

North Hollywood to Pasadena Bus Rapid Transit (BRT) Corridor Planning and Environmental Study

Operating Statistics and O&M Costs

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1. Introduction

This Technical Memorandum summarizes the operating statistics and operations and maintenance (O&M) costs associated with the North Hollywood to Pasadena Bus Rapid Transit (BRT) project. Operating statistics are based on the BRT operating plan concept presented in the *BRT Service Plan* draft memorandum prepared April 24, 2020. O&M costs are estimated based on the methodology described in the *O&M Cost Methodology* memorandum updated January 22, 2019, using O&M cost models based on Fiscal Year 2018 expense and operating data from the Los Angeles County Metropolitan Transportation Authority (LACMTA or Metro).

Alignments in the Draft EIR include various route options by segment. For purposes of ridership and operations analysis, three modeling scenarios have been defined.

- Scenario 1 – Street Running: This modeling scenario uses Chandler Boulevard-Vineland Avenue-Lankershim Boulevard in North Hollywood, Broadway in Glendale, and the Fair Oaks Avenue interchange and Colorado Boulevard in Pasadena.
- Scenario 2 – Street Running with Other Streets: This modeling scenario uses the Lankershim Boulevard route option in North Hollywood, Colorado Street in Glendale, and Colorado Boulevard via the Colorado Boulevard interchange in Pasadena.
- Scenario 3 – Freeway Running: This modeling scenario uses Lankershim Boulevard in North Hollywood, the SR-134 Freeway through Glendale and Eagle Rock, and the Fair Oaks Avenue interchange along with the Green Street-Union Street couplet in Pasadena.

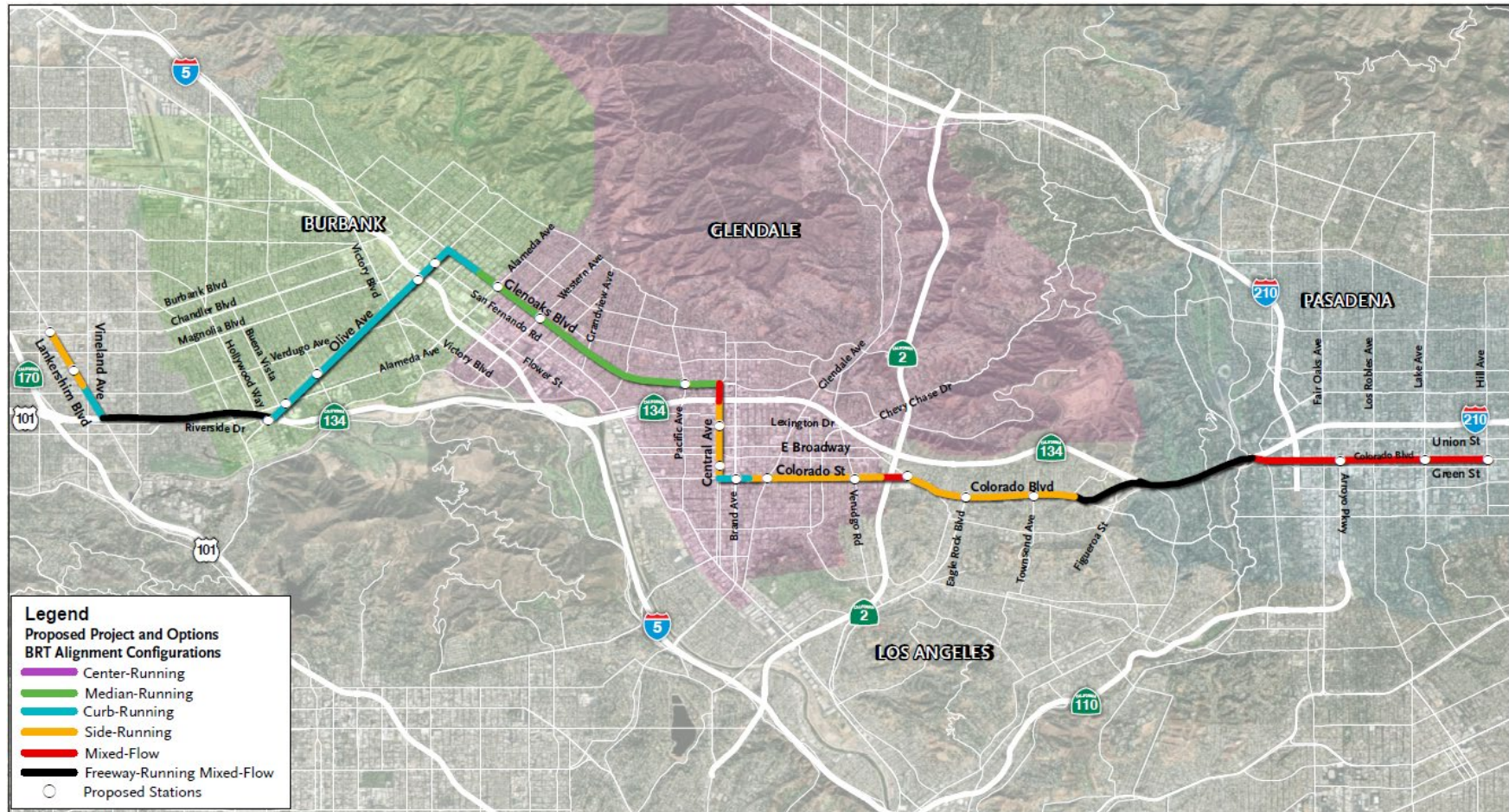
These alignments are shown in **Figures 1** through **Figure 3**. Operating statistics and O&M costs presented in this report are based on these three modeling scenarios.

Figure 1 – Scenario 1: Street Running



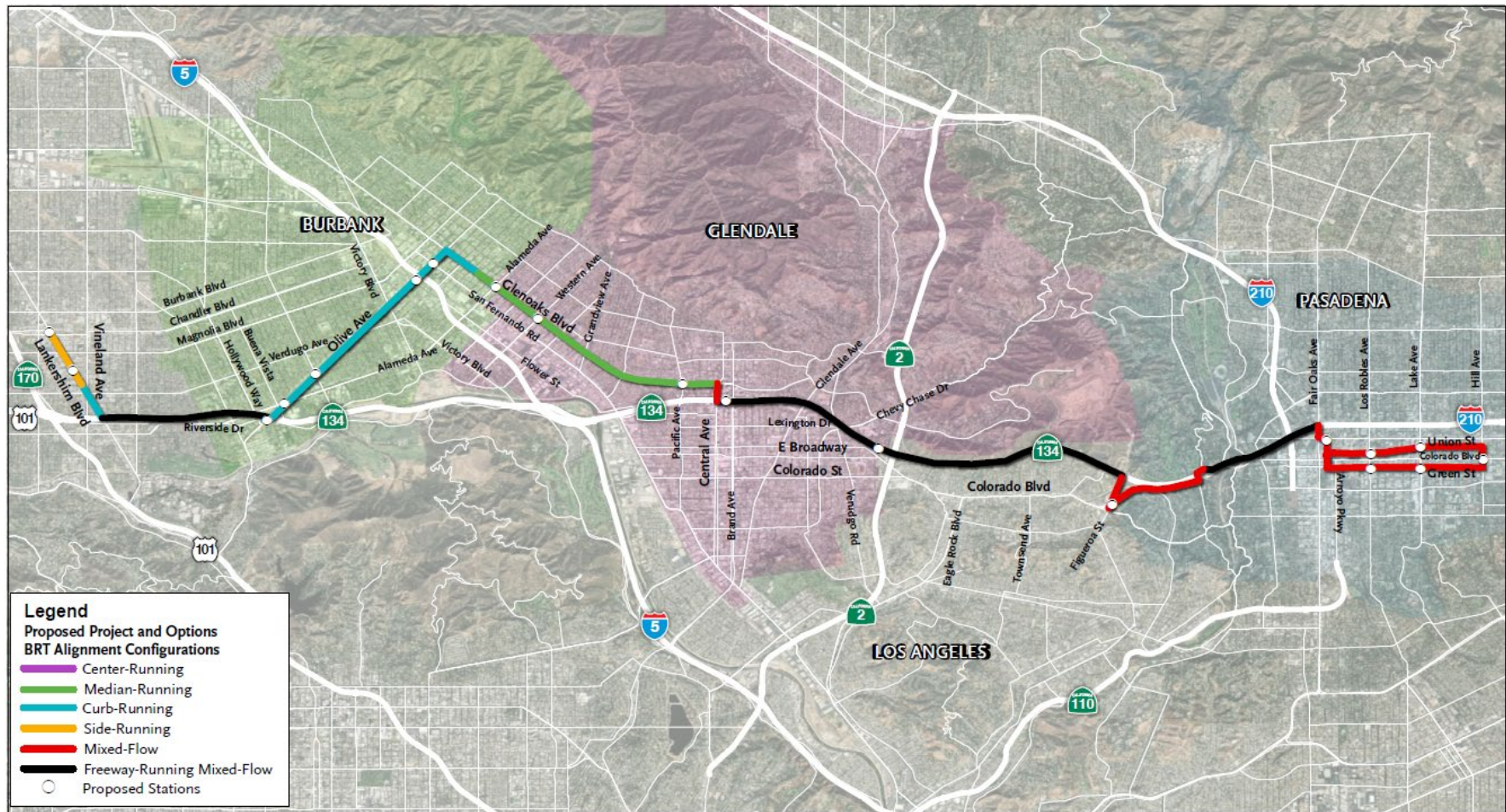
Source: Kimley-Horn and Associates, June 2020.

Figure 2 – Scenario 2: Street Running on Other Streets



Source: Kimley-Horn and Associates, June 2020.

Figure 3 – Scenario 3: Freeway Running



Source: Kimley-Horn and Associates, June 2020.

2. Operating Statistics

Operating statistics were estimated for the BRT service as well as the proposed background bus service changes associated for each scenario. This is a necessary step in determining O&M costs, as operating statistics are multiplied by unit costs to determine the total annual O&M cost for each scenario.

For BRT service, the following operating statistics are developed for use in the BRT O&M cost model:

- Revenue hours – the annual in-service hours required to operate the BRT service and proposed background bus changes, based on a minimum of 15% layover/recovery time, but not including deadhead to/from the garage for each driver block.
- Revenue miles – the annual in-service miles required to operate the BRT service and proposed background bus changes, but not including deadhead to/from the garage for each driver block.
- Peak vehicles – the number of vehicles required for BRT service, based on the defined peak headway.

