



Contract No. AE49337000

North San Fernando Valley Bus Rapid Transit Corridor Study

Final Ridership Forecasting Technical Memorandum

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Acronyms and Abbreviations

BRT	Bus Rapid Transit
CBM18	Metro Corridors Based Model 18
CSUN	California State University Northridge
LAX	Los Angeles International Airport
TAZ	Traffic Analysis Zone
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled

1. Purpose of Memo

Purpose of Memo

This memo describes the ridership estimates for Bus Rapid Transit (BRT) alignments for the North San Fernando Valley BRT Planning and Environmental Study (“the Study”) to all project participants. This memo uses the methodology described in the North San Fernando Valley BRT Transit Corridor Study Modeling Methodology Technical Memorandum (dated October 19, 2018). The project team used the Metro Corridors Based Model 18 (CBM18) to analyze the BRT alignment options in the North San Fernando Valley corridor.

The BRT alignment options are evaluated for the Study through a series of performance measures that inform decision-making for BRT alignments in the study area. These performance measures are reported for the CBM18 model region, which includes six counties in Southern California (Los Angeles County, Imperial County, Orange County, Riverside County, San Bernardino County, and Ventura County) as well as the study area. The performance measures include:

Ridership Forecasts

- **Transit Trips** are average weekday transit trips for the region. Transit trips can include transfers and represent person trips from the origin to the destination. Higher transit trips indicate that the travelers are choosing to ride transit more often because the transit service alignment provides better service.
- **Mode Share** is the average total weekday regional transit trips divided by the average total weekday regional person trips. Higher transit mode shares indicate that the travelers are choosing transit more often because the transit service alignment provides better service.
- **Boardings** are average weekday boardings for the region and by station for the North San Fernando Valley BRT service. Boardings are from station-to-station so, for example, a transit trip that includes one transfer represents two boardings. Boardings per station are also reported to assess the new transit services on a per station basis.
- **Transfer Rate** is the total boardings divided by the total transit trips.
- **Peak Load** includes an assessment of the number of transit riders on a particular route segment and direction during the peak hour. This allows a comparison of the peak load to the capacity of the transit services provided.

Market Analysis

- **Transit Trips by Market** segment transit trips within the study area, with one end in the Study area and one end outside the study area.
- **Transit Trips by Direction** segment transit trips to/from the north of the study area, to/from the south of the study area, to/from the east of the study area and to/from the west of the study area.

- **Low-Income Work Transit Trips** segment trips by market segment and identifies the percent of new transit trips that are low-income work trips.

Traffic Forecasts

- **Vehicle Miles Traveled (VMT)** is the average weekday auto vehicle trips times the miles traveled. This measure indicates how much the alignment is reducing auto travel.

2. 2017 Transit Model Validation

The transit network validation involves whether the model can replicate base year conditions at a regional and local scale. The CBM18 model was validated by Metro at the regional scale and these regional validation statistics are confirmed once the updates for the corridor calibration were included.

Regional Transit Model Validation

Table 1 presents the regionwide system boardings for bus and rail, which closely match. Reasonableness is determined, in part, by the overall corridor matches observed and the modal differences regionwide; these comparisons are reasonable.

	2017 ACTUAL	2017 ESTIMATED	DIFFERENCE	PERCENTAGE ERROR
Bus Boardings	941,198	954,396	13,198	1.4%
Rail Boardings	357,868	355,732	-2,136	-0.6%
Metro Boardings	1,299,066	1,310,128	11,062	0.9%

Table 1: 2017 Observed and Estimated Metro Systemwide Daily Boardings

Transit mode share for the CBM18 model is 1.9%, as shown in Table 2. The estimated Metro rail ridership is within 2% of the observed rail riders.

MODEL OUTCOME	2017 MODEL SUMMARY
Total Person Trips (All Modes)	65,546,017
Total Linked Transit Trips	1,218,140
Transit Mode Share	1.9%
Estimated Metro Rail Riders	39,185
Observed Metro Rail Riders	39,967

Table 2: 2017 Estimated Trips, Mode Share and Rail Riders Compared to Observed

Corridor Model Updates

The CBM18 model was updated during the corridor calibration for the Vermont Transit Corridor Technical Study Phase 2 and North Hollywood to Pasadena BRT Environmental Impact Statement studies in consultation with Metro staff. The technical team made changes to the CBM18 mode choice program during the calibration for these two studies to improve the model’s ability to replicate observed transit ridership for these corridors. These changes focused primarily on improving the transit network input data. A summary of these changes to update

the 2017 No-Build scenario for the North San Fernando Valley ridership analysis is provided here for context:

- The Metrolink service schedule was updated to better reflect the 2017 timetables.
- Station penalties were added or removed as part of the calibration to the 2017 ridership reports provided by Metro.
- The Glendale and Pasadena transit systems were updated to better represent the current routes and timetables of these services.

Specific to the North San Fernando Valley BRT Corridor, the Los Angeles Department of Transportation Northridge/Reseda services were included to reflect current timetables.

Corridor Transit Model Validation

The project team evaluated the performance of the model in replicating the base year ridership in the study area. The evaluation was conducted by comparing the estimated ridership from the model with the observed weekday ridership for the base year 2017.¹ It is not expected that the estimated ridership will match on a route by route basis, but at the corridor level the model should do a reasonable job of reflecting the travel patterns and characteristics. The model should match the observed within about ten percent at the corridor level.²

The project team evaluated the base year ridership estimates in the North San Fernando Valley corridor to the observed boardings in 2017. Table 3 summarizes the average annual 2017 boardings and initial CBM18 boardings for the local bus services in the corridor. Overall, the local bus ridership is within two percent of observed values in the corridor. Generally, the local bus routes are slightly under-estimated in the corridor. The local buses provide the best validation of the CBM18 model in the corridor since these are serving similar east-west movements within the corridor.

DESCRIPTION	BUS ROUTE	ACTUAL RIDERSHIP 2017 ³	ESTIMATED RIDERSHIP 2017	DIFFERENCE	PERCENTAGE DIFFERENCE
Plummer	167	2,253	358	-1,895	-84.1%
Nordhoff	166/364	5,911	6,741	830	14.0%
Roscoe	152	10,667	8,811	-1,856	-17.4%
Sherman	163/363	9,148	7,049	-2,099	-22.9%
Vanowen	165	7,652	9,058	1,406	18.4%
Victory	164	6,115	9,113	2,998	49.0%
Total		41,746	41,130	-616	-1.5%

Table 3: 2017 Observed and Estimated Daily Boardings in the North San Fernando Valley Corridor

There are several north-south local bus routes (e.g. 240, 224, 230) and three Rapid bus services in the study area (Reseda, Van Nuys and Sepulveda) and the actual transit ridership was

¹ <http://isotp.metro.net/MetroRidership/IndexAllBus.aspx>

² The recent West Santa Ana Branch Transit Corridor Environmental Study also uses this ten percent target for transit model validation.

³ Limited Service Line 364 is a branch of Line 166, so the ridership for these lines is reported together. Similarly, Line 363 is a branch of Line 163 and the ridership is reported together.

compared to the CBM18 model ridership for these routes. The results were an under-estimation of ridership for these Rapid services, but these serve primarily north-south trips in the study area where the alignments considered in the North San Fernando Valley are primarily east-west. As a result, this under-estimation was not a concern for the validation of the CBM18 model in the corridor.

Attachment A provides additional details of the 2017 existing travel behavior. Details include existing person and transit trips, existing mode shares by market, and a map of the markets defined for evaluating travel behavior.

3. Scenarios

Scenario Year

The project team conducted the alternatives analysis in a 2042 scenario year using a base year of 2017. Metro technical staff provided 2017 and 2042 No-Build trip tables and networks. The project team's analysis is consistent with the following projects currently in the planning and environmental phase that are using 2017 and 2042 datasets:

- West Santa Ana Branch
- Sepulveda Transit Corridor
- Vermont Transit Corridor
- North Hollywood to Pasadena BRT

2042 No-Build Scenario

The project team updated the No-Build scenario to reflect the other network changes expected in 2042, such as the Vermont Corridor BRT and the North Hollywood to Pasadena BRT. The North San Fernando Valley BRT connects with the existing Orange Line BRT and the proposed North Hollywood to Pasadena BRT at the North Hollywood Station.

The project team made several additional changes to the CBM18 2042 No-Build Scenario to provide consistency across corridors:

- Changed the proposed East San Fernando Light Rail run times to reflect the speed of at-grade running times for a total time of 30 minutes, as per the operations plan provided by Metro.
- Removed the Sepulveda Transit Corridor segment between Exposition Boulevard and Los Angeles International Airport (LAX).
- Redistributed university trips to destinations in TAZ which contain the California State University Northridge (CSUN) campus. University trips assigned to TAZ 347 were shifted to TAZ 349 and TAZ 348 where CSUN is located. These TAZ's are shown in Figure 1.⁴

⁴ Similar evaluations of university trips around Pierce College and California Institute of Technology (Cal Tech) indicated a need to shift university trips to their respective campuses.

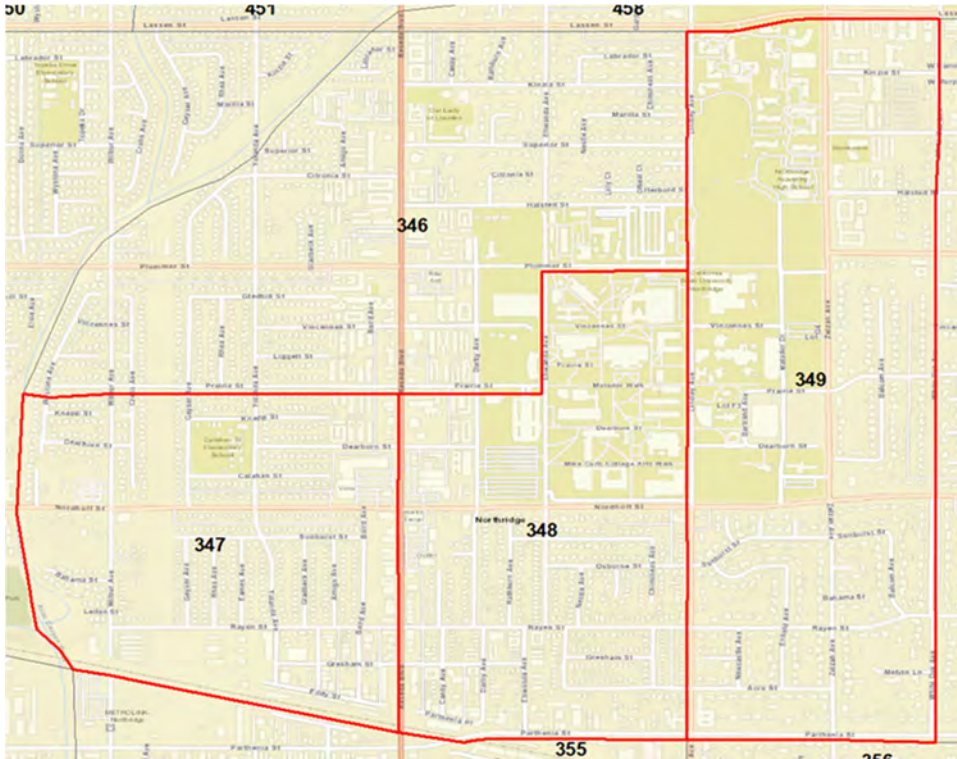


Figure 1: CSUN Traffic Analysis Zones

The 2042 No-Build Scenario is used as a basis for evaluating alignments in the North San Fernando Valley study area, so all services included in the No-Build are present in the build scenarios.

2042 BRT Scenarios

The North San Fernando Valley BRT Corridor was modeled with seven initial alignment options and corresponding station assumptions. Figures 2 through 8 depict the alignment options.

- Option 1: Roscoe-NoHo via Reseda with 20 stations
- Option 2: Roscoe-NoHo via Lindley with 20 stations
- Option 3: Nordhoff-Sylmar/San Fernando with 17 stations
- Option 4: Nordhoff-NoHo via Woodley with 21 stations
- Option 5: Nordhoff-NoHo via Haskell with 21 stations
- Option 6: Nordhoff-NoHo via Sepulveda with 21 stations
- Option 7: Nordhoff-NoHo via Woodman with 21 stations

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Figure 2: Alignment Option 1: Roscoe - NoHo via Reseda

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Figure 1: Alignment Option 2: Roscoe - NoHo via Lindley

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Figure 2: Alignment Option 3: Nordhoff - Sylmar/San Fernando

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Figure 3: Alignment Option 4: Nordhoff - NoHo via Woodley

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Figure 4: Alignment Option 5: Nordhoff - NoHo via Haskell

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Figure 5: Alignment Option 6: Nordhoff - NoHo via Sepulveda

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Figure 6: Alignment Option 7: Nordhoff - NoHo via Woodman

The seven BRT alignment options were coded with walk access to nearby or connecting services, meaning that riders could walk to access these services. Table 4 lists the transfer times to walk between services. Walk access coding estimates walk time to each station at three miles per hour. The CBM18 model can report riders who walk or drive to each station.⁵

STATION-TO-STATION	WALK TIME (MINUTES)
Red Line NoHo to North San Fernando Valley (NSFV) BRT	4
NSFV BRT To Red Line NoHo	5
Orange Line NoHo to NSFV BRT	4
NSFV BRT to Orange Line NoHo	5
ESFV LRT at Roscoe/Van Nuys to NSFV BRT	1
ESFV LRT at Nordhoff/Van Nuys to NSFV BRT	2.25
ESFV LRT and Sylmar/San Fernando Metrolink to NSFV BRT	1
Orange Line Nordhoff to NSFV BRT	1
Orange Line Chatsworth to NSFV BRT	1
Metrolink Chatsworth to NSFV BRT	1

Table 4: 2042 Station-to-Station Walk Transfer Times

Table 5 shows the peak period and midday period travel times for the seven alignments in the North San Fernando Valley corridor. Peak and midday travel times are the same for each alignment. The overall travel times are similar for all the alignments.

ALIGNMENT	TRAVEL TIMES (MINUTES)
Option 1: Roscoe-NoHo via Reseda	58.3
Option 2: Roscoe-NoHo via Lindley	58.3
Option 3: Nordhoff-Sylmar/San Fernando	56.3
Option 4: Nordhoff-NoHo via Woodley	56.3
Option 5: Nordhoff-NoHo via Haskell	56.3
Option 6: Nordhoff-NoHo via Sepulveda	58.3
Option 7: Nordhoff-NoHo via Woodman	56.8

Table 5: 2042 Travel Times for North San Fernando Valley Alignments

The project team modeled the seven initial alignments as BRTs (fixed guideway service) and represented each station with the same drive access as its TAZ. The project team coded each station with curb-side drop off (e.g. kiss-and-ride) and 15-second walk access. All alignments were assumed to have 5-minute peak period headways and 10-minute off-peak headways.

⁵ The CBM18 model has a limitation that can only report access for up to two stations of the same mode type at a given location. As a result, the project team coded the North Hollywood BRT station the same as the Orange Line BRT station; the North San Fernando Valley BRT was coded separately.

Project Mode Definition

This Study coded the BRT alternatives as a hybrid of Metro Rapid and Metro BRT service. In each BRT alternative, the project team coded two separate scenarios: one with the service coded as a Rapid and one with the service coded as a (Orange Line) BRT. The project team coded the Rapid alternative to match the station-to-station travel times of the BRT alternative so that these services would have consistent travel times.

The CBM18 model includes five bus mode alternatives; each mode includes mode-specific constants that represent the utility/disutility of each mode. These utilities represent travelers' mode-specific biases, including subjective perceptions of safety, cleanliness, convenience, reliability, and other unobserved factors. These biases are independent of more objective measures of service like headway and travel times, which are accounted for explicitly within the model.

