

I. EXECUTIVE SUMMARY

The Los Angeles County Metropolitan Transportation Authority (Metro) is looking to enhance the safety, mobility and quality of life for the Glendale and Los Angeles community by closing the Doran Street at-grade crossing with the Metro-owned railroad corridor. To accomplish this goal, the project intends to construct a grade separation. To fully understand the needs of the community, it was important to study the project area to observe the traffic patterns, identify land uses, and determine local business operations. It is unavoidable that the construction of grade separation in a fully developed area will have impacts on right-of-way and the community. It is the objective of Metro to explore alternatives that will minimize these impacts while improving safety and mobility of the project area.

The project area includes a second at-grade crossing a half mile south of Doran Street at Broadway/Brazil. With the two at-grade crossings being in close proximity, there is an increased chance for an incident to occur in the project area. Moreover, the number of incidents County-wide has continued to increase in the last five years, as shown in Table 1 below. The ultimate safety enhancement would be to close both crossings and separate the vehicles and pedestrians from the trains. It is also important to note that emergency responders will require ingress and egress across the railroad tracks in a similar manner as they do today. This means that a new access point for each crossing closed will be required. The Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor Agency has a planned service expansion and the California High Speed Rail Authority is also proposing this railroad corridor for their Palmdale/Los Angeles segment. This will increase future rail traffic by 50%, and ultimately, the high speed rail to utilize a dedicated corridor which will require all at-grade crossings to be either grade separated or closed.

With the potential for two grade separations in close proximity, the impacts to right-of-way and the community would be doubled. Therefore, Metro expanded the alternative analysis to evaluate opportunities to close both crossings with a single grade separation while still providing the necessary points of ingress and egress for emergency responders and local businesses.

Table 1: Los Angeles County Incident Table

Year	Accidents	Fatalities	Injuries
2009	24	5	4
2010	20	6	9
2011	21	5	11
2012	20	9	19
2013	32	12	35
Totals	117	37	78

Source: Federal Railroad Administration

This Project Study Report (Equivalent) evaluates feasible alternatives for the construction of a grade separation in order to close the at-grade crossings at Doran Street and Broadway/Brazil Street. The preferred alternative(s) will move forward into the environmental clearance phase.

Alternatives

No Build: This alternative would keep Doran Street and Broadway/Brazil as at-grade crossings. However, this does not meet the requirements of the CPUC Order that will take steps to close the Doran Street crossing. One such requirement is to modify this crossing to a one-way westbound direction only. Therefore, for this PSRE, the No Build Alternative will consist of the one-way westbound Doran Street crossing and Broadway/Brazil functioning as it does today.

Alternative 1: Doran Overpass: Alternative 1 proposes to raise Doran Street over San Fernando Road, the rail tracks, and West San Fernando Road. The existing intersection of Doran Street and San Fernando Road will be replaced with a new signalized intersection at a widened and realigned Commercial Street. This will facilitate traffic movements between San Fernando Road, Doran Street and the State Route 134 ramps. Milford Street will tie to Commercial Street in a tee-intersection. West San Fernando Road will pass under the Doran Street overpass bridge and connect to Doran Street. This alternative will close the Doran Street at-grade crossing while Broadway/Brazil will remain an at-grade crossing. Refer to Figure 1 for a conceptual layout of this alternative.

Alternative 2: Fairmont Connector and Salem/Sperry Overpass: Alternative 2 has two components, the first consists of a connector road that extends West San Fernando Road to the Fairmont Avenue bridge and the second is an overpass crossing over San Fernando Road, the rail tracks, and West San Fernando Road in the vicinity of Salem Street and Sperry Street. This alternative will also consider options for potentially providing a pedestrian and bicyclist crossings of the Verdugo Wash, as planned in the City of Glendale River Walk project, and over San Fernando Road and the railroad tracks in the vicinity of Doran Street. Alternative 2 will close both the Doran Street and Broadway/Brazil at-grade crossings. Refer to Figure 2 for a conceptual layout of this alternative.

Alternative 3: Fairmont Connector and Zoo Drive Connector: Alternative 3 utilizes the same connector road from West San Fernando Road to the Fairmont Avenue bridge as Alternative 2. However, this alternative proposes to construct this road in conjunction with a road that connects Doran Street across the Los Angeles River to Zoo Drive. This alternative will also consider options for potentially providing a pedestrian and bicyclist crossings of the Verdugo Wash, as planned in the City of Glendale River Walk project, and over San Fernando Road and the railroad tracks in the vicinity of Doran Street. Alternative 3 will close the Doran Street at-grade crossing while Broadway/Brazil will remain an at-grade crossing. Refer to Figure 3 for a conceptual layout of this alternative.



