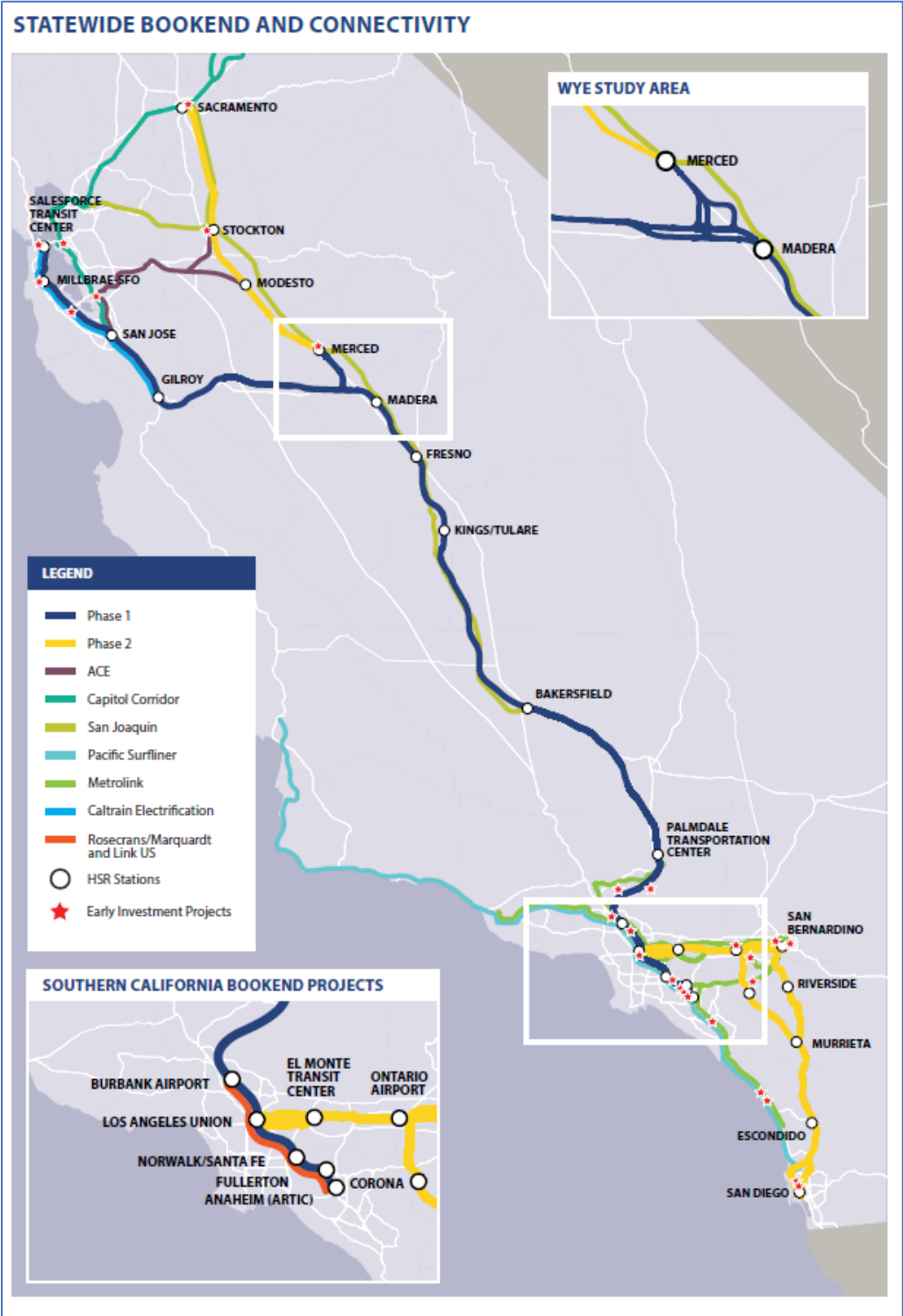


Getting Southern California High Speed Rail-Ready with an Investment in Metrolink's Burbank to Anaheim Corridor



Contents

Executive Summary..... 1

Metrolink Overview 3

A Vision for Metrolink..... 4

Integrating Statewide Service within Southern California..... 5

Realizing the Vision in the Burbank – Anaheim Corridor..... 5

Burbank – Anaheim Corridor People Benefits 6

Burbank – Anaheim Corridor Economic Benefits 7

Burbank – Anaheim Corridor Environmental Benefits 7

Burbank – Anaheim Corridor Connectivity Benefits..... 8

Metrolink Delivers Results 9

The Future is Now 10

FIGURES

Figure 1: Metrolink System Map..... 3

Figure 2: SCORE Vision for 2028 4

Figure 3: Travel Time from Burbank Airport to Anaheim 6

TABLES

Table 1: Burbank-Anaheim Corridor Disadvantaged Community (DAC) Station Area Population..... 7

Table 2: Estimated Metrolink Ridership, GHG and Criteria Pollutant Benefits through 2058 (ZEV Scenario) 8

Table 3: Estimated HSR and LOSSAN Ridership and GHG Benefits through 2058..... 8

Table 4: Systemwide Projects Delivered by Metrolink 9

Table 5: Current Investment Needs in the Burbank-Anaheim Corridor 11

Table 6: Current Investment Needs in the Burbank-Anaheim Corridor (By Phase) 12

Appendix 1: Southern California Optimized Rail Expansion (SCORE) Complete Project List

Cover Image Source: California High-Speed Rail Connectivity and Bookend Investments Fact Sheet
https://www.hsr.ca.gov/communication/info_center/factsheets.aspx

Executive Summary

The California High-Speed Rail Authority (CAHSR) Board of Directors met on July 16, 2019, during which Director Ernesto Camacho requested that CAHSR staff perform a side-by-side comparison of the Central Valley, the Bay Area, and the Los Angeles Corridor. As a result, the Southern California Regional Rail Authority (Metrolink) received a request from CAHSR on August 6, 2019 to provide information regarding investments that could be made in the Southern California rail network that would benefit future High-Speed Rail deployment. Those investments and their present-day and future benefits are provided in the attached report.