The mode-specific constant for the BRT mode in the Metro model is estimated from the ridership profile of one line—the Orange Line—and the Rapid mode is estimated from all the ridership on the Metro Rapid routes. The proposed new service for a BRT in the North San Fernando Valley corridor does not have a dedicated off-street running environment like the Orange Line, so representing this in the Metro model as a BRT mode would have overrepresented the attractiveness of the service. At the same time, the proposed new service is modeled with dedicated lanes and will be planned with station amenities and other features that will boost its attractiveness relative to Rapid service, so representing this in the Metro model as a Rapid mode will underrepresent the attractiveness of the service.

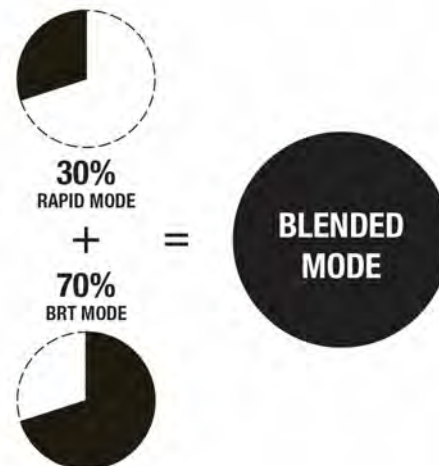


Figure 9: Blended Project Mode Definition

The project team coordinated with Metro staff to evaluate this representativeness challenge. All parties agreed that the North San Fernando Valley BRT would likely share bus attributes, in some combination, with the Orange Line and the existing Rapid routes in terms of travel time, reliability, and other physical and service attributes. So, the BRT alignments in this corridor reflect a blend of 30% Rapid mode boardings and 70% BRT mode boardings for all Alternatives, which is consistent with the assumptions used in the Vermont Transit Corridor and North Hollywood to Pasadena BRT ridership forecasts. Figure 9 illustrates the blended project mode definition. This reflects the assumption that the North San Fernando Valley BRT service will provide rider benefits closer to the Orange Line, but with some features like existing Metro Rapid service.

4. Ridership Forecasts

Ridership Summary

Transit Trips and Boardings

Table 6 and Table 7 present ridership statistics, transit trips, and boardings for the BRT alternatives in 2042. Transit mode share increases slightly for all 2042 scenarios, as expected.

In general, the Nordhoff-NoHo options forecasted the greatest increase in new transit trips. The Nordhoff-NoHo via Woodley option in particular is forecasted to increase by 13,566 new transit trips which are shifting from another mode (likely auto) to transit. Higher new transit trips is therefore a significant measure of how well the service provides *modal* options for travelers. Higher transit mode share also indicates better modal options and confirms that Nordhoff-NoHo via Woodley, Haskell, Sepulveda, and Woodman provide the best modal options for travelers.

BLENDING ALTERNATIVES	TOTAL PERSON TRIPS (ALL MODES)	TOTAL TRANSIT RIDERS	NEW TRANSIT RIDERS	TRANSIT MODE SHARE
No-Build	77,652,996	1,716,008	--	2.21%
Option 1: Roscoe-NoHo via Reseda		1,726,578	10,570	2.22%
Option 2: Roscoe-NoHo via Lindley		1,726,908	10,900	2.22%
Option 3: Nordhoff-Sylmar/San Fernando		1,725,611	9,603	2.22%
Option 4: Nordhoff-NoHo via Woodley		1,729,574	13,566	2.23%
Option 5: Nordhoff-NoHo via Haskell		1,728,717	12,709	2.23%
Option 6: Nordhoff-NoHo via Sepulveda		1,727,725	11,717	2.22%
Option 7: Nordhoff-NoHo via Woodman		1,727,993	11,985	2.23%

Table 6: 2042 Transit Trips and Boardings Summary

BLENDING ALTERNATIVES	METRO BOARDINGS	METRO BUS BOARDINGS	NEW METRO BOARDINGS	NORTH SAN FERNANDO VALLEY BOARDINGS
No-Build	2,187,347	1,170,691	--	--
Option 1: Roscoe-NoHo via Reseda	2,211,028	1,185,852	23,681	26,328
Option 2: Roscoe-NoHo via Lindley	2,211,562	1,186,185	24,215	26,516
Option 3: Nordhoff-Sylmar/San Fernando	2,207,724	1,183,977	20,377	20,846
Option 4: Nordhoff-NoHo via Woodley	2,220,080	1,188,887	32,733	28,652

BLENDDED ALTERNATIVES	METRO BOARDINGS	METRO BUS BOARDINGS	NEW METRO BOARDINGS	NORTH SAN FERNANDO VALLEY BOARDINGS
Option 5: Nordhoff-NoHo via Haskell	2,216,706	1,189,920	29,359	28,120
Option 6: Nordhoff-NoHo via Sepulveda	2,213,105	1,187,488	25,758	27,461
Option 7: Nordhoff-NoHo via Woodman	2,213,331	1,187,381	25,984	27,393

Table 7: 2042 Person Trips and Boardings Summary—Metro Boardings

Boardings are provided for the full Metro system, for all the bus modes, and for the North San Fernando Valley service specifically. The North San Fernando Valley boardings are a subset of new Metro boardings since this new service may increase boardings on services that travelers use to access the new service. Boardings are highest for the Nordhoff-NoHo via Woodley Alternative, with 32,733 new Metro boardings. Of these new Metro boardings, 28,652 boardings are on the North San Fernando Valley service. The remaining alternatives have fewer total Metro boardings than the Nordhoff-NoHo via Woodley Alternative.

Transfer rates are calculated as a regionwide measure, so the transfer rate for each alternative is effectively the same (1.7 boardings per trip). The transfer rate is defined as the average number of boardings per trip. So if there were 3 single seat trips and 1 3-seat (one initial boarding and two transfer boarding) trip, those 4 trips and 6 boardings result in a transfer rate of 1.5, or 1.5 boardings per trip. In 2017, transfers are 1.5 boardings per trip. This compares to data from the 2017 National Household Travel Survey on transfer rates that indicate 55 percent of transit riders transfer.

In 2042, transfers increase to 1.7 boardings per trip, due to a number of factors. Transfer rates tend to increase when more routes are added as the transit system grows, confirming the increase in transfer rates in 2042 where the transit system has expanded. Whereas it is preferred to have less transfers, in general transfer rates go up as the number of transit lines and extensions increases. The transfer rates for the seven alternatives selected for analysis are all equivalent at 1.7 with no discernable difference between them from a transfer rates perspective.

Table 8 presents statistics on the seven alignment options in the corridor. The Nordhoff-NoHo via Woodley alignment option produced the highest boardings per station, the highest new trips per station, and the highest overall boardings. The total boardings for each of the seven alternatives are within 7% of each other and the boardings per station are within 10% of each other.

BLENDING ALTERNATIVES	NUMBER OF STATIONS	BOARDINGS PER STATION	NEW TRIPS PER STATION
Option 1: Roscoe-NoHo via Reseda	20	1,316	528
Option 2: Roscoe-NoHo via Lindley	20	1,326	545
Option 3: Nordhoff-Sylmar/San Fernando	17	1,226	565
Option 4: Nordhoff-NoHo via Woodley	21	1,364	646
Option 5: Nordhoff-NoHo via Haskell	21	1,339	605
Option 6: Nordhoff-NoHo via Sepulveda	21	1,308	558
Option 7: Nordhoff-NoHo via Woodman	21	1,304	571

Table 8: 2042 North San Fernando Valley Boardings

Attachment B provides station level boardings and the details behind the blended ridership forecasts. The station boardings are concentrated around a few critical stations:

- Greater than 25 percent of boardings occur at the Van Nuys/Roscoe Blvd station with a connection to the future East San Fernando Valley light rail
- Approximately 14 percent of boardings occur at the Reseda Blvd/Nordhoff St station serving the California State University at Northridge
- Approximately 12 percent of boardings occur at the Chandler Blvd/Lankershim Blvd station with a connection to the North Hollywood station on the Red Line.

Peak Load

The peak load point is the busiest segment in the peak direction for a selected transit route. It is used to check the operational feasibility of the project. Operations are expected to put 12 buses per hour into operation with an average capacity of 80 passengers per 60-foot articulated bus for a total peak hour capacity of 960 passengers per hour. All of the alignments produce peak loads well within this peak load capacity.

The project team created peak hour load summaries for each of the 2042 alternatives. Figures 10 through 16 present the westbound AM peak hour load for each alternative respectively. These figures show the boardings (ons), alightings (offs), and peak hour load for each station and each alignment for the westbound direction. Attachment C includes the eastbound AM peak hour loads for each alignment. The maximum peak hour load occurs in the morning AM westbound direction at the Sepulveda/Parthenia Street station with 500–1,000 riders for all alternatives. The Roscoe alignments (Figures 10 and 11) have lower peak hour loads than the Nordhoff alignments.

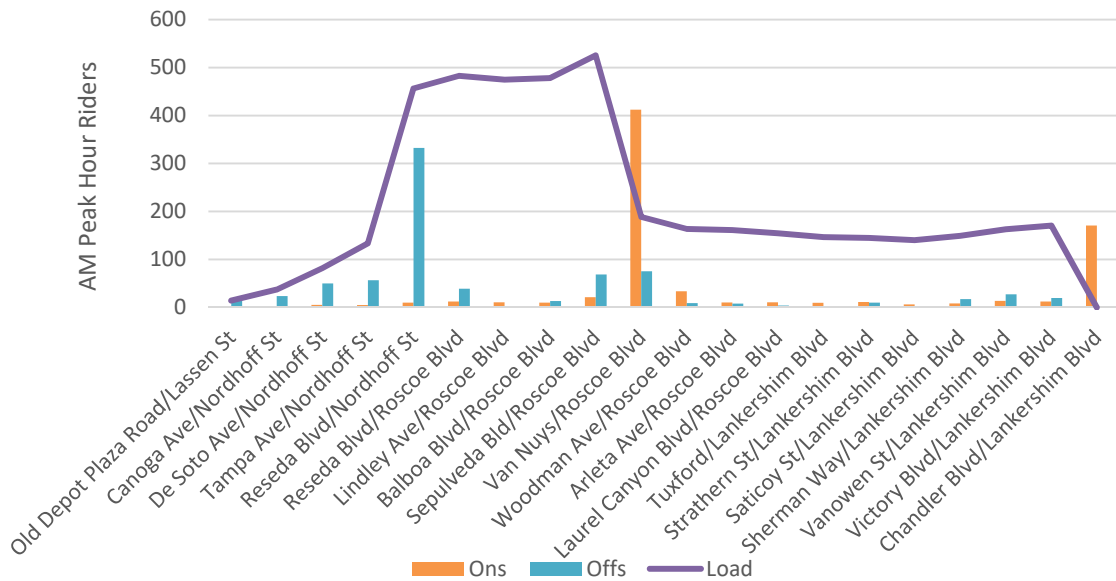


Figure 10: 2042 Option 1: Roscoe-NoHo via Reseda Westbound AM Peak Hour Load

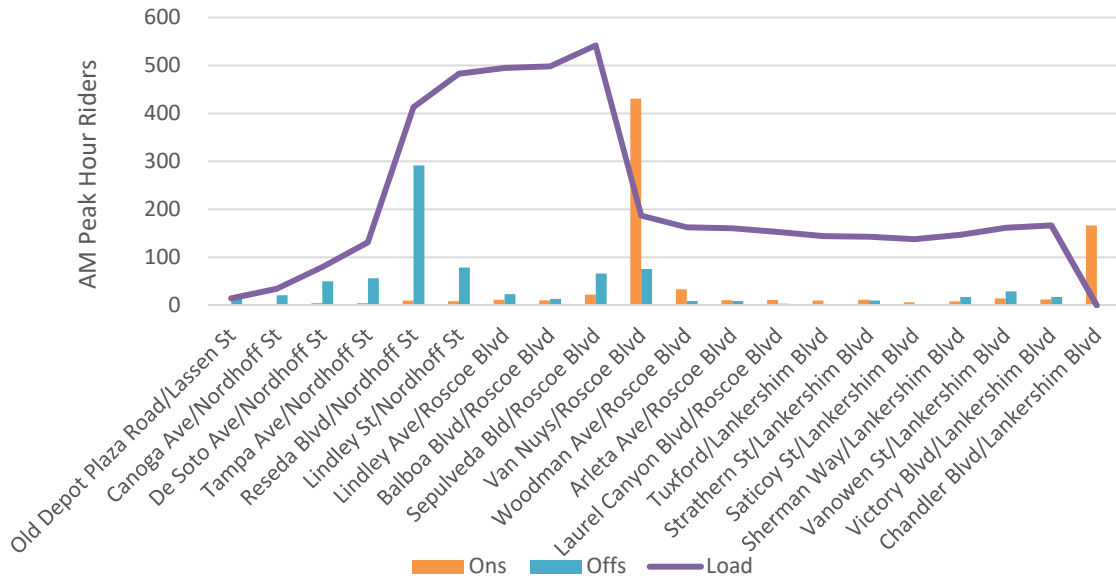


Figure 11: 2042 Option 2: Roscoe-NoHo via Lindley Westbound AM Peak Hour Load

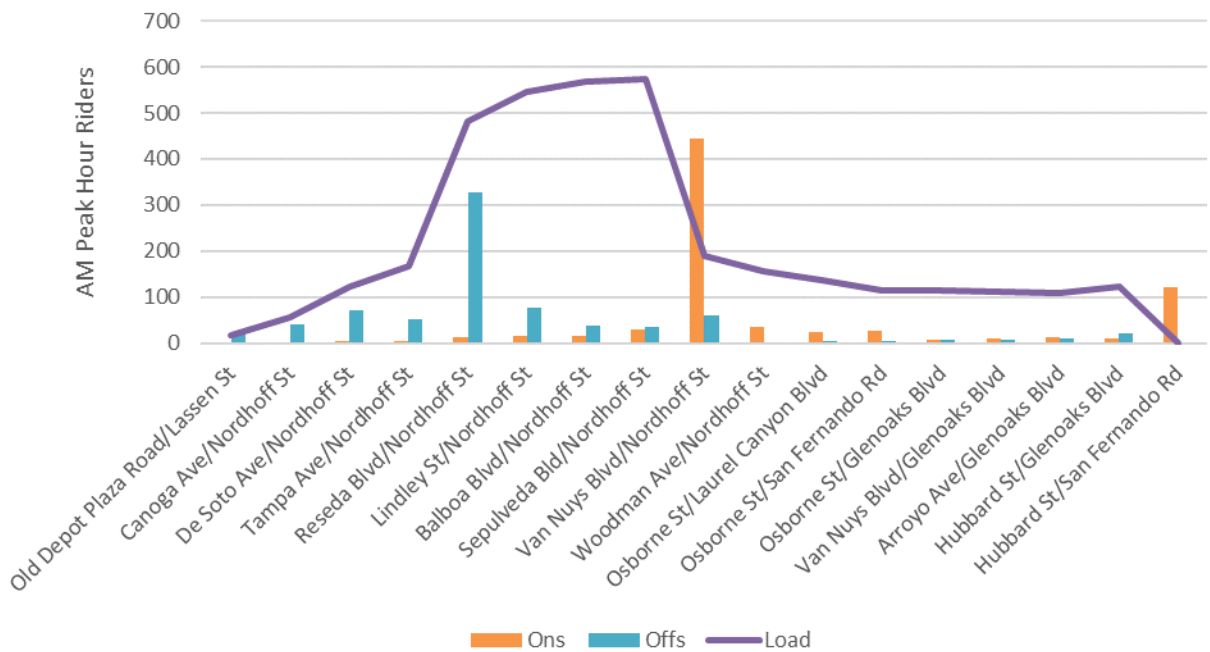


Figure 12: 2042 Option 3: Nordhoff-Sylmar/San Fernando Westbound AM Peak Hour Load

