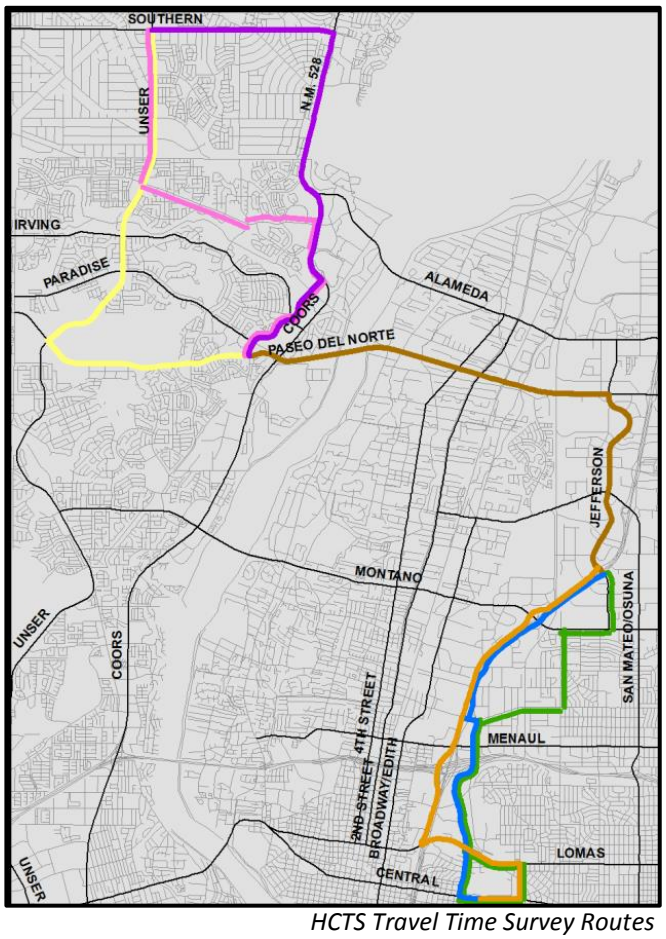
Results of the High Capacity Transit Study Travel Time Survey

Mid-Region Council of Governments
April 2013

The goal of the Paseo del Norte High Capacity Transit Study (HCTS) is to link the northwestern Albuquerque metropolitan area with the Jefferson St/Journal Center corridor and other activity centers east of the Rio Grande using the Paseo del Norte river crossing. When implemented, this transit service will enhance the capacity of the river crossing, improve mobility options, and decrease reliance on single-occupancy vehicle travel.

These needs were all identified in the *2035 Metropolitan Transportation Plan*, which forecast that the region would need to double its river crossing capacity — a measure both impractical and undesirable — to meet expected demand. In response to these ominous conditions, the Metropolitan Transportation Board, the policy-making body for the Albuquerque Metropolitan Planning Area, established mode share goals that 10 percent and 20 percent of all river crossing trips would be completed via transit by 2025 and 2035, respectively. The Board set aside 25 percent of federal discretionary funds for projects that enhance transit capacity on those corridors. The HCTS is an important step in addressing the transit mode share goals established in the MTP for the region's river crossings.

Introducing transit service to the region's Westside is challenging, even though large numbers of residents share commuting routes to employment sites and services located east of the river. Current land use patterns promote vehicle-dependent lifestyles, and to make transit a viable alternative, new service must be competitive with private vehicle travel times. The HCTS proposed several routes to connect key destinations and station locations; ultimately the study will result in a locally-preferred alternative and a plan for implementation.



HCTS Travel Time Survey Routes

To assist in the selection of a locally-preferred alternative, MRCOG conducted a survey to compare travel times along the short-list of potential alignments for the northwest area, as well as a set of connections between the Jefferson St/Journal Center corridor and the University of New Mexico (UNM). The study offered multiple benefits. First, it enabled the various route alignments to be compared to each other to determine the clear benefits or shortcomings of each option. Second, the survey identified bottlenecks and locations with high levels of congestion. Rather than necessarily being locations to avoid, these places may provide opportunities for transit-related improvements such as signal coordination, queue-jump facilities, or dedicated

infrastructure that could make transit travel time competitive with or even more efficient than private vehicles.

It is also important to compare the travel times of proposed routes against existing service. ABQ Ride operates the successful Rapid Ride Blue Line between the Northwest Transit Center at Ellison Rd and Coors By-Pass and the University of New Mexico. The route carries almost 2,400 riders a day, most of whom make long-distance trips to UNM. The HCTS considered the possibility of rerouting the Blue Line or adding complementary service. In either case, it is important to determine whether the routes proposed in the HCTS are competitive with or provide travel time savings compared to existing service. Adding new destinations is important, but service along Paseo del Norte only makes sense for existing users if travel times are improved or at least stay the same compared to the Blue Line.

It should be made clear that travel time is not everything. Successful transit depends on residential density, access to employment and services, connections to other transit routes, and the potential for growth along the route, among other factors. But travel time data do provide important insight into the most efficient means of serving key destinations and the ability for proposed alignments to create a viable alternative to private-vehicle travel.

Methodology

The survey was conducted using the floating car method in which private vehicles travel with the flow of traffic as time and velocity is recorded by a GPS device. Drivers made complete runs, beginning at the intersection of Southern Blvd and Unser Blvd in Rio Rancho and ending at Yale Blvd and Central Ave at UNM, or vice versa. The data therefore reflects observed through-travel, rather than a composite of individual segment averages. Such an approach allows one to see the variation between peak periods, but also within each period of the day, and to understand the overall trip duration to key destinations such as the Journal Center and UNM/CNM areas.