The calculation of these service statistics requires the estimation of BRT end-to-end travel times. The estimated BRT travel time, BRT route distance, and service characteristics (headways and span by period of day and day of week), as defined in the *BRT Service Plan* report and shown in Appendix B, allow the calculation of annual service statistics and BRT peak and total fleet size. Beyond these service statistics, the BRT O&M cost model requires the quantification of the following physical features of the proposed BRT facilities.

- Directional lane miles – the mileage of center, side, or curb-running dedicated lanes. It does not include mileage for segments in mixed traffic (whether on street or freeway).
- Station platforms – the number of distinct station platform areas to be maintained. A split platform (separate platforms for eastbound versus westbound service, for example) counts as two separate platforms.
- Maintenance facilities – since the single BRT service is not likely to trigger a new maintenance facility, this is expressed as a proportional increase over the existing average size of Metro's bus maintenance facilities, given the additional BRT vehicles to be accommodated. Metro 2018 data reports 1,761 peak vehicles and 13 maintenance facilities, averaging 135.4 peak vehicles per maintenance facility. Thus, for example, adding 14 peak vehicles would add about 10% to the existing average-sized facility.

For background bus operating statistics, the standard bus O&M cost model uses revenue hours, revenue miles, and peak vehicles using the same principles as described for BRT service. Statistics focus on calculating incremental changes to revenue hours, revenue miles and peak vehicles for routes that are proposed to be modified or eliminated.

2.1. BRT Travel Times

As previously discussed, BRT travel time estimates are necessary to calculate operating statistics needed for the BRT O&M cost model. BRT travel time estimates were completed for each scenario through use of a travel time model. Travel times consist of three components: the time the vehicle is in motion, time spent at intersections, and time spent at stations.

2.1.1. Time in Operation

The time in operation includes the time it takes for the bus to accelerate, the time the bus spends cruising at the designated top speed, and the time for the bus to decelerate. The following items were used to estimate time in operation:

- Speeds governed by posted speed limit; the ability to reach posted speeds may be limited by geometry or distance between stops.
- Acceleration assumed at 2.0 mph/sec from 0 to 25 mph, decreasing to 0.45 mph/sec from 25 to 55 mph.
- Deceleration rate 2.0 mph/sec constant.
- BRT operating in mixed traffic environments use calculated arterial level of service (LOS) to reflect travel time impacts of congestion to the BRT service.
- BRT operating in side-running dedicated lane environments have an assumed arterial level of service (LOS) of B. This is to account for a mostly free and clear operating environment, but with occasional interference from right turning vehicles, vehicles entering or exiting driveways, and other minor delays.
- BRT operating in center running dedicated lane environments have an assumed arterial level of service (LOS) of A. This is to account for a free and clear operating environment.
- BRT operating on freeway portions are assumed to operate in mixed traffic with delays associated with traffic conditions. For purposes of this analysis, BRT operating speeds are assumed to correspond with traffic conditions. It is worth noting that without dedicated lanes, BRT speeds will likely degrade over time in accordance with worsening congestion, leading to longer travel times, more vehicles required to meet scheduling needs, and increased operating costs.

2.1.2. Intersection Delay

Intersection delay is the amount of time the vehicle spends waiting at intersections. Signal delay is randomized, meaning that a vehicle may spend 30 or 45 seconds waiting at one intersection and then 0 seconds at the next by virtue of entering during a green

phase. As a result, the methodology assumes intersection delay is the average delay that occurs at any intersection along the proposed alignment. The following items were used to estimate intersection delay:

- Signalized intersections classified by traffic signal cycle length (Class 1, 2 or 3).
- Potential time savings from anticipated changes in intersection LOS due to no waiting (center-running) or minimal waiting (side-running) behind other vehicles if in exclusive lanes.
- Travel time methodology assumes center-running segments have intersection LOS A and side-running segments have LOS B.
- BRT vehicles operating in mixed traffic segments use calculated intersection LOS.
- Transit signal priority (TSP) is reflected in the travel time estimates. Travel time savings is based on signal delay curves provided in Transit Cooperative Research Program (TCRP) Report 118 – Bus Rapid Transit Practitioner’s Guide.
- Signal delay curves are based on intersection LOS from Transit Cooperative Research Program (TCRP) Report 118 – Bus Rapid Transit Practitioner’s Guide.

2.1.3. Dwell Times

Dwell time is the time the vehicle spends waiting at stations for passengers to board or alight the vehicle. The following items were used to estimate dwell time:

- Proposed dwell times are categorized as high or medium based on estimated ridership load. The dwell times are as follows:
 - High: 20 seconds
 - Medium: 10 seconds
- Dwell times reflect facilitated boarding (through all-door boarding and other techniques).

Table 1 shows the estimated peak period round trip travel times for the three scenarios, along with estimated layover/recovery time, total cycle time (round trip runtime plus layover), and the resulting number of peak buses required. Travel times are estimated for year 2024 and year 2042, incorporating projected LOS for street or freeway segments operating in mixed traffic.

Table 1 – BRT Travel Time Summary

	2024 AM Peak				2042 AM Peak			
	Round Trip Runtime	Layover	Cycle	Peak Buses	Round Trip Runtime	Layover	Cycle	Peak Buses
Scenario 1 – Street Running	2:13:22	0:26:38	2:40:00	16	2:19:08	0:20:52	2:40:00	16
Scenario 2 – Street Running with Other Streets	2:10:32	0:29:27	2:40:00	16	2:15:36	0:24:23	2:40:00	16
Scenario 3 – Freeway Running	1:58:08	0:21:52	2:20:00	14	2:04:55	0:25:05	2:30:00	15

The longer travel times estimated for 2042 reflect expected increased congestion along the mixed traffic segments. Detailed station-to-station BRT travel times for each scenario are provided in Appendix A.

2.2. Summary of BRT Operating Statistics

This section presents statistics for operating the North Hollywood to Pasadena BRT mainline service that are used in calculating O&M costs. Revenue hours, revenue miles, peak vehicles, and maintenance facilities are based on operating statistics generated from the service plan presented in the *BRT Service Plan* memorandum, which generally defines 10-minute all-day weekday BRT service tapering to 15 to 20 minutes during the evenings, and 15-minute weekend BRT service tapering to 30 minutes in the evenings. The directional miles and station platforms are based on the infrastructure definition for each scenario. Appendix B details the service plan assumptions by period of day and day of week, and resulting operating statistics calculated for each BRT scenario. **Table 2** summarizes the operating statistics for the three BRT scenarios, based on 2024 travel times.

Table 2 – BRT Operating Statistics Summary (based on 2024 travel times)

	BRT Mainline Service					
	Annual Revenue Hours	Annual Revenue Miles	Peak Vehicles	Directional Lane Miles ¹	Station Platforms ²	Maintenance Facilities ³
Scenario 1 – Street Running	90,200	1,348,500	16	23.7	45	0.12
Scenario 2 – Street Running with Other Streets	90,200	1,298,600	16	21.4	41	0.12
Scenario 3 – Freeway Running	79,700	1,361,700	14	13.1	32	0.10

1. Directional lane miles are the number of curbside or center running lane miles. Excludes miles in mixed traffic and freeway miles.
2. Split platforms counted separately; Scenario 1 includes optional stations.
3. Percentage based on scenario's required peak vehicles divided by average peak bus vehicles per maintenance facility (1,761 total peak vehicles divided by 13 maintenance facilities).

Table 3 summarizes the operating statistics for the three BRT scenarios, based on 2042 travel times.

Table 3 – BRT Operating Statistics Summary (based on 2042 travel times)

	BRT Mainline Service					
	Annual Revenue Hours	Annual Revenue Miles	Peak Vehicles	Directional Lane Miles ¹	Station Platforms ²	Maintenance Facilities ³
Scenario 1 – Street Running	90,200	1,348,500	16	23.7	45	0.12
Scenario 2 – Street Running with Other Streets	90,200	1,298,600	16	21.4	41	0.12
Scenario 3 – Freeway Running	84,400	1,361,700	15	13.1	32	0.11

1. Directional lane miles are the number of curbside or center running lane miles. Excludes miles in mixed traffic and freeway miles.
2. Split platforms counted separately; Scenario 1 includes optional stations.
3. Percentage based on scenario's required peak vehicles divided by average peak bus vehicles per maintenance facility (1,761 total peak vehicles divided by 13 maintenance facilities).

A comparison between 2024 and 2042 statistics show identical values for Scenario 1 and Scenario 2, whereas anticipated worsening freeway congestion leads to increased vehicle and revenue hour statistics by 2042 for Scenario 3. While Scenarios 1 and 2 also lead to increased travel times by 2042, their overall cycle times (and resulting statistics) remain unchanged because of reduced layover times, as can be seen in **Table 1**.

2.3. Summary of Background Bus Operating Statistics

This section presents statistics for changes to background bus operations for each scenario. Metro's NextGen service redesign plan is assumed as the baseline service for the purpose of this BRT study given its anticipated implementation in December 2020. The statistics presented here are based on the service plan changes discussed in the *BRT Service Plan* memorandum. For the street-running Scenarios 1 and 2, Metro 180 is restructured to reduce service along the portion generally overlapping the BRT corridor from Glendale to Pasadena, while retaining full frequencies between Glendale, Hollywood and Los Angeles (Fairfax corridor to La Cienega/Jefferson E (Expo) Line Station in the West Adams district). This is achieved by a full-length pattern from Pasadena to West Adams operating at 15-minute all-day weekday frequencies, and a short-length pattern from Glendale to West Adams operating at 15-minute all-day service frequencies. The net result is 7.5-minute all-day service between Glendale and West Adams, and 15-minute all-day service from Glendale to Pasadena. Street-running Scenarios 1 and 2 also may involve potential changes to Metro 501. For the freeway-running Scenario 3, Metro 501 is replaced by the BRT route.

Table 4 provides summary incremental statistics for street-running Scenario 1 and Scenario 2. Negative values indicate a savings, due to scaling back the duplicating service of Metro 180 and potential changes to Metro 501.

Table 4 – Changes to Background Bus Operating Statistics for Street Running Scenarios 1 and 2

	All Scenarios - Background Bus Changes		
	Annual Revenue Hours	Annual Revenue Miles	Peak Vehicles
Metro 180	-26,393	-303,124	-9
Metro 501 (potential)	-25,960	-488,565	-8
Total Changes	-26,393 to -52,353	-303,124 to -791,689	-9 to -17

Table 5 provides summary incremental statistics for freeway-running Scenario 3. Total changes reflect the savings from elimination of Metro 501.

Table 5 – Changes to Background Bus Operating Statistics for Freeway Running Scenario 3

	All Scenarios - Background Bus Changes		
	Annual Revenue Hours	Annual Revenue Miles	Peak Vehicles
Metro 501	-25,960	-488,565	-8
Total Changes	-25,960	-488,565	-8

Appendix C details the background bus service plan assumptions by period of day and day of week, and resulting operating statistics calculated for each scenario.