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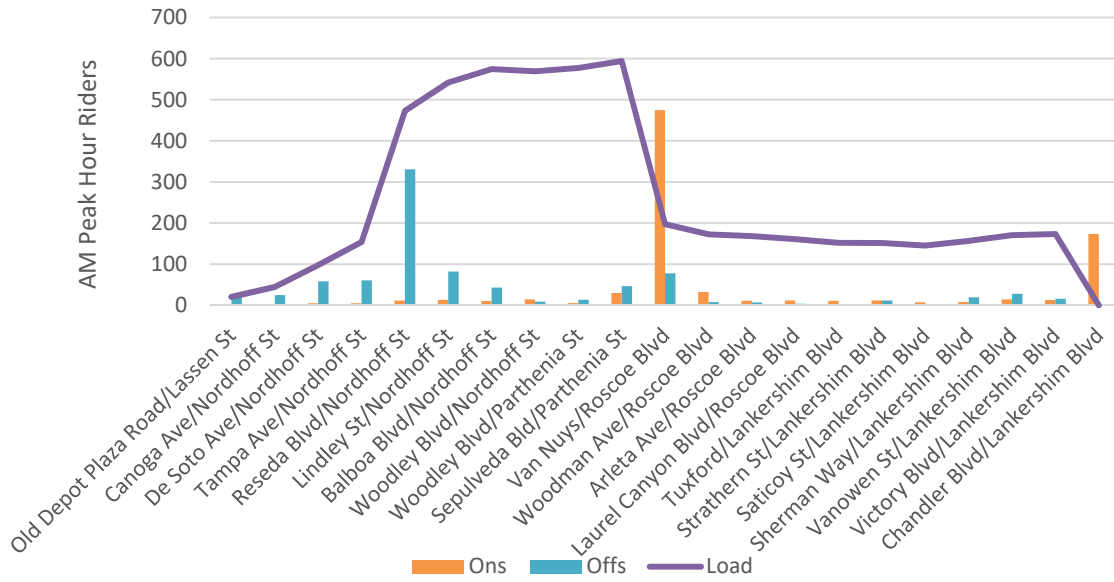


Figure 13: 2042 Option 4: Nordhoff-NoHo via Woodley Westbound AM Peak Hour Load

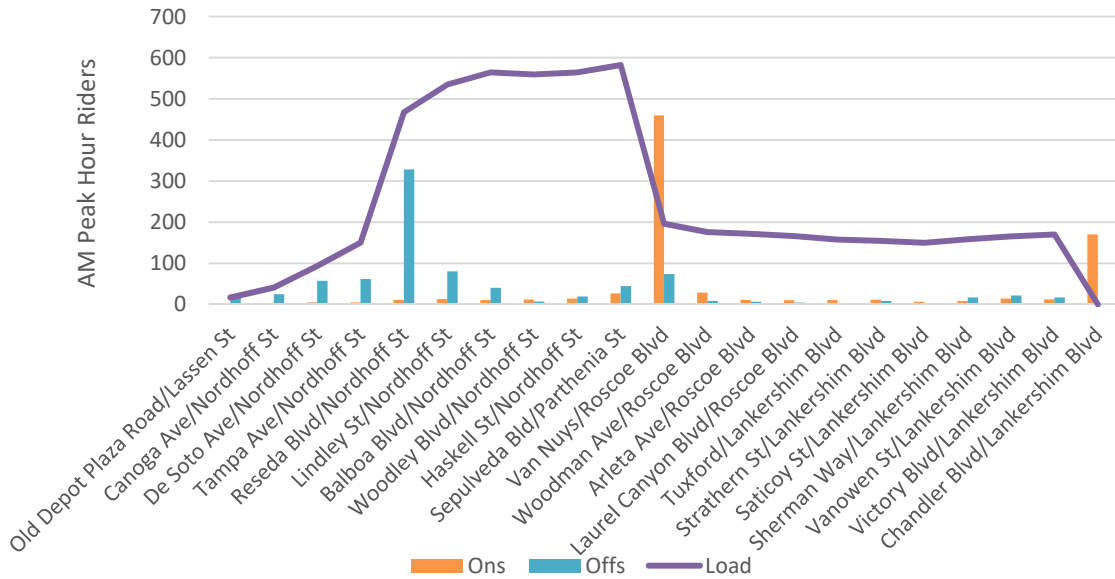


Figure 14: 2042 Option 5: Nordhoff-NoHo via Haskell Westbound AM Peak Hour Load

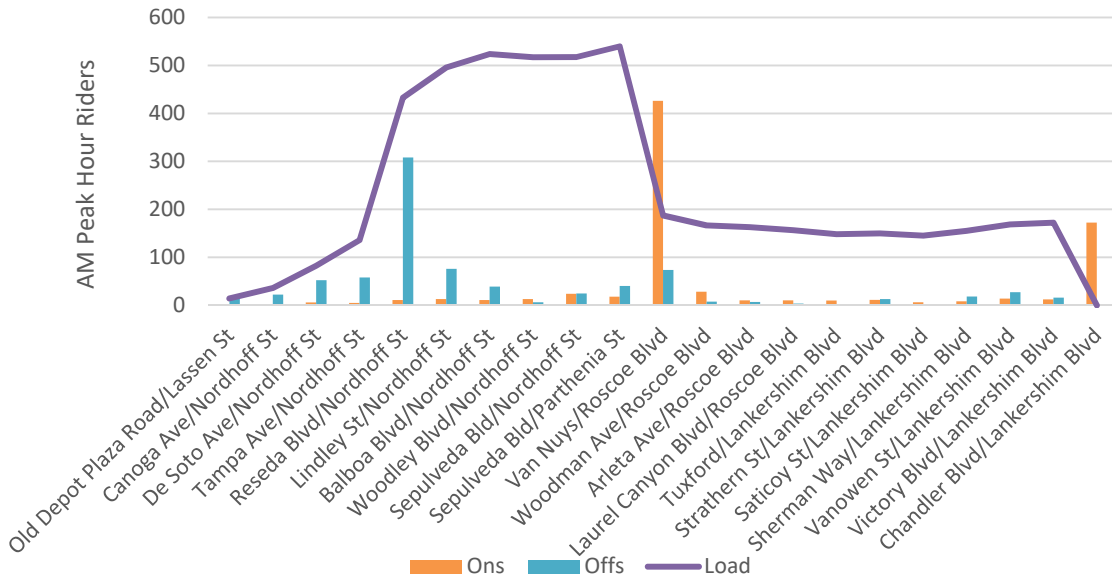


Figure 15: 2042 Option 6: Nordhoff-NoHo via Sepulveda Westbound AM Peak Hour Load

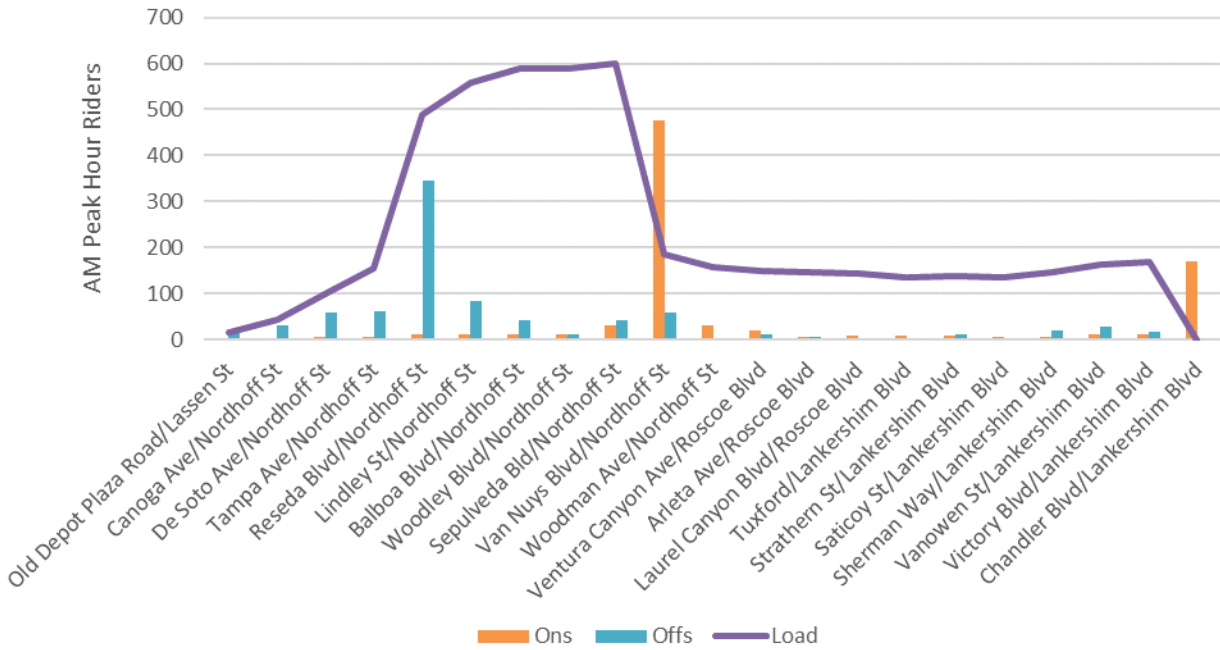


Figure 16: 2042 Option 7: Nordhoff-NoHo via Woodman Westbound AM Peak Hour Load

Market Analysis

Transit Trips

The project team also created a geographic market segmentation for the North San Fernando Valley corridor to better understand the transit travel patterns resulting from improved transit service in the corridor. The project team evaluated the new transit trips based on a super-district to super-district analysis. Figure 17 shows these super-districts.

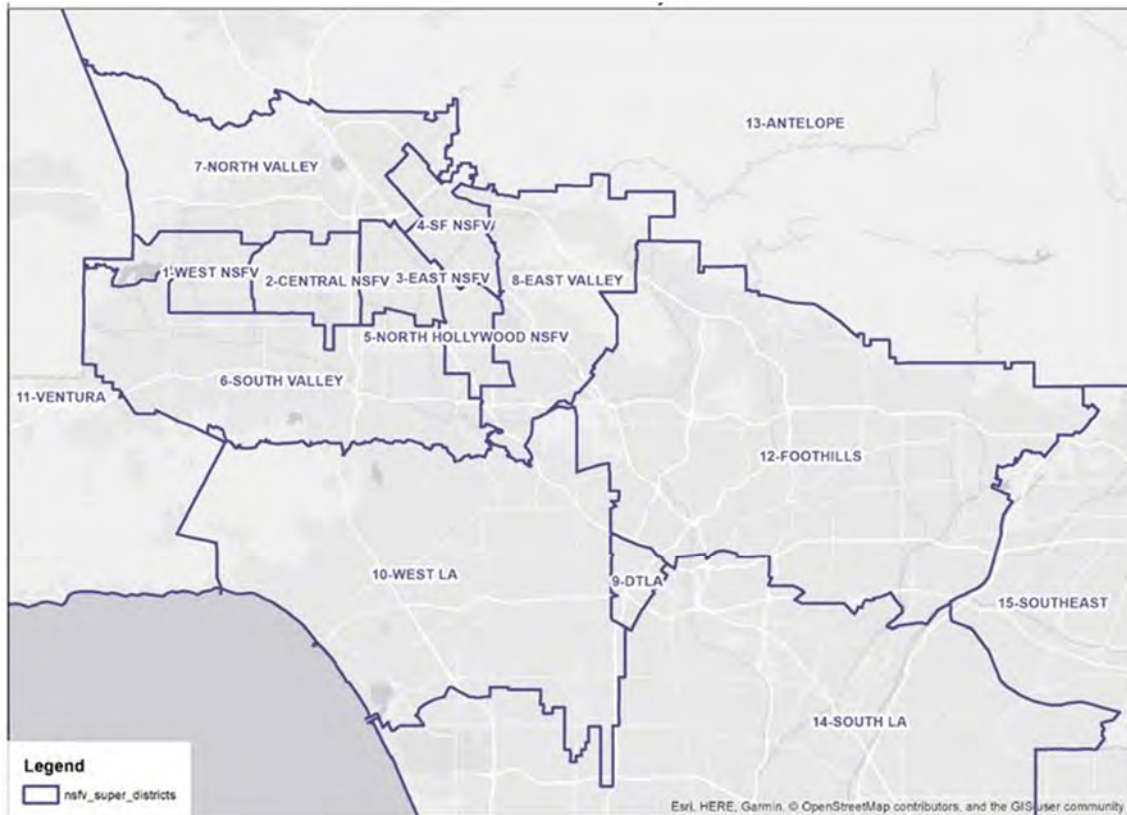


Figure 17: North San Fernando Valley BRT Super-Districts

The seven alternatives have similar transit trip markets (Table 9). There are approximately 52 to 63 percent of new transit trips within the study area, 40 to 46 percent of new transit trips with one endpoint in the study area and -2 to 3 percent of new transit trips outside the study area. The North San Fernando Valley BRT route serves residents in the study area primarily and secondarily to travelers going to or returning from the study area.

BLENDED ALTERNATIVES	MARKET ASSESSMENT FOR LINKED TRIPS					
	NEW TRANSIT TRIPS WITHIN STUDY AREA		NEW TRANSIT TRIPS WITH ONE ENDPOINT IN STUDY AREA		NEW TRANSIT TRIPS OUTSIDE OF STUDY AREA	
Option 1: Roscoe-NoHo via Reseda	5,982	57%	4,637	44%	-47	0%
Option 2: Roscoe-NoHo via Lindley	6,193	57%	4,717	43%	-8	0%
Option 3: Nordhoff-Sylmar/San Fernando	6,041	63%	3,797	40%	-231	-2%
Option 4: Nordhoff-NoHo via Woodley	7,077	52%	6,282	46%	219	2%
Option 5: Nordhoff-NoHo via Haskell	6,867	54%	5,493	43%	355	3%
Option 6: Nordhoff-NoHo via Sepulveda	6,589	56%	5,036	43%	95	1%
Option 7: Nordhoff-NoHo via Woodman	6,805	57%	5,045	42%	139	1%

Table 9: New Transit Trip Market Summary

Attachment D provides the individual new transit trips to and from each super-district. The transit trip market with the highest ridership potential for all seven alternatives in the corridor is from the East to the Central North San Fernando Valley districts. The transit trip markets with the highest ridership potential (again, for all seven alternatives) with one endpoint in the corridor is from the North Valley to the Central North San Fernando Valley districts.

Further evaluation of the new transit trip market patterns by direction shows congruence between the Nordhoff alignments. The Roscoe alignments serve lower numbers of trips to and from the north, although the overall patterns by direction are similar. Table 10 shows the new transit trips market patterns by direction.

BLENDED ALIGNMENT	NEW LINKED TRIPS TO/FROM			
	NORTH	SOUTH	EAST	WEST
Option 1: Roscoe-NoHo via Reseda	1,880	1,840	1,206	16
Option 2: Roscoe-NoHo via Lindley	2,020	1,805	1,239	16
Option 3: Nordhoff-Sylmar/San Fernando	3,074	1,041	412	19
Option 4: Nordhoff-NoHo via Woodley	2,392	2,680	1,421	24
Option 5: Nordhoff-NoHo via Haskell	2,348	2,120	1,331	20
Option 6: Nordhoff-NoHo via Sepulveda	2,200	1,953	1,269	20
Option 7: Nordhoff-NoHo via Woodman	2,574	1,824	1,256	20

Table 10: New Transit Trips Market Patterns by Direction

The new transit trips can also be evaluated spatially to better understand the spatial locations of riders, as shown in Figure 18 for the North San Fernando Valley BRT Nordhoff-NoHo via

Woodley alignment option. The remaining alignments are provided in Attachment E. The map of new transit riders demonstrates that the service is primarily serving trips in the study area.

