DRAFT
Supplemental Environmental Impact Report for
METRO GOLD LINE FOOTHILL EXTENSION
Azusa to Montclair (SCH No. 2010121069)

Evaluating Station Area Parking Modifications at Glendora, San Dimas, La Verne, Pomona and Claremont

Appendix A - Travel Demand Technical Memorandum

September 2020

Foothill Gold Line

Metro Gold Line Foothill Extension Construction Authority

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METRO GOLD LINE FOOTHILL EXTENSION - AZUSA TO MONTCLAIR

Travel Demand Modeling Technical Memorandum

Supplemental Environmental Impact Report

Metro Gold Line Foothill Extension Construction Authority

August, 2020

Metro Gold Line
Foothill Extension Project

Travel Demand Modeling
Technical Memorandum

Supplemental Environmental Impact Report

August, 2020

Metro Gold Line Foothill Extension
Construction Authority

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1.0 INTRODUCTION

1.1 Background

The Gold Line Extension Phase 2B project evaluates a 12.3-mile extension from Azusa to Montclair, following the 11.5-mile extension of Phase 2A from Pasadena to Azusa completed in 2015. The Final Environmental Impact Report (2013 FEIR) for the Phase 2B was issued in 2013, which was followed by four EIR addenda that addressed minor changes to the project. In 2019, a Supplemental EIR (2019 SEIR) was prepared to evaluate impacts of the potentially phased construction due to funding limitations.

The current approved project extends the Metro Gold Line from just east of the Azusa-Citrus Station to the Montclair Transcenter and includes six new stations in Glendora, San Dimas, La Verne, Pomona, Claremont, and Montclair. As evaluated in the 2013 FEIR, the anticipated travel time would be approximately 18 minutes between Azusa-Citrus Station and Montclair Station. It is anticipated that trains would operate with 10-minute headways during peak periods and 20-minute headways during off-peak periods and would have a projected ridership of approximately 17,800 passengers per day. The projected passenger daily boardings at each proposed station in 2035 from the 2013 FEIR are as shown in **Table 1** below:

Table 1 Ridership at Stations from the 2013 FEIR

Station	Glendora	San Dimas	La Verne	Pomona	Claremont	Montclair
Ridership	1,860	1,780	1,840	3,010	2,840	6,440

Note: Passenger boardings at the Claremont and Montclair Stations did not necessitate updates as part of the 2019 SEIR. The boardings for those two stations are from the 2013 FEIR.

As a result of Project Modifications and revised Metro parking provision guidance resulting from a parking study completed by Metro, parking structures will be replaced by surface parking lots for the Glendora, San Dimas, La Verne, and Pomona locations as well as a combination of either a parking structure or parking lot and leased parking space arrangements at Claremont is warranted. This would reduce the total number of available parking spaces at the stations. At some of these stations, the potential change from a structure to a surface lot would result in minor changes related to the configuration of vehicle and pedestrian access. The proposed parking at the stations are show in **Table 2** below.

Table 2 Proposed Parking Spaces at the Project Stations

Station	Glendora	San Dimas	La Verne	Pomona	Claremont	Montclair
Parking Spaces	302	289	299	550	539	1,600

Note: The parking spaces include parking for both Gold Line stations and Metrolink stations for the Pomona, Claremont and Montclair stations.

1.2 Purpose of Memo

This memo documents the methodology and results of the model runs using the original (as was used in the 2013 FEIR and the 2019 SEIR) to offer a fair comparison to the previous modeling efforts. The results of this modeling analysis shed light on potential direct and indirect effects that the ridership changes can bring about due to the project modifications.

The following sections of this memo describe the alternatives considered and the modeling methodology, as well as provide a summary of the results and preliminary conclusions.