Peak Period Hours

AM	OFF	PM
6:30 am - 9:00 am	9:00 am - 3:30 pm	3:30 pm - 6:00 pm

The survey took place from Tuesday through Thursday, January 15-17, 2013 and was conducted under normal driving conditions in which there were no major incidents along any of the routes being studied. Rio Rancho and Albuquerque Public Schools, the University of New Mexico, and Central New Mexico Community College were all in session. Some construction was underway at the intersection of Carlisle Blvd and Candelaria Rd which had a minor impact on results for the Green Route.

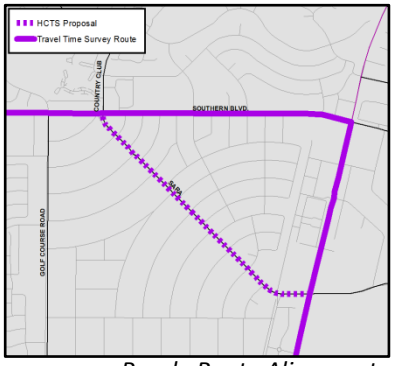
The one exception to the methodology was the Purple Route, where data from previous MRCOG travel time surveys was already available. Rather than reflecting complete runs driven in January 2013, Purple Route data is a composite of results surveys taken in the past three years, as well as some data from the most recent HCTS travel time survey where portions of the route overlapped with the Pink Route. Although the dates are different (travel time data was collected in the month of April) the methodology was the same and sample sizes were similar.

Description of Alignments

Northwest Area

The northwest portion of the study considers service between Southern Blvd and Unser Blvd, the commercial center of Rio Rancho, and the intersection of Paseo del Norte and Eagle Ranch Rd, which has been identified by the HCTS as a suitable location for a major park and ride facility. It is a growing region with modest amount of transit service, but has significant development potential at the Rust Medical Center, Volcano Heights Town Center, and other smaller sites. The area also includes the Cottonwood Mall, Intel, and the highly-utilized Northwest Transit Center

The Purple Route follows the more developed Southern Blvd and NM 528 commercial corridors, providing service to Cottonwood Mall, the Northwest Transit Center, Intel and other retail sites in Rio Rancho.[1] The Pink Route and Yellow Route both follow Unser Blvd south from Southern Blvd, but the Pink Route proceeds along McMahon Blvd to connect with the Northwest Transit Center. The Yellow Route travels south on Unser Blvd to Paseo del Norte, the site of the proposed Volcano Heights Town Center.



Purple Route Alignments

River Crossing

The middle segment of the survey connects northwest Albuquerque and southern Rio Rancho with employment sites in the Jefferson St/Journal Center area. From west to east, the segment travels along Paseo del Norte between Eagle Ranch Rd and Jefferson St, before continuing down Jefferson St to the interchange with I-25. Data collection along this segment was important for identifying bottlenecks and points of delay, and in particular locations that would be suitable for queue-jump facilities or where dedicated transit lanes would provide substantial travel time savings.

The HCTS identified Paseo del Norte as the river crossing facility most suitable for Bus Rapid Transit (BRT). However, Paseo del Norte can be subject to severe congestion during the peak commuting periods – it is ranked by MRCOG as the #3 most congested corridor in the metro area – especially at the intersections with Coors Blvd, Jefferson St, and the I-25 interchange. Other alignments through the Jefferson St corridor were identified in the HCTS, but these roadways are proposed (i.e. they do not yet exist) and it is not possible to collect current travel time data.

UNM Connection

An important piece of the HCTS, although not a primary focus, is creating connections to UNM and CNM. The travel time survey collected data for three alignments between Jefferson St/I-25 interchange and UNM. All three survey alignments follow the existing Rapid Ride Blue Line route for the UNM area by circumnavigating main campus clockwise along Lomas Blvd, Girard Blvd, and Central Avenue. The southbound direction terminates at the intersection of Yale Blvd and Central Ave, an existing Rapid Ride stop. The northbound direction proceeds west on Central Ave from Yale Blvd and continues north on University Blvd.

The roadway network does not allow for obvious transit connections to UNM from Jefferson St. The three alignments considered here reflect the tradeoffs between travel time and accessibility, and

[1] The HCTS utilizes Sara Rd as part of the alignment; however the travel time survey refers to data from Southern Blvd to NM 528 only. It is unclear how much of a difference there is between the two alignments.

indicate how much travel time might be sacrificed by pursuing intermediate stops and transit connections. The Orange Route follows the longest though most direct route along the Interstate Frontage Rd system and would likely provide express service between Jefferson St and UNM with few if any intermediate stops.[2] The Blue and Green Routes follow the street network which would provide the most access to employment sites and connections to existing transit routes.

RESULTS

Overall travel times from the intersection of Southern Blvd and Unser Blvd to UNM (Yale Blvd and Central Ave) range from 38-45 minutes heading south and 35-45 minutes heading north. The total distance traveled equals 20.1 to 21.4 miles, depending on the alignment. Average speeds range from 26-34 MPH, with the slowest times found in the AM southbound and PM northbound directions. In general, AM peak and off peak times are pretty comparable; however, results can be best understood by first examining the various areas of the study, then considering location-based congestion.