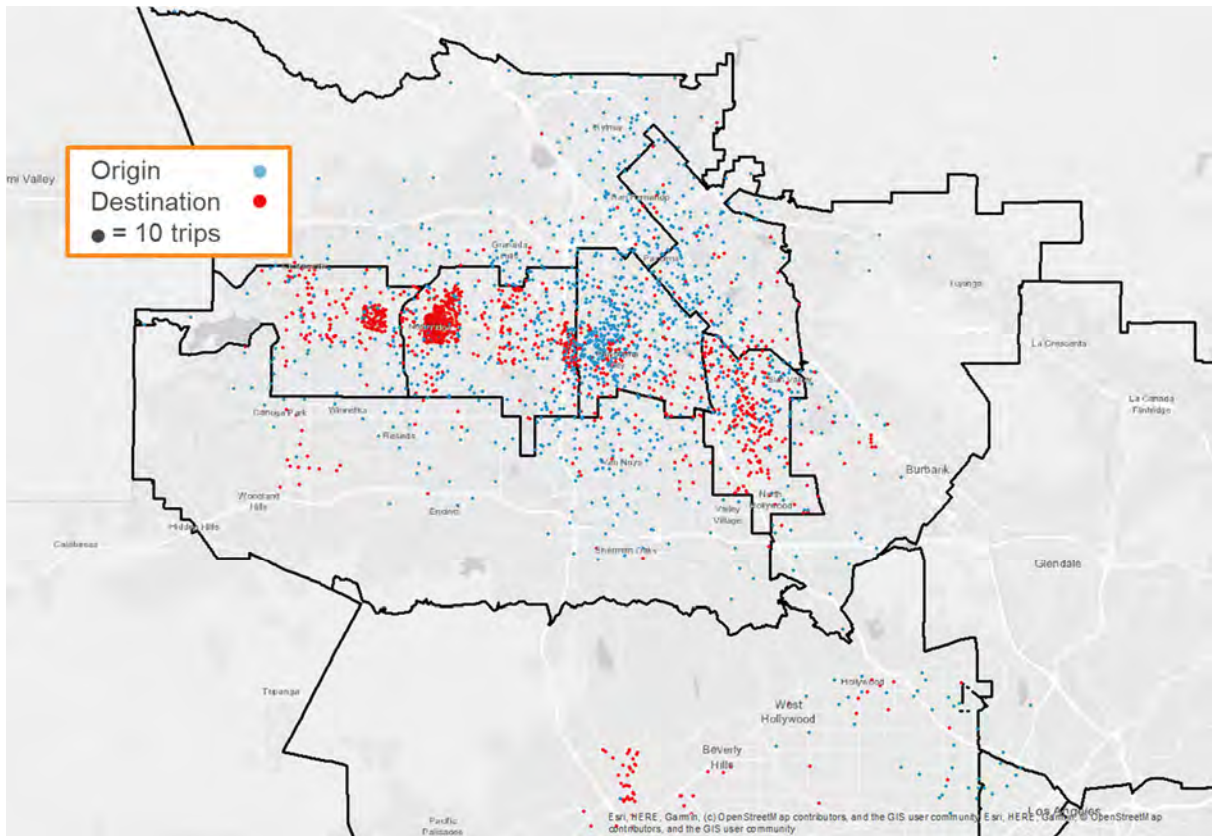


Figure 18: Origins and Destinations of New Transit Riders for Option 1: Nordhoff-NoHo via Woodley

Boardings

The project team also reviewed the boardings by district to evaluate the three main segments of the new North San Fernando Valley BRT service (East, Central and West). These districts are presented in Figure 18 and the boardings per station by district are presented in Figure 19. The Eastern district demonstrates that all alignments serve this district well except for Nordhoff-Sylmar/San Fernando alignment, which has lower overall boardings and lower boardings per station. The Nordhoff-Sylmar/San Fernando alignment serves the Central district better than the remaining six alignments, with the Nordhoff-NoHo via Woodman producing more riders than the remaining alignments. The Western district has lower riders per station overall, but is relatively equally served by all alignments.

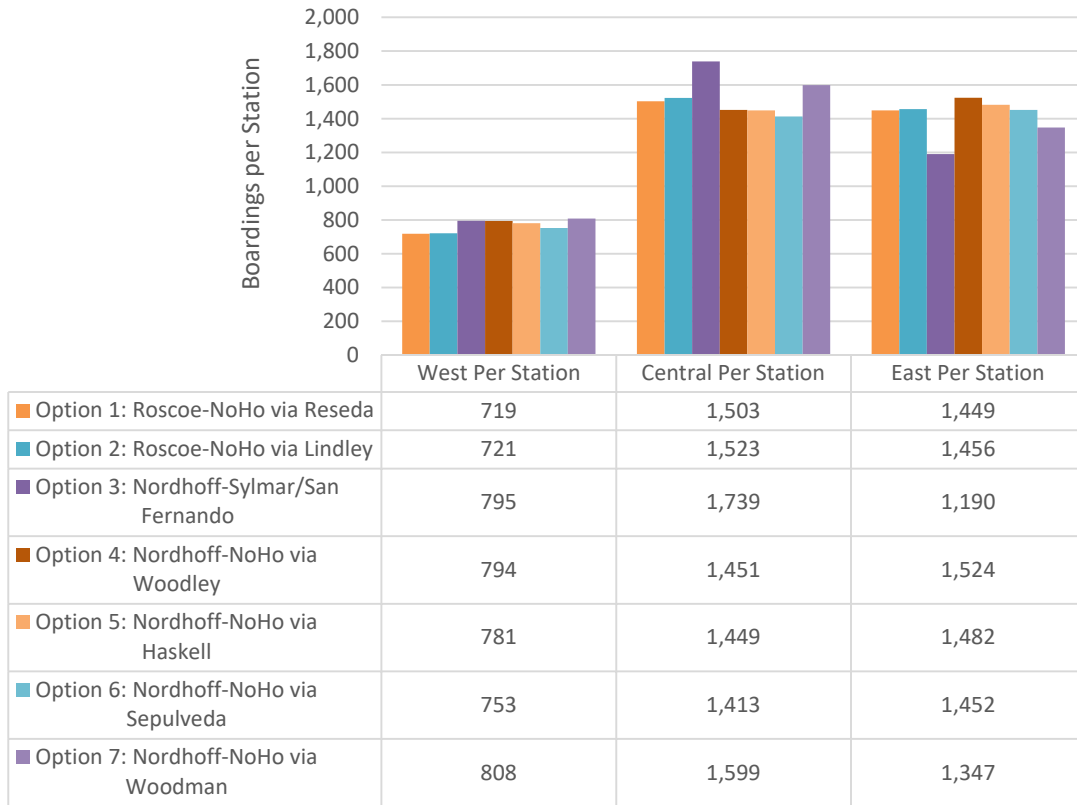


Figure 19: 2042 North San Fernando Valley Boardings per Station by District

The project team also reviewed the new transit trips for low-income work trips. These are the only trips that are segmented by income, so these trips provide an opportunity to review market patterns based on income. Table 11 presents the new transit trips market patterns for low-income work trips and shows that overall the Nordhoff-NoHo via Woodley alignment serves the highest number of low-income work trips (2,323) and Nordhoff-Sylmar/San Fernando serves the lowest number of low-income work trips (1,071).

BLENDED ALIGNMENT	MARKET ASSESSMENT FOR NEW TRANSIT TRIPS				
	WITHIN STUDY AREA	WITH ONE ENDPOINT IN STUDY AREA	OUTSIDE OF STUDY AREA	LOW-INCOME WORK	PERCENTAGE LOW-INCOME WORK
Option 1: Roscoe-NoHo via Reseda	316	910	475	1,700	16.1%
Option 2: Roscoe-NoHo via Lindley	302	871	474	1,648	15.1%
Option 3: Nordhoff-Sylmar/San Fernando	330	592	149	1,071	11.1%
Option 4: Nordhoff-NoHo via Woodley	382	1,221	720	2,323	17.1%
Option 5: Nordhoff-NoHo via Haskell	364	1,048	656	2,069	16.3%
Option 6: Nordhoff-NoHo via Sepulveda	343	969	481	1,793	15.3%
Option 7: Nordhoff-NoHo via Woodman	357	978	463	1,797	15.0%

Table 11: New Transit Trips Market Patterns for Low-Income Work Trips

Traffic Analysis (VMT)

The traffic analysis measure at this point in the analysis is a calculation of Vehicle Miles Traveled (VMT) to estimate changes in the amount of auto travel across the region as a result of this project. The CBM18 model calculates VMT as the product of auto vehicle trips and miles traveled. A reduction of VMT can result in the model as new transit trips are generated as a result of the introduction of a more attractive mode relative to the auto mode.

As expected, each of the proposed alignments results in lower VMT than the No-Build (Table 12) scenario. The VMT reduction overall and per capita is not significantly different among the seven North San Fernando Valley BRT alignments at the regional scale but may be more important at the local scale. Local traffic analysis will be conducted in the Environmental Assessment phase of this project to evaluate these impacts at the local scale. The forecast total population for the SCAG region in the year 2042 of 23,499,823 was used to calculate per capita VMT.

BLENDING ALIGNMENT	VMT	VMT PER CAPITA	CHANGE IN VMT	PERCENT CHANGE IN VMT
No-Build	511,926,864	21.8		
Option 1: Roscoe-NoHo via Reseda	511,862,477	21.8	-64,387	-0.013%
Option 2: Roscoe-NoHo via Lindley	511,861,059	21.8	-65,805	-0.013%
Option 3: Nordhoff-Sylmar/San Fernando	511,882,291	21.8	-44,573	-0.009%
Option 4: Nordhoff-NoHo via Woodley	511,834,159	21.8	-92,705	-0.018%
Option 5: Nordhoff-NoHo via Haskell	511,847,498	21.8	-79,366	-0.016%
Option 6: Nordhoff-NoHo via Sepulveda	511,859,674	21.8	-67,190	-0.013%
Option 7: Nordhoff-NoHo via Woodman	511,854,492	21.8	-72,372	-0.014%

Table 12: 2042 Daily VMT Analysis

Further analysis of the VMT by market shows that more than half of the VMT reduction is for trips with one end of the trip in the study area (a range of 55-87 percent of the reduction, depending on the alignment). A much smaller portion of the VMT reduction (a range of 14-27 percent, depending on the alignment) is within the study area. This indicates that the service is reducing VMT outside the study area as well as inside the study area.

5. Summary

The Nordhoff-NoHo via Woodley alignment option produces more new transit riders, more boardings and greater reductions in VMT than any other alignment. Importantly, this option shows 7 percent more new transit riders, 11 percent more boardings and 28 percent reduction in VMT compared to the next best option, Nordhoff-NoHo via Haskell. The Nordhoff-NoHo via Sepulveda option succeeds in reducing VMT almost as much as Nordhoff-NoHo via Woodley (within 2 percent) but does not achieve as many new transit riders (Nordhoff-NoHo via Woodley is 27 percent better) or as many boardings (Nordhoff-NoHo via Woodley is 16 percent better). The Nordhoff-NoHo via Woodley option also serves the highest percentage (17 percent) of low-income work trips. In summary, the Nordhoff-NoHo via Woodley option is the preferred alignment from a ridership perspective, but other factors may influence this from an overall perspective.

More than half of the boardings on all alignments are from three critical stations with connections to other services like the East San Fernando Valley light rail and the Red Line and serving the California State University at Northridge. The service between the East San Fernando Valley light rail and the California State University at Northridge in the westbound direction represents the peak load on the system.

Attachment A: Year 2017 Existing Transit Travel Markets

Table 13 display the 2017 total linked transit trips categorized by district; Figure 17 depicts these super-districts and their geographic boundaries.

ZONES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1-West North San Fernando Valley	1,150	614	70	22	24	2,253	220	83	258	359	59	113	8	146	26	5,404
2-Central North San Fernando Valley	829	1,883	435	125	117	2,646	650	254	437	945	24	155	20	220	36	8,775
3-East North San Fernando Valley	640	2,009	1,104	383	297	2,962	526	557	460	1,726	31	282	26	323	46	11,372
4-San Fernando North San Fernando Valley	169	505	363	682	287	903	638	728	313	744	8	348	24	237	36	5,985
5-North Hollywood North San Fernando Valley	166	422	319	327	1,232	3,045	160	2,338	728	2,580	13	736	18	457	77	12,617
6-South Valley North San Fernando Valley	1,766	2,556	1,020	251	1,076	23,493	614	2,566	2,081	7,151	399	1,042	44	1,058	166	45,282
7-North Valley North San Fernando Valley	413	1,149	259	443	116	1,253	1,234	380	756	968	22	354	140	489	73	8,048
8-East Valley	90	326	153	245	774	2,397	163	4,920	1,801	3,753	18	3,052	26	874	130	18,724
9-DTLA	156	283	118	439	327	1,371	109	1,704	42,353	31,848	26	8,239	57	20,021	1,221	108,272
10-West LA	295	383	274	163	940	4,544	169	4,174	41,961	198,818	141	13,468	138	33,594	1,761	300,824
11-Ventura	110	179	24	8	12	1,153	30	158	702	334	11,588	241	19	347	140	15,044
12-Foothills	135	252	87	147	349	1,466	120	3,785	18,539	21,834	73	65,110	130	14,849	5,797	132,672
13-Antelope	215	255	38	132	64	569	189	490	2,194	2,610	38	1,034	9,323	1,485	177	18,815
14-South LA	277	231	87	189	350	1,832	156	1,468	41,590	51,604	122	15,479	231	203,317	8,658	325,591
15-Southeast	54	72	24	35	74	432	40	424	6,897	4,701	37	6,720	49	10,453	170,705	200,717
Total	6,466	11,118	4,375	3,591	6,038	50,318	5,019	24,028	161,069	329,974	12,600	116,373	10,254	287,870	189,050	1,218,140

Table 13: 2017 Total Linked Transit Trips

Table 14 presents the 2017 transit mode shares, which are as high as 22% for the downtown Los Angeles to North San Fernando Valley. For comparison, the regional average weekday transit mode share is 1.9%.

ZONES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
1-West North San Fernando Valley	1%	2%	2%	1%	1%	2%	1%	2%	11%	2%	0%	2%	0%	2%	1%	2%
2-Central North San Fernando Valley	2%	2%	2%	2%	3%	3%	2%	2%	12%	3%	0%	1%	0%	2%	1%	2%
3-East North San Fernando Valley	5%	3%	1%	2%	2%	4%	1%	3%	11%	4%	0%	2%	0%	2%	1%	2%
4-San Fernando North San Fernando Valley	2%	4%	2%	1%	2%	3%	1%	3%	11%	2%	0%	2%	0%	2%	1%	2%
5-North Hollywood North San Fernando Valley	3%	5%	3%	3%	1%	4%	2%	3%	16%	6%	0%	3%	0%	3%	1%	3%
6-South Valley North San Fernando Valley	2%	3%	2%	2%	2%	2%	1%	3%	11%	3%	0%	2%	0%	2%	1%	2%
7-North Valley North San Fernando Valley	1%	2%	1%	1%	1%	2%	1%	1%	10%	1%	0%	1%	0%	2%	1%	1%
8-East Valley	2%	3%	2%	1%	2%	3%	1%	1%	14%	4%	0%	3%	0%	2%	1%	2%
9-DTLA	7%	14%	11%	22%	16%	10%	4%	17%	15%	19%	0%	11%	1%	15%	4%	15%
10-West LA	2%	2%	2%	1%	5%	3%	1%	4%	17%	5%	0%	5%	0%	4%	1%	5%
11-Ventura	1%	1%	1%	0%	0%	1%	0%	1%	8%	0%	0%	1%	0%	1%	1%	0%
12-Foothills	1%	2%	1%	1%	2%	2%	1%	3%	11%	5%	0%	2%	0%	3%	1%	3%
13-Antelope	2%	1%	0%	1%	1%	1%	1%	1%	16%	2%	0%	2%	1%	3%	0%	1%
14-South LA	2%	2%	1%	2%	3%	2%	1%	2%	15%	5%	0%	3%	0%	2%	1%	3%
15-Southeast	1%	1%	1%	1%	1%	1%	0%	1%	9%	2%	0%	2%	0%	1%	1%	1%
Total	2%	2%	2%	1%	2%	2%	1%	2%	14%	5%	0%	3%	0%	3%	1%	2%

Table 14: 2017 Transit Mode Share

Attachment B: Station Level Boardings

Table 15 presents the station level boardings for each alignment in 2042. Table 15 provides the average weekday boardings for each station within each alignment.

