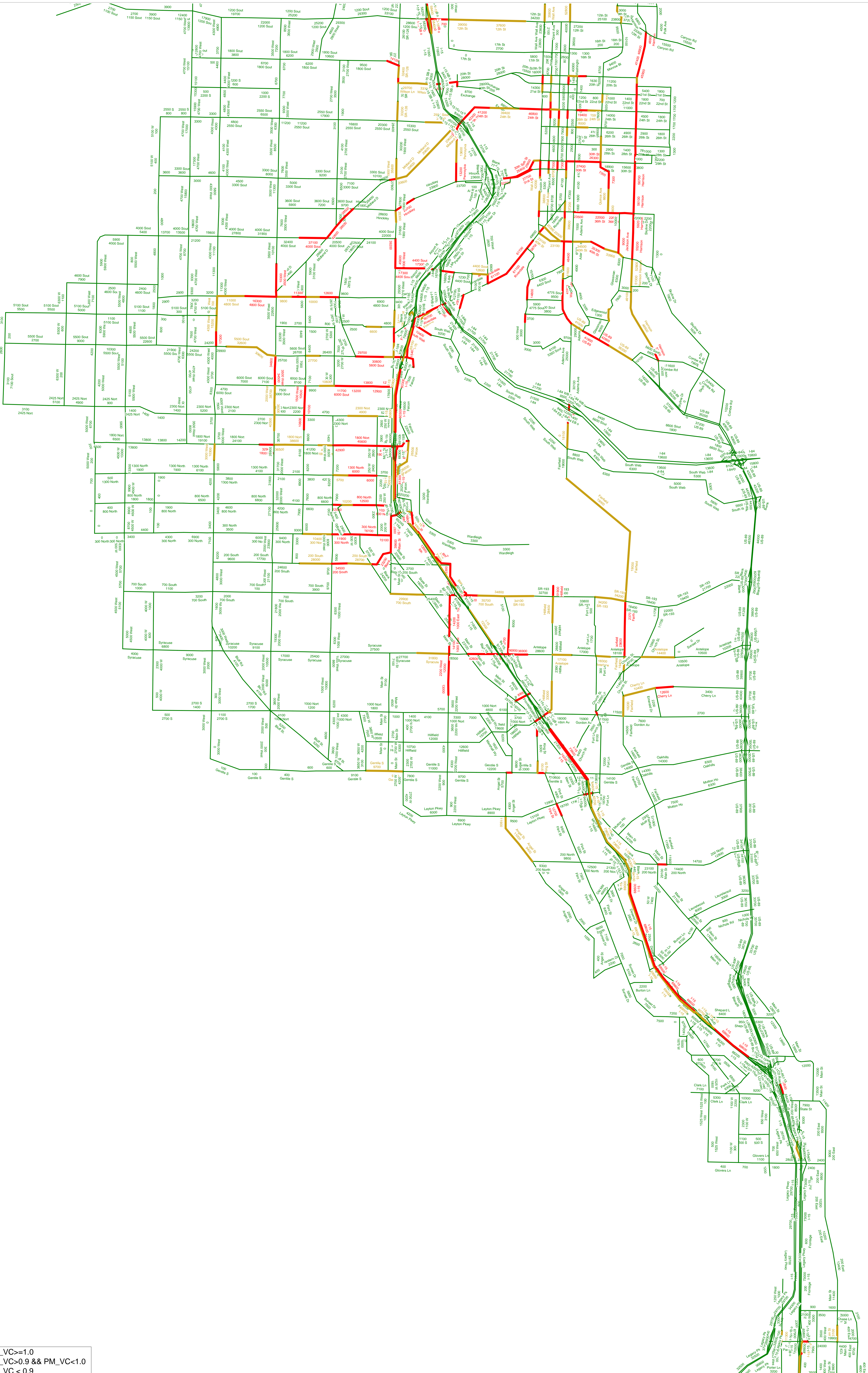
Revised
Study Area
June 2011

2040 - West Davis Corridor EIS
 No Build - AWDT and PM V/C
 7/15/10 (With Draft SE 4-26-10)



