Supplemental Phase 1B Analysis

NORTH I-25 FREEWAY OPERATIONS STUDY

Comanche Road Interchange to Tramway Road Interchange

Former NMDOT Project: TPA-TPU-025-4(122)228, CN D3018

Submitted to:

New Mexico DEPARTMENT OF TRANSPORTATION

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Introduction

The *Phase IB Alternatives Analysis Final Report for the North I-25 Freeway Operations Study* (CN D3018) was completed in November 2011. Several conditions have changed since then. The recommended build alternative that resulted from the 2011 study incorporated an overall I-25/Paseo del Norte interchange configuration (CN D3026) that differed substantially from what was constructed in 2014. In addition, the Mid Region Council of Governments (MRCOG) has adopted the *Future's 2040 Metropolitan Transportation Plan* (MTP) whereas the previous Phase IB effort was based on the 2030 MTP. The NMDOT has also constructed other improvements in the North I-25 corridor and is in the process of addressing commitments made as part of the recent I-25/Paseo del Norte interchange project (CN A301180) between Jefferson Street and San Antonio Drive.

This objectives of this supplement to the North I-25 Freeway Operations Study Phase IB report are to:

- Modify the recommended build alternative to incorporate the improvements constructed along North I-25 and that are currently being developed.
- Evaluate the traffic operational performance of mainline I-25 based on a 2040 design year.
- Revise the schematic phasing plan and associated costs for the updated recommended build alternative.

The North I-25 study area is shown in Exhibit 1.

Updates to the Recommended Build Alternative

The recommended build alternative configuration for the North I-25 corridor needs to be updated to incorporate recent and ongoing improvements by the NMDOT, which include:

- The three-lane bottleneck on northbound I-25 at Comanche Road was improved with the addition of a fourth general purpose lane.
- The I-25/Paseo del Norte Interchange improvements were constructed, which included improvements from Jefferson Street to Alameda Boulevard. With this and the previous project, a fourth northbound lane was added from the Comanche Road interchange to the Alameda Boulevard interchange.
- The second construction phase of the I-25/Paseo del Norte improvements (CN A301181) is currently under development, which involves extending a fourth lane south through the Jefferson Street interchange on southbound I-25 and adding an auxiliary lane for the San Antonio off-ramp on northbound I-25.

Additional modifications to the recommended build alternative are presented later in this document which are based on the updated traffic analysis.

Considerations regarding the I-25/Paseo del Norte (I-25/PDN) interchange improvements are listed below. These are differences between what was recently constructed and the configuration of the I-25/PDN interchange included in the 2011 corridor study.

1. The collector-distributor (CD) road that originated at the northbound San Antonio off-ramp and was grade-separated across San Antonio Drive was not constructed. The purpose of this CD road was to accommodate local trips along Paseo del Norte and to reduce the traffic volume within the weave segment between the San Mateo on-ramp and the high-demand Paseo del Norte directional off-ramps.
2. The current layout keeps the southbound off-ramp to Paseo del Norte so the need to move the Alameda southbound off-ramp substantially further north is not necessary.
3. The design of the north-to-west flyover ramp moved further south to accommodate the slip off-ramp to the northbound frontage road for local trips along eastbound and westbound Paseo del Norte. This shortened the spacing between the San Mateo on-ramp and the Paseo del Norte off-ramp by a few hundred feet even though the San Mateo on-ramp gore also shifted south.
4. While the configuration of the Paseo del Norte southbound on-ramps changed by providing a west-to-south loop ramp, the resulting gore location for the east-to-south directional ramp stayed about the same.
5. The I-25/PDN improvements kept the San Antonio southbound off-ramp. In the 2011 recommended alternative, preference was given to providing full access at the San Mateo/Osuna interchange which would eliminate the San Antonio southbound off-ramp (as well as the San Antonio southbound on-ramp).

An updated ramp layout schematic for the recommended build alternative is provided as Exhibit 2.

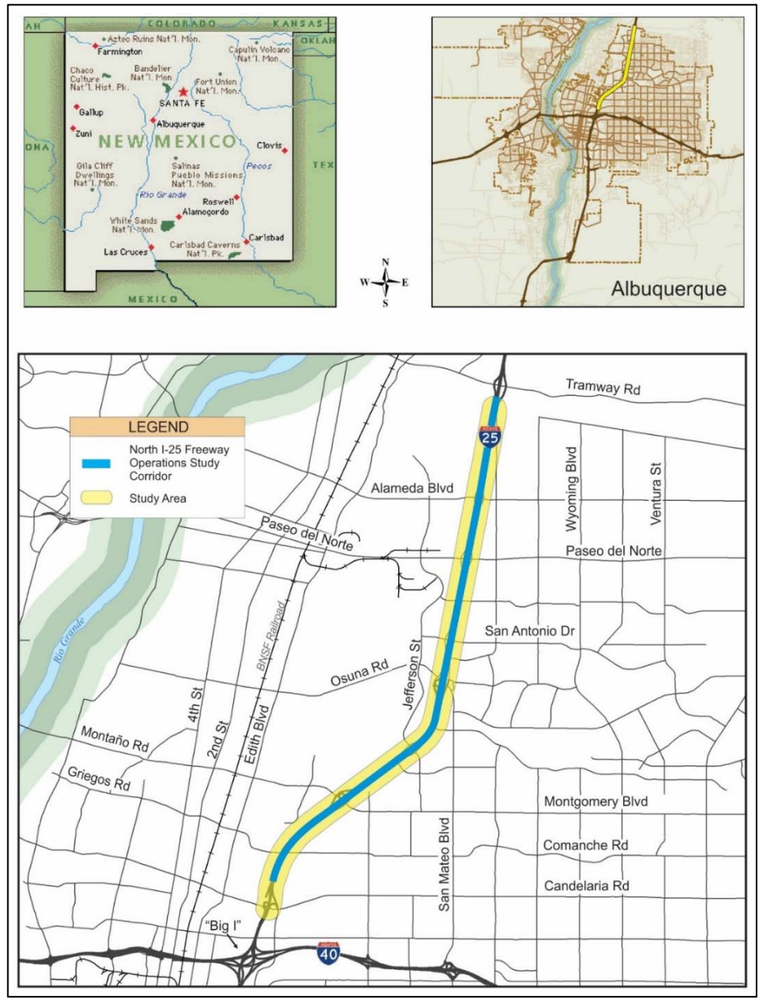


Exhibit 1, Study Area and Vicinity Map

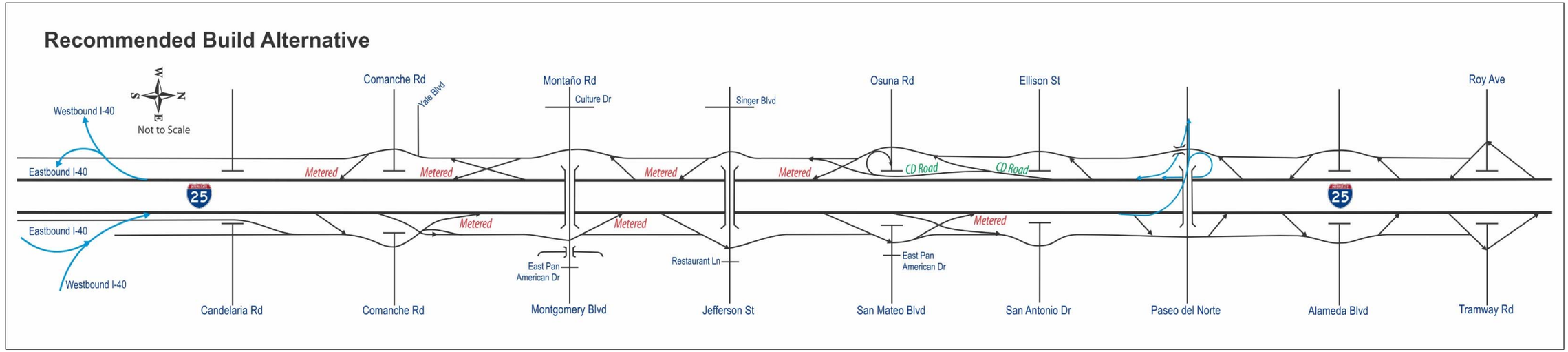


Exhibit 2, Updated Ramp Layout Schematic for the Recommended Build Alternative

Design Year Traffic Forecasts

Design-year traffic forecasts were developed based on the *Futures 2040 Metropolitan Transportation Plan* (2040 MTP) adopted by the Mid-Region Council of Governments (MRCOG). The design-year traffic forecasts were developed in cooperation with the MRCOG using their CUBE regional travel demand model and the adopted 2040 MTP data sets including the planned transportation network and socio-economic data. MRCOG also provided the Year 2012 model representing the base year condition.

The traffic forecasts were developed for the mainline segments of northbound and southbound I-25, the on-ramps and off-ramps in both directions from I-40 to Tramway Road, and for the San Mateo/Osuna and San Antonio interchanges only. The San Mateo/Osuna interchange and the San Antonio interchange are key interchanges involved in the second construction phase of the I-25/PDN improvements (CN A301181).

The post-processing protocol followed MRCOG-accepted methodologies. The design-year forecasts are summarized in Table 1 through Table 3 in Attachment A.

Updated Existing Traffic Counts

Existing condition traffic volumes were updated to facilitate the development of 2040 design-year traffic forecasts. The existing AM and PM peak-hour traffic volumes were assembled as follows:

- For mainline I-25, traffic volume data were obtained from the NMDOT's intelligent transportation system (ITS) Wavetronics Sensors. Data were compiled for several weekdays in March 2015 to calculate average weekday peak-hour traffic volumes.
- For the I-25 on and off-ramps, the most recent available traffic volumes from the traffic count database maintained by MRCOG were used.
- Intersection turn movement counts were performed in November 2015 by Mike Henderson Consulting. Five intersections were counted including:
  - San Mateo Boulevard/Osuna Road @ Pan American West
  - San Mateo Boulevard @ Pan American East
  - San Mateo Boulevard @ Pan American Road
  - San Antonio Drive/Ellison Street @ Pan American West
  - San Antonio Drive @ Pan American East

Existing traffic volumes are summarized in Tables 1 through 3 in Attachment A together with the 2040 forecasts for comparative purposes.

Traffic Performance Evaluation

The performance of northbound and southbound I-25 under the 2040 design year traffic conditions was evaluated to define expected operations and to identify if any further modifications to the recommended build alternative should be considered. Both directions of mainline I-25 and the San Mateo/Osuna and San Antonio interchanges were included in the evaluation.

Freeway Facilities

The freeway facilities module of the 2010 Highway Capacity Software (HCS 2010) was used to evaluate I-25. The freeway facilities including basic freeway segments, ramp junctions and weaving segments from I-40 to the I-25/Tramway Road interchange were evaluated. The evaluation utilized twelve 15-minute time slices to ensure uncongested traffic conditions before and after the peak-hour.

Key input assumptions used for the freeway facilities analyses are summarized below.

- Jam Density: 190 passenger cars per mile per lane (pcpmpl)
- Free-Flow Speed:
  - I-25 Mainline: 70 mph
  - I-25 Ramps: 50 mph for directional ramps; 30 mph for loop ramps
- Terrain: mostly level
- Truck Percentages: 2% to 5% trucks

Weaving segments are the critical performance areas in both directions of mainline I-25. Per the 2010 Highway Capacity Manual (2010 HCM), the weaving segment capacity is controlled by a density of 43 passenger cars per mile per lane (pcpmpl) or the weaving demand flow rate, which is 2400 passenger cars per hour (pcph) for a two-lane weave and 3500 pcph for a three-lane weave.

A key parameter for weave segments is the volume ratio which is based on the weaving volume and the total volume. High volume ratios result in more turbulence on the freeway and longer weaving lengths. The 2010 HCM method is calibrated based on a weaving length of 2800 feet. Depending on the volume ratio and the number of lanes within the weaving segment, the calculated maximum weaving lengths can be very long. If the calculated maximum weave length is substantially longer than the available weave length, poor traffic performance should be expected.

While many weave segments were eliminated in the recommended build alternative by braiding ramps or eliminating ramps, there are several weave segments that remain and many of them have high volume ratios that exceed the maximum weaving demand flow rates of 2400 and 3500 pcph. In these cases, LOS F would result and the freeway facilities analysis would not be useful because of extensive queuing into upstream segments and/or traffic demand would not be served. As such, where high volume ratios are expected, the freeway facilities analysis was performed as both weaving segments and basic freeway segments or just as basic freeway segments. This approach was used to calculate density in upstream segments knowing that the weave segment is deficient so that the upstream segments could be evaluated without the congestion resulting from the deficient weave segment. This is discussed further below.

The analysis results are summarized in Tables 4 through 10 in Attachment B. Key findings by travel direction are discussed next.

Northbound I-25

The northbound freeway facilities results are summarized in Table 4 through Table 6. Table 4 (AM peak) and Table 5 (PM peak) summarize the results with the segment between the San Mateo on-ramp and the Paseo del Norte off-ramp evaluated as a weave segment. This is a high-demand weave segment that is expected to operate at LOS F during both peak hours. Extensive queuing is expected during the PM peak that impacts several upstream segments. As such, Table 6 (PM peak) is provided to show the results with the segment between the San Mateo on-ramp (lane add) and the Paseo del Norte off-ramp (lane drop) as basic freeway segments. This analysis does not result in extensive queuing which can be used to assess the operations in the segments upstream from the deficient weave segment (i.e., the critical deficiency is the weave segment not the upstream segments although LOS E is expected for some of the upstream segments anyway).