2.0 ALTERNATIVES CONSIDERED

Two scenarios were analyzed for the 2035 forecast year – No Build and Build. The 2035 No Build network from the 2019 SEIR study was used. It includes all the projects from Measure R including the Pasadena to Azusa extension. The Gold Line was defined as part of the North - South line that includes existing stations of the Blue Line, future stations in the Regional Connector and existing stations on the Gold Line north of Union station. All existing Gold Line stations between Union Station and Atlantic are included in the East-West line and are not part of the North-South line. The North - South line would have two variations – Short line and Long line. The Short variation would operate between Long Beach on the Blue Line and Sierra Madre Villa on the Gold Line.

For the Build Alternative, the Gold Line is extended from Glendora to Montclair to include six new stations - Glendora, San Dimas, La Verne, Pomona, Claremont, and Montclair. Out of the new stations, three stations – Pomona North, Claremont and Montclair are common to the Metrolink San Bernardino Line and the Gold Line extension. The headways modeled are 10 minutes and 20 minutes for peak and off peak respectively. Similar to the No Build, the Gold Line is defined as part of the North – South line and the North-South line operates in two variations. Though the shorter variation is the same as the No Build, the long line version operates between Long Beach in the south to Montclair. In addition to the full build, two build scenarios – build extensions with terminal stations as Pomona and Claremont were also run.

3.0 METHODOLOGY

The ridership estimates and parking analysis were done using the Los Angeles County Metropolitan Transportation Authority's (LACMTA) 2009 Corridor Based Model (CBM09). This version of the model was selected because it was used for the 2019 Final SEIR. No additional validation was done for CBM09 as part of this analysis, since the validation process was completed for the 2019 SEIR.

One of the key factors influencing ridership at a station as well as the station area planning is the availability of parking. For the Gold Line extension, it is important to

develop a methodology to estimate parking needs and compare it to the proposed parking spaces to check for the adequacy or make suggestions for extra parking. To develop parking demand estimates, model runs are run “constrained”, where parking at each station is constrained to a fixed capacity. The parking supply is capped to the numbers associated with Project Modifications evaluated in the 2020 SEIR (as shown in **Table 2**).

The total spaces available include spaces that may be shared with commuter rail and other transit service. The constrained run also assumes a “no-spillover’ condition, which means that the parking is assumed to be available only at the park and ride facility. Hence a driver driving to the station can only park at the station, and in the event there is no parking available, the driver would go to the next convenient station or chose a different mode of travel such as bus, bike, carpool, walk, etc. to the chosen station or does not make the trip on the Gold or the Metrolink lines. The model assumes that there is a $3 parking cost at the extension stations and assumes a vehicle occupancy of 1.05 persons per vehicle for the model runs. Also, the model assumes that there is zero turnover, which means that the riders who park a car in the morning peak do not leave during the morning peak.

The “constrained” run is essential to make an assessment of whether the approved parking capacity at the build stations would suffice to fulfill the demand. Should the demand be found close to the constrained number of spaces, the Metro Gold Line Foothill Extension Construction Authority’s goal to provide enough parking for the peak period users will be achieved.

The No Build Alternative of the CBM09 model was updated to include the proposed extension of the North – South line. Three alternatives were analyzed

- Extension from Azusa to Pomona station (Phase 1)
- Extension from Azusa to Claremont station (Phase 2)
- Extension from Azusa to Montclair station (Phase 3)

The no build model of the CBM09 model was updated to include the proposed extension of the North – South line from Azusa to Montclair. The station definitions were updated to include the proposed $3 parking cost for the Glendora, San Dimas, La Verne, Pomona, Claremont and Montclair stations. The model was run for the year 2035 by adjusting the parking access to the stations to meet the proposed constrained parking spaces.

4.0 RESULTS

This section discusses the results from the model runs including ridership, parking, as well as Vehicle Miles Traveled (VMT) Estimates. **Table 3** through **Table 5** show the 2035 model year estimated boardings for all phases of the project by time period at the project stations. The model assumes peak period as AM peak (6AM-9AM) and PM peak (3PM-7PM) periods and the off-peak as mid-day (9AM-3PM) and night (7PM-1AM & 4AM-6AM) periods. The model assumes that a trip occurring in the morning peak will occur in the reverse direction in the evening peak, hence half of the peak period boardings occur in the AM peak and the other half in the PM peak. Boardings (which are the average of Ons and Offs) provide an estimate of station activity. With full build-out, the six project stations on the North-South line would have about 17,200 daily boardings with about 11,600 occurring in the peak and about 5,600 during the off-peak period.

