7.0 EVALUATION OF ALTERNATIVES

This chapter presents the results of the evaluation of the benefits, costs, and impacts of the Refined Build Alternative, as compared to the No-Build Alternative. This comparison is made from four perspectives—effectiveness in meeting the purpose and need, cost effectiveness, feasibility, and environmental and other considerations. Important trade-offs also are highlighted.

The evaluation in this chapter draws upon and summarizes the information provided in the previous chapters of this Final Supplemental Environmental Impact Statement/ Subsequent Environmental Impact Report (SEIS/SEIR). The evaluation measures used in this chapter reflect local goals for the Refined Build Alternative as described in Chapter 1.0. This chapter has been revised since the Draft SEIS/SEIR to reflect the approval of refinements to the Build Alternative (now referred to as the Refined Build Alternative) by the San Diego Association of Governments (SANDAG) Board of Directors for evaluation in the Final SEIS/SEIR. The Refined Build Alternative reflects decisions among the options presented in the Draft SEIS/SEIR, modifications to the project to reduce impacts, and further engineering refinements, as described in Chapter 2.0 of this document. Revisions to this chapter also reflect updates to the Section 5309 New Starts program criteria implemented under Moving Ahead for Progress in the 21st Century Act of 2012 (MAP-21). The cost information presented in Section 7.4 was revised based on the information presented in Chapter 6.0 of this document. Additionally, the findings of the environmental analysis, as summarized in Section 7.5, were revised to reflect changes in Chapter 4.0 of this document. Section 7.5.3 was revised to reflect impacts to an ephemeral basin containing San Diego fairy shrimp (*Branchinecta sandiegonensis*) and formal consultation with U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the federal Endangered Species Act. Impacts to San Diego fairy shrimp were evaluated in the *Mid-Coast Corridor Transit Project Supplemental Environmental Impact Statement/Supplement to the Subsequent Environmental Impact Report*, which was circulated for review and comment from July 18, 2014 to September 2, 2014.

7.1 Effectiveness in Meeting Purpose and Need

Chapter 1.0 presents the purpose and need for the Mid-Coast Corridor Transit Project. As stated in that chapter, the purpose of the proposed project is to provide for implementation of transit improvements that improve transit service in the Mid-Coast Corridor between Downtown San Diego, Old Town, and University City. Although the Mid-Coast Corridor is currently served by transit, the existing transit system does not offer the level of service needed to meet the region's goals for mobility, accessibility, reliability, and efficiency, as defined in the SANDAG *2030 San Diego Regional Transportation Plan: Pathways for the Future* (2030 RTP) (SANDAG, 2007a). The COASTER commuter rail service passes through the corridor, but its stations are widely spaced and it does not have a station in close proximity to the University of California, San Diego (UCSD) or the University Towne Centre (UTC) Transit Center. The San Diego Trolley (Trolley) Blue Line terminates at the Old Town Transit Center (OTTC)

under existing conditions[1]. While transit mobility and accessibility to northern portions of the corridor are provided by express and local buses, the speed and reliability of bus service are constrained by roadway congestion, and many transit riders are required to transfer in Downtown San Diego or at the OTTC to reach destinations in University City. With congestion projected to increase in the future, the level of service, reliability, and efficiency of the transit system will all decrease.

To meet the region's goals most effectively, the Mid-Coast Corridor needs a transit system that is better able to serve the major travel destinations of UCSD and the UTC Transit Center in University City. This transit system must provide a frequency of service, speed, and reliability that would better serve existing transit riders and attract new riders. The exclusive right-of-way for transit that is proposed for the Mid-Coast Corridor Transit Project would shorten travel times, improve reliability, and reduce the number of transfers required for travel between major travel markets, thereby improving service for existing riders and attracting new riders. With the improved transit service provided by the project, one-seat rides (trips that do not require a transfer) would be available from the U.S.–Mexico international border to University City, and between communities in South San Diego County, Downtown San Diego, and University City, making transit an attractive alternative to travel by automobile.

Section 1.6 identifies other important local goals related to livability, sustainability, and equity. The following sections describe the effectiveness of the Refined Build Alternative in meeting these goals and addressing the project's purpose and need.

