

DRAFT MEMORANDUM

Date: March 4, 2011

To: Eugene Kim & John Gahbauer, PB

From: John Stutsman, John Muggridge and Jill Liu

Subject: ***Metro Grade Crossing Policy Initial Screening (Milestone 1)***
Metro Gold Line Foothill Extension Azusa to Montclair

SM10-2411

This memorandum presents an initial operation and safety assessment for light rail crossings along the Metro Gold Line Foothill Extension Azusa to Montclair alignment. This alignment (City of Azusa to City of Montclair) contains 29 LRT crossings, including 26 existing at-grade rail crossings, one existing grade-separated location and two existing at-grade locations that would become grade-separated with the current corridor design. The initial screening (Milestone 1) was conducted using the Metropolitan Transportation Authority's (Metro) *Policy for Grade Crossing for Light Rail Transit* (December 4, 2003). This analysis provides an initial assessment of how highway traffic would be affected by proposed train headway operations. It is also used to determine if an at-grade crossing is feasible or whether a grade separation should be studied in more detail.

METRO GRADE CROSSING POLICY

The Metro grade crossing policy provides a framework for assessing traffic safety and operations related to at-grade crossings and identifying the need for safety treatments and/or grade separation. The policy includes a systematic review process and identifies corresponding "milestones" before the determination of the feasibility of a grade-crossing. The review process is summarized below:

- Initial Screening (Milestone 1) – The first step is a planning-level assessment to categorize the grade crossings based on the roadway volumes conflicting with the LRT operations and the train frequencies. Each grade crossing is assigned to one of three groups: "At-Grade Should be Feasible," "Possible At-Grade Operation," and "Grade Separation Usually Required." When a crossing is identified as "At-Grade Should be Feasible," detailed engineering-level operational and safety analyses can still be triggered for (1) gated crossing with traffic pre-emption and (2) locations with salient geometry or safety issues.
- Detailed Analysis (Milestone 2) – The second step is to provide a further safety and operation analysis to evaluate the potential impacts of LRT train operations (such as pre-emption or signal priority) on the traffic delay and cross-street progression. Review of existing and future site conditions, geometry, intersection volume-to-capacity ratio, traffic control, rail operation design and options is required. Preliminary disposition from this process would either be "At-Grade Operation Should be Feasible" or "Grade Separation Usually Required." This analysis may also identify potential operational impacts or safety concerns as a result of LRT train operations and possible mitigation measures for safety enhancements.
- Verification (Milestone 3) – This is the final step before determining the adequacy of an at-grade crossing design and recommending whether a grade separation should be required. This analysis would only be required if an agreement regarding the proposed final design solutions



cannot be obtained from Metro and local constituencies (including other involved agencies and the community as appropriate) due to concerns relating to safety, cost, operations, policy, and/or community desires). This task may involve refinement and validation of projected traffic volumes and rail operations using simulation modeling.

Milestone 1 is usually undertaken during the preliminary planning for the project. Milestones 2 and 3 are typically undertaken during preliminary engineering and environmental clearance. The final decision should be secured in conjunction with final engineering of the Project.

Appendix A contains *MTA Grade Crossing Policy for Light Rail Transit* (December 4, 2003) flow charts for the evaluation process and the Nomograph for Initial Screening.

PROPOSED LRT OPERATIONS

The Gold Line Foothill Extension Azusa to Montclair is 12.6 miles long, connecting six cities (Azusa, Glendora, San Dimas, La Verne, Pomona, Claremont, and Montclair). A total of 29 LRT crossings were analyzed in the transit corridor based on *Gold Line Foothill Extension Azusa to Montclair Preliminary Engineering* (Parsons Brinckerhoff, January 2011). A portion of the proposed LRT alignment would operate parallel to the existing San Bernardino-Los Angeles Metrolink Commuter trains providing service to three Metrolink stations at Pomona, Claremont Village, and Montclair. Table 1 provides the list of analyzed crossing locations.

Table 1. List of Analyzed Crossing Locations	
City	Crossing Intersections
Glendora	<ul style="list-style-type: none"> • Barranca Ave • Grand Ave/Foothill Bl • Vermont Ave/Ada Ave • Glendora Ave • Pasadena Ave • Glenwood Ave • Elwood Ave • Loraine Ave • Lone Hill Ave/Auto Center Dr
San Dimas	<ul style="list-style-type: none"> • Gladstone St • Eucla St • Cataract Ave/Bonita Ave • Monte Vista Ave • San Dimas Ave • Walnut Ave • San Dimas Canyon Rd
La Verne	<ul style="list-style-type: none"> • Wheeler Ave • A St • D St • E St • White Ave
Pomona	<ul style="list-style-type: none"> • Fulton Rd • Garey Ave • Towne Ave
Claremont	<ul style="list-style-type: none"> • Cambridge Ave • Indian Hill Bl • College Ave • Claremont Bl/South Mill Rd
Montclair	<ul style="list-style-type: none"> • Monte Vista Ave



For the purposes of this memorandum, peak hour headways of 10 minutes were assumed for the project, resulting in six trains per hour in each direction. It is understood that the segment of the alignment between La Verne and Montclair would operate parallel with the existing San Bernardino-Los Angeles Metrolink commuter trains. This study has taken into consideration the future proposed headways for Metrolink trains, operating at 15 minutes during the peak (four trains per hour) and 60 minutes off-peak (one per hour). This translates into a maximum of five Metrolink trains per hour during the peak period. This segment, with the dual track alignment, accounts for a total of 11 trains in the peak hour.

FUTURE TRAFFIC FORECASTS

This analysis also considered future intersection peak hour volumes for year 2035. This was based on annual growth factors derived from the Southern California Association of Governments' (SCAG) 2035 RTP model. The traffic forecasts obtained from the SCAG 2035 RTP were reviewed at and around the analyzed grade crossings during the peak period under year 2003 and 2035 conditions. A comparison of these forecasts indicates that the overall traffic growth in the vicinity of the project corridor is expected to range from approximately 14.3% to 21.9% from 2010 to 2035.