Table 6 through **Table 8** shows the urban rail boardings for peak period, off-peak period and daily for the no-build and build scenarios. The North-South line from Long Beach to Montclair, has an increase of about 21,600 compared to no build scenario. The other urban rail lines do not see much impact. On a systemwide basis, the total urban line boardings increase by about 20,000.

Table 9 through **Table 11** show the estimated Park -and-Ride (PNR) demand at the proposed stations along with the Kiss-and-Ride (KNR) demand. The tables illustrate that the parking demand reaches relative equilibrium with the number proposed parking spaces, while shifts to other modes of station access occur.

Table 12 through

Table 14 show the estimated average weekday boardings by mode of access to the project stations. The Gold Line boardings do not include transfers from Metrolink. Note that the PNR access numbers in the table are slightly higher than the PNR demand from the **Table 9** through **Table 11**. This is due to the assumption that there would be a 5% reduction in trips to account for the average vehicle occupancy of vehicles parked at the stations.

Table 3 Year 2035 Average Weekday Model Boardings and Alightings Summary for the Project Stations (Phase 1)

Station	Peak				Total Peak	Off-Peak				Total Off-Peak	Total Daily
	Read down		Read up			Read down		Read up			
	On	Off	On	Off	Boardings	On	Off	On	Off	Boardings	Boardings
Pomona	6,309	0	0	2,304	4,307	2,092	0	0	809	1,451	5,757
La Verne	917	714	272	601	1,252	647	330	109	268	677	1,929
San Dimas	708	350	215	634	954	573	103	74	300	525	1,479
Glendora	1,234	164	238	560	1,098	769	74	77	362	641	1,739
Total	**9,168**	**1,228**	**725**	**4,099**	**7,610**	**4,081**	**507**	**260**	**1,739**	**3,294**	**10,904**

Table 4 Year 2035 Average Weekday Model Boardings and Alightings Summary for the Project Stations (Phase 2)

Station	Peak				Total Peak	Off-Peak				Total Off-Peak	Total Daily
	Read down		Read up			Read down		Read up			
	On	Off	On	Off	Boardings	On	Off	On	Off	Boardings	Boardings
Claremont	3,993	0	0	2,376	3,185	1,271	0	0	915	1,093	4,278
Pomona	3,508	303	403	1,190	2,702	1,709	123	228	503	1,282	3,984
La Verne	828	689	209	594	1,160	632	358	104	263	679	1,839
San Dimas	703	289	236	634	931	572	108	77	299	528	1,459
Glendora	1,234	171	266	557	1,114	590	79	86	333	544	1,658
Total	**10,266**	**1,452**	**1,114**	**5,351**	**9,092**	**4,774**	**668**	**495**	**2,313**	**4,125**	**13,217**

Table 5 Year 2035 Average Weekday Model Boardings and Alightings Summary for the Project Stations (Phase 3)

Station	Peak				Total Peak	Off-Peak				Total Off-Peak	Total Daily
	Read down		Read up			Read down		Read up			
	On	Off	On	Off	Boardings	On	Off	On	Off	Boardings	Boardings
Montclair	5,722	0	0	3,432	4,577	2,499	0	0	1,305	1,902	6,479
Claremont	1,288	300	272	1,134	1,497	736	175	166	671	874	2,371
Pomona	2,639	365	389	1,106	2,250	1,436	164	246	483	1,165	3,414
La Verne	784	703	192	597	1,138	573	370	98	268	655	1,793
San Dimas	807	320	261	637	1,013	427	131	91	294	472	1,484
Glendora	1,230	183	283	547	1,122	572	85	96	329	541	1,663
Total	**12,470**	**1,871**	**1,397**	**7,453**	**11,596**	**6,243**	**925**	**697**	**3,350**	**5,608**	**17,203**