7.1.1 Mobility and Accessibility

Just as mobility and congestion have worsened over the years, congestion in 2030 will be worse than it is today. Congestion reduces travel speeds and increases travel time. For transit riders, the increase in congestion would directly affect their mobility because travel times on buses would increase. Although the planned high-occupancy vehicle (HOV) lanes on Interstate (I-) 5 under the No-Build Alternative would offset the effects of congestion for transit riders using buses operating in the HOV lanes, other riders would be affected by congestion.

Mobility and accessibility under the No-Build and Refined Build Alternatives were evaluated in terms of transit travel time, the number of transfers required to complete a trip, and transit ridership with a focus on the key travel markets identified in Chapter 1.0 (Downtown San Diego and areas to the east and south and University City). Table 7-1 summarizes the mobility and accessibility benefits of the alternatives.

7.1.1.1 Transit Travel Time and Speed

Travel time represents how long it takes a passenger to complete a trip by transit and is affected by the speed of the transit vehicle, roadway congestion, the number of stops, and the distance between stops. Transit riders benefit if a transit investment helps them complete their trip more quickly. Additionally, choice transit riders, defined as those

[1] Existing conditions generally refers to conditions in 2010 when the Notice of Preparation for the California Environmental Quality Act was issued.

Table 7-1. Effectiveness of Alternatives—Mobility and Accessibility Benefits

Measures	No-Build Alternative	Refined Build Alternative	Difference
Transit Travel Time (peak period in minutes)			
Golden Triangle to Centre City/Downtown	47.1	43.5	-3.6
South San Diego to UCSD	68.6	51.9	-16.7
Mission Valley to UCSD	51.6	39.1	-12.5
Transit Ridership			
Average weekday linked trips—systemwide	309,900	323,300	+13,400
Average weekday boardings—local bus	360,300	367,100	+6,800
Average weekday boardings—express bus	59,300	53,000	-6,300
Average weekday boardings—Trolley	152,200	180,800	+28,600
Daily passenger miles	3,604,858	3,800,297	+195,439
Transfers (Daily Transfer Rate)			
University City to Centre City/Downtown	2.01	1.70	-0.31
South to University City	2.62	2.08	-0.54
East to University City	2.51	2.38	-0.13

Source: SANDAG, 2014v
Note: UCSD = University of California, San Diego

individuals who could complete a trip by either automobile or transit, may decide to ride transit if it becomes more competitive with automobile travel time. Despite implementation of the planned roadway and transit improvements identified in the 2030 RTP, highway speeds will be slower as regional population, employment, and congestion grow by 2030. As highway speeds become slower, transit projects that increase transit speeds will make transit a more attractive alternative to travel by automobile.

Travel times between three of the major travel markets identified in Chapter 1.0—Golden Triangle to Centre City (Downtown San Diego), South San Diego to UCSD, and Mission Valley to UCSD—are presented in Table 7-1. As described in Sections 1.2.3 and 1.2.4, a substantial number of trips currently occur between areas of San Diego south and east of the OTTC and the University City and UCSD area. Furthermore, the number of trips between these areas would increase by 2030. Connecting these areas with reliable, efficient transit service is one of the purposes of the project.

The Refined Build Alternative offers much faster transit travel time than the No-Build Alternative for the three major travel markets described above, with peak-period time savings ranging from 3.6 to 16.7 minutes per trip. These travel times include time spent on transit in addition to the initial wait time, walk time to reach a transfer, and any wait time for that transfer. As shown by the improvement in transit travel times and speed, the Refined Build Alternative achieves the project objective of increasing speed. Chapter 3.0 provides additional information on the project's travel-time benefits.

Under the Refined Build Alternative, the faster transit travel times and increased transit speeds result in transportation system user benefits, measured in terms of equivalent

hours of travel-time savings. Transportation system user benefits capture a diverse set of benefits to transit riders—including reductions in walk times, wait times, ride times, transfer time, and costs (converted to time)—expressed in terms of savings in travel time. There would be approximately 11,500 hours per day of user benefits under the Refined Build Alternative.

User benefit thematic maps are included in the *Mid-Coast Corridor Transit Project Transportation Impacts and Mitigation Report* (SANDAG, 2014v). These maps show that travelers starting their trips in the Mid-Coast Corridor would gain the greatest benefit. Travelers starting their trips in the Marina–Ballpark (District 29), Mission Valley (District 7), and South Bay (District 11) travel analysis districts and areas along the U.S.–Mexico international border would also benefit, indicating that user benefits of the project would be widespread (refer to Figure 1-2 for a map of travel analysis districts).