3. O&M Cost Estimate

O&M cost models were used to estimate the annual cost to operate, maintain and administer a transit system for a given set of service indicators. O&M costs are expressed as the annual total of employee wages and salaries, fringe benefits, contract services, materials and supplies, utilities and other day-to-day expenses incurred in the operation and maintenance of a transit system. O&M costs include costs directly related to the provision of transit service (e.g., bus operators and mechanics) and an allocation of administrative functions to each mode of service that is related to the provision of transit service (e.g., customer service, finance and accounting).

For the North Hollywood to Pasadena BRT study, two cost models have been applied, as discussed in the separate *O&M Cost Methodology* memorandum. The bus cost model is based on Metro's standard bus service and cost characteristics as submitted for the 2018 National Transit Database (NTD). The BRT cost model is based on Metro G (Orange) Line BRT service and cost characteristics as reflected in 2018, to account for unique BRT expenses associated with stations and/or enhanced stops, ITS features, fare equipment, fare enforcement and security, and dedicated lane and right-of-way maintenance. Some unit costs were factored to account for anticipated differences between existing G (Orange) Line BRT and proposed North Hollywood to Pasadena BRT service and facility characteristics. For example, North Hollywood to Pasadena BRT scenarios are unlikely to require the same level of landscaping/right-of-way maintenance as the Metro G (Orange) Line. The approach is described more fully in a separate *O&M Cost Methodology* report, which was submitted before the subsequent cost model update, using expenses and operating data as submitted for the 2018 NTD.

The bus O&M cost model applied to standard bus service (e.g., local Metro routes) uses the following service supply characteristics as inputs for estimating annual O&M costs:

- Annual Revenue Bus-Hours
- Annual Revenue Bus-Miles
- Peak Buses
- Garages

The BRT O&M cost model uses the following service supply characteristics as inputs for estimating annual O&M costs:

- Annual Revenue Bus-Hours
- Annual Revenue Bus-Miles
- Peak Buses
- BRT Station Platforms
- BRT Directional Lane Miles
- BRT Maintenance Facilities (Garages)

The O&M cost models currently are calibrated to 2018 NTD and 2018 dollars.

3.1. O&M Cost Estimates

Table 6 summarizes Metro's estimated annual O&M costs associated with each scenario. The O&M cost model line item detail is provided in Appendix D (BRT O&M Cost Model results) and Appendix E (Bus O&M Cost Model results).

Table 6 – Metro Annual O&M Cost Estimates (2018 Dollars)

	Annual O&M Cost (2018 Dollars)		
	BRT	Background Bus	Total
Scenario 1 – Street Running (2024 or 2042)	\$18,458,000	-\$4,596,000 to -\$7,297,000	\$11,161,000 to \$13,862,000
Scenario 2 – Street Running with Other Streets (2024 or 2042)	\$18,178,000	-\$4,596,000 to -\$7,297,000	\$10,881,000 to \$13,582,000
Scenario 3 – Freeway Running (2024)	\$16,604,000	-\$2,701,000	\$13,903,000
Scenario 3 – Freeway Running (2042)	\$17,286,000	-\$2,701,000	\$14,585,000

Note: Ranges in Scenarios 1 and 2 depend on Metro 501 potential service changes

The estimated annual cost of BRT service in 2024 ranges from about \$16.6 million for Scenario 3 to \$18.5 million for Scenario 1. This difference is primarily due to Scenario 3 having a faster travel time (requiring fewer buses to operate service), fewer stations, and fewer dedicated lane miles. Again, it is worth noting that Scenario 3 operating costs are expected to increase over time as freeway congestion worsens and travel times degrade.

Modification of Metro 180 is estimated to save around \$4.5 million (costed as directly operated service). If Metro 501 is eliminated, it is estimated to save about \$2.7 million when costed as purchased transportation (contracted service). When accounting for potential background bus savings, Scenarios 1 and 2 end up more than offsetting the higher cost of operating the street-running BRT (with or without Metro 501 savings), as seen in totals reported in Table 6.

As an additional exercise, BRT service statistics were applied to the standard bus O&M cost model to determine the difference in costs if the BRT service were operated as a standard bus. **Table 7. BRT versus Standard Bus Comparison of Annual O&M Cost Estimates (2018 Dollars)** presents the results.

**Table 7 – BRT versus Standard Bus Comparison of Annual O&M Cost Estimates
(2018 Dollars)**

	Annual O&M Cost (2018 Dollars)			
	BRT	BRT as Standard Bus	Difference	BRT Premium
Scenario 1 – Street Running (2024 or 2042)	\$18,458,000	\$15,638,000	\$2,820,000	18.0%
Scenario 2 – Street Running with Other Streets (2024 or 2042)	\$18,178,000	\$15,467,000	\$2,711,000	17.5%
Scenario 3 – Freeway Running (2024)	\$16,604,000	\$14,379,000	\$2,225,000	15.5%
Scenario 3 – Freeway Running (2042)	\$17,286,000	\$14,980,000	\$2,306,000	15.4%

This analysis shows that Scenario 3 adds about a 15-16% premium compared to standard bus service, while Scenarios 1 and 2 add about an 18% premium. Again, the higher premium for the street-running scenarios relate to the increased number of stations and more miles of dedicated lanes compared to the freeway scenario.

Appendix A: BRT Station to Station Travel Times (2024)

Scenario 1 Street Running (2024)				AM Peak	
Station	Station	EB Distance [miles]	WB Distance [miles]	EB Time [minutes]	WB Time [minutes]
North Hollywood Station	Vineland/Hesby	0.8	0.8	0:02:20	0:02:42
Vineland/Hesby	Olive/Riverside	2.8	2.6	0:07:44	0:06:48
Olive/Riverside	Olive/Alameda	0.4	0.4	0:01:47	0:01:46
Olive/Alameda	Olive/Buena Vista	0.5	0.5	0:01:45	0:01:55
Olive/Buena Vista	Olive/Verdugo	0.6	0.6	0:02:13	0:02:15
Olive/Verdugo	Olive/Burbank Metrolink	0.9	0.9	0:02:40	0:02:56
Olive/Burbank Metrolink	Olive/San Fernando	0.3	0.3	0:01:34	0:01:30
Olive/San Fernando	Glenoaks/Alameda	0.9	0.9	0:02:55	0:02:55
Glenoaks/Alameda	Glenoaks/Western	0.6	0.6	0:01:57	0:01:57
Glenoaks/Western	Glenoaks/Grandview	0.6	0.6	0:02:01	0:02:01
Glenoaks/Grandview	Glenoaks/Pacific	1.1	1.1	0:03:00	0:02:54
Glenoaks/Pacific	Central/Lexington	0.9	0.9	0:04:28	0:04:29
Central/Lexington	Broadway/Brand	0.5	0.5	0:02:29	0:02:37
Broadway/Brand	Broadway/Glendale	0.5	0.5	0:02:09	0:02:09
Broadway/Glendale	Broadway/Verdugo	0.7	0.7	0:02:45	0:02:45
Broadway/Verdugo	Colorado/Broadway	0.7	0.7	0:02:42	0:02:31
Colorado/Broadway	Colorado/Eagle Rock	0.7	0.7	0:02:24	0:02:38
Colorado/Eagle Rock	Colorado/Townsend	0.8	0.8	0:02:51	0:02:56
Colorado/Townsend	Memorial Park Station	3.4	3.4	0:08:05	0:08:17
Memorial Park Station	Colorado/Los Robles	0.6	0.6	0:03:06	0:03:27
Colorado/Los Robles	Colorado/Lake	0.5	0.5	0:02:45	0:02:29
Colorado/Lake	Colorado/Hill	0.6	0.6	0:02:56	0:02:56
		19.4 miles	19.2 miles	1:06:32	1:06:50
Average Speed (mph)				17.5	17.3

Line by line travel time information is documented in Microsoft Excel file *NoHo-Pasadena_travel times with TSP_with variability_LOS 2024_v9_values only.xls*

Scenario 2 Street Running on Other Streets (2024)				AM Peak	
Station	Station	EB Distance [miles]	WB Distance [miles]	EB Time [minutes]	WB Time [minutes]
North Hollywood Station	Lankershim/Hesby	0.5	0.5	0:01:45	0:02:01
Lankershim/Hesby	Olive/Riverside	2.8	2.6	0:07:49	0:06:57
Olive/Riverside	Olive/Alameda	0.4	0.4	0:01:47	0:01:46
Olive/Alameda	Olive/Buena Vista	0.5	0.5	0:01:45	0:01:55
Olive/Buena Vista	Olive/Burbank Metrolink	1.5	1.5	0:04:27	0:04:46
Olive/Burbank Metrolink	Olive/San Fernando	0.3	0.3	0:01:34	0:01:30
Olive/San Fernando	Glenoaks/Alameda	0.9	0.9	0:02:55	0:02:55
Glenoaks/Alameda	Glenoaks/Western	0.6	0.6	0:01:57	0:01:57
Glenoaks/Western	Glenoaks/Pacific	1.8	1.8	0:04:28	0:04:13
Glenoaks/Pacific	Central/Lexington	0.9	0.9	0:04:39	0:04:29
Central/Lexington	Central at Americana Way	0.5	0.5	0:02:21	0:02:27
Central at Americana Way	Colorado/Brand	0.3	0.3	0:01:33	0:01:33
Colorado/Brand	Colorado/S. Glendale Ave	0.3	0.3	0:01:39	0:01:37
Colorado/S. Glendale Ave	Colorado/Verdugo Rd.	0.9	0.9	0:03:10	0:03:19
Colorado/Verdugo Rd.	Colorado/Broadway	0.4	0.4	0:02:12	0:02:12
Colorado/Broadway	Colorado/Eagle Rock	0.7	0.7	0:02:24	0:02:38
Colorado/Eagle Rock	Colorado/Townsend	0.8	0.8	0:02:51	0:02:56
Colorado/Townsend	Colorado/Arroyo Pkwy	3.2	3.3	0:08:19	0:09:13
Colorado/Arroyo Pkwy	Colorado/Lake	0.9	0.9	0:04:21	0:04:25
Colorado/Lake	Colorado/Hill	0.6	0.6	0:02:56	0:02:56
		18.6 miles	18.5 miles	1:04:50	1:05:43

Average Speed (mph)

17.2

16.9

Line by line travel time information is documented in Microsoft Excel file *NoHo-Pasadena_travel times with TSP_with variability_LOS 2024_v9_values only.xls*