Metrolink is the nation’s third largest commuter rail system with **538** total route miles, serving six Southern California counties with a cumulative population of **21.5 million people**. Currently, Metrolink customers ride an average of 36 miles one-way and remove more than **9 million car trips** annually, equating to a **28% reduction** in traffic volume during the peak hour in peak direction on parallel freeways. The result is an annual Vehicle Miles Traveled (VMT) reduction of over **335 million miles** in Southern California. That reduction will only grow with Metrolink’s vision to double ridership by 2023 and provide 30-minute, bidirectional service throughout the system by the 2028 Olympic Games. As a joint powers authority that relies on member agency contributions, it is critical to leverage state and federal investment to realize the vision.

Metrolink Today	
Annual Ridership (FY 2019)	11.9 million
Annual VMT Reduced	335 million +
Time Saved vs. Driving I-5	Up to 54 minutes
Annual Greenhouse Gases Reduced	130,000 metric tons
Metrolink Tomorrow	
Annual Ridership (FY 2028)	20 million +
Annual VMT Reduced	500 million +
Time Saved vs. Driving I-5	Up to 84 minutes
Annual Greenhouse Gases Reduced (average annual 2024-2028)	207,000 + metric tons

California High Speed Rail is looking to make key investments in the Burbank – Anaheim Corridor in Southern California that will benefit the statewide service when it begins to operate in the future. Metrolink and its Member Agencies are currently spending \$1.8 billion on the Corridor through the Southern California Optimized Rail Expansion (SCORE) Program. Metrolink has identified approximately \$9.4 billion¹ in capital projects and rolling stock deployments needed for the Corridor. A phased delivery strategy reduces that need in the short term to \$3.5 - \$5.5 billion by 2024, which would allow the Burbank to Anaheim Corridor to initiate a high-speed rail ready service and enhance **connectivity with multiple existing services throughout Southern California**. This investment will lay the groundwork for CAHSR and help to reduce VMT along with greenhouse gas (GHG) and criteria pollutant emissions, while providing attractive zero emissions rail choices for the traveling public and for visitors to California.

Investments in this corridor will help operating efficiencies related to facilitating 130 train movements in the corridor each weekday, including 80 freight trains and 50 passenger trains on a corridor of regional and national significance. These investments also will benefit the Los Angeles – San Diego – San Luis Obispo (LOSSAN) Rail Corridor immediately by providing additional capacity, flexibility and reliability, while also providing these same benefits to CA HSR when it begins to operate. Finally, private entities like Virgin Trains have expressed interest and the potential for **private funding** in this

¹ \$7 billion for capital projects; \$2.5 billion for ZEV rolling stock and facilities.

corridor, further demonstrating the benefits of investments in the Burbank – Anaheim Corridor and making this a unique opportunity for California.

In summary, investment in the Burbank – Anaheim Corridor enables immediate mobility improvement in Southern California by strengthening the backbone of the entire system and creating the capacity to accept additional systemwide improvements that enable high-frequency services throughout the day, while simultaneously making Southern California high-speed rail ready. State investment in the Burbank – Anaheim Corridor also has the potential to unlock significant **federal funding** and pave the way for **private investment** in Southern California.

Director Camacho’s motion recognizes the ridership, congestion relief, GHG reductions and other near-term benefits early investment in Northern and Southern California can provide in conjunction with ongoing investment in the Central Valley. The Metrolink Burbank – Anaheim Corridor stands ready to maximize the early benefits of state, federal, local funding, and potential private fund sources to deliver high-speed rail ready infrastructure to get faster congestion relief, greenhouse gas emissions reductions, and mitigate the impacts of climate change. The future is now.

Metrolink Overview

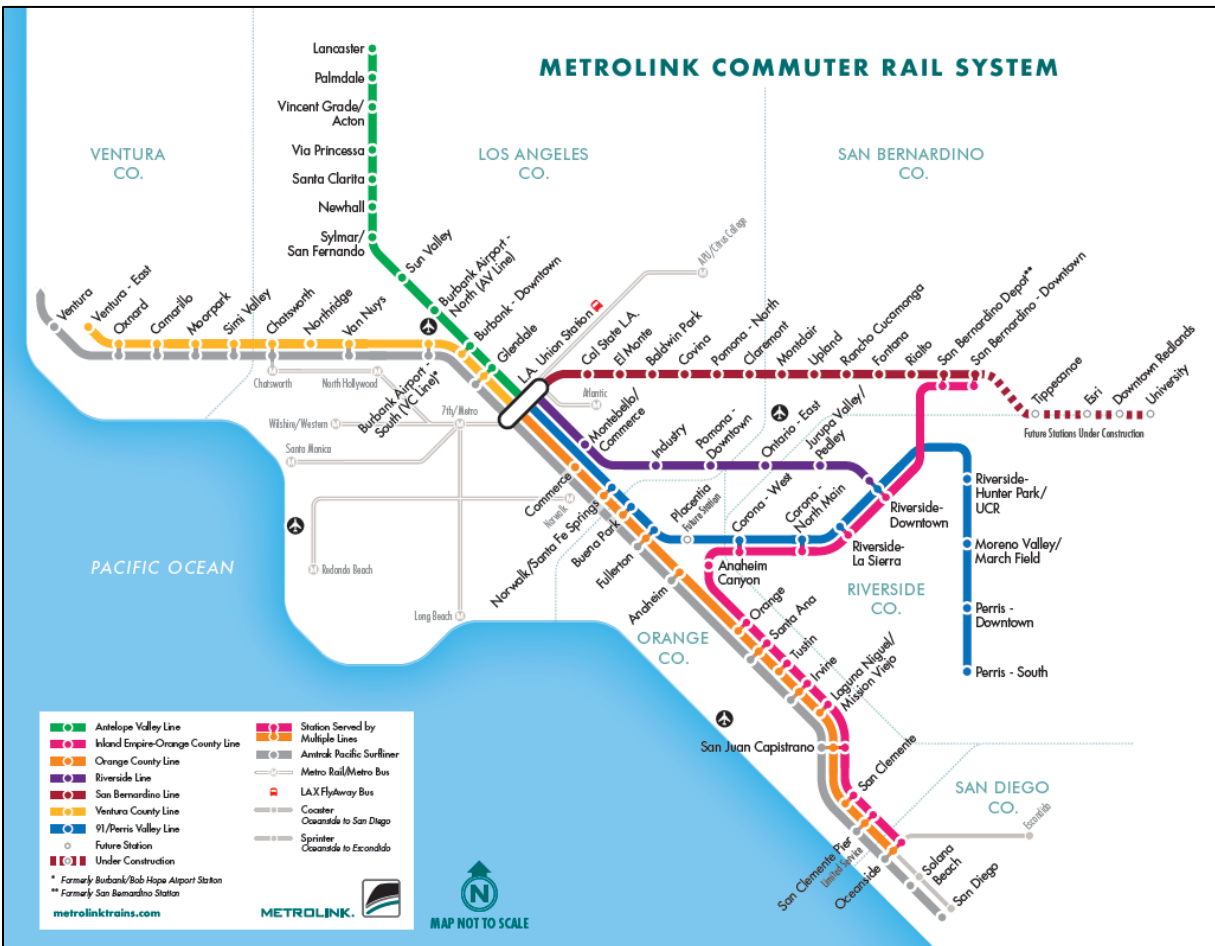
Metrolink is the nation’s third largest commuter rail system, based on its **538** total route miles, serving six Southern California counties with a cumulative population of **21.5 million people** – over half of California’s total population. Over the next 15 years, these counties are forecasted to add **one million people**, while also meeting the State’s ambitious greenhouse gas (GHG) reduction and housing goals. Commuter rail service is an important resource to connect our region’s affordable housing to key economic job centers.