7.1.1.2 Transit Ridership

The extent to which a transit project can attract more ridership is a direct reflection of its benefits to potential riders, including changes in travel time, transfers, and reliability, among other factors. Linked transit trips in 2030 under the Refined Build Alternative would increase by 13,400 trips per day (4 percent) over the No-Build Alternative. Linked trips are a trip from origin to destination regardless of the number of transfers needed to complete the trip. This increase in transit ridership under the Refined Build Alternative reflects the improvement in mobility and accessibility provided by extending the Trolley Blue Line and providing continuous service from the San Ysidro Transit Center at the U.S.–Mexico international border to University City. These are trips that would not be made by automobile on congested roadways.

The Refined Build Alternative would increase systemwide ridership on the Trolley by 28,600 boardings per day compared to the No-Build Alternative, from 152,200 to 180,800 (19 percent). Some of these riders would be new to transit. Others would be riders who would use buses under the No-Build Alternative but would benefit from a faster and more reliable trip on the Trolley with the project. The increase in transit ridership under the Refined Build Alternative is an indication of the effectiveness in making transit an attractive alternative to the automobile.

7.1.1.3 Number of Transfers

Some transit passengers are able to take one bus route from their starting point to their end point without the need to board another vehicle. However, for other passengers, a transfer may be required. A transfer can be from one bus to another, or between bus and rail (for instance, taking a bus to reach a Trolley station and then taking the Trolley to complete the trip). The number of transfers needed to complete a trip is another way to measure mobility benefits. Transfers add travel time and uncertainty to the trip, especially if transit services at the transfer point are not coordinated and wait times are long.

Table 7-1 lists the number of transfers required to complete a transit trip between three of the major travel markets identified in Chapter 1.0: University City to Centre City (including Downtown San Diego), South San Diego to UCSD, and East San Diego (including Mission Valley) to UCSD. The table presents transfer rates; a transfer rate of

2.62 means that, on average, for every transit trip from the south to University City 1.62 transfers per trip are required. As shown, the Refined Build Alternative would reduce the number of transfers required to complete these trips. Consequently, the Refined Build Alternative achieves the project objective of reducing transfers for these major travel markets.

Transfers still would be required for passengers traveling between University City and areas east of downtown; however, these transfers would be easier under the Refined Build Alternative. With the extension of the Trolley Blue Line from Santa Fe Depot to the UTC Transit Center under the Refined Build Alternative, passengers who would take the Trolley Green Line and then transfer to bus Route 150 under the No-Build Alternative would instead use the Trolley Blue Line. The Refined Build Alternative would provide faster service than a bus and thus would reduce travel time, even with any required transfers. Additionally, passengers transferring between the Trolley Blue and Green Lines at the OTTC would walk across the Trolley platform, rather than walking through the pedestrian undercrossing to access the bus as they would under the No-Build Alternative. Further, the Refined Build Alternative would reduce transfer wait times, especially during the midday off-peak period, since it would operate with 7.5-minute headways from 6:00 a.m. to 6:00 p.m. Because of the improved convenience of transferring and shorter frequencies, transfers under the Refined Build Alternative would be more convenient than under the No-Build Alternative, thus benefitting passengers.

7.1.2 Efficiency

The Metropolitan Transit System (MTS) uses “passengers per in-service hour” as a measure of transit’s efficiency. It is a measure of the number of boardings on the route divided by the hours that the route is available to transport passengers. The *Coordinated Plan 2010-2014* (SANDAG, 2010c) established a guideline of 35 revenue passenger boardings per service hour. If a route does not meet the guideline, then it may be providing service for more hours than is needed to serve the ridership demand. In these cases, the transit agency may adjust service by reducing service during off-peak periods or reducing the service span to serve demand more efficiently.

Although the Refined Build Alternative would lead to substantially higher Trolley Blue Line ridership than under the No-Build Alternative, the Trolley Blue Line in-service hours would grow more rapidly than ridership. As a result, the Trolley Blue Line under the Refined Build Alternative would serve approximately 370 passengers per in-service hour, making it somewhat less efficient than under the No-Build Alternative (approximately 430 passengers per in-service hour). This would represent a 12-percent decrease in efficiency. Nonetheless, the Trolley Blue Line would be substantially more efficient than existing conditions (280 passengers per in-service hour) and would far exceed the guidelines established by the *Coordinated Plan 2010-2014*.