Station	Option 1: Roscoe- NoHo via Reseda	Option 2: Roscoe- NoHo via Lindley	Option 3: Nordhoff- Sylmar/San Fernando	Option 4: Nordhoff- NoHo via Woodley	Option 5: Nordhoff- NoHo via Haskell	Option 6: Nordhoff- NoHo via Sepulveda	Option 7: Nordhoff- NoHo via Woodman
Old Depot Plaza Road/Lassen St	421	423	447	483	462	438	461
Canoga Ave/Nordhoff St	519	517	716	562	565	565	621
De Soto Ave/Nordhoff St	838	844	912	943	921	872	958
Tampa Ave/Nordhoff St	1,097	1,102	1,105	1,189	1,176	1,137	1,192
Reseda Blvd/Roscoe Blvd	996						
Reseda Blvd/Nordhoff St	3,773	3,442	3,746	3,966	3,904	3,698	4,065
Lindley St/Nordhoff St		1,132	1,183	1,262	1,244	1,193	1,263
Lindley Ave/Roscoe Blvd	297	641					
Balboa Blvd/Nordhoff St			810	845	849	803	832
Balboa Blvd/Roscoe Blvd	546	526					
Woodley Blvd/Parthenia St				399			
Woodley Blvd/Nordhoff St				475	405	392	449
Haskell St/Nordhoff St					662		
Sepulveda Blvd/Roscoe Blvd	1,901	1,872					
Sepulveda Blvd/Nordhoff St			1,219			1,035	1,384
Sepulveda Blvd/Parthenia St				1,762	1,629	1,358	
Van Nuys/Roscoe Blvd	7,180	7,285		7,963	7,651	7,276	
Van Nuys Blvd/Nordhoff St			6,007				7,196
Hubbard St/San Fernando Rd			1,326				
Woodman Ave/Nordhoff St			608				703
Hubbard St/Glenoaks Blvd			581				
Woodman Ave/Roscoe Blvd	908	908		875	839	837	
Ventura Canyon Ave/Roscoe Blvd							719
Arroyo Ave/Glenoaks Blvd			478				
Osborne St/Laurel Canyon Blvd			438				
Van Nuys Blvd/Glenoaks Blvd			393				
Osborne St/San Fernando Rd			626				
Arleta Ave/Roscoe Blvd	487	486		497	485	491	379
Osborne St/Glenoaks Blvd			252				
Laurel Canyon Blvd/Roscoe Blvd	300	300		304	288	292	258
Victory Blvd/Lankershim Blvd	785	784		791	762	784	765
Webb Ave/Lankershim Blvd							
Sherman Way/Lankershim Blvd	680	684		686	685	687	681
Vanowen St/Lankershim Blvd	1,001	998		1,015	967	1,002	957
Strathern St/Lankershim Blvd	584	581		593	582	581	559
Tuxford/Lankershim Blvd	340	346		356	356	336	319
Saticoy St/Lankershim Blvd	337	335		346	339	336	324
Chandler Blvd/Lankershim Blvd	3,339	3,310		3,339	3,350	3,348	3,307
Total	26,328	26,516	20,846	28,652	28,120	27,461	27,393

Table 15: Station Level Boardings for each 2042 Alignment

To ensure transparency, Table 16 provides the station level boardings for each of the components (BRT and Rapid) of the blended mode alignments.

Station	Option 1: Roscoe-NoHo via Reseda		Option 2: Roscoe-NoHo via Lindley		Option 3: Nordhoff- Sylmar/San Fernando		Option 4: Nordhoff- NoHo via Woodley		Option 5: Nordhoff- NoHo via Haskell		Option 6: Nordhoff- NoHo via Sepulveda		Option 7: Nordhoff- NoHo via Woodman	
	As BRT	As Rapid	As BRT	As Rapid	As BRT	As Rapid	As BRT	As Rapid	As BRT	As Rapid	As BRT	As Rapid	As BRT	As Rapid
Old Depot Plaza Road/Lassen St	452	347	455	348	485	359	520	397	493	391	471	362	485	405
Canoga Ave/Nordhoff St	512	538	511	530	747	642	551	589	552	598	552	596	588	701
De Soto Ave/Nordhoff St	804	918	813	916	813	1,144	898	1,049	873	1,033	831	968	866	1,173
Tampa Ave/Nordhoff St	1,221	810	1,226	813	1,226	824	1,314	898	1,298	892	1,255	864	1,284	980
Reseda Blvd/Roscoe Blvd	1,008	969												
Reseda Blvd/Nordhoff St	4,762	1,465	4,357	1,308	4,652	1,632	4,975	1,613	4,892	1,599	4,630	1,524	4,974	1,945
Lindley St/Nordhoff St			1,364	591	1,451	557	1,536	625	1,509	624	1,448	599	1,518	668
Lindley Ave/Roscoe Blvd	352	169	653	614										
Balboa Blvd/Nordhoff St					876	658	878	768	882	772	842	712	847	796
Balboa Blvd/Roscoe Blvd	566	500	550	473										
Woodley Blvd/Parthenia St							403	389						
Woodley Blvd/Nordhoff St							524	361	434	337	414	342	471	399
Haskell St/Nordhoff St									681	620				
Sepulveda Bld/Roscoe Blvd	2,084	1,477	2,057	1,443										
Sepulveda Bld/Nordhoff St					1,141	1,401					1,037	1,031	1,293	1,598
Sepulveda Bld/Parthenia St							1,842	1,576	1,748	1,353	1,522	976		
Van Nuys/Roscoe Blvd	8,245	4,695	8,412	4,657			9,087	5,341	8,780	5,018	8,387	4,684		
Van Nuys Blvd/Nordhoff St					7,341	2,894							8,070	5,155
Hubbard St/San Fernando Rd					1,305	1,376								
Woodman Ave/Nordhoff St					668	469							801	474
Hubbard St/Glenoaks Blvd					592	556								
Woodman Ave/Roscoe Blvd	1,000	696	1,001	691			952	697	906	685	902	687		

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Ventura Canyon Ave/Roscoe Blvd												764	614	
Arroyo Ave/Glenoaks Blvd				499	430									
Osborne St/Laurel Canyon Blvd				420	481									
Van Nuys Blvd/Glenoaks Blvd				376	433									
Osborne St/San Fernando Rd				437	1,068									
Arleta Ave/Roscoe Blvd	471	526	471	523		480	537	467	526	476	525	382	373	
Osborne St/Glenoaks Blvd				267	219									
Laurel Canyon Blvd/Roscoe Blvd	272	367	274	361		278	367	257	361	264	358	248	284	
Victory Blvd/Lankershim Blvd	754	858	754	854		762	861	723	852	754	854	736	835	
Webb Ave/Lankershim Blvd														
Sherman Way/Lankershim Blvd	657	735	658	745		661	744	655	756	659	753	653	748	
Vanowen St/Lankershim Blvd	1,057	870	1,058	860		1,070	888	1,008	874	1,059	872	1,030	788	
Strathern St/Lankershim Blvd	517	742	513	741		526	750	516	736	514	738	495	709	
Tuxford/Lankershim Blvd	312	404	317	415		321	437	324	430	305	408	288	391	
Saticoy St/Lankershim Blvd	342	325	340	322		352	332	347	323	344	317	336	296	
Chandler Blvd/Lankershim Blvd	3,470	3,033	3,433	3,024		3,446	3,092	3,454	3,108	3,491	3,017	3,459	2,954	
Total	28,852	20,439	29,213	20,224	23,291	15,141	31,371	22,306	30,794	21,882	30,153	21,181	29,583	22,282

Table 16: Station Level Boardings for BRT and Rapid Mode for each Alignment

Attachment C: Eastbound AM Peak Hour Loads

Figures 20 through 26 provide the eastbound AM peak hour load for each alignment. The eastbound AM peak hour loads are all well within the operational capacity for the service, being lower than the westbound AM peak hour loads in most cases. The prominent direction of travel in the AM peak hour is westbound and these are also within the capacity for the service.