This analysis indicates a deficiency between the San Mateo on-ramp and the Paseo del Norte off-ramp. Potential strategies to address this deficiency include:

- Do not eliminate the Jefferson on-ramp which would reduce the traffic using the San Mateo on-ramp thereby reducing the weaving volume within the critical segment. This would create a weave segment between the Jefferson on-ramp and the San Antonio off-ramp, with a diverging movement to the San Mateo off-ramp in between. The Jefferson on-ramp gore would be about 2000 feet from the San Mateo off-ramp gore and another 2000 feet to the San Antonio off-ramp gore. This spacing is reasonable and the on-ramp demand would be dispersed which may balance traffic enough to avoid total breakdown and upstream stop-and-go traffic (i.e. shockwaves) north of the San Mateo on-ramp. A two-lane exit at the San Antonio off-ramp would benefit the weaving segment operations. This would also reduce the load on the San Mateo/northbound frontage road intersection. [Note that is option was not evaluated as part of this supplemental analysis and would require additional travel demand modeling by MRCOG.]
- Remove the slip off-ramp from the Paseo del Norte north-to-west directional ramp that connects to the northbound frontage road. Replace the access with a CD Road that would begin at the San Antonio off-ramp and would be grade-separated across San Antonio Drive to accommodate local trips destined for westbound Paseo del Norte, the frontage road north of Paseo del Norte, and all trips destined for eastbound Paseo del Norte. This concept was included in the previous Phase IB report. However, the recent investments at the Paseo del Norte interchange make this an undesirable option.
- Use ramp metering to manage the demand using the San Mateo on-ramp, as recommended in the previous Phase IB report.

The northbound segment between the I-40 on-ramps and the Montgomery off-ramp is also a high-demand weaving segment where the forecast volume ratio exceeds the 2010 HCM maximum demand flow rates. This segment was only evaluated as basic freeway segments with lane additions at the I-40 on-ramps, a lane drop at the Montgomery off-ramp, and with an off-ramp diverge at the Comanche off-ramp in between. Congestion should be expected within this segment. The Montgomery off-ramp was modified to provide a two-lane exit, which is intended to lessen weaving turbulence.

The analyses also show LOS E for the northbound facilities between the Comanche on-ramp and the Jefferson off-ramp. The recommendation to plan for future ramp metering remains applicable.

Southbound I-25

The southbound freeway facilities results are summarized in Table 7 through Table 10 in Attachment B. The analysis was performed for two scenarios; with and without the San Antonio off-ramp.

Based on the conceptual design layout, maintaining the San Antonio off-ramp can be considered although access spacing is reduced to minimum standards in several instances and guide signing is more compressed. The painted gore-to-gore spacing would be 2100 feet from the PDN E-S on-ramp to the San Antonio off-ramp and 1000 feet to the CD Road off-ramp. Along the CD Road, the distance to the Osuna off-ramp would be at the minimum spacing of 600 feet.

Considering traffic operations, this is a complicated configuration because there is an off-ramp diverge within a weaving segment. This configuration would best be evaluated using micro-simulation. Based on basic lane capacity, the five-lane section could handle the forecast traffic volume of approximately 9000 vehicles per hour, but this does not include the effect of weaving turbulence.

Advantages associated with the San Antonio off-ramp include:

- It would improve the weave segment between the Alameda on-ramp and the Paseo del Norte off-ramp because traffic destined to San Antonio drive would not exit at Paseo del Norte.
- It would reduce the load on the upstream (Paseo del Norte) and downstream (San Mateo/Osuna) intersection operations along the southbound frontage road.
- It would provide direct access to San Antonio Drive.

Disadvantages associated with the San Antonio off-ramp include:

- It would add to weaving maneuvers within the segment between the high-demand PDN E-S on-ramp and the CD Road off-ramp.
- More traffic stays on southbound I-25 through the Paseo del Norte interchange. During the AM peak, the three-lane segment downstream of the PDN loop on-ramp changes from LOS D to LOS E.
- During the PM peak hour, the San Antonio off-ramp is LOS D but has a demand/capacity ratio of 0.95 so the diverging movement would be near capacity.

Considering the access spacing and guide signing together with the operational performance, the preferred option is to eliminate the San Antonio southbound off-ramp and rely on the frontage road system for access to San Antonio Drive and Ellison Street. The advance U-turn at the San Mateo/Osuna interchange is more of a luxury than a need and is recommended to be removed from the recommended build alternative with or without the southbound San Antonio off-ramp.

For the remainder of the corridor, the results are the same for the two scenarios with several segments at LOS E from the San Mateo/Osuna on-ramp to the I-40 off-ramps.

The San Mateo/Osuna southbound on-ramp is a high-demand ramp because it also serves the San Antonio on-ramp traffic. As such, the downstream four-lane section north of the Jefferson on-ramp is expected to operate at LOS E. The LOS E continues into the weave segment between the Jefferson on-ramp and the Montgomery off-ramp.

High-demand weaving segments where the forecast volume ratios exceed the 2010 HCM maximum demand flow rates resulting in deficient segments include:

- Paseo del Norte E-S on-ramp to CD Road off-ramp (with or without the San Antonio off-ramp)
- Comanche on-ramp to I-40 off-ramps

As discussed above, when analyzed as basic freeway segments, LOS D was shown for the Paseo del Norte/CD Road segment and LOS E was shown for the Comanche/I-40 segment. Because additional lanes are not viable, travel demand management would be required to address the expected congestion. As such, the recommendation to plan for future ramp metering remains applicable.

Signalized Intersections

The signalized intersections at the San Mateo/Osuna interchange and at the San Antonio interchange were evaluated using Synchro based on the design-

year AM and PM peak-hour turning movement forecasts. These were the only intersections evaluated for this supplemental analysis. The intersection performance results along with the lane configurations are summarized in Table 11 in Attachment C for the scenarios with and without the southbound San Antonio off-ramp. The intersection levels of service were determined based on capacity using control delay and/or demand using the volume-to-capacity (V/C) ratio.

Key assumptions used in the Synchro analyses include:

- Truck percentages ranged from 2% to 4% depending on the movement.
- Peak-hour factor was 0.95.
- The default saturation flow rate was 1900 vehicles per hour per lane.
- Adjustments to lane utilization factors were made for multi-lane movements where imbalanced use of the available lanes was anticipated due to downstream destinations.

The results show that the San Antonio interchange is expected to provide acceptable traffic performance under both scenarios. With the elimination of the southbound on-ramp to I-25, some traffic is expected to relocate from San Antonio Drive east of I-25 to other routes which would reduce the demand for the existing high west-to-south left-turn movement.

The overall improvement plan for the North I-25 corridor assumes reconstruction of the interchanges. With this, additional lanes and changes to the configuration were assumed for the San Mateo/Osuna interchange. Yet, capacity deficiencies are expected for the San Mateo/Osuna interchange as the forecast travel demand is high at this interchange.

During the AM peak, the southbound frontage road intersection and the Pan American Road intersection are expected to be deficient. The AM deficiencies are not excessive as the volume-to-capacity (V/C) ratios for critical movements are just over 1.0. Providing three southbound through lanes on the frontage road would help (i.e., shared left/thru, thru, thru).

During the PM peak, the northbound frontage road intersection is expected to be deficient with a critical movement being the westbound right turn. The forecast demand for this right turn movement is 1470 vehicles per hour (vph) (see Table 3) which is nearly double the existing volume and may not be practical. Adjusting the 2040 forecast to consider intersection capacity would be reasonable as motorists will tolerate some congestion but will redistribute to other available routes. A reduction of the westbound right-turn volume to indicate modest growth to a value of 900 vph would result in this intersection being slightly over capacity. Therefore, no major changes to the configuration of the San Mateo/Osuna interchange are proposed at this time.

In addition, because the San Mateo/northbound frontage road intersection is over-capacity, it is possible that the demand estimate for the San Mateo northbound on-ramp is high because the intersection cannot process the demand. Under this assumption, the weaving segment deficiency on northbound I-25 between the San Mateo on-ramp and the Paseo del Norte off-ramp may be reduced however it would not be fully mitigated. Further reduction in traffic entering this intersection would occur if the northbound Jefferson on-ramp was not eliminated.

Revised Recommended Build Alternative

Revisions to the recommended build alternative were identified based on the 2040 design-year analysis and a review of the conceptual design to identify areas that could be improved for operations or to reduce cost. The revised typical sections and plan view layouts for the recommended build alternative are provided in Attachment D. The modifications to the conceptual layout include:

1. Two-lane exit at the northbound Montgomery off-ramp to facilitate weaving maneuvers.
2. Two-lane diverge to the southbound Montgomery on-ramp from the frontage road to improve the lane utilization at the upstream intersection.
3. I-25/Paseo del Norte interchange improvements, including the second phase of commitments that are currently being developed.
4. Removed the advance U-turn on the north side of the San Mateo/Osuna interchange to reduce bridge costs and because of low expected use.
5. Option to keep the southbound off-ramp to San Antonio Drive, although this is not preferred.
6. Removed the advance U-turns at the Alameda interchange to reduce bridge costs and because of low expected use.
7. Relocated the southbound Alameda off-ramp closer to the existing ramp location because the Paseo del Norte off-ramp was kept.
8. Updated the typical sections to reflect the improvements that have been constructed.

With regard to the expected weaving deficiency on northbound I-25 between the San Mateo on-ramp and the Paseo del Norte off-ramp, several options were presented earlier in this document. While also considering the capacity issues at the San Mateo/northbound frontage road intersection, it would be worthwhile considering keeping the northbound Jefferson on-ramp and evaluating that condition. The northbound CD Road option that revises what was constructed by the I-25/Paseo del Norte project may not be acceptable because of cost and the elimination of direct access to Paseo del Norte via the slip-ramp from the north-to-west flyover ramp. In either case, future ramp metering could also be used to manage the demand within the critical segments of the freeway.

Phasing Plan and Cost Estimates

The proposed improvements will require a substantial capital investment and are expected to be implemented in phases over time. There are multiple approaches that could be utilized to phase and prioritize the identified improvements. One possible phasing and implementation plan is provided below.

As for the 2011 Phase IB Report, the construction phasing approach was based on building from the outside in although the interchange improvements could be constructed before or after the frontage road projects. The frontage roads would be reconstructed, including access modifications and utility work, to make room for the ramp roadway modifications, braided ramps and mainline freeway widening. Temporary transitions will be needed between the phases which may modify how access is provided to and from the mainline freeway.

A suggested phasing plan with updated cost estimates is shown in Exhibit 3, and a potential priority listing is provided below. Note that the frontage road projects could be further divided as needed based on available funding amounts. Improvements to the arterial street medians to manage access adjacent to the interchanges could be implemented at any time. Advance right-of-way acquisition should occur as soon as practical for those identified properties that are currently undeveloped.

1. Montgomery/Montaño Interchange and Street
2. Northbound and Southbound Frontage Roads
3. Southbound Montaño/Comanche Braid and Mainline
4. Northbound Comanche/Montgomery Braid and Mainline
5. Jefferson Bridge and Street
6. Southbound Frontage Road and Mainline
7. Southbound CD Road, Osuna/Jefferson Braid, and Mainline
8. San Mateo/Osuna I-25 Bridge and Street
9. Comanche I-25 Bridge and Street
10. Alameda I-25 Bridge and Street

The planning-level cost estimates were updated based on unit bid prices from construction projects in 2015 and consider all improvements completed or in process. The costs reflect complete projects including design, right-of-way acquisition and construction. Overall, the corridor improvement cost increased by approximately 19%, from $219 million to $260 million.

Phase IC, Phase ID and IACR

Because the capital investment required by the proposed improvements is significant, phased implementation is anticipated. While the improvements are expected to be implemented in phases, it is recommended that the Phase IC NEPA environmental documentation be completed for the entire length of project along with Phase ID preliminary design. Until construction funding is programmed, the actions authorized by the NEPA document should request approval for right-of-way acquisition and final design activities. To authorize construction, environmental re-evaluations would be completed specific to the phase to be constructed. Phase ID preliminary design plans for the entire North I-25 corridor are recommended to establish the project footprint and better determine the likely impacts of project

construction, as per the current Location Study Procedures. The Phase IC NEPA document and authorization will be needed to complete an Interstate Access Change Request for the corridor.

The Interstate Access Change Request (IACR) should also include the entire study corridor as a system. A comprehensive IACR is anticipated for the North I-25 corridor because of the number of phases identified to implement the proposed improvements, the multiple evaluations of interim conditions between the phases, and the potential application of ramp metering. The IACR analyses should include micro-simulation and specific evaluations by phase as well as for the entire system at full build-out. Completion of the IACR will require that the implementation priorities are established and adhered to, otherwise IACR re-evaluations will also be required.

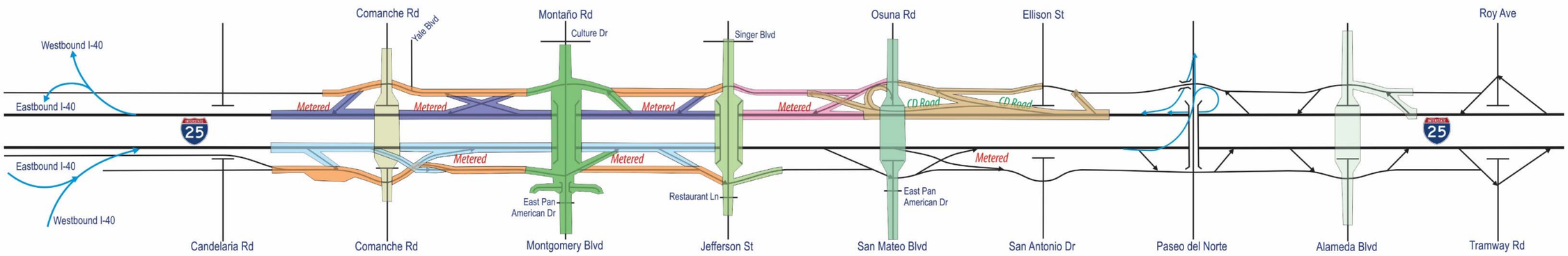
In addition to the standard work plan for Phases IC and ID and the IACR, activities that should be planned for the upcoming phases include:

- Updated existing traffic counts for the interchanges and ramps within the corridor to re-establish existing baseline conditions. The San Mateo/Osuna interchange and the San Antonio interchange ramp terminals were recently counted and should not need to be updated.
- Field traffic studies, such as travel time runs and queue lengths at key locations, will be needed to calibrate the micro-simulation model.
- Additional travel demand modeling by MRCOG and post-processing to investigate the 2040 demand for the northbound Jefferson on-ramp scenario. This would require updates to the 2040 forecasts for northbound I-25 from the Jefferson interchange to the Paseo del Norte interchange, at a minimum.
- Defining the number of phases that will be needed as part of the IACR prior to full build-out of the corridor, with particular attention on impacts to the mainline freeway and/or access changes.
- The extent and type of ramp metering that should be implemented (i.e., fixed time, metered-at-demand, traffic responsive) for demand management purposes. A ramp metering evaluation and study should be conducted to refine the approach for implementation and subsequent operation.