Scenario 3 Freeway Running (2024)				AM Peak	
Station	Station	EB Distance [miles]	WB Distance [miles]	EB Time [minutes]	WB Time [minutes]
North Hollywood Station	Lankershim/Hesby	0.5	0.5	0:01:45	0:02:01
Lankershim/Hesby	Olive/Riverside	2.8	2.6	0:07:49	0:06:57
Olive/Riverside	Olive/Alameda	0.4	0.4	0:01:47	0:01:46
Olive/Alameda	Olive/Buena Vista	0.5	0.5	0:01:45	0:01:55
Olive/Buena Vista	Olive/Burbank Metrolink	1.5	1.5	0:04:27	0:04:46
Olive/Burbank Metrolink	Olive/San Fernando	0.3	0.3	0:01:34	0:01:30
Olive/San Fernando	Glenoaks/Alameda	0.9	0.9	0:02:55	0:02:55
Glenoaks/Alameda	Glenoaks/Western	0.6	0.6	0:01:57	0:01:57
Glenoaks/Western	Glenoaks/Pacific	1.8	1.8	0:04:28	0:04:13
Glenoaks/Pacific	Central/Sanchez (with station)	0.6	0.7	0:03:04	0:03:07
Central/Sanchez (with station)	Harvey/SR-134 EB off-ramp	1.9	1.7	0:03:49	0:04:22
Harvey/SR-134 EB off-ramp	Colorado/Figueroa St Station	3.0	3.4	0:05:24	0:08:58
Colorado/Figueroa St Station	Memorial Park Station	2.7	2.9	0:06:21	0:08:27
Memorial Park Station	Green/Los Robles	0.8	0.6	0:03:39	0:03:07
Green/Los Robles	Green/Lake	0.5	0.5	0:02:39	0:02:34
Green/Lake	Colorado/Hill	0.7	0.8	0:03:13	0:03:00
		19.3 miles	19.6 miles	0:56:35	1:01:33
Average Speed (mph)				20.5	19.1

Line by line travel time information is documented in Microsoft Excel file *NoHo-Pasadena_travel times with TSP_with variability_LOS 2024_v9_values only.xls*

Appendix B: BRT Station to Station Travel Times (2042)

Scenario 1 Street Running (2042)				AM Peak	
Station	Station	EB Distance [miles]	WB Distance [miles]	EB Time [minutes]	WB Time [minutes]
North Hollywood Station	Vineland/Hesby	0.8	0.8	0:02:20	0:02:42
Vineland/Hesby	Olive/Riverside	2.8	2.6	0:08:18	0:07:30
Olive/Riverside	Olive/Alameda	0.4	0.4	0:01:47	0:01:46
Olive/Alameda	Olive/Buena Vista	0.5	0.5	0:01:47	0:01:57
Olive/Buena Vista	Olive/Verdugo	0.6	0.6	0:02:13	0:02:15
Olive/Verdugo	Olive/Burbank Metrolink	0.9	0.9	0:02:43	0:02:58
Olive/Burbank Metrolink	Olive/San Fernando	0.3	0.3	0:01:34	0:01:30
Olive/San Fernando	Glenoaks/Alameda	0.9	0.9	0:03:02	0:03:02
Glenoaks/Alameda	Glenoaks/Western	0.6	0.6	0:01:57	0:01:57
Glenoaks/Western	Glenoaks/Grandview	0.6	0.6	0:02:01	0:02:01
Glenoaks/Grandview	Glenoaks/Pacific	1.1	1.1	0:03:00	0:02:54
Glenoaks/Pacific	Central/Lexington	0.9	0.9	0:04:39	0:04:32
Central/Lexington	Broadway/Brand	0.5	0.5	0:02:31	0:02:40
Broadway/Brand	Broadway/Glendale	0.5	0.5	0:02:09	0:02:09
Broadway/Glendale	Broadway/Verdugo	0.7	0.7	0:02:48	0:02:45
Broadway/Verdugo	Colorado/Broadway	0.7	0.7	0:02:42	0:02:34
Colorado/Broadway	Colorado/Eagle Rock	0.7	0.7	0:02:27	0:02:40
Colorado/Eagle Rock	Colorado/Townsend	0.8	0.8	0:02:51	0:02:56
Colorado/Townsend	Memorial Park Station	3.4	3.4	0:09:52	0:10:09
Memorial Park Station	Colorado/Los Robles	0.6	0.6	0:03:03	0:03:24
Colorado/Los Robles	Colorado/Lake	0.5	0.5	0:02:45	0:02:29
Colorado/Lake	Colorado/Hill	0.6	0.6	0:02:56	0:02:56
		19.4 miles	19.2 miles	1:09:23	1:09:45

Average Speed (mph)

16.7

16.5

Line by line travel time information is documented in Microsoft Excel file *NoHo-Pasadena_travel times with TSP_with variability_LOS 2042_v9_values only.xls*

Scenario 2 Street Running with Other Streets (2042)				AM Peak	
Station	Station	EB Distance [miles]	WB Distance [miles]	EB Time [minutes]	WB Time [minutes]
North Hollywood Station	Lankershim/Hesby	0.5	0.5	0:01:45	0:02:01
Lankershim/Hesby	Olive/Riverside	2.8	2.6	0:08:23	0:07:39
Olive/Riverside	Olive/Alameda	0.4	0.4	0:01:47	0:01:46
Olive/Alameda	Olive/Buena Vista	0.5	0.5	0:01:47	0:01:57
Olive/Buena Vista	Olive/Burbank Metrolink	1.5	1.5	0:04:43	0:04:48
Olive/Burbank Metrolink	Olive/San Fernando	0.3	0.3	0:01:34	0:01:30
Olive/San Fernando	Glen Oaks/Alameda	0.9	0.9	0:03:02	0:03:02
Glen Oaks/Alameda	Glen Oaks/Western	0.6	0.6	0:01:57	0:01:57
Glen Oaks/Western	Glen Oaks/Pacific	1.8	1.8	0:04:28	0:04:24
Glen Oaks/Pacific	Central/Lexington	0.9	0.9	0:04:50	0:04:45
Central/Lexington	Central at Americana Way	0.5	0.5	0:02:21	0:02:27
Central at Americana Way	Colorado/Brand	0.3	0.3	0:01:33	0:01:33
Colorado/Brand	Colorado/S. Glendale Ave	0.3	0.3	0:01:41	0:01:39
Colorado/S. Glendale Ave	Colorado/Verdugo Rd.	0.9	0.9	0:03:12	0:03:22
Colorado/Verdugo Rd.	Colorado/Broadway	0.4	0.4	0:02:12	0:02:12
Colorado/Broadway	Colorado/Eagle Rock	0.7	0.7	0:02:27	0:02:40
Colorado/Eagle Rock	Colorado/Townsend	0.8	0.8	0:02:51	0:02:56
Colorado/Townsend	Colorado/Arroyo Pkwy	3.2	3.3	0:08:42	0:11:17
Colorado/Arroyo Pkwy	Colorado/Lake	0.9	0.9	0:04:21	0:04:16
Colorado/Lake	Colorado/Hill	0.6	0.6	0:02:56	0:02:56
		18.6 miles	18.5 miles	1:06:31	1:09:06

Average Speed (mph)

16.8

16.1

Line by line travel time information is documented in Microsoft Excel file *NoHo-Pasadena_travel times with TSP_with variability_LOS 2042_v9_values only.xls*

Scenario 3 Freeway Running (2042)				AM Peak	
Station	Station	EB Distance [miles]	WB Distance [miles]	EB Time [minutes]	WB Time [minutes]
North Hollywood Station	Lankershim/Hesby	0.5	0.5	0:01:45	0:02:01
Lankershim/Hesby	Olive/Riverside	2.8	2.6	0:08:23	0:07:39
Olive/Riverside	Olive/Alameda	0.4	0.4	0:01:47	0:01:46
Olive/Alameda	Olive/Buena Vista	0.5	0.5	0:01:47	0:01:57
Olive/Buena Vista	Olive/Burbank Metrolink	1.5	1.5	0:04:43	0:04:48
Olive/Burbank Metrolink	Olive/San Fernando	0.3	0.3	0:01:34	0:01:30
Olive/San Fernando	Glen Oaks/Alameda	0.9	0.9	0:03:02	0:03:02
Glen Oaks/Alameda	Glen Oaks/Western	0.6	0.6	0:01:57	0:01:57
Glen Oaks/Western	Glen Oaks/Pacific	1.8	1.8	0:04:28	0:04:24
Glen Oaks/Pacific	Central/Sanchez (with station)	0.6	0.7	0:03:07	0:03:09
Central/Sanchez (with station)	Harvey/SR-134 EB off-ramp	1.9	1.7	0:04:16	0:04:56
Harvey/SR-134 EB off-ramp	Colorado/Figueroa St Station	3.0	3.4	0:06:07	0:10:02
Colorado/Figueroa St Station	Memorial Park Station	2.7	2.9	0:06:39	0:09:46
Memorial Park Station	Green/Los Robles	0.8	0.6	0:03:42	0:03:14
Green/Los Robles	Green/Lake	0.5	0.5	0:02:39	0:02:34
Green/Lake	Colorado/Hill	0.7	0.8	0:03:13	0:03:03
		19.3 miles	19.6 miles	0:59:08	1:05:47
Average Speed (mph)				19.6	17.9

Line by line travel time information is documented in Microsoft Excel file *NoHo-Pasadena_travel times with TSP_with variability_LOS 2042_v9_values only.xls*

Appendix C: BRT Operating Statistics

Scenario 1 - Street Running

based on 2024 runtimes

		One-way Distance	One-way travel time		Headway							Operating Hours							Total Hours
	Day		Peak	Base	Early	AM	MID	PM	E Eve	Eve	L Eve	Early	AM	MID	PM	E Eve	Eve	L Eve	
North Hollywood to Pasadena	Monday-Thursday	19.29	66.7 min	66.7 min	20	10	10	10	15	20	20	2.0	3.0	6.0	4.0	2.0	3.0	1.0	21.0
	Friday		66.7 min	66.7 min	20	10	10	10	15	20	20	2.0	3.0	6.0	4.0	2.0	3.0	3.0	23.0
	Saturday		66.7 min	66.7 min	30	15	15	15	15	30	30	2.0	3.0	6.0	4.0	2.0	3.0	3.0	23.0
	Sunday/Holiday		66.7 min	66.7 min	30	15	15	15	15	30	30	2.0	3.0	6.0	4.0	2.0	3.0	1.0	21.0

Day	One-way daily bus trips							Total Trips
	Early	AM	MID	PM	E Eve	Eve	L Eve	
North Hollywood to Pasadena	Monday-Thursday	12	36	72	48	16	18	208
	Friday	12	36	72	48	16	18	220
	Saturday	8	24	48	32	16	12	152
	Sunday/Holiday	8	24	48	32	16	12	144