The following Table 2 shows the estimated annual traffic growth and the estimated overall growth for each of the local jurisdictions in the project corridor.

City	Annual Traffic Growth Factor	Total Traffic Growth
Glendora	0.7%	16.6%
San Dimas	0.9%	21.9%
La Verne	0.6%	14.3%
Pomona	0.7%	17.5%
Claremont	0.7%	17.0%
Montclair	0.7%	18.0%

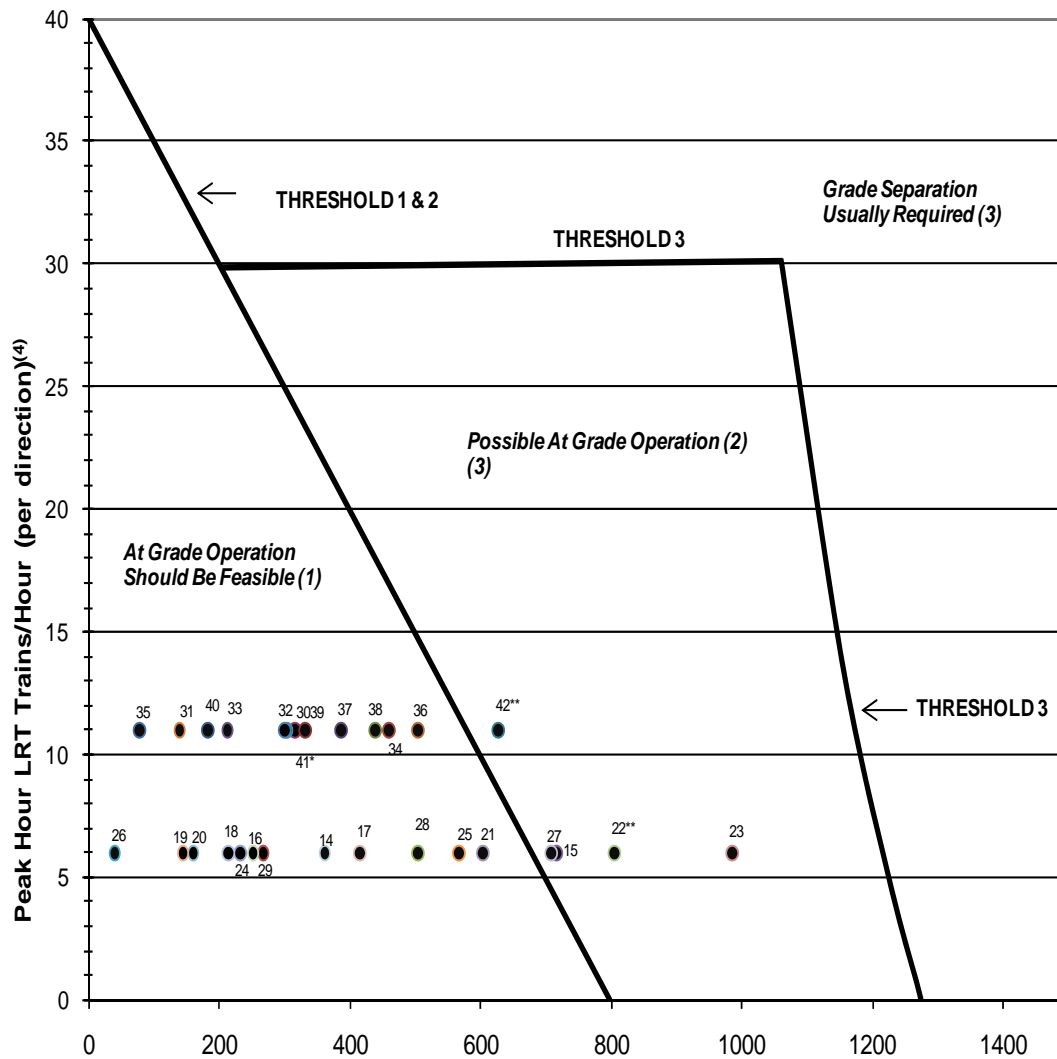
These factors were applied to year 2010 traffic volumes, at the analyzed crossings, to develop estimates for 2035.

INITIAL SCREENING RESULTS

Maximum peak hour roadway volumes per lane affected by the conflicting LRT movement were estimated for each location for both existing year 2010 and future 2035 conditions, as shown in Table 3. Based on the estimated traffic volumes in Table 3 and the nomograph (Figure 1), the Milestone 1 screening finds that no grade separations are required for the analyzed crossing locations based on proposed train headways and the conflicting traffic volumes per hour per line. The Monte Vista Avenue crossing (location 41) is currently grade-separated and would remain grade-separated (even though the analysis indicated that the traffic volumes crossing the rail track would not trigger the grade separation). In addition, the Lone Hill Avenue/Auto Center Drive (Location 22) and the Towne Avenue crossing (location 42) are proposed to be grade separated under the current corridor design. The analysis indicates that traffic volumes crossing the rail track would not trigger the grade separation at either location.



