Los Angeles County
Metropolitan Transportation Authority

TEN-YEAR BUS FLEET MANAGEMENT PLAN

JUNE 2015

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INTRODUCTION

Purpose

This an update to the Bus Fleet Management Plan (BFMP) previously submitted in October 2012. The BFMP details how Metro will acquire, maintain, and operate its bus fleet through Fiscal Year 2025. Its five primary purposes are:

- Describe and evaluate existing bus operations and maintenance facilities.
- Identify new transit projects and other factors that impact bus operations.
- Describe bus fleet management and maintenance practices.
- Provide a framework for vehicle procurement and facility planning.
- Become a source for capital and operating budget preparation.

Los Angeles County Metropolitan Transportation Authority (Metro)

Metro is responsible for the continuous improvement of an efficient and effective transportation system for Los Angeles County. Metro serves as the County's transportation planner, coordinator, designer, builder, and transit operator for one of the country's largest, most populous counties. More than 9.6 million people, nearly one-third of California's residents, live, work, and play within its service area.

Metro is the 3rd largest transit provider in the United States behind MTA New York City Transit and Chicago Transit Authority (CTA) operating over 2,200 buses and 275 rail cars. Metro is governed by a 13-member Board of Directors comprised of:

- Five Los Angeles County Supervisors;
- The Mayor of Los Angeles;
- Three City of Los Angeles mayor-appointed members;
- Four city council members representing the other 87 cities in Los Angeles County; and
- The Governor of California appoints one non-voting member

Service Area

Metro's service area is over 1,400-square-miles and is divided into five distinct geographical service areas which have their own localized community-based Metro Service Councils (MSC). The five geographic areas are as follows (Figure 1.1):

- Gateway Cities
- San Fernando Valley
- San Gabriel Valley
- South Bay
- Westside/Central

Notes:

(1) Appendix 2 lists all municipalities located within each Metro Service Area
(2) Appendix 3 lists all transit operators operating within each Metro Service Area.

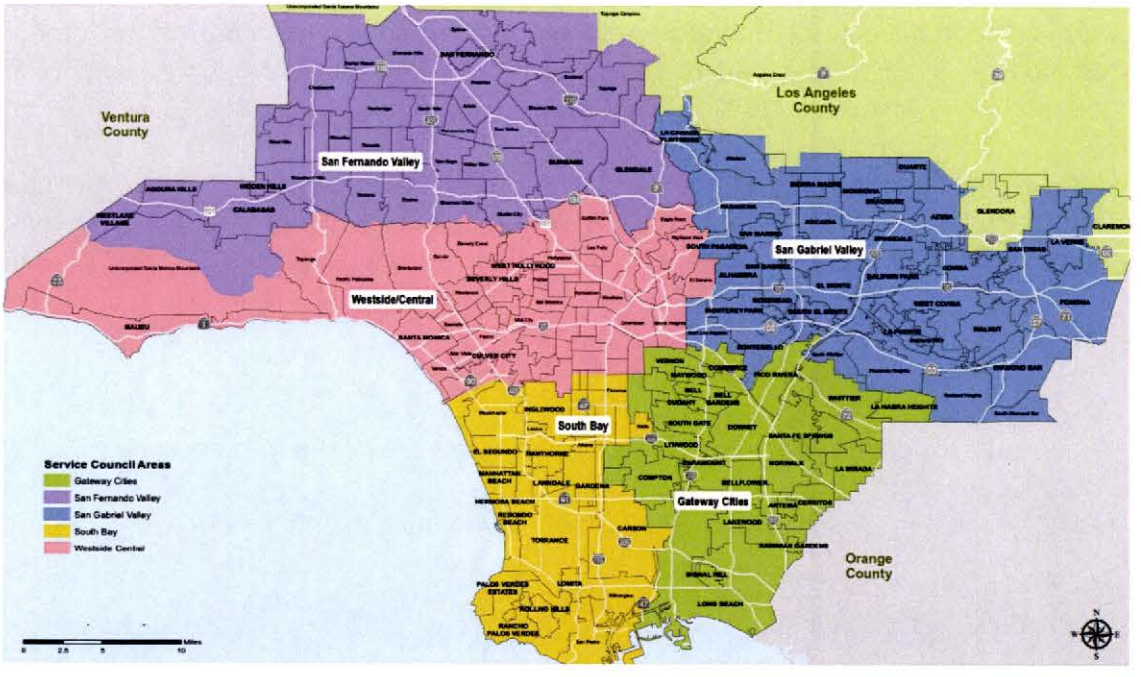

Figure 1.1 *Metro's Five Geographical Service Area*

Metro Service Council

Each MSC is comprised of nine representatives that live, represent, or work in the communities within the boundaries of a designated region they represent. MSCs primary responsibilities are to:

- Receive community input on staff's proposed service change modifications

- Approve staff's final service change modifications related to their respective service, which is then forwarded to Metro's Board of Directors for full Board approval.

MSCs promote greater community involvement and sub-regional perspectives. The purpose of the MSCs is to help Metro better understand the needs of its customers, and promote efficient service coordination with municipal and local transit providers to provide a seamless transit experience. MSCs work closely with Metro's Service Planning & Scheduling Department.

Metro's service changes generally occur in June and December. Proposed service changes are taken through a public review process and are subsequently considered for approval by the MSCs. MSCs primary responsibilities comprise receipt of community input on proposed service modifications and to render decisions on proposed bus route changes considering staff's recommendations and public comments. In this effort, MSCs are responsible for:

- Conducting public hearings in accordance with Metro's Administrative Codes 2-50-020 (Public Hearings) and 2-50-025 (Public Hearing Procedures); and

- Approving all proposed major service changes as defined in Metro's Administrative Code 2-50-010.

Service Planning & Scheduling Department

Metro's Service Planning & Scheduling Department continuously monitors Metro's bus & rail operations. Service Planners evaluate and analyze system level / line level performance and based on findings develop a set of proposals designed to improve service delivery and cost effectiveness. Guiding this effort is Metro's Transit Service Policy. Schedule Makers develop and modify bus and rail schedules to optimize service levels to address ridership demand and running time changes as required. Service Performance Analysts collect bus & rail service data, process it, validate it, and make it available for reference and specific studies. The data collected is used to develop a number of performance reports as well as develop key system indicators such as boarding per revenue service hours, cost per passenger mile, on-time performance, load ratios, complaints per 100,000, etc.

Bus & Rail Divisions

Metro operates 11 bus divisions and 4 rail divisions. Transit vehicles are housed and maintained within their respective divisions. Each division is staffed with administrators, operators, mechanics, and other support staff. Divisions are responsible for service delivery and ensuring service objectives are achieved such as providing safe, clean, reliable, on-time, courteous service to Metro customers. Metro is in the process of building one additional bus division and 3 additional rail divisions to support its rail expansion projects.

1.0 TRANSIT OPERATIONS

Metro operates bus, light rail, and heavy rail services. Metro's bus operations consist of both Directly Operated (DO) and Purchased Transportation (PT) services. Metro operates the largest share of all bus services provided in the region. However, municipal operators provide additional fixed route services in reserved service areas where Metro provides limited service or no service at all. Metro's FY 2016 projected annual operating cost for bus is a little over $1 Billion and for rail is approximately $400 million.

Metro Bus

Metro currently operates 1,957 scheduled peak buses on any given weekday. As of December 2014, Metro bus system offers 169 routes (Table 1.1) and provides more than 7.06 million annual revenue service hours with an average of 1.14 million daily boarding serving over 15,000 bus stops. **Appendix 3** provides line level detail for Fiscal Years 2013, 2014, and 2015.

Table 1.1

Metro Bus Route Service Type

Local	Limited	Shuttle	Express	Rapid	Metro Liner
114	12	12	10	19	2

*Section 1.2 provides an in-depth description

Metro Rail

The Metro rail system consists of 275 light and heavy rail cars operating on six lines serving 83 stations across approximately 84.0 route miles in heavily congested travel corridors. Metro's light rail lines serve 67 stations along 68.0 miles of track and its heavy rail lines serve 16 stations along 16.0 miles of track. Metro rail provides connections to many multi-modal transportation hubs and accounts for approximately 350,000 weekday boardings.

1.1 TRANSIT GOALS AND OBJECTIVES

Metro's operational goals and objectives are to provide a high quality regionally coordinated transit system that is reliable, fully integrated, convenient, simple to use, and provides maximum benefit to Metro customers in light of scarce resources. In this effort, Metro developed a service concept that defines the roles of Metro bus, rail, and municipal operations, and identifies and prioritizes essential service quality attributes that serve as policy guidelines. The key principles of Metro's service concept are:

- *Service Priorities:* Service should be focused first in high-density areas and be scaled to fit the overall density and passenger demand in the service area.

- *Service Design:* The network should be coordinated and designed to be simple and user-friendly to increase trip-making by existing riders and attract new riders.

- *Service Attributes:* The system should provide high quality service to better serve existing riders and attract new riders. Service quality priorities include:

    - Reliability
    - Fast travel options
    - Real-time, readily-available information
    - Clean and safe transit vehicles, stops, and all transit facilities (e.g. Transit Centers, Park and Ride, Rail Stations, etc.)

- *Governance:* Metro should serve as a facilitator to coordinate services among operators in the region.

These service concepts serve as the foundation for the development of policy guidelines reflected in Metro's Transit Service Policy (TSP). Metro's TSP provides quantitative tools to evaluate its transit system that are used to identify opportunities for service improvements and ensure the regional transit network is adjusted accordingly to achieve the goals and objectives of the service concept.

1.2 DESCRIPTION OF SERVICE TYPES

Metro operates four (4) light rail lines (Blue, Green, Gold, and Expo), two (2) heavy rail subway lines (Red and Purple), a number of Local, Limited, Shuttle, Express, and nineteen (19) Rapid bus routes, and two (2) Metro Liner bus routes.

Metro Rail

Metro Rail serves as the backbone of public transportation in the greater Los Angeles region, linking many key multi-modal transportation centers and destinations. Metro has a number of rail projects that will be completed or undergoing construction during the life of this plan. Metro's four light rail lines are powered by overhead wires, operate a maximum three-car consist, and operating on right-of-ways ranging from complete grade separation to at-grade in mixed flow traffic. Metro's two (2) heavy rail lines are powered by a third rail, operate a maximum six-car consist, and operate underground on an exclusive right-of-way. Rail routes are designated with route numbers between 800 and 899. Figure 1.2 displays Metro's present rail system.

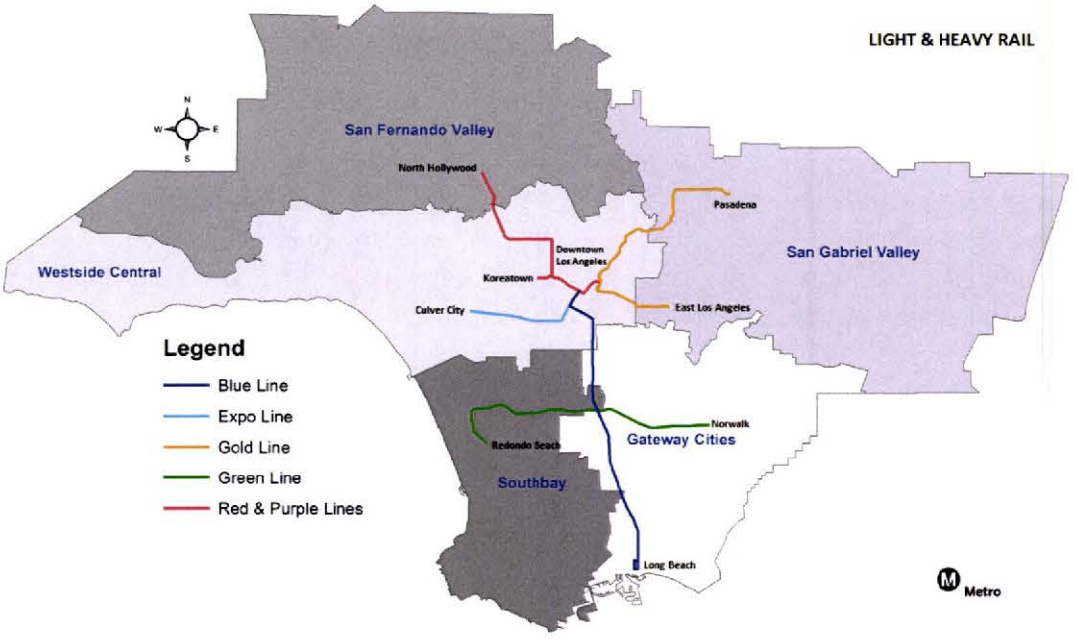

Figure 1.2 *Current Metro Rail System Map*

Metro Bus

Local & Limited Routes

Local bus routes provide the bulk of Metro's transit services operating on city streets serving all stops along their routes. These routes create an interconnected regional network throughout Los Angeles. Some local lines are augmented with limited stop routes and operate in corridors with high transit demand providing patrons a faster transit option through wider stop spacing and serving to key transfer points and major activity centers. Local routes are designated with route numbers between 1 and 299. Limited stop routes are designated with route numbers between 300 and 399. Figure 1.3 displays the combination of local, limited, and shuttle routes that operate throughout Metro's service area.

Shuttle Routes

Shuttle routes operate primarily on secondary streets and serve short-distance trips. Shuttle routes are not an interconnected network but rather serve as local community circulators providing connections to regional bus lines and rail lines. They have route numbers between 600 and 699.

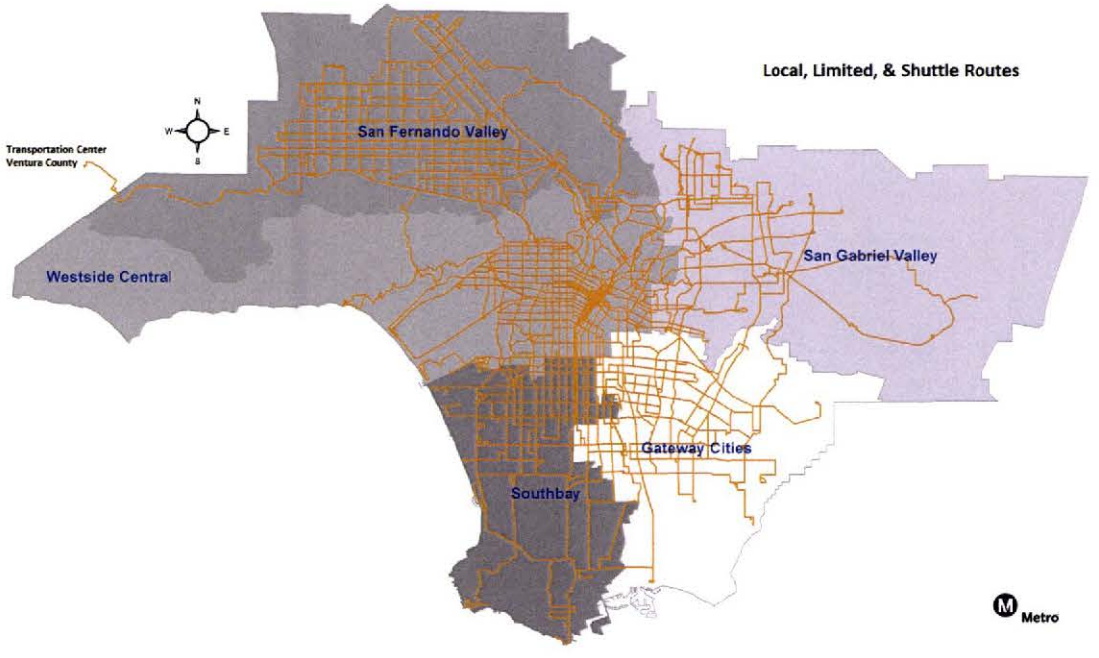

Figure 1.3 *Local, Limited, and Shuttle Routes*

Express Routes

Express routes are used for longer distance trips, make fewer stops, and offer service that typically becomes more localized near the end of their routes (Figure 1.4). Express services usually originate from a collector area, such as a park and ride location, operating in a particular corridor with stops en-route at major transfer points or activity centers. In addition, these services generally operate a major portion of their routing on freeways either in mixed flow traffic or on HOV/HOT lanes. This service type charges a premium fare and is designated with route numbers between 400 and 599.

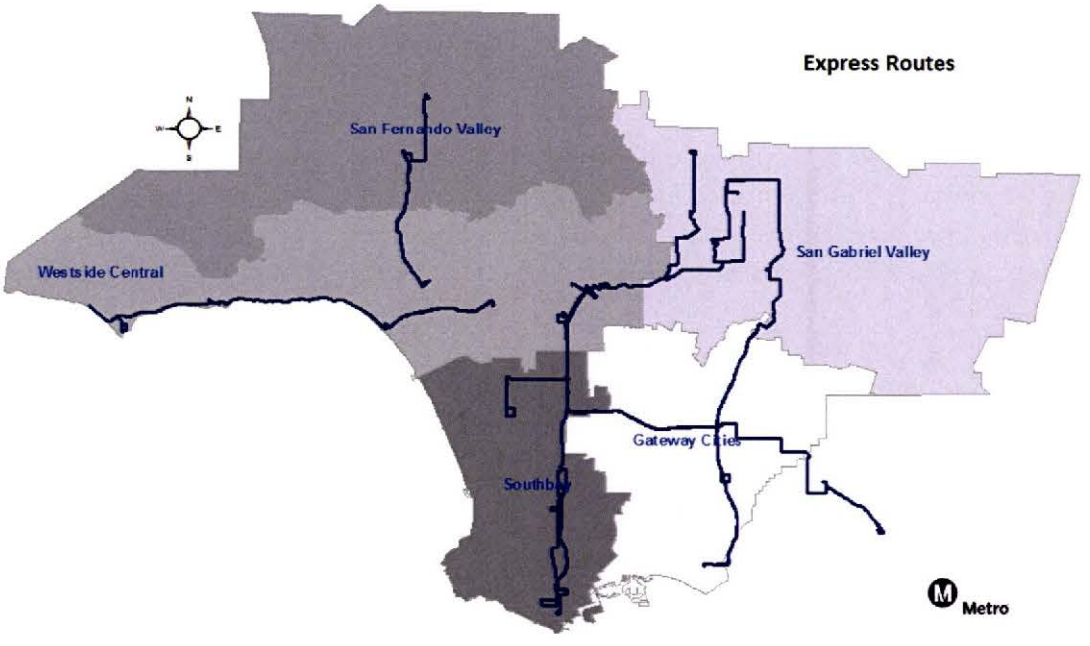

Figure 1.4 *Express Routes*

Rapid Bus Routes

Metro operates nineteen (19) Rapid Bus Routes (Figure 1.5). Rapid Bus creates an interconnected regional network and is a form of BRT that operates in mixed-flow traffic on heavily traveled corridors. Time reductions are achieved through the use of a number of key BRT attributes such as fewer bus stops and transit signal priority. Rapid bus routes operate specially branded red buses that distinguish them from local buses, which have a California poppy color scheme. Rapid Bus Routes are designated with route numbers between 700 and 799.