Here are a few key statistics:

- **11.9 million** annual riders in Fiscal Year 2019;
- **81%** of weekday trips are work-related, reducing traffic volume during the peak hour in peak direction by up to **28%** on parallel freeways such as the 5, 10, 57, 101, 134, 215, 710 freeways– some of the most congested roadways in the nation;
- **60%** of Metrolink riders travel across county lines;
- Metrolink eliminates **130,000 metric tons** of greenhouse gas (GHG) emissions annually; and
- Metrolink eliminates **335,080,746** vehicle miles traveled (VMT) per year from area roadways.

Approximately **15 million people** live within five miles of Metrolink’s **62 stations** throughout Southern California. Our average trip length is **36 miles** and **85% of our riders** have access to a car, but choose commuter rail, making a Metrolink trip an avoided freeway trip. Despite its impact, Metrolink does not yet have the infrastructure investment needed to achieve its full congestion relief potential.

Figure 1: Metrolink System Map

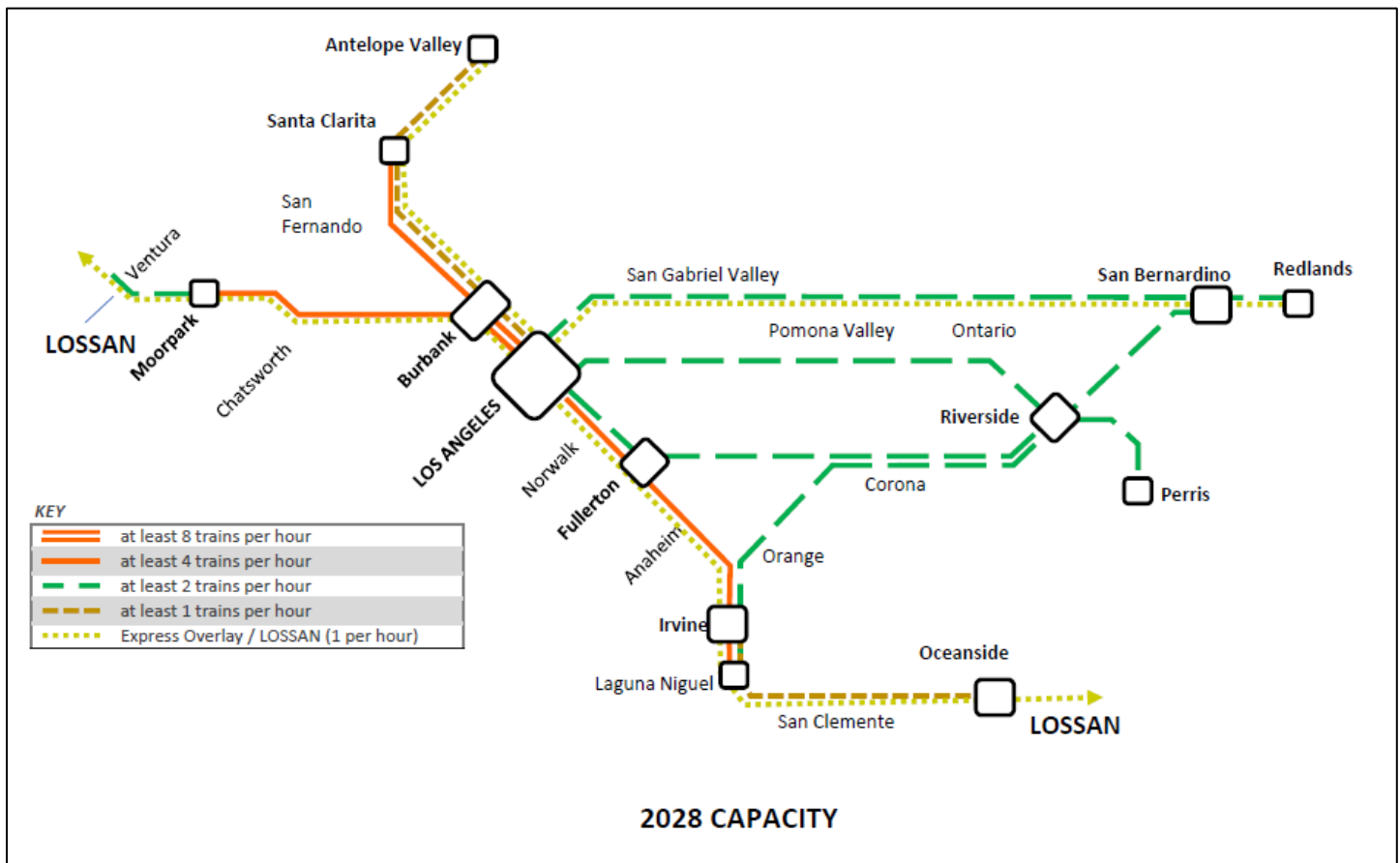


A Vision for Metrolink

The Chief Executive Officer’s overall vision for Metrolink is to double system ridership in five years. Achieving that goal will require trains reliably arriving at least every 30 minutes, with higher performance trainsets that will include deployment of zero emission vehicles (ZEV). Realizing the vision will require targeted investments in the Southern California Optimized Rail Expansion (SCORE) program, along with additional investments in the 45-mile Burbank – Anaheim Corridor, and the introduction of ZEV trainsets in the Burbank – Anaheim Corridor by the time Southern California hosts the 2028 Olympics.