Northwest Area

Travel Times in Minutes (with Standard Deviation) and Average Speed

SOUTHBOUND		AM		OFF		PM	
Route	Distance	Time (SD)	Speed - MPH	Time (SD)	Speed - MPH	Time (SD)	Speed - MPH
Pink	6.53	14.36 (1.72)	27.29	12.77 (1.24)	30.70	14.25 (1.13)	27.50
Yellow	7.28	**13.89** (1.29)	31.44	**12.09** (0.95)	36.12	**13.94** (1.19)	31.33
Purple	7.13	16.02 (n/a)	26.70	n/a	n/a	15.89 (n/a)	26.93

NORTHBOUND		AM		OFF		PM	
Route	Distance	Time (SD)	Speed - MPH	Time (SD)	Speed - MPH	Time (SD)	Speed - MPH
Pink	6.53	14.61 (1.35)	26.83	13.60 (1.27)	28.81	15.38 (1.49)	25.48
Yellow	7.28	**12.59** (1.17)	34.69	**12.35** (0.89)	35.38	**13.73** (1.06)	31.81
Purple	7.13	13.80 (n/a)	31.01	n/a	n/a	13.75 (n/a)	31.11

The Yellow Route, despite being the longest of the alignments in the Northwest Area, is the fastest route for each period in both directions. The route follows relatively uncongested portions of Unser Blvd and Paseo del Norte, two limited access principal arterials with wide rights-of-way. The survey indicates that delay is mostly minor and that dedicated infrastructure along the entire alignment is not currently necessary for ensuring high speeds, although there are opportunities to preserve travel time through transit-specific infrastructure if travel times deteriorate. What is more, there is not much variation between periods along the Yellow Route, indicating the portions of Unser Blvd and Paseo del Norte along which transit would run are not currently subject to high commute-related traffic volumes.

Although slower in each period than the Yellow Route, the Pink Route does not require significantly more time to traverse; the greatest differences are in the northbound direction which requires an additional two minutes, but for most other periods the difference is less than one minute. Travel times along the Pink Route are consistently between 12 and 14 minutes for all periods and directions, without particularly high variability. The Pink Route is also the shortest of the alignments, meaning that drivers proceeded at much lower speeds to attain the same travel time as the Yellow Route.

[2] Although the Interstate system would provide faster travel times today, the survey focused on the Frontage Rd system to better understand how transit could work on these facilities as there is more potential for transit improvements over times than on the Interstates themselves.

The Purple Route is measurably slower in the southbound direction for both peak periods, requiring an additional two minutes. However, travel times in the northbound direction are competitive with the other alignments, in particular during the PM peak, which requires essentially the same amount of time to travel from Paseo del Norte and Eagle Ranch Rd to the intersection of Southern Blvd and Unser Blvd. Rerouting to Sara Rd, as proposed by the HCTS, would eliminate conflicts associated with the intersection of NM 528 and Southern Blvd, which seems to be a source of recurring congestion, but would require slower speeds along a more residential area.[3]

River Crossing

Travel Times in Minutes (with Standard Deviation) and Average Speed

SOUTHBOUND		AM		OFF		PM	
Route	Distance	Time (SD)	Speed - MPH	Time (SD)	Speed - MPH	Time (SD)	Speed - MPH
Brown	7.38	14.44 (1.95)	30.66	11.19 (0.77)	39.56	11.58 (0.99)	38.23

NORTHBOUND		AM		OFF		PM	
Route	Distance	Time (SD)	Speed - MPH	Time (SD)	Speed - MPH	Time (SD)	Speed - MPH
Brown	7.38	10.75 (0.82)	41.19	11.05 (0.89)	40.06	13.80 (2.03)	32.09

The survey indicates a clear difference in travel times depending on the direction and the time of day. Not surprisingly, the *AM southbound* direction (east on Paseo del Norte) and *PM northbound* direction (west on Paseo del Norte) have the greatest travel times, reflective of the overall commuting patterns in the corridor. These directions also demonstrated the greatest travel time variability, indicated by the higher standard deviation values. By contrast, travel in the *off peak* period is nearly identical in each direction (just over 11 minutes to cover 7.38 miles), while travel in the peak periods in the counter-flow, or "reverse commute" direction (i.e. AM northbound and PM southbound) is both high velocity, with average speeds across the segment around 40 MPH, and reliable, as evidenced by the low standard deviation values.

In the *AM southbound* direction, which follows the commuting flow, the average travel time is an average of 14.44 minutes, although some individual runs (i.e. survey runs that started from Paseo del Norte and Eagle Ranch Rd between 7:45-8:15 a.m.) required nearly 19 minutes. Outside of the highest commuting demand portion, travel times fall below the overall overage for the peak period.

PM northbound runs that began from the I-25/Jefferson St interchange after 4:30 p.m. were significantly slower than runs that occurred earlier in the PM peak period, with one run taking 20 minutes to cover the length of the corridor.

[3] The sample size for off peak travel time data was not sufficient to be included in this study.

UNM Connection

Travel Times in Minutes (with Standard Deviation) and Average Speed

SOUTHBOUND		AM		OFF		PM	
Route	Distance	Time (SD)	Speed - MPH	Time (SD)	Speed - MPH	Time (SD)	Speed - MPH
Orange	6.76	16.05 (1.47)	25.26	15.07 (1.20)	26.92	**14.34 (1.10)**	28.28
Blue	6.36	15.11 (1.40)	25.25	**14.68 (1.29)**	25.98	15.07 (1.59)	25.31
Green	6.18	**14.89 (1.33)**	24.88	15.19 (1.59)	24.40	15.93 (1.65)	23.27

NORTHBOUND		AM		OFF		PM	
Route	Distance	Time (SD)	Speed - MPH	Time (SD)	Speed - MPH	Time (SD)	Speed - MPH
Orange	5.71	11.80 (1.11)	29.05	**12.17 (1.09)**	28.17	**13.82 (1.73)**	24.79
Blue	5.34	**11.62 (1.03)**	27.54	**12.17 (1.12)**	26.31	15.07 (1.80)	21.24
Green	6.10	14.20 (1.16)	25.79	15.30 (1.22)	23.94	18.08 (2.01)	20.25

Travel in each of the *southbound* periods to UNM directions requires 14-16 minutes to traverse, regardless of the route, and the ranges between the slowest and fastest alignment averages are no more than 90 seconds per peak period. However, there is a fairly high level of variability for each of alignment. Along the Orange Route, for example, the AM travel times average 16.05 minutes but range from 14-19 minutes. In short, when traveling southbound there is no particular travel time advantage to be gained by forgoing employment sites and transit connection opportunities in favor of the most direct path to UNM.