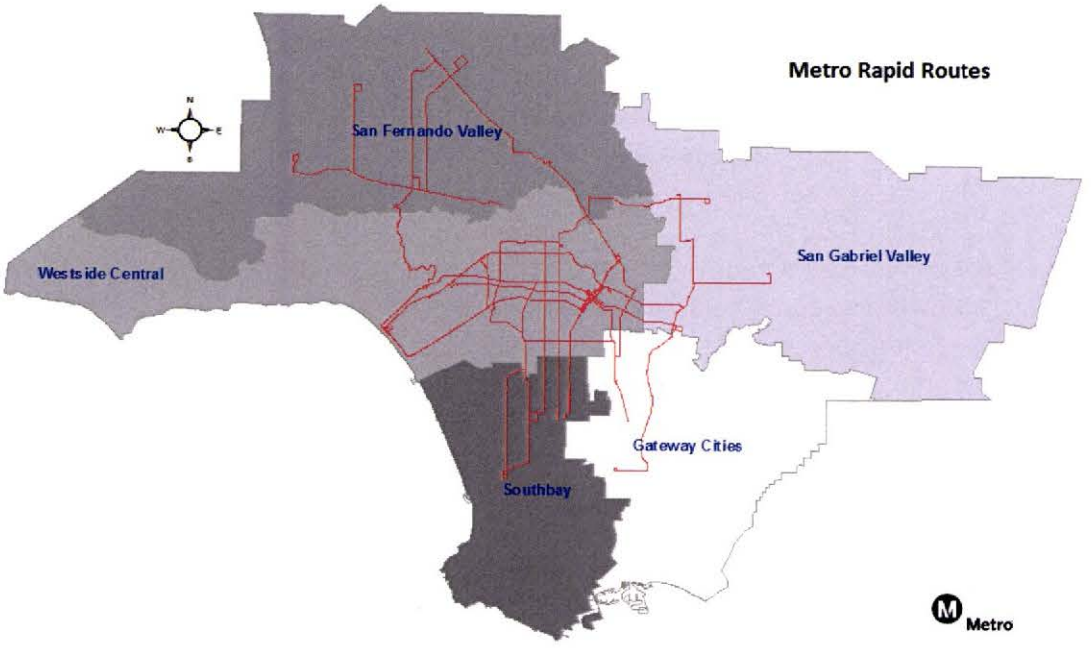

Figure 1.5 *Rapid Bus Routes*

Metro Liner Routes

Metro operates two Metro Liner Bus Routes (Figure 1.6). Both are unique and distinct from Metro's other bus services. The Orange Line is Metro's premier Bus Rapid Transit (BRT) Route and the Silver Line is Metro's Dual-Corridor Express Line. Metro Liner Routes are designated with route numbers between 900 and 999.

- **Orange Line (901):** The Orange Line is Metro's premier BRT Line. This service provides many of the features expected of rail services operating on an exclusive right-of-way, station stops with Park & Ride Lots, and Ticket Vending Machines (TVMs) for pre-paid boarding (buses are not equipped with fare boxes). The Orange Line operates in the San Fernando Valley linking the North Hollywood terminus of the Metro Rail Line to Canoga Park and Chatsworth. The Metro Orange Line uses 60-foot articulated buses, painted in a distinctive silver color, and makes 18 station stops along its 18.9 mile route.

- **Silver Line (910):** The Silver Line is a Metro's Dual-Corridor Express Line. The Silver Line serves two distinct corridors operating predominantly on the I-10 and I-110 high-occupancy toll lanes (Express Lanes) linking El Monte to Artesia via limited stop service in Downtown Los Angeles. The Silver Line operates 45-foot buses, painted in a distinctive silver color, makes station stops along the Express lanes, and makes limited stops through LA Downtown. This route is approximately 26 miles long.

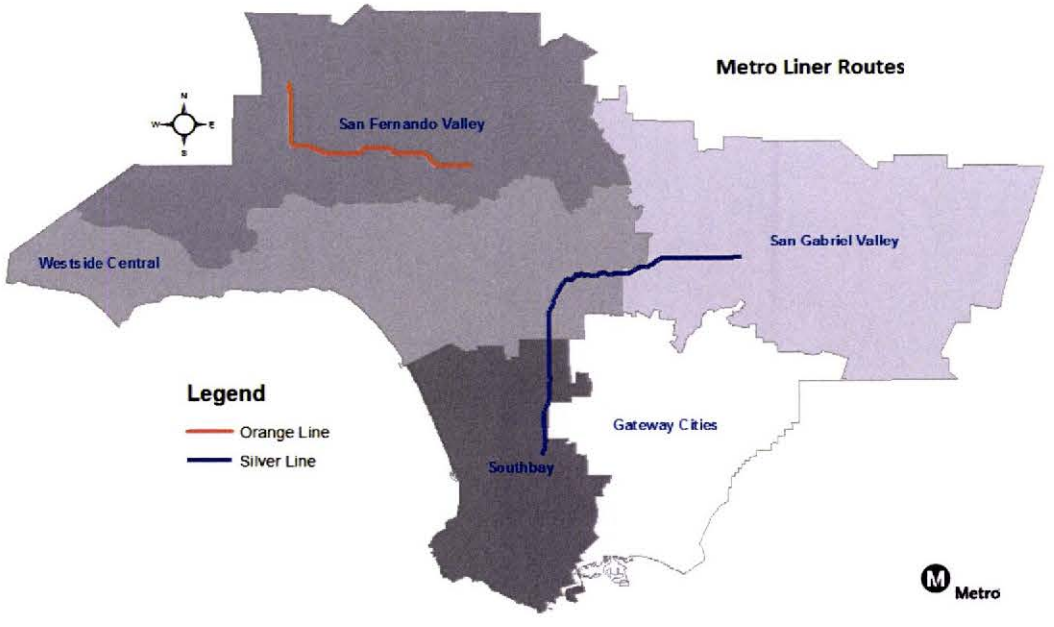

Figure 1.6 *Orange Line (BRT) and Silver Lines (Dual-Corridor Express)*

24-Hour Routes

Metro recognizes the need to provide travel options for its patrons who don't have other means of transportation after mid-night and until morning daytime bus service resumes. Metro is the only transit regional operator that operates a core network of 24-hour bus service seven days a week. These services are commonly referred to as "Owl Service". Metro's owl services are much more limited in geographic coverage than its daytime services (Figure 1.7). A large majority of owl routes operate to and from Downtown Los Angeles where they make hourly timed connections to one another.

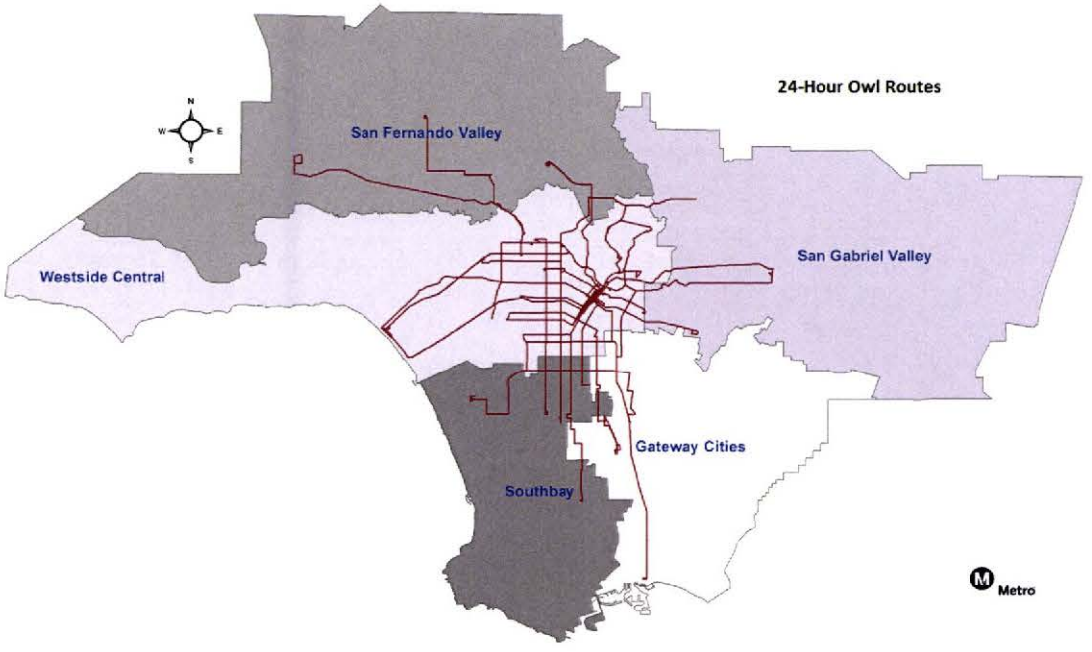

Figure 1.7 *24-Hour Bus Routes (Owl Service)*

Purchased Transportation

Metro contracts 18 of its 169 bus routes with three private operators (13 local routes, 4 shuttle routes, and 1 express route). In addition to these 18 bus routes Metro partially funds 5 additional bus lines operated by the Palos Verdes Peninsula Transportation Authority (PVPTA) and the City of Los Angeles Department of Transportation (LADOT).

1.3 BUS SERVICE TYPE & LINE IDENTIFICATION

Each bus service type has a set of features that differentiates them from one another and unique numerical identifiers that indicate their service type and primary route direction. Table 1.2 summarizes each service type's general characteristics and key features and Table 1.3 summarizes their numerical identifier as well as their color scheme.

Table 1.2

Bus Service Type & Features

Features	Local / Limited	Express	Shuttle	Rapid	Metro Liner
Right of Way	Major Arterials	Major Arterials and Freeways	Local Streets	Major Arterials	Right-of-Way and HOV/HOT Lanes
Maximum Average Stop Spacing	0.25 mile/0.60 mile	1.25 miles	0.25 mile	0.80 mile	1.25 miles
Target Travel Market	Inter-Community	Inter-Community Regional	Neighbor-hood	Inter-Community	Inter-Community
Vehicle Type	40/45/60-foot buses	40-foot bus	40-foot bus or smaller	40/45/60-foot buses	45/60-foot buses
Color Coded Buses	California Poppy	California Poppy	California Poppy	Red	Silver
Communities Served	Multiple	Multiple	1 - 2	Multiple	Multiple
Signal Priority	No	No	No	Yes	BRT Yes / Express No
Fare Collection	On board	On Board	On board	On Board	BRT Pre-Paid /Express On Board
Passenger Amenities	Benches and Shelters	Shelters and Stations	Benches and Shelters	Shelters and Stations	Shelters and Stations
Real-time Passenger Info	No	No	No	Yes	Yes
Route Number Designations	1-399	400-599	600-699	700-799	900-999

Table 1.3

Bus Line Identification, Route Numbering, & Color Schemes

Service Type	Numbering	Primary Route Direction	Color Scheme
Local	1-99	Serves Downtown LA - counterclockwise from NW quadrant.	California Poppy
	100-149	Primarily EW operation in areas S of LACBD	California Poppy
	150-199	Primarily EW operation in areas N of LACBD	California Poppy
	200-249	Primarily NS operation in areas W of LACBD	California Poppy
	250-299	Primarily NS operation in areas E of LACBD	California Poppy
Limited	300-399	Branch of local lines.	California Poppy
Express	400-499	Serves Downtown LA -- numbered counterclockwise from NW quadrant.	California Poppy
	500-599	Does not serve LACBD.	California Poppy
	788	Does not serve LACBD.	California Poppy
Shuttles	601-649	Generally circuitous routing within service area.	California Poppy
	650-659	Generally scheduled service operating point-to-point.	California Poppy
	660-699	Generally serves a rail line within service area.	California Poppy
Rapid Bus	*700-799	Usually operates with an underlying local line.	Red
Metro Liner	901	Orange Line (Right-of-Way)	Silver
	910	Silver Line (Express Lanes)	Silver

*Express Line 788 is an exception to the Rapid Bus route numbering identification.

Operating different size buses and using various color schemes has a direct impact on bus operations. The rationale for branding buses for different service types is aimed directly at our customer. The color designation visually differentiates local from rapid services in particular. The impacts on operations are: (1) color differentiation limits interline opportunities impeding Metro's ability to maximize operational efficiencies; (2) it increases operational costs, and (3) increases fleet requirements. Conversion of lines from standard size coaches (forty-foot operation to a longer higher capacity bus) requires lengthening stop zones/layover zones to accommodate the longer bus. Finally, service is scheduled in accordance with Metro's policy load ratio. Substituting a higher capacity bus with a lower capacity bus on lines scheduled for higher capacity buses may cause overloads.

1.4 PROGRAMMED TRANSIT PROJECTS

Metro has a number of programmed transit projects that when completed and implemented will provide greater mobility, better access, and faster services improving transit service for current customers and attract new riders.

Wilshire Bus Rapid Transit Project Phase 3 (September 2015)

Wilshire Blvd. is the heaviest traveled bus corridor in Los Angeles County experiencing over 56,000 total boardings on an average weekday on Metro Bus Lines 20 and 720 combined. Approximately 84.5% of the boardings occur during combined peak periods (Over 47,000). Approximately 24,000 people are currently traveling in 20,000 cars along Wilshire Blvd. during combined peak periods.

The Wilshire BRT Project converts existing curb lanes by re-striping and street widening in selected sections along Wilshire Blvd. This project will be opened in three phases. Phases 1 & 2 have opened and the final phase of the project will open this September.

- *Phase 1*: On June 5, 2013, Metro opened the first 1.8-mile route segment along Wilshire Blvd. between South Park View St. and Western Ave.

- *Phase 2*: On April 8, 2015, an additional 5 miles of bus lanes opened. These 5 miles include the segments from Western Ave. to San Vicente Blvd. (3.6 miles), the western border of the City of Beverly Hills to Comstock Ave. (0.5 miles), Selby Ave. to just east of Veteran Av (0.5 miles), and Bonsall Ave. to Federal Ave. (0.4 miles).

- *Phase 3*: This phase is expected to open in early September 2015 adding 0.9 miles from Federal Ave. to Centinela Ave. for a total of 7.7 miles.

The new bus lanes are reserved for transit buses and bicyclists between the hours of 7 a.m. to 9 a.m. and 4 p.m. to 7 p.m. The Wilshire BRT Project is intended to encourage a shift from automobile use to public transit by reducing travel time and improving service

reliability of the existing Wilshire Rapid Bus service. When all segments have been implemented this project is expected to significantly reduce commute times for Metro bus riders, especially those traveling the entire stretch of Wilshire Blvd.

A majority of the project falls within the mid-western area of the City of Los Angeles, and includes 9.7 miles of peak period curbside bus lanes (Figure 1.8). A small portion of the project, between Veteran Ave. and Federal Ave. (approximately 0.8 miles), near the Veterans Administration facilities, is within Los Angeles County jurisdiction.

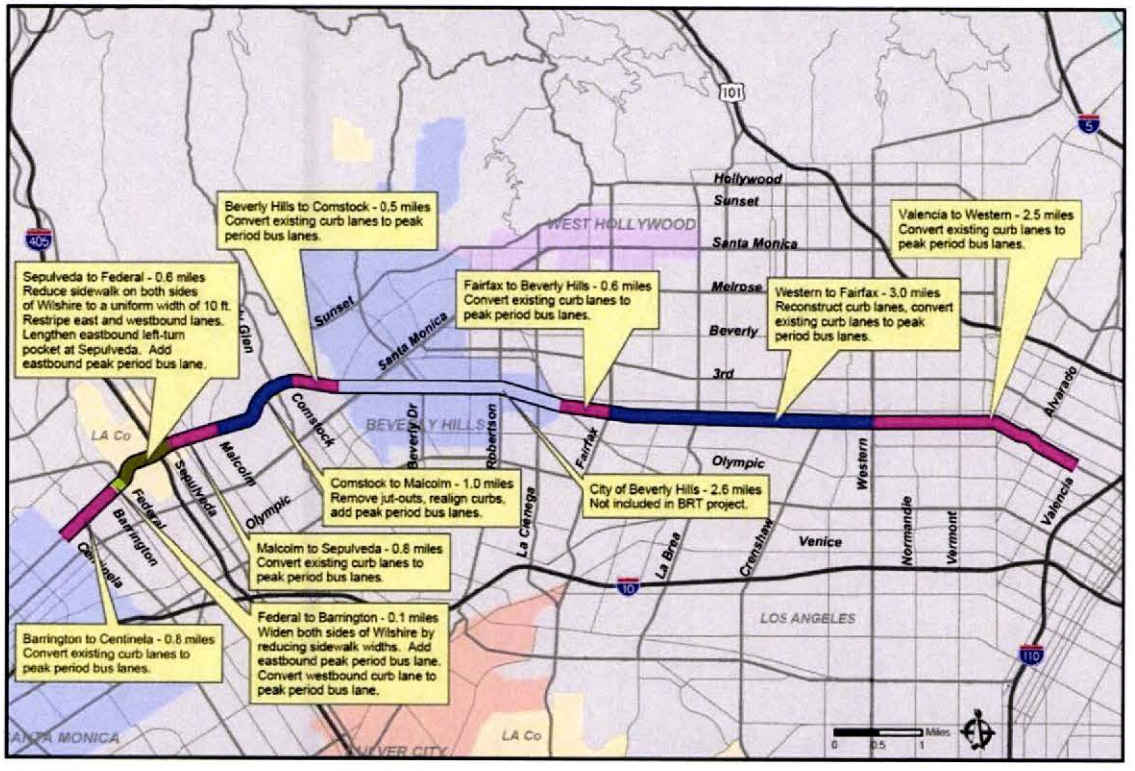

Figure 1.8 *Wilshire Bus Rapid Transit Project*

The Wilshire BRT Project will improve the effectiveness and the efficiency of the existing Wilshire Rapid service. Other agencies that operate bus service along Wilshire Blvd. will also benefit from the use of the bus lanes such as Antelope Valley Transit Authority, Big Blue Bus, Foothill Transit, and LADOT.

Rail Projects

Metro has a number of rail projects planned to be completed or undergoing construction during the life of this plan as indicated below. Figure 1.9 illustrates Metro's projected rail network when completed as well as its Metro Liner services.