Table 6 Year 2035 Model Boardings Summary for the Urban Rail Lines (Phase 1)

Rail Line	No Build Boardings			Build Boardings			Difference (Build - No Build)		
	PEAK	Off-Peak	Daily	PEAK	Off-Peak	Daily	PEAK	Off-Peak	Daily
Purple Line - Wilshire Bl/Westwood	80,656	26,407	107,063	79,988	26,621	106,609	-668	214	-454
Red Line - USTA-North Hollywood	93,994	31,540	125,534	93,395	31,739	125,134	-599	199	-400
Green Line- Norwalk-Torrance	21,805	10,738	32,543	21,862	10,824	32,686	57	86	143
Green Line- Norwalk-LAX	17,657	6,798	24,455	17,778	6,802	24,580	121	4	125
LAX People Mover (Lot C)	1,206	731	1,937	1,235	677	1,912	29	-54	-25
LAX People Mover (Century/Aviation)	1,317	905	2,222	1,285	812	2,097	-32	-93	-125
Crenshaw - Expo - Torrance	18,142	8,082	26,224	18,044	7,997	26,041	-98	-85	-183
N-S Line - Montclair-Long Beach	72,058	29,627	101,685	79,781	33,778	113,559	7,723	4,151	11,874
N-S Line -SMV-Long Beach	54,628	23,095	77,723	53,641	22,942	76,583	-987	-153	-1,140
E-W Line- East LA - Santa Monica	87,587	38,678	126,265	87,041	38,257	125,298	-546	-421	-967
Total	**449,050**	**176,601**	**625,651**	**454,050**	**180,449**	**634,499**	**5,000**	**3,848**	**8,848**

Table 7 Year 2035 Model Boardings Summary for the Urban Rail Lines (Phase 2)

Rail Line	No Build Boardings			Build Boardings			Difference (Build - No Build)		
	PEAK	Off-Peak	Daily	PEAK	Off-Peak	Daily	PEAK	Off-Peak	Daily
Purple Line - Wilshire Bl/Westwood	80,656	26,407	107,063	80,064	26,666	106,730	-592	259	-333
Red Line - USTA-North Hollywood	93,994	31,540	125,534	93,472	31,812	125,284	-522	272	-250
Green Line- Norwalk-Torrance	21,805	10,738	32,543	21,903	10,858	32,761	98	120	218
Green Line- Norwalk-LAX	17,657	6,798	24,455	17,816	6,812	24,628	159	14	173
LAX People Mover (Lot C)	1,206	731	1,937	1,235	680	1,915	29	-51	-22
LAX People Mover (Century/Aviation)	1,317	905	2,222	1,285	808	2,093	-32	-97	-129
Crenshaw - Expo - Torrance	18,142	8,082	26,224	18,043	7,992	26,035	-99	-90	-189
N-S Line - Montclair-Long Beach	72,058	29,627	101,685	81,760	34,987	116,747	9,702	5,360	15,062
N-S Line -SMV-Long Beach	54,628	23,095	77,723	53,442	22,916	76,358	-1,186	-179	-1,365
E-W Line- East LA - Santa Monica	87,587	38,678	126,265	87,000	38,192	125,192	-587	-486	-1,073
Total	**449,050**	**176,601**	**625,651**	**456,020**	**181,723**	**637,743**	**6,970**	**5,122**	**12,092**

Table 8 Year 2035 Model Boardings Summary for the Urban Rail Lines (Phase 3)