Figure 1
Initial Screening Nomograph for Proposed LRT Crossing Intersections
Gold Line Foothill Extension 2B - Azusa (Citrus) to Montclair



Crossing ID	City	Crossing Intersection
14	Glendora	Barranca Ave
15	Glendora	Grand Ave/Foothill Bl
16	Glendora	Vermont Ave/Ada Ave
17	Glendora	Glendora Ave
18	Glendora	Pasadena Ave
19	Glendora	Glenwood Ave
20	Glendora	Elwood Ave
21	Glendora	Loraine Ave
22	Glendora	Lone Hill Ave/Auto Center Dr
23	San Dimas	Gladstone St
24	San Dimas	Eucla St
25	San Dimas	Cataract Ave/Bonita Ave
26	San Dimas	Monte Vista Ave
27	San Dimas	San Dimas Ave
28	San Dimas	Walnut Ave
29	San Dimas	San Dimas Canyon Rd
30	La Verne	Wheeler Ave
31	La Verne	A St
32	La Verne	D St
33	La Verne	E St
34	La Verne	White Ave
35	Pomona	Fulton Rd
36	Pomona	Garey Ave
42	Pomona	Towne Ave
37	Claremont	Cambridge Ave
38	Claremont	Indian Hill Bl
39	Claremont	College Ave
40	Claremont	Claremont Bl/South Mill Rd
41	Montclair	Monte Vista Ave

Peak Hour Volume per Lane

Notes:
 (1) With crossing gates and pre-emption or traffic signal priority.
 (2) With traffic signal priority and some LRT delay.
 (3) Engineering study required to define or confirm at grade operation.
 (4) This analysis assumed a 10-minute headway (6 trains per hour) for the proposed project LRT operations plus an additional five Metrolink commuter trains per hour in the shared project corridor in the Cities of La Verne, Pomona, Claremont and Montclair.
 *Monte Vista Avenue crossing (#41) is currently grade-separated and would remain grade-separated.
 **Lone Hill Avenue/Auto Center Drive (#22) and Towne Avenue crossing (#42) are existing at-grade rail crossings. Both locations are proposed to be grade separated under the current corridor design.



At Grade Operation Should be Feasible

As shown in Figure 1, if 11 trains per hour are assumed for combined LRT and Metrolink train operation in each direction, at-grade operation should be feasible at a crossing when conflicting roadway volumes fall under 580 vehicles if there is no salient geometry or safety issue. Where six trains per hour are assumed for the LRT train operations, at-grade operation should be feasible at a crossing when the conflicting roadway volumes fall under 680 vehicles.

The initial screening process indicates that at-grade operation “Should Be Feasible” at 23 of the 26 proposed at-grade crossing locations.

Based on the policy, when a crossing is identified as “At-Grade Should be Feasible,” detailed operational and safety analysis can still be triggered for the following two reasons:

- (1) Gated crossings with traffic pre-emption, and,
- (2) Locations with salient geometry or safety issues (e.g., the proposed diagonal crossing at Cataract Avenue and Bonita Avenue in the City of San Dimas).

Fehr & Peers reviewed the summary of the public comments¹ specific to grade crossing operations received during the recent project interagency coordination meeting, the four project public scoping meetings held in the cities of Pomona, Glendale, Claremont and San Dimas in January 2011 and those received during the public comment period on or before February 2, 2011. In addition, Fehr & Peers reviewed the summary of the comments received from the previous agency coordination meetings with the cities of Claremont, Glendora, La Verne, Montclair, Pomona and San Dimas and public comments included in the previous Year 2007 FEIS/FEIR (Chapter 13 – Response to Comments).

Fehr & Peers recommends that the project team continue coordination with corridor cities and California Public Utilities Commission (CPUC) and jointly explore if the any of the remaining 23 proposed at-grade crossing locations have potential safety or traffic operations issues that would trigger the need for a detailed engineering study during the project engineering and design phase.

Possible At-Grade Operation

Figure 1 also indicates that at-grade operations are possible at the remaining three crossing locations that are expected to carry volumes crossing the rail track that would exceed the Threshold 2 volume levels, but would not exceed Threshold 3 volume levels required for grade separation. These three locations are:

- #15 – Grand Avenue/Foothill Boulevard (City of Glendora)
- #23 – Gladstone Street (City of San Dimas)
- #27 – San Dimas Avenue (City of San Dimas)

Based on the grade crossing policy, a detailed engineering study **would be required** at these three at-grade crossings before any determination is made on whether at-grade crossing is adequate or whether grade separation is required.

According to Metro’s policy, the engineering study includes two major components: an Operational Analysis and a Safety Analysis. Milestone 2 analysis may include the following tasks:

1. Evaluation of the existing and future intersection volume and level of service

¹ Source: PB America, February 23, 2011



2. Queuing analysis for the vehicular queue resulting from LRT train operations. The vehicle queue may be built from an adjacent signalized intersection along the cross streets toward the grade crossing or built from a grade crossing toward an adjacent roadway-roadway intersection. Available queuing storage would be compared to the estimated queue, and potential impacts and mitigation measures should be identified.
3. Level of service analysis for the controlling intersection (the most congested intersection during the peak hour in the project corridor) at the grade crossing or along the cross street in the influence zone of the grade crossing.
4. Identification of the impacts of rail pre-emption on progressive traffic movements along the project corridor. This involves identification and adjustment of the green time allocation of a signalized intersection to reflect the LRT train frequency and evaluation of the volume-to-capacity ratio and operating conditions of the controlling intersection in the project corridor.
5. Preliminary safety analyses jointly by the project engineering and design team and jurisdictions to address the potential safety concerns raised by the stakeholders (e.g., Metro, specific city, the communities, California Public Utilities Commission, Union Pacific Railroad Company, etc.). Issues may include traffic queuing, approach and corner sight distance, visual confusion/sign or signal clutter, high truck percentages (keep them off the track), school access route, emergency vehicle route, accident histories, delineation and roadway marking, motorist compliance (prevailing high traffic speed, gate drive-around potential, traffic control observance, etc.). Effective safety measures should be identified to address the issues.