Schematic Phasing Plan for Recommended Build Alternative - Updated 2016

Phases are not Shown in Order of Implementation Priorities

Not to Scale



- Northbound and Southbound Frontage Roads — Estimated Cost $30,500,000
- Southbound Frontage Road and Mainline — Estimated Cost $11,000,000
- Northbound Comanche/Montgomery Braid and Mainline — Estimated Cost $24,500,000
- Southbound Montaño/Comanche Braid and Mainline — Estimated Cost $27,000,000
- Southbound CD Road, Osuna/Jefferson Braid, and Mainline — Estimated Cost $22,400,000
- Comanche I-25 Bridge and Street — Estimated Cost $29,600,000
- Montgomery/Montaño Interchange and Street — Estimated Cost $39,000,000
- Jefferson Bridge and Street — Estimated Cost $24,800,000
- San Mateo/Osuna I-25 Bridge and Street — Estimated Cost $33,300,000
- Alameda I-25 Bridge and Street — Estimated Cost $17,900,000

Exhibit 3, Suggested Phasing Plan and Estimated Costs per Phase, Not in Prioritized Order

ATTACHMENTS

Attachment A
Tabular Summaries of 2040 Design Year Traffic Forecasts and Existing Traffic Volumes

Table 1, Existing and Design Year Traffic Volumes for Northbound I-25 - AM and PM Peak Hour

PRE-IMPROVEMENTS	EXISTING (veh/hr)		EXISTING / FUTURE	2040 MTP (veh/hr)	
NORTHBOUND SEGMENT/RAMP DESCRIPTION	AM PEAK	PM PEAK	NORTHBOUND SEGMENT/RAMP DESCRIPTION	AM PEAK	PM PEAK
South of I-40 Ramps	3759	4414	South of I-40 Ramps	6490	6350
I-40 On-Ramps	3928	3258	I-40 On-Ramps	3930	3760
I-40 On-Ramps to Comanche Off-Ramp	7687	7672	I-40 On-Ramps to Comanche Off-Ramp	10420	10110
Comanche Off-Ramp	1088	895	Comanche Off-Ramp	1100	920
Comanche Off-Ramp to Comanche On-Ramp	6599	6777	Comanche Off-Ramp to Montgomery Off-Ramp	9320	9190
Comanche On-Ramp	913	1270	Montgomery Off-Ramp	1330	1240
Comanche On-Ramp to Montgomery Off-Ramp	7512	8047	Montgomery Off-Ramp to Comanche On-Ramp	7990	7950
Montgomery Off-Ramp	1045	1080	Comanche On-Ramp	1170	1340
Montgomery Off-Ramp to Montgomery On-Ramp	6467	6967	Comanche On-Ramp to Montgomery On-Ramp	9160	9290
Montgomery On-Ramp	479	559	Montgomery On-Ramp	820	780
Montgomery On-Ramp to Jefferson Off-Ramp	6946	7526	Montgomery On-Ramp to Jefferson Off-Ramp	9980	10070
Jefferson Off-Ramp	1067	1097	Jefferson Off-Ramp	1810	1560
Jefferson Off-Ramp to Jefferson On-Ramp	5879	6429		-	-
Jefferson On-Ramp	342	499		-	-
Jefferson On-Ramp to San Mateo Off-Ramp	6221	6928	Jefferson Off-Ramp to San Mateo Off-Ramp	8170	8510
San Mateo Off-Ramp	488	446	San Mateo Off-Ramp	780	590
San Mateo Off-Ramp to San Antonio Off-Ramp	5733	6482	San Mateo Off-Ramp to San Antonio Off-Ramp	7390	7920
San Antonio Off-Ramp	939	717	San Antonio Off-Ramp	970	770
San Antonio Off-Ramp to San Antonio On-Ramp	4794	5765	San Antonio Off-Ramp to San Mateo On-Ramp	6420	7150
San Antonio On-Ramp	481	684	San Mateo On-Ramp	1620	2080
San Antonio On-Ramp to Paseo del Norte Off-Ramp	5275	6449	San Mateo On-Ramp to Paseo del Norte Off-Ramp	8040	9230
Paseo del Norte Off-Ramp	1443	2140	Paseo del Norte Off-Ramp	2880	3910
Paseo del Norte Off-Ramp to Paseo del Norte On-Ramp	3832	4309	Paseo del Norte Off-Ramp to Paseo del Norte On-Ramp	5160	5320
Paseo del Norte On-Ramp	385	376	Paseo del Norte On-Ramp	730	800
Paseo del Norte On-Ramp to Alameda Off-Ramp	4217	4685	Paseo del Norte On-Ramp to Alameda Off-Ramp	5890	6120
Alameda Off-Ramp	1429	1631	Alameda Off-Ramp	1460	1640
Alameda Off-Ramp to Alameda On-Ramp	2788	3054	Alameda Off-Ramp to Alameda On-Ramp	4430	4480
Alameda On-Ramp	350	279	Alameda On-Ramp	490	650
Alameda On-Ramp to Tramway Off-Ramp	3138	3333	Alameda On-Ramp to Tramway Off-Ramp	4920	5130
Tramway Off-Ramp	611	610	Tramway Off-Ramp	810	770
Tramway Off-Ramp to Tramway On-Ramp	2527	2723	Tramway Off-Ramp to Tramway On-Ramp	4110	4360
Tramway On-Ramp	329	281	Tramway On-Ramp	680	340

Table 2, Existing and Design Year Traffic Volumes for Southbound I-25 - AM and PM Peak Hour

PRE-IMPROVEMENTS SOUTHBOUND SEGMENT/RAMP DESCRIPTION	EXISTING (veh/hr) AM PEAK	EXISTING (veh/hr) PM PEAK	EXISTING / FUTURE SOUTHBOUND SEGMENT/RAMP DESCRIPTION	2040 MTP (veh/hr) AM PEAK	2040 MTP (veh/hr) PM PEAK
North of Tramway Off-Ramp	3048	2688	North of Tramway Off-Ramp	4610	4890
Tramway Off-Ramp	198	367	Tramway Off-Ramp	300	490
Tramway Off-Ramp to Tramway On-Ramp	2850	2321	Tramway Off-Ramp to Tramway On-Ramp	4310	4400
Tramway On-Ramp	295	473	Tramway On-Ramp	410	480
Tramway On-Ramp to Alameda Off-Ramp	3145	2794	Tramway On-Ramp to Alameda Off-Ramp	4720	4880
Alameda Off-Ramp	188	184	Alameda Off-Ramp	430	440
Alameda Off-Ramp to Alameda On-Ramp	2957	2610	Alameda Off-Ramp to Alameda On-Ramp	4290	4440
Alameda On-Ramp	1327	1266	Alameda On-Ramp	1590	1490
Alameda On-Ramp to Paseo del Norte Off-Ramp	4284	3876	Alameda On-Ramp to Paseo del Norte Off-Ramp	5880	5930
Paseo del Norte Off-Ramp	390	459	Paseo del Norte Off-Ramp (+ San Antonio)	1110	1270
Paseo del Norte Off-Ramp to Paseo del Norte On-Ramp	3894	3417	Paseo del Norte Off-Ramp to PDN W-S Loop On-Ramp	4770	4660
Paseo del Norte On-Ramp	1862	1707	PDN W-S Loop On-Ramp	1190	1010
	-	-	PDN W-S Loop On-Ramp to PDN E-S On-Ramp	5960	5670
	-	-	PDN E-S On-Ramp	2680	2890
Paseo del Norte On-Ramp to San Antonio Off-Ramp	5756	5124		-	-
San Antonio Off-Ramp	288	204		-	-
San Antonio Off-Ramp to San Antonio On-Ramp	5468	4920	PDN E-S On-Ramp to CD Road Off-Ramp	8640	8560
San Antonio On-Ramp	1300	1176	CD Road Off-Ramp	1970	1670
San Antonio On-Ramp to San Mateo Loop Off-Ramp	6768	6096	*Osuna Off-Ramp*	*470*	*200*
San Mateo Loop Off-Ramp	337	480	*San Mateo Loop Off-Ramp*	*900*	*950*
San Mateo Loop Off-Ramp to San Mateo/Osuna On-Ramp	6431	5616	*Jefferson Off-Ramp*	*600*	*520*
San Mateo/Osuna On-Ramp	1175	1000	CD Road Off-Ramp to San Mateo/Osuna On-Ramp	6670	6890
San Mateo/Osuna On-Ramp to Jefferson Off-Ramp	7606	6616	San Mateo/Osuna On-Ramp	2070	1690
Jefferson Off-Ramp	489	457		-	-
Jefferson Off-Ramp to Jefferson On-Ramp	7117	6159	San Mateo/Osuna On-Ramp to Jefferson On-Ramp	8740	8580
Jefferson On-Ramp	551	832	Jefferson On-Ramp	780	990
Jefferson On-Ramp to Montgomery/Montaño Off-Ramp	7668	6991	Jefferson On-Ramp to Montgomery/Montaño Off-Ramp	9520	9570
Montgomery/Montaño Off-Ramp	463	553	Montgomery/Montaño Off-Ramp	680	950
Montgomery/Montaño Off-Ramp to Montgomery Loop On-Ramp	7205	6438		-	-
Montgomery Loop On-Ramp	408	466		-	-
Montgomery Loop On-Ramp to Montgomery/Montaño On-Ramp	7613	6904	Montgomery/Montaño Off-Ramp to Comanche Off-Ramp	8840	8620
Montgomery/Montaño On-Ramp	880	1235	Comanche Off-Ramp	1300	1240
Montgomery/Montaño On-Ramp to Comanche Off-Ramp	8493	8139	Comanche Off-Ramp to Montgomery/Montaño On-Ramp	7540	7380
Comanche Off-Ramp	909	1140	Montgomery/Montaño On-Ramp	1330	1670
Comanche Off-Ramp to Comanche On-Ramp	7584	6999	Montgomery/Montaño On-Ramp to Comanche On-Ramp	8870	9050
Comanche On-Ramp	698	1153	Comanche On-Ramp	760	1390
Comanche On-Ramp to I-40 Off Ramps	8282	8152	Comanche On-Ramp to I-40 Off Ramps	9630	10440
I-40 Off-Ramps	2809	4332	I-40 Off-Ramps	3810	4930
South of I-40 Off-Ramps	5473	3820	South of I-40 Off-Ramps	5820	5510

With San Antonio Off-Ramp SOUTHBOUND DESCRIPTION	2040 MTP (veh/hr) AM PEAK	2040 MTP (veh/hr) PM PEAK
Paseo del Norte Off-Ramp	760	920
PDN Off to PDN Loop On	5120	5010
PDN W-S Loop On-Ramp	1190	1010
PDN Loop On to PDN E-S On	6310	6020
PDN E-S On-Ramp	2730	2940
PDN E-S On to SA Off	9040	8960
San Antonio Off-Ramp	520	530
SA Off to CD Road Off	8520	8430
CD Road Off-Ramp	1850	1540
Osuna Off-Ramp	*390*	*120*
San Mateo Loop Off	*860*	*900*
Jefferson Off-Ramp	*600*	*520*