Figure 1: Alternative 1 Doran Overpass



Figure 2: Alternative 2 Fairmont Connector and Salem/Sperry Overpass



Figure 3: Alternative 3 Fairmont Connector and Zoo Drive Connector

Alternatives Withdrawn from Consideration: The team evaluated additional alternatives that were ultimately withdrawn from consideration due to their feasibility and significance of their impacts. These included raising or lowering the rail tracks, a roadway underpass, and an overpass at California/Cutter.

Summary of Alternatives

The following table summarizes each of the three feasible alternatives selected along with the estimated project costs.

Table 2: Executive Summary Table

Alternative	Summary	Construction Costs*	Right-of-Way Costs*	Total Project Costs**
1 Doran Overpass	<ul style="list-style-type: none"> • Closes the Doran Street at-grade crossing • Will require a future grade separation at Broadway/Brazil • Proposed traffic routes most closely resemble existing traffic routes • Impacts sixteen (17) commercial/ industrial parcels – 379,000 sq ft 	\$26.99M	\$37.03M	\$71.31M
2 Fairmont Connector and Salem / Sperry Overpass	<ul style="list-style-type: none"> • Closes both Doran Street and Broadway/Brazil at-grade crossings • Will not require a future grade separation • Most consistent with proposed L.A. River Revitalization • Impacts eleven (11) commercial/ industrial parcels – 277,000 sq ft 	\$29.73M	\$45.97M	\$83.73M
3 Fairmont Connector and Zoo Dr Connector	<ul style="list-style-type: none"> • Closes the Doran Street at-grade crossing • Will require a future grade separation at Broadway/Brazil • Significant increase in construction and staging cost • No temporary impacts to rail operations • Will require environmental impact statement due to L.A. River impacts • Impacts six (6) industrial parcels – 237,000 sq ft 	\$30.85M	\$25.31M	\$64.49M

* Construction and right-of-way costs include a 20% contingency

** Total cost includes design, environmental and construction management. See Appendix I for complete breakdown.

Constraint Analysis Matrix

In order to provide a quantitative comparison of the three proposed alternatives, a Constraint Analysis Matrix has been prepared. Ten main design considerations were identified during the alternative analysis process and selected for the comparison within the matrix due to their potential impact on the feasibility of an alternative. Each main design consideration consists of subcategories to further define and rank the considerations. Each consideration is also weighted depending on the level of significance as shown in Table 3. Following is a brief description of the ten main design considerations:

1. **Cost/Fundability:** Compares the estimated alternative costs to the initial budgeted estimate of \$40 million per grade crossing to be closed while also being consistent with the main funding sources.
2. **Right-of-Way:** Compares the three alternatives to each other in regards to the total square footage of acquisition, impact to land uses that are difficult to relocate and the number of businesses that will be relocated.
3. **Environmental Considerations:** Evaluates each alternative based upon the level of impact to the Los Angeles River, Verdugo Wash, parcels with potential for hazardous materials, and parcels of historical sensitivity.
4. **Traffic Circulation and Diversion:** Evaluates each alternative based upon maintaining traffic on primary streets and on how significant of a diversion from the existing traffic patterns the proposed routes will cause.
5. **Constructability:** Evaluates each alternative based upon the complexity of construction, the need for extensive staging requirements, and the ability to maintain traffic operations and access during construction.
6. **Railroad Impacts:** Evaluates each alternative based upon impacts to railroad operations for both during and post construction.
7. **Geometrics:** Evaluates each alternative on meeting design requirements of the applicable jurisdictions, meeting the latest Americans with Disabilities Act requirements, and providing accommodations for pedestrians and cyclists.
8. **Utility Impacts:** Compares the three alternatives to each other in regards to the number of utilities requiring relocation as well as the estimated costs for those relocations.
9. **L.A. River Revitalization Plan Consistency:** Evaluates each alternative based upon the size of the area of encroachment into the L.A. River Revitalization Plan footprint and the alternative's ability to mitigate that encroachment.
10. **Programmatic Outlook and Future Community Impacts:** Evaluates each alternative based upon a programmatic view of the corridor taking into consideration future projects, including increased rail service, expected within the project area and rating the alternative on the overall impacts to the community.