Northbound travel offers a clearer picture of travel time benefits. Overall, the Orange and Blue Routes offer relatively high speeds and are comparable with the exception of the PM peak period, where northbound travel on the Orange Route is over a minute faster than the Blue Route. Travel times for the AM and off peak periods are also comparable (about 12 minutes), while driving conditions worsen in the PM peak period (14-15 minutes). The Green Route proves substantially slower in the northbound direction than the alternatives, with travel times around three minutes higher in each period. The northbound PM peak is also highly variable; the Orange Route requires 11.5-19.6 minutes to complete, while the Green Route requires 13.4-22.3 minutes.

Other Considerations

The survey indicates that service to UNM from the northwest portion of the metropolitan area via Paseo del Norte would not result in added travel time for existing transit users, in particular passengers on the Rapid Ride Blue Line. The Blue Line makes 10 stops and requires 42-51 minutes to travel southbound to reach UNM from the Northwest Transit Center, depending on the time of day. The total driving time between the Northwest Transit Center (NWTC) and UNM via the HCTS is about 31-36 minutes, excluding stops.[4] Transit driving time may be slightly longer than the time required for smaller private vehicles, although BRT typically entails fewer stops meaning less time lost accelerating and decelerating as well as boarding and alighting, or "dwell time." If one assumes 90 seconds delay per stop associated with deceleration and dwell time – a high value for BRT, which may reduce dwell significantly through off-

[4] The composite route data from the survey indicates the driving time southbound between the intersection of Eagle Ranch Rd and Paseo del Norte is 29-30 minutes in the AM peak and 26-27.5 minutes in the off peak and PM peak. Time between the NWTC and Eagle Ranch/Paseo del Norte intersection is an additional 5-6 minutes heading southbound, depending on the period. This is significant because the Yellow Route does not travel between the Northwest Transit Center and the proposed station at Eagle Ranch Rd and Paseo del Norte.

board fair collection – and eight to ten stops between the NWTC and UNM, the total travel time along the proposed alignments is roughly equal to the existing Rapid Ride.

Another important consideration is the time added due to stops, even if the delay associated with stops can be minimized through off-board fare collection and level boarding platforms. Adding stops between the Jefferson St/Journal Center corridor and UNM will add time to any alignment. The Orange Route is designed to minimize the number of stops and proceed directly to UNM. However, the travel time survey indicates the Orange Line only has marginal benefits, if any, in terms of speed. The Blue Route would likely entail multiple stops along University Blvd to serve retail sites and the burgeoning medical facilities along the corridor. The Green Route calls for further stops to provide connections to existing transit service along Montgomery Blvd and San Mateo Blvd.

Location-Specific Congestion

A common measure of congestion is delay or speed differential, which is the percentage difference between the posted speed and the observed speed. The greater the percentage value, the higher the level of delay along a segment. High speed differentials can be a result of delay at intersections, a large number of turning movements which can require trailing vehicles to slow down, or high-volume roadways. The calculation is a means of comparing relative levels of congestion and identifying the most inefficient segments of a roadway.

Calculating speed differential has practical implications in transit planning. In particular, segments with high levels of delay may be good candidates for transit-specific improvements such as signal coordination, queue-jump facilities, or dedicated lanes, which could provide significant travel time savings. If improvements are not practical these segments could be avoided altogether.

The greatest conflicts in the *northwest area* are found along McMahon Blvd and two difficult intersections involving Eagle Ranch Rd: northbound at Coors By-Pass and southbound at Paseo del Norte. Approaching the intersection of Eagle Ranch Rd while heading west on Paseo del Norte (northbound direction) also presents consistent problems. In short, whichever alignment is utilized, accessing and departing from the proposed park and ride site at Paseo del Norte and Eagle Ranch Rd will require special treatment.

The *river crossing* segment is marked by congestion along Paseo del Norte from 2nd St to Jefferson St, but the most critical issues are at several intersections. Paseo del Norte and Jefferson St is problematic in all directions, although the intersection may be improved over time as part of the I-25/Paseo interchange reconstruction. Travelling north-south on Jefferson St is marked by delay at the I-25/Jefferson interchange and the Osuna Rd and Singer Rd intersections.

Providing a rapid *connection to UNM* can be achieved even while providing intermediate stops and connections to existing transit services, such as at Menaul Blvd. One reason is that the Frontage Roads, which in theory should be an ideal way to provide direct, seamless service to UNM, operate below expectations and do not provide substantial time savings over surface streets, although this could be addressed through signal prioritization. The most logical alternative involves University Blvd, which also faces high levels of delay during the peak periods approaching and leaving the UNM area. Transit-related improvements, though costly, could have a significant impact along University Blvd since delay is over a fairly long stretch of roadway rather than at individual intersections.