Rail Line	No Build Boardings			Build Boardings			Difference (Build - No Build)		
	PEAK	Off-Peak	Daily	PEAK	Off-Peak	Daily	PEAK	Off-Peak	Daily
Purple Line - Wilshire Bl/Westwood	80,656	26,407	107,063	80,326	26,806	107,132	-330	399	69
Red Line - USTA-North Hollywood	93,994	31,540	125,534	93,693	31,925	125,618	-301	385	84
Green Line- Norwalk-Torrance	21,805	10,738	32,543	22,048	10,949	32,997	243	211	454
Green Line- Norwalk-LAX	17,657	6,798	24,455	17,952	6,881	24,833	295	83	378
LAX People Mover (Lot C)	1,206	731	1,937	1,249	690	1,939	43	-41	2
LAX People Mover (Century/Aviation)	1,317	905	2,222	1,277	813	2,090	-40	-92	-132
Crenshaw - Expo - Torrance	18,142	8,082	26,224	18,028	7,984	26,012	-114	-98	-212
N-S Line - Montclair-Long Beach	72,058	29,627	101,685	85,889	37,352	123,241	13,831	7,725	21,556
N-S Line -SMV-Long Beach	54,628	23,095	77,723	53,314	22,781	76,095	-1,314	-314	-1,628
E-W Line- East LA - Santa Monica	87,587	38,678	126,265	86,920	38,155	125,075	-667	-523	-1,190
Total	**449,050**	**176,601**	**625,651**	**460,696**	**184,336**	**645,032**	**11,646**	**7,735**	**19,381**

Table 9 Year 2035 Model Parking Demand Summary for the Project Stations (Phase 1)

Station	Line	Parking Spaces	Daily Parking Demand	Daily Boardings	Total PNR Demand	Difference	Daily KNR Demand	Total KNR Demand
Pomona	Metro Gold Line	550	481	5,757	545	-5	251	635
	Metrolink		65	2,303			384	
La Verne	Metro Gold Line	299	303	1,929	303	4	127	127
San Dimas	Metro Gold Line	289	275	1,479	275	-14	103	103
Glendora	Metro Gold Line	302	292	1,739	292	-10	78	78
Phase 2 Gold Line Total		-	1,351	10,904	-	-	-	559
Metrolink Total		-	65	2,303	-	-	-	384
Phase 2 Gold Line, Metrolink		1,440	1,415	13,206	1,415	-25	943	943

Table 10 Year 2035 Model Parking Demand Summary for the Project Stations (Phase 2)

Station	Line	Parking Spaces	Daily Parking Demand	Daily Boardings	Total PNR Demand	Difference	Daily KNR Demand	Total KNR Demand
Claremont	Metro Gold Line	539	461	4,278	561	22	180	376
	Metrolink		100	1,852			196	
Pomona	Metro Gold Line	550	466	3,984	556	6	189	594
	Metrolink		90	1,429			405	
La Verne	Metro Gold Line	299	313	1,839	313	14	95	95
San Dimas	Metro Gold Line	289	287	1,459	287	-2	94	94
Glendora	Metro Gold Line	302	287	1,658	287	-15	75	75
Phase 2 Gold Line Total		-	1,814	13,217	-	-	-	633
Metrolink Total		-	190	3,281	-	-	-	601
Phase 2 Gold Line, Metrolink		1,979	2,005	16,498	2,005	25	1,234	1,234

Table 11 Year 2035 Model Parking Demand Summary for the Project Stations (Phase 3)

Station	Line	Parking Spaces	Daily Parking Demand	Daily Boardings	Total PNR Demand	Difference	Daily KNR Demand	Total KNR Demand
Montclair	Metro Gold Line	1,600	1,372	6,479	1,521	-79	170	332
	Metrolink		150	1,631			162	
Claremont	Metro Gold Line	539	344	2,371	542	3	112	315
	Metrolink		198	1,111			203	
Pomona	Metro Gold Line	550	439	3,414	539	-11	135	542
	Metrolink		100	1,440			407	
La Verne	Metro Gold Line	299	296	1,793	296	-3	77	77
San Dimas	Metro Gold Line	289	284	1,484	284	-5	78	78
Glendora	Metro Gold Line	302	288	1,663	288	-14	76	76
Phase 2 Gold Line Total		-	3,023	17,203	-	-	646	-
Metrolink Total		-	447	4,182	-	-	772	-
Phase 2 Gold Line, Metrolink		3,579	3,471	21,385	3,471	-108	1,418	1,418