CONCLUSIONS

This memorandum presents the Milestone 1 initial operation and safety assessment for light rail crossings along the Metro Gold Line Foothill Extension Azusa to Montclair alignment. This alignment contains 29 LRT crossings, including 26 existing at-grade rail crossings, one existing grade-separated crossing and two future proposed grade-separated crossings with the current corridor design. As summarized in Table 4, the initial screening concludes that no grade separations are required for the 26 proposed at-grade crossing locations. However, a detailed engineering study would be required at three proposed at-grade crossings based on the estimated crossing volumes before any determination is made on whether at-grade crossing is adequate or whether grade separation is required.

- #15 – Grand Avenue/Foothill Boulevard (City of Glendora)
- #23 – Gladstone Street (City of San Dimas)
- #27 – San Dimas Avenue (City of San Dimas)

Finally, the initial screening indicated that at-grade operations would be feasible at the remaining 23 of the 26 locations. Fehr & Peers recommends that the project team continue coordination with corridor cities and the CPUC and jointly explore if any of these remaining 23 locations have potential safety or traffic operations issues that would also trigger the need for a detailed engineering study during the project engineering and design phase.

TABLE 3. INITIAL SCREENING FOR PROPOSED LIGHT RAIL CROSSINGS

ID	City	Crossing Intersection	Type	# of Lanes by Direction				Total Number of Lanes	Existing 2010 Volumes per hour per Lane Crossing the Proposed LRT Tracks***				Total Growth Rates from Year 2010 to Year 2035				Future 2035 Volumes per Lane Crossing the Proposed LRT Tracks				Maximum Peak Hour Volume Per Lane	Trains per hour per direction	Preliminary Disposition
				NB	SB	EB	WB		AM		PM		AM		PM		AM		PM				
									NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB			
14	Glendora	Barranca Ave	Mid-block	2	2			4	163	310	163	114	16.6%	16.6%	16.6%	16.6%	190	362	190	132	362	6	At-Grade Operation Should be Feasible
15	Glendora	Grand Ave/Foothill Bl	Diagonal	2	2	2	2	4 & 4	520	607	606	435	16.6%	16.6%	16.6%	16.6%	606	708	707	507	708	6	Possible At-Grade Operation
16	Glendora	Vermont Ave/Ada Ave	Mid-block	1	1			2	132	216	186	216	16.6%	16.6%	16.6%	16.6%	154	252	217	252	252	6	At-Grade Operation Should be Feasible
17	Glendora	Glendora Ave	Mid-block	2	2			4	336	250	356	307	16.6%	16.6%	16.6%	16.6%	391	292	415	357	415	6	At-Grade Operation Should be Feasible
18	Glendora	Pasadena Ave	Mid-block	1	1			2	184	125	146	130	16.6%	16.6%	16.6%	16.6%	215	146	170	152	215	6	At-Grade Operation Should be Feasible
19	Glendora	Glenwood Ave	Mid-block	1	1			2	75	110	124	118	16.6%	16.6%	16.6%	16.6%	87	128	145	138	145	6	At-Grade Operation Should be Feasible
20	Glendora	Elwood Ave	Mid-block	1	1			2	89	106	138	102	16.6%	16.6%	16.6%	16.6%	104	124	161	119	161	6	At-Grade Operation Should be Feasible
21	Glendora	Loraine Ave	Mid-block	2	2			2	294	517	308	339	16.6%	16.6%	16.6%	16.6%	343	603	359	395	603	6	At-Grade Operation Should be Feasible
22	Glendora	Lone Hill Ave/ Auto Center Dr	Existing Mid-block/ Future Grade-Separated	2/3*	2			4/5	335	582	646	690	16.6%	16.6%	16.6%	16.6%	391	678	753	805	805	6	Grade-Separated as Proposed
23	San Dimas	Gladstone St	Mid-block			1	1	2	313	606	808	527	21.9%	21.9%	21.9%	21.9%	382	739	985	642	985	6	Possible At-Grade Operation
24	San Dimas	Eucla St	Mid-block	1	1			2	60	124	140	191	21.9%	21.9%	21.9%	21.9%	73	151	171	233	233	6	At-Grade Operation Should be Feasible
25	San Dimas	Cataract Ave/ Bonita Ave	Diagonal	1	1	2	2	2 & 4	187	333	466	308	21.9%	21.9%	21.9%	21.9%	227	406	568	375	568	6	At-Grade Operation Should be Feasible
26	San Dimas	Monte Vista Ave	Mid-block	1	1			2	12	20	33	30	21.9%	21.9%	21.9%	21.9%	15	24	40	37	40	6	At-Grade Operation Should be Feasible
27	San Dimas	San Dimas Ave	Mid-block	1	1			2	298	328	587	561	21.9%	21.9%	21.9%	21.9%	363	400	716	684	716	6	Possible At-Grade Operation
28	San Dimas	Walnut Ave	Mid-block	1	1			2	178	180	377	414	21.9%	21.9%	21.9%	21.9%	217	219	460	505	505	6	At-Grade Operation Should be Feasible
29	San Dimas	San Dimas Canyon Rd	Mid-block	2	2/3**			4	172	220	204	183	21.9%	21.9%	21.9%	21.9%	210	268	248	223	268	6	At-Grade Operation Should be Feasible
30	La Verne	Wheeler Ave	Mid-block	2	2			4	209	267	245	183	14.3%	14.3%	14.3%	14.3%	238	305	280	209	305	11	At-Grade Operation Should be Feasible
31	La Verne	A St	Mid-block	1	1			2	56	52	122	29	14.3%	14.3%	14.3%	14.3%	64	59	139	33	139	11	At-Grade Operation Should be Feasible
32	La Verne	D St	Mid-block	1	1			2	155	133	263	153	14.3%	14.3%	14.3%	14.3%	177	152	301	175	301	11	At-Grade Operation Should be Feasible
33	La Verne	E St	Mid-block	2	2			4	128	110	186	97	14.3%	14.3%	14.3%	14.3%	146	125	213	110	213	11	At-Grade Operation Should be Feasible
34	La Verne	White Ave	Mid-block	2	2			4	246	309	403	281	14.3%	14.3%	14.3%	14.3%	281	353	461	321	461	11	At-Grade Operation Should be Feasible
35	Pomona	Fulton Rd	Mid-block	1	1			2	66	64	45	64	17.5%	17.5%	17.5%	17.5%	78	75	53	75	78	11	At-Grade Operation Should be Feasible
36	Pomona	Garey Ave	Mid-block	2	2			4	317	429	419	367	17.5%	17.5%	17.5%	17.5%	372	503	492	431	503	11	At-Grade Operation Should be Feasible
42	Pomona	Towne Ave	Existing Mid-block/ Future Grade-Separated	2	2			4	507	534	505	487	17.5%	17.5%	17.5%	17.5%	595	627	593	572	627	11	Grade-Separated as Proposed
37	Claremont	Cambridge Ave	Mid-block	1	1			2	330	293	257	274	17.0%	17.0%	17.0%	17.0%	386	343	301	321	386	11	At-Grade Operation Should be Feasible
38	Claremont	Indian Hill Bl	Mid-block	2	2			4	309	319	376	370	17.0%	17.0%	17.0%	17.0%	361	373	439	433	439	11	At-Grade Operation Should be Feasible
39	Claremont	College Ave	Mid-block	1	1			2	251	200	231	283	17.0%	17.0%	17.0%	17.0%	294	234	270	331	331	11	At-Grade Operation Should be Feasible
40	Claremont	Claremont Bl/ South Mill Rd	Mid-block	2	2			4	152	147	157	153	17.0%	17.0%	17.0%	17.0%	177	172	183	179	183	11	At-Grade Operation Should be Feasible
41	Montclair	Monte Vista Ave	Grade-Separated	3	4			7	198	171	268	192	18.0%	18.0%	18.0%	18.0%	234	201	317	226	317	11	Remain Grade-Separated as Existing