The corridor between Burbank and Anaheim is shared with Amtrak, freight rail and, in the future, with California High-Speed Rail. The aforementioned investments support the long-term State investment in the California High-Speed Rail System and growth in state-supported Amtrak service; benefits the nationally significant freight corridors emanating from the Ports of Los Angeles and Long Beach; and is consistent with State’s Transportation Plan 2040 Vision, the 2018 State Rail Plan, the 2018 High Speed Rail (HSR) Business Plan and the Southern California Association of Governments’ Sustainable Communities Plan.

Figure 2: SCORE Vision for 2028



Integrating Statewide Service within Southern California

The 2018 California High Speed Rail Business Plan (Business Plan) identifies the approximately 45-mile rail corridor connecting Burbank-Los Angeles-Anaheim as one, “...of regional and statewide significance and critical to supporting the Southern California economy.” The Burbank – Anaheim Corridor connects significant California residential and commercial markets, along with tourist, entertainment, cultural and business destinations. The Corridor also provides strategic connections across the Southern California network, and is fundamental to the rail operator partnerships between Metrolink, Burlington Northern Santa Fe Railway (BNSF), Union Pacific Railroad (UPRR), Los Angeles – San Diego – San Luis Obispo Rail (LOSSAN), California High-Speed Rail and our Member Agencies who are working together to address regional mobility needs.

The Business Plan further articulates the following as consistent with California High-Speed Rail objectives and principles, citing the need to invest in, “...*vital, high-priority projects in Southern California along the Burbank to Los Angeles to Anaheim corridor that improve freight, local and regional passenger rail service, enhance transit connections, improve safety, and accommodate the introduction of high-speed rail service in Southern California.*”

The cover image shows the Burbank – Anaheim Corridor in the context of the California High-Speed Rail Phase 1, which is scheduled to deliver high-speed rail to Southern California by 2033, replacing the planned interim bus service between Bakersfield and Burbank. The Figure also illustrates the connectivity between HSR and Metrolink and the Amtrak Pacific Surfliner, which underscores the importance of readying the regional network to receive the influx of HSR passengers starting in 2033. Investing in the Burbank – Anaheim Corridor also helps to accomplish the Business Plan mobility and environmental goals to:

- “Use 100 % renewable energy to power the electrified system.”
- “Eliminate the equivalent of 322,000 passenger vehicles from roads and highways each year.”
- “Realize 189 lbs. of GHG reductions for each rider.”

State investment in the Burbank – Anaheim Corridor has the potential to unlock new federal investments from programs like the Federal Transit Administration (FTA) Core Capacity Program, which requires a one-to-one match for funding provided.

Realizing the Vision in the Burbank – Anaheim Corridor

Metrolink and its Member Agencies are currently spending \$1.8 billion on the Corridor through the Southern California Optimized Rail Expansion (SCORE) Program. Accomplishing the vision for the region by opening up capacity in the Burbank – Anaheim Corridor will require an estimated \$9.4 billion in capital improvements and rolling stock deployments. Additional investment in the corridor would allow Metrolink to address approximately \$50 million in State of Good Repair needs, and would provide the resulting physical safety, capacity and reliability improvements including:

- 90 total miles of double track infrastructure
- 50 total miles of triple track infrastructure
- 33 total miles of four-track infrastructure
- 12 additional sidings
- 15 at-grade crossing upgrades and grade separations
- 44 zero-emissions trainsets deployed
- New and modernized maintenance facilities

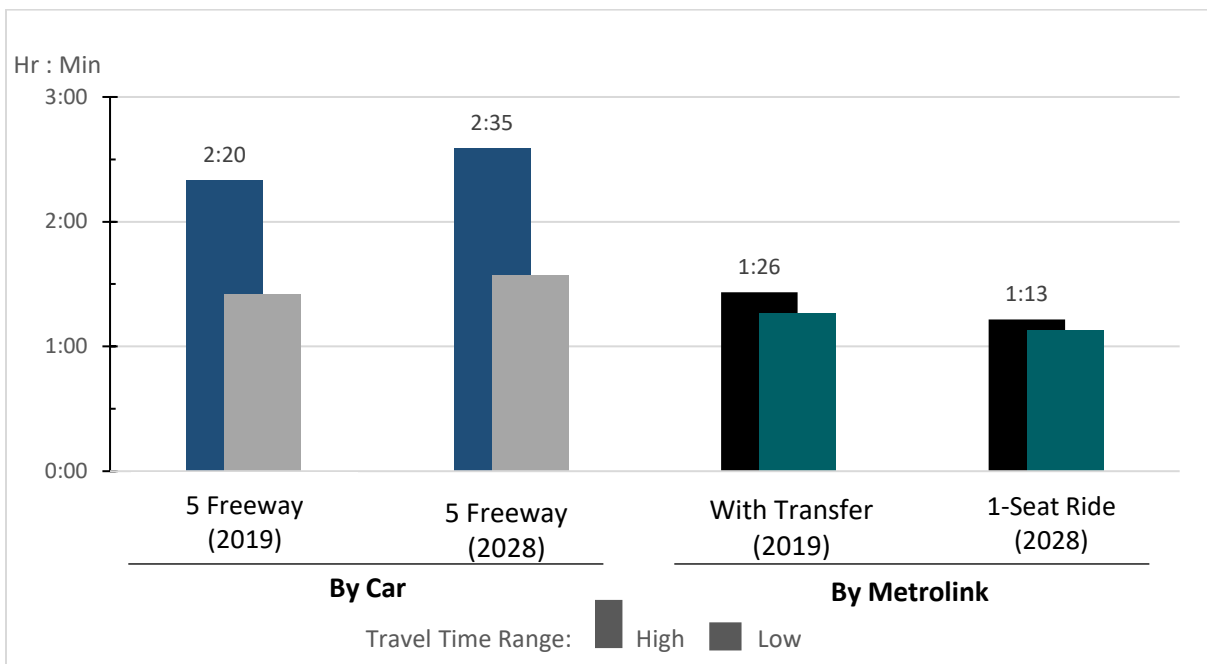
A phased delivery strategy reduces that need in the short term to \$3.5 - \$5.5 billion by 2024, which would allow the Burbank to Anaheim Corridor to initiate a high-speed rail ready service and enhance **connectivity with multiple existing services throughout Southern California.**

