PALOMAR STREET GRADE SEPARATION

Project Report

January 17, 2020

Adopted by Chula Vista Resolution 2020-015
January 28, 2020

Prepared for:

San Diego Association of Governments
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Errata

The following revisions have been made to this document subsequent to the January 17, 2020 submission:

Location	Change
Cover	Added: Adopted by Chula Vista Resolution 2020-015, January 28, 2020
Signature	Added: Two pages with Chula Vista Resolution 2020-015
Pg 8, Sect 5, Para 5	Revised to read "…Industrial Boulevard overcrossing"
Pg 31 / Heading	Revised heading to read "Industrial Boulevard Overcrossing"

This Project Report has been prepared under the direction of the following registered civil engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusion and decisions are based.

1/17/2020

Patrick L. Somerville *Date*
Registered Civil Engineer

Concurrence By:

SANDAG: Omar Atayee Jan. 17, 2020

Omar Atayee *Date*
Senior Engineer

City of Chula Vista: Francisco X. Rivera January 17, 2020

Francisco X. Rivera *Date*
Principal Civil Engineer

Project Report Adopted By:

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RESOLUTION NO. 2020-015

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CHULA VISTA ADOPTING THE PROJECT REPORT FOR THE PALOMAR STREET RAIL-GRADE SEPARATION CIP STM0361 PROJECT, AND TRANSFERRING $100,000 IN TRANSNET APPROPRIATIONS FROM CIP TRF0397 TO CIP STM0361

WHEREAS, per City Council Resolution No. 2012-118, the City of Chula Vista entered a Memoranda of Understanding (MOU) with SANDAG for the purpose of preparing an environmental document that will consider project alternatives for grade-separating the Blue Line Light Rail Trolley crossing at Palomar Street and commensurate improvements; and

WHEREAS, the Palomar Street rail-grade crossing is identified as the highest needed location within San Diego County; and

WHEREAS, the City of Chula Vista provided full funding for the MOU as it related to the preliminary studies along the Interstate-5 corridor including the rail corridor; and

WHEREAS, several design alternatives were evaluated by the project team of the City of Chula Vista, SANDAG, and the railroad consultant, HNTB; and

WHEREAS, the preferred project alternative, will keep the railroad tracks and Industrial Blvd. at their current grade elevation and lower Palomar Street to pass under the railroad corridor and Industrial Blvd. This alternative will construct a railroad/pedestrian bridge and roadway/sidewalk bridge; and

WHEREAS, the project report has been completed and presented for adoption.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Chula Vista that it adopts the project report for the Palomar Street Rail-Grade Separation CIP STM0361 Project.

BE IT FURTHER RESOLVED by the City Council of the