- Gold Line Foothill Extension – Phase 1 (FY 2016)
- Expo Line Extension – Phase 2 (FY 2016)
- Crenshaw/LAX Transit Corridor (FY 2020)
- Regional Connector (FY 2021)
- Westside Purple Line Extension Project – Section 1 (FY 2023)

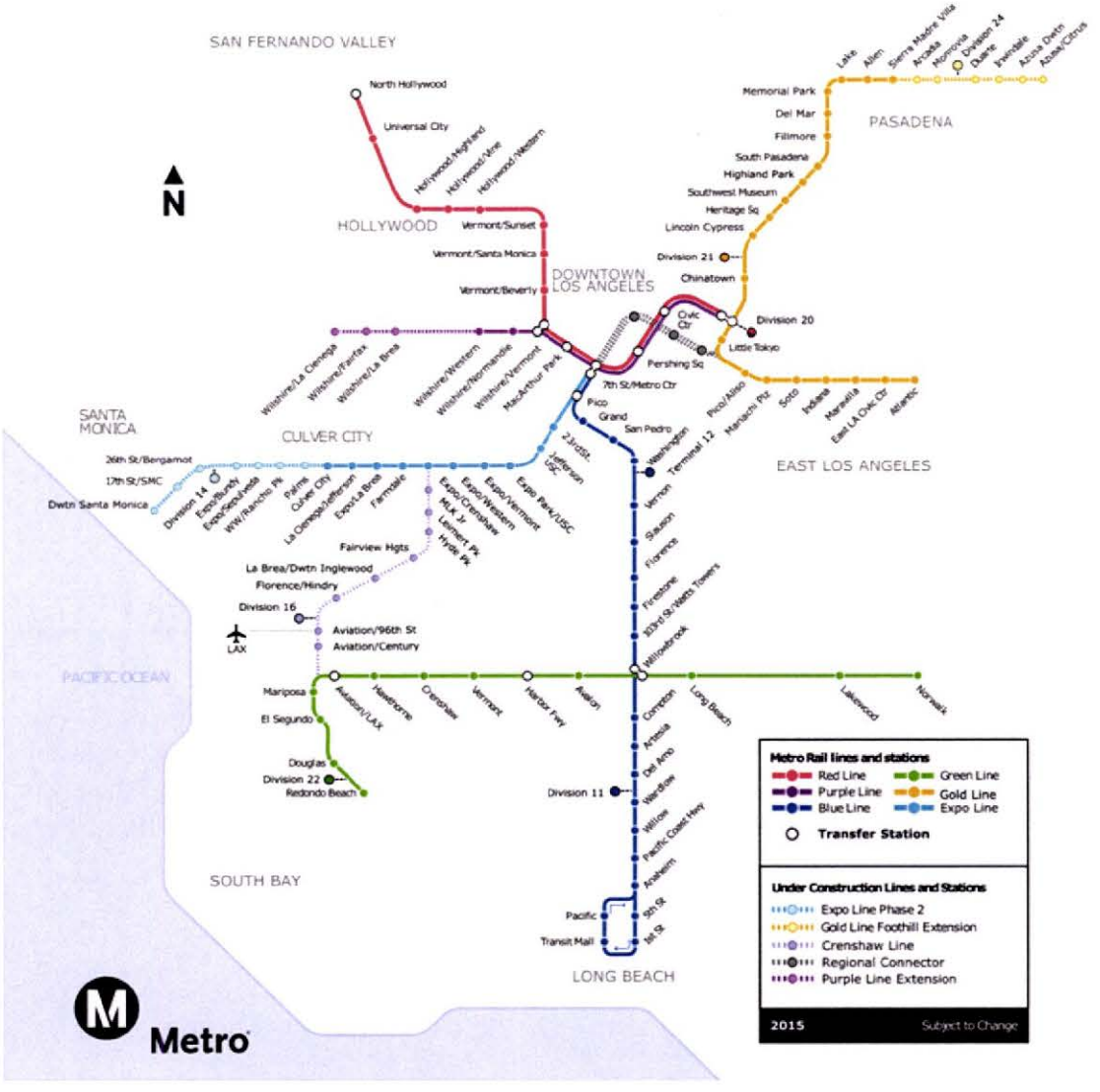

Figure 1.9 Metro Rail Projected Concept Map

The Service Planning & Scheduling Department develops a detailed bus/rail interface plan one year prior to the implementation of a new rail line or the implementation of a new segment extension of an existing rail line. Per Metro's Transit Service Policy Metro will restructure its underlying bus grid system to maximize bus/rail connections, optimize transfer opportunities, improve access to rail stations, take advantage of new transfer facilities, and reduce bus and rail service duplication by implementing a number of changes:

- Discontinuing competing limited stop and express service where duplication exists.
- Diverting parallel and intersecting bus lines to serve a rail station.
- Extend terminating bus lines by anchoring it to a rail station when feasible.
- Develop new bus feeder routes if a need is demonstrated.
- Develop coordinating bus and rail schedules to maximize bus/rail connections.

Gold Line Foothill Extension Phase 1 (FY 2016)

The Metro Gold Line Foothill Extension extends the Gold Line east from Pasadena to Azusa. The first phase will travel more than 11 miles from Sierra Madre Villa Station to Azusa (Figure 1.10)

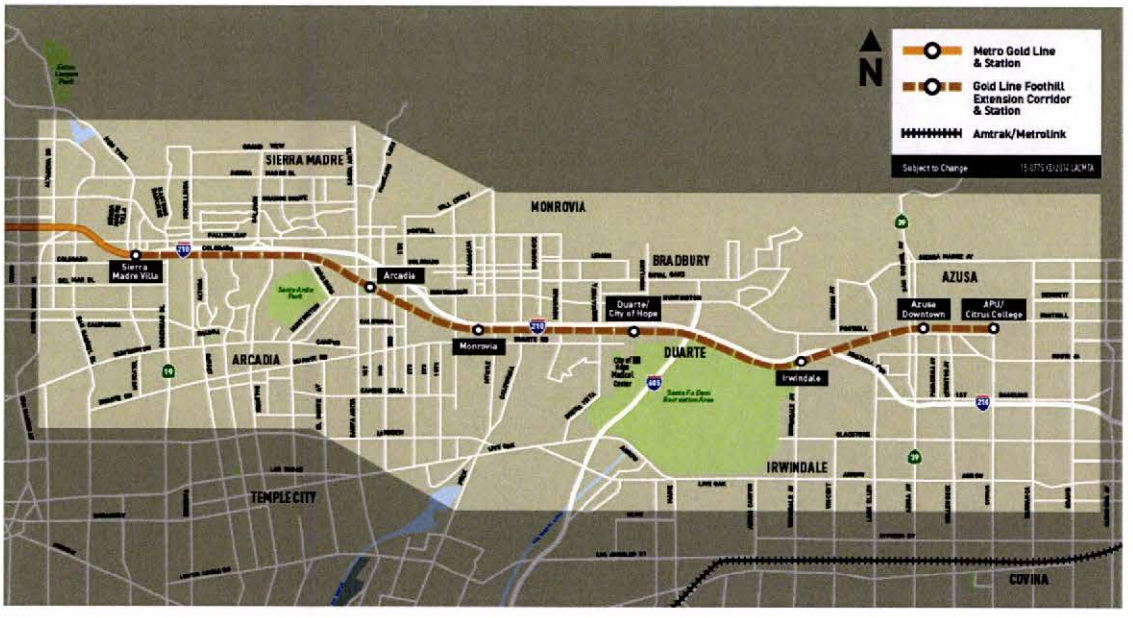

Figure 1.10 *Gold Line Foothill Extension Phase 1*

This extension will add six stations in the cities of Arcadia, Monrovia, Duarte, Irwindale, and Azusa.

- Arcadia
- Monrovia
- Duarte/City of Hope
- Irwindale
- Azusa Downtown
- Azusa Pacific University (APU)/Citrus College

Construction of Phase 1 began in June 2010 and is expected to open in 2016. Riders will be able to make easy connections with Metro and municipal bus lines, other Metro Rail lines, Metrolink commuter rail lines, and other regional transportation services.

Metro will be serving the first three new rail stations (Arcadia, Monrovia, and Duarte) rerouting Lines 79, 264, 270, and 487 to convenient bus/rail transfers at the Arcadia, Monrovia, and Duarte Station. There are no expected significant impacts to peak bus requirements or revenue service hours (RSH) as a result of minor rerouting of these lines.

The chief fixed route operator east of the Duarte Station in the San Gabriel Valley is Foothill Transit and they will provide the primary service to the Irwindale, Azusa Downtown, and APU/Citrus College Stations. There is a planned second phase extension of the Gold Line further east of Azusa to Montclair that would add six additional stations; however, no funding for the second phase extension has been identified.

Exposition Light Rail Transit – Phase 2 (FY 2016)

The first phase of the Expo Light Rail opened in June 2012, operating between Downtown Los Angeles to Culver City. The Expo Line connects riders to the Blue, Purple, and Red Lines at 7th St/Metro Center as well as other bus lines along its route. Phase 2 is currently under construction and is expected to open in FY 2016. Phase 2 will extend the Expo Line 6.6 miles east of Culver City to Colorado/4th St. in Santa Monica adding 7 new stations (Figure 1.11):

- Palms
- Westwood/Rancho Park
- Expo/Sepulveda
- Expo/Bundy
- 26th St./Bergamot
- 17th St./SMC
- Downtown Santa Monica

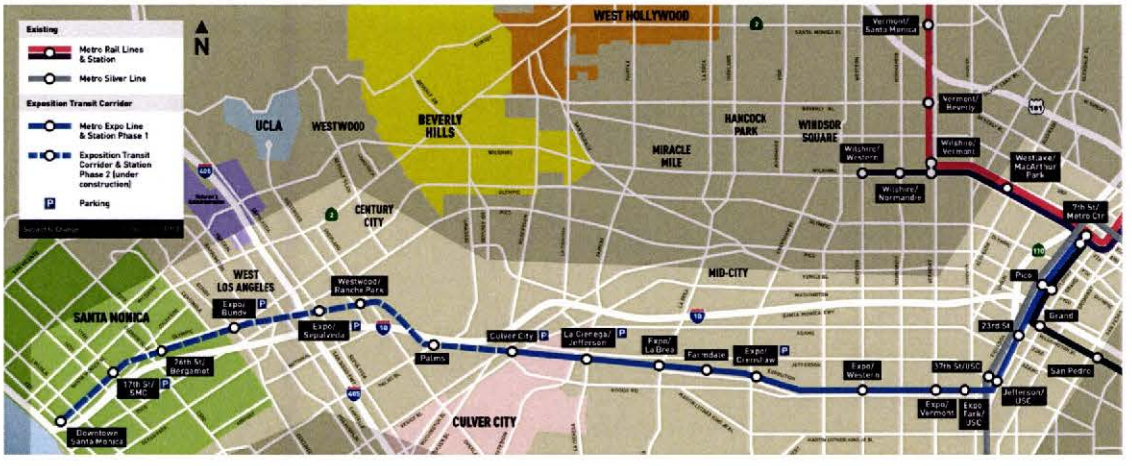

Figure 1.11 *Expo Line Phase 2*

The bulk of the services along the Expo Line are provided by Santa Monica Big Blue Bus and Culver City Bus. Metro operates five bus lines that terminate in Santa Monica (Lines 20, 33, 534, 720, and 733). Minor reroutes for these bus lines are planned. There are no expected significant impacts to peak bus requirements or revenue service hours as a result. However, Metro plans to restructure Express Lines 534 and 788 when Expo Phase 2 is completed. The net result is a reduction of 3,600 annual RSH that will be reinvested to selected bus lines to enhance service.

- **Express Line 534:** Is an east/west route operating between Malibu and the Washington/Fairfax Transit Hub. This service will be shortened to terminate in Santa Monica at Expo Line Colorado/4th St. Station (West Terminal). This restructure is estimated to save approximately 5,500 annual RSH.

- **Express Line 788:** Is a new peak period weekday only express service. This is a north/south route providing service from San Fernando Valley to Westwood via Van Nuys Blvd. and the 405 Freeway. Keeping in line with continuously improving regional mobility this line will be extended 2 miles further south connecting with the Expo Line at the Sepulveda Station. This restructure is estimated to add approximately 1,900 annual RSH.

Crenshaw/LAX Transit Corridor Project (FY 2020)

The Crenshaw/LAX Transit Corridor Project is an 8.5-mile light-rail line that will provide service to Crenshaw District, Inglewood, Westchester, and other surrounding areas (Figure 1.12). This project will add eight new stations improving access and regional mobility linking the Green Line and Expo Line and major connections with the Los Angeles International Airport (LAX) as well as the countywide bus network.

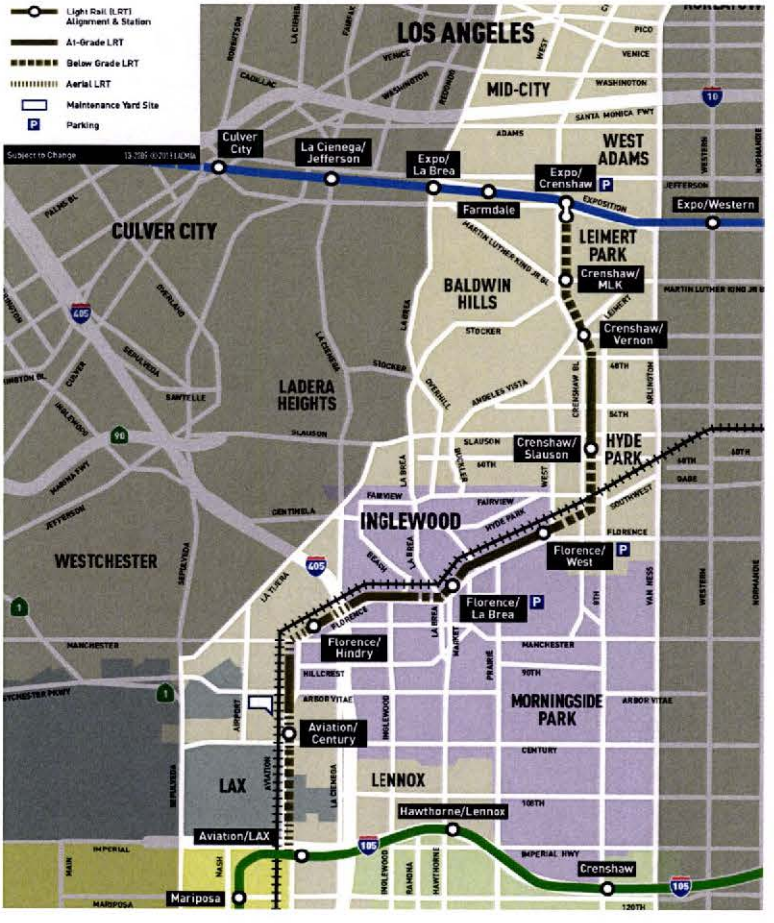

Figure 1.12 *Crenshaw Light Rail*

New Stations

- Expo/Crenshaw
- Crenshaw/Martin Luther King
- Crenshaw/Vernon (Leimert Park)
- Crenshaw/Slauson
- Florence/West
- Florence/La Brea
- Florence/Hindry
- ***Aviation/96th (Optional)**
- Aviation/Century

Note: *The *Aviation/96th Station is an optional rail station that would connect with a proposed LAX People Mover that would operate on its own fixed guideway connecting LAX to the Crenshaw Line and Green Line. The 96th Street station was approved by Metro's Board of Directed on May 28, 2015.*

Several rail scheduling scenarios are being discussed. Current plans call for the Crenshaw Line to operate south of the Aviation/Century Station to provide service to the following Green Line Stations:

- Mariposa
- El Segundo
- Douglas
- Redondo Beach

Every other Green Line trip will be scheduled to terminate at the Redondo Beach Station (current route of line) and every other trip will be scheduled to terminate at the Aviation/Century Station.

The Crenshaw Line will closely parallel the existing route of Line 740. Initial proposals are to cancel Rapid Line 740 and adjust service levels on Local Line 40 accordingly. A comprehensive bus/rail interface plan will be developed, in accordance with Metro's Transit Service policy and finalized within a one-year time period prior to its implementation. This plan will include restructuring the underlying bus grid system to maximize bus/rail connections and optimize transfer opportunities. The impact to RSH and equipment requirements will be determined at a later date.

Regional Connector Transit Corridor Project (FY 2021)

The Metro Regional Connector Project is a 1.9-mile underground light-rail system connecting the Metro Gold Line to the 7th Street/Metro Center Station. Once completed the Blue Line, Expo Line, and Gold Line operations will be reconfigured from a 3-line operation to a 2-line regional operation (Figure 1.13).

Figure 1.13 *Reconfigured Rail Operations*

Three new underground stations will be added in downtown Los Angeles: 1st Street/Central Ave., 2nd Street/Broadway, and 2nd Place/Hope St. (Figure 1.14):

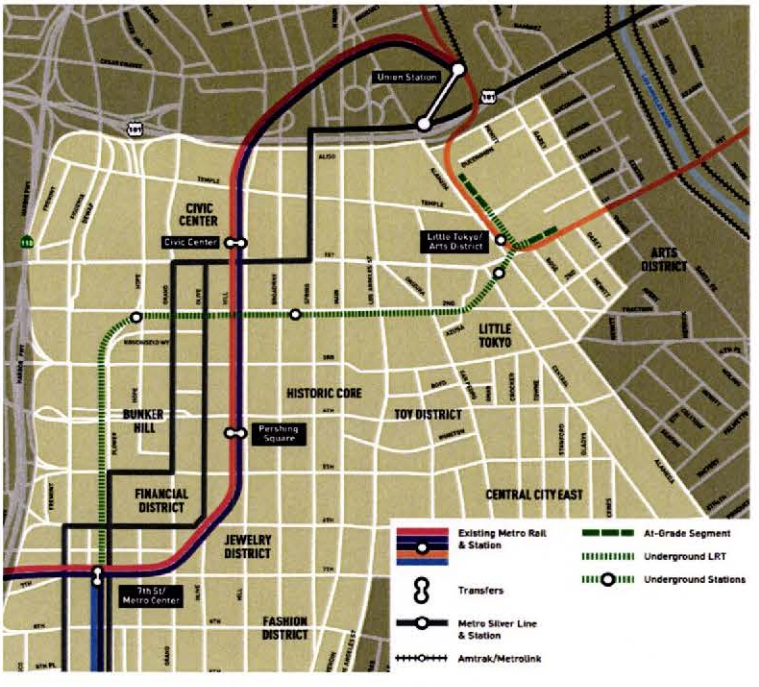

Figure 1.14 *Regional Connector Transit Corridor Project*

The Regional Connector will improve access to both local and regional destinations by providing continuous thru service between these lines and providing major connectors to other bus and rail lines via the 7th St/Metro Center Station.

Downtown Los Angeles is one of the largest destinations in the County. In addition to serving major activity centers the majority of bus lines operating in Downtown either directly serve or operate within close proximity of a downtown rail station making bus to rail transfers already convenient. Therefore Downtown bus operations will not be restructured as a result of this project.

Westside Purple Line Extension Project - Section 1 (2023)

Metro is one step closer to extending the Purple Line to the Westside. On October 28, 2010, the Metro Board of Directors approved the Draft Environmental Impact Statement/Environmental Impact Report (Draft EIS/EIR) and selected the Locally Preferred Alternative (LPA) for the Purple Line Extension. Metro has plans to extend its Purple Line 9-miles west of Downtown Los Angeles to Westwood (Figure 1.15). The construction phase is scheduled to begin in 2014.