Source: Fehr & Peers

*Existing northbound through has two lanes. Future northbound through will be three lanes. Existing future volume per lane was estimated based on two lanes. Future traffic volume per lane was adjusted to reflect three lanes.

**San Dimas provides two through lanes in the area, but it widens to one right-turn lane, one through lane and one left-turn lane at the crossing.

***Traffic counts were conducted in May 2010.

TABLE 4. SUMMARY OF MILESTONE 1 INITIAL SCREENING RESULTS							
ID	City	Crossing Intersection	Type	Milestone 1 Preliminary Disposition	Previous salient Issues/comments received from the agency coordination meetings and 2007 FEIS/FEIR Chapter 13 (Responses to Comments)	New comments received from the agency coordination meeting and 4 public scoping meetings (January and February 2011)	Need for Milestone 2 Study
14	Glendora	Barranca Ave	Mid-block	At-Grade Feasible	1. One public comment suggested grade separation at Lone Hill, Foothill, and Barranca. Per 2007 FEIS/FEIR, these three crossing did not meet the criteria to warrant a grade separation.		To be determined ^[1]
15	Glendora	Grand Ave/Foothill Bl	Diagonal	At-Grade Possible	1. One public comment suggested grade separation at Lone Hill, Foothill, and Barranca. Per 2007 FEIS/FEIR, these three crossing did not meet the criteria to warrant a grade separation.	1. Bicycle safety	Required per future 2035 crossing volumes
16	Glendora	Vermont Ave/Ada Ave	Mid-block	At-Grade Feasible			To be determined[1]
17	Glendora	Glendora Ave	Mid-block	At-Grade Feasible	1. The City of Glendora was interested in the traffic impacts to the Ada and Glendora intersections near the station.		To be determined[1]
18	Glendora	Pasadena Ave	Mid-block	At-Grade Feasible	1. The City of Glendora was concerned about potential closure of certain streets crossing the rail line.		To be determined[1]
19	Glendora	Glenwood Ave	Mid-block	At-Grade Feasible	1. The City was concerned about potential closure of certain streets crossing the rail line.		To be determined[1]
20	Glendora	Elwood Ave	Mid-block	At-Grade Feasible	1. The City of Glendora was concerned about potential closure of certain streets crossing the rail line.		To be determined[1]
21	Glendora	Lorraine Ave	Mid-block	At-Grade Feasible			To be determined[1]
22	Glendora	Lone Hill Ave/Auto Center Dr	Existing Mid-block/ Future Grade-Separated	Grade-Separated as Proposed	1. One public comment suggested grade separation at Lone Hill, Foothill, and Barranca. Per 2007 FEIS/FEIR, these three crossing did not meet the criteria to warrant a grade separation.	1. Clarification of grade-separation (LRT overcrossing or undercrossing)	Not required, assume grade-separated as proposed
23	San Dimas	Gladstone St	Mid-block	At-Grade Possible			Required per future 2035 crossing volumes
24	San Dimas	Eucla St	Mid-block	At-Grade Feasible			To be determined[1]
25	San Dimas	Cataract Ave/Bonita Ave	Diagonal	At-Grade Feasible	1. The City of San Dimas asked consideration for an overcrossing at Bonita and Cataract. 2. The City of San Dimas proposed modification of the intersection to make Cataract Avenue a "Tee" intersection for the north side and south side of Bonita Avenue. The City expected that this intersection modification would potentially eliminate the signal and allow more space for queuing. 3. The City of San Dimas indicated that the street could be reconfigured to lessen the crossing angle. 4. Two public comments supported grade separation at Bonita Avenue and Cataract Avenue. No need for a grade crossing at Bonita/Cataract was shown based on traffic conditions. The City was made aware of opportunities to finance a grade separation at this location but was also informed of the potential impacts that would result from such a structure.	1. Diagonal crossing operations.	To be determined[1]
26	San Dimas	Monte Vista Ave	Mid-block	At-Grade Feasible			To be determined[1]
27	San Dimas	San Dimas Ave	Mid-block	At-Grade Possible			Required per future 2035 crossing volumes