7.1.3 Reliability

Improved reliability is a third goal of SANDAG’s 2030 RTP. Transit system reliability generally is measured in terms of on-time performance (i.e., whether the bus or Trolley departs a stop less than zero seconds early and no more than five minutes past the scheduled time). Roadway congestion has a direct impact on the reliability of transit

services, particularly buses. In comparison, the Trolley operates in an exclusive right-of-way with a few grade crossings in Downtown San Diego and is not hindered by fluctuations in traffic. As a result, under existing conditions, the Trolley Blue Line has 93 percent on-time reliability throughout the day, whereas Express Bus Route 150, operating between Downtown San Diego and the UTC Transit Center, has 86 percent reliability during the p.m. peak period when roadways are more congested.

By 2030, a 54-percent increase in vehicle hours of delay is projected, representing increased congestion on corridor roadways. As highway congestion increases, the reliability of buses operating in mixed traffic is expected to decline. The exceptions include bus routes operating in I-5 HOV lanes; however, buses still would need to travel on arterials and local roadways to reach these lanes, which would affect reliability.

The 10.9-mile extension of the Trolley Blue Line under the Refined Build Alternative would be operated in exclusive right-of-way completely separate from roadway congestion, thus offering much greater reliability for transit riders. As identified in Section 3.4.1.2, passenger miles in exclusive right-of-way on the Trolley system would increase 27 percent compared to the No-Build Alternative. Because the Trolley operates primarily in exclusive right-of-way, the Trolley Blue, Green, and Orange Lines are currently able to maintain higher on-time performance, and similar performance would be expected under the Refined Build Alternative. Passenger miles on buses operating in HOV lanes would decrease under the Refined Build Alternative, partly because Route 150 would be eliminated and some bus passengers would switch to the Trolley. The Refined Build Alternative achieves the project objective of increasing transit reliability in the corridor.

7.2 Effectiveness in Supporting Other Local Goals

The 2030 RTP established goals not only for mobility, accessibility, efficiency, and reliability, but also for livability, sustainability, and equity. While these goals do not directly contribute to the purpose and need for a transit investment in the Mid-Coast Corridor, the project does support these other goals, as described in this section.

7.2.1 Livability

The livability goal seeks to focus transit improvements in areas with compatible land uses that support an efficient transit system, and to foster smart-growth land uses. As stated in Section 4.1.3, the continuation and enhancement of bus Route 150 under the No-Build Alternative would be inconsistent with local goals and policies, which aim to increase the intensity of development along transit corridors, enhance regional connectivity, and minimize environmental impacts.

The Refined Build Alternative would connect the region's two largest population and employment centers—Downtown San Diego in the southern area and University City in the northern area of the corridor—thus supporting this goal. Since the mid-1980s, communities in the corridor have been identifying the Mid-Coast Corridor Transit Project in their plans. Additionally, SANDAG has designated Smart Growth Opportunity Areas, and the City of San Diego has developed the "City of Villages" strategy of integrating

land use and transit to address potential growth. All nine of the proposed stations under the Refined Build Alternative are located in Smart Growth Opportunity Areas.

When evaluating proposed projects for New Starts funding, in accordance with federal law and regulations, land use and economic development are two of the criteria that the Federal Transit Administration (FTA) uses to establish a project justification rating. The other project justification criteria are mobility improvements, cost effectiveness, environmental benefits, and congestion relief. The land use and economic development criteria take into account both existing land use and adopted plans and policies to help shape development and foster more transit-oriented patterns. In 2011, FTA gave the Mid-Coast Corridor Transit Project a "medium" rating for land use and a "medium-high" rating for economic development. In its economic development rating, FTA cited the city's *Smart Growth Concept Map* that identifies Smart Growth Opportunity Areas in which all of the proposed stations would be located. It also cited the additional city plans and policies, including: (1) the *City of San Diego General Pla*n (City of San Diego, 2008a), which focuses new development and redevelopment in existing communities, (2) the *City of San Diego Pedestrian Master Plan* (City of San Diego, 2006b), and (3) the *San Diego Street Design Manual* (City of San Diego, 2002b).