The complete matrix along with a detailed explanation of each consideration, subcategories and the findings is provided in Appendix J. The weight factors shown below are the maximum scores possible for each consideration. A higher score within a consideration means that an alternative closely meets the goals of that consideration. Therefore, the alternative with the highest overall score has best met the ten main design considerations.

Table 3: Constraint Analysis Matrix Summary

Item No.	Consideration	Weight Factor	Alternative 1 Score	Alternative 2 Score	Alternative 3 Score
1	Cost/Fundability	15	10	13	5
2	Right-of-Way	15	9	12	11
3	Environmental Considerations	15	13	10.5	6.5
4	Traffic Circulation and Diversion	10	9	8	6
5	Constructability	5	3	5	1
6	Railroad Impacts	5	2	4	3
7	Geometrics and Safety	10	8	7	5
8	Utility Impacts	5	2	4	3
9	L.A. River Revitalization Plan Consistency	10	5	10	2
10	Programmatic Outlook and Community Impacts	10	5	10	5
	TOTAL	100	66	83.5	47.5

Cumulative and Programmatic Impact

When developing a project it is important to understand how that project fits into overall plans for the corridor as well as the cumulative impacts. This approach will ensure that projects will fit together seamlessly, avoiding duplicative expenditures (ie. throwaway costs), and results in an overall program that minimizes overall impacts to the community and reduces costs while providing the most benefit. The Doran Street and Broadway/Brazil Safety and Access Project is just one of many projects through this corridor, and must account for the Los Angeles River Revitalization, Glendale Narrows Riverwalk, Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor Agency service expansion and California High Speed Rail (HSR).

While the alternatives have addressed the L.A. River Revitalization and Glendale Narrows Riverwalk projects, of primary concern in a cumulative and programmatic viewpoint is the planned increase in rail service through this corridor from both the LOSSAN service expansion and HSR.

LOSSAN Corridor Agency developed a Strategic Implementation Plan in April 2012 which reflects a planned service expansion in this corridor (Burbank-Bob Hope Airport to Los Angeles Union Station). This expansion will increase the train trips from 84 (current volume) to 124 trains per day by 2030, inclusive of Amtrak (12 to 16 trains per day), Metrolink (61 to 90 trains per day) and freight (11 to 18 trains per day). This is a 50% increase in trains being implemented over the next 15 years. With this expansion, at-grade crossings along the corridor will see increased vehicular delays.

HSR is accelerating their program to have an operational segment from Palmdale to Burbank-Bob Hope Airport station, just north of our project corridor, by 2022. With that segment in operation, commuter rail volume will increase in the project corridor by 2022 through the use of a shared corridor with HSR in order to connect from the terminus station in Burbank to Union Station in downtown Los Angeles. By 2028, it is anticipated that HSR will be operating in a dedicated corridor which would require all crossings to be grade separated.

The challenge is two-fold. First, with the increase in rail volume by 2022 from the LOSSAN service expansion and the HSR terminus in Burbank, at-grade crossings within the corridor will see increased delay and potential for incidents. The Broadway/Brazil crossing already experiences considerable delays, a condition that will be significantly worsened with the increased rail volumes. Second, by 2028 all at-grade crossings will need to be grade separated to accommodate a dedicated HSR corridor.

Alternative 2 is the only alternative that addresses the impacts of the LOSSAN service expansion and HSR in both the 2022 and 2028 conditions. Alternatives 1 and 3 only close the Doran Street at-grade crossing. As a result, a future grade separation would be required in the vicinity of Broadway/Brazil, similar to the Salem/Sperry Overpass shown in Alternative 2, creating cumulative impacts as discussed below.

Construction: It is expected that construction would commence in 2017 for any of the alternatives being evaluated in this report. Construction duration for Alternatives 1 and 2 are 2.5 years; Alternative 3 would be 3 years in length.

As Alternatives 1 and 3 would require a future grade separation similar to the Salem/Sperry Overpass, a second construction period of 2.5 years is expected and could commence as early as 2022. Over an 8 year period between 2017 and 2025, the community would be subjected to the following cumulative period of construction:

Alternative 1 + Future Grade Separation = 5 years of construction

Alternative 2 + (not applicable) = 2.5 years of construction

Alternative 3 + Future Grade Separation = 5.5 years of construction

Right-of-Way: As Alternatives 1 and 3 require the construction of a future grade separation, resulting in a cumulative impact on right-of-way through the need for additional acquisition and business relocation. This additional right-of-way need is the same as the Alternative 2 need for the Salem/Sperry Overpass. Figure 4 reflects the cumulative right-of-way impacts for the three alternatives. Table 4 quantifies the increase in both acquisition and affected parcels.