Daily			Annual	
Rev.-Hr.	Rev.-Mi.	Pk Veh.	Rev.-Hr.	Rev.-Mi.
270	4,012	16.0	54,800	814,400
270	4,243	16.0	14,000	220,600
195	2,932	11.0	10,100	152,400
195	2,777	11.0	11,300	161,100
TOTALS		16	90,200	1,348,500

based on 2042 runtimes

		One-way Distance	One-way travel time			Headway						Operating Hours							Total Hours
	Day		Peak	Base	Early	AM	MID	PM	E Eve	Eve	L Eve	Early	AM	MID	PM	E Eve	Eve	L Eve	Hours
North Hollywood to Pasadena	Monday-Thursday	19.29	69.6 min	69.6 min	20	10	10	10	15	20	20	2.0	3.0	6.0	4.0	2.0	3.0	1.0	21.0
	Friday		69.6 min	69.6 min	20	10	10	10	15	20	20	2.0	3.0	6.0	4.0	2.0	3.0	3.0	23.0
	Saturday		69.6 min	69.6 min	30	15	15	15	15	30	30	2.0	3.0	6.0	4.0	2.0	3.0	3.0	23.0
	Sunday/Holiday		69.6 min	69.6 min	30	15	15	15	15	30	30	2.0	3.0	6.0	4.0	2.0	3.0	1.0	21.0

Day	One-way daily bus trips							Total Trips
	Early	AM	MID	PM	E Eve	Eve	L Eve	
North Hollywood to Pasadena	Monday-Thursday	12	36	72	48	16	18	208
	Friday	12	36	72	48	16	18	220
	Saturday	8	24	48	32	16	12	152
	Sunday/Holiday	8	24	48	32	16	12	144

Daily			Annual	
Rev.-Hr.	Rev.-Mi.	Pk Veh.	Rev.-Hr.	Rev.-Mi.
270	4,012	16.0	54,800	814,400
270	4,243	16.0	14,000	220,600
195	2,932	11.0	10,100	152,400
195	2,777	11.0	11,300	161,100
TOTALS		16	90,200	1,348,500

Scenario 2 - Street Running with Other Streets

based on 2024 runtimes

	Day	One-way Distance	One-way travel time		Headway							Operating Hours							Total Hours
			Peak	Base	Early	AM	MID	PM	E Eve	Eve	L Eve	Early	AM	MID	PM	E Eve	Eve	L Eve	
North Hollywood to Pasadena	Monday-Thursday	18.57	65.3 min	65.3 min	20	10	10	10	15	20	20	2.0	3.0	6.0	4.0	2.0	3.0	1.0	21.0
	Friday		65.3 min	65.3 min	20	10	10	10	15	20	20	2.0	3.0	6.0	4.0	2.0	3.0	3.0	23.0
	Saturday		65.3 min	65.3 min	30	15	15	15	15	30	30	2.0	3.0	6.0	4.0	2.0	3.0	3.0	23.0
	Sunday/Holiday		65.3 min	65.3 min	30	15	15	15	15	30	30	2.0	3.0	6.0	4.0	2.0	3.0	1.0	21.0

		One-way daily bus trips							Total Trips
		Early	AM	MID	PM	E Eve	Eve	L Eve	
North Hollywood to Pasadena	Monday-Thursday	12	36	72	48	16	18	6	208
	Friday	12	36	72	48	16	18	18	220
	Saturday	8	24	48	32	16	12	12	152
	Sunday/Holiday	8	24	48	32	16	12	4	144

Daily			Annual	
Rev.-Hr.	Rev.-Mi.	Pk Veh.	Rev.-Hr.	Rev.-Mi.
270	3,863	16.0	54,800	784,200
270	4,086	16.0	14,000	212,500
195	2,823	11.0	10,100	146,800
195	2,674	11.0	11,300	155,100
TOTALS		16	90,200	1,298,600

based on 2042 runtimes

	Day	One-way Distance	One-way travel time		Headway							Operating Hours							Total Hours
			Peak	Base	Early	AM	MID	PM	E Eve	Eve	L Eve	Early	AM	MID	PM	E Eve	Eve	L Eve	
North Hollywood to Pasadena	Monday-Thursday	18.57	67.8 min	67.8 min	20	10	10	10	15	20	20	2.0	3.0	6.0	4.0	2.0	3.0	1.0	21.0
	Friday		67.8 min	67.8 min	20	10	10	10	15	20	20	2.0	3.0	6.0	4.0	2.0	3.0	3.0	23.0
	Saturday		67.8 min	67.8 min	30	15	15	15	15	30	30	2.0	3.0	6.0	4.0	2.0	3.0	3.0	23.0
	Sunday/Holiday		67.8 min	67.8 min	30	15	15	15	15	30	30	2.0	3.0	6.0	4.0	2.0	3.0	1.0	21.0

		One-way daily bus trips							Total Trips
		Early	AM	MID	PM	E Eve	Eve	L Eve	
North Hollywood to Pasadena	Monday-Thursday	12	36	72	48	16	18	6	208
	Friday	12	36	72	48	16	18	18	220
	Saturday	8	24	48	32	16	12	12	152
	Sunday/Holiday	8	24	48	32	16	12	4	144

Daily			Annual	
Rev.-Hr.	Rev.-Mi.	Pk Veh.	Rev.-Hr.	Rev.-Mi.
270	3,863	16.0	54,800	784,200
270	4,086	16.0	14,000	212,500
195	2,823	11.0	10,100	146,800
195	2,674	11.0	11,300	155,100
TOTALS		16	90,200	1,298,600

Scenario 3 - Freeway Running

based on 2024 runtimes

		One-way Distance	One-way travel time		Headway								Operating Hours								Total Hours
	Day		Peak	Base	Early	AM	MID	PM	E Eve	Eve	L Eve	Early	AM	MID	PM	E Eve	Eve	L Eve			
North Hollywood to Pasadena	Monday-Thursday	19.48	59.1 min	59.1 min	20	10	10	10	15	20	20	2.0	3.0	6.0	4.0	2.0	3.0	1.0	21.0		
	Friday		59.1 min	59.1 min	20	10	10	10	15	20	20	2.0	3.0	6.0	4.0	2.0	3.0	3.0	23.0		
	Saturday		59.1 min	59.1 min	30	15	15	15	15	30	30	2.0	3.0	6.0	4.0	2.0	3.0	3.0	23.0		
	Sunday/Holiday		59.1 min	59.1 min	30	15	15	15	15	30	30	2.0	3.0	6.0	4.0	2.0	3.0	1.0	21.0		

		One-way daily bus trips							Total Trips
		Early	AM	MID	PM	E Eve	Eve	L Eve	
North Hollywood to Pasadena	Monday-Thursday	12	36	72	48	16	18	6	208
	Friday	12	36	72	48	16	18	18	220
	Saturday	8	24	48	32	16	12	12	152
	Sunday/Holiday	8	24	48	32	16	12	4	144

Rev.-Hr.	Daily		Pk Veh.	Annual	
	Rev.-Mi.	Rev.-Hr.		Rev.-Hr.	Rev.-Mi.
237	4,051	14.0	48,100	822,300	
237	4,285	14.0	12,300	222,800	
175	2,960	10.0	9,100	153,900	
175	2,804	10.0	10,200	162,700	
TOTALS		14	79,700	1,361,700	

based on 2042 runtimes

	One-way Distance	One-way travel time		Headway								Operating Hours								Total Hours
Day		Peak	Base	Early	AM	MID	PM	E Eve	Eve	L Eve	Early	AM	MID	PM	E Eve	Eve	L Eve			
North Hollywood to Pasadena	Monday-Thursday	19.48	62.5 min	62.5 min	20	10	10	10	15	20	20	2.0	3.0	6.0	4.0	2.0	3.0	1.0	21.0	
	Friday		62.5 min	62.5 min	20	10	10	10	15	20	20	2.0	3.0	6.0	4.0	2.0	3.0	3.0	23.0	
	Saturday		62.5 min	62.5 min	30	15	15	15	15	30	30	2.0	3.0	6.0	4.0	2.0	3.0	3.0	23.0	
	Sunday/Holiday		62.5 min	62.5 min	30	15	15	15	15	30	30	2.0	3.0	6.0	4.0	2.0	3.0	1.0	21.0	

		One-way daily bus trips							Total Trips
		Early	AM	MID	PM	E Eve	Eve	L Eve	
North Hollywood to Pasadena	Monday-Thursday	12	36	72	48	16	18	6	208
	Friday	12	36	72	48	16	18	18	220
	Saturday	8	24	48	32	16	12	12	152
	Sunday/Holiday	8	24	48	32	16	12	4	144

Rev.-Hr.	Daily		Pk Veh.	Annual	
	Rev.-Mi.	Rev.-Hr.		Rev.-Hr.	Rev.-Mi.
255	4,051	15.0	51,800	822,300	
255	4,285	15.0	13,300	222,800	
175	2,960	10.0	9,100	153,900	
175	2,804	10.0	10,200	162,700	
TOTALS		15	84,400	1,361,700	