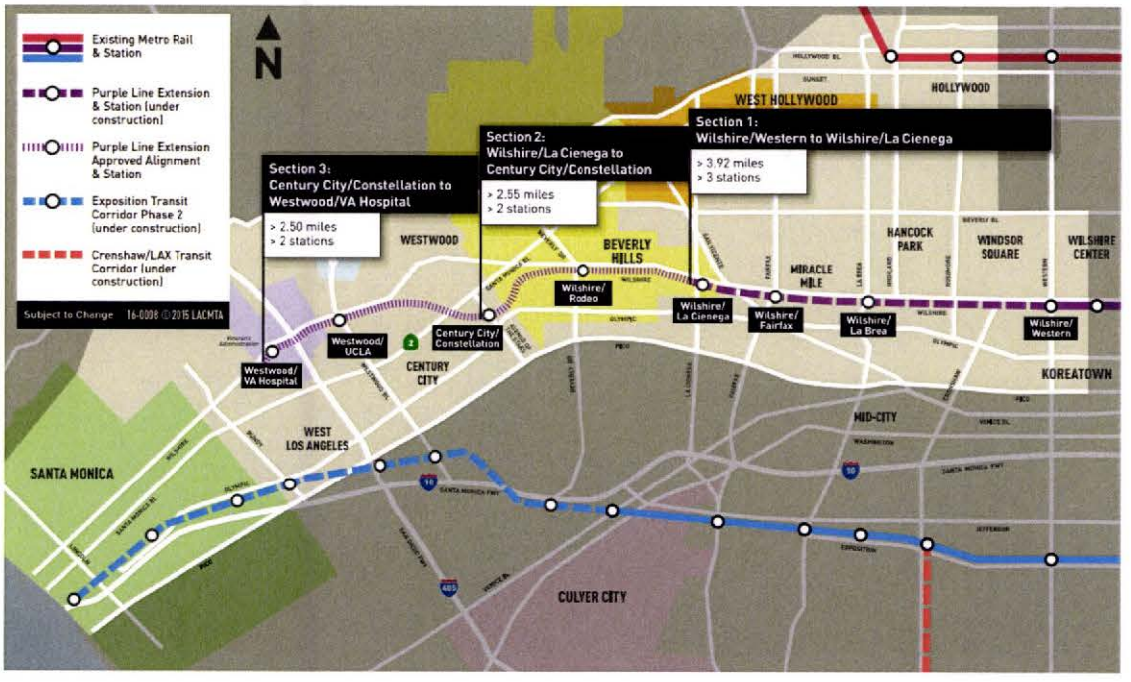

Figure 1.15 *Westside Purple Line Extension Project*

The Purple Line Extension Project is a critically important rail project that will provide a high-capacity, high-speed, dependable alternative for commuters to travel between downtown Los Angeles and Westwood in just 25 minutes. Over 300,000 people travel into the Westside every day for work from areas throughout the County. This project is expected to increase rail ridership by 49,000 per day along Wilshire Blvd.

Based on funding currently dedicated to the project in the adopted Long Range Transportation Plan for Los Angeles County the Final EIS/EIR recommends that the subway be built and opened in three phases:

- *Section 1* (FY 2023): Wilshire/Western to Wilshire/La Cienega
- *Section 2* (FY 2026): Wilshire/La Cienega to Century City/Constellation
- *Section 3* (FY 2036): Century City/Constellation to Westwood/VA Hospital

Metro operates Local Line 20 and Rapid Line 720 along the Wilshire Corridor. Approximately 55,000 board these two lines combined on any given weekday. The Purple Line Extension will provide a faster alternative for many of these riders.

The Purple Line extension to Westwood provides Metro an opportunity to restructure bus service along the Wilshire Blvd. and the Whittier Blvd. corridors. A comprehensive bus/rail interface plan will be developed, in accordance with Metro's Transit Service policy and finalized within a one-year time period prior to its implementation. This plan will include restructuring the underlying bus grid system to maximize bus/rail connections, optimize transfer opportunities, and identify impacts to RSH and equipment. Table 1.4 is a summary list of potential bus line change considerations.

Table 1.4

Westside Purple Line Extension Project: Bus/Rail Interface Plan Considerations

Line	Current Route	Under consideration
18	Montebello Metrolink Station to Downtown LA via Whittier Blvd.	1. Continue operating route with 40-foot buses. 2. Consider implementing a **NEW** Limited 318 route to replace cancelled Rapid Line 720 if the decision is made not to implement a new Rapid Line 718. 3. Adjust service levels as required.
20	Downtown LA to Westwood via Wilshire Blvd. Late Night/Owl trips operate to Santa Monica when Line 720 is not in operation.)	1. Consider 60-foot CNG bus operations when Line 720 is cancelled (currently operates 40-foot buses). 2. Consider operating to Santa Monica all day. 3. Adjust service levels as required.
718	**NEW**	1. Consider implementing new Rapid Line 718 to operate along Whittier Blvd. to replace cancelled Rapid Line 720. 2. Consider 45-foot CNG bus operations.
720	Operates from City of Commerce to Downtown LA via Whittier Blvd. and then from Downtown LA to Santa Monica via Wilshire Blvd.	1. Upon completion of **Phase 1** Purple Line Extension discontinue service on the Whittier Segment and operate from the new West Terminal of the Purple Line. 2. Upon completion of **Phase 2** Purple Line Extension operate from the new West Terminal of the Purple Line. 3. Upon completion of **Phase 3** Purple Line Extension **CANCEL** Rapid Line 720.
Other Local Lines	North/South Intersecting Routes	1. Reroute or restructure bus lines as needed.

Note: Impact to RSH and equipment requirements to be determined at a later date.

New Bus Division (FY 2016)

Metro will commission a new bus division in FY 2016 (Figure 1.16). *Division 13* will be centrally located northeast of Downtown Los Angeles at the intersection of Vignes St. and Cesar E. Chavez Ave. This new facility is to be constructed on one of Metro's existing properties (Terminal 31) adjacent to the Fleet Management Support Service Facility and the Twin Towers Correctional Facility. The construction phase began in November 2012 and is expected to be completed by and opened in FY 2016.

Figure 1.16 *New Bus Division 13*

Division 13 will be designed to accommodate a fleet of 200 40-foot CNG buses. However, this facility will have the capability to support higher capacity buses such as Metro's 45-foot and 60-foot articulated buses. Key features of this division are a multi-level structured parking garage; maintenance building, transportation offices, fueling site, washing, maintenance, and support areas. In addition, Metro included a number of sustainable design features such as natural ventilation, day lighting to all major work areas, solar panels, a 275,000 gallon underground storm water retention tank, and water efficient landscaping.

New Rail Divisions

In FY 2016 Metro will commission two new rail divisions to support the Expo Line and Gold Line extension projects. New *Division 14* is located in Santa Monica and will support the Expo Line. New *Division 24* is located in Monrovia and will support the Gold Line.

- **Expo Line Division** (Division 14): This facility will include: vehicle storage, inspection, cleaning, light and running repair functions for all vehicles assigned to the Expo Line. However, it will not be able to accommodate heavy repair, paint and body shop work. For these activities Metro plans on expanding Division 11 to handle the work. With respect to vehicle capacity, the new Santa Monica Division will be able to store up to 48 vehicles.

- **Gold Line Division** (Division 24): The maintenance facility will provide: vehicle storage, inspection, cleaning, and all major light and running repair functions for vehicles assigned to the Gold Line. This facility will also include a body shop and a painting facility and will have storage capacity for no less than 84 vehicles.

- **Crenshaw Line Division** (Division 16): In FY 2020 Metro will commission a new rail division to support the opening of the Crenshaw Line. New *Division 16* is located adjacent to Los Angeles International Airport (LAX). This division will provide vehicle storage, inspection, cleaning, light and some heavy repair functions and have storage capacity to support no less than 70 vehicles.

Patsaouras Plaza Busway Station (FY 2017)

For some time now the entrance and exit to the El Monte Bus way Express Lanes at the Union Station has been in need of reconfiguration that would allow for the more efficient ingress and egress of pedestrians, buses, and automobiles. Currently, the passengers boarding/alighting areas are not located contiguous with Union Station, but rather are situated at the corner of Alameda St. and the bus way entrance located more than a 1/4-mile distance from the Patsaouras Transit Plaza.

There is no direct pedestrian connection to Union Station currently and there are no passenger amenities such as lighting, Closed Circuit Television (CCTV), information displays, or landscaping. This issue became more acute with the implementation of the Silver Line whose ridership has increased by more than 40% since opening in December 2010. Passengers are forced to walk a 1/4-mile to make transit connections with the Gold Line, Red/Purple Lines, Metrolink, Amtrak, and a number of bus lines located on the Patsaouras Transit Plaza.

To resolve these issues and provide a more user-friendly passenger experience, a number of potential configurations were evaluated. The preferred configuration is to relocate the existing passenger boarding/alighting areas to the southeast side of Union Station and Patsaouras Plaza (Figure 1.17). By providing a more convenient connection between the Silver Line, other bus lines, and rail with reduced pedestrian walking distance to encourage mode shift to regional and local bus and rail services. In addition, this new configuration will also improve the overall operational efficiency of Patsaouras Transit Plaza. The visible changes that would result from the proposed project include the proposed station platform with the addition of benches, shelters, light posts, directory stands, elevators, and stairs connecting the bus way station to Union Station and Patsaouras Transit Plaza. These proposed changes would be consistent with surrounding land uses, which are primarily designated for transportation uses.

Figure 1.17 *Patsaouras Plaza Busway Station*

In an effort to provide funding for the project, staff has vigorously pursued various options to fund this important and much-needed project. As part of this effort, in October 2011, PPBS was awarded a Sustainable and Livable Communities Grant from the FTA in the amount of $9,679,000. Originally the total cost of this project was projected at just under $17M and was scheduled to be opened in FY 2014. For a number of reasons this project was delayed. Currently this project is in the design phase and construction is expected to begin in FY 2016. Total projected cost of project is $30M and this new station is expected to open in FY 2017.

1.5 TRANSIT ACCESS PASS (TAP)

In April 2008, Metro introduced a new Transit Access Pass (TAP), which is a part of the Universal Fare System (UFS). UFS is a regional effort to integrate transit fares in order to continue efforts for seamless travel and connectivity with other regional transit agencies ease of use and convenience for our customers. The fare medium is a wallet-sized Smart Card (TAP) embedded with a computer chip, which can be programmed to store cash for use on public transit or other goods and services through partnerships with entities near bus and rail stations (e.g., schools, parking lots, retailers). Some of the advantages of this technology are as follows:

- Enables single card access to all LA County participants.
- Grants regional transfers automatically.
- Provides 24-hour regional customer service.
- Incorporates convenient features like balance protection and auto load.
- Harnesses data for countywide service planning, marketing and accounting.

The UFS electronic technology eliminates the need for cash, passes and tokens on Metro buses, participating Municipal buses and Metro Rail. By simplifying the fare collection process the goal is reduce dwell time by boarding passengers more quickly, which will result in faster and more efficient service.

In FY 2015, the TAP regional smart card system was completed by adding its twenty-sixth transit operator, ensuring regional connectivity and ease of travel across multiple transit agencies. Innovations were also added, such as new ticket vending machine (TVM) screen-flows that simplify and enhance the TAP customer experience. For FY 2016, mobile phone application planning is underway that will allow users to manage their TAP accounts, register cards, enjoy payment options and purchase a variety of fare products – all from their mobile device. A new state-of-the-art website and new customer relationship management system will also be introduced in FY 2016.

1.6 ADVANCED TRANSPORTATION MANAGEMENT SYSTEM (ATMS)

Installed on Metro's entire bus fleet is the Advanced Transportation Management System (ATMS). Known in the industry as "Smart Bus" technology, ATMS is a high-tech system composed of hardware and software communication and fleet management tools. The components provide the following functions:

- Voice and Data Radio System enables bus operators to communicate much more quickly with dispatchers and receive faster roadside assistance by having the option of using a voice or data radio. The latter tool includes a driver control module with numerical keys representing numerous categories of emergencies.

- Automatic Vehicle Locator enables dispatchers and law enforcement officials to be guided to the exact location of a bus in distress with the aid of global positioning satellites. Locations are displayed on dispatch center monitors.

- Automatic Passenger Counter provides transit planners the ability to make immediate short- and long-term service adjustments by analyzing information about passengers loads and ridership patterns recorded by on board infrared beam sensors that are relayed to an on board processor and then downloaded at day's end.

- Video Surveillance System allows bus operators to see activity on the exterior of the bus by looking at an on board monitor which shows live images transmitted by outside cameras. Also included are the interior cameras that record operator and passenger behavior. A hard drive stores 72 hours of images, which are later downloaded onto a central processor.

- Computer Aided Dispatch enables immediate priority response to any type of emergency on board a Metro bus, streamlines data collection, and updates database.

- Voice Annunciation System using global positioning satellites, activates bilingual computerized voices that greet customers, announces all stops, and makes safety messages. In addition, this system is fully ADA-compliant, using both audio (public address system) and visual (electronic message sign) announcements.

ATMS enables Metro to improve its transit services, increase efficiencies, reduce operating costs, and enhance safety by providing a more comprehensive, accurate, and detailed data for routine analysis.

2.0 VEHICLE TECHNOLOGY

Vehicle Technology (VT) provides ongoing support to Metro Maintenance through the bus specification and procurement process. VT is responsible for the inspection, acceptance, and introduction of new buses. These buses are highly diversified, ranging from 40', 45' and 60' articulated buses. These buses are on the "cutting edge" of technology, operating exclusively on compressed natural gas (CNG). With VT's leadership, Metro has become an industry leader in the operation and maintenance of CNG-powered vehicles.

2.1 GENERAL FLEET STATISTICS

Metro's directly operated fleet consist of three different size buses; 40' CNG bus (40 seats), 45' CNG Compo bus (46 seats), and 60' CNG articulated bus (57 seats). Metro also operates three color schemes: California poppy, red, and silver (Figure 2.1). Each color scheme differentiates service type as discussed in Section 1.4. In 2004, Metro began deploying higher capacity buses. These higher capacity buses allow Metro to maintain its peak seats and provide the same level of service with fewer resources. As of June 2015, Metro's directly operated assigned bus fleet's average age is 7.5 years.

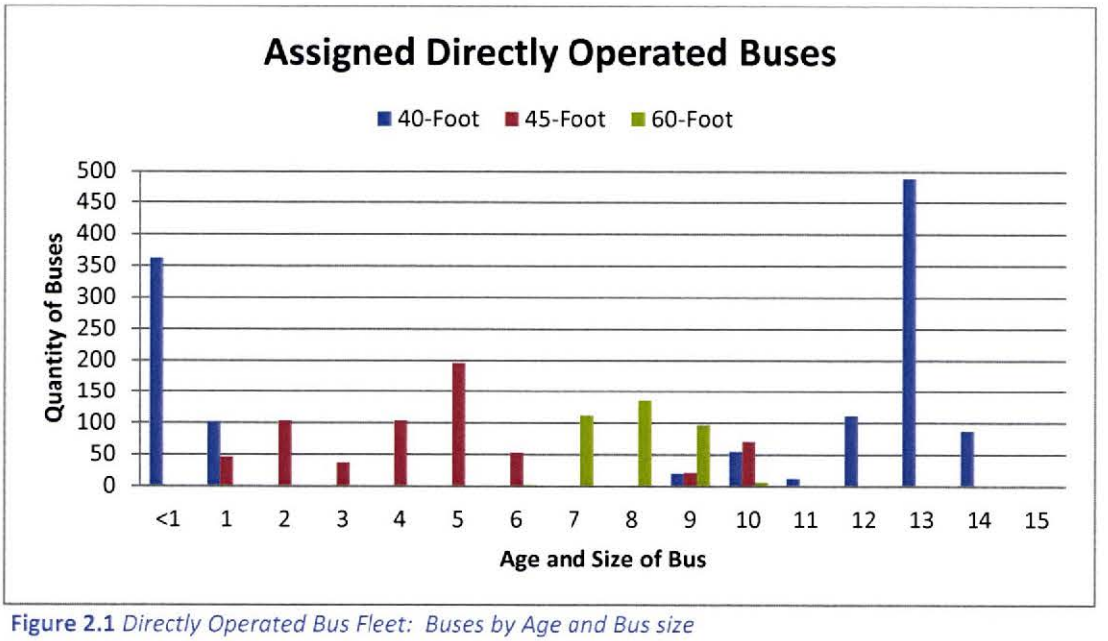

Figure 2.1 *Directly Operated Bus Fleet: Buses by Age and Bus size*

As of December 2014 Metro total fleet size was 2,607. This number includes both active and inactive buses (Table 2.1). Metro operates an active fleet of 2,212 directly operated buses with a mixed fleet consisting of 363 CNG 60-foot articulated buses, 629 CNG 45-foot buses, and 1,220 CNG 40-foot buses. Metro's contract operators maintain a total fleet of 152 buses consisting of 38-foot and 40-foot buses (Mix of Diesel & CNG buses).

Table 2.1

Metro Bus Assignments as of December 2014

Category	Alt. Fuel (CNG)	Diesel	Total
Directly Operated (DO)			
Total Scheduled Peak Service	1,835	0	1,835
Spares - Peak Scheduled	377	0	377
Total DO Assigned	**2,212**	**0**	**2,212**
Contract Operated (PT)			
Total Scheduled Peak Service	68	54	122
Spares - Peak Scheduled	18	12	30
Total PT Assigned	**86**	**66**	**152**
Active Fleet Assigned			
Total Scheduled Peak Service	1,903	54	1,957
Spares - Peak Scheduled	395	12	407
Total Active Assigned	**2,298**	**66**	**2,364**
Inactive Fleet			
Museum	0	2	2
Marketing	1	0	1
Legal Hold	2	0	2
Fire	5	0	5
Mid-Life	29	0	29
Paint	11	0	11
Training Buses	14	0	14
Not Yet Assigned	30	***6**	36
Approved For Sale	125	0	125
Total Inactive	**235**	**8**	**243**
Total Fleet	**2,533**	**74**	**2,607**

42-foot hybrid electric/diesel buses. Staff is proposing to convert these buses to all-electric bus operation.

Note:
*In addition to the regularly scheduled peak bus service Metro operates additional peak buses for long-term transit projects lasting greater than 30 days. These additional peak buses are not reflected in Metro's 4-12 Report above. Metro is currently operating up to 22 additional PM peak buses on the Dodger Stadium Express (**funded through a grant provided by the Mobile Source Review Committee**) on game days only and 18 additional peak buses to operate a bus bridge on the Blue Line due to a rehabilitation rail construction project.*

2.2 SPARE RATIO

Spares are the quantity of active fleet buses above and beyond the maximum required number of peak period pull-out buses required. Spare ratio is defined as the number of spare vehicles divided by the maximum number of buses required in-service (excludes occasional special events). Spare ratio is expressed as a percentage (e.g. 100 vehicles required and 20 spare vehicles is a 20 percent spare ratio). The Federal Transit Administration (FTA) allows a maximum spare ratio of 20% for agencies that operate 50 or more revenue vehicles.

Maintaining a proper number of spare buses allows for maintenance activities to be performed (e.g. preventative maintenance or when a bus breaks down in-service, etc.) and ensures the maximum number of buses required in revenue service are operating as scheduled. Metro maintains an average spare ratio of 19.6% at its operating bus divisions.

Metro Orange Line operates higher capacity buses and average 25% more miles per year than the overall fleet average and as a result requires additional maintenance time. In addition, due to off-board fare collection Metro's Orange Line (BRT) buses operate without fare boxes making them ineligible for use in normal street running environment. As a result Metro maintains a dedicated 30% spare ratio on its Orange Line.

Similar to the Orange Line, on a sub-fleet basis, Metro is in the process of determining whether or not to dedicate a higher than 20% spare on other lines that operate on fixed guide ways and dedicated right of ways (e.g. Silver and Rapid Line 720) to meet additional maintenance requirements and increased demands.