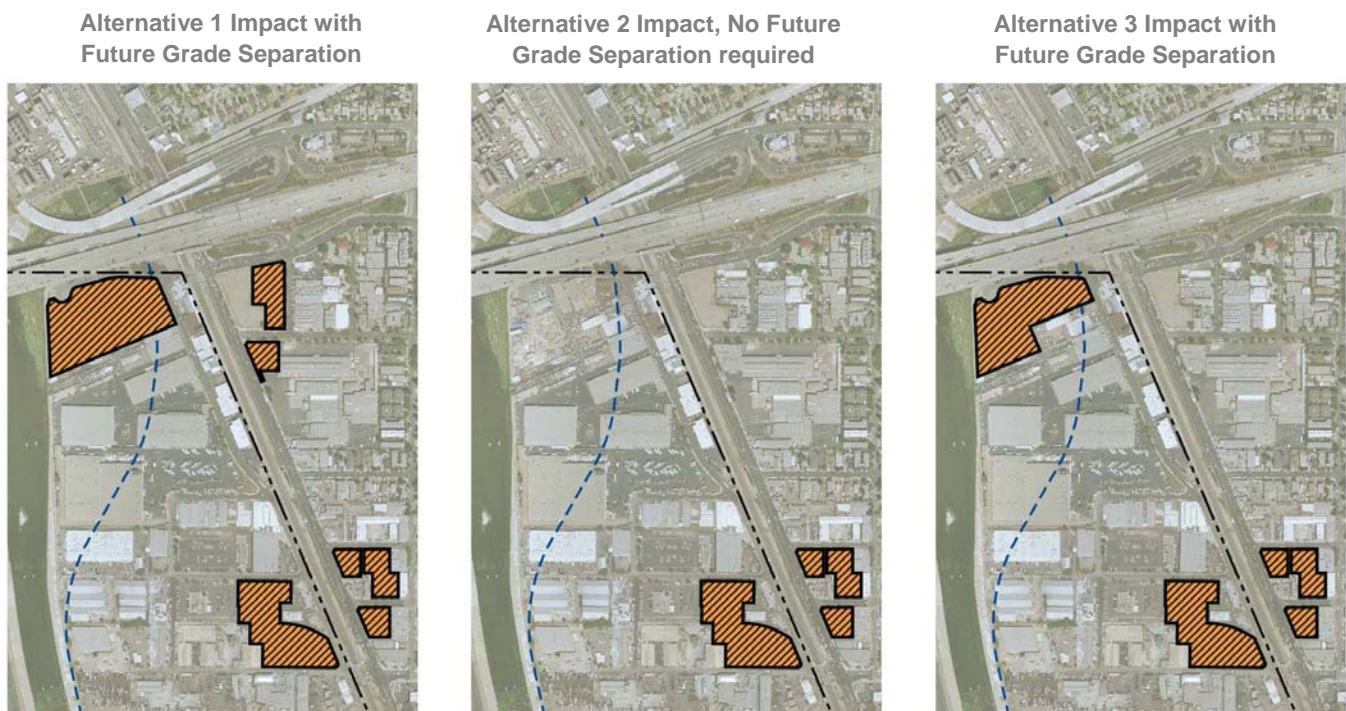


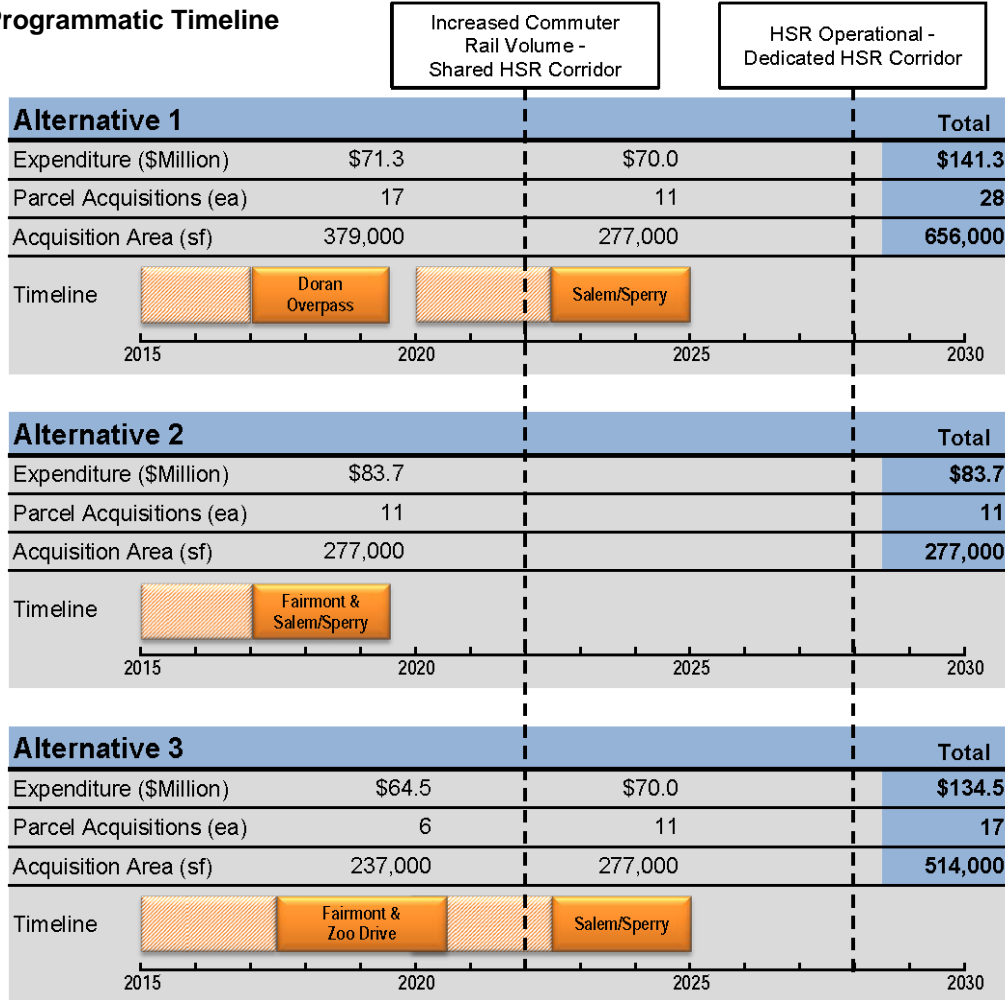
Figure 4: Programmatic Right-of-Way Impacts

Environmental: The increase in commuter rail traffic in 2022 will result in additional delays at the Broadway/Brazil crossing, a crossing that is already experiencing noticeable delays in its current configuration. The increase in idling cars is detrimental to air quality.

As Alternatives 1 and 3 require the construction of a second grade separation, the temporary impacts are compounded with a second round of heavy construction. As noted above, the community could experience over 5 years of construction over an 8 year period. Common environmental challenges, though temporary, during construction include noise, air quality, dust control, traffic delays and detours.

Fiscal Implications: Programming of grade separations in fully developed corridors require substantial funds due to construction and right-of-way costs. Regardless of funding sources, the ability to close two at-grade crossings with a single grade separation is the fiscally prudent approach. Alternatives 1 or 3 will result in an additional \$70 million in program costs due to the need for the future grade separation. These impacts are reflected in Table 4 below.

Table 4: Programmatic Timeline



Legend:
 Environmental, Design and Right-of-Way
 Construction
 Expenditures shown in 2015 Dollars (Millions)

Recommendation