Appendix D: Background Bus Operating Statistics

Route	Alternative	Description	Day of week	Direction	SERVICE SPAN					FREQUENCY					TRAVEL TIME				DAILY STATS		ANNUAL STATS		AM Peak Vehicle	PM Peak Vehicle				
					EARLY	AM PK	MID	PM PK	EVE	NIGHT	EARLY	AM PK	MID	PM PK	EVE	NIGHT	One-way Trips	One-way trip length	Trip Length	Est. speed	Layover Percent	Cycle Time			Rev Hrs	Rev Miles	Rev Hrs	Rev Miles
NextGen Baseline																												
180 eb	NextGen Base	180	Weekday	1	2.0	3.0	6.0	4.0	2.0	7.0	20	7.5	7.5	7.5	10	42	132.0	21.4	21.4	10.6	15%	140	270	2,829	68,723	721,334	14.5	19.0
180 wb	NextGen Base	180	Weekday	1	2.0	3.0	6.0	4.0	2.0	7.0	20	7.5	7.5	7.5	10	42	132.0	21.4	21.4	10.6	15%	140	254	2,829	64,643	721,334	13.5	17.5
180 eb	NextGen Base	180	Saturday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	161	1,672	8,346	86,920		
180 wb	NextGen Base	180	Saturday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	143	1,672	7,410	86,920		
180 eb	NextGen Base	180	Sunday/Holiday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	172	1,672	9,947	96,949		
180 wb	NextGen Base	180	Sunday/Holiday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	154	1,672	8,903	96,949		
501 eb	NextGen Base	501	Weekday	1	1.0	3.0	6.0	4.0	3.0	1.0	30.0	15.0	30.0	15.0	30.0	60.0	49.0	16.5	16.5	20.1	15%	57	44	809	11,220	206,168	3.5	4.0
501 wb	NextGen Base	501	Weekday	1	1.0	3.0	6.0	4.0	3.0	1.0	30.0	15.0	30.0	15.0	30.0	60.0	49.0	16.5	16.5	20.9	15%	54	44	809	11,220	206,168	3.5	4.0
501 eb	NextGen Base	501	Weekend/Holiday	1	0.0	3.0	6.0	4.0	3.0	0.0	0	45	45	48	45	0	21.0	16.5	16.5	28.7	15%	40	16	347	1,760	38,115		
501 wb	NextGen Base	501	Weekend/Holiday	1	0.0	3.0	6.0	4.0	3.0	0.0	0	45	45	48	45	0	21.0	16.5	16.5	28.7	15%	40	16	347	1,760	38,115		
SCENARIO 1: STREET RUNNING																												
180 eb	Scenario 1	180	Weekday	1	2.0	3.0	6.0	4.0	2.0	7.0	20	15.0	15.0	15.0	10	42	80.0	21.4	21.4	10.6	15%	140	160	1,714	40,673	437,172	7.5	9.5
180 wb	Scenario 1	180	Weekday	1	2.0	3.0	6.0	4.0	2.0	7.0	20	15.0	15.0	15.0	10	42	80.0	21.4	21.4	10.6	15%	140	152	1,714	38,760	437,172	7.0	9.0
180 eb	Scenario 1	180	Saturday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	161	1,672	8,346	86,920		
180 wb	Scenario 1	180	Saturday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	143	1,672	7,410	86,920		
180 eb	Scenario 1	180	Sunday/Holiday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	172	1,672	9,947	96,949		
180 wb	Scenario 1	180	Sunday/Holiday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	154	1,672	8,903	96,949		
180 SL eb	Scenario 1	180 SL	Weekday	1	2.0	3.0	6.0	4.0	2.0	7.0	0	15	15	15	0	0	52.0	10.0	10.0	10.6	15%	65	56	520	14,153	132,600	3.5	4.5
180 SL wb	Scenario 1	180 SL	Weekday	1	2.0	3.0	6.0	4.0	2.0	7.0	0	15	15	15	0	0	52.0	10.0	10.0	10.6	15%	65	53	520	13,388	132,600	3.5	4.5
SCENARIO 2: STREET RUNNING WITH OTHER STREETS																												
180 eb	Scenario 2	180	Weekday	1	2.0	3.0	6.0	4.0	2.0	7.0	20	15.0	15.0	15.0	10	42	80.0	21.4	21.4	10.6	15%	140	160	1,714	40,673	437,172	7.5	9.5
180 wb	Scenario 2	180	Weekday	1	2.0	3.0	6.0	4.0	2.0	7.0	20	15.0	15.0	15.0	10	42	80.0	21.4	21.4	10.6	15%	140	152	1,714	38,760	437,172	7.0	9.0
180 eb	Scenario 2	180	Saturday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	161	1,672	8,346	86,920		
180 wb	Scenario 2	180	Saturday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	143	1,672	7,410	86,920		
180 eb	Scenario 2	180	Sunday/Holiday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	172	1,672	9,947	96,949		
180 wb	Scenario 2	180	Sunday/Holiday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	154	1,672	8,903	96,949		
180 SL eb	Scenario 2	180 SL	Weekday	1	2.0	3.0	6.0	4.0	2.0	7.0	0	15	15	15	0	0	52.0	10.0	10.0	10.6	15%	65	56	520	14,153	132,600	3.5	4.5
180 SL wb	Scenario 2	180 SL	Weekday	1	2.0	3.0	6.0	4.0	2.0	7.0	0	15	15	15	0	0	52.0	10.0	10.0	10.6	15%	65	53	520	13,388	132,600	3.5	4.5
SCENARIO 3: FREEWAY RUNNING																												
180 eb	Scenario 3	180	Weekday	1	2.0	3.0	6.0	4.0	2.0	7.0	20	7.5	7.5	7.5	10	42	132.0	21.4	21.4	10.6	15%	140	270	2,829	68,723	721,334	14.5	19.0
180 wb	Scenario 3	180	Weekday	1	2.0	3.0	6.0	4.0	2.0	7.0	20	7.5	7.5	7.5	10	42	132.0	21.4	21.4	10.6	15%	140	254	2,829	64,643	721,334	13.5	17.5
180 eb	Scenario 3	180	Saturday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	161	1,672	8,346	86,920		
180 wb	Scenario 3	180	Saturday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	143	1,672	7,410	86,920		
180 eb	Scenario 3	180	Sunday/Holiday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	172	1,672	9,947	96,949		
180 wb	Scenario 3	180	Sunday/Holiday	1	2.0	3.0	6.0	4.0	2.0	7.0	30	15	15	15	15	30	78.0	21.4	21.4	10.6	15%	140	154	1,672	8,903	96,949		

Appendix E: BRT O&M Cost Model Detail by Scenario

BRT O&M COST MODEL

Scenario 1

Expense Line Item	2018 RB Expenses	Supply Variable Unit Cost (\$2018)							Inflate Factor	1.0000
		D.O. Rev. Bus-Hours	D.O. Rev. Bus-Miles	D.O. Peak Buses	BRT Stations	Dir. Lane Miles	Maint. Facilities	Fixed	Inflation Factor	Estimated Annual Cost (VOE \$)
VEHICLE OPERATIONS	\$22,151,808									\$10,442,819
Operators' Salaries and Wages	\$4,120,870	\$37.32							1.000	\$3,366,019
Other Salaries and Wages	\$1,153,916	\$3.83		\$6,892.14			\$942,284.86		1.000	\$566,903
Fringe Benefits	\$4,226,053	\$33.23		\$5,565.57			\$760,917.79		1.000	\$3,175,930
Service Costs	\$11,751,627	\$22.19		\$17,058.81	\$11,017.15				1.000	\$2,770,604
Fuel and Lubricants	\$603,889		\$0.29						1.000	\$386,205
Tires and Tubes	\$221,595		\$0.11						1.000	\$152,738
Other Materials and Supplies	\$64,652		\$0.01	\$414.71					1.000	\$21,575
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$9,206						\$24,080.55		1.000	\$2,846
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
VEHICLE MAINTENANCE	\$3,498,997									\$4,536,492
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$1,264,269	\$4.40	\$1.27						1.000	\$2,110,263
Fringe Benefits	\$972,007	\$3.32	\$0.96						1.000	\$1,592,023
Service Costs	\$73,685	\$0.12	\$0.03						1.000	\$57,624
Fuel and Lubricants	\$87,793		\$0.04						1.000	\$56,131
Tires and Tubes	\$4,403		\$0.00						1.000	\$3,035
Other Materials and Supplies	\$1,093,257		\$0.37	\$13,768.54					1.000	\$716,309
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$3,583						\$9,372.03		1.000	\$1,107
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
NON-VEHICLE MAINTENANCE	\$3,555,588									\$934,276
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$439,774			\$3,476.87			\$475,353	\$43,977	1.000	\$111,802
Fringe Benefits	\$348,629			\$2,673.92			\$365,575	\$34,863	1.000	\$85,982
Service Costs	\$2,657,857				\$6,229	\$17,334			1.000	\$691,306
Fuel and Lubricants	\$0								1.000	\$0
Tires and Tubes	\$0								1.000	\$0
Other Materials and Supplies	\$109,328		\$0.02	\$868.54					1.000	\$45,186
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$0								1.000	\$0
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
GENERAL ADMINISTRATION	\$5,070,469									\$2,544,410
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$1,435,484	\$4.50		\$16,192				\$143,548	1.000	\$664,650
Fringe Benefits	\$848,362	\$3.15		\$11,340				\$84,836	1.000	\$465,509
Service Costs	\$1,856,347	\$3.42		\$12,328				\$185,635	1.000	\$506,056
Fuel and Lubricants	\$0								1.000	\$0
Tires and Tubes	\$0								1.000	\$0
Other Materials and Supplies	\$48,467		\$0.05	\$1,907.40					1.000	\$99,232
Utilities	\$554,031						\$1,418,612		1.000	\$167,635
Casualty and Liability Costs	\$172,609		\$0.27	\$9,957					1.000	\$517,996
Taxes	\$39,058						\$102,170		1.000	\$12,073
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$116,111						\$941,515		1.000	\$111,257
TOTALS IN 2018 DOLLARS	\$34,276,862	\$115.48	\$3.43	\$102,443	\$17,247	\$17,334	\$5,039,881	\$492,860		
TOTALS IN SPECIFIED YEAR DOLLARS	\$34,276,862	\$115.48	\$3.43	\$102,443	\$17,247	\$17,334	\$5,039,881	\$492,860		\$18,457,997
2018 Resource Variable Values		119,137	1,943,594	31	32	35	0.2	1.0		
									DO Rev. Bus-Hrs.	90,200
									DO Rev. Bus-Mi.	1,348,500
									DO Peak Buses	16
									BRT Stations	45
									Dir. Lane Miles	24
									Garages	0.12

Note: Unit costs shown in Red are based on factored LACMTA BRT unit costs

Operating Statistics and O&M Costs Report
North Hollywood to Pasadena BRT Corridor P&E Study