(CONTINUED) TABLE 4. SUMMARY OF MILESTONE 1 INITIAL SCREENING RESULTS							
ID	City	Crossing Intersection	Type	Milestone 1 Preliminary Disposition	Previous salient Issues/comments received from the agency coordination meetings and 2007 FEIS/FEIR Chapter 13 (Responses to Comments)	New comments received from the agency coordination meeting and 4 public scoping meetings (January and February 2011)	Need for Milestone 2 Study
28	San Dimas	Walnut Ave	Mid-block	At-Grade Feasible			To be determined[1]
29	San Dimas	San Dimas Canyon Rd	Mid-block	At-Grade Feasible		1. Cumulative traffic effect of Metrolink and Gold line gate operations.	To be determined[1]
30	La Verne	Wheeler Ave	Mid-block	At-Grade Feasible		n/a	To be determined[1]
31	La Verne	A St	Mid-block	At-Grade Feasible	1. The City of La Verne indicated that the potential at-grade street closures of A Street, D Street and E Street by the CPUC in the 2004 environmental document seemed unreasonable. A Street was mentioned as one the City of La Verne would like to keep open.	n/a	To be determined[1]
32	La Verne	D St	Mid-block	At-Grade Feasible		n/a	To be determined[1]
33	La Verne	E St	Mid-block	At-Grade Feasible		1. Pedestrian crossing Arrow Highway between the proposed La Verne Station and the parking lot on the southside of Arrow Highway. 2. Consideration for budge overpass pedestrian crossing.	To be determined[1]
34	La Verne	White Ave	Mid-block	At-Grade Feasible	1. The City of La Verne indicated that the number of signals that there would be on White Avenue, (which is a freeway connector between Arrow Highway and Bonita Avenue, including at the Gold Line crossing) is also a concern. 2. Two public comments suggested grade separation for this location. Per 2007 FEIS/FEIR, grade separation of White Avenue was not found to be warranted based on previous Milestone 2 analysis.	n/a	To be determined[1]
35	Pomona	Fulton Rd	Mid-block	At-Grade Feasible	1. One public comment suggested grade separation for this location. Per 2007 FEIS/FEIR, grade separation of Fulton Road was not found to be warranted based on previous Milestone 1 analysis.	n/a	To be determined[1]
36	Pomona	Garey Ave	Mid-block	At-Grade Feasible	1. One public comment suggested grade separation for this location. Per 2007 FEIS/FEIR, grade separation of Fulton Road was not found to be warranted based on previous Milestone 2 analysis.	1. Traffic congestion on Garey Avenue during the L.A. Fair and cumulative traffic effect of Metrolink and Gold Line trains.	To be determined[1]
42	Pomona	Towne Ave	Existing Mid-block/ Future Grade-Separated	Grade-Separated as Proposed	1. One public comment suggested grade separation for this location. Per 2007 FEIS/FEIR, grade separation of Towne Avenue was part of the project corridor design.	1. Clarification of grade-separation (LRT overcrossing or undercrossing) 2. Availability of the environmental documentation for the grade-separation.	Not required, assume grade-separated as proposed
37	Claremont	Cambridge Ave	Mid-block	At-Grade Feasible	1. Two public comments suggested grade separation for this location. Per 2007 FEIS/FEIR, grade separation of Cambridge Avenue was not found to be warranted based on previous Milestone 1 analysis.	1. Cumulative traffic effect of Metrolink and Gold Line trains.	To be determined[1]