2.3 CONTINGENCY FLEET

This section is strictly informational. Metro does not currently maintain a contingency fleet. In the event Metro creates one it will follow FTA guidelines. Buses may be placed in an inactive contingency fleet in preparation for emergencies. No bus may be stockpiled before the vehicle has reached the end of its minimum life requirement. Buses held in a contingency fleet must be properly stored, maintained, and documented in a contingency plan, updated as necessary, to support the continuation of a

contingency fleet. Any rolling stock not supported by a contingency plan will be considered part of the active fleet. Since vehicles in the contingency fleet are not part of the active fleet, they do not count in the calculation of spare ratio.

2.4 FUTURE BUS PROCUREMENT CONSIDERATIONS

There are a number of considerations that the Vehicle Technology Department considers when developing a bus procurement plan:

- Bus Replacement Cycle (Retire Eligible)
- Rebuild Program
- CNG Tank Expiration Dates (CNG Tank Replacement vs. New Bus Procurement)
- Corporate Initiatives (e.g. Fleet Mix)
- California Air Resources Board (CARB) regulations (Alternative Fuel & ZEV requirements)
- Projected Service Requirements (e.g. Reductions vs. Expansion)
- Funding Availability for Bus Replacement

Bus Replacement Cycle

In 1985, the Federal Transit Administration established its minimum life requirements that must be met before a bus can be considered retire eligible. The minimum life for heavy duty buses is 12 years or 500,000 miles (whichever comes first). As of June 2015 Metro operates 575 retire eligible buses in its active fleet.

Rebuild Program

In lieu of retiring a bus Metro's rebuild program is designed to extend a bus's useful life. A bus is eligible for rebuild near the end of its useful life and must be in need of major structural and/or mechanical rebuilding. Once performed the minimum extension of useful life is four years.

CNG Tank Expiration Dates

Metro is operating CNG buses constructed with CNG tanks certified with a maximum life of either 15 years or 20 years. It is not legal to continue operating CNG buses beyond the expiration of their CNG tank certification. Buses with expired CNG fuel tanks must be removed from the active fleet. Metro must make a business decision to either replace the expired CNG tank or procure a replacement bus. Current bus fleet replacement plans are constrained to fit within funding levels currently programmed in Metro's budget and financial plans. Metro will be taking steps in FY 2016 –FY 2017 to replace CNG fuel tanks on some of the fleet's older buses to ensure that current service levels can be maintained.

Corporate Initiatives

The Metro Board of Directors will consider staff recommendations on bus procurements based on a number of considerations (e.g. programmed services, service requirements, corporate goals, etc.). For example:

- Prior to 1995, Metro primarily operated diesel buses. In an effort to reduce vehicle emissions Metro made a decision to convert its diesel fleet to that all future bus procurements would replace diesel buses as these buses were retired. Today 100% of Metro's DO active bus fleet is powered by compressed natural gas (CNG).

- In June 2000, Metro began implementing its Metro Rapid Program, which included unique vehicle branding. These buses were procured with a different color scheme (Red & White) to differentiate it from its other bus services (California Poppy Color).

- Prior to FY 2005, Metro primarily operated 40-foot buses. In FY 2005, Metro introduced higher capacity buses (45-foot and 60-foot articulated buses) in an effort to provide the same level of service (based on the number of peak seats) with less resources resulting in increased productivity.

California Air Resources Board (CARB) regulations

On December 12, 2008, the California Air Resources Board approved the Truck and Bus regulation to significantly reduce particulate matter, or PM, and oxides of nitrogen emissions from existing diesel vehicles operating in California. The regulation applies to nearly all privately and federally owned diesel fueled trucks and buses and to privately and publicly owned school buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds. The regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses must meet PM filter requirements beginning January 1, 2012. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent (Table 2.2).

Table 2.2

2010 Engine Model Year Schedule

Engine Model Year	Requirements for Heavier Trucks from January 1
Pre-1994	No requirements until 2015, then 2010 engine
1994-1995	No requirements until 2016, then 2010 engine
1996-1999	PM filter from 2012 to 2020, then 2010 engine
2000-2004	PM filter from 2013 to 2021, then 2010 engine
2005-2006	PM filter from 2014 to 2022, then 2010 engine
*2007-2009	No requirements until 2023, then 2010 engine
*2010	Meets final requirement

* Must have PM filter by January 1, 2014, if not originally equipped.

Projected Service Requirements

Another consideration is to determine the appropriate bus fleet size based on ridership projections and current capacity. Presently, bus boardings account for approximately 75% of all total boardings and rail 25%. Over the next 10-years, as described in Section 1, Metro will have significantly expanded its rail system. As a result, Metro's forecasted cumulative combined annual rail boardings are expected to increase 42.8% and will account for 30% of all total boardings by FY 2025. While the percentage growth in rail boardings is significant bus boardings are forecasted to increase 5.1% by FY 2025. Overall, bus and rail combined, boardings are expected to increase 14.2% by FY 2025 (Table 2.3).

Although bus boardings will experience a cumulative 5.1% increase by FY 2025, Metro has determined that its current bus fleet has sufficient capacity to absorb this growth. Therefore Metro projects that RSH and the active bus fleet will remain relatively constant over the next ten years as indicated in Table 2.3. Any RSH savings generated through restructured bus service will be reinvested onto selected bus lines to enhance service (e.g. reallocate resources from less productive lines to more productive bus lines) or in the development of new bus services (e.g. BRTs).

Table 2.3

Annual Boarding forecast (Millions)

	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	%
BUS	359.3	361.1	362.9	364.7	366.5	368.3	370.2	372.0	373.9.	375.8	377.6	5.1%
RAIL	114.1	125.0	128.5	130.5	134.4	143.1	144.7	156.2	157.6	159.0	162.9	42.8%
TOTAL	**473.4**	**486.1**	**491.4**	**495.2**	**500.9**	**511.4**	**514.9**	**528.2**	**531.5**	**534.8**	**540.5**	**14.2%**

Funding Availability for Bus Replacement

As buses near their minimum life requirement and as CNG tanks near their expiration date Metro must make one of two budgetary decisions, which is based on funding availability:

- Procure New Buses vs. Rebuild Existing Buses to Extend Useful Life
- Procure New Buses vs. Replace Expiring CNG Tanks

Developing a bus procurement plan ensures a smooth transition from aging vehicles to new technologies and improved performance. Development of a fleet replacement plan allows a procurement process to be initiated and repeated in a timely fashion to meet either expansion of the fleet/services or matching the schedule of retiring existing buses.

2.5 ZERO EMISSION BUSES

The critical role of zero-emission buses is acknowledged in Governor Brown's 2013 ZEV Action Plan. California requires the introduction of zero emission technology vehicles, including fuel cell electric buses, in order to meet its air quality improvement and emissions reduction goals. There have been significant technological advances in the performance, reliability and durability of zero emission buses and these buses are expected to be suitable for regular review service in the future.

Conversion of Hybrid Buses to All-Electric Bus Operation

In 2007-2008, six hybrid buses were delivered and put into revenue service. These experimental buses operated with limited reliability. The original manufacturer of the hybrid drivetrain went bankrupt in 2010 and resulted in Metro no longer able to get critical replacement parts or get the technical support needed to keep these buses reliably operational. In June 2015, Metro staff will recommend to the Metro Board of Directors to convert these six hybrid buses to all-electric bus operation at a total projected cost of $4M (local funds). Assuming the conversion proposal is approved it is estimated to take between 12-18 months to fully convert all six hybrid buses.

Electric Bus Testing

In December 2014, Metro tested a 60-foot articulated electric vehicle, including collecting operating data. In particular, the prototype electric bus is being tested for range, passenger comfort, and operator opinion to better understand battery electric buses and operating parameters. Metro is finalizing operability of five new 40-foot electric buses, and will assign these buses for operation from Metro's Division 1 in Downtown Los Angeles upon completion. The electric bus purchase is part of Metro's continuing quest for greener, more sustainable operation methods.

2.6 BUS PROCUREMENT SCHEDULE

As stated earlier there are no plans to expand the fleet size. Future bus procurements will replace retirement eligible buses. In January 2013, Metro Board of Directors approved the procurement of up to 900 CNG 40-foot replacement buses. The base order of buses started delivery in Fall 2013, and all 550 buses in the base order are on schedule for delivery by June 30, 2015. An option for 350 additional 40-foot CNG buses was exercised in February 2015, and first buses in this option are currently scheduled for delivery beginning in the first part of FY 2016 through FY2017.

Metro first introduced 60-foot articulated CNG buses in FY 2005. Metro's articulated bus fleet is operated in heavily traveled corridors and will be retirement eligible beginning in FY 2017. Between FY 2018 and FY 2021, Metro assumes replacing its aging articulated bus fleet by procuring up to 350 60-foot articulated CNG buses. This will require the identification of sufficient funding and Metro Board approval. As discussed

in Section 2.5, Metro will be introducing additional zero emission buses (ZEB) with plans to procure up to 25 ZEB buses by FY 2017.

In April 2015, Metro's Board of Directors approved initiation of a new competitive solicitation for up to 600 40-foot CNG buses. Funding for this procurement has yet to be identified. *Planned bus procurements beyond FY 2018 are unfunded.* Table 2.4 is a summary table of Metro's ten-year bus fleet forecast.

Table 2.4 Metro's Ten-Year Bus Fleet Forecast

REVENUE SERVICE HOURS (RSH)	FY15 BASE YEAR	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
Directly Operated (DO) RSH	6,327,663	6,327,663	6,327,663	6,327,663	6,327,663	6,327,663	6,327,663	6,327,663	6,327,663	6,327,663	6,327,663
Purchased Transportation (PT) Operated RSH	519,176	519,176	519,176	519,176	519,176	519,176	519,176	519,176	519,176	519,176	519,176
Orange Line RSH	130,516	130,516	130,516	130,516	130,516	130,516	130,516	130,516	130,516	130,516	130,516
Silver Line RSH	84,380	84,380	84,380	84,380	84,380	84,380	84,380	84,380	84,380	84,380	84,380
Total RSH	7,061,735	7,061,735	7,061,735	7,061,735	7,061,735	7,061,735	7,061,735	7,061,735	7,061,735	7,061,735	7,061,735
RSH ADJUSTMENTS											
Wilshire BRT Bus Lane Only (FY 2016)		0									
Gold Line Foothill Extension (FY 2016)		0									
[1]Exposition Light Rail - Phase 2 (FY 2016)		(3,600)									
Crenshaw/LAX Light Rail (FY 2020)						TBD					
Regional Rail Connector (FY 2021)							0				
Westside Subway Extension Phase 1 (FY 2023)									TBD		
Total RSH Adjustment	0	(3,600)	0	0	0	0	0	0	0	0	0
PEAK BUSES	**FY15**	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**
40' (40 seats)	1,007	1,002	992	982	982	982	982	982	982	982	982
ZEV 40' (40 seats)		5	15	25	25	25	25	25	25	25	25
45' (46 seats)	507	507	507	507	507	507	507	507	507	507	507
60' (57 seats)	321	321	321	321	321	321	321	321	321	321	321
Total Directly Operated Buses	1,835	1,835	1,835	1,835	1,835	1,835	1,835	1,835	1,835	1,835	1,835
*Contract Operated Buses	122	122	122	122	122	122	122	122	122	122	122
Total Peak Buses	1,957	1,957	1,957	1,957	1,957	1,957	1,957	1,957	1,957	1,957	1,957
BUS SPARES (20%)	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
Directly Operated											
40'	213	213	213	213	213	213	213	213	213	213	213
45'	122	122	122	122	122	122	122	122	122	122	122
60'	42	42	42	42	42	42	42	42	42	42	42
Total DO Spares	377	377	377	377	377	377	377	377	377	377	377
Contract Operated Spares	30	30	30	30	30	30	30	30	30	30	30
Total Spares	407	407	407	407	407	407	407	407	407	407	407
Total Active Fleet	2,364	2,364	2,364	2,364	2,364	2,364	2,364	2,364	2,364	2,364	2,364
SCHEDULED PEAK SEATS	85,937	85,937	85,937	85,937	85,937	85,937	85,937	85,937	85,937	85,937	85,937
BUS PROCUREMENT SCHEDULE	**FY15**	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**
60'				100	100	100	50				
45'											
40' CNG	275	175	175	200	100	100	125	175	175	175	175
ZEB/SLEB 40'	5	10	10								
Total Planned Procurement	280	185	185	300	200	200	175	175	175	175	175
Costs ($Millions)	$162.4	$109.2	$109.2	$200.0	$142.5	$142.5	$114.4	$100.6	$100.6	$100.6	$100.6
AVERAGE AGE OF ACTIVE FLEET	7.5	6.4	6.1	5.1	-	-	-	-	-	-	-

Note: Planned bus procurements beyond FY 2018 are unfunded. Staff is working on identifying and securing funds.

3.0 FLEET MANAGEMENT

Fleet Management (FM) is responsible for the assignment of buses to Metro's operating bus divisions based on the scheduling needs of bus lines operating out of each division. In this effort FM works with the Planning and Scheduling Department twice a year to execute bi-annual service changes reassigning equipment as required. Following each bi-annual shakeup FM continues to move and reallocate buses "as needed" to assure service. Fleet Management also coordinates with the CMF and all bus operating divisions to ensure the relocation of vehicles for various mid-life and/or refurbishment projects.

The FM prepares a 4-12 Report (Equipment Assignment) based on the demand schedule set forth in Service Planning & Scheduling Department's bi-annual Equipment Update Report that identifies bus line assignment and bus type requirements at each operating division. The 4-12 Report directs the operating divisions on bus moves into and out of their respective divisions required to meet the operating schedule.

3.1 FLEET ASSIGNMENT

FM assigns buses to the appropriate divisions, directs the movement of buses between divisions, directs the movement of buses to the Central Maintenance Facility to ensure buses with major mechanical issues or cosmetic defects get repaired, determines to the decommissioning of buses, and reallocates vehicles to assure an adequate number of buses to meet daily "roll out" requirements.

It is a complex task to assign buses given the challenge that Metro operates a variety of services that require the specific use of different size buses and various color schemes. FM must plan for the necessary bus relocations to fully utilize Metro's limited resources and minimize operating costs. In this effort, FM works to limit the number of bus types to two to-three bus types per division. This strategy minimizes the number of required parts a bus division maintenance unit must maintain in its inventory.

The FM is also responsible for assigning new buses. When a new bus is delivered, Vehicle Technology inspects the vehicle for potential defects and determines the acceptance or rejection of the equipment. Upon acceptance the Electronic Communication Technician (ECT) prepares buses for in-service operation. Upon completion the ECT enters the bus into the Maintenance and Material Management System (M3).

Bus Bridge

In the event of an emergency (i.e. unexpected power outage, accident, etc.) or scheduled single tracking (planned rail repairs, upgrades, etc.) Rail Operations Control (ROC) will coordinate with Bus Operations Control (BOC) to implement a bus bridge and turn-backs. Depending on the location of the emergency the appropriate bus division(s)

will be contacted to supply buses from their spares and extra-board or Voluntary Call Back, (VCB) bus operators to operate the bus bridge. Both Rail Transit Operations Supervisors and Bus Transit Operations Supervisors will be dispatched to coordinate and direct on-street operations. Temporary schedules will be developed for events known ahead of time (i.e. single tracking due to maintenance, special events, etc.).

3.2 ROAD CALLS

Quality Assurance (QA) provides mechanical roadside assistance to buses en-route and at layover zones. The group responsible for this task is known as Field Equipment Technicians (FET). The FET group responds to as many as 2,000 road calls per month. When buses operating in-service break down, an FET will attempt to make on-street repairs in an effort to keep the bus in-service rather than pull-out another bus to replace it in-service.

Road calls are tracked and reported annually to the Federal Transit Administration (FTA). Road calls are defined as a bus mechanical failure during revenue service which requires a bus exchange. Certain road calls are excluded from the count to improve the value of the data. Excluded instances are the following:

- Authorized bus change.
- Dirty interior or exterior.
- Passenger caused.
- When another road call is requested for the same problem on the same bus within two hours. For example, a bus stalling @ 14:00 and a bus stalling @ 15:00 would be counted as one road call. However, a bus stalling @ 14:00 and transmission not shifting @ 15:00 would be counted as two road calls.
- No-response road calls. This is a new category. If a bus has a broken fare box, head sign, bike rack, or camera it is not taken out of service when reported. These types of failures will not put a bus out of service; however the BOCC generates an incident so the problem can be addresses once the bus completes its daily assignment.

Metro measures its performance against its stated system goal of 4,000 or greater Mean Miles Between Mechanical Failures Requiring Bus Exchange (MMBMF). Metro has exceeded its system goal in both FY 2014 and FY 2015 to year to date (YTD) as shown in Table 3.1.

Table 3.1

Average Mean Miles between Mechanical Failures

Fiscal Year	System wide MMBMF
2010	3,222
2011	3,523
2012	3,756
2013	3,827
2014	4,163
*2015	4,568

*YTD

3.3 MID-LIFE & REBUILD PROGRAMS

Metro prides itself in maintaining a reliable bus fleet that enables all its bus division to make roll-out and operate all bus lines as scheduled. Every bus is monitored. FM and Metro's maintenance staff consistently reviews and assesses the condition of its bus fleet and develops a plan to ensure all its buses perform to the end of its useful life. Metro's preventative maintenance program (PMP), normally performed at a division, plays a key role in this effort.

In accordance with MAP-21 and FTA Circular C 5100.1, Bus and Bus Facilities Formula Program: Guidance and Application Instructions, dated May 18, 2015, Metro operates a ***Mid-Life Program*** and a ***Rebuild Program***.

- Metro's *Mid-Life Program* overhauls buses that have accumulated at least 40% of its useful life and is performed to ensure that bus will perform to the end of its useful life.

- Metro's *Rebuild Program* is designed to extend a bus's useful life. A bus is eligible for rebuild near the end of its useful life and must be in need of major structural and/or mechanical rebuilding. Once performed the minimum extension of useful life is four years. This may or may not include replacing expiring CNG Tanks.

4.0 DIVISION MAINTENANCE

Metro owns and operates 11 bus-operating divisions. As discussed in Section 1.5 Metro is building a 12th bus-operating division. Each bus division has a maintenance unit headed by a Maintenance Manager. Collectively all maintenance units are responsible for the upkeep of nearly $6 billion dollars in facilities, systems, and other equipment used in transit service operation. Each division's maintenance unit performs routine maintenance, preventive maintenance, running repairs, and minor bus overhauls. All divisions are staffed 24 hours a day seven days a week to ensure buses meet specifications for in-service operation with the exception of Division 6, which is closed after midnight on weekdays, weekends and major holidays. Metro bus-operated divisions are distributed throughout the County as well as other facilities (Figure 4.1).