7.2.2 Sustainability

This section discusses how the Refined Build Alternative supports the 2030 RTP's sustainability goal, which seeks to improve air quality and reduce greenhouse gas (GHG) emissions. Table 7-2 highlights key findings from the results of the air quality analysis presented in Sections 4.5 and 4.6.

Table 7-2. Effectiveness of Alternatives—Sustainability Benefits

Measures	Existing Conditions	No-Build Alternative	Refined Build Alternative
Roadway vehicle miles traveled within corridor (million miles per day)*	10.693	12.472	12.407
Greenhouse gas emissions within region (metric tons of carbon dioxide per day)	37,439	46,243	45,963

Source: SANDAG, 2014q
Note: * Includes on-road vehicle miles traveled, including bus transit

As shown in Table 7-2, vehicle miles traveled (VMT) would increase 17 percent between 2010 and 2030 under the No-Build Alternative. Emissions of air pollutants and GHG increase as VMT increases. Consequently, as stated in Section 4.5.3, emission levels for several air pollutants, including sulfur dioxide and particulate matter, would increase between 2010 and 2030. Similarly, emissions of GHG would increase.

The Refined Build Alternative would help reduce VMT, resulting in a decrease in air pollutants and GHG compared to the No-Build Alternative. The FTA's project justification criterion for environmental benefits, which is based on changes in VMT, will be addressed when SANDAG seeks approval to advance the project into the Engineering phase following the Record of Decision.

7.2.3 Equity

The 2030 RTP equity goal establishes that SANDAG will provide equitable levels of transportation services for all population segments, including low-income, minority, elderly, and persons with disabilities. Environmental justice (EJ) populations are communities with a higher proportion of minority and/or low-income populations compared to the surrounding community. The expanded bus service that would be provided under the No-Build Alternative may not offer faster or more convenient access to jobs and services in the corridor to the same extent as the Refined Build Alternative.

As noted in Section 4.20, five of the nine identified EJ populations are located within one-half mile of the project alignment and thus would be well served by the Refined Build Alternative. Benefits of the Refined Build Alternative to transit users include increased transit options, improved mobility, proximity to transit stations, and access to employment and activity centers. The project would be fully compliant with the Americans with Disabilities Act, thus ensuring equitable service to persons with disabilities. Transit performance would improve within the Mid-Coast Corridor, and all population segments would share in these benefits.

Table 7-3 compares the transportation system user benefits for low-income groups with those benefits for all income groups combined. More than 60 percent of the Refined Build Alternative's user benefits (7,066 out of 11,473 hours) would accrue to low-income groups. These benefits would accrue to low-income groups inside the Mid-Coast Corridor and those outside the corridor who have a travel destination within the corridor.

Table 7-3. Benefits to Low-Income Persons in 2030

	Low Income	All Income Groups Combined
Transportation System User Benefits (hours per day)	7,066	11,473

Source: Series 11 model

As described in Section 4.20, the Refined Build Alternative would not result in substantial and disproportionately high and adverse effects to EJ populations. In addition, the Veterans Administration Medical Center Station would provide convenient access for veterans, disabled and otherwise, seeking medical treatment.

7.3 Cost-Effectiveness

The cost-effectiveness analysis considers whether the project's benefits would justify its capital and operating costs. Cost-effectiveness analysis offers another perspective for evaluating the Refined Build Alternative and is one of the criteria that FTA uses to evaluate the justification for projects proposed for Section 5309 New Starts funding.

Cost-effectiveness has been evaluated using the measure that FTA required at the time that the Mid-Coast Corridor Transit Project was approved into Preliminary Engineering in 2011. That measure was the ratio of the project's incremental annual cost (both capital and operating) divided by the project's incremental annual benefits in terms of the hours of user benefit in 2030. Both costs and user benefits were calculated in relation to a

New Starts baseline, which represented the best that could be done to improve transit service without building a new fixed guideway. The resulting ratio was compared with the cost-effectiveness breakpoints that FTA established for rating projects on a five-level scale, from high to low. Using this measure, FTA gave the Mid-Coast Corridor Transit Project a "medium" rating for cost effectiveness in 2011.