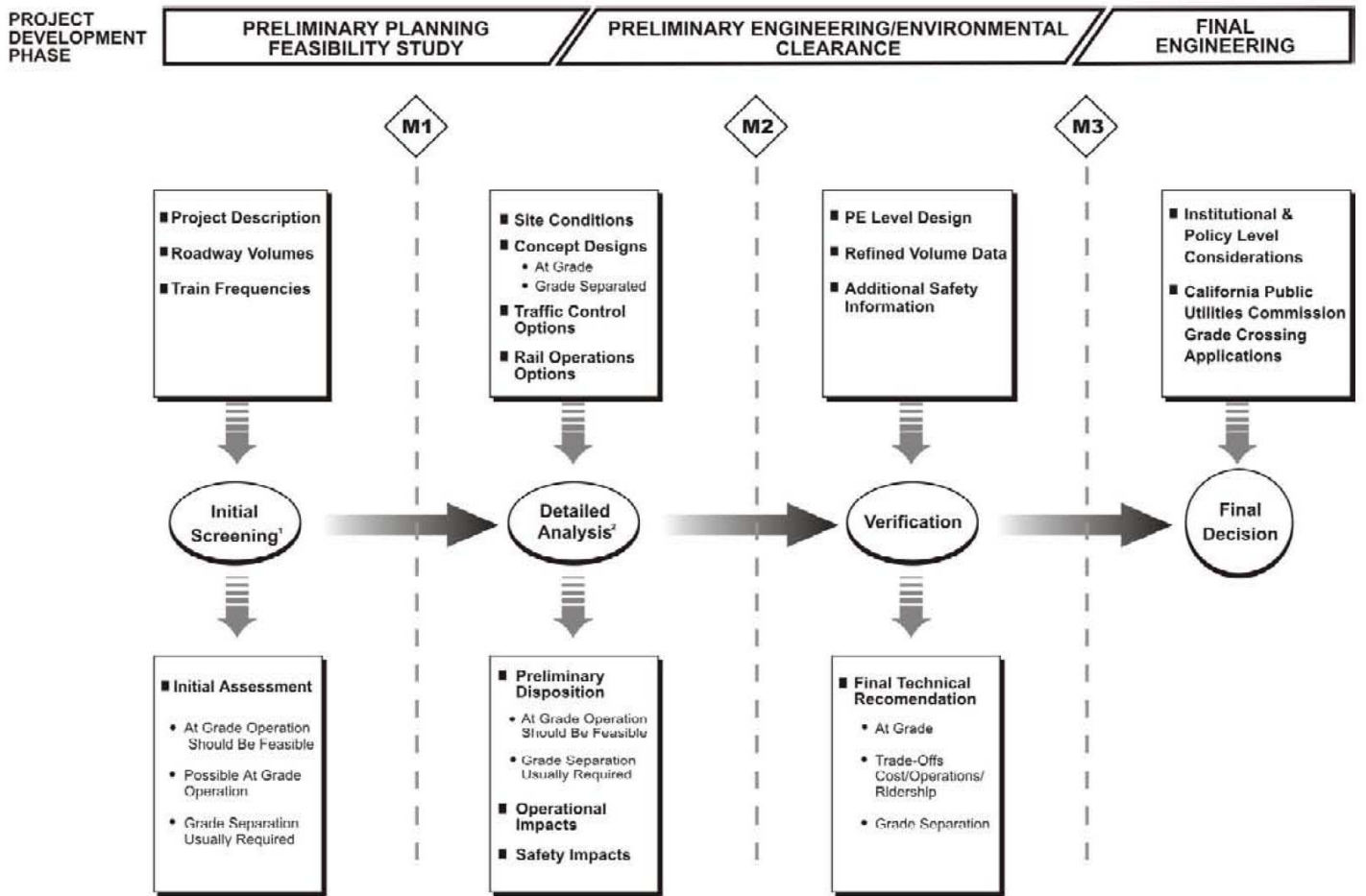
(CONTINUED) TABLE 4. SUMMARY OF MILESTONE 1 INITIAL SCREENING RESULTS							
ID	City	Crossing Intersection	Type	Milestone 1 Preliminary Disposition	Previous salient Issues/comments received from the agency coordination meetings and 2007 FEIS/FEIR Chapter 13 (Responses to Comments)	New comments received from the agency coordination meeting and 4 public scoping meetings (January and February 2011)	Need for Milestone 2 Study
38	Claremont	Indian Hill Bl	Mid-block	At-Grade Feasible	1. The City of Claremont advised that Indian Hill Boulevard backs-up to Arrow Highway when the crossing gates are down for the Metrolink and freight train operations. The Authority advised that when a light rail train is in the station with sufficient clearance, the gates will not be down. 2. One public comment suggested grade separation for this location. Per 2007 FEIS/FEIR, grade separation of Indian Hill was not found to be warranted based on previous Milestone 2 analysis.	1. Cumulative traffic effect of Metrolink and Gold line gate operations.	To be determined[1]
39	Claremont	College Ave	Mid-block	At-Grade Feasible	1. One public comment suggested grade separation for this location. Per 2007 FEIS/FEIR, grade separation of College Avenue was not found to be warranted based on previous Milestone 1 analysis.	1. Cumulative traffic effect of Metrolink and Gold Line trains. 2. High pedestrian and bicycle activities between the proposed Claremont Station and the Claremont Community College.	To be determined[1]
40	Claremont	Claremont Bl/South Mill Rd	Mid-block	At-Grade Feasible	1. One public comment suggested grade separation for this location. Per 2007 FEIS/FEIR, grade separation of Claremont Boulevard was not found to be warranted based on previous Milestone 1 analysis.	1. Cumulative traffic effect of Metrolink and Gold Line trains. 2. Consideration for open trench method for the LRT to minimize conflict with traffic. 3. Consideration for underground pedestrian passage or undergrade pedestrian crossings or access to train stations or better pedestrian access across all four tracks. 4. Extension of existing pedestrian crossing to Metrolink station. 5. Consideration for building the LRT below grade on the south side of existing Metrolink tracks.	To be determined[1]
41	Montclair	Monte Vista Ave	Grade-Separated	Remain Grade-Separated	n/a	n/a	To be determined[1]

Note:

[1] The project team should coordinate with local jurisdictions and CPUC and identify if there are any safety or traffic operations issues at these crossings and determine if a detailed Milestone 2 analysis is needed.