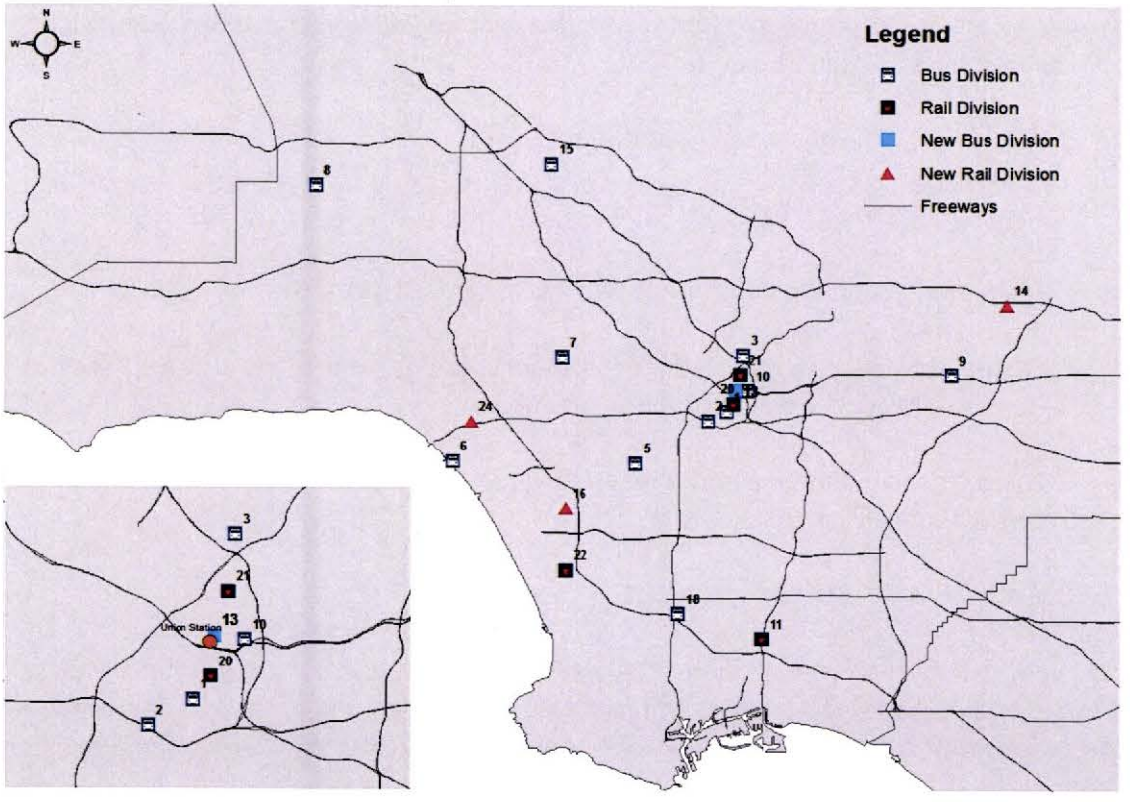

Figure 4.1 *Metro Facilities*

4.1 MAINTENANCE OPERATIONAL GOALS AND GUIDANCE

Metro has set a number of specific goals for maintenance staff. These goals include maintaining an acceptable level of vehicle life and serviceability, minimizing the number of road failures, and minimizing cost of the maintenance function through training and improved productivity. Each year Metro staff prepares budgets and Management

Action Plans (MAPs) reflecting, in a measurable way, staff's commitment to performance objectives. The Metro Maintenance Department objectives are to:

- Operate a safe, clean, convenient and efficient mass transportation system for the general public and visitors to the Los Angeles Metropolitan region.
- Develop and maintain an integrated bus and rail system incorporating the strengths of other service providers into the fabric of the Metro system.
- Improve the productivity of the transportation and maintenance staff.
- Protect and enhance the public's investment in the public transportation system.

In order to provide more specific guidance, the maintenance organization has included the following objectives in its MAPs:

- Provide a 100% on-time pullout rate for buses.
- Maintain 4,000 or greater MMBMF.
- Maintain fleet size in accordance with the Board-Adopted Fleet Mix Policy.
- Ensure that all securement devices, doors, radios, and other disabled service items are in good working order at all times.
- Operate and maintain Metro owned CNG facilities and meet the requirements of the CNG development program.

4.2 REVENUE SERVICE BUS MAINTENANCE PLAN

The Federal Transit Administration (FTA) guidelines require that the grantee (Metro) keep federally funded equipment and facilities in good operating order and that it has a current maintenance plan. This plan is intended to meet the FTA requirements for Rolling Stock as defined in FTA Circular 9030.1E and FTA Circular 5010.1D.

In this effort the Maintenance Department is guided by a Revenue Service Vehicle Maintenance Plan, which was developed to preserve and maintain the agency's capital assets (rolling stock), ensure that all revenue and non-revenue vehicles are operable in a safe and effective condition, and establish reasonable standards and practices necessary to meet these objectives. The Revenue Service Vehicle Maintenance Plan was revised and updated in January 2011 and consists of the following major components.

- Maintenance Plan
- Bus Assignment (Active) and Replacement Plan

- Maintenance Department Organizational Structure
- Bus Procurement/Inspection Policy
- Maintenance Directives
- Preventive Maintenance Program (PMP) Schedule
- Technical Training Courses
- QA Inspection Program
- Bus Warranty Processing Procedures
- Injury and Illness Prevention (IIP) Program
- Personal and Protective Equipment (PPE)

The Revenue Service Vehicle Maintenance Plan is reviewed annually and periodically updated to ensure adequate documentation of current maintenance practices and procedures.

5.0 QUALITY ASSURANCE & MAINTENANCE MONITORING

Quality Assurance (QA) is responsible for the following functions:

- Perform post vehicle inspections on equipment involved in Type 230 (rear-end and Code-2 (passenger injuries requiring transport for medical assistance) accidents.

- Performs vehicle fire investigations, clears vehicle citations and performs simulated California Highway Patrol (CHP) inspections against the North American Out-of-Service Criteria and Title 13 of the California Code of Regulations to determine vehicle conditions.

- Manages goods and services contracts; i.e. revenue tires, bus and automotive batteries.

- Ensures that the bus operating divisions comply with the DMV Driver License Employer Pull Notice Program and determine if operator logbooks (Operator hours of service) comply with Title 13 of the California Code of Regulations.

- Provides training in the areas of general vehicle and brake and safety inspections as required. Tests new chemical products, bus components and other items that may improve vehicle reliability and cleanliness.

- Responds to complaints from the operating divisions on non-conforming component problems and investigates equipment performance problems. Assists divisions by providing technical support when required.

- Works closely with the CHP Accident Investigation Team when a Metro bus or other Metro vehicle is involved in a major crash. Maintains a working relationship with the CHP Motor Carrier Inspection Team and is present during annual terminal inspections.

- Manages Bus Pest Control contract.

5.1 CHP COMPLIANCE

Quality Assurance also performs ongoing simulated CHP Motor Carrier (bus) Inspections on Metro regulated equipment. Metro has developed more stringent criteria than the CHP for their own quarterly inspections to help ensure compliance. Each facility is inspected for vehicle condition, maintenance records, and driver log books. At the conclusion of each inspection the facility manager is briefed as to the overall condition of the fleet based on a random sample of the inspected buses.

5.2 QA CONTRACT ADMINISTRATION

QA Contract Administration manages numerous contracts for goods and services and provides contract project management to ensure compliance with related requirements set forth by federal, state and local agencies. Of the 20 contracts managed the two largest are the tire lease contract, with a current annual budget of approximately $6M and the liquid waste disposal contract amounting to $600K per year.

5.3 ELECTRONIC TECHNOLOGY

Metro's Radio/Fare Box/Headsign Shops provides depot level maintenance of fare boxes, headsigns, DVRs, Smartdrive, and ATMS units for all divisions. They install new radio systems on new buses as well as non-revenue vehicles (e.g. Supervisory, Heavy Maintenance, Freeway Service Patrol, and CHP vehicles). In addition, they tests new/warranty sub-components of the ATMS radio and processes radio and fare box for warranty.

5.4 ENVIRONMENTAL COMPLIANCE

The Environmental Compliance Section is responsible for the following functions:

- Oversees the proper accumulation and legal disposal of hazardous waste such as used oil, waste antifreeze, waste absorbents, drained used oil filters and waste paint related materials.

- Schedules the servicing of wastewater processing systems that generate hazardous and non-hazardous waste liquid associated with the servicing and maintenance of buses, rail cars and non-revenue vehicles.

- Oversee the proper accumulation and legal disposal of universal waste such as waste fluorescent light tubes, high intensity discharge lights, waste light ballasts, waste alkaline batteries, waste aerosol cans and various waste batteries (NiCad, Lithium, and Lead Acid).

- Coordinates the testing of underground storage tank components at Metro facilities as required by the State Water Resources Control Board.

- Coordinates the certification of underground storage tank leak detection monitoring systems as required by the State Water Resources Control Board.

- Schedules the re-verification testing of unleaded fuel dispensing systems in accordance with South Coast Air Quality Management District.

- Responds to hazardous material releases and trauma scene incidents that occur on public highways, Metro rail right-of-ways and Metro vehicles on a 24-hour basis.

5.5 NON-REVENUE EQUIPMENT

Non-Revenue Equipment Section manages the maintenance of non-revenue equipment. This section operates from nine locations throughout the greater Los Angeles area and is responsible for the following functions:

- Maintain and service approximately 2,200 different pieces of non-revenue equipment throughout the agency.
- Maintain 30 emergency generators that support Metro's telecom repeaters, rail substations, and main facilities.
- Perform all required smog tests.
- Perform all required smoke opacity tests on regulated vehicles,
- Maintains all rail hi-gear equipment.
- Provide non-revenue towing throughout the agency.
- Coordinate and manage sale of retired vehicles.
- Procure expansion and replacement vehicles.
- Specs new equipment for all MTA departments.

5.6 STOPS & ZONES

Stops & Zones establishes and maintains Over 15,000 bus stops and terminal/layover locations within a 1,433 square mile service area. Efforts are coordinated with the Metro Clean unit, which manages the court referral work program to deploy adult and juvenile offenders who are eligible for alternative sentencing through community service work. The program accommodates up to 50 adult referrals weekdays and up to 63 adults and 18 juveniles on weekends as part of a character-building component.

- **Stops & Zones Unit:**

  - Maintains the bus stop signs that provide line information, such as line number, destinations, and service qualifications of routes.
  - Installs and maintains 511 Nextrip plaques or cube inserts with Braille letters for the visually impaired.
  - Paints red curbed bus zones for operations safety.
  - Participates in local meetings with municipal, business and residential representatives on bus stop-related issues.
  - Investigates internal and external complaints concerning bus stop issues, recommends action, and coordinates a response with Customer Relations or requesting party.

- Reviews and advises on proposed municipal street modifications, or internal terminal plans, to ensure plans comply with ADA and Metro operational standards.
- Establish layover locations and negotiate contracts with private businesses to provide restroom facilities for bus operator's use.

– **Metro Clean Unit:**

- Inspects, cleans and pressure washes bus stops on a daily basis.
- Eliminates debris and blight along segments of Metro's inactive rail right-of-ways and parcel properties.
- Removes trash, debris and any graffiti from Metro buses.
- Provides roving janitorial services to 12 major Metro bus operating terminals and facilities, along with distribution of supplies to contract restroom sites located throughout the Metro service area.

6.0 FACILITIES MAINTENANCE

Facilities Maintenance develops and delivers quality projects from inception to close-out on time, within scope, and budget. This group is responsible to:

- Manage grants
- Develop project scope of authorized capital projects
- Oversee facility project design
- Manage aspects of engineering and construction projects.
- Review contract documents
- Prepare change notices
- Negotiates change orders
- Ensure operating specifications and requirements are established before making a substantial investment
- Perform all PMP maintenance of facilities
- Provide facilities maintenance support for HVAC, painting, and custodial
- Manages over 40 contracted services

6.1 FACILITIES OVERVIEW

Facilities Maintenance must ensure Metro's infrastructure continues to support fleet size, fleet type, and new technologies. Included in this responsibility are eleven bus divisions that support and operate an active fleet size of over 2,200 directly operated buses throughout the County of Los Angeles. Table 6.1 identifies where these bus divisions are located, their design parking capacity, and their capabilities.

Table 6.1

Directly Operated Bus Division Profile

		Year Built			Service Bays						Bus Lifts			
Division	Location	Transportation	Maintenance	40-Foot Design Capacity	Maint. Bldg.	Tire Shop	Steam Clean	Fueling Station	Dino Shop	Paint Shop	Maint. Bldg.	Steam Clean	Tire Shop	Fuel Capabilities
1	Central LA (Southwest)	1981	1987	245	16	2	1	3	0	0	12	1	0	CNG
2	Central LA (Southeast)	1987	1930	195	26	1	2	8	0	0	0	0	0	CNG
3	Cypress Park	1984	1977	210	18	1	2	8	1	0	12	0	0	CNG
5	South LA	1979	1984	247	18	2	1	8	1	0	10	1	0	CNG
6	Venice	1930	1930	79	10	1	2	2	0	0	0	0	0	Diesel
7	West Hollywood	1977	1977	248	20	2	2	8	1	0	12	0	0	CNG
8	Chatsworth	1982	1982	238	22	2	2	8	1	1	16	1	2	CNG
9	El Monte	1975	1975	235	16	1	2	8	1	0	2	0	0	CNG
10	Central LA (Northeast)	1984	1984	259	18	4	2	4	1	0	12	1	0	CNG
15	Sun Valley	1982	1982	262	22	2	2	8	1	1	16	1	2	CNG
18	Carson	1984	1984	280	18	2	2	8	0	0	9	1	0	CNG
			Total	2498	204	20	20	73	7	2	101	6	4	

In addition to the maintenance divisions, Metro has other facilities located throughout Los Angeles County.

- **Division 4:** Located in the City of Downey, this facility is currently equipped to provide non-revenue vehicle maintenance for Metro automobiles, trucks and vans. In addition, new vehicles are prepared for service at this facility. This can include the installation of radios, lights, customized racks, equipment and decals. This facility also houses the auto salvage storage area. Although the facility was formerly a bus maintenance facility, there are currently no fueling or vehicle servicing capabilities.

- **Division 12:** Located in Long Beach. This division is used to store buses ready for retirement and buses to be sold.

- **Location 29:** The Cash Counting Facility is located at Division 2. Cash and tokens collected through bus and rail revenue operations are counted at this site.

- **Location 30:** CMF is located in the northeast portion of Downtown Los Angeles, one block from Metro headquarters building at Gateway Center. This central maintenance facility is recognized as one of the most advanced and efficient bus repair operations facilities of its kind in the world and contains the following functions:

Electronic fare box repair	Emissions testing
Alternate fuels testing	Body shop
Bus painting	Unit repair
Heavy maintenance bus support	Central Stores

  CMF also serves as the primary site for the Transportation and Maintenance Departments' Central Instruction function. All training for new operators, mechanics, and service attendants occur at this facility, as well as refresher training classes for existing operators, mechanics, and service attendants.

- **Location 33:** The San Gabriel Office located at El Monte Station houses Access Services, Sheriff Satellite Station, and Division 9 (Transit Operation).

- **Location 34:** Vernon Yard is located south of Downtown Los Angeles in the City of Vernon. Personnel of the Rail Facilities Maintenance section primarily occupy this facility. Additionally, the fare box and rail ticket vending machine (TVM) maintenance section is located here.

6.2 DIRECTLY OPERATED BUS DIVISION PARKING CAPACITY

Metro bus operating division's design capacity is based on the standard 40-foot bus. Because Metro operates different size buses Metro uses a 40-foot equivalency factor to evaluate system wide storage capacity. For purposes of the parking evaluation, the following factors are used: a 60-foot articulated bus equates to 1.5 40-foot buses and a

45-foot bus equates to 1.125 40-foot buses. Table 6.2 shows Metro's directly operated bus division parking capacity by its 40-foot equivalence. System wide, Metro is operating at 99% design capacity; however, four bus divisions are operating over design capacity. Divisions operating over design capacity negatively impacts operational flexibility and strains efficient management of bus operations. Current space constraints at these bus operating divisions result in poor circulation of buses and inadequate parking.

Table 6.2

Directly Operated Division Assignments
Effective December 2014

Division	Current 40-Foot Storage Capacity	40'	45'	60'	Actual Number of Buses	40-Foot Bus Equivalence	Capacity Used (Under) / Over	Operating Storage Capacity
1	245	142	23	51	216	244	(1)	100%
2	195	183			183	183	(12)	94%
3	210	94	103		197	210	(0)	100%
5	247	139	9	49	197	223	(24)	90%
6	79		36		36	41	(39)	51%
7	248	165	48	32	245	267	19	108%
8	238	38	123	40	201	236	(2)	99%
9	235	225	36		261	266	31	113%
10	259	93		87	180	224	(36)	86%
15	262	86	129	36	251	285	23	109%
18	280	55	122	68	245	294	14	105%
Total	**2,498**	**1,220**	**629**	**363**	**2,212**	**2,472**	**(26)**	**99%**

As discussed in Section 1.5 Metro is building a new bus division centrally located just outside of Downtown Los Angeles expanding Metro's bus parking capacity by another 200 40-foot parking spaces.

60-Foot CNG Articulated Bus Support

Nine of out 11 bus divisions were redesigned to support 60-foot bus operations. However, only seven bus divisions operate articulated buses. The current configuration of Divisions 2 and 6 does not allow for maintenance and operation of articulated buses. Key features required to support articulated buses at a division are:

- Division reconfiguration to accommodate parking and turning movements
- Maintenance building modifications (drive through bays preferred)
- Extra bus lifts (ground hoists)
- Vacuum, fueling, and washing equipment retrofits
- Extension of maintenance pits where required

Metro's new downtown division will support higher capacity buses. Metro's goal is to support the maintenance ratio of 15 articulated buses per articulated capable bus bay. The current average system wide ratio is 15 articulated buses per a bus bay; however, this ratio is currently higher at Divisions 1, 7, 8, 15, and 18 as indicated in Table 6.3.

Table 6.3

Articulated Bus Division Assignments
Effective December 2014

Division	60-Foot Buses	60-Foot Maintenance Bays	Avg. Buses Per Maintenance Bay
1	51	2	26
2			
3		1	
5	49	5	10
6			
7	32	1	32
8	40	2	20
9		2	
10	87	6	15
15	36	2	18
18	68	4	17
Total	**363**	**25**	**15**

6.3 CAPITAL PROJECT PROGRAMMED LIST

A variety of replacement, rehabilitation, and upgrade capital projects are identified in Metro's FY 2016 Proposed budget. Table 6.4 is a list of Bus Capital Projects. For a more complete comprehensive list refer to Metro's FY 2016 Proposed budget.