Table 3, Existing and Design-Year Turning Movement Volumes - AM and PM Peak Hour

Intersection	Peak Hour	TRAFFIC VOLUMES IN VEHICLES PER HOUR											
		NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND		
		LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT
San Mateo/Osuna @ Pan American West													
Existing	AM	-	-	-	270	612	199	-	832	352	870	1415	-
2040 without Southbound San Antonio Off-Ramp	AM	-	-	-	420	900	450	-	1130	500	900	1570	-
2040 with Southbound San Antonio Off-Ramp	AM	-	-	-	410	910	340	-	1110	500	920	1570	-
Existing	PM	-	-	-	324	417	164	-	1081	481	502	969	-
2040 without Southbound San Antonio Off-Ramp	PM	-	-	-	420	820	360	-	1550	610	560	1070	-
2040 with Southbound San Antonio Off-Ramp	PM	-	-	-	400	820	300	-	1550	610	560	1070	-
San Mateo @ Pan American East													
Existing	AM	604	254	229	-	-	-	188	1187	-	-	1797	563
2040 without Southbound San Antonio Off-Ramp	AM	400	750	180	-	-	-	450	2000	-	-	2070	1280
2040 with Southbound San Antonio Off-Ramp	AM	400	750	180	-	-	-	400	1980	-	-	2090	1270
Existing	PM	358	413	386	-	-	-	255	1655	-	-	1129	769
2040 without Southbound San Antonio Off-Ramp	PM	310	760	410	-	-	-	780	2140	-	-	1320	1470
2040 with Southbound San Antonio Off-Ramp	PM	310	760	410	-	-	-	750	2100	-	-	1320	1470
San Mateo @ Pan American Road													
Existing	AM	17	8	2	138	3	333	137	1284	47	5	1957	118
2040 without Southbound San Antonio Off-Ramp	AM	20	10	0	210	10	440	160	1980	40	10	2890	120
2040 with Southbound San Antonio Off-Ramp	AM	20	10	0	220	10	440	160	1960	40	10	2900	120
Existing	PM	31	9	10	142	4	225	67	1971	22	24	1676	130
2040 without Southbound San Antonio Off-Ramp	PM	30	10	10	140	10	400	90	2440	20	20	2360	120
2040 with Southbound San Antonio Off-Ramp	PM	30	10	10	140	10	400	90	2400	20	20	2360	120
San Antonio/Ellison @ Pan American West													
Existing	AM	-	-	-	230	973	242	-	233	243	922	1313	-
2040 without Southbound San Antonio Off-Ramp	AM	-	-	-	420	460	310	-	280	280	760	1270	-
2040 with Southbound San Antonio Off-Ramp	AM	-	-	-	460	460	410	-	280	280	760	1270	-
Existing	PM	-	-	-	437	874	144	-	616	326	456	426	-
2040 without Southbound San Antonio Off-Ramp	PM	-	-	-	480	520	380	-	720	410	420	510	-
2040 with Southbound San Antonio Off-Ramp	PM	-	-	-	550	520	450	-	720	410	420	510	-
San Antonio @ Pan American East													
Existing	AM	768	214	396	-	-	-	74	391	-	-	1457	70
2040 without Southbound San Antonio Off-Ramp	AM	730	200	460	-	-	-	100	600	-	-	1300	130
2040 with Southbound San Antonio Off-Ramp	AM	730	200	450	-	-	-	110	630	-	-	1300	130
Existing	PM	247	373	554	-	-	-	147	913	-	-	629	106
2040 without Southbound San Antonio Off-Ramp	PM	250	690	560	-	-	-	220	980	-	-	680	120
2040 with Southbound San Antonio Off-Ramp	PM	250	690	550	-	-	-	230	1040	-	-	680	120

Attachment B
Freeway Facilities Analysis Summary Tables

Table 4, Northbound Freeway Results – Weave Section from San Mateo to PDN – AM Peak

2040 MTP Weave from San Mateo to PDN Northbound I-25 - AM Peak Hour			Average of 4 Critical Time Slices for Peak Hour					
From	To	Type	No. of Lanes	max d/c Ratio	Queue	Density (pcpmpl)	Speed (mph)	LOS
I-40 NB Off-Ramps	I-40 NB On-Ramps	Basic	3	0.91	0	37	59	E
I-40 NB On-Ramps	Mainline I-25	Basic	5	0.92	0	46	38	E
Mainline I-25	Comanche Off-Ramp	Off Ramp	5	0.88	0	26	66	C
Comanche Off-Ramp	Montgomery Off-Ramp	Basic	5	0.79	0	24	65	C
Montgomery Off-Ramp	Comanche On-Ramp	Basic	4	0.85	0	25	67	C
Comanche On-Ramp	Mainline I-25	On Ramp	4	0.98	0	32	62	D
Mainline I-25	Montgomery On-Ramp	Basic	4	0.98	0	31	63	D
Montgomery On-Ramp	Jefferson Off-Ramp	Weaving	5	0.89	0	26	57	C
Jefferson Off-Ramp	Mainline I-25	Basic	4	0.87	0	27	66	D
Mainline I-25	San Mateo Off-Ramp	Off Ramp	5	0.70	0	21	67	C
San Mateo Off-Ramp	San Antonio Off-Ramp	Basic	5	0.63	0	20	66	B
San Antonio Off-Ramp	San Mateo On-Ramp	Basic	4	0.69	0	20	69	C
San Mateo On-Ramp	PDN Off-Ramp	Weaving	5	1.16	0	29	55	F
PDN Off-Ramp	PDN On-Ramp	Basic	4	0.56	0	17	70	B
PDN On-Ramp	Alameda Off-Ramp	Weaving	5	0.64	0	25	58	C
Alameda Off-Ramp	Alameda On-Ramp	Basic	3	0.65	0	20	70	C
Alameda On-Ramp	Mainline I-25	Basic	4	0.54	0	18	64	B
Mainline I-25	Mainline I-25	Basic	4	0.54	0	17	70	B
Mainline I-25	Tramway Off-Ramp	Basic	4	0.54	0	18	65	B
Tramway Off-Ramp	Tramway On-Ramp	Basic	3	0.60	0	18	74	B
Tramway On-Ramp	Mainline I-25	On Ramp	3	0.70	0	23	66	C

Table 5, Northbound Freeway Results – Weave Section from San Mateo to PDN – PM Peak

2040 MTP Weave from San Mateo to PDN Northbound I-25 - PM Peak Hour			Average of 4 Critical Time Slices for Peak Hour					
From	To	Type	No. of Lanes	max d/c Ratio	Queue	Density (pcpmpl)	Speed (mph)	LOS
I-40 NB Off-Ramps	I-40 NB On-Ramps	Basic	3	0.90	0	36	60	E
I-40 NB On-Ramps	Mainline I-25	Basic	5	0.89	0	40	43	E
Mainline I-25	Comanche Off-Ramp	Off Ramp	5	0.86	0	26	66	C
Comanche Off-Ramp	Montgomery Off-Ramp	Basic	5	0.78	0	24	66	C
Montgomery Off-Ramp	Comanche On-Ramp	Basic	4	0.84	0	27	63	C
Comanche On-Ramp	Mainline I-25	On Ramp	4	0.99	0	35	58	D
Mainline I-25	Montgomery On-Ramp	Basic	4	0.99	200	39	53	E
Montgomery On-Ramp	Jefferson Off-Ramp	Weaving	5	0.89	1074	44	46	F
Jefferson Off-Ramp	Mainline I-25	Basic	4	0.91	1703	108	29	F
Mainline I-25	San Mateo Off-Ramp	Off Ramp	5	0.72	1417	92	17	F
San Mateo Off-Ramp	San Antonio Off-Ramp	Basic	5	0.67	1980	112	11	F
San Antonio Off-Ramp	San Mateo On-Ramp	Basic	4	0.76	1090	104	13	F
San Mateo On-Ramp	PDN Off-Ramp	Weaving	5	1.49	0	34	54	F
PDN Off-Ramp	PDN On-Ramp	Basic	4	0.57	0	13	70	B
PDN On-Ramp	Alameda Off-Ramp	Weaving	5	0.71	0	27	57	C
Alameda Off-Ramp	Alameda On-Ramp	Basic	3	0.64	0	16	70	B
Alameda On-Ramp	Mainline I-25	Basic	4	0.55	0	15	64	B
Mainline I-25	Mainline I-25	Basic	4	0.55	0	14	70	B
Mainline I-25	Tramway Off-Ramp	Basic	4	0.55	0	15	65	B
Tramway Off-Ramp	Tramway On-Ramp	Basic	3	0.63	0	15	75	B
Tramway On-Ramp	Mainline I-25	On Ramp	3	0.67	0	18	68	B

Table 6, Northbound Freeway Results – Basic Freeway from San Mateo to PDN – PM Peak

2040 MTP Basic Freeway from San Mateo to PDN Northbound I-25 - PM Peak Hour			Average of 4 Critical Time Slices for Peak Hour					
From	To	Type	No. of Lanes	max d/c Ratio	Queue	Density (pcpmpl)	Speed (mph)	LOS
I-40 NB Off-Ramps	I-40 NB On-Ramps	Basic	3	0.90	0	36	60	E
I-40 NB On-Ramps	Mainline I-25	Basic	5	0.89	0	73	28	E
Mainline I-25	Comanche Off-Ramp	Off Ramp	5	0.86	0	31	66	D
Comanche Off-Ramp	Montgomery Off-Ramp	Basic	5	0.78	0	28	67	C
Montgomery Off-Ramp	Comanche On-Ramp	Basic	4	0.84	0	32	62	D
Comanche On-Ramp	Mainline I-25	On Ramp	4	0.99	0	39	60	E
Mainline I-25	Montgomery On-Ramp	Basic	4	0.99	0	43	55	E
Montgomery On-Ramp	Jefferson Off-Ramp	Weaving	5	0.89	0	37	55	E
Jefferson Off-Ramp	Mainline I-25	Basic	4	0.91	0	36	59	E
Mainline I-25	San Mateo Off-Ramp	Off Ramp	5	0.72	0	25	69	C
San Mateo Off-Ramp	San Antonio Off-Ramp	Basic	5	0.67	0	23	69	C
San Antonio Off-Ramp	San Mateo On-Ramp	Basic	4	0.76	0	28	66	D
San Mateo On-Ramp	Mainline I-25	Basic	5	0.78	0	31	60	D
Mainline I-25	PDN Off-Ramp	Basic	5	0.78	0	30	62	D
PDN Off-Ramp	PDN On-Ramp	Basic	4	0.57	0	19	70	C
PDN On-Ramp	Alameda Off-Ramp	Weaving	5	0.71	0	21	58	C
Alameda Off-Ramp	Alameda On-Ramp	Basic	3	0.64	0	22	69	C
Alameda On-Ramp	Mainline I-25	Basic	4	0.55	0	21	63	C
Mainline I-25	Mainline I-25	Basic	4	0.55	0	19	70	C
Mainline I-25	Tramway Off-Ramp	Basic	4	0.55	0	19	68	B
Tramway Off-Ramp	Tramway On-Ramp	Basic	3	0.63	0	20	72	C
Tramway On-Ramp	Mainline I-25	On Ramp	3	0.67	0	24	66	C

Table 7, Southbound Freeway Results – With the San Antonio Off-Ramp – AM Peak

2040 MTP San Antonio Off-Ramp Southbound I-25 - AM Peak Hour			Average of 4 Critical Time Slices for Peak Hour					
From	To	Type	No. of Lanes	max d/c Ratio	Queue	Density (pcpmpl)	Speed (mph)	LOS
Mainline I-25	Mainline I-25	Basic	3	0.66	0	22	71	C
Mainline I-25	Tramway Off-Ramp	Off Ramp	3	0.66	0	22	71	C
Tramway Off-Ramp	Tramway On-Ramp	Basic	3	0.61	0	20	73	C
Tramway On-Ramp	Mainline I-25	Basic	4	0.50	0	19	64	B
Mainline I-25	Alameda Off-Ramp	Basic	4	0.50	0	17	69	B
Alameda Off-Ramp	Alameda On-Ramp	Basic	3	0.61	0	21	69	C
Alameda On-Ramp	PDN Off-Ramp	Weaving	4	0.70	0	28	53	D
PDN Off-Ramp	PDN W-S Loop On-Ramp	Basic	3	0.73	0	26	67	D
PDN W-S Loop On-Ramp	Mainline I-25	On Ramp	3	0.89	0	36	59	E
Mainline I-25	PDN E-S On-Ramp	Basic	3	0.89	0	35	60	E
PDN E-S On-Ramp	Mainline I-25	Basic	5	0.77	0	32	56	D
Mainline I-25	San Antonio Off-Ramp	Off Ramp	5	0.77	0	28	66	C
San Antonio Off-Ramp	CD Road Off-Ramp	Basic	5	0.72	0	26	67	C
CD Road Off-Ramp	Osuna On-Ramp	Basic	4	0.71	0	25	67	C
Osuna On-Ramp	Mainline I-25	On Ramp	4	0.93	0	36	61	E
Mainline I-25	Jefferson On-Ramp	Basic	4	0.93	0	38	58	E
Jefferson On-Ramp	Montano Off-Ramp	Weaving	5	0.82	0	35	55	E
Montano Off-Ramp	Mainline I-25	Basic	4	0.94	0	39	58	E
Mainline I-25	Comanche Off-Ramp	Off Ramp	4	0.94	0	34	66	D
Comanche Off-Ramp	Montano On-Ramp	Basic	4	0.83	0	31	63	D
Montano On-Ramp	Mainline I-25	On Ramp	4	0.94	0	37	61	E
Mainline I-25	Comanche On-Ramp	Basic	4	0.94	0	39	58	E
Comanche On-Ramp	Mainline I-25	Basic	5	0.82	0	31	62	D
Comanche On-Ramp	I-40 Off-Ramp	Basic	5	0.82	0	31	62	D
I-40 Off-Ramp	Mainline I-25	Basic	3	0.82	0	31	64	D