APPENDIX A
METRO GRADE CROSSING POLICY
EVALUATION FLOW CHARTS AND NOMOGRAPH FOR INITIAL SCREENING

Figure 1 – Light Rail Roadway Crossing Review Process



¹ See Initial Screening Chart

M = Milestone

² See Detailed Analysis Flowchart

Figure 2 – Evaluation Flowchart

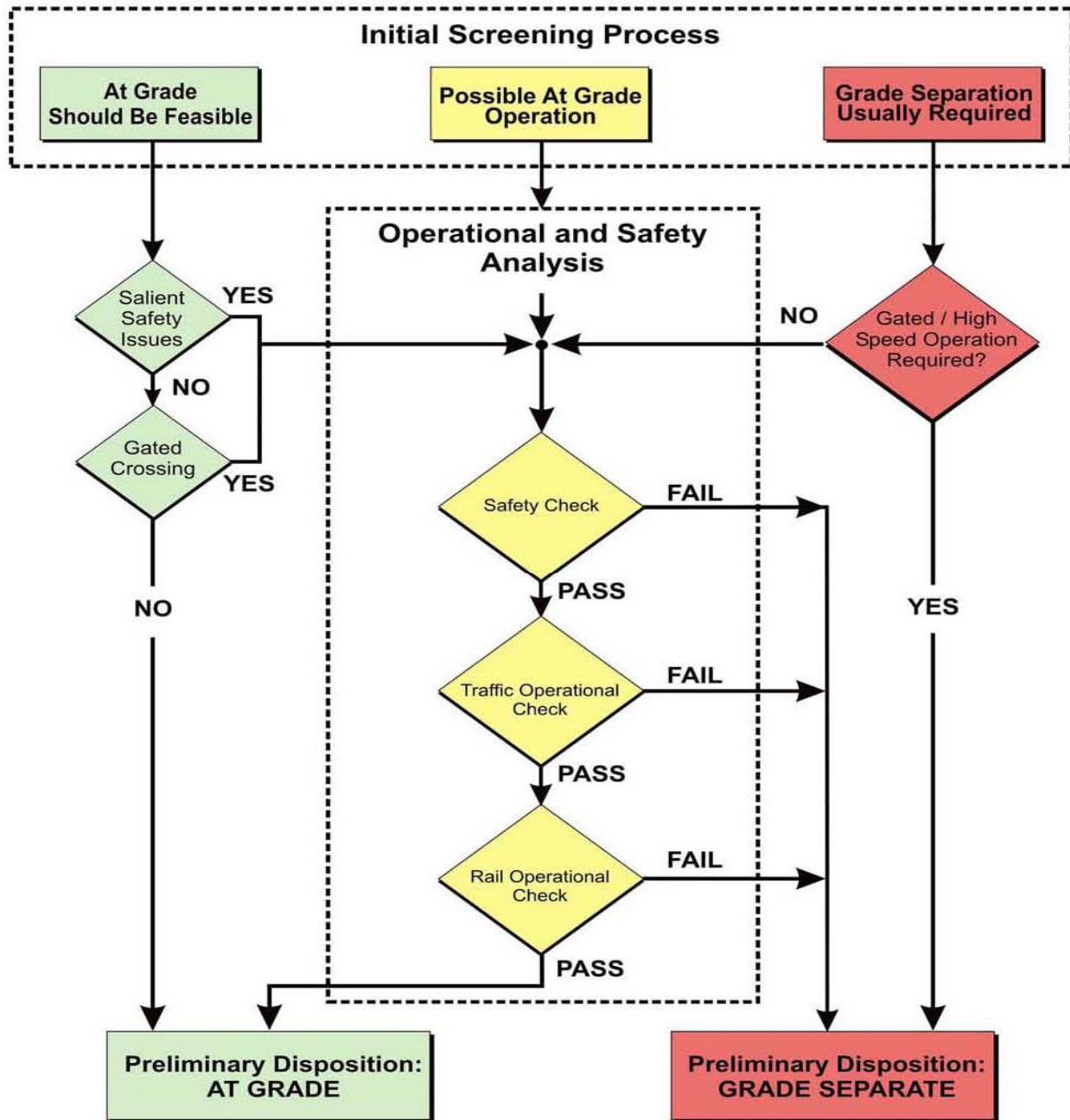
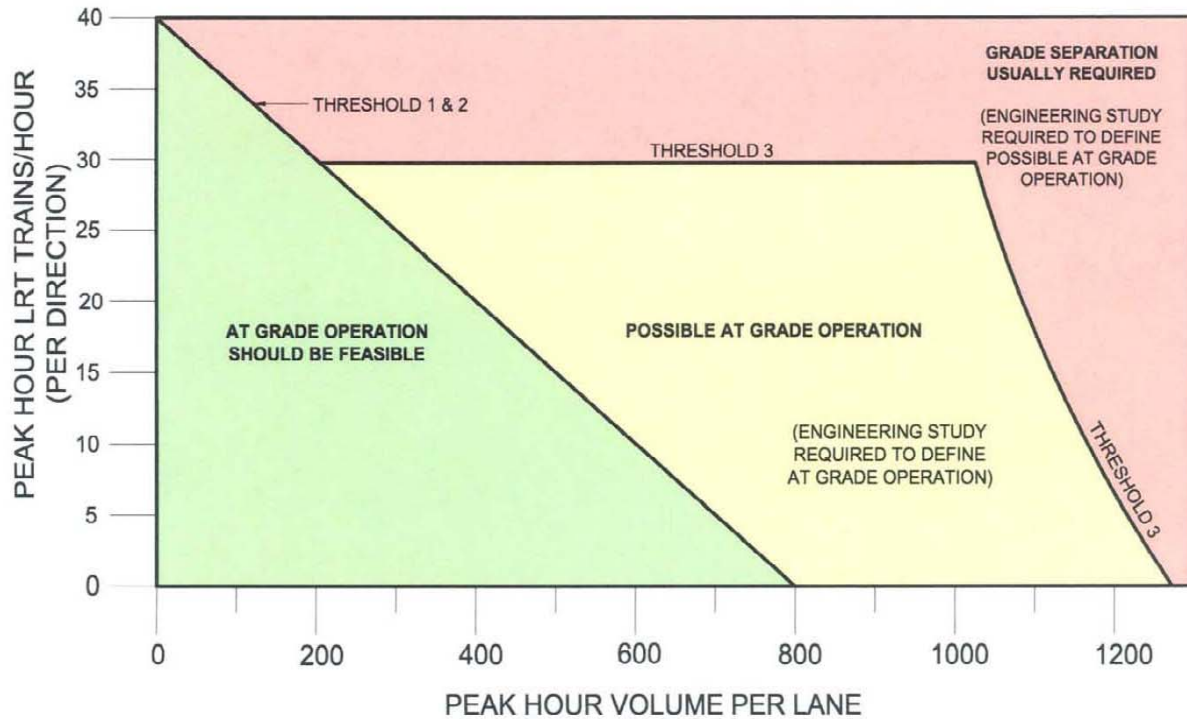


Figure 3 – Nomograph for Initial Screening



NOTES:

- ROADWAY VOLUME IS PEAK HOUR, HIGHEST PER LANE FLOW RATE
- ADAPTED FROM INSTITUTE OF TRANSPORTATION ENGINEERS INFORMATIONAL REPORT, LIGHT RAIL TRANSIT GRADE SEPARATION GUIDELINES, 1992, THRESHOLD 1 AND THRESHOLD 2 COMBINED.