Burbank – Anaheim Corridor People Benefits

Today, the following stations along the corridor are in the top 15 in average weekday boardings: LA Union Station (1); Fullerton (2); Burbank-Downtown (5); Norwalk-Santa Fe Springs (8) and Glendale (12). Also, the following corridor stations are ranked in the top 10 for the number of trains stopping: LA Union Station (1); Burbank – Downtown (4); Glendale (5-tie); Fullerton (5-tie); and Anaheim (7).

Metrolink travel times compare very favorably to parallel freeways, which include Interstates 5, 10, 210, 405 and 605; and State Routes 14, 91 and 170. Current Burbank – Anaheim Corridor ridership is over 1.8 million annually; and we want to double that. Current riders have found their travel time comparison is favorable when they take Metrolink in lieu of driving, as illustrated in Figure 3. Metrolink passengers will reduce their travel time by 22% with these investments in the corridor. Future high-speed rail services running on the corridor could make the Burbank – LA – Anaheim trip in just over an hour on the proposed improvements. Giving people back their time is priceless, as anyone who navigates Southern California traffic knows.

Figure 3: Travel Time from Burbank Airport to Anaheim



As shown in Table 1, the Burbank – Anaheim corridor stations include 203,233 residents within one-half mile. Of the 46 total census tracts, 76% of them are categorized as SB 535 Disadvantaged Communities, and 70% are categorized as AB 1550 Low-Income Communities. The mobility, public health and economic benefits of the project extend far beyond the station area, to the entire corridor service area, where similar percentages of disadvantaged communities are located. Public health benefits are associated with safer rail crossings, cleaner air, more biking and walking opportunities, safer mobility options and access to health services via affordable transit. The SCORE Program will net 3.7 million new walk/bike trips per year, 84% of which will occur in disadvantaged communities.

Table 1: Burbank-Anaheim Corridor Disadvantaged Community (DAC) Station Area Population

Assets (1/2-mile buffer)	General Info		Disadvantaged Communities		Low-Income Buffer		Low-Income Communities	
	Total Population	Total Tracts	# DAC Tracts	% DAC Tracts	# LI-B Tracts	% LI-B Tracts	# LI Tracts	% LI Tracts
AVL - Burbank - Downtown	23,301	5	4	80%	1	20%	4	80%
AVL - Glendale	30,525	8	7	88%	0	0%	7	88%
AVL - Union Station	34,732	10	8	80%	1	10%	8	80%
Commerce	15,287	3	3	100%	0	0%	3	100%
OCL - Norwalk/Santa Fe Springs	24,671	7	7	100%	0	0%	3	43%
OCL - Buena Park	26,046	4	2	50%	0	0%	2	50%
OCL - Fullerton	29,034	6	3	50%	0	0%	4	67%
OCL - Anaheim	19,637	3	1	33%	0	0%	1	33%
TOTALS	203,233	46	35	76%	2	4%	32	70%

Source: California Air Resources Board: <https://ww3.arb.ca.gov/cc/capandtrade/auctionproceeds/lowincomemapfull.htm>

Burbank – Anaheim Corridor Economic Benefits

The Metrolink system largely connects more affordable housing with job centers. In addition, economic development and individual opportunities are improved as transit options strengthen current linkages and create new linkages to markets, education, jobs, housing, and health care. Using the American Public Transportation Association methods from 2014, the investments in the corridor will create 336,115 jobs, more than half of which will be long-term sustainable jobs made possible by transit efficiencies. The transit efficiencies accrue because of the investments made in an area where there are already 1,204,995 jobs within five miles of the Burbank – Anaheim Corridor and 1,976,374 employed residents. Instead of the adage “drive-until-you-qualify” (for mortgaged or rental housing), Metrolink riders are instead “riding-until-they qualify”.

The Burbank – Anaheim Corridor has the most daily freight and passenger trains on the Metrolink system. Investments in this corridor will help operating efficiencies related to facilitating 130 train movements in the corridor each weekday, including 80 freight trains and 50 passenger trains on a corridor of regional and national significance, and accommodate future growth.

The Hollywood Burbank Airport terminal project is slated for completion in 2024 and will be a critical multi-modal transportation hub for thousands of Californians every day. Constructing a fourth track in the core helps all of the branch lines, enabling more frequent passenger trains, and reducing delays to freight trains by at least 75% at Fullerton Junction, thereby reducing truck traffic and shipping costs.

Burbank – Anaheim Corridor Environmental Benefits

Table 2 shows the reductions in VMT, greenhouse gas emissions and criteria pollutant emissions due to the introduction of ZEV technology to serve the Burbank – Anaheim Corridor based upon the California Air Resources Board (CARB) 2018-2019 Tool provided for TIRCP applications². The benefits are based on net incremental ridership gains in the Corridor as a result of the investments identified in Tables 5 and 6. The analysis assumes an initial introduction of ZEV technology in 2024, and a larger deployment of ZEV trainsets by 2028.

² While this methodology differs from the Southern California Association of Governments methodology, they have agreed the CARB methodology is best utilized for this type of investment analysis.