More recently, in accordance with MAP-21, FTA revised its cost-effectiveness measure and breakpoints. In the future, a project's cost-effectiveness will be rated in terms of the annual cost (both capital and operating) per project trip. The Mid-Coast Corridor Transit Project will be rated using this new measure when SANDAG seeks approval to advance the project into the Engineering phase.

7.4 Feasibility

This section addresses two feasibility measures—financial feasibility and constructability—highlighting significant factors covered in Chapters 4.0 and 6.0.

Based on the assumptions underlying the *Mid-Coast Corridor Transit Project Financial Plan* (SANDAG, 2014y), as summarized in Chapter 6.0, the Refined Build Alternative is considered to be financially feasible. The financial plan expects that the Refined Build Alternative would be funded through a combination of available *TransNet* funds and FTA New Starts funds (Table 7-4).

Table 7-4. Financial Feasibility

Measures	No-Build Alternative	Refined Build Alternative
Capital cost (million 2013 $)[1]	Base	$1,489
Capital cost (million YOE $)[2]	Base	$2,112
TransNet funding (million YOE $)[3]	$0	$1,069
New Starts funding (million YOE $)	$0	$1,043

Source: SANDAG, 2014y
Notes: YOE $ = year-of-expenditure dollars
[1] Does not include financing costs
[2] Includes financing costs
[3] Includes both bond proceeds and capital revenues

Chapter 6.0 explains that *TransNet* funding is in place, but New Starts funding is not ensured. To receive New Starts funding, the project must complete the National Environmental Policy Act process—of which this document is a part—and the FTA New Starts process with at least a "medium" rating for both project justification and local financial commitment based in FTA's latest criteria. When FTA approved the project's entry into Preliminary Engineering on September 2, 2011, the project received an overall rating of "medium-high." In addition, New Starts funding is dependent upon future congressional actions to authorize the program when MAP-21 expires in September 2014 and to provide annual appropriations.

SANDAG intends to request federal funds in an amount equal to 49.4 percent of the total capital cost (including finance charges). As shown in Table 6-3, SANDAG has the ability to fund the capital cost of the project within the proposed federal and local revenue sources.

The financial plan also demonstrates that SANDAG and MTS have sufficient financial capacity to operate and maintain the project while operating and maintaining the existing system in a state of good repair.

In terms of constructability, the engineering performed to date has not revealed construction issues that cannot be managed. The cost estimate reflects current understanding about the complexity of construction, and the capital cost estimate includes contingencies for unknown conditions that may arise as design progresses.

7.5 Environmental and Other Considerations

While the Refined Build Alternative would provide mobility and accessibility, livability, and sustainability benefits, as discussed in the previous sections, the project would result in transportation and environmental impacts, which are discussed in Chapters 3.0 and 4.0, respectively. This section summarizes the major impacts, specifically traffic, visual, biological, and construction.

7.5.1 Traffic Impacts

As discussed in Section 3.3.2, the Refined Build Alternative would adversely affect roadway performance. Adverse impacts would occur at 15 intersections (13 intersections south of the San Diego River and 2 intersections north of the river) as a result of the increased frequency of trains traveling through grade crossings in the south or additional traffic accessing proposed stations and park-and-ride facilities in the north. The adverse impacts would be fully mitigated at all but two intersections through implementation of geometric (e.g., the addition of turning lanes) and operational (e.g., changes to traffic signal phasing or timing) modifications.

Adverse and unavoidable impacts would occur for one roadway segment and two intersections. The level of service on Balboa Avenue from the I-5 southbound on-ramp to the I-5 northbound off-ramp would deteriorate under the Refined Build Alternative because of traffic accessing the Balboa Avenue Station and park-and-ride facility. Traffic to the proposed Balboa Avenue Station also would increase delay at the intersection of Mission Bay Drive and Garnet Avenue during p.m. peak hours, exceeding guidance established by the City of San Diego. Mitigation measures for these adverse impacts were considered. Mitigating the impact to the segment of Balboa Avenue would require reconstruction of the I-5 and railroad bridges and thus was deemed infeasible. Mitigating the impact at Mission Bay Drive and Garnet Avenue would require right-of-way acquisition and utility relocations. This intersection operates at level of service (LOS) E today and would continue to operate at LOS E under the Refined Build Alternative, but with greater delay. The mitigation measures identified for this intersection would decrease delay but the intersection would continue to operate at LOS E. Therefore, the benefits of mitigating this intersection would not outweigh the

secondary impacts, and the Refined Build Alternative impact at this location would remain adverse and not mitigated.