Table 6.4

FY 2016 Proposed Budget: Capital Program Project List ($ in thousands)

Project Description ($ in thousands)	Forecasted Expenditures thru FY15	FY16 Proposed	Life of Project	Note
BUS (CAPITAL PROJECTS)				
Articulated Bus Replacement	-	$196	$51,436	**NEW**
Bus Acquisition 550 & 350 40-Foot	$262,494	$82,500	$503,443	
Bus Facilities Lighting Retrofit	$1,312	$1,074	$4,250	
Bus Facilities Maintenance & Improvement - Phase 3	-	$1,422	$21,650	**NEW**
Bus Facility Maintenance Improvements & Enhancements Phase 1	$19,491	$966	$21,231	
Bus Facility Maintenance Improvements & Enhancements Phase 2	$13,254	$3,046	$20,896	
Bus Midlife Program	-	$10,251	$68,669	**NEW**
Bus Midlife Program thru FY14 (Closeout)	$81,016	$13,001	$101,488	
Bus Stop Improvement at Venice Blvd and South Robertson Blvd	-	**$250**	**$250**	**NEW**
Central Maintenance Bus Engine Replacement Program	-	**$4,000**	**$24,690**	**NEW**
Central Maintenance Facility Building 5 Vent & Air	-	$351	$785	
Central Maintenance Shop Engine Replacement Program thru FY14 (Closeout)	$26,121	$4,250	$32,112	
Central Maintenance Shop Equipment Replacement	$1,625	$1,047	$2,928	
Digital Video Recording Equipment Refurbishment	$625	$515	$3,102	
Division 1 Improvements	$1,169	$2,392	$20,866	
Division 2 Maintenance Building Renovation & Facility Upgrade	$3,656	-	$33,375	
Division 3 Master Plan Phases 2-4	$12,209	$991	$13,200	
El Monte Busway Access Road Repair	-	**$449**	**$1,426**	**NEW**
Emergency Generators for Communications Network	$50	$236	$500	
Facility Equipment & Upgrades	$1,533	$695	$2,254	
Fuel Storage Tank System Enhancements (FY15 - FY17)	$2,723	$3,086	$6,500	
Metro Art Enhancement	$559	$30	$615	
Metro Silver Line Improvements & Upgrades	$3,947	$2,154	$7,845	
Non-Revenue Vehicles for Bus	$5,794	$276	$6,923	
Patsaouras Bus Plaza Paver Retrofit	$2,528	$5,113	$9,093	
Patsaouras Plaza Bus Station Construction	$12,069	$14,509	$30,984	
Pavement Repairs at Central Maintenance Facility, Division 7 & 8	-	**$493**	**$4,249**	**NEW**
Revenue Collection Equipment Midlife Refurbishment	$1,311	$75	$1,521	
Sylmar Child Center Rehabilitation	$840	$34	$987	
System Projects	-	$9,750	$9,750	
Terminals 47 And 48 Corrosion	$849	$108	$965	
Underground Storage Tank Replacements thru FY14 (Closeout)	$6,684	-	$7,500	
TOTAL	**$461,859**	**$163,260**	**$1,015,483**	

APPENDIX 1: WEEKDAY BUS SYSTEM DATA

Metro Weekday Bus System Data						FY 2013			FY 2014			FY 2015		
Line	Routes	Line Name	Service Type	Direction	Service Area	Scheduled Max. Peak of the Peak Buses	Est. Daily Boardings	Weekday Revenue Service Hours	Scheduled Max. Peak of the Peak Buses	Est. Daily Boardings	Weekday Revenue Service Hours	Scheduled Max. Peak of the Peak Buses	Est. Daily Boardings	Weekday Revenue Service Hours
2	2, 302	Downtown LA - Pacific Palisades via Sunset Bl	Local	E/W	W/C	44	19,418	423.4	44	19,018	420.8	45	18,363	413.7
4	4	Downtown LA - West LA - Santa Monica via Santa Monica Bl	Local	E/W	W/C	32	22,258	402.3	32	21,840	428.4	30	18,838	385.9
10	10, 48	10 Downtown LA - West Hollywood via Temple St & Melrose Av 48 Downtown LA - Avalon Station via Main St & South San Pedro St	Local	E/W	W/C	25	13,635	266.5	25	13,233	269.8	29	13,336	274.2
14	14, 37	14 Downtown LA - Beverly Hills via Beverly Bl 37 Downtown LA - Fairfax/Washington via Adams Bl	Local	N/S	W/C	38	21,445	360.8	38	20,799	362.9	40	20,437	367.7
16	16, 316	Downtown LA - Century City via 3rd St	Local	E/W	W/C	36	25,513	388.8	36	24,591	385.9	41	23,599	384.6
18	18	Wilshire Center - Montebello via Sixth St & Whittier Bl	Local	E/W	G	30	24,686	318.6	30	23,286	299.3	30	21,766	296.1
20	20	Downtown LA - Santa Monica via Wilshire Bl	Local	E/W	W/C	28	17,490	299.8	28	16,609	293.1	29	16,016	291.5
28	28	Downtown LA - Century City via Olympic Bl	Local	E/W	W/C	16	8,671	150.8	16	8,260	152.2	27	12,985	248.2
30	30,330	Downtown LA - Santa Monica Via Venice Bl	Local	E/W	W/C	26	19,087	329.3	26	16,663	308.8	25	15,452	303.7
33	33	Downtown LA - Santa Monica via Venice Bl	Local	E/W	W/C	25	13,545	259.2	25	13,462	268.3	25	11,606	258.2
35	35, 38	35 Downtown LA - Fairfax/Washington via Washington Bl 38 Downtown LA - Fairfax/Washington via Jefferson Bl	Local	N/S	W/C	17	11,817	200.4	17	11,321	206.4	17	10,981	205.4
40	40	South Bay Galleria - Union Station via Hawthorne Bl, Crenshaw Bl & ML King Bl	Local	N/S	SB	30	24,016	396.9	30	20,726	368.6	28	19,772	347.7
45	45	Lincoln Heights - Rosewood via Broadway	Local	N/S	G	34	22,718	319.1	34	21,908	336.1	33	20,810	337.6
51	51,52, 352	Downtown LA - Compton - Artesia Transit Center via Avalon Bl	Local	N/S	G	46	29,540	411.8	46	28,964	420.2	46	27,846	422.9
53	53	Downtown LA - CSU Dominguez Hills via Central Av	Local	N/S	G	24	14,600	222.2	24	14,580	222.7	24	14,502	223.6
55	55, 355	Downtown LA - Imperial Station via Compton Av	Local	N/S	G	24	9,644	186.5	24	8,935	182	21	8,801	182.9

Metro Weekday Bus System Data						FY 2013			FY 2014			FY 2015		
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60	60	Downtown LA - Artesia Station via Long Beach Bl	Local	N/S	G	35	20,812	330.5	35	20,395	336.4	32	18,954	336.9
62	62	Downtown LA - Hawaiian Gardens via Telegraph Rd	Local	E/W	G	14	5,233	148.2	14	5,309	152.3	13	5,218	152.9
66	66	Wilshire Center - Montebello via Olympic Bl & 8th St	Local	E/W	G	25	18,280	256.5	25	16,180	219	32	14,886	225.1
68	68	Los Angeles - Montebello via Cesar E Chavez Av	Local	E/W	SGV	Implemented in FY 2015			Implemented in FY 2015			11	5,899	123.5
70	70	Los Angeles - El Monte via Garvey Av	Local	E/W	SGV	18	12,907	224	18	12,461	232.7	18	11,955	234.9
71	71	Downtown LA - Cal State LA via Wabash Av & City Terrace Dr	Local	E/W	SGV	7	1,987	50.9	7	1,866	50.7	7	1,888	51.2
76	76	El Monte - Downtown LA via Valley Bl	Local	E/W	SGV	16	10,534	196.3	16	10,443	203.3	16	10,049	204.5
78	78, 79, 378	Arcadia - Los Angeles via Huntington Dr & Las Tunas Dr	Local	E/W	SGV	26	12,111	266.6	26	11,592	269.6	26	11,102	269.7
81	81	Eagle Rock - Exposition Park via Figueroa	Local	N/S	SGV	28	17,973	295.4	28	17,837	293.8	29	17,299	296.4
83	83	Eagle Rock - Downtown LA viaYork	Local	N/S	SGV	9	3,550	97.5	9	3,517	95.6	9	3,091	95.3
84	68, 84	Eagle Rock Bl - Downtown LA - Montebello via Eagle Rock Bl & Cesar Chavez Av	Local	N/S	SGV	17	10,085	193.7	17	10,084	198.2	Line 28 absorbed Route 84. Route 68 is now a stand-alone bus line		
90	90, 91	Los Angeles - Sunland via Foothill Bl, Cañada Bl and Glendale Av	Local	N/S	SFV	25	7,391	148.3	25	8,210	199.7	21	7,878	201.7
92	92	Burbank to Downtown Los Angeles via Glenoaks Bl, Brand Bl, Glendale Bl, Temple St, Spring St and Main St	Local	N/S	SFV	16	5,868	143.6	16	5,670	143.2	14	5,493	142.0
94	94	Sylmar - Downtown L.A.via San Fernando Rd & Hill St	Local	N/S	SFV	21	6,431	155.8	21	5,968	157.1	17	5,565	155.8
96	96	Downtown LA - Burbank Station via Griffith Pk Dr & Riverside Dr (Contract)	Local	N/S	SFV	6	1,702	90.8	6	1,544	84.8	6	1,514	85.0
102	102	LAX City Bus Center - South Gate Vis La Tijera-Exposition	Local	E/W	G	6	2,823	92.8	6	2,677	83.8	6	2,763	83.9
105	105	West Hollywood - Vernon via La Cienega Bl & Vernon Av	Local	N/S	G	18	13,614	205.2	18	13,219	211.7	16	12,624	206.1
108	108, 358	Marina Del Rey - Pico Rivera via Slauson Av	Local	E/W	SB	33	17,670	298.1	33	18,227	310.6	33	18,382	319.8

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110	110	Playa Vista - Bell Gardens via Jefferson Bl - Gage Av	Local	E/W	SB	22	9,939	202.2	22	10,077	208.6	22	10,122	209.7
111	111, 311	LAX to Norwalk via Florence Av	Local	E/W	SB	25	20,001	283.2	25	19,608	282.9	25	18,551	284.3
115	115	Playa Del Rey - Norwalk via Manchester Av, Firestone Bl	Local	E/W	SB	28	17,906	279.2	28	17,484	275.6	29	17,019	280.7
117	117	LAX City Bus Center - Downey via Century Bl, 103rd St, Tweedy Bl & Imperial Hwy	Local	E/W	SB	11	10,048	162.5	11	9,998	168.1	11	9,728	168.3
120	120	Aviation Station - Whittwood Mall via Imperial Hwy	Local	E/W	SB	10	4,547	109.8	10	4,110	121.9	10	4,208	122.1
125	125	Plaza El Segundo - Norwalk Station via Rosecrans Av (Contract)	Local	E/W	G	12	6,398	138.2	12	6,096	137.6	12	5,952	138.3
126	126	Manhattan Beach - Hawthorne Station via Manhattan Beach Bl	Local	E/W	SB	3	225	12.1	3	243	12.9	3	230	12.9
127	127	Compton Station - Downey via Compton Bl & Somerset Bl	Local	E/W	G	3	998	26.3	3	960	27.7	3	920	27.9
128	128	Compton - Cerritos via Alondra Bl (Contract)	Local	E/W	G	4	1,544	44.8	4	1,475	45.3	4	1,503	45.2
130	130	Redondo Beach - Cerritos via Artesia Bl (Contract)	Local	E/W	G	9	4,095	103.2	9	3,919	106.2	9	3,660	107.4
150	150, 240	Canoga Park - Universal City via Ventura Bl. / Northridge via Reseda Bl	Local	E/W	SFV	21	11,360	240	21	10,531	239.4	22	9,919	241.1
152	152, 353	Woodland Hills - No. Hollywood Sta. via Roscoe Bl.	Local	E/W	SFV	27	13,729	226.5	27	13,112	222.1	26	12,607	222.1
154	154	Tarzana - Burbank via Burbank Bl & Oxnard St	Local	E/W	SFV	6	1,232	40.9	6	1,213	41.6	4	1,090	42.0
155	155	Sherman Oaks - Burbank Station via Riverside Dr, Olive Av	Local	E/W	SFV	12	1,903	64.6	12	1,980	62.2	12	1,922	62.3
156	156, 656	Van Nuys - Hollywood; Panorama City - Hollywood Owl	Local	E/W	SFV	5	1,901	72.5	5	1,789	72.7	5	1,720	72.8
158	158	Chatsworth Metrolink Station -Sherman Oaks via Devonshire St. & Woodman Av	Local	E/W	SFV	9	2,571	58.6	9	2,621	58.1	9	2,434	60.8
161	161	Thousand Oaks - Agoura Hills - Calabasas - Warner Center	Local	E/W	SFV	11	1,477	59.8	11	1,557	59.2	10	1,519	59.6
163	162, 163	West Hills -Sun Valley - North Hollywood Via Sherman Way	Local	E/W	SFV	22	10,893	185.7	22	10,730	189.5	22	10,556	188.9

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164	164	West Hills - Burbank via Victory Bl.	Local	E/W	SFV	25	7,886	154.2	25	7,393	157.4	24	7,089	158.4
165	165	West Hills - Burbank via Vanowen St	Local	E/W	SFV	35	9,265	170.7	35	8,639	176.1	30	8,515	175.3
166	166, 364	Chatsworth - Pacoima via Nordhoff St & Osborne St	Local	E/W	SFV	23	6,678	141.6	23	6,581	147.2	21	6,518	149.3
167	167	Chatsworth Metrolink Sta - Studio City via Plummer St & Coldwater Cyn Av (Contract)	Local	E/W	SFV	6	2,538	89.1	6	2,600	89.5	6	2,622	89.7
169	169	West Hills - Sunland via Saticoy St and Sunland Bl	Local	E/W	SFV	9	2,723	59.6	9	2,369	62.9	11	2,388	79.8
175	175	Silver Lake - Hollywood via Hyperion Av & Fountain Av	Local	E/W	SGV	7	650	14.1	7	684	15.1	7	775	15.1
176	176	Highland Park - Montebello Via Mission-Tyler - Rush	Local	E/W	SGV	5	2,054	73.5	5	1,942	73.5	5	1,914	73.6
177	177	JPL - Pasadena via I-210 & California Bl (Contract)	Local	E/W	SGV	2	173	8.2	2	178	8.2	2	168	8.2
180	180, 181	Pasadena - Hollywood via Colorado Bl and Hollywood Bl	Local	E/W	SGV	15	11,292	224.7	15	11,497	224.9	15	10,689	226.1
183	183	Sherman Oaks - Glendale via Magnolia Bl	Local	E/W	SFV	8	2,661	69.8	8	2,364	69.8	7	2,317	69.6
190	190, 194	El Monte Station - Cal Poly Pomona via Ramona Bl & Valley Bl	Local	E/W	SFV	21	8,687	225.2	21	7,885	219.8	21	7,224	219.8
200	200	Echo Park - Exposition Park via Alvarado St & Hoover St	Local	N/S	G	17	16,165	191.9	17	15,540	186.8	16	14,410	189.7
201	201	Glendale - Koreatown via Silver Lake Bl	Local	N/S	SGV	3	1,219	43.7	3	1,305	43.7	3	1,200	43.7
202	202	Willowbrook to Wilmington via Alameda	Local	N/S	SB	3	278	20.7	3	313	20.9	3	317	20.9
204	204	Athens - Hollywood via Vermont Ave	Local	N/S	SB	23	27,386	287.6	23	24,813	272.7	23	25,059	277.8
205	205	Imperial/Wilmington Sta. - San Pedro via Wilmington Av, Vermont Av & Western Av (Contract)	Local	N/S	SB	12	5,153	144.8	12	4,891	144.7	12	4,617	145.1
206	206	Athens - Hollywood via Normandie Ave	Local	N/S	SB	18	14,096	197.9	18	14,161	199.4	18	14,037	199.5
207	207	Athens - Hollywood via Western Ave	Local	N/S	SB	19	22,187	244.2	19	19,874	224.3	19	19,787	225.9
209	209	Athens - Wilshire Center via Van Ness Ave & Arlington Ave	Local	N/S	SB	3	1,098	41.5	3	1,107	43.9	3	1,076	43.9
210	210	South Bay Galleria - Hollywood via Crenshaw Bl	Local	N/S	SB	21	16,095	251.8	21	15,177	252.6	21	14,592	247.5

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211	211, 215	South Bay Galleria - Redondo Beach via Prairie Av, Inglewood Av	Local	E/W	SB	6	757	31.2	6	759	30.3	6	725	30.6
212	212, 312	Hawthorne - Hollywood via La Brea	Local	N/S	SB	27	15,280	263	27	15,069	262.4	26	15,016	264.3
217	217	Hollywood/Vine Station - Culver City Transit Center via Hollywood - Fairfax	Local	N/S	W/C	19	8,858	176.6	19	8,730	177.6	19	7,992	181.2
218	218	Studio City - Beverly Hills via Laurel Canyon Bl (Contract)	Local	N/S	W/C	4	1,266	48.6	4	1,194	48.7	4	1,167	48.7
220	220	West Hollywood - Culver City via Robertson Bl	Local	N/S	W/C	4	284	15.6	4	296	15.6	4	318	15.0
222	222	Sun Valley - Hollywood via Hollywood Way	Local	N/S	SFV	4	1,373	48.9	4	1,301	49.4	7	1,828	70.2
224	224	Sylmar-Universal City via San Fernando Rd, Lankershim Bl	Local	N/S	SFV	17	9,709	163.5	17	9,207	158.6	17	8,524	158.7
230	230	San Fernando - Studio City via Laurel Canyon Bl	Local	E/W	SFV	13	5,138	94.8	13	5,034	95.2	13	4,995	97.9
232	232	Long Beach - LAX via Pacific Coast Hwy & Sepulveda Bl (Contract)	Local	N/S	SB	17	7,225	180.2	17	7,074	181	17	6,634	181.1
233	233	Lake View Terrace - Sherman Oaks via Van Nuys Bl	Local	N/S	SFV	12	15,088	190.4	12	14,113	186.7	15	12,691	171.9
234	234	Sherman Oaks - Sylmar via Sepulveda Bl & Brand Bl	Local	N/S	SFV	11	6,647	117.9	11	6,316	119.3	10	5,729	134.2
236	236, 237	Sylmar-Encino via Balboa Bl / Encino-Sherman Oaks via Balboa Bl, Woodley Av	Local	E/W	SFV	11	2,858	75.5	11	2,742	75.6	13	2,765	75.9
239	239	Encino - Sylmar/San Fernando Metrolink Station via White Oak Av, Rinaldi St	Local	E/W	SFV	7	1,129	38.1	7	1,006	38.2	7	1,012	38.6
243	242, 243	Porter Ranch - Woodland Hills via Tampa Av. & Winnetka Av.	Local	E/W	SFV	7	2,143	52.9	7	2,050	52.9	7	2,084	53.1
245	244, 245	Woodland Hills - Chatsworth via Topanga Canyon Bl & De Soto Av	Local	E/W	SFV	15	3,468	79.7	15	3,346	77.2	14	3,172	77.5
246	246	San Pedro - Artesia Transit Center via Avalon Bl	Local	N/S	SB	10	2,994	71.5	10	2,986	76.7	10	2,899	76.6
251	251	Cypress Park - Lynwood via Soto St	Local	N/S	SGV	13	10,127	162	13	10,574	163.3	13	10,015	163.6