Northwest Area Congested Segments

- Both directions and both the AM and PM peak periods at the intersection of Ellison Rd and Coors By-Pass
- Severe delay southbound at the intersection of Eagle Ranch Rd and Paseo del Norte
- Northbound at the intersection of Eagle Ranch Rd and Coors By-Pass
- Intersection of Unser Blvd and McMahon Blvd in both directions and peak periods
- Unser Blvd southbound from County line to Paradise Blvd
- Intersection of McMahon Blvd and Golf Course Rd (severe in AM peak in both directions)

River Crossing Congested Segments

- Intersection of Jefferson St and Paseo del Norte, and the northbound direction in particular, has one of the highest rates of delay in the entire region
- Westbound on Paseo del Norte in the AM peak from 2nd St to Jefferson St
- Southbound on Jefferson St at Osuna Rd in both AM and PM peak periods

UNM Connection Congested Segments

- University Blvd in the PM peak northbound direction from Central Ave to Indian School Rd and from Menaul Blvd to Candelaria Rd
- South Frontage Rd from Montgomery Blvd to Menaul Blvd in both peak periods
- Lomas Blvd from I-25 to University Blvd southbound in both peak periods
- South on Jefferson St and west on Montgomery Blvd in the PM peak southbound

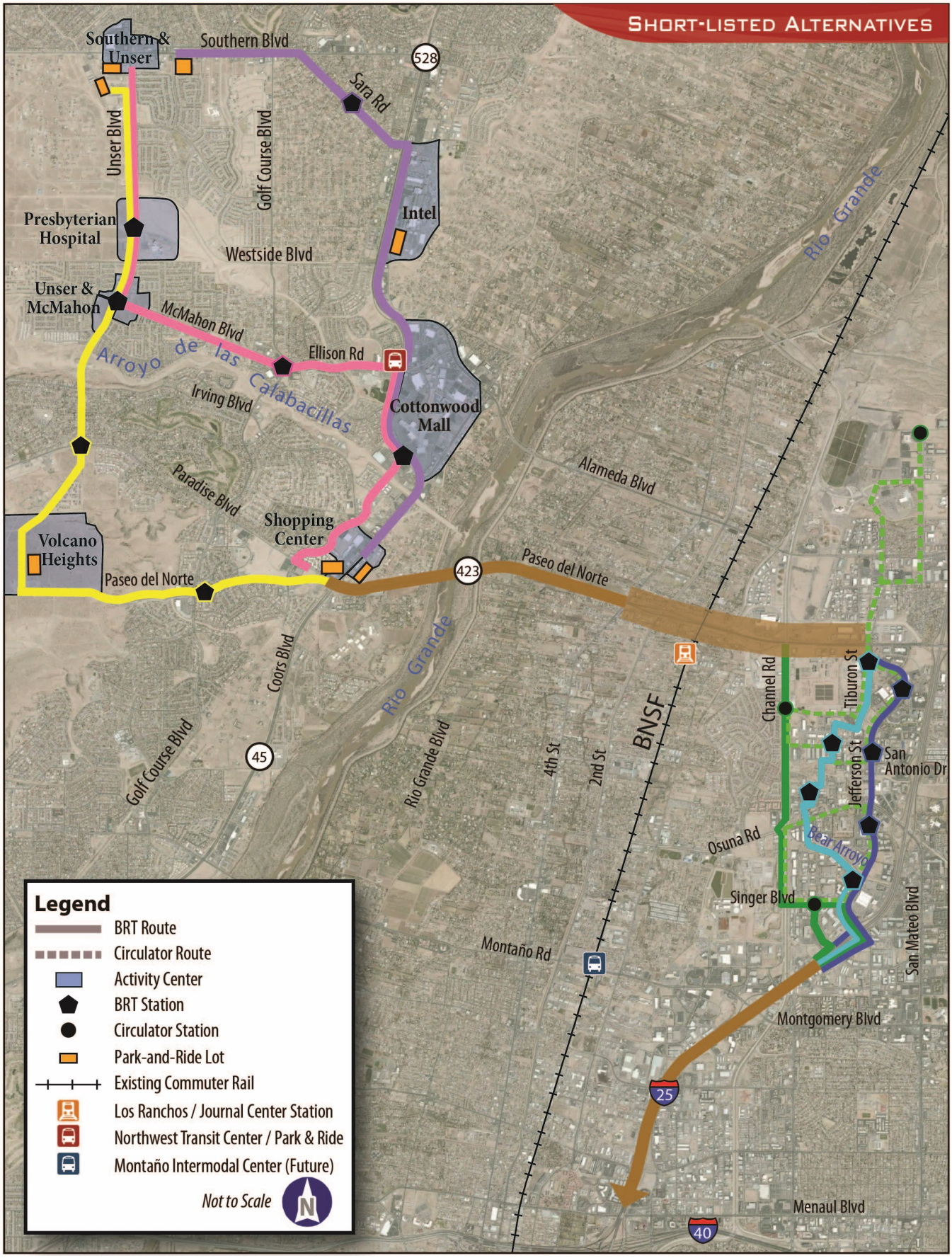
Conclusions

The recently conducted HCTS travel time survey sheds light on the most efficient means of serving destinations in the study area and locations that should be prioritized for improvements. The survey also demonstrates that transit service from the northwestern portion of the metropolitan area to UNM via Paseo del Norte and Jefferson St would be comparable in travel time to existing transit services.

New service to UNM is likely to generate interest due to cost savings and limited parking availability, especially if such routes extend to market areas that are currently underserved by transit. However, other destinations do not provide such incentives. What is more, taking transit requires additional time on both ends of the trip: getting to a station and from the arrival station to a destination. Ensuring competitive travel times is therefore essential for providing real alternatives to single-occupancy vehicle travel and increasing the likelihood that a wider range of riders will utilize public transit.