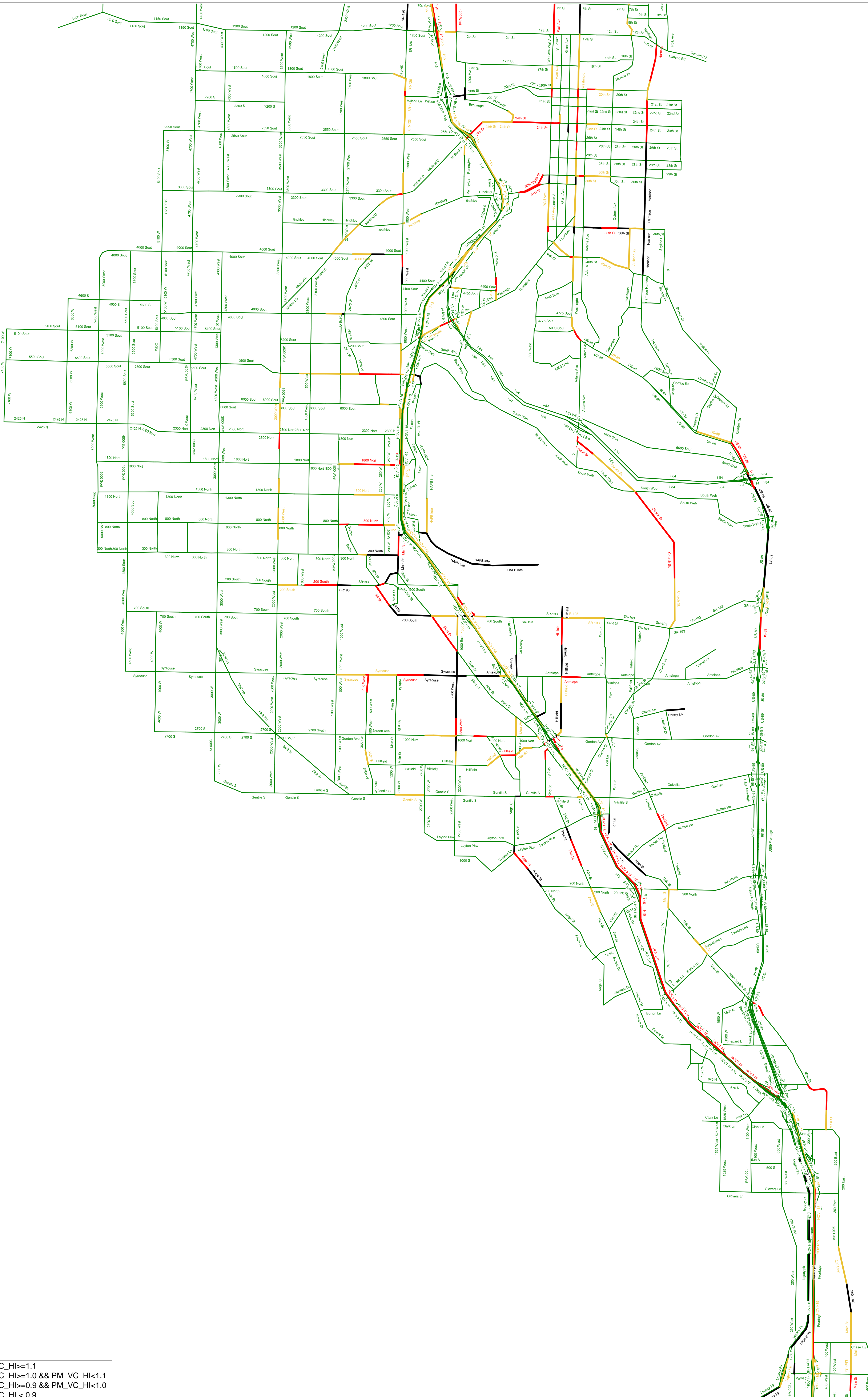
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— PM_VC > 0.9 && PM_VC < 1.0
— PM_VC < 0.9