Table 8, Southbound Freeway Results – With the San Antonio Off-Ramp – PM Peak

2040 MTP San Antonio Off-Ramp Southbound I-25 - PM Peak Hour			Average of 4 Critical Time Slices for Peak Hour					
From	To	Type	No. of Lanes	max d/c Ratio	Queue	Density (pcpmpl)	Speed (mph)	LOS
Mainline I-25	Mainline I-25	Basic	3	0.70	0	24	70	C
Mainline I-25	Tramway Off-Ramp	Off Ramp	3	0.70	0	24	70	C
Tramway Off-Ramp	Tramway On-Ramp	Basic	3	0.63	0	21	72	C
Tramway On-Ramp	Mainline I-25	Basic	4	0.52	0	19	64	B
Mainline I-25	Alameda Off-Ramp	Basic	4	0.52	0	18	69	B
Alameda Off-Ramp	Alameda On-Ramp	Basic	3	0.63	0	22	69	C
Alameda On-Ramp	PDN Off-Ramp	Weaving	4	0.71	0	28	54	D
PDN Off-Ramp	PDN W-S Loop On-Ramp	Basic	3	0.71	0	25	67	C
PDN W-S Loop On-Ramp	Mainline I-25	On Ramp	3	0.85	0	33	61	D
Mainline I-25	PDN E-S On-Ramp	Basic	3	0.85	0	33	62	D
PDN E-S On-Ramp	Mainline I-25	Basic	5	0.76	0	33	55	D
Mainline I-25	San Antonio Off-Ramp	Off Ramp	5	0.95	0	34	66	D
San Antonio Off-Ramp	CD Road Off-Ramp	Basic	5	0.72	0	25	67	C
CD Road Off-Ramp	Osuna On-Ramp	Basic	4	0.73	0	26	67	D
Osuna On-Ramp	Mainline I-25	On Ramp	4	0.91	0	35	62	E
Mainline I-25	Jefferson On-Ramp	Basic	4	0.91	0	37	59	E
Jefferson On-Ramp	Montano Off-Ramp	Weaving	5	0.84	0	36	54	E
Montano Off-Ramp	Mainline I-25	Basic	4	0.91	0	37	59	E
Mainline I-25	Comanche Off-Ramp	Off Ramp	4	0.91	0	33	66	D
Comanche Off-Ramp	Montano On-Ramp	Basic	4	0.81	0	30	64	D
Montano On-Ramp	Mainline I-25	On Ramp	4	0.96	0	37	61	E
Mainline I-25	Comanche On-Ramp	Basic	4	0.96	0	40	57	E
Comanche On-Ramp	Mainline I-25	Basic	5	0.89	0	35	60	E
Comanche On-Ramp	I-40 Off-Ramp	Basic	5	0.89	0	36	59	E
I-40 Off-Ramp	Mainline I-25	Basic	3	0.78	0	28	65	D

Table 9, Southbound Freeway Results – Without the San Antonio Off-Ramp – AM Peak

2040 MTP No San Antonio Off-Ramp Southbound I-25 - AM Peak Hour			Average of 4 Critical Time Slices for Peak Hour					
From	To	Type	No. of Lanes	max d/c Ratio	Queue	Density (pcpmpl)	Speed (mph)	LOS
Mainline I-25	Mainline I-25	Basic	3	0.66	0	22	71	C
Mainline I-25	Tramway Off-Ramp	Off Ramp	3	0.66	0	22	71	C
Tramway Off-Ramp	Tramway On-Ramp	Basic	3	0.61	0	20	73	C
Tramway On-Ramp	Mainline I-25	Basic	4	0.50	0	19	64	B
Mainline I-25	Alameda Off-Ramp	Basic	4	0.50	0	17	69	B
Alameda Off-Ramp	Alameda On-Ramp	Basic	3	0.61	0	21	69	C
Alameda On-Ramp	PDN Off-Ramp	Weaving	4	0.78	0	28	53	D
PDN Off-Ramp	PDN W-S Loop On-Ramp	Basic	3	0.68	0	24	68	C
PDN W-S Loop On-Ramp	PDN E-S On-Ramp	On Ramp	3	0.85	0	34	60	D
PDN E-S On-Ramp	Mainline I-25	Basic	5	0.73	0	30	58	D
Mainline I-25	CD Road Off-Ramp	Basic	5	0.73	0	26	67	C
CD Road Off-Ramp	San Mateo On-Ramp	Basic	4	0.71	0	25	67	C
San Mateo On-Ramp	Mainline I-25	On Ramp	4	0.93	0	36	61	E
Mainline I-25	Jefferson On-Ramp	Basic	4	0.93	0	38	58	E
Jefferson On-Ramp	Montano Off-Ramp	Weaving	5	0.82	0	35	55	E
Montano Off-Ramp	Mainline I-25	Basic	4	0.94	0	39	58	E
Mainline I-25	Comanche Off-Ramp	Off Ramp	4	0.94	0	34	66	D
Comanche Off-Ramp	Montano On-Ramp	Basic	4	0.83	0	31	63	D
Montano On-Ramp	Mainline I-25	On Ramp	4	0.94	0	37	61	E
Mainline I-25	Comanche On-Ramp	Basic	4	0.94	0	39	58	E
Comanche On-Ramp	Mainline I-25	Basic	5	0.82	0	31	62	D
Mainline I-25	I-40 Off-Ramp	Basic	5	0.82	0	31	62	D
I-40 Off-Ramp	Mainline I-25	Basic	3	0.83	0	31	64	D

Table 10, Southbound Freeway Results – Without the San Antonio Off-Ramp – PM Peak

2040 MTP No San Antonio Off-Ramp Southbound I-25 - PM Peak Hour			Average of 4 Critical Time Slices for Peak Hour					
From	To	Type	No. of Lanes	max d/c Ratio	Queue	Density (pcpmpl)	Speed (mph)	LOS
Mainline I-25	Mainline I-25	Basic	3	0.70	0	24	70	C
Mainline I-25	Tramway Off-Ramp	Off Ramp	3	0.70	0	24	70	C
Tramway Off-Ramp	Tramway On-Ramp	Basic	3	0.63	0	21	72	C
Tramway On-Ramp	Mainline I-25	Basic	4	0.52	0	19	64	B
Mainline I-25	Alameda Off-Ramp	Basic	4	0.52	0	18	69	B
Alameda Off-Ramp	Alameda On-Ramp	Basic	3	0.63	0	22	69	C
Alameda On-Ramp	PDN Off-Ramp	Weaving	4	0.80	0	28	54	D
PDN Off-Ramp	PDN W-S Loop On-Ramp	Basic	3	0.66	0	23	68	C
PDN W-S Loop On-Ramp	PDN E-S On-Ramp	On Ramp	3	0.80	0	32	61	D
PDN E-S On-Ramp	Mainline I-25	Basic	5	0.73	0	30	57	D
Mainline I-25	CD Road Off-Ramp	Basic	5	0.73	0	26	68	C
CD Road Off-Ramp	San Mateo On-Ramp	Basic	4	0.73	0	26	67	D
San Mateo On-Ramp	Mainline I-25	On Ramp	4	0.91	0	35	62	E
Mainline I-25	Jefferson On-Ramp	Basic	4	0.91	0	36	59	E
Jefferson On-Ramp	Montano Off-Ramp	Weaving	5	0.84	0	36	54	E
Montano Off-Ramp	Mainline I-25	Basic	4	0.91	0	37	59	E
Mainline I-25	Comanche Off-Ramp	Off Ramp	4	0.91	0	33	66	D
Comanche Off-Ramp	Montano On-Ramp	Basic	4	0.81	0	30	64	D
Montano On-Ramp	Mainline I-25	On Ramp	4	0.96	0	37	61	E
Mainline I-25	Comanche On-Ramp	Basic	4	0.96	0	40	57	E
Comanche On-Ramp	Mainline I-25	Basic	5	0.89	0	35	60	E
Mainline I-25	I-40 Off-Ramp	Basic	5	0.89	0	36	59	E
I-40 Off-Ramp	Mainline I-25	Basic	3	0.78	0	28	65	D

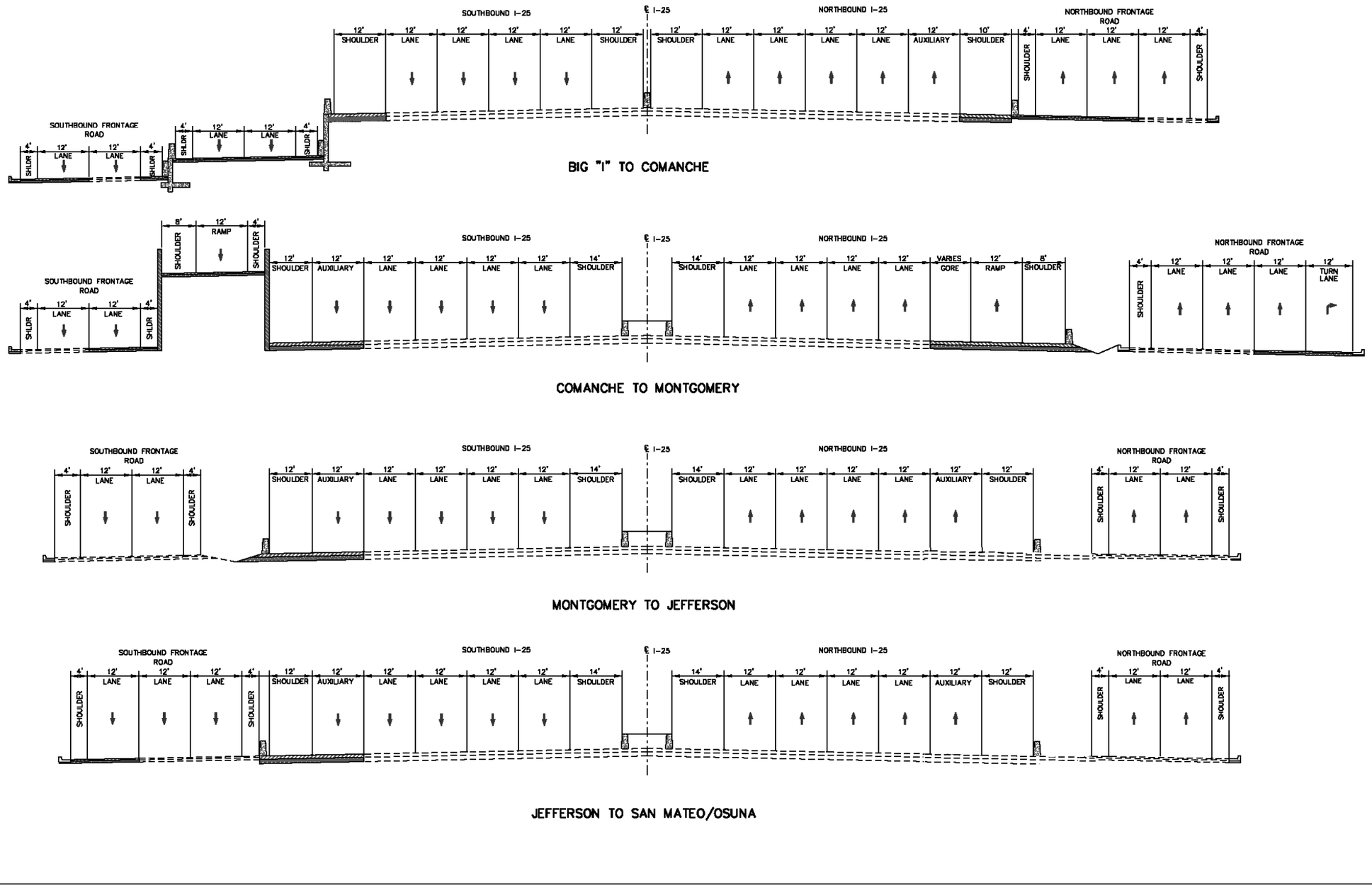
Attachment C
Intersection Analysis Summary Table