Table 2: Estimated Metrolink VMT, GHG and Criteria Pollutant Reductions through 2058 (ZEV Scenario)

Pollutant or Factor	Reduction	Time Period
Annual Project Passenger VMT Reductions (miles)	193,021,330	Annual Average
Total Project GHG Emission Reductions (MTCO ₂ e)	2,308,055	2024-2058
Total Project ROG Emission Reductions (lbs.)	666,068	2024-2058
Total Project NOx Emission Reductions (lbs.)	10,843,249	2024-2058
Total Project PM _{2.5} Emission Reductions (lbs.)	382,171	2024-2058
Total Project Diesel PM Emission Reductions (lbs.)	404,565	2024-2058

Source: CARB/TIRCP FY 2018-2019 Calculator Tool Outputs

Additionally, as shown in Table 3, based on the estimated ridership from the base case scenario in the 2018 High-Speed Rail Business Plan, the region would see additional total GHG emissions reductions of 16.9 million tons between 2028 and 2058, based on increased ridership from Amtrak’s Pacific Surfliner and Coast Starlight, and the completion of Phase 1 of the High-Speed Rail plan. The Business Plan further states that ridership on HSR would begin at 11 million during its first year of operation in 2033, and rise to 13.9 million by 2058, as travelers in the state’s largest markets avail themselves of one-seat rides from Northern to Southern California.

Table 3: Estimated HSR and LOSSAN Ridership and GHG Benefits through 2058

CARB TIRCP GHG Tool Analysis	Year 1	Year 1 Ridership	Year Final	Year Final Ridership	Total GHG Reductions
HSR (Southern California Phase 1 Stations Burbank - Anaheim)	2033	11,000,000	2058	13,994,925	15,203,192
LOSSAN Pacific Surfliner + Coast Starlight	2028	1,666,035	2058	3,017,791	1,733,324
Total (HSR + LOSSAN)		12,666,035		17,012,716	16,936,517

Source: HSR ridership based on 2018 Business Plan; LOSSAN ridership based on estimate from Caltrans 2018 modeling.

Burbank – Anaheim Corridor Connectivity Benefits

The Metrolink system throughout Southern California benefits from the multiple present and future connections that will further benefit future growth. Some of these connections include the LA Metro East San Fernando Valley Corridor, Sepulveda Transit Corridor, Regional Connector, West Santa Ana Branch and Orange County Streetcar projects, adding billions of dollars of additional investment and tens of millions in new ridership into the system. Most importantly, maximizing these connections can be done almost completely within established rail right of way, with minimal need for property acquisition and major utility moves or permitting that add significant cost and risk to delivering the benefits to the traveling public.

Above and beyond the public investment in the region, the Burbank – Anaheim Corridor is the only corridor at this time that presents a true opportunity to unlock private investment into a major rail corridor in California. Virgin Trains USA has made public its intention to operate train service to Las Vegas, potentially utilizing the High Desert Corridor to connect into Los Angeles via Palmdale. According to the 2017 High Desert Corridor Investment Grade Ridership & Revenue Forecasts, this connection is projected to add new ridership of approximately 6.5 million, further leveraging the State’s investment in this corridor.

Metrolink Delivers Results

Metrolink has a 15-year track record of leading and delivering capital and rehabilitation projects and supporting third-party projects throughout the Metrolink system, including track, signal, and station projects. In December 2018, Metrolink completed the \$247 million investment in Positive Train Control, making it one of only four rail systems to complete installation and interoperability by the federal deadline. Table 4 shows systemwide projects delivered by Metrolink since 2003. Metrolink is currently delivering an additional \$169 million in projects in the Burbank – Anaheim Corridor, further indicating readiness for High-Speed Rail investment.

Table 4: Systemwide Projects Delivered by Metrolink

Project Description	Year Complete	Cost	Location	Project Beneficiaries
Track and Signals				
Communications Backhaul Terminal Mission Signal Improvements Cesar Chavez Tunnel Rehab Track & Structures Rehab Burbank Station Pedestrian Xing Improvements North Main Street Bridge Widening Grade Crossing Improvements	2005-2017	\$81 M	Burbank – LA	UPRR, Metrolink, LOSSAN, HSR
Metrolink Service Expansion Program Fullerton Turnback & Anaheim Layover Facility New Control Points Orange Relief Siding Signal Improvements Turnout, Rail, Ties, Xing Replacement Bridge Rehab Communication System Upgrade Right-of-Way Grading and Drainage North Anaheim OH Widening State College Grade Separation	2003-2017	\$154 M	LA – Anaheim	UPRR, BNSF, Metrolink, LOSSAN, HSR
Positive Train Control (PTC) Signal Respacing Customer Information Systems	2006-2018	\$247M	Systemwide	
Sub-Total Track and Signals		\$482M		
Stations and Facilities				
Platform and Security Improvements Canopy Rehab Customer Information System Platform Lighting	2006-2013	\$26M	Union Station	Metrolink, LOSSAN, HSR
Van Nuys Station	Ongoing	\$31M	Burbank – LA	UPRR, Metrolink, LOSSAN, HSR
ARTIC Customer Information System Rehabilitation (Surfliner Stations)	2011-2013	\$3M	LA – Anaheim	UPRR, BNSF, Metrolink, LOSSAN, HSR
Sub-Total Stations and Facilities		\$60M		
Rolling Stock				
Tier 4 F125 Locomotives and passenger cars	Ongoing	\$328M	Systemwide	Metrolink
Sub-Total Rolling Stock		\$328M		
Total Investment Delivered		\$870M		

The Future is Now

Metrolink recently reached the highest ridership in its 26-year history with 11.9 million annual riders for fiscal year ending June 30, 2019. The vision is to double that in the next five years and to set the stage for a fortified transit service that will be a mobility highlight during the 2028 Olympic Games.

Investment in the Burbank – Anaheim Corridor, enables immediate mobility improvement in Southern California by strengthening the backbone of the entire system and creating the capacity to accept additional systemwide improvements that enable high-frequency services throughout the day, while simultaneously making Southern California high-speed rail ready. State investment in the Burbank – Anaheim Corridor also has the potential to unlock significant federal funding and pave the way for private investment in Southern California; the only region that can make such a claim.

Metrolink is poised to deliver.