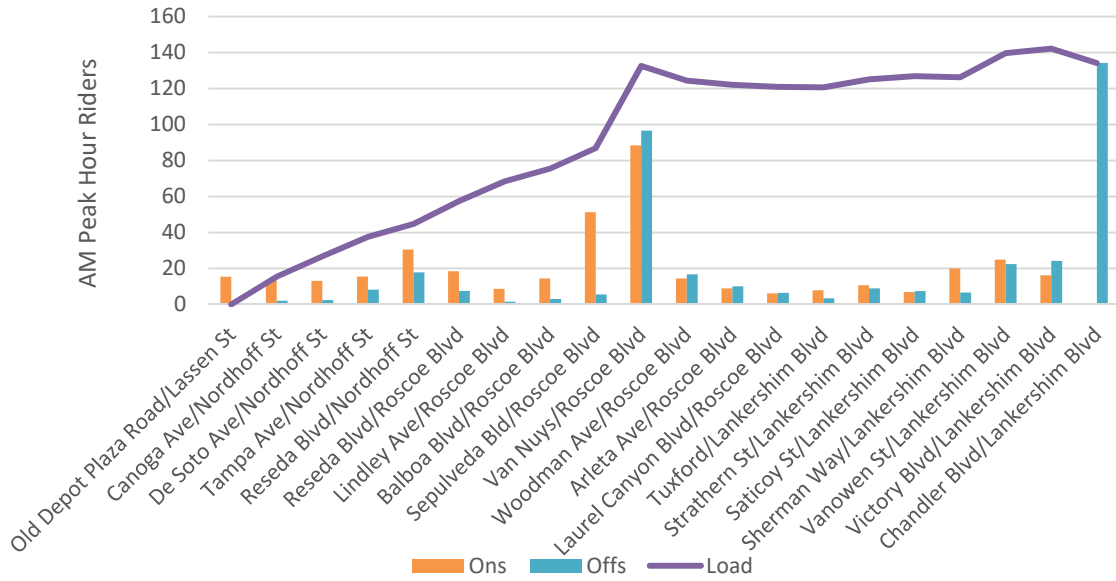


Figure 20: Option 1: Roscoe-NoHo via Reseda Eastbound AM Peak Hour Load

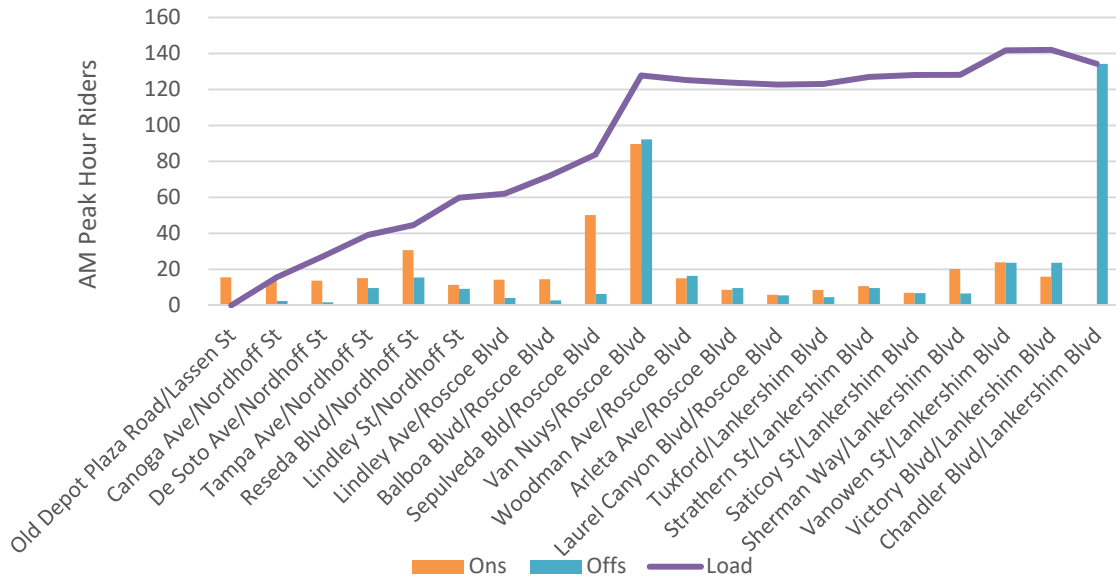


Figure 21: Option 2: Roscoe-NoHo via Lindley Eastbound AM Peak Hour Load

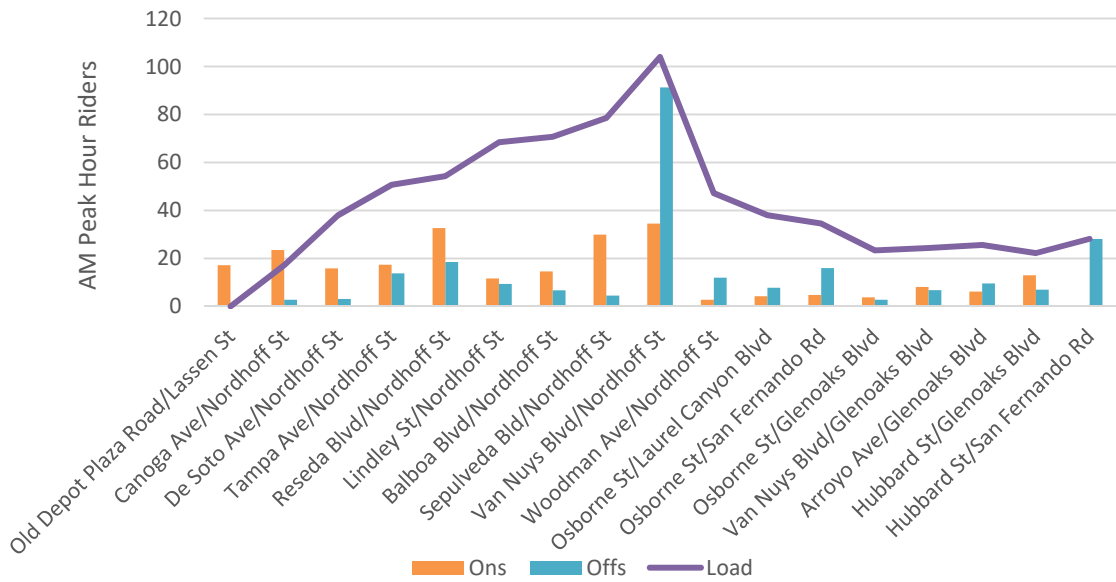


Figure 22: Option 3: Nordhoff-Sylmar/San Fernando Eastbound AM Peak Hour Load

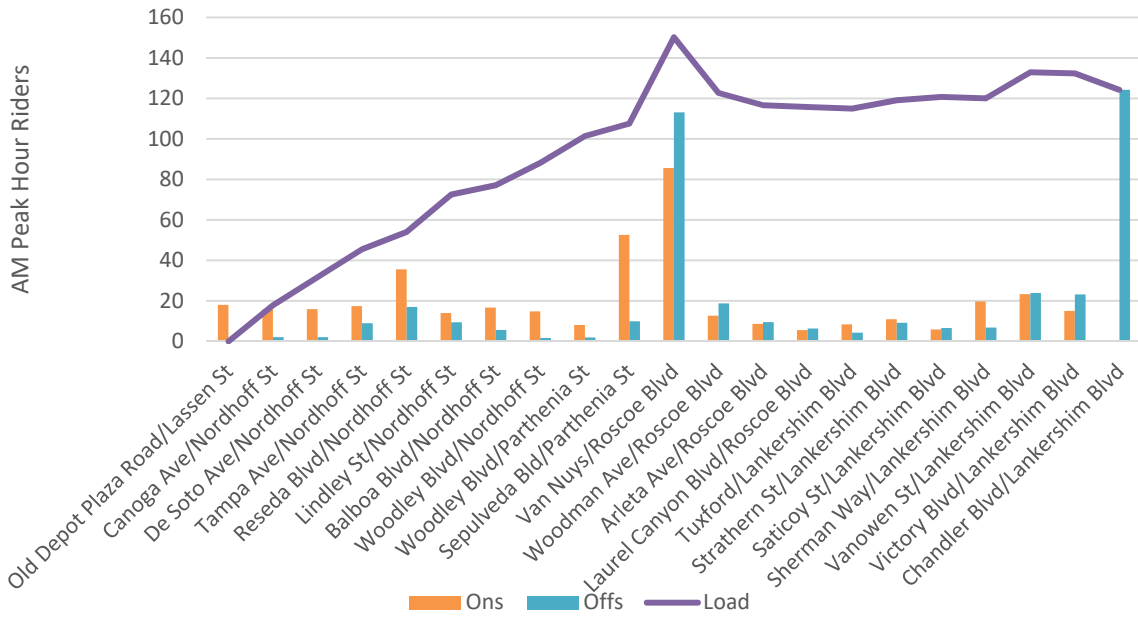


Figure 23: Option 4: Nordhoff-NoHo via Woodley Eastbound AM Peak Hour Load

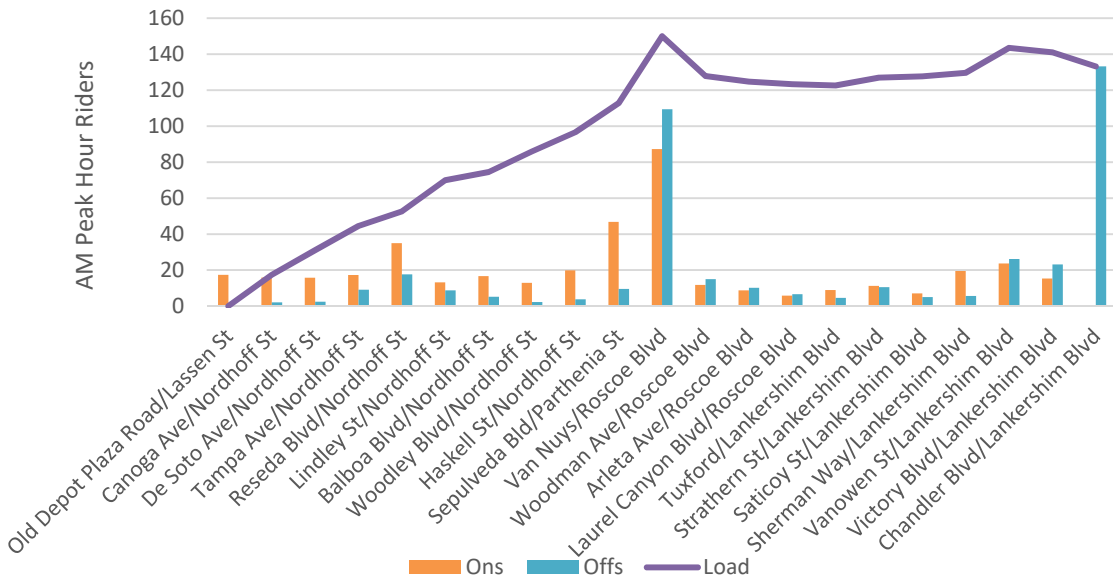


Figure 24: Option 5: Nordhoff-NoHo via Haskell Eastbound AM Peak Hour Load

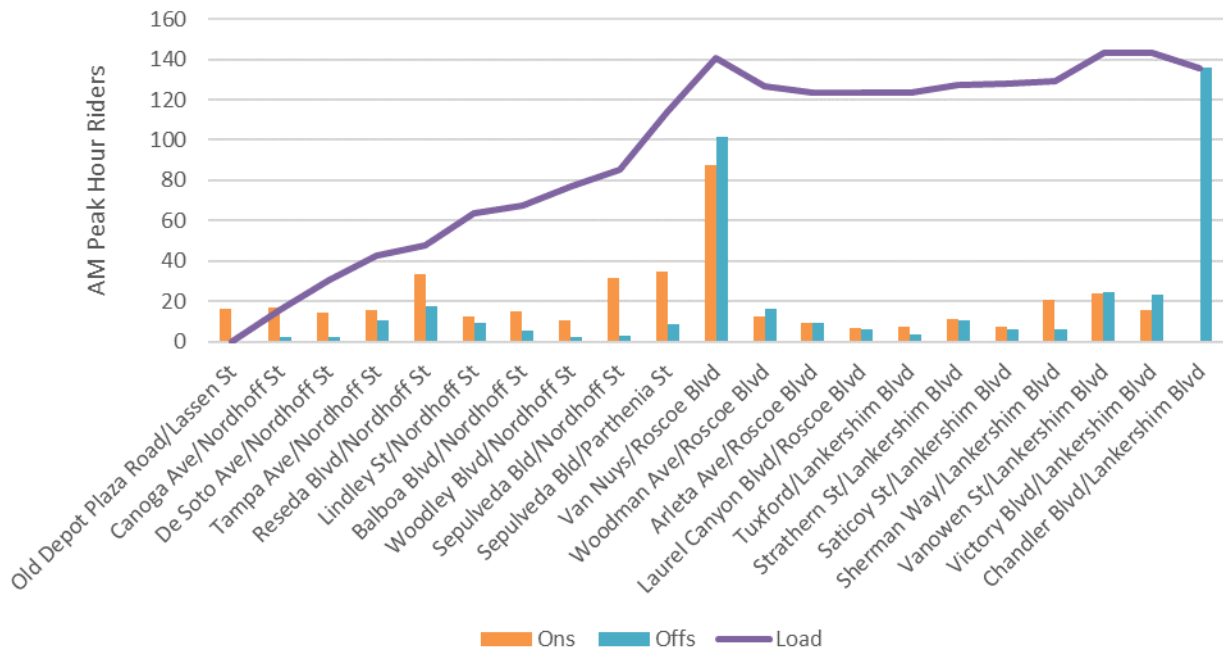


Figure 25: Option 6: Nordhoff-NoHo via Sepulveda Eastbound AM Peak Hour Load

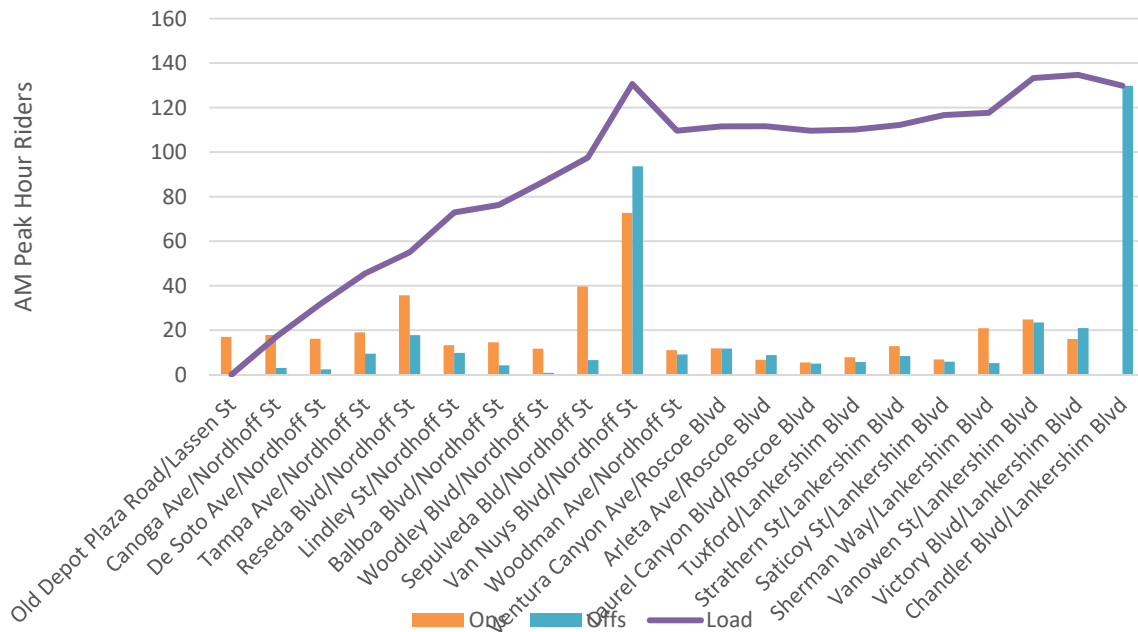


Figure 26: Option 7: Nordhoff-NoHo via Woodman Eastbound AM Peak Hour Load

Attachment D: New Transit Trips by Market

Tables 17 through 23 present the new transit trips by market for each of the seven alignments. These reflect strong ridership to the Central North San Fernando Valley district from within the study area and from the North and South Valley districts.

RN1	WEST NSFV	CENTRAL N	EAST NSFV	SF NSFV	NORTH HO	SOUTH VAL	NORTH VAL	EAST VALLE	DTLA	WEST LA	VENTURA	FOOTHILLS	ANTELOPE	SOUTH LA	SOUTHEAS	Total
WEST NSFV	217	307	24	7	19	(20)	9	8	1	5	0	3	0	2	1	585
CENTRAL N	336	831	132	25	82	83	30	32	11	47	1	9	0	9	2	1,629
EAST NSFV	220	1,502	311	60	240	72	29	65	11	81	1	14	1	11	2	2,619
SF NSFV	91	479	59	48	149	38	14	20	6	49	0	2	1	7	1	965
NORTH HO	86	206	104	49	398	(25)	13	17	19	71	0	2	0	21	5	967
SOUTH VAL	244	570	124	42	215	(109)	7	10	(1)	(41)	(0)	(2)	0	(1)	1	1,059
NORTH VAL	153	752	46	20	75	6	17	6	4	8	0	1	2	3	1	1,095
EAST VALLE	30	148	39	18	135	5	2	5	3	15	0	(12)	0	3	0	392
DTLA	22	16	14	3	35	0	0	4	(0)	(0)	0	1	0	0	(0)	96
WEST LA	83	122	87	18	157	10	2	24	1	(0)	1	3	0	(1)	(1)	506
VENTURA	3	11	0	0	4	0	0	0	(0)	(0)	(0)	(0)	0	0	0	19
FOOTHILLS	27	77	18	4	48	4	0	5	(1)	0	0	(94)	0	1	(1)	89
ANTELOPE	30	108	1	0	8	(2)	0	(0)	0	2	(0)	(0)	0	1	(0)	148
SOUTH LA	49	81	24	9	67	4	1	5	(1)	0	(0)	34	0	1	(0)	273
SOUTHEAS	24	51	8	5	26	1	1	(0)	(0)	2	(0)	13	0	(0)	(0)	130
Total	1,615	5,262	993	308	1,658	70	126	200	52	238	2	(28)	5	57	12	10,572

Table 17: Option 1: Roscoe-NoHo via Reseda New Transit Trips

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RN2	WEST NSFV	CENTRAL N	EAST NSFV	SF NSFV	NORTH HO	SOUTH VAL	NORTH VAL	EAST VALLE	DTLA	WEST LA	VENTURA	FOOTHILLS	ANTELOPE	SOUTH LA	SOUTHEAS	Total
WEST NSFV	214	318	23	7	19	(22)	9	7	1	5	0	2	0	2	1	588
CENTRAL N	332	877	129	24	81	75	30	30	11	48	0	9	0	9	2	1,658
EAST NSFV	217	1,620	308	60	239	67	29	66	10	80	0	14	1	11	2	2,724
SF NSFV	90	519	59	48	149	36	14	20	6	49	0	2	1	7	1	1,002
NORTH HO	85	224	103	49	398	(26)	14	16	18	71	0	2	0	21	5	982
SOUTH VAL	236	588	121	42	215	(89)	7	11	0	(35)	(0)	(2)	0	(1)	1	1,095
NORTH VAL	156	841	47	20	75	9	19	7	5	12	0	1	2	5	1	1,199
EAST VALLE	30	160	39	18	135	4	2	5	4	15	0	(12)	0	3	1	403
DTLA	22	17	14	3	35	0	0	4	(0)	(0)	(0)	1	0	0	(0)	96
WEST LA	82	96	87	18	156	10	1	25	1	(0)	1	3	0	(0)	(1)	478
VENTURA	3	13	0	0	4	0	0	0	(0)	(1)	(0)	(0)	0	0	0	19
FOOTHILLS	26	87	19	3	48	3	1	5	(1)	0	0	(93)	0	1	(1)	98
ANTELOPE	30	114	1	0	8	(2)	1	(0)	(0)	2	(0)	(0)	0	1	0	155
SOUTH LA	48	75	24	9	67	4	1	5	(1)	0	(0)	34	0	1	(0)	266
SOUTHEAS	24	61	8	5	26	1	0	0	(0)	2	0	12	0	0	(0)	139
Total	1,595	5,609	982	307	1,657	71	129	200	54	248	2	(27)	5	59	13	10,902

Table 18: Option 2: Roscoe-NoHo via Lindley New Transit Trips

NHSy	WEST NSFV	CENTRAL N	EAST NSFV	SF NSFV	NORTH HO	SOUTH VAL	NORTH VAL	EAST VALLE	DTLA	WEST LA	VENTURA	FOOTHILLS	ANTELOPE	SOUTH LA	SOUTHEAS	Total
WEST NSFV	214	317	18	18	1	(33)	15	2	2	(7)	0	1	0	4	(0)	552
CENTRAL N	344	932	98	58	3	70	51	6	2	19	0	1	0	3	(0)	1,588
EAST NSFV	268	1,859	240	139	4	37	82	1	1	24	1	(1)	1	2	(1)	2,656
SF NSFV	166	710	81	356	7	35	189	(5)	1	37	1	(4)	2	3	0	1,578
NORTH HO	39	139	11	22	(3)	(1)	8	(18)	(1)	(6)	(0)	(3)	(0)	(1)	(0)	184
SOUTH VAL	210	540	42	68	(0)	(5)	17	(1)	(0)	(4)	0	(1)	0	(1)	0	864
NORTH VAL	219	1,052	64	244	4	24	190	(6)	1	22	1	(2)	2	3	(0)	1,819
EAST VALLE	23	145	10	30	(3)	(2)	12	(22)	(1)	(1)	1	(8)	(3)	(2)	(1)	178
DTLA	20	6	0	1	(0)	0	0	(1)	(0)	(0)	0	1	0	0	0	28
WEST LA	36	24	5	10	1	(1)	2	(2)	(2)	(14)	0	(1)	(1)	(19)	(6)	31
VENTURA	3	15	0	2	0	0	1	(0)	(0)	(1)	(0)	(0)	(0)	(0)	0	19
FOOTHILLS	16	11	1	2	(0)	(0)	1	(3)	(2)	(7)	0	(96)	(0)	0	(1)	(78)
ANTELOPE	123	288	6	27	(3)	4	7	(331)	(0)	1	1	(1)	(0)	0	(0)	121
SOUTH LA	19	8	0	3	(0)	0	1	(1)	(1)	(8)	(0)	32	(0)	(7)	(1)	45
SOUTHEAS	6	3	0	1	(0)	0	0	(1)	(0)	(0)	(0)	12	0	0	(0)	22
Total	1,705	6,051	575	981	9	128	576	(383)	(2)	55	5	(69)	1	(14)	(11)	9,607