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252	252	Montecito Heights - Boyle Heights via Soto St.	Local	N/S	SGV	5	2,940	53.7	5	2,846	53.8	6	2,676	53.2
254	254	Boyle Heights - Watts via Boyle Av & Lorena St) (Contract)	Local	N/S	G	3	944	33.2	3	921	35.4	3	981	35.4
256	256	Commerce - Altadena via Eastern Av & Hill Av (Contract)	Local	N/S	SGV	5	2,014	79.6	5	1,914	79.7	5	2,042	79.7
258	258	Alhambra - Paramount via Fremont Av & Eastern Av.	Local	N/S	SGV	6	2,088	62.4	6	1,933	62.4	6	1,955	62.4
260	260	Altadena - Artesia Station via Fair Oaks Av & Atlantic Bl	Local	N/S	SGV	20	13,026	230.9	20	12,911	242.6	20	12,407	243.3
265	265	Pico Rivera - Lakewood Center Mall via Paramount Bl	Local	N/S	G	4	1,942	52.3	4	1,842	52.4	4	1,893	52.4
266	266	Pasadena - Lakewood via Rosemead Bl & Lakewood Bl (Contract)	Local	N/S	G	8	5,604	103.2	8	5,690	103.3	8	5,571	103.7
267	264, 267	264 Duarte - Altadena via Duarte Rd & Altadena Dr 267 Altadena - El Monte via Temple City Bl & Lincoln Av	Local	N/S	SGV	8	3,910	111.3	8	3,730	114.7	8	3,678	115.7
268	268	La Cañada Flintridge - El Monte via Baldwin Av & Washington Bl	Local	N/S	SGV	11	2,309	76.8	11	2,251	78.3	11	2,140	78.3
270	270	Norwalk - Monrovia via Workman Mill Rd & Peck Rd (Contract)	Local	N/S	G	7	3,194	79.7	7	3,092	80.6	7	2,832	86.6
290	290	Sylmar - Sunland via Foothill Bl	Local	N/S	SFV	6	1,125	36.9	Discontinued			Discontinued		
292	292	Sylmar/San Fernando Metrolink Station - Universal City Station via Glenoaks Bl & West Alameda Av	Local	N/S	SFV	13	2,588	68.3	13	2,623	70.5	9	2,634	70.4
344	344	Artesia Transit Center - Palos Verdes via Hawthorne Bl	Local	N/S	SB	9	2,061	62.7	9	2,002	64	9	1,773	64.1
442	442	Hawthorne - Union Station via Hawthorne Bl, La Brea Av, Manchester Bl. & Harbor Transitway	Express	N/S	SB	4	307	11.9	4	306	12.9	3	235	10.4
450	450	Downtown LA - San Pedro via Harbor Transitway	Express	N/S	SB	12	1,850	51.5	12	1,709	52.8	11	1,740	50.9
460	460	Downtown LA - Disneyland via Harbor Transit way & I-105 Fwy	Express	N/S	G	16	5,082	188.3	16	5,034	203.8	17	5,097	204.7
485	485	Downtown LA - Altadena via Fremont Av & Lake Av	Express	N/S	SGV	4	1,571	54.3	4	1,557	55.1	4	1,504	55.2

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487	487, 489	El Monte Station - Sierra Madre Villa Station - Downtown LA	Express	N/S	SGV	18	4,077	138.7	18	3,919	142.7	19	3,828	144.7
534	534	Malibu - Washington / Fairfax Transit Hub via Pacific Coast Hwy	Express	E/W	W/C	14	3,012	124.2	14	3,063	122.6	14	2,873	123.8
550	550	Exposition Park / USC - San Pedro via Harbor Transitway	Express	N/S	SB	5	1,744	60.4	5	1,722	60.6	5	1,698	60.6
577X	577X	El Monte Station - Long Beach VA Medical Center via I-605 Fwy (Contract)	Express	N/S	G	4	741	61	4	831	61	4	856	62.1
603	603	Glendale Galleria - Grand Station via Hoover St. & Rampart Bl (Contract)	Express	N/S	W/C	17	7,841	182	17	8,145	189	17	8,203	189.4
605	605	LAC/USC Medical Ctr - Boyle Heights via Soto St, 4th St & Lorena St (Contract)	Express	N/S	SGV	5	2,772	55.5	5	2,524	55.5	5	2,598	55.5
607	607	Windsor Hills - Inglewood Shuttle (Contract)	Express	CW / CCW	SB	1	98	9	1	90	9.1	1	81	9.1
611	611	Huntington Park Shuttle	Shuttle	CW / CCW	G	5	2,005	54.8	5	1,891	55	4	1,753	55.0
612	612	South Gate Shuttle	Shuttle	CW / CCW	G	4	1,553	55.7	4	1,578	57.6	4	1,557	57.6
620	620	Boyle Heights via Cesar Chavez Av & State St	Shuttle	CCW	SGV	1	250	14.8	1	238	14.8	1	237	14.8
625	625	Green Line Shuttle - World Way West (Contract)	Shuttle	CCW	SB	2	256	18.3	2	328	18.6	2	324	19.3
645	645	Woodland Hills - West Hills via Valley Circle Bl. & Mulholland Dr	Shuttle	E/W	SFV	7	609	23.6	7	632	22.1	Discontinued		
665	665	Cal State LA - City Terrace Shuttle	Shuttle	N/S	SGV	5	768	24.4	5	752	24.4	5	760	25.9
685	685	Glendale - Glassell Park via Verdugo Rd	Shuttle	N/S	SGV	2	783	29.8	2	774	29.8	2	793	29.8
687	686, 687	Altadena - Pasadena - Colorado Bl & Allen Av; Los Robles Av & Fair Oaks Av	Shuttle	N/S	SGV	5	1,838	62	5	1,705	62	5	1,674	62.0
704	704	Downtown LA - Santa Monica via Santa Monica Bl	Shuttle	E/W	W/C	25	11,237	217	25	11,010	217	27	12,282	257.9

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705	705	West Hollywood - Vernon via La Cienega Bl & Vernon Av	Shuttle	N/S	G	17	8,051	131.7	17	7,629	138.3	18	7,137	139.4
710	710	South Bay Galleria - Wilshire Center via Crenshaw Bl	Rapid	N/S	SB	16	8,413	152.4	16	8,835	161.3	16	8,552	159.9
720	720	Santa Monica - Commerce via Wilshire Bl & Whittier Bl	Rapid	E/W	W/C	63	41,535	653.9	63	40,239	640.1	66	39,103	660.7
728	728	Downtown LA - Century City via Olympic Bl	Rapid	E/W	W/C	14	6,290	126.2	14	5,915	126.5	14	5,563	128.5
733	733	Downtown LA - Santa Monica via Venice Bl	Rapid	E/W	W/C	23	12,708	238	23	12,373	243.2	26	12,256	258.7
734	734	Sherman Oaks - Sylmar/San Fernando Station via Sepulveda Bl. - Brand Bl. - Truman St.	Rapid	N/S	SFV	9	3,800	69.6	9	3,541	70.8	15	6,323	163.7
740	740	EXPO/Crenshaw Station - South Bay Galleria via Hawthorne	Rapid	N/S	SB	9	3,619	107.8	9	3,370	98.7	9	3,227	98.4
741	741	Tarzana - Northridge via Reseda Bl.	Rapid	N/S	SFV	6	2,836	58.5	6	3,020	58.9	Discontinued		
744	744	Reseda - Ventura -Van Nuys Blvds.	Rapid	N/S	SFV	Implemented in FY 2015			Implemented in FY 2015			13	10,683	176.8
745	745	Downtown Los Angeles - Harbor Freeway Station via Broadway	Rapid	N/S	G	21	6,596	133.5	21	6,865	133.9	20	6,359	133.7
750	750	Warner Center - Universal City via Ventura Bl	Rapid	E/W	SFV	15	5,006	135.9	15	4,663	129.8	13	3,517	113.0
751	751	Cypress Park - Huntington Park via Soto Street	Rapid	N/S	SGV	10	5,684	102.2	10	5,349	94.9	10	4,942	94.9
754	754	Athens - Hollywood via Vermont Ave	Rapid	N/S	SB	26	21,157	228.8	26	20,368	222.9	26	20,554	223.7
757	757	Hawthorne - Hollywood via Western Av	Rapid	N/S	SB	19	14,044	168	19	14,087	178.2	20	14,213	186.6
760	760	Downtown LA - Lynwood via Long Beach Bl	Rapid	N/S	G	12	6,216	110	12	6,018	111.2	12	5,249	110.7
761	761	Pacoima - Westwood via Van Nuys Bl	Rapid	N/S	SFV	19	12,280	207.9	19	12,140	203.4	Discontinued		
762	762	Pasadena - Artesia Blue Line Stationvia Fair Oaks & Atlantic	Rapid	N/S	SGV	10	4,669	119.1	10	4,593	118.7	10	4,621	119.5
770	770	Los Angeles - El Monte via Cesar E Chavez Av & Garvey Av	Rapid	E/W	SGV	14	8,837	179.5	14	8,653	171.1	14	8,067	171.0

Metro Weekday Bus System Data						FY 2013			FY 2014			FY 2015		
Line	Routes	Line Name	Service Type	Direction	Service Area	Scheduled Max. Peak of the Peak Buses	Est. Daily Boardings	Weekday Revenue Service Hours	Scheduled Max. Peak of the Peak Buses	Est. Daily Boardings	Weekday Revenue Service Hours	Scheduled Max. Peak of the Peak Buses	Est. Daily Boardings	Weekday Revenue Service Hours
780	780	Pasadena - West Los Angeles via Colorado Bl & Hollywood Bl	Rapid	E/W	SGV	21	10,953	197.5	21	10,168	201.5	21	9,760	201.6
788	788	Valley-Westside Express	Express	N/S	SFV	Implemented in FY 2015			Implemented in FY 2015			10	1,648	62.5
794	794	Downtown Los Angeles - Burbank Station via San Fernando Rd, Brand Bl	Rapid	N/S	SFV	13	5,622	141.4	13	5,279	139.3	13	5,380	137.3
901	Orange Line	Metro Orange Line: Warner Center - North Hollywood - Chatsworth Metrolink Station	Metro Liner	E/W	SFV	33	29,907	363.9	33	28,285	399.8	33	28,489	400.0
910	Silver Line	Metro Silver Line: El Monte - Los Angeles - Artesia Transit Center	Metro Liner	N/S	SGV	34	12,705	230.4	34	14,223	275.2	34	14,900	316.2

APPENDIX 2:
METRO SERVICE AREAS - MUNICIPALITIES

Gateway	San Fernando Valley	San Gabriel Valley	Southbay	Westside Central
Avalon	Agoura Hills	Alhambra	Carson	Beverly Hills
Artesia	Burbank	Arcadia	El Segundo	Culver City
Bell	Calabasas	Azusa	Gardena	Los Angeles
Bell Gardens	Glendale	Baldwin Park	Hawthorne	Malibu
Bellflower	Hidden Hills	Bradbury	Hermosa Beach	Santa Monica
Cerritos	La Canada-Flintridge	Claremont	Inglewood	West Hollywood
Commerce	Los Angeles	Covina	Lawndale	
Compton	San Fernando	Diamond Bar	Lomita	
Cudahy	Westlake Village	Duarte	Los Angeles	
Downey		El Monte	Manhattan Beach	
Hawaiian Gardens		Foothill	Palos Verdes Estates	
Huntington Park		Glendora	Ranch Palos Verdes	
Industry		Irwindale	Redondo Beach	
La Habra Heights		La Puente	Rolling Hills	
La Mirada		La Verne	Rolling Hills Estates	
Lakewood		Los Angeles	Torrance	
Long Beach		Monrovia		
Los Angeles		Montebello		
Lynwood		Monterey Park		
Maywood		Pasadena		
Norwalk		Pomona		
Paramount		Rosemead		
Pico Rivera		San Dimas		
Santa Fe Springs		San Gabriel		
Signal Hill		San Marino		
South Gate		Sierra Madre		
Vernon		South El Monte		
Whittier		South Pasadena		
		Temple City		
		Walnut		
		West Covina		

APPENDIX 3:
METRO SERVICE AREAS - MUNICIPAL & COMMUNITY TRANSIT OPERATORS

Gateway	San Fernando Valley	San Gabriel Valley	South Bay	Westside Central
Bell Gardens Town Trolley (562) 806-8777	Agoura Hills Dial-A-Ride (818) 707-2005	City of Arcadia Transit & Dial-A-Ride (626) 445-2211	Carson Circuit & Dial-A-Ride (310) 352-3250	Culver CITYBUS (310) 253-6500
Bellflower Bus & Dial-A-Ride (562) 865-RIDE	Antelope Valley Transit (661) 729-2203	Alhambra Community Transit (626) 289-1220	El Segundo (310) 524-2704	Hahn Trolley/ Shuttle (562) 563-5639 or (626) 458-3968
Cerritos-On-Wheels (COW) & Dial-A-Ride (562) 928-4269	Burbank Local Transit (BLT) (818) 246-4258	Azusa Transit (626) 969-4287	Gardena Municipal Bus Lines (310) 324-1475	LADOT (213) 808-2273
Commerce Municipal Bus Lines (323) 887-4419	Calabasas Dial-A-Ride/ Calabasas Trolley (818) 878-4242	Baldwin Park Transit (626) 813-5215	Inglewood Shopper's Shuttle (310) 412-4378	Santa Monica Big Blue Bus (310) 451-5444
Compton Renaissance Transit System (310) 605-5505	Glendale Bee Line (818)548-3960	Children's Court Shuttle (626) 458-3956	The Lawndale Beat (310) 973-3270	West Hollywood Cityline (323) 583-6095
Cudahy Area Rapid Transit (323) 772-5143 ext.233	LADOT (213) 808-2273	Claremont Dial-A-Ride (909) 596-7664	LADOT (213) 808-2273	
Downey Link (562) 529-LINK	Metrolink (800) 371-LINK	Duarte Mini Transit System (626) 357-7931 ext. 246	Palos Verdes Peninsula Transit (310) 544-7108	
Huntington Park Dial-a-Ride (323) 583-2163	Santa Clarita Transit (661) 294-1287	El Sol Shuttle (626) 485-3596	Redondo Beach Wave (310) 372-1171 Ext. 2670 or Ext. 2511	
La Mirada Transit & Dial-A-Ride (562) 943-6776 or (714) 521-0330		El Monte Trolley Company (626) 443-7384	Torrance Transit (310) 618-6266	
Long Beach Transit (562) 591-2301		Foothill Transit (800-RIDE-INFO)		
LADOT (213) 808-2273		Glendora Transit (Metrolink Shuttle) (626) 914-8233		
Lynwood Trolley Company (310) 603-0220 ext 287		La Puente Link (626) 855-1500		
Norwalk Transit System (562) 929-5550		LADOT (213) 808-2273		
Paramount Easy Rider Shuttle Dial-A-Ride (562) 220-2121		Metrolink (800) 371-LINK		
Sante Fe Springs Metro Express Shuttle (562) 929-5550		Montebello Bus Lines (323) 558-1625		
Whittier Transit/ Whittier Dial-A-Ride (562) 698-2131		Monrovia Transit (310) 358-3538		
		Monterey Park Spirit (626) 307-7842		
		Pasadena Area Rapid Transit System (ARTS) (626) 740-4055		
		Pomona Valley Transportation Authority (909) 596-7664		
		Rosemead Shopping Express (818) 572-4099		
		Sierra Madre Dial-A-Ride (626) 355-3873		
		Temple City Dial-A-Ride (626) 286-2456		
		West Covina Shuttle & Dial-A-Ride (626) 939-8491		

APPENDIX 4: GLOSSARY OF TERMS

BRT – Bus Rapid Transit (BRT) is a bus service operated on exclusive rights-of-way (busway), HOV, and on short stretches of street lanes.

Bus/Rail Interface Plan –The integration of bus and rail services at rail stations. Generally the integration of a bus lines that travel near or cross a rail corridor, which may require a reroute of the line to connect with a rail station.

Transit-Signal Priority – This is an operational strategy that facilitates the movements of in-service transit vehicles through signalized intersections to improve transit performance by extending the green phase or shortening the red phase of traffic signals.

CARB – The California Air Resources Board (CARB) was established by the California Legislature in 1967 to attain and maintain healthy air quality, conduct research into the causes of and solutions to air pollution, and systematically attack the serious problem caused by motor vehicles, which are the major causes of air pollution in the State. Since its formation CARB has worked with the public, the business sector, and local governments to protect public health, the economy, and state ecological resources through cost-effective reduction of air pollution.

SCAQMD –The South Coast Air Quality Management District (SCAQMD), formerly called Air Pollution Control District, has authority for control of emissions from stationary sources within the Los Angeles region. The control includes restrictions on use of paints and solvents by site. Through extension of the agency's on-site emission control the SCAQMD sets extensive requirements on employers for ride sharing encouragement.

CNG – Is Compressed Natural Gas (CNG) fuel that is becoming an alternative to the diesel fuel commonly used in transit buses. The attraction of CNG is due to its ability to meet the low emission regulations being imposed upon the transit industry and the abundant supply of the fuel in the United States. CNG is pressurized to 3600psi and stored in carbon fiber containment vessels aboard the vehicles.

Congestion Pricing – Congestion pricing is the concept of charging for the use of a transportation facility, such as a roadway, based on the level of congestion. The greater the level of congestion, usually occurring during morning and evening rush hours, the higher the cost to use the facility.

Deadhead – The movement of a transit vehicle without customers aboard, often to and from a terminal or from one route to another.

High Capacity Vehicle – Any bus that provides seating for more than 40 passengers (e.g. double decker buses, 45-foot buses, and 60-Foot articulated buses).

HOV Lanes – High-Occupancy Vehicle (HOV) Lanes are lanes in streets and highways set aside for High Occupancy Vehicles (vehicles with multiple occupants). Such lanes are also called "diamond" or carpool lanes and rules for their use are posted.

HOT Lanes – High-Occupancy Toll (HOT) lanes are designated lanes that motorists driving alone can use if they pay a toll, allowing them to avoid traffic delays in the adjacent regular lanes. HOT lanes are usually combined with high-occupancy-vehicle (HOV or carpool) lanes that have enough capacity to handle more vehicles. Toll-paying drivers and toll-free carpools/vanpools share the lane, increasing the number of total vehicles using the HOV/HOT lane and generating revenues that can be used for transportation improvements.

HVAC – Stand for heating, ventilating, and air conditioning. HVAC is the technology of indoor and vehicular environmental comfort. Its goal is to provide thermal comfort and acceptable indoor air quality.

MSRC – The Mobile Source Air Pollution Reduction Review Committee (MSRC) whose sole mission is to fund projects that reduce air pollution from motor vehicles within the South Coast Air District in Southern California. Grants fund the implementation of programs to reduce air pollution from motor vehicles pursuant to air quality plans and provisions of the California Clean Air Act.

M3 – The Maintenance & Material Management (M3) system is a material, equipment, and facilities management system that automates the control, planning, acquisition and distribution of inventory and tracking of maintenance activities.

NTD – The National Transit Database (NTD) is the mechanism through which the Federal Transit Administration (FTA) collects uniform data needed by the Secretary of Transportation to administer Department programs. The data collected consists of selected financial and operating data that generally describe mass transportation characteristics.

ZEV – Zero Emission Vehicle (ZEV) is a vehicle that emits no tailpipe pollutants from the onboard source of power.

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