Table 11, Intersection Performance Summary under 2040 Design-Year Conditions

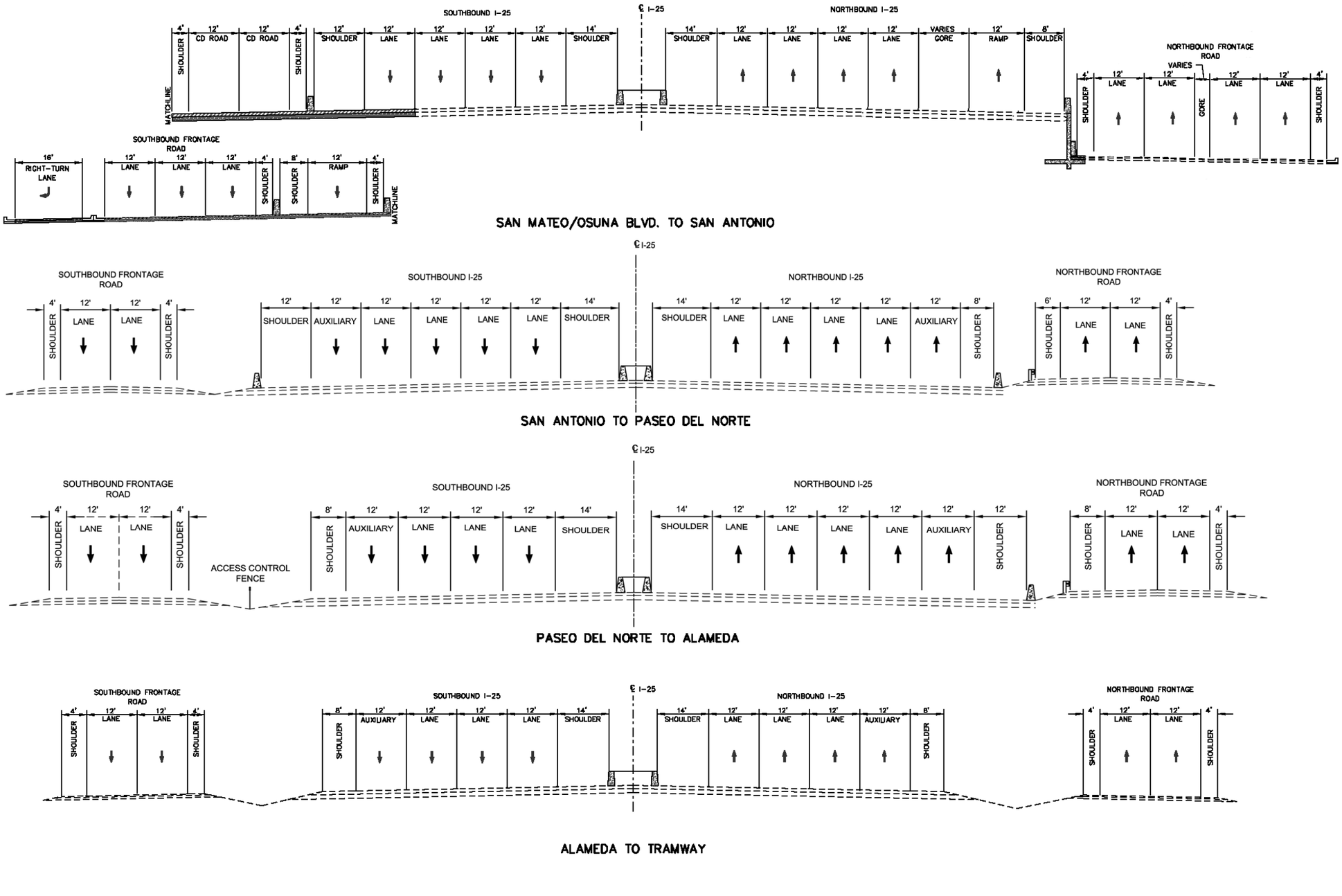
Intersection / Peak Hour	Cycle Length (sec)	Eastbound		Westbound		Northbound		Southbound		Intersection			LOS F Movements
		Delay (veh/sec)	LOS	Delay (veh/sec)	LOS	Delay (veh/sec)	LOS	Delay (veh/sec)	LOS	Delay (veh/sec)	LOS	Max V/C	
AM PEAK HOUR													
San Mateo/Osuna @ Pan Am West	*Lanes*	***T T T R***		***L L T T T***		**-**		***L L T T R***					
with the SB San Antonio off-ramp	120	53	D	23	C	-	-	66	E	44	D	1.05	EBR, WBL, SBT
without the SB San Antonio off-ramp	120	53	D	22	C	-	-	71	E	45	D	1.03	EBR, WBL, SBT, SBR
San Mateo @ Pan American East	*Lanes*	***L L T T T T***		***T T T R R***		***L L T T T R***		**-**					
with the SB San Antonio off-ramp	120	17	B	6	A	59	E	-	-	20	B	0.89	-
without the SB San Antonio off-ramp	120	18	B	12	B	62	E	-	-	23	C	0.92	-
San Mateo @ Pan American Road	*Lanes*	***L T T T TR***		***L T T T TR***		***LTR***		***L TR***					
with the SB San Antonio off-ramp	120	9	A	61	E	31	C	67	E	42	D	1.04	WBT
without the SB San Antonio off-ramp	120	11	B	63	E	31	C	67	E	44	D	1.03	EBL, WBT
San Antonio/Ellison @ Pan Am West	*Lanes*	***T T R***		***L L T T***		**-**		***L L T T R***					
with the SB San Antonio off-ramp	90	25	C	9	A	-	-	28	C	18	B	0.78	-
without the SB San Antonio off-ramp	90	21	C	6	A	-	-	30	C	16	B	0.70	-
San Antonio @ Pan American East	*Lanes*	***L T T***		***T T R***		***L L T T R***		**-**					
with the SB San Antonio off-ramp	90	8	A	26	C	36	D	-	-	26	C	0.89	-
without the SB San Antonio off-ramp	90	9	A	26	C	36	D	-	-	26	C	0.89	-
PM PEAK HOUR													
San Mateo/Osuna @ Pan Am West	*Lanes*	***T T T R***		***L L T T T***		**-**		***L L T T R***					
with the SB San Antonio off-ramp	120	39	D	21	C	-	-	54	D	38	D	0.97	-
without the SB San Antonio off-ramp	120	39	D	21	C	-	-	55	D	38	D	0.97	-
San Mateo @ Pan American East	*Lanes*	***L L T T T T***		***T T T R R***		***L L T T T R***		**-**					
with the SB San Antonio off-ramp	120	50	D	75	E	76	E	-	-	65	E	1.25	EBL, WBR, NBR
without the SB San Antonio off-ramp	120	50	D	83	F	76	E	-	-	68	E	1.26	EBL, WBR, NBR
San Mateo @ Pan American Road	*Lanes*	***L T T T TR***		***L T T T TR***		***LTR***		***L TR***					
with the SB San Antonio off-ramp	120	6	A	31	C	30	C	53	D	22	C	0.89	-
without the SB San Antonio off-ramp	120	7	A	31	C	30	C	53	D	22	C	0.89	-
San Antonio/Ellison @ Pan Am West	*Lanes*	***T T R***		***L L T T***		**-**		***L L T T R***					
with the SB San Antonio off-ramp	90	23	C	5	A	-	-	29	C	21	C	0.72	-
without the SB San Antonio off-ramp	90	21	C	6	A	-	-	29	C	20	C	0.69	-
San Antonio @ Pan American East	*Lanes*	***L T T***		***T T R***		***L L T T R***		**-**					
with the SB San Antonio off-ramp	90	11	B	29	C	27	C	-	-	22	C	0.87	-
without the SB San Antonio off-ramp	90	10	A	31	C	26	C	-	-	22	C	0.86	-

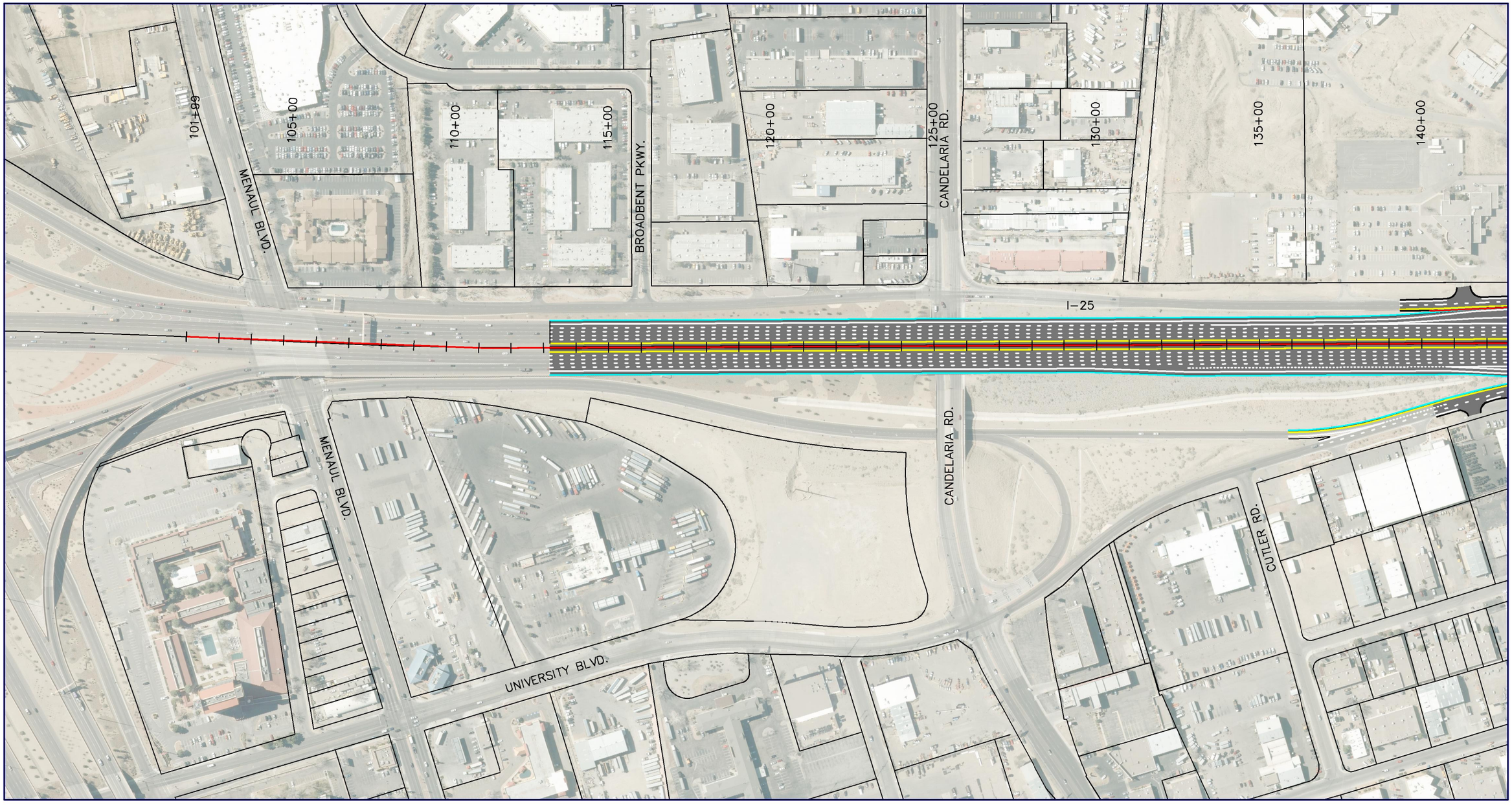
Attachment D
Revised Recommended Build Alternative Typical Sections and Plan View Layout Sheets

Typical Sections for the Recommended Build Alternative



Typical Sections for the Recommended Build Alternative (continued)





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- MEDIAN
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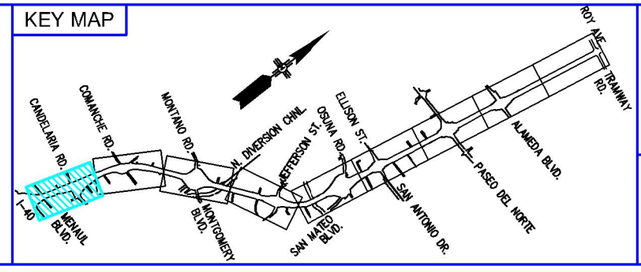
- WALL BARRIER
- RETAINING WALLS

KEY MAP



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INTERSTATE 40 TO TRAMWAY ROAD
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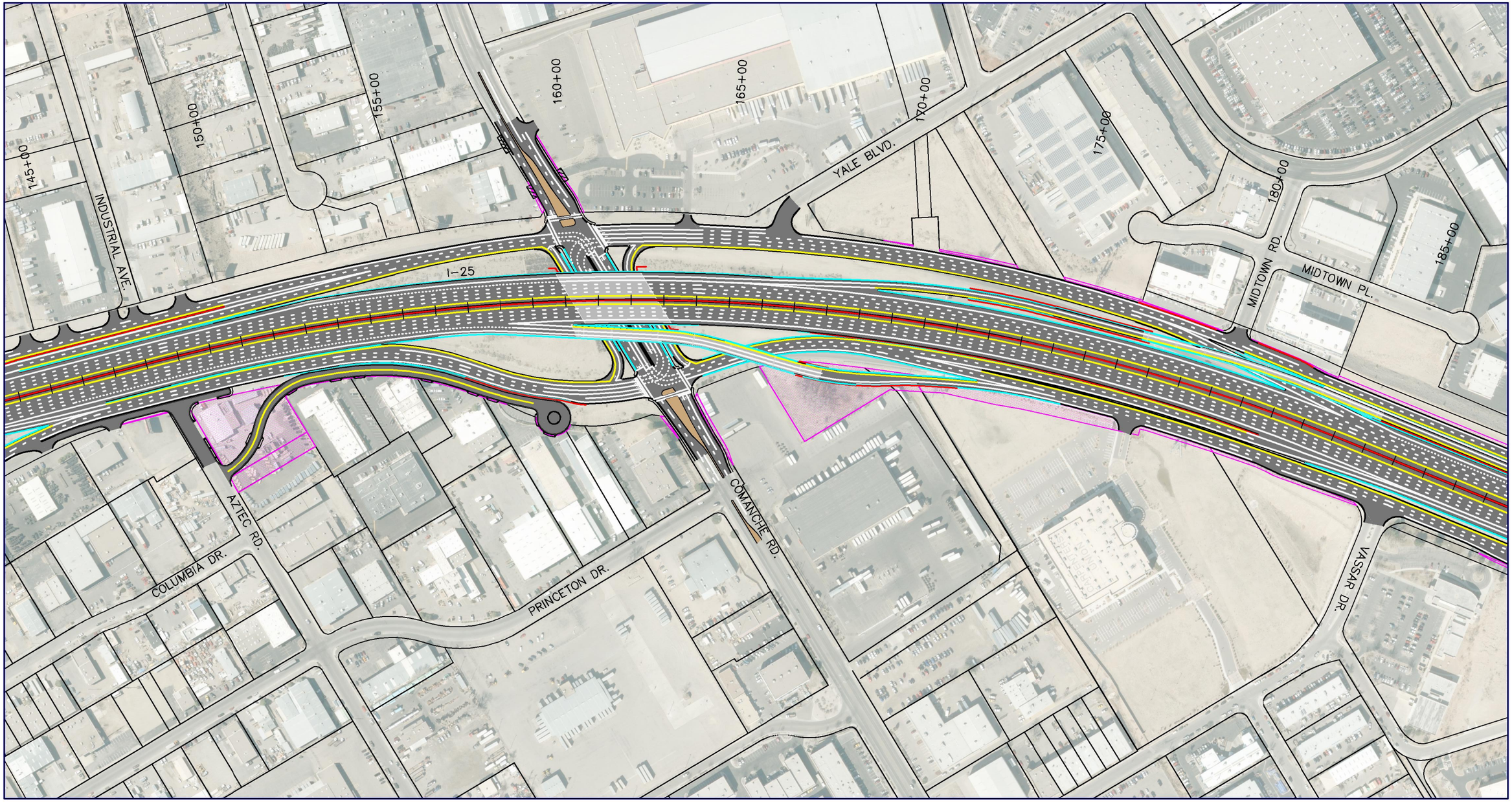
RECOMMENDED BUILD ALTERNATIVE

NEW MEXICO PROJECT NO. CN D3018



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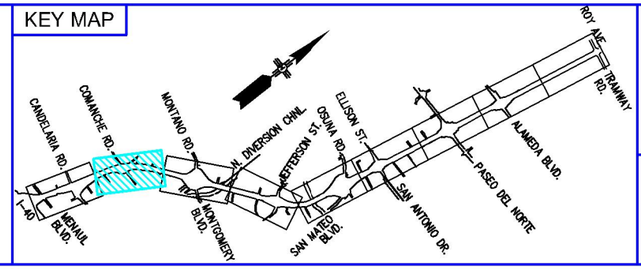