An adverse and unmitigated impact was also identified at the stop-controlled intersection of Beech Street and Pacific Highway, located south of the San Diego River. During the a.m. peak hour, the intersection would operate at LOS E with a delay 0.6 second greater than that experienced under the No-Build Alternative. A traffic signal was examined as mitigation; however, the intersection is within close proximity of two other signalized intersections and adding a traffic signal at this location would reduce vehicular storage capacity in the area and increase delay along Pacific Highway. Therefore, the impact at Beech Street and Pacific Highway remains adverse and not mitigated.

7.5.2 Visual Impacts

The Refined Build Alternative would have adverse visual impacts, as described in Section 4.4. The adverse impacts would be fully mitigated through implementation of design and landscaping mitigation measures. At UCSD, project features consist of new rail lines, ballast, retaining walls, grading, catenary lines, and poles. These project elements would add to the visual landscape. The removal of some mature trees and vegetation may be required within Pepper Canyon. However, project features would not contrast substantially with the surrounding visual quality or character. The project would have a low-to-moderate visual impact on the visual resources at UCSD.

The elevated structure would introduce a new visual element that would affect the physical and visual character of the adjacent Matthews Apartments, resulting in a localized adverse impact to the Matthews Apartments. This aerial structure would obstruct west-facing views, but these views are not of the coast or of public view corridors, and thus the impact is not adverse.

The UTC and University City area contains architecture and mature landscaping with distinct visual character. The Refined Build Alternative includes an overhead structure with columns in the center of the Genesee Avenue median and with two straddle bents on Genesee Avenue. One straddle bent would be located west of Regents Road where the alignment would enter Genesee Avenue and the second one would be located at the intersection of Executive Square and Genesee Avenue to support the tracks and the station platform. The Refined Build Alternative would have a moderate adverse impact on this area; however, the impact would be mitigated.

Various mitigation measures would be implemented to minimize visual impacts. These measures include the replacement of trees and implementation of design treatments so project features blend with their surroundings.

7.5.3 Biological Resources

As described in Section 4.8, the Refined Build Alternative would result in the long-term loss of jurisdictional aquatic resources (refer to Section 4.8.1.2 for a definition of this term). Long-term direct impacts to wetlands and non-wetland waters under U.S. Army Corps of Engineers (USACE) and Regional Water Quality Control Board jurisdiction total 0.37 acre (or 3.01 acres including construction and shading impacts). Long-term direct impacts to streambed and riparian areas under the California Department of Fish and

Wildlife and the City of San Diego jurisdiction total 0.87 acre (or 4.95 acres including construction and shading impacts). Long-term direct impacts would occur to coastal wetlands under the jurisdiction of the California Coastal Commission, totaling 0.23 acre (0.88 acre including construction and shading impacts). The project would avoid and minimize impacts to jurisdictional wetlands and waters to the extent practicable. As long-term impacts to areas under USACE jurisdiction do not exceed 0.5 acre within any of the affected watersheds, it is anticipated that the project would be authorized under Section 404 through the Nationwide Permit program. Although the Nationwide Permits appropriate for the activities associated with the proposed project would be determined by the USACE as part of the permitting process, potentially applicable Nationwide Permits include Nationwide Permit 3 (Maintenance), Nationwide Permit 12 (Utility Line Activities), Nationwide Permit 14 (Linear Transportation), and Nationwide Permit 33 (Temporary Construction, Access, and Dewatering).