Table 19: Option 3: Nordhoff-Sylmar/San Fernando New Transit Trips

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NH1	WEST NSFV	CENTRAL N	EAST NSFV	SF NSFV	NORTH HO	SOUTH VAL	NORTH VAL	EAST VALLE	DTLA	WEST LA	VENTURA	FOOTHILLS	ANTELOPE	SOUTH LA	SOUTHEAS	Total
WEST NSFV	219	339	27	8	21	(5)	11	11	5	35	1	6	0	10	2	690
CENTRAL N	365	1,108	146	26	86	126	47	37	19	113	1	14	2	19	4	2,112
EAST NSFV	258	1,935	339	64	249	173	45	79	19	187	2	23	3	34	5	3,417
SF NSFV	104	592	62	49	152	110	17	28	10	119	1	9	3	24	4	1,284
NORTH HO	98	262	110	52	406	(2)	19	18	19	83	1	1	4	20	4	1,094
SOUTH VAL	271	764	166	59	233	(54)	25	15	5	32	1	1	5	8	1	1,533
NORTH VAL	185	991	58	22	82	86	27	20	19	126	2	13	4	37	10	1,682
EAST VALLE	34	191	43	19	135	15	5	(18)	4	34	1	(26)	7	3	(1)	447
DTLA	24	22	14	4	35	0	2	2	(4)	(8)	(3)	(3)	8	(11)	2	83
WEST LA	93	159	99	26	157	10	10	21	(22)	(71)	(5)	(18)	17	(83)	(17)	376
VENTURA	3	15	1	1	4	1	1	0	1	5	0	0	0	1	(1)	34
FOOTHILLS	29	109	20	5	48	3	2	(14)	(18)	(14)	(6)	(148)	18	(23)	3	16
ANTELOPE	38	149	5	0	9	88	0	1	6	210	7	2	3	13	(6)	525
SOUTH LA	55	114	32	18	67	4	7	2	(56)	(40)	(11)	(49)	19	(95)	14	82
SOUTHEAS	26	85	10	5	26	1	2	(1)	(15)	22	(11)	(10)	1	(24)	85	202
Total	1,803	6,836	1,133	359	1,708	555	222	199	(8)	833	(18)	(184)	95	(67)	111	13,577

Table 20: Option 4: Nordhoff-NoHo via Woodley New Transit Trips

NH2	WEST NSFV	CENTRAL N	EAST NSFV	SF NSFV	NORTH HO	SOUTH VAL	NORTH VAL	EAST VALLE	DTLA	WEST LA	VENTURA	FOOTHILLS	ANTELOPE	SOUTH LA	SOUTHEAS	Total
WEST NSFV	217	336	27	8	20	(18)	11	8	2	9	0	3	0	3	1	630
CENTRAL N	360	1,068	135	24	81	98	46	32	12	63	0	10	1	9	2	1,942
EAST NSFV	254	1,890	316	60	241	69	44	66	11	80	1	15	3	13	2	3,063
SF NSFV	102	585	60	48	148	35	17	19	6	44	0	2	4	6	1	1,078
NORTH HO	93	247	102	48	397	(44)	16	19	28	125	0	13	1	40	11	1,097
SOUTH VAL	247	685	115	40	214	(78)	10	15	7	(25)	(0)	5	1	8	2	1,247
NORTH VAL	183	987	57	22	80	21	27	11	8	23	1	4	6	7	1	1,437
EAST VALLE	32	180	39	17	131	(3)	3	9	14	57	0	2	1	23	6	511
DTLA	24	24	13	7	35	1	3	6	0	1	0	1	0	0	(1)	114
WEST LA	91	153	89	29	157	14	8	42	0	1	0	2	1	2	(0)	587
VENTURA	3	15	0	0	4	(0)	0	1	0	2	(0)	(1)	0	0	0	25
FOOTHILLS	30	114	19	7	50	5	4	16	0	4	0	12	0	3	1	264
ANTELOPE	38	139	2	1	23	16	0	11	0	13	0	(41)	0	1	0	203
SOUTH LA	55	120	26	20	73	8	12	37	(0)	0	(0)	2	0	1	(1)	353
SOUTHEAS	27	85	8	13	29	3	5	21	(1)	(5)	(0)	(2)	0	(4)	(16)	163
Total	1,756	6,627	1,007	343	1,684	129	206	312	86	392	4	27	19	113	10	12,715

Table 21: Option 5: Nordhoff-NoHo via Haskell New Transit Trips

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NH3	WEST NSFV	CENTRAL N	EAST NSFV	SF NSFV	NORTH HO	SOUTH VAL	NORTH VAL	EAST VALLE	DTLA	WEST LA	VENTURA	FOOTHILLS	ANTELOPE	SOUTH LA	SOUTHEAS	Total
WEST NSFV	215	328	26	7	18	(21)	11	7	1	5	0	2	0	2	1	603
CENTRAL N	349	1,002	141	24	79	93	42	30	10	54	1	8	0	8	2	1,842
EAST NSFV	237	1,761	334	61	240	68	40	65	10	80	1	14	1	12	2	2,927
SF NSFV	94	542	63	48	148	35	17	20	6	46	0	2	1	6	1	1,029
NORTH HO	86	233	105	49	398	(27)	15	16	18	70	(0)	1	0	21	5	991
SOUTH VAL	227	629	121	39	213	(74)	9	12	0	(32)	(0)	(1)	0	(1)	1	1,144
NORTH VAL	175	930	60	23	79	19	27	10	7	21	0	2	2	7	2	1,363
EAST VALLE	29	168	41	18	135	4	3	5	3	14	0	(13)	0	3	0	410
DTLA	22	22	13	3	35	1	0	4	(0)	(0)	(0)	0	0	0	(0)	100
WEST LA	82	135	89	18	157	10	2	25	1	(1)	0	(1)	0	0	(0)	517
VENTURA	3	15	0	0	4	(0)	1	0	(0)	(1)	(0)	(0)	0	0	0	21
FOOTHILLS	26	99	19	4	49	3	1	5	(1)	0	0	0	0	1	(0)	206
ANTELOPE	31	119	1	0	8	(2)	1	(0)	0	1	(0)	(1)	0	1	(0)	158
SOUTH LA	48	105	26	9	66	5	2	4	(1)	0	(0)	0	0	2	1	265
SOUTHEAS	24	75	8	5	26	1	1	1	(0)	2	0	0	0	0	(0)	142
Total	1,648	6,162	1,048	308	1,656	115	171	203	54	262	2	14	4	62	13	11,720

Table 22: Option 6: Nordhoff-NoHo via Sepulveda New Transit Trips

NH4	WEST NSFV	CENTRAL N	EAST NSFV	SF NSFV	NORTH HO	SOUTH VAL	NORTH VAL	EAST VALLE	DTLA	WEST LA	VENTURA	FOOTHILLS	ANTELOPE	SOUTH LA	SOUTHEAS	Total
WEST NSFV	217	325	24	9	19	(19)	12	8	2	9	0	3	0	3	1	615
CENTRAL N	351	982	114	24	73	87	44	30	10	44	0	8	0	9	2	1,777
EAST NSFV	272	1,900	290	60	231	73	48	67	9	80	1	14	1	12	2	3,061
SF NSFV	122	660	69	55	154	34	23	24	5	46	0	3	1	6	2	1,204
NORTH HO	91	235	89	49	388	(59)	16	13	17	54	0	0	0	18	5	918
SOUTH VAL	220	568	77	30	175	(47)	9	9	1	(21)	(0)	(1)	0	(0)	0	1,020
NORTH VAL	199	1,050	59	25	80	18	32	11	8	20	1	2	2	7	1	1,516
EAST VALLE	33	179	32	18	133	2	4	4	3	13	0	(14)	0	3	0	410
DTLA	24	21	10	3	35	0	0	3	(0)	0	0	1	0	0	(0)	99
WEST LA	87	128	68	18	155	11	3	24	1	(1)	0	(1)	0	0	(0)	493
VENTURA	3	15	0	0	4	(0)	1	(0)	(0)	(1)	(0)	(0)	0	(0)	0	22
FOOTHILLS	29	103	13	4	49	3	1	5	(2)	0	0	(0)	0	1	(0)	206
ANTELOPE	55	160	2	0	8	1	1	(0)	(0)	2	0	(1)	0	1	(0)	229
SOUTH LA	53	110	22	9	66	5	2	5	(1)	0	(0)	1	0	1	0	272
SOUTHEAS	26	81	6	5	26	1	1	1	0	3	0	(0)	0	(0)	(0)	148
Total	1,781	6,518	874	312	1,597	109	196	205	53	250	3	14	5	61	13	11,990

Table 23: Option 7: Nordhoff-NoHo via Woodman New Transit Trips

Attachment E: Origins and Destinations of New Transit Riders

Figures 27 through 32 present the origins and destinations of new transit riders for six of the seven alignments. The Option 4: Nordhoff-NoHo via Woodley alignment was previously presented in Figure 18.

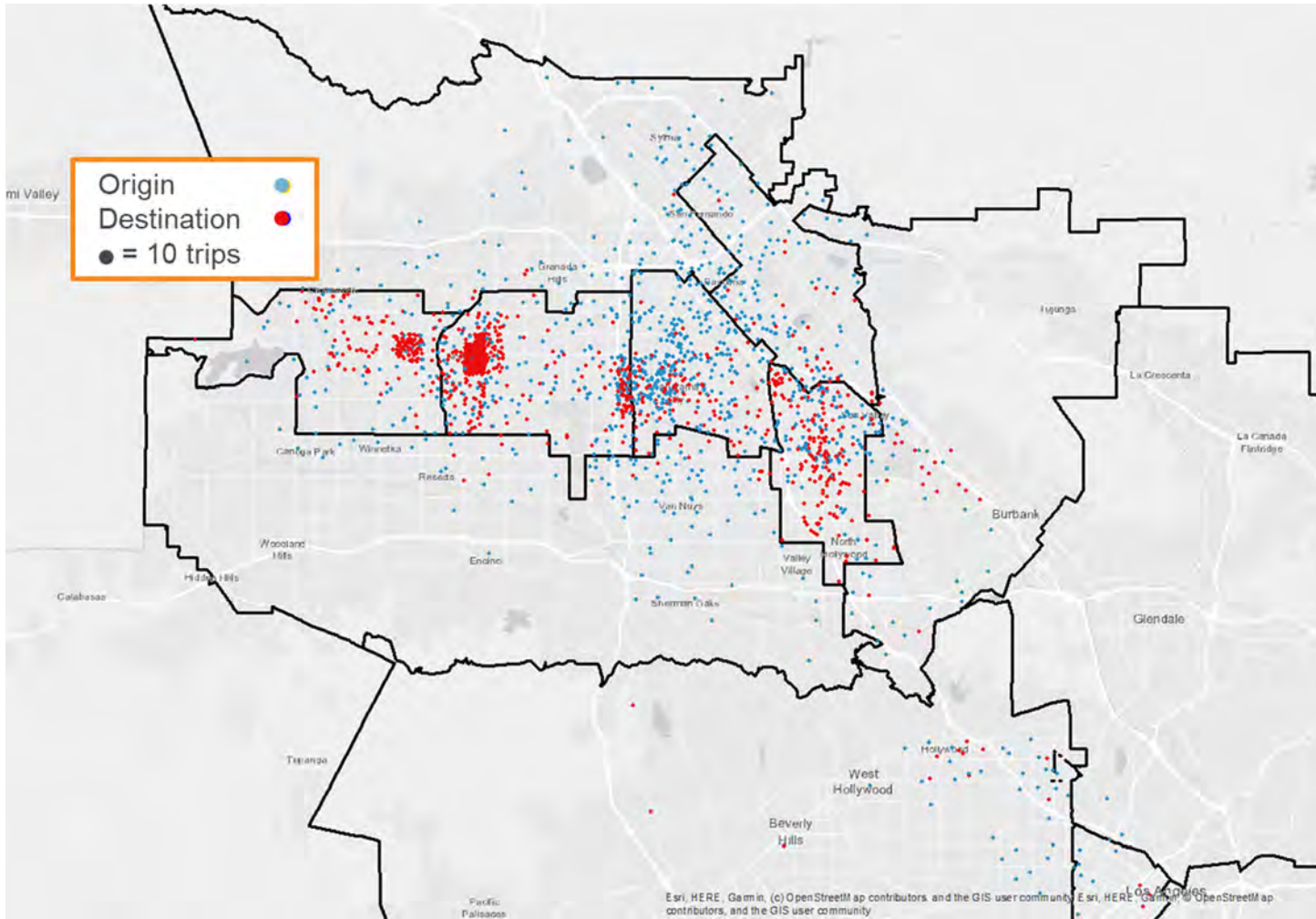


Figure 27: Option 1: Roscoe-NoHo via Reseda Origins and Destinations of New Transit Riders

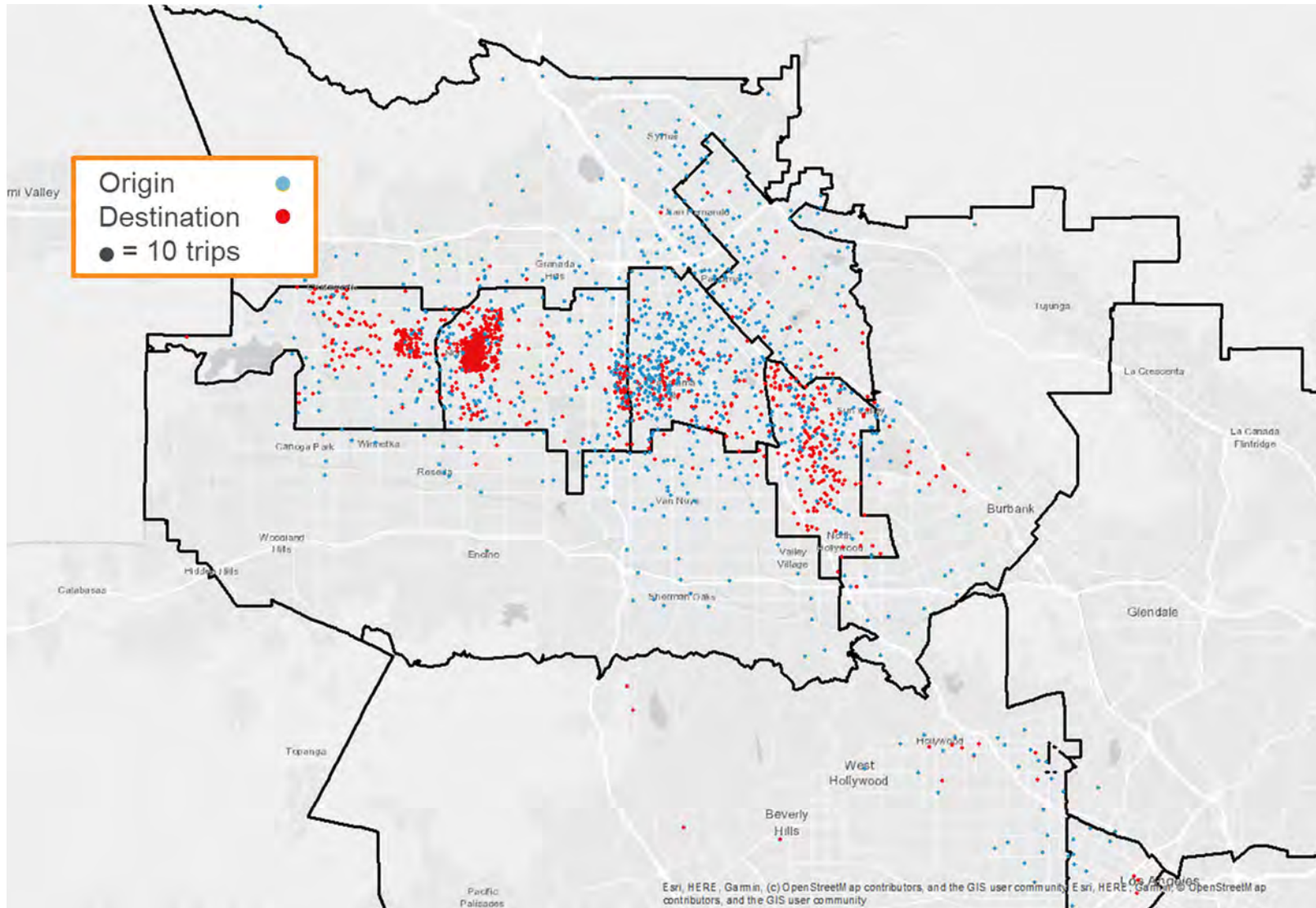


Figure 28: Option 2: Roscoe-NoHo via Lindley Origins and Destinations of New Transit Riders