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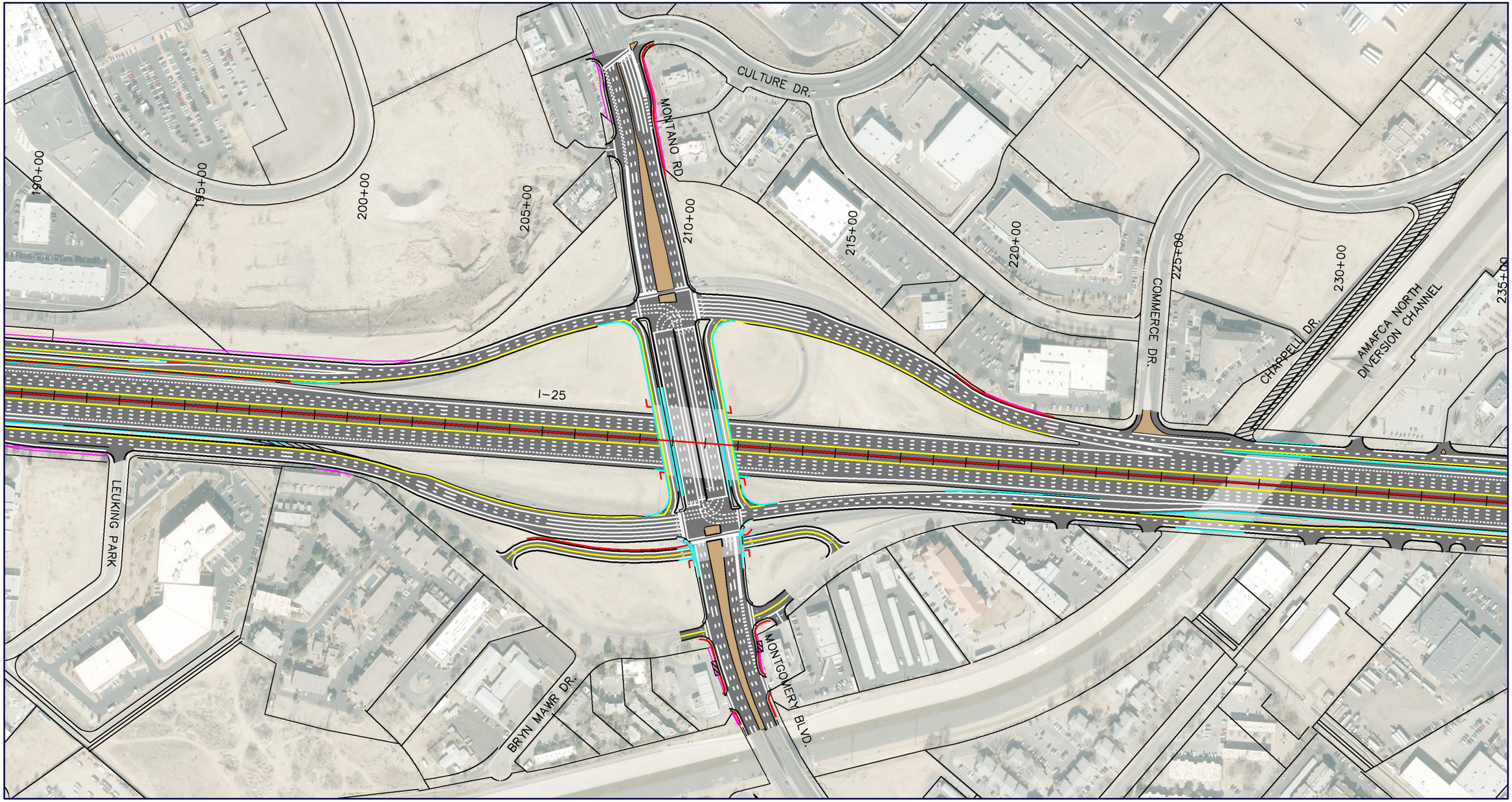

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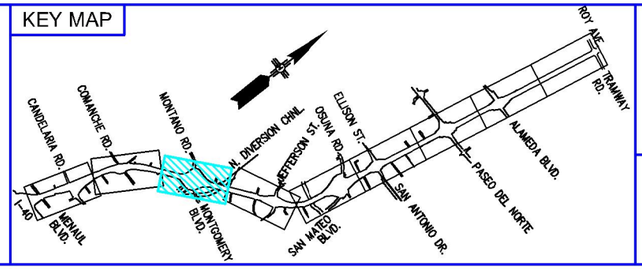

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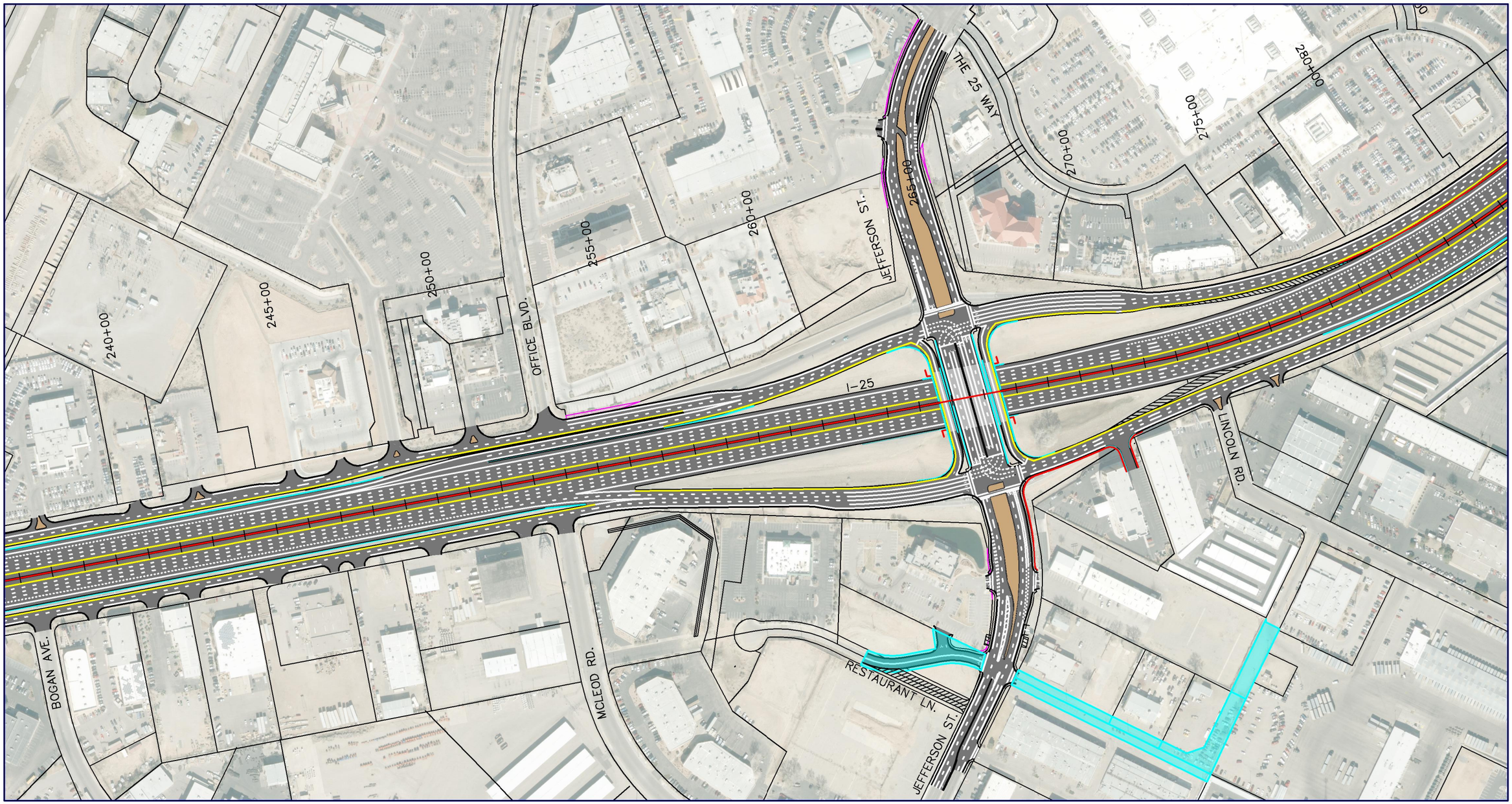

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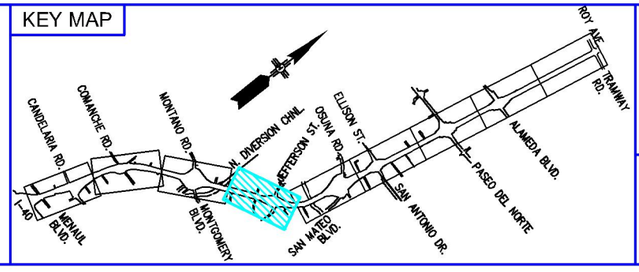

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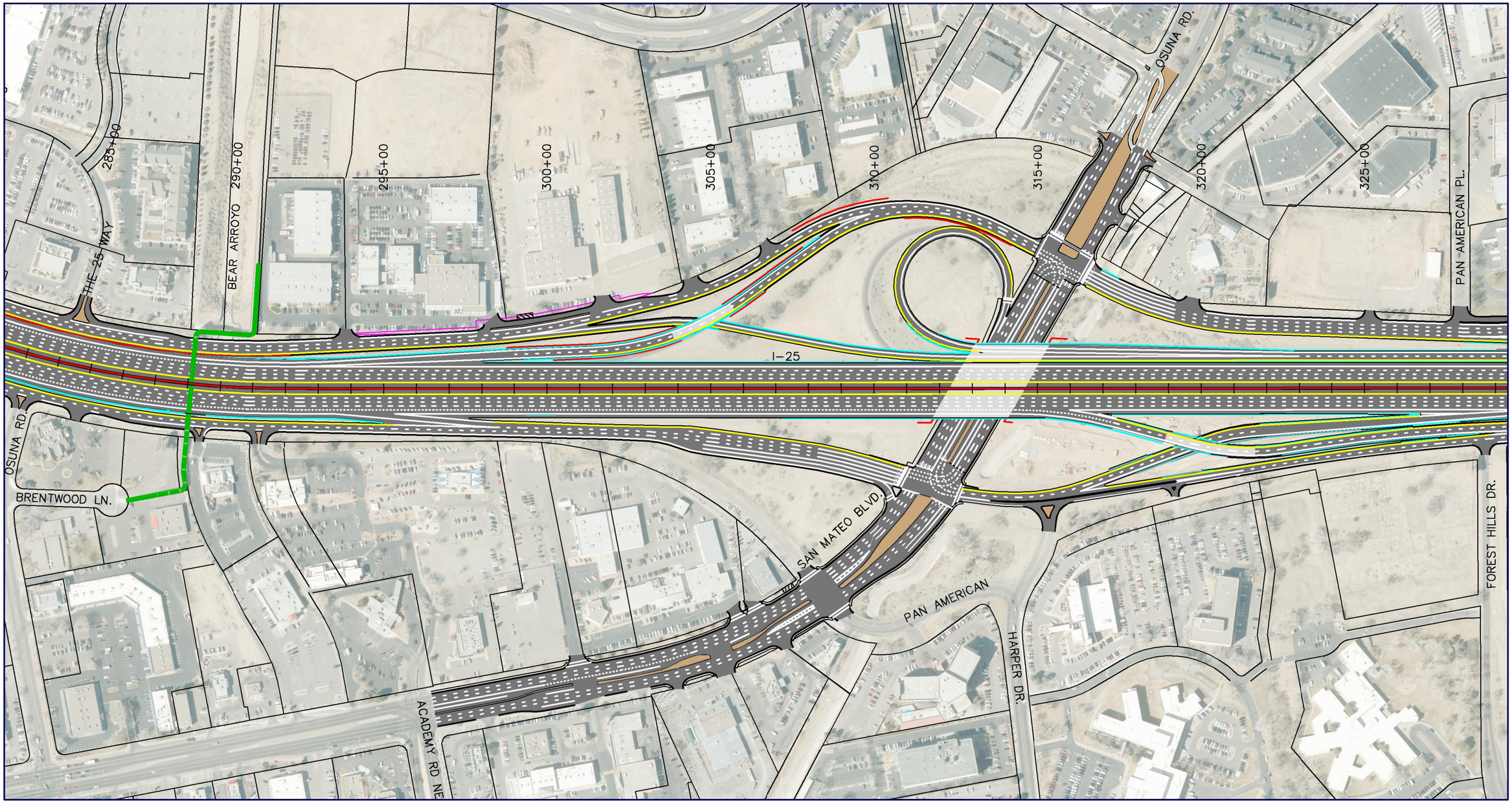

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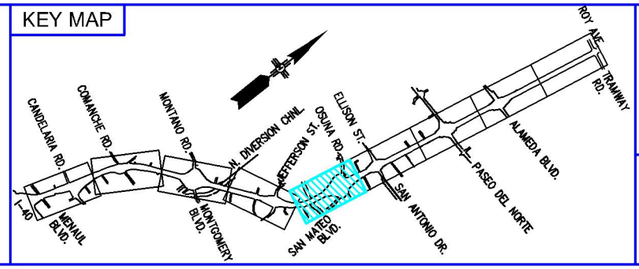