Contract Number AE49369000
June 11, 2020

BRT O&M COST MODEL

Scenario 2

Expense Line Item	2018 RB Expenses	Supply Variable Unit Cost (\$2018)							Inflate Factor 1.0000	
		D.O. Rev. Bus-Hours	D.O. Rev. Bus-Miles	D.O. Peak Buses	BRT Stations	Dir. Lane Miles	Maint. Facilities	Fixed	Inflation Factor	Estimated Annual Cost (YOE \$)
VEHICLE OPERATIONS	\$22,151,808									\$10,378,254
Operators' Salaries and Wages	\$4,120,870	\$37.32							1.000	\$3,366,019
Other Salaries and Wages	\$1,153,916	\$3.83		\$6,892.14			\$942,284.86		1.000	\$566,903
Fringe Benefits	\$4,226,053	\$33.23		\$5,565.57			\$760,917.79		1.000	\$3,175,930
Service Costs	\$11,751,627	\$22.19		\$17,058.81	\$11,017.15				1.000	\$2,726,535
Fuel and Lubricants	\$603,889		\$0.29						1.000	\$371,913
Tires and Tubes	\$221,595		\$0.11						1.000	\$147,086
Other Materials and Supplies	\$64,652		\$0.01	\$414.71					1.000	\$21,022
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$9,206						\$24,080.55		1.000	\$2,846
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
VEHICLE MAINTENANCE	\$3,498,997									\$4,402,996
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$1,264,269	\$4.40	\$1.27						1.000	\$2,046,868
Fringe Benefits	\$972,007	\$3.32	\$0.96						1.000	\$1,544,196
Service Costs	\$73,685	\$0.12	\$0.03						1.000	\$55,893
Fuel and Lubricants	\$87,793		\$0.04						1.000	\$54,054
Tires and Tubes	\$4,403		\$0.00						1.000	\$2,923
Other Materials and Supplies	\$1,093,257		\$0.37	\$13,768.54					1.000	\$697,954
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$3,583						\$9,372.03		1.000	\$1,107
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
NON-VEHICLE MAINTENANCE	\$3,555,588									\$867,986
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$439,774			\$3,476.87			\$475,353	\$43,977	1.000	\$111,802
Fringe Benefits	\$348,629			\$2,673.92			\$365,575	\$34,863	1.000	\$85,982
Service Costs	\$2,657,857				\$6,229	\$17,334			1.000	\$626,174
Fuel and Lubricants	\$0								1.000	\$0
Tires and Tubes	\$0								1.000	\$0
Other Materials and Supplies	\$109,328		\$0.02	\$868.54					1.000	\$44,028
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$0								1.000	\$0
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
GENERAL ADMINISTRATION	\$5,070,469									\$2,528,594
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$1,435,484	\$4.50		\$16,192				\$143,548	1.000	\$664,650
Fringe Benefits	\$848,362	\$3.15		\$11,340				\$84,836	1.000	\$465,509
Service Costs	\$1,856,347	\$3.42		\$12,328				\$185,635	1.000	\$506,056
Fuel and Lubricants	\$0								1.000	\$0
Tires and Tubes	\$0								1.000	\$0
Other Materials and Supplies	\$48,467		\$0.05	\$1,907.40					1.000	\$96,690
Utilities	\$554,031						\$1,418,612		1.000	\$167,635
Casualty and Liability Costs	\$172,609		\$0.27	\$9,957					1.000	\$504,723
Taxes	\$39,058						\$102,170		1.000	\$12,073
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$116,111						\$941,515		1.000	\$111,257
TOTALS IN 2018 DOLLARS	\$34,276,862	\$115.48	\$3.43	\$102,443	\$17,247	\$17,334	\$5,039,881	\$492,860		
TOTALS IN SPECIFIED YEAR DOLLARS	\$34,276,862	\$115.48	\$3.43	\$102,443	\$17,247	\$17,334	\$5,039,881	\$492,860		\$18,177,830
2018 Resource Variable Values		119,137	1,943,594	31	32	35	0.2	1.0		
									DO Rev. Bus-Hrs.	90,200
									DO Rev. Bus-Mi.	1,298,600
									DO Peak Buses	16
									BRT Stations	41
									Dir. Lane Miles	21
									Garages	0.12

Note: Unit costs shown in Red are based on factored LACMTA BRT unit costs

BRT O&M COST MODEL

Scenario 3 - 2024

Expense Line Item	2018 RB Expenses	Supply Variable Unit Cost (\$2018)							Inflate Factor	1.0000
		D.O. Rev. Bus-Hours	D.O. Rev. Bus-Miles	D.O. Peak Buses	BRT Stations	Dir. Lane Miles	Maint. Facilities	Fixed	Inflation Factor	Estimated Annual Cost (YOE \$)
VEHICLE OPERATIONS	\$22,151,808									\$9,205,710
Operators' Salaries and Wages	\$4,120,870	\$37.32							1.000	\$2,974,187
Other Salaries and Wages	\$1,153,916	\$3.83		\$6,892.14			\$942,284.86		1.000	\$499,007
Fringe Benefits	\$4,226,053	\$33.23		\$5,565.57			\$760,917.79		1.000	\$2,804,688
Service Costs	\$11,751,627	\$22.19		\$17,058.81	\$11,017.15				1.000	\$2,360,227
Fuel and Lubricants	\$603,889		\$0.29						1.000	\$389,985
Tires and Tubes	\$221,595		\$0.11						1.000	\$154,233
Other Materials and Supplies	\$64,652		\$0.01	\$414.71					1.000	\$20,892
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$9,206						\$24,080.55		1.000	\$2,490
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
VEHICLE MAINTENANCE	\$3,498,997									\$4,461,775
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$1,264,269	\$4.40	\$1.27						1.000	\$2,080,811
Fringe Benefits	\$972,007	\$3.32	\$0.96						1.000	\$1,569,803
Service Costs	\$73,685	\$0.12	\$0.03						1.000	\$56,820
Fuel and Lubricants	\$87,793		\$0.04						1.000	\$56,681
Tires and Tubes	\$4,403		\$0.00						1.000	\$3,065
Other Materials and Supplies	\$1,093,257		\$0.37	\$13,768.54					1.000	\$693,627
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$3,583						\$9,372.03		1.000	\$969
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
NON-VEHICLE MAINTENANCE	\$3,555,588									\$643,749
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$439,774			\$3,476.87			\$475,353	\$43,977	1.000	\$97,826
Fringe Benefits	\$348,629			\$2,673.92			\$365,575	\$34,863	1.000	\$75,234
Service Costs	\$2,657,857				\$6,229	\$17,334			1.000	\$426,933
Fuel and Lubricants	\$0								1.000	\$0
Tires and Tubes	\$0								1.000	\$0
Other Materials and Supplies	\$109,328		\$0.02	\$868.54					1.000	\$43,755
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$0								1.000	\$0
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
GENERAL ADMINISTRATION	\$5,070,469									\$2,292,546
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$1,435,484	\$4.50		\$16,192				\$143,548	1.000	\$585,053
Fringe Benefits	\$848,362	\$3.15		\$11,340				\$84,836	1.000	\$409,761
Service Costs	\$1,856,347	\$3.42		\$12,328				\$185,635	1.000	\$445,452
Fuel and Lubricants	\$0								1.000	\$0
Tires and Tubes	\$0								1.000	\$0
Other Materials and Supplies	\$48,467		\$0.05	\$1,907.40					1.000	\$96,090
Utilities	\$554,031						\$1,418,612		1.000	\$146,681
Casualty and Liability Costs	\$172,609		\$0.27	\$9,957					1.000	\$501,594
Taxes	\$39,058						\$102,170		1.000	\$10,564
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$116,111						\$941,515		1.000	\$97,350
TOTALS IN 2018 DOLLARS	\$34,276,862	\$115.48	\$3.43	\$102,443	\$17,247	\$17,334	\$5,039,881	\$492,860		
TOTALS IN SPECIFIED YEAR DOLLARS	\$34,276,862	\$115.48	\$3.43	\$102,443	\$17,247	\$17,334	\$5,039,881	\$492,860		\$16,603,779
2018 Resource Variable Values		119,137	1,943,594	31	32	35	0.2	1.0		
									DO Rev. Bus-Hrs.	79,700
									DO Rev. Bus-Mi.	1,361,700
									DO Peak Buses	14
									BRT Stations	32
									Dir. Lane Miles	13
									Garages	0.10

Note: Unit costs shown in Red are based on factored LACMTA BRT unit costs

Operating Statistics and O&M Costs Report
North Hollywood to Pasadena BRT Corridor P&E Study

Contract Number AE49369000
June 11, 2020

BRT O&M COST MODEL

Scenario 3 - 2042

Expense Line Item	2018 RB Expenses	Supply Variable Unit Cost (\$2018)							Inflate Factor	1.0000
		D.O. Rev. Bus-Hours	D.O. Rev. Bus-Miles	D.O. Peak Buses	BRT Stations	Dir. Lane Miles	Maint. Facilities	Fixed	Inflation Factor	Estimated Annual Cost (YOE \$)
VEHICLE OPERATIONS	\$22,151,808									\$9,702,253
Operators' Salaries and Wages	\$4,120,870	\$37.32							1.000	\$3,149,579
Other Salaries and Wages	\$1,153,916	\$3.83		\$6,892.14			\$942,284.86		1.000	\$530,850
Fringe Benefits	\$4,226,053	\$33.23		\$5,565.57			\$760,917.79		1.000	\$2,972,035
Service Costs	\$11,751,627	\$22.19		\$17,058.81	\$11,017.15				1.000	\$2,481,597
Fuel and Lubricants	\$603,889		\$0.29						1.000	\$389,985
Tires and Tubes	\$221,595		\$0.11						1.000	\$154,233
Other Materials and Supplies	\$64,652		\$0.01	\$414.71					1.000	\$21,307
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$9,206						\$24,080.55		1.000	\$2,668
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
VEHICLE MAINTENANCE	\$3,498,997									\$4,512,476
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$1,264,269	\$4.40	\$1.27						1.000	\$2,101,501
Fringe Benefits	\$972,007	\$3.32	\$0.96						1.000	\$1,585,412
Service Costs	\$73,685	\$0.12	\$0.03						1.000	\$57,385
Fuel and Lubricants	\$87,793		\$0.04						1.000	\$56,681
Tires and Tubes	\$4,403		\$0.00						1.000	\$3,065
Other Materials and Supplies	\$1,093,257		\$0.37	\$13,768.54					1.000	\$707,395
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$3,583						\$9,372.03		1.000	\$1,038
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
NON-VEHICLE MAINTENANCE	\$3,555,588									\$656,979
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$439,774			\$3,476.87			\$475,353	\$43,977	1.000	\$104,814
Fringe Benefits	\$348,629			\$2,673.92			\$365,575	\$34,863	1.000	\$80,608
Service Costs	\$2,657,857				\$6,229	\$17,334			1.000	\$426,933
Fuel and Lubricants	\$0								1.000	\$0
Tires and Tubes	\$0								1.000	\$0
Other Materials and Supplies	\$109,328		\$0.02	\$868.54					1.000	\$44,624
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$0								1.000	\$0
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
GENERAL ADMINISTRATION	\$5,070,469									\$2,414,482
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$1,435,484	\$4.50		\$16,192				\$143,548	1.000	\$622,378
Fringe Benefits	\$848,362	\$3.15		\$11,340				\$84,836	1.000	\$435,903
Service Costs	\$1,856,347	\$3.42		\$12,328				\$185,635	1.000	\$473,871
Fuel and Lubricants	\$0								1.000	\$0
Tires and Tubes	\$0								1.000	\$0
Other Materials and Supplies	\$48,467		\$0.05	\$1,907.40					1.000	\$97,998
Utilities	\$554,031						\$1,418,612		1.000	\$157,158
Casualty and Liability Costs	\$172,609		\$0.27	\$9,957					1.000	\$511,551
Taxes	\$39,058						\$102,170		1.000	\$11,319
PT Funds In Report	\$0								1.000	\$0
Miscellaneous Expenses	\$116,111						\$941,515		1.000	\$104,304
TOTALS IN 2018 DOLLARS	\$34,276,862	\$115.48	\$3.43	\$102,443	\$17,247	\$17,334	\$5,039,881	\$492,860		
TOTALS IN SPECIFIED YEAR DOLLARS	\$34,276,862	\$115.48	\$3.43	\$102,443	\$17,247	\$17,334	\$5,039,881	\$492,860		\$17,286,190
2018 Resource Variable Values		119,137	1,943,594	31	32	35	0.2	1.0		
									DO Rev. Bus-Hrs.	84,400
									DO Rev. Bus-Mi.	1,361,700
									DO Peak Buses	15
									BRT Stations	32
									Dir. Lane Miles	13
									Garages	0.11