Table 5: Current Investment Needs in the Burbank– Anaheim Corridor

Project Description	Cost (YOE) ¹	Projected Start of Construction	Projected End of Construction	ZEV 30-Year GHG Reduction ² , Metric Tons CO ₂ e	ROG Reduction (lbs.)	NOx Reductions (lbs.)	PM2.5 + Diesel Emission Reductions (lbs.)	Project Beneficiaries
Grade Separations								
Norwalk Boulevard/Los Nietos Road Grade Seps.	\$129 M	2022	2026	288,937	13,403	62,673	5,190	BNSF, Metrolink, LOSSAN, HSR
Pioneer Boulevard/Los Nietos Road Grade Seps.	\$129 M	2022	2026	288,937	13,403	62,673	5,190	
Doran Street and Broadway/Brazil Grade Sep.	\$170 M	2020	2028	380,475	17,648	82,528	6,835	UPRR, Metrolink, LOSSAN, HSR
Sub-Total Grade Separations	\$428 M			958,349	44,454	207,874	17,215	
Track and Signals								
4 th Main Track Hobart to Pico	\$1,351 M	2020	2024	3,022,782	140,217	655,669	54,293	BNSF, Metrolink, LOSSAN, HSR
4 th Main Track Pico to Basta	\$1,140 M	2022	2028	2,551,629	118,361	553,467	45,835	UPRR, Metrolink, LOSSAN, HSR
4 th Main Track Basta to Fullerton	\$338 M	2020	2024	755,697	35,055	163,917	13,574	BNSF, Metrolink, LOSSAN, HSR
Link Union Station Phase B ⁴	\$1,500 M	2024	2028	3,357,132	155,726	728,187	60,304	Metrolink, LOSSAN, HSR
Express Tracks Burbank to LA	\$1,004 M	2022	2028	2,246,974	104,230	487,385	40,363	UPRR, Metrolink, LOSSAN, HSR
Burbank Junction Flyovers	\$266 M	2022	2028	595,377	27,618	129,141	10,694	BNSF, Metrolink, LOSSAN, HSR
Fullerton Junction Reconfiguration Phase 2	\$226 M	2020	2024	505,137	23,432	109,568	9,074	BNSF, Metrolink, LOSSAN, HSR
State of Good Repair Backlog	\$34 M	2020	2028	76,751	3,560	16,647	1,379	BNSF, Metrolink, LOSSAN, HSR
Turn Tracks at Anaheim	\$9 M	2022	2024	19,852	920	4,305	357	BNSF, Metrolink, LOSSAN, HSR
Turn Tracks at Burbank	\$8 M	2020	2024	17,636	818	3,825	317	UPRR, Metrolink, LOSSAN, HSR
Signal Respacing: Fullerton and Anaheim	\$5 M	2020	2024	10,967	509	2,379	197	BNSF, Metrolink, LOSSAN, HSR
Sub-Total Track and Signals	\$5,881 M			13,159,934	610,446	2,854,490	236,387	
Station and Facilities								
Acq. 1 st St. Yard: LINK US Arts Dist. Com. Rail Station	\$286 M	2020	2028	640,742	29,722	138,982	11,510	Metrolink, LOSSAN, HSR
Customer Service Improvements ³	\$183 M	Underway	2024	408,899	18,968	88,693	7,346	Metrolink, LOSSAN, HSR
So. Side Turn Fac. & Arts Dist. Com. Rail Station	\$140 M	2022	2026	313,333	14,534	67,964	5,629	Metrolink, LOSSAN, HSR
Sub-Total Station and Facilities	\$609 M			1,362,974	63,224	295,639	24,485	
Zero Emission Vehicles (ZEVs) and Facilities								
ZEV Locomotive-Hauled Consists (15)	\$539 M	2020	2024	301,775	354,159	6,403,278	458,708	Metrolink
ZEV Updates for Eastern. Maint. Facility	\$236 M	2020	2024	529,085	24,543	114,762	9,504	
ZEV Updates Central Maintenance Facility	\$236 M	2020	2024	529,085	24,543	114,762	9,504	
ZEV Updates Orange County Maint. Facility	\$334 M	2020	2024	747,633	34,681	162,167	13,430	
ZEV Rail Consists (29 for Expansion)	\$1,173 M	2020	2028	1,655,737	296,723	4,370,039	321,370	
Sub-Total Zero Emission Vehicles and Facilities	\$2,518 M			3,763,315	734,649	11,165,008	812,516	
Total Corridor Funding Need ⁵	\$9,436 M							
GHG and Criteria Emissions Benefit for Metrolink, LOSSAN and HSR				19,244,572	1,452,773	14,523,011	1,090,603	
GHG and Criteria Emissions Benefit for Metrolink Only				2,308,055	666,068	10,843,249	786,736	
Net Average Annual Metrolink Ridership Increases Due to Corridor Project (2028-2058) = 5,336,677				Net Average Annual HSR Ridership Increases Due to Corridor Project (2033-2058) = 12,497,463				

(1) Projects costs are shown in Year-of-Expenditure (YOE) dollars and total may not foot due to rounding. Projects have minimal design, making cost and schedule estimates preliminary.

(2) GHG and criteria pollutant results were analyzed using an “electric vehicle” scenario in the CARB TIRCP calculator tool, for Metrolink, LOSSAN and HSR. A “hydrogen fuel cell” option for Metrolink produced the same results for criteria pollutants, though slightly lower GHG emissions reductions than the electric vehicle scenario. The vehicle-related reductions were then allocated to the ZEV Vehicle and Facilities projects, with the remainder pro-rated based on project cost to derive a very approximate project-specific benefit. However, it is important to understand that these projects were designed to be bundled in order to achieve operational capacity, service performance and other metrics that, only when combined, can deliver the ridership, GHG and air quality benefits identified for the entire package.

(3) Customer service improvements include Wi-Fi, updated signage, replaced ticket vending devices, updated signage and public announcement systems. The corridor currently provides access to the Hollywood-Burbank Airport. In the future, access to the Ontario Airport can be made via a train-to-plane connection on Metrolink.

(4) The funding need reflected is for Link US Phase B. Link US Phase A has been fully funded at \$950M.

(5) Project costs include a portion of approximately \$5 billion in estimated HSR bookend contributions (2018 Business Plan, Capital Cost Basis of Estimate Report, pp. 31-32), such as additional track to Fullerton, and other track, structure and signal modifications. A portion of signal and vehicle costs were identified in the HSR Readiness Program.