Table 12 Year 2035 Average Weekday Mode of Access Summary for Gold Line Stations (Phase 1)

Line	Station	Walk Access	Bus Access	PNR Access	KNR Access	Total Access*
Metro Gold Line	Glendora	970	308	307	78	1,663
	San Dimas	718	290	289	103	1,399
	La Verne	1,316	115	319	127	1,877
	Pomona	1,181	2,665	506	251	4,602
	Total	**4,185**	**3,377**	**1,421**	**558**	**9,541**
Metrolink	Pomona North	544	1,308	68	384	2,304
	Total	**544**	**1,308**	**68**	**384**	**2,304**

Table 13 Year 2035 Average Weekday Mode of Access Summary for Gold Line Stations (Phase 2)

Line	Station	Walk Access	Bus Access	PNR Access	KNR Access	Total Access*
Metro Gold Line	Glendora	979	222	299	75	1,575
	San Dimas	732	234	303	94	1,362
	La Verne	1,320	31	332	95	1,777
	Pomona	1,234	1,876	491	189	3,788
	Claremont	1,127	1,490	485	180	3,281
	Total	**5,391**	**3,852**	**1,909**	**632**	**11,782**
Metrolink	Pomona North	548	381	95	405	1,429
	Claremont	492	1,060	106	196	1,852
	Total	**1,040**	**1,441**	**201**	**600**	**3,281**

Table 14 Year 2035 Average Weekday Mode of Access Summary for Gold Line Stations (Phase 3)

Line	Station	Walk Access	Bus Access	PNR Access	KNR Access	Total Access*
Metro Gold Line	Glendora	996	223	303	76	1,598
	San Dimas	752	243	299	78	1,372
	La Verne	1,321	11	312	77	1,720
	Pomona	1,239	1,369	462	135	3,205
	Claremont	1,198	557	363	112	2,228
	Montclair	579	3,510	1,444	170	5,702
	Total	**6,083**	**5,912**	**3,183**	**646**	**15,823**
Metrolink	Pomona North	542	386	106	407	1,440
	Claremont	482	218	208	203	1,111
	Montclair	300	1,012	158	162	1,631
	Total	**1,323**	**1,616**	**471**	**772**	**4,182**

System-wide vehicle miles travelled and vehicle miles travelled in the study area (2-mile buffer area around the Gold line stations from Azusa to Montclair) were estimated. **Table 15** shows the average weekday VMT estimates for 2035. The estimated vehicle miles travelled by the autos are lower for the proposed build scenario for the systemwide and study area compared to the No build scenario. This indicates that all phases of construction would contribute to reductions in VMT, but that a full extension to Montclair would help reduce auto usage by the greatest amount.

Table 15 Year 2035 Average Weekday VMT Estimates

Alternative	Vehicle Miles Traveled (miles per day)	
	Region	Study Area
Existing Conditions (2013)	463,245,800	N/A
No Build (to Azusa)*	537,968,460	10,563,900
Approved Project*	537,473,260	10,517,100
Phase 1 with Project Modifications**	537,805,631	10,546,303
Change in VMT for Phase 1 vs. No Build	-162,829	-17,597
Phase 2 with Project Modifications**	537,755,392	10,539,739
Change in VMT for Phase 2 vs. No Build	-213,068	-24,161
Phase 3 with Project Modifications**	537,597,655	10,523,826
Change in VMT for Phase 3 vs. No Build	-370,805	-40,074

Source: *No Build and Approved Project: As reported in 2019 SEIR, WSP, 2018.

Source: **Project Modifications: Reflects parking reduction. AECOM, 2020.

5.0 CONCLUSIONS

The modeling assumptions are updated to reflect proposed parking changes at stations to generate revised forecasts as provided in this memo. Compared to the previous modeling results, the total boardings at stations are 9% lower as a whole, this is due to reduced available spaces and the $3 parking cost at the project stations.