2040 - Travel Model v7 Draft RTP
No Build
PM_V/C and AWDT - 5/24/11



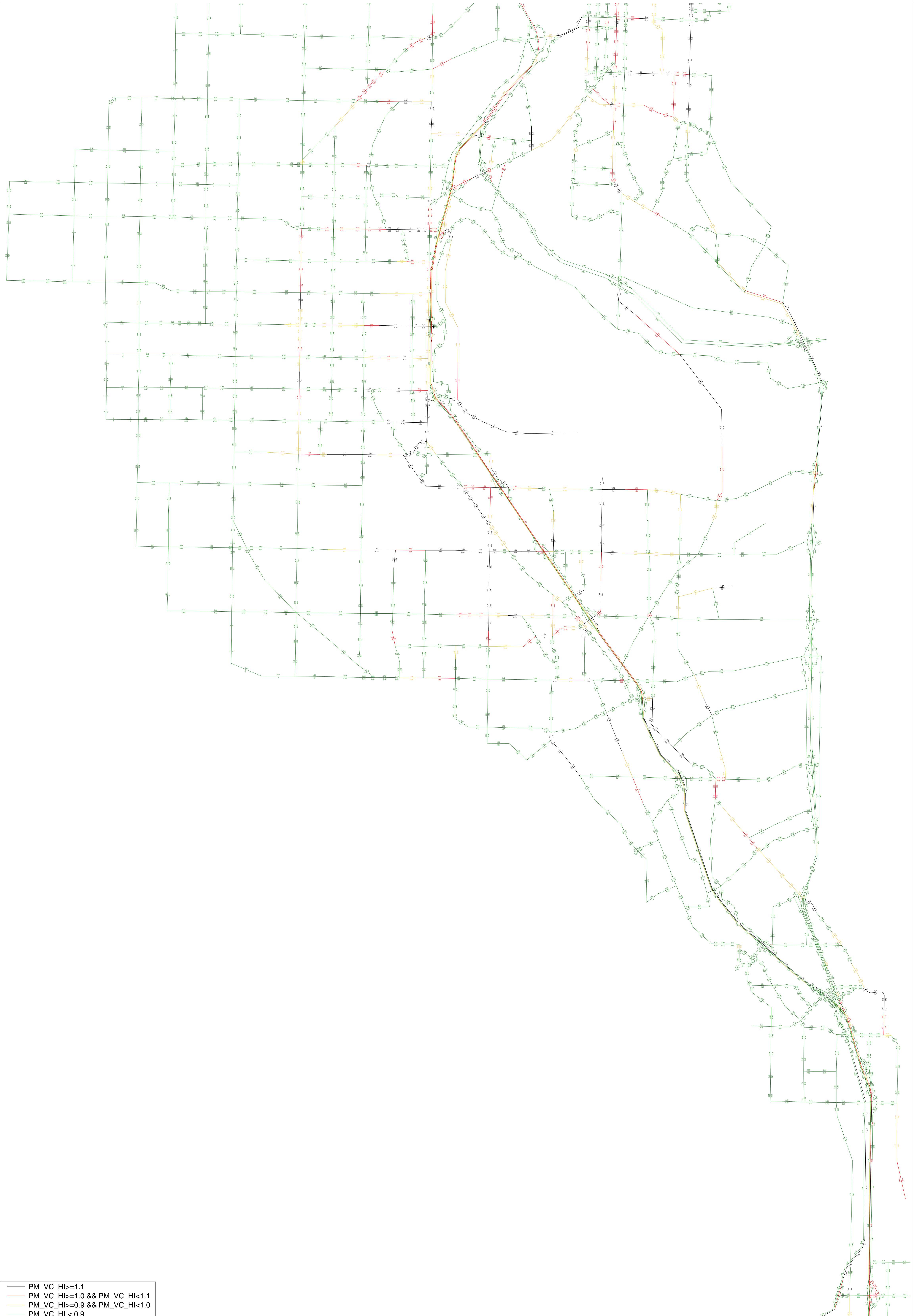
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PM_V/C > 0.9 && PM_V/C < 1.0
PM_V/C < 0.9

2040 - V8.1 Travel Demand Model - Managed Motorways
 WDC No Build 3/30/16
 PM V/C



- PM_VC_HI >= 1.1
- PM_VC_HI >= 1.0 && PM_VC_HI < 1.1
- PM_VC_HI >= 0.9 && PM_VC_HI < 1.0
- PM_VC_HI < 0.9

2040 - V8.1 Travel Demand Model - Managed Motorways
WDC No Action Alternative 3/30/16
PM 1-Hr Peak V/C



- PM_V/C_Hi >= 1.1
- PM_V/C_Hi >= 1.0 && PM_V/C_Hi < 1.1
- PM_V/C_Hi >= 0.9 && PM_V/C_Hi < 1.0
- PM_V/C_Hi < 0.9