Table 6: Current Investment Needs in the Burbank-Anaheim Corridor (By Phase)

Project Description	Cost (YOE) ¹	Projected Start of Construction	Projected End of Construction	ZEV 30-Year GHG Reduction ² , Metric Tons CO ₂ e	ROG Reduction (lbs.)	NOx Reductions (lbs.)	PM2.5 + Diesel Emission Reductions (lbs.)	Project Beneficiaries
Phase 1 (Completion by 2024)								
4th Main Track Hobart to Pico	\$1,351 M	2020	2024	3,022,782	140,217	655,669	54,293	BNSF, Metrolink, LOSSAN, HSR
4th Main Track Basta to Fullerton	\$338 M	2020	2024	755,697	35,055	163,917	13,574	BNSF, Metrolink, LOSSAN, HSR
Fullerton Junction Reconfiguration Phase 2	\$226 M	2020	2024	505,137	23,432	109,568	9,074	BNSF, Metrolink, LOSSAN, HSR
Customer Service Improvements ³	\$183 M	Underway	2024	408,899	18,968	88,693	7,346	Metrolink, LOSSAN, HSR
Turn Tracks at Anaheim	\$9 M	2022	2024	19,852	920	4,305	357	BNSF, Metrolink, LOSSAN, HSR
Turn Tracks at Burbank	\$8 M	2020	2024	17,636	818	3,825	317	UPRR, Metrolink, LOSSAN, HSR
Signal Respacing: Fullerton and Anaheim	\$5 M	2020	2024	10,967	509	2,379	197	BNSF, Metrolink, LOSSAN, HSR
ZEV Locomotive-Hauled Consists (15)	\$539 M	2020	2024	301,775	354,159	6,403,278	458,708	Metrolink
ZEV Updates Orange County Maint. Facility	\$334 M	2020	2024	747,633	34,681	162,167	13,430	
ZEV Updates Central Maintenance Facility	\$236 M	2020	2024	529,085	24,543	114,762	9,504	
ZEV Updates for Eastern. Maint. Facility	\$236 M	2020	2024	529,085	24,543	114,762	9,504	
Sub-Total Phase 1	\$3,465 M			6,848,548	657,845	7,823,325	576,304	
Phase 2 (Completion by 2028)								
So. Side Turn Fac. & Arts Dist. Com. Rail Station	\$140 M	2022	2026	313,333	14,534	67,964	5,629	Metrolink, LOSSAN, HSR
Norwalk Boulevard/Los Nietos Road Grade Seps.	\$129 M	2022	2026	288,937	13,403	62,673	5,190	BNSF, Metrolink, LOSSAN, HSR
Pioneer Boulevard/Los Nietos Road Grade Seps.	\$129 M	2022	2026	288,937	13,403	62,673	5,190	
ZEV Rail Consists (29 for Expansion)	\$1,173 M	2020	2028	1,655,737	296,723	4,370,039	321,370	
Link Union Station Phase B ⁴	\$1,500 M	2024	2028	3,357,132	155,726	728,187	60,304	Metrolink, LOSSAN, HSR
4th Main Track Pico to Basta	\$1,140 M	2022	2028	2,551,629	118,361	553,467	45,835	UPRR, Metrolink, LOSSAN, HSR
Express Tracks Burbank to LA	\$1,004 M	2022	2028	2,246,974	104,230	487,385	40,363	UPRR, Metrolink, LOSSAN, HSR
Acq. 1st St. Yard: LINK US Arts Dist. Com. Rail Station	\$286 M	2020	2028	640,742	29,722	138,982	11,510	Metrolink, LOSSAN, HSR
Burbank Junction Flyovers	\$266 M	2022	2028	595,377	27,618	129,141	10,694	BNSF, Metrolink, LOSSAN, HSR
Doran Street and Broadway/Brazil Grade Sep.	\$170 M	2020	2028	380,475	17,648	82,528	6,835	UPRR, Metrolink, LOSSAN, HSR
State of Good Repair Backlog	\$34 M	2020	2028	76,751	3,560	16,647	1,379	BNSF, Metrolink, LOSSAN, HSR
Sub-Total Phase 2	\$5,971 M			12,396,024	794,928	6,699,686	514,299	
Total Corridor Funding Need ⁵	\$9,436 M							
GHG and Criteria Emissions Benefit for Metrolink, LOSSAN and HSR				19,244,572	1,452,773	14,523,011	1,090,603	
GHG and Criteria Emissions Benefit for Metrolink Only				2,308,055	666,068	10,843,249	786,736	
Net Average Annual Metrolink Ridership Increases Due to Corridor Project (2028-2058) = 5,336,677					Net Average Annual HSR Ridership Increases Due to Corridor Project (2033-2058) = 12,497,463			

(1) Projects costs are shown in Year-of-Expenditure (YOE) dollars and total may not foot due to rounding. Projects have minimal design, making cost and schedule estimates preliminary.

(2) GHG and criteria pollutant results were analyzed using an “electric vehicle” scenario in the CARB TIRCP calculator tool, for Metrolink, LOSSAN and HSR. A “hydrogen fuel cell” option for Metrolink produced the same results for criteria pollutants, though slightly lower GHG emissions reductions than the electric vehicle scenario. The vehicle-related reductions were then allocated to the ZEV Vehicle and Facilities projects, with the remainder pro-rated based on project cost to derive a very approximate project-specific benefit. However, it is important to understand that these projects were designed to be bundled in order to achieve operational capacity, service performance and other metrics that, only when combined, can deliver the ridership, GHG and air quality benefits identified for the entire package.

(3) Customer service improvements include Wi-Fi, updated signage, replaced ticket vending devices, updated signage and public announcement systems. The corridor currently provides access to the Hollywood-Burbank Airport. In the future, access to the Ontario Airport can be made via a train-to-plane connection on Metrolink.

(4) The funding need reflected is for Link US Phase B. Link US Phase A has been fully funded at \$950M.

(5) Project costs include a portion of approximately \$5 billion in estimated HSR bookend contributions (2018 Business Plan, Capital Cost Basis of Estimate Report, pp. 31-32), such as additional track to Fullerton, and other track, structure and signal modifications. A portion of signal and vehicle costs were identified in the HSR Readiness Program.