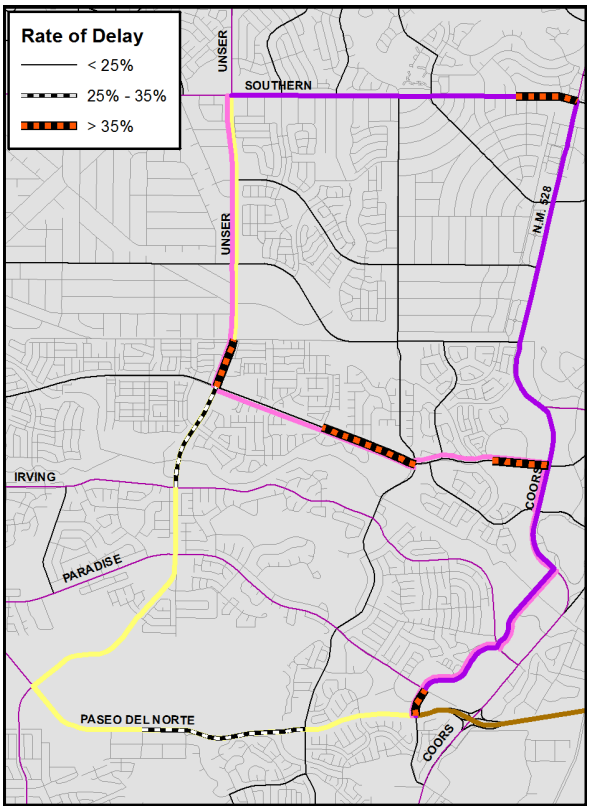
The survey indicates that delay in the Albuquerque metropolitan area is often a result of bottlenecks in key areas and at certain times of day. It is not a widespread and continuous concern, at least not yet. This is significant, as transit service and transit travel times can be improved through targeted investments, which can be implemented over time as funding permits.

HCTS Short-Listed Alternatives — Spring 2013

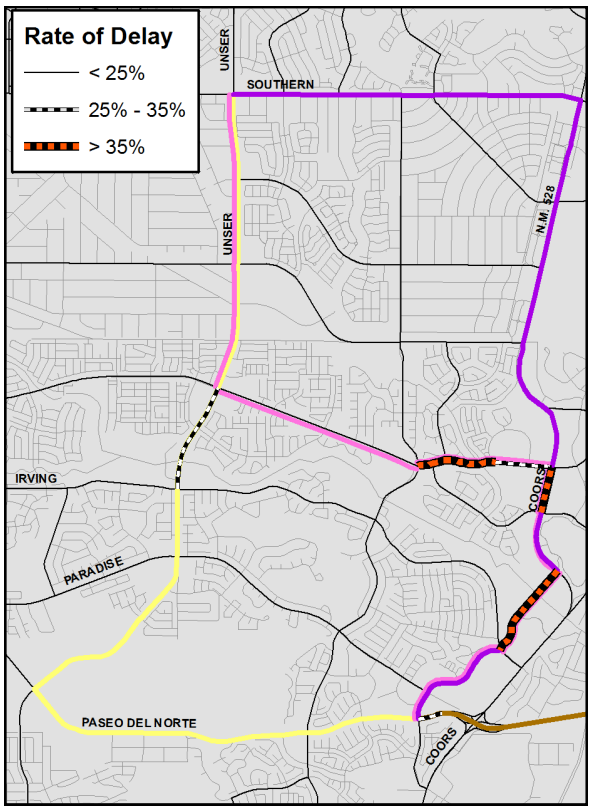


Speed Differential — Northwest Area

AM South



AM North



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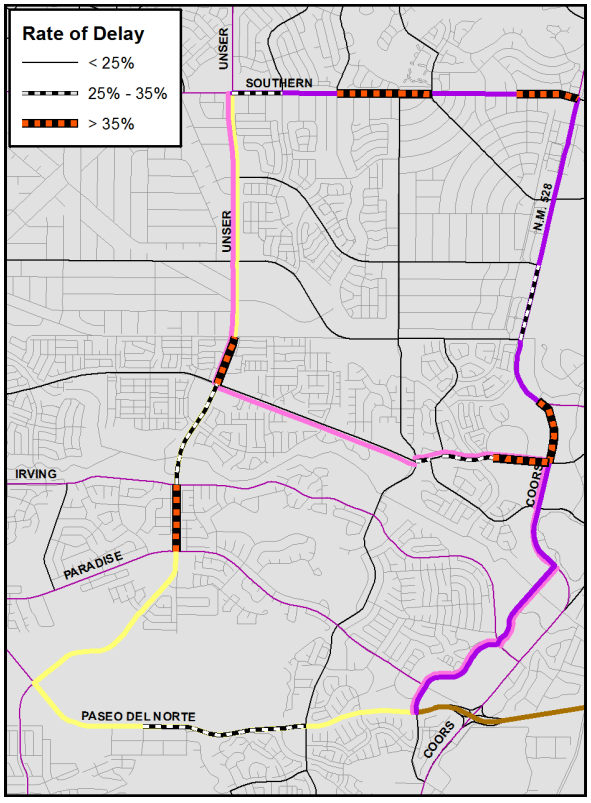