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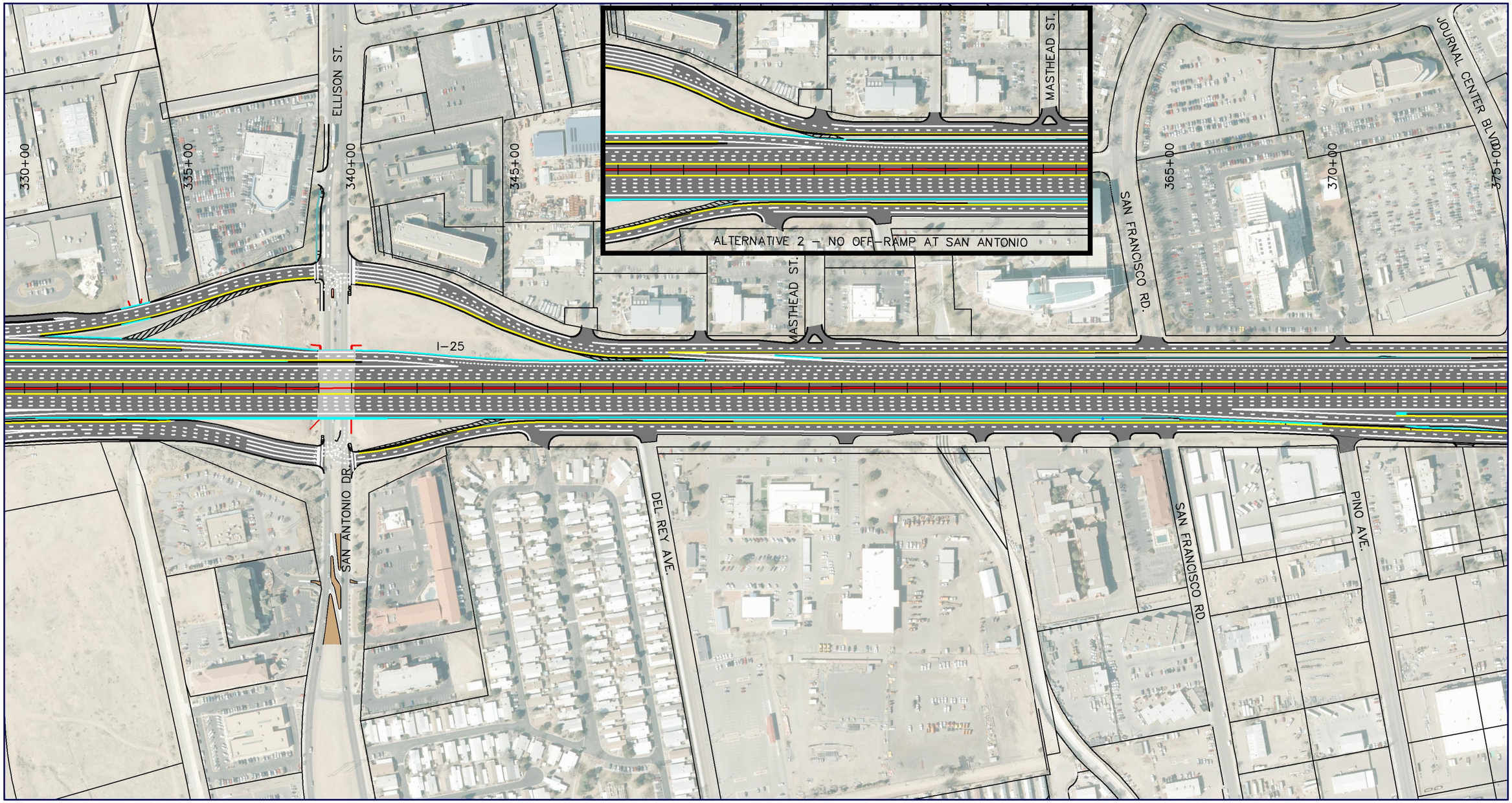

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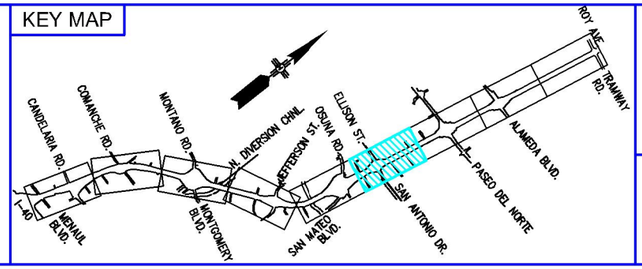

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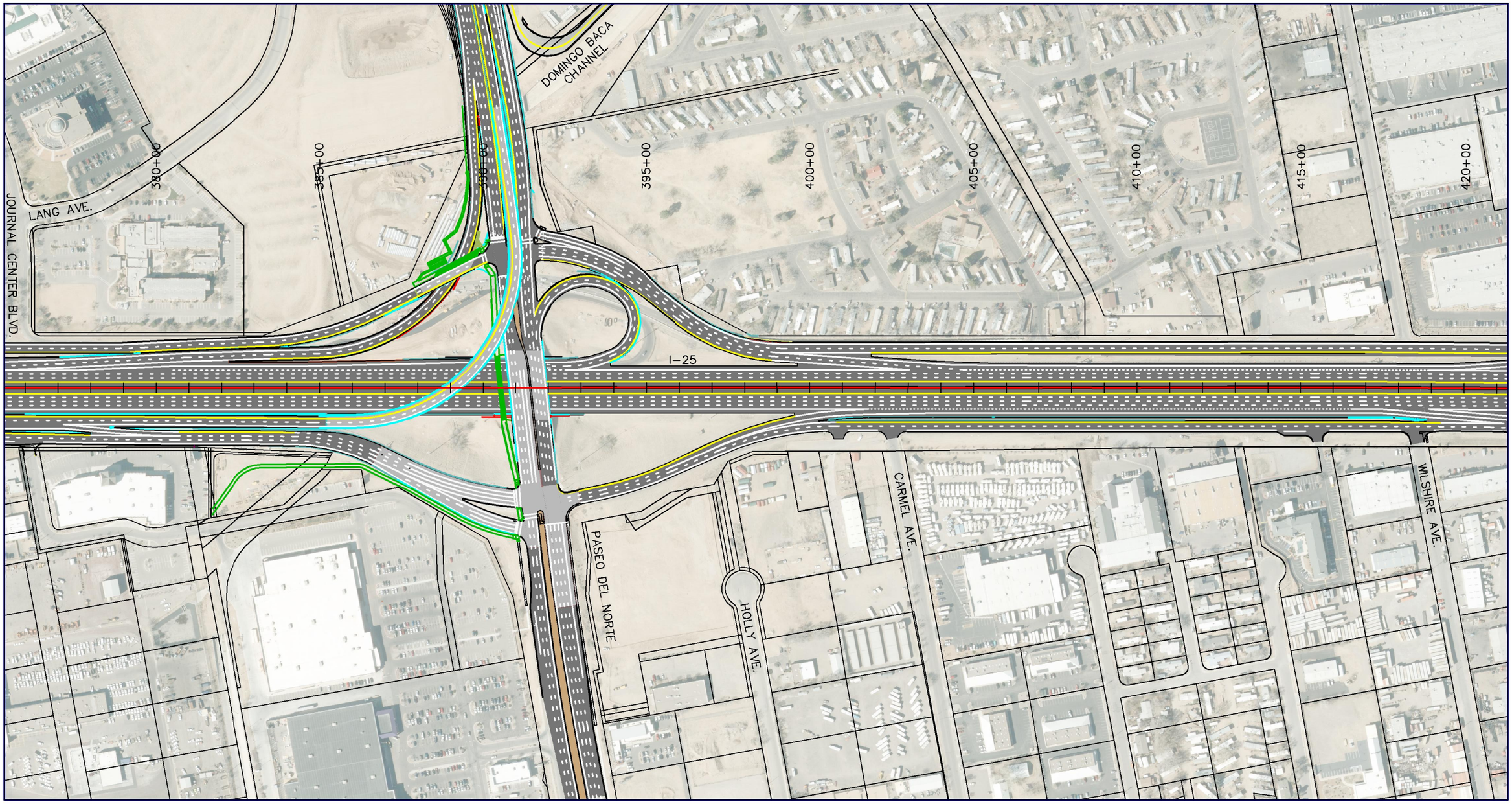

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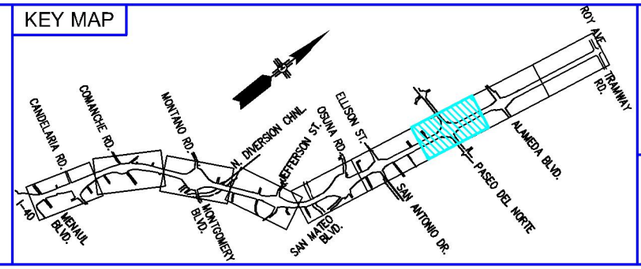

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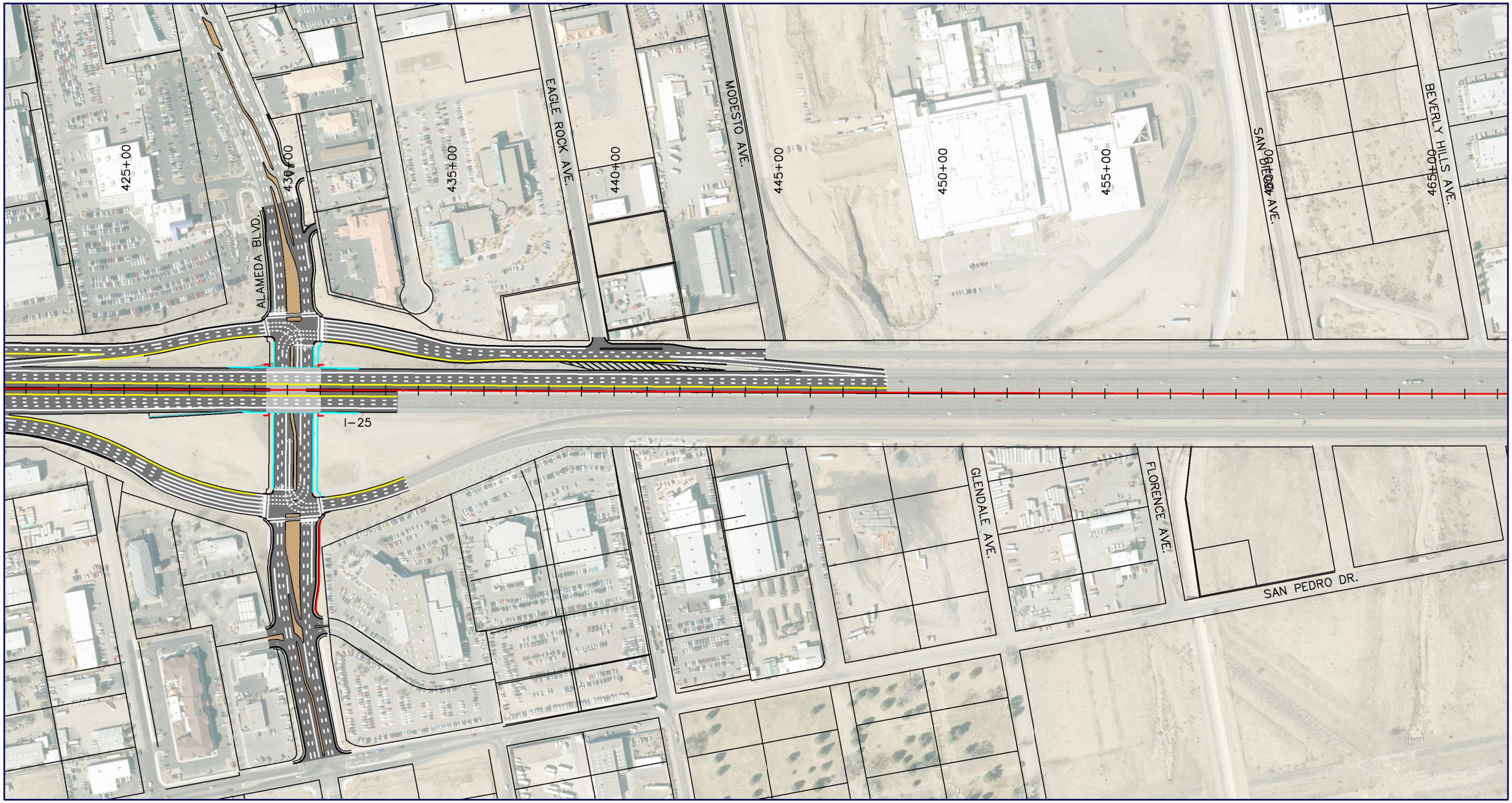

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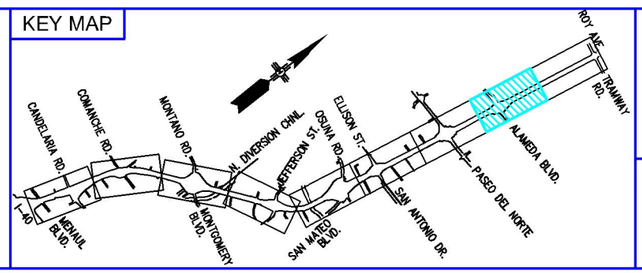

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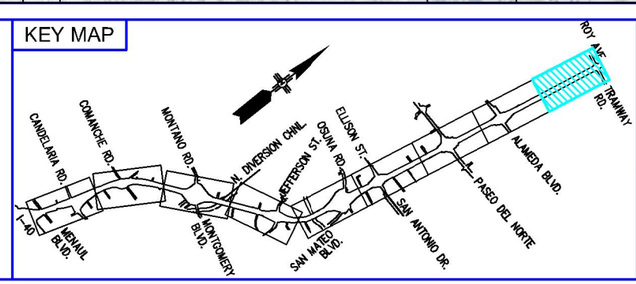

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