The Refined Build Alternative would result in the long-term loss of 8.29 acres of riparian, Diegan coastal sage scrub, and non-native grassland (wetlands and Tiers II–III) that provide foraging and/or nesting habitat for special-status wildlife species. Specifically, implementation of the project would result in direct impacts to an ephemeral basin containing San Diego fairy shrimp, and would also impact suitable habitat for coastal California gnatcatcher (*Polioptila californica californica*), least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax traillii extimus*). The project would also impact suitable foraging habitat for light-footed clapper rail (*Rallus longirostris levipes*). Direct impacts to San Diego fairy shrimp triggered formal Section 7 consultation with the USFWS, which was initiated on June 12, 2014. On September 5, 2014, the USFWS issued a Biological Opinion concurring with the FTA's determination that the project is not likely to adversely affect coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, or light-footed clapper rail, or critical habitat for these species. While the project would directly affect San Diego fairy shrimp, the Biological Opinion concludes that the project is not likely to jeopardize the continued existence of the San Diego fairy shrimp, and included authorization for incidental take of San Diego fairy shrimp. Affected areas would be limited to locations within or immediately adjacent to the existing MTS right-of-way where comparatively large areas of native habitats remain available. In addition, vegetation community impacts would be mitigated through the SANDAG *TransNet* Environmental Mitigation Program using one or more of the ratios shown in Chapter 4.0, Table 4-19, Table 4-20, and Table 4-21 of this SEIS/SEIR. Mitigation for impacts to Tier II and Tier IIIB vegetation communities within and outside of the Multi-Habitat Planning Area is shown in Table 4-20 and Table 4-21. As a result, adverse impacts to special-status wildlife species through the reduction of foraging and/or nesting habitat would be negligible.

About 92 percent of the existing wetlands and Tier II–III vegetation communities would remain after implementation of the Refined Build Alternative, and direct impacts to wetlands and Tier II–III vegetation would be mitigated, as described in Section 4.8.4.

7.5.4 Construction Impacts

Construction impacts are described in Section 4.17. Despite the project's scope and length, the construction impacts of the Refined Build Alternative on the built and natural environment are limited. The land use encroachments for construction are temporary,

and the contractor would return these sites to their original condition when the construction phase ends. Additionally, the project has been designed to minimize the number of temporary encroachments needed during construction. Commercial signage and business visibility could be affected during construction; however, the contractor would be required to install temporary signage and signage to direct vehicles to parking and/or access. Therefore, adverse impacts to businesses would not be anticipated.

Some construction activities would occur during nighttime hours, which could result in adverse impacts to residences, particularly along Charmant Drive and Genesee Avenue and in the northeast corner of Cape La Jolla Gardens housing complex adjacent to I-5. Noise-reducing curtains, noise masking machines, or temporary lodging in an approved hotel would be offered to residents when excessive nighttime construction noise is expected.

Impacts to wetlands and waters under the jurisdiction of the USACE, the Regional Water Quality Control Board, the California Department of Fish and Wildlife, the California Coastal Commission, and the City of San Diego would be mitigated as specified in Section 4.17.3.2; additional measures may be required during the permitting processes. With the mitigation identified in Section 4.17.3.2, no adverse impacts would occur.

Air quality impacts during construction would be adverse. Emissions from construction equipment and from hauling and worker trips all would result in air pollutant emissions. Adverse and unavoidable impacts would remain even after implementation of project measures, resulting in exceedance of thresholds for nitrogen oxides and carbon dioxide.

Section 3.4.7 summarizes construction impacts on the transportation system. Construction of the project would affect Trolley and bus travel times, roadway traffic, and off-street parking supply. Project features and mitigation would be implemented to reduce impacts and would consist of detours and the provision of off-street parking in other locations, as available; however, some adverse and unavoidable impacts would remain.

7.6 Summary of Important Trade-offs

A decision to invest in the Refined Build Alternative reflects an assessment that the project's benefits justify its costs and impacts. Through more than 20 years of local planning, SANDAG and other local agencies have evaluated the project and concluded that the project has merit. The SANDAG Board of Directors reconfirmed the Locally Preferred Alternative in 2010 and approved the Refined Build Alternative in November 2013[2]. In addition, the project is a priority under the *TransNet* sales tax program adopted by San Diego County voters. By approving the Mid-Coast Corridor Transit Project into the New Starts program in 2011, FTA concluded that the project met its New Starts criteria for project justification and was likely to be a good candidate for funding.

[2] The SANDAG Board of Directors subsequently amended the Refined Build Alternative on May 9, 2014.

7.7 Environmentally Superior Alternative

California Environmental Quality Act Guidelines (Section 15126.6(e)(2)) require that an environmentally superior alternative be identified among the alternatives considered. The environmentally superior alternative is generally defined as the alternative that would result in the least adverse environmental impacts to the project site and surrounding area. If the No-Build Alternative is found to be the environmentally superior alternative, the document must identify an environmentally superior alternative among the build alternatives. The analysis in this document has found the Refined Build Alternative to be environmentally superior to the No-Build Alternative.