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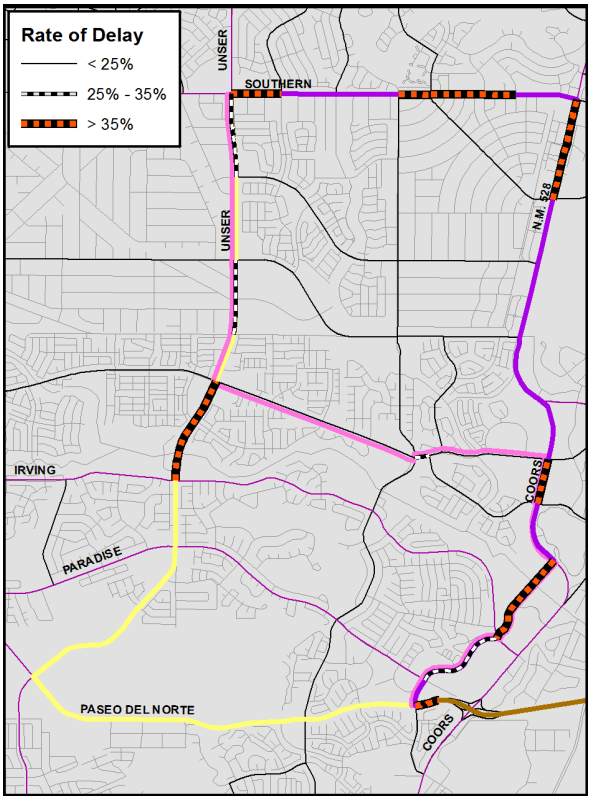
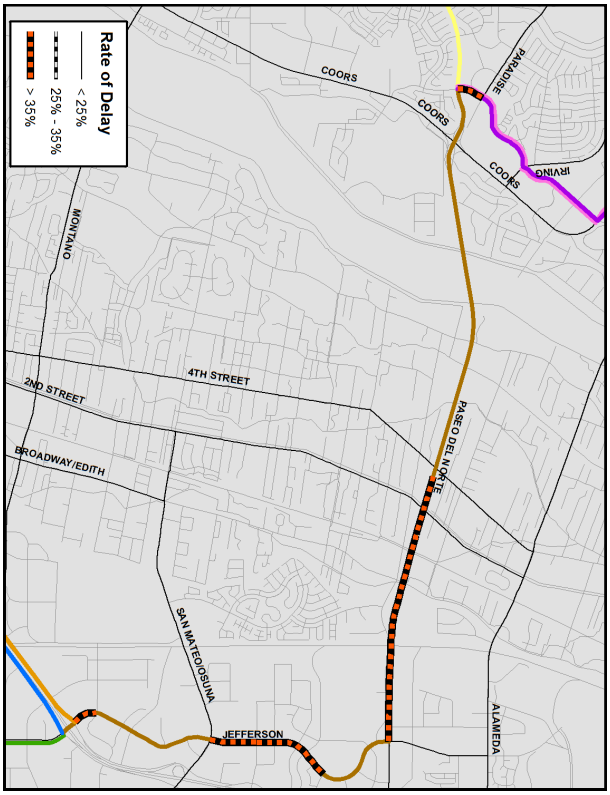


Speed Differential — River Crossing Area

AM South



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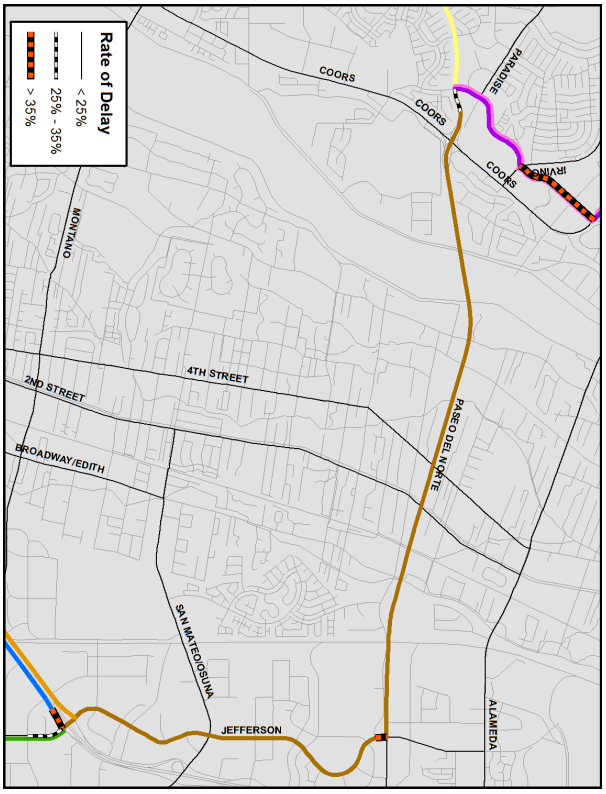