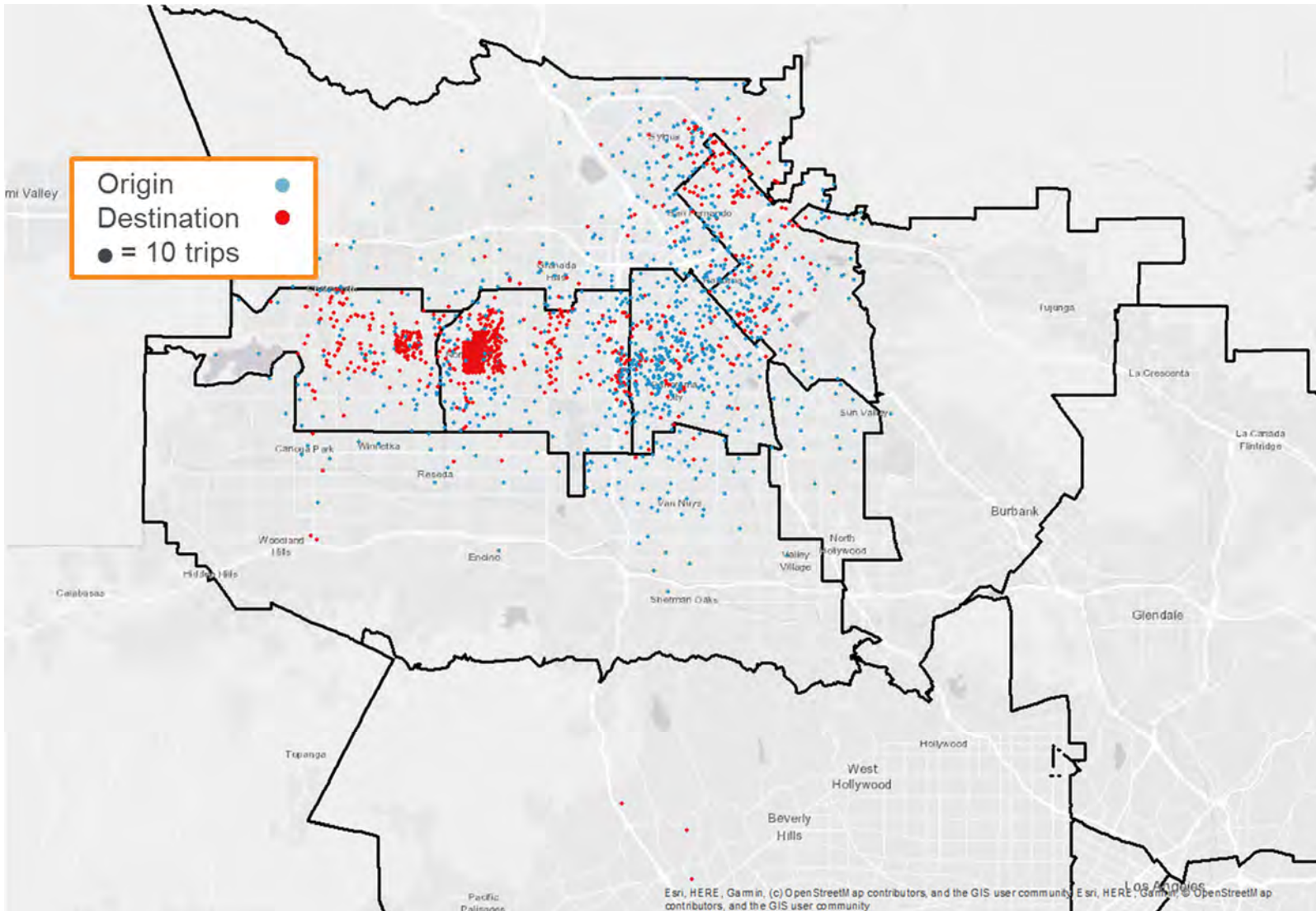


Figure 29: Option 3: Nordhoff-Sylmar/San Fernando Origins and Destinations of New Transit Riders

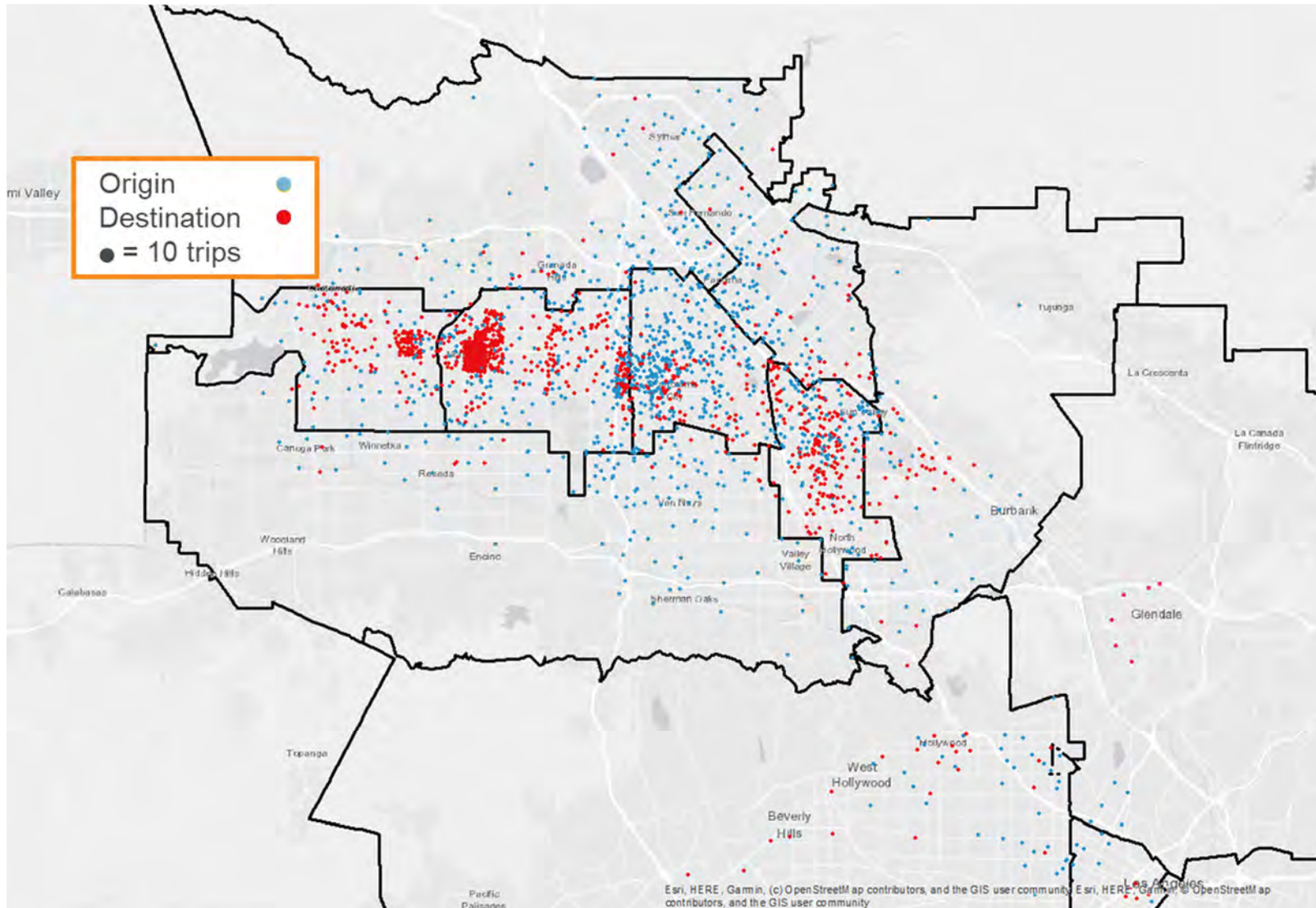


Figure 30: Option 5: Nordhoff-NoHo via Haskell Origins and Destinations of New Transit Riders

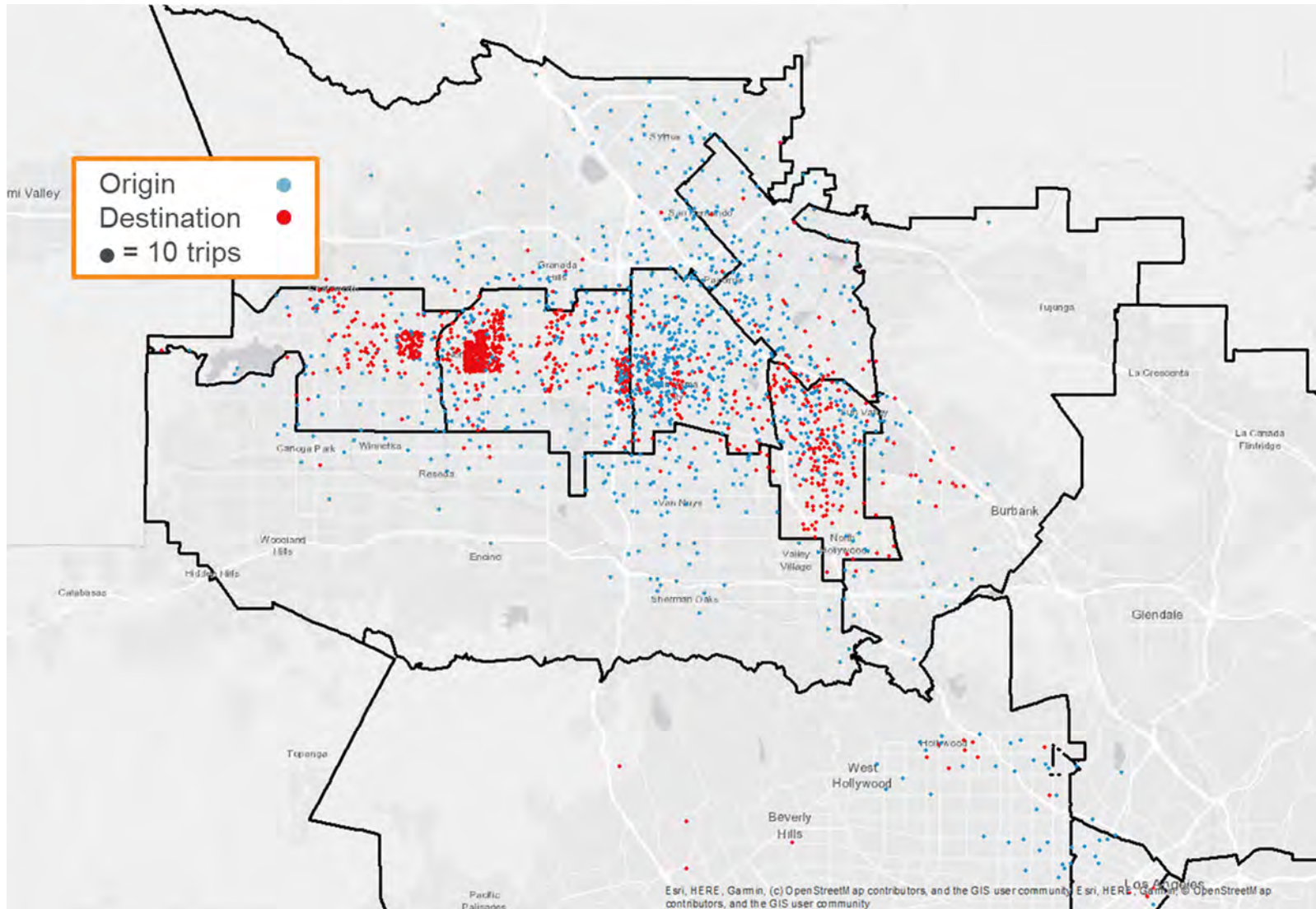


Figure 31: Option 6: Nordhoff-NoHo via Sepulveda Origins and Destinations of New Transit Riders

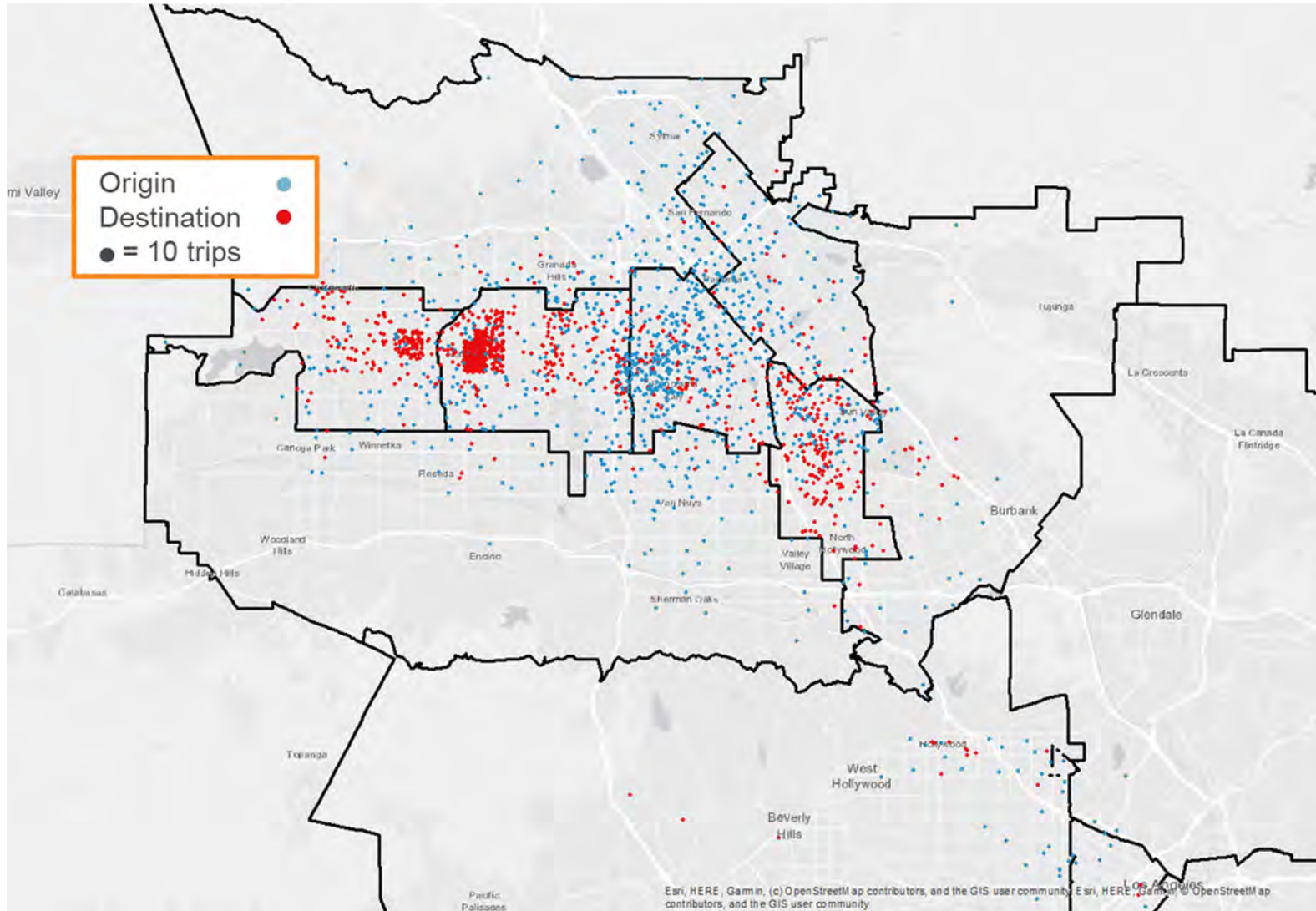


Figure 32: Option 7: Nordhoff-NoHo via Woodman Origins and Destinations of New Transit Riders