Construction of a grade separation in a fully developed area inherently impacts the community, right-of-way, and traffic during construction. This Project Study Report (Equivalent) details the thorough analysis of three feasible alternatives, evaluating their impacts, with the intent to select a preferred alternative. The preferred alternative should best meet the goals and objectives that were set forth by Metro, and conferred with the Cities. These goals and objectives are incorporated into the Constraint Analysis Matrix design considerations.

Alternative 2 clearly provides the best overall solution to the corridor for the following reasons:

- Ranked highest by a considerable margin in a direct comparison to Alternatives 1 and 3 in the Constraints Analysis
- Provides the largest safety enhancement with the closure of two at-grade crossings
- Results in two points of uninterrupted access for residents, businesses and first responders across the rail corridor
- Addresses the future needs for the corridor including the LOSSAN service expansion and the High Speed Rail
- Eliminates the need for a future grade separation and thus avoids additional construction impacts to the community that would result in over 5 years of construction in an 8 year period
- Provides significant programmatic benefit as the most fiscally prudent solution while eliminating the need for additional right-of-way acquisition and relocation of businesses

Based on all these factors, Alternative 2 best supports the Project goals and objectives, and provides the largest long-term benefit to the cities and community. It is recommended that Alternative 2 be advanced into the environmental clearance phase of the project development.