Note: Unit costs shown in Red are based on factored LACMTA BRT unit costs

Appendix F: Bus O&M Cost Model Detail by Scenario

BUS O&M COST MODEL

Scenario 1+2 bus

Expense Line Item	2018 MB Expenses	Supply Variable Unit Cost (\$2018)							Inflate Factor	1.0000
		D.O. Rev. Bus-Hours	P.T. Rev. Bus-Hours	D.O. Rev. Bus-Miles	P.T. Rev. Bus-Miles	D.O. Peak Buses	P.T. Peak Buses	Maint. Facilities	Inflation Factor	Estimated Annual Cost (YOE \$)
VEHICLE OPERATIONS	\$628,547,773									(\$2,496,081)
Operators' Salaries and Wages	\$235,161,454	\$37.32							1.000	(\$984,915)
Other Salaries and Wages	\$48,244,985	\$3.83				\$6,892.14		\$942,285	1.000	(\$163,060)
Fringe Benefits	\$228,857,546	\$33.23				\$5,565.57		\$760,918	1.000	(\$927,018)
Service Costs	\$56,943,110					\$32,538.92			1.000	(\$292,850)
Fuel and Lubricants	\$18,760,797			\$0.29					1.000	(\$86,813)
Tires and Tubes	\$7,419,602			\$0.11					1.000	(\$34,333)
Other Materials and Supplies	\$1,451,480			\$0.01		\$414.71			1.000	(\$7,091)
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$308,231							\$24,081	1.000	\$0
PT Funds In Report	\$31,400,568		\$64.05						1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
VEHICLE MAINTENANCE	\$257,835,101									(\$1,141,869)
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$110,963,058	\$4.40		\$1.27					1.000	(\$501,287)
Fringe Benefits	\$83,712,644	\$3.32		\$0.96					1.000	(\$378,180)
Service Costs	\$3,030,032	\$0.12		\$0.03					1.000	(\$13,688)
Fuel and Lubricants	\$2,726,705			\$0.04					1.000	(\$12,618)
Tires and Tubes	\$147,426			\$0.00					1.000	(\$682)
Other Materials and Supplies	\$48,189,890			\$0.37		\$13,768.54			1.000	(\$235,413)
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$119,962							\$9,372	1.000	\$0
PT Funds In Report	\$8,945,384				\$1.56				1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
NON-VEHICLE MAINTENANCE	\$42,878,604									(\$104,250)
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$13,521,153					\$3,476.87		\$475,353	1.000	(\$31,292)
Fringe Benefits	\$10,398,577					\$2,673.92		\$365,575	1.000	(\$24,065)
Service Costs	\$14,709,786					\$3,782.52		\$517,141	1.000	(\$34,043)
Fuel and Lubricants	\$0								1.000	\$0
Tires and Tubes	\$0								1.000	\$0
Other Materials and Supplies	\$3,039,897			\$0.02		\$868.54			1.000	(\$14,850)
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$0								1.000	\$0
PT Funds In Report	\$1,209,191						\$4,478.49		1.000	\$0
Miscellaneous Expenses	\$0								1.000	\$0
GENERAL ADMINISTRATION	\$249,894,463									(\$853,745)
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$62,967,581	\$4.50				\$16,191.66			1.000	(\$264,401)
Fringe Benefits	\$44,101,423	\$3.15				\$11,340.37			1.000	(\$185,182)
Service Costs	\$61,640,669	\$3.42				\$12,328.13			1.000	(\$201,311)
Fuel and Lubricants	\$0								1.000	\$0
Tires and Tubes	\$0								1.000	\$0
Other Materials and Supplies	\$6,675,886			\$0.05		\$1,907.40			1.000	(\$32,613)
Utilities	\$18,158,230							\$1,418,612	1.000	\$0
Casualty and Liability Costs	\$34,848,355			\$0.27		\$9,956.67			1.000	(\$170,238)
Taxes	\$1,307,780							\$102,170	1.000	\$0
PT Funds In Report	\$8,143,144						\$30,159.79		1.000	\$0
Miscellaneous Expenses	\$12,051,395							\$941,515	1.000	\$0
TOTALS IN 2018 DOLLARS	\$1,179,155,941	\$93.28	\$64.05	\$3.43	\$1.56	\$121,706	\$34,638	\$5,557,021		
TOTALS IN SPECIFIED YEAR DOLLARS	\$1,179,155,941	\$93.28	\$64.05	\$3.43	\$1.56	\$121,706	\$34,638	\$5,557,021		(\$4,595,945)
2018 Resource Variable Values		6,301,677	490,280	65,506,552	5,741,745	1,750	135	12.8		
									DO Rev. Bus-Hrs.	(26,393)
									PT Rev. Bus-Hrs.	0
									DO Rev. Bus-Mi.	(303,124)
									PT Rev. Bus-Mi.	0
									DO Peak Buses	(9)
									PT Peak Buses	0
									Garages	0.0

Operating Statistics and O&M Costs Report
North Hollywood to Pasadena BRT Corridor P&E Study

Contract Number AE49369000
June 11, 2020

BUS O&M COST MODEL

Scenario 3 bus

Expense Line Item	2018 MB Expenses	Supply Variable Unit Cost (\$2018)							Inflate Factor	Estimated Annual Cost (YOE \$)
		D.O. Rev. Bus-Hours	P.T. Rev. Bus-Hours	D.O. Rev. Bus-Miles	P.T. Rev. Bus-Miles	D.O. Peak Buses	P.T. Peak Buses	Maint. Facilities	Inflation Factor	1.0000
VEHICLE OPERATIONS	\$628,547,773									(\$1,662,639)
Operators' Salaries and Wages	\$235,161,454	\$37.32							1.000	\$0
Other Salaries and Wages	\$48,244,985	\$3.83				\$6,892.14		\$942,285	1.000	\$0
Fringe Benefits	\$228,857,546	\$33.23				\$5,565.57		\$760,918	1.000	\$0
Service Costs	\$56,943,110					\$32,538.92			1.000	\$0
Fuel and Lubricants	\$18,760,797			\$0.29					1.000	\$0
Tires and Tubes	\$7,419,602			\$0.11					1.000	\$0
Other Materials and Supplies	\$1,451,480			\$0.01		\$414.71			1.000	\$0
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$308,231							\$24,081	1.000	\$0
PT Funds In Report	\$31,400,568		\$64.05						1.000	(\$1,662,639)
Miscellaneous Expenses	\$0								1.000	\$0
VEHICLE MAINTENANCE	\$257,835,101									(\$761,163)
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$110,963,058	\$4.40		\$1.27					1.000	\$0
Fringe Benefits	\$83,712,644	\$3.32		\$0.96					1.000	\$0
Service Costs	\$3,030,032	\$0.12		\$0.03					1.000	\$0
Fuel and Lubricants	\$2,726,705			\$0.04					1.000	\$0
Tires and Tubes	\$147,426			\$0.00					1.000	\$0
Other Materials and Supplies	\$48,189,890			\$0.37		\$13,768.54			1.000	\$0
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$119,962							\$9,372	1.000	\$0
PT Funds In Report	\$8,945,384				\$1.56				1.000	(\$761,163)
Miscellaneous Expenses	\$0								1.000	\$0
NON-VEHICLE MAINTENANCE	\$42,878,604									(\$35,828)
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$13,521,153					\$3,476.87		\$475,353	1.000	\$0
Fringe Benefits	\$10,398,577					\$2,673.92		\$365,575	1.000	\$0
Service Costs	\$14,709,786					\$3,782.52		\$517,141	1.000	\$0
Fuel and Lubricants	\$0								1.000	\$0
Tires and Tubes	\$0								1.000	\$0
Other Materials and Supplies	\$3,039,897			\$0.02		\$868.54			1.000	\$0
Utilities	\$0								1.000	\$0
Casualty and Liability Costs	\$0								1.000	\$0
Taxes	\$0								1.000	\$0
PT Funds In Report	\$1,209,191						\$4,478.49		1.000	(\$35,828)
Miscellaneous Expenses	\$0								1.000	\$0
GENERAL ADMINISTRATION	\$249,894,463									(\$241,278)
Operators' Salaries and Wages	\$0								1.000	\$0
Other Salaries and Wages	\$62,967,581	\$4.50				\$16,191.66			1.000	\$0
Fringe Benefits	\$44,101,423	\$3.15				\$11,340.37			1.000	\$0
Service Costs	\$61,640,669	\$3.42				\$12,328.13			1.000	\$0
Fuel and Lubricants	\$0								1.000	\$0
Tires and Tubes	\$0								1.000	\$0
Other Materials and Supplies	\$6,675,886			\$0.05		\$1,907.40			1.000	\$0
Utilities	\$18,158,230							\$1,418,612	1.000	\$0
Casualty and Liability Costs	\$34,848,355			\$0.27		\$9,956.67			1.000	\$0
Taxes	\$1,307,780							\$102,170	1.000	\$0
PT Funds In Report	\$8,143,144						\$30,159.79		1.000	(\$241,278)
Miscellaneous Expenses	\$12,051,395							\$941,515	1.000	\$0
TOTALS IN 2018 DOLLARS	\$1,179,155,941	\$93.28	\$64.05	\$3.43	\$1.56	\$121,706	\$34,638	\$5,557,021		
TOTALS IN SPECIFIED YEAR DOLLARS	\$1,179,155,941	\$93.28	\$64.05	\$3.43	\$1.56	\$121,706	\$34,638	\$5,557,021		(\$2,700,908)
2018 Resource Variable Values		6,301,677	490,280	65,506,552	5,741,745	1,750	135	12.8		
									DO Rev. Bus-Hrs.	0
									PT Rev. Bus-Hrs.	(25,960)
									DO Rev. Bus-Mi.	0
									PT Rev. Bus-Mi.	(488,565)
									DO Peak Buses	0
									PT Peak Buses	(8)
									Garages	0.0