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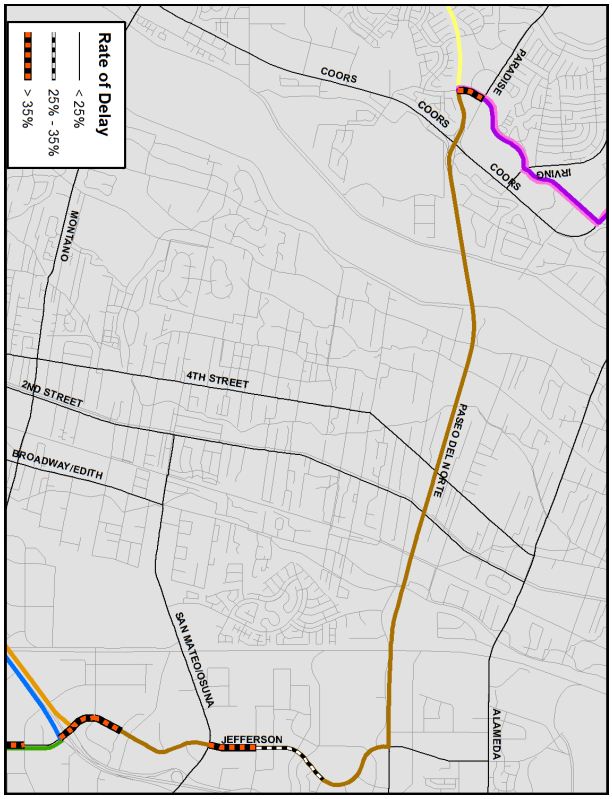
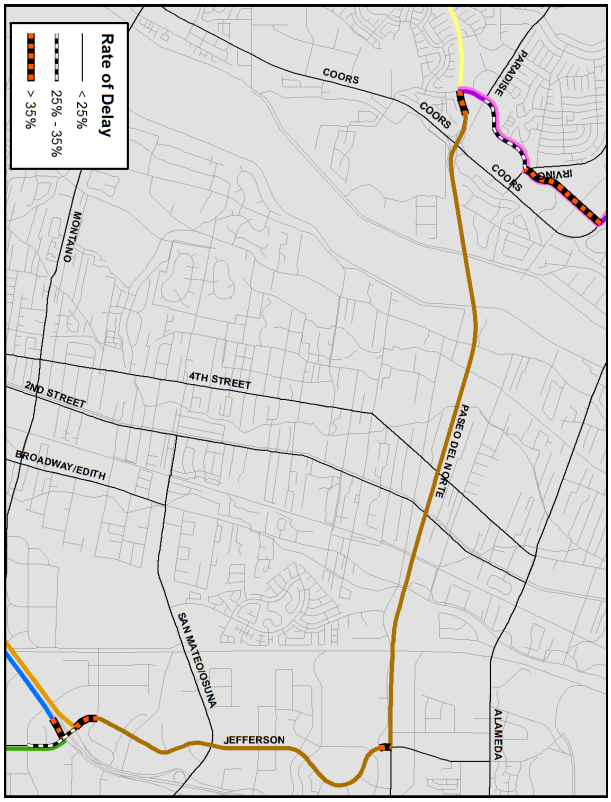
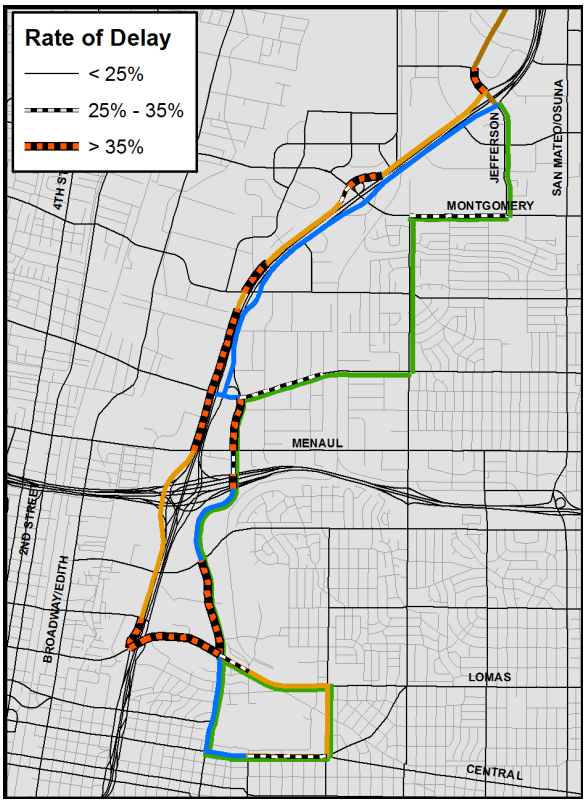


PM North

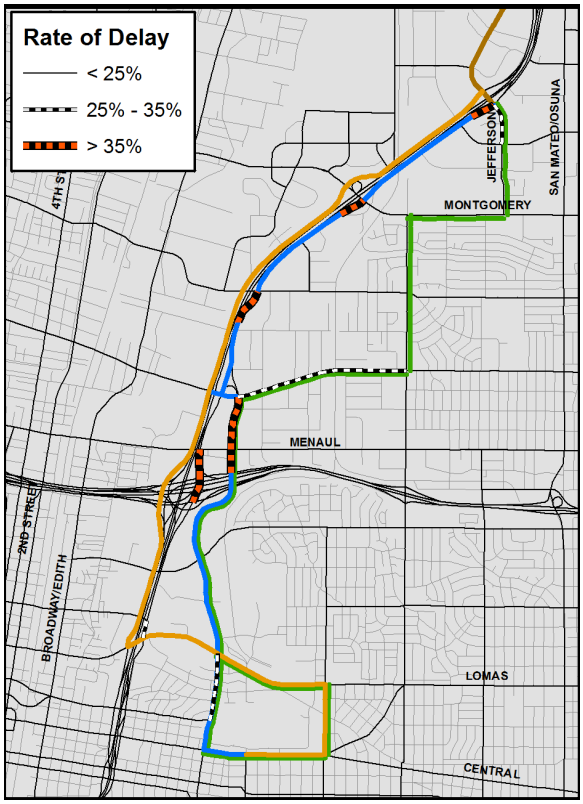


Speed Differential — UNM Area

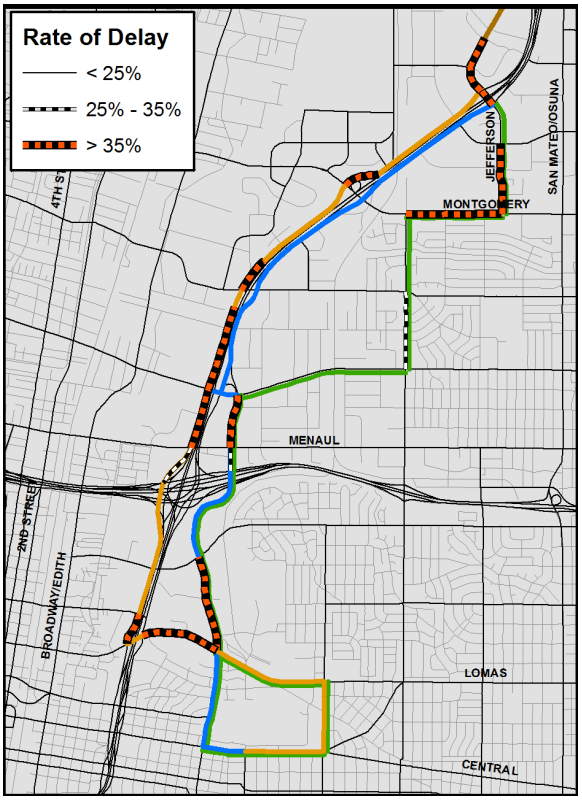
AM South



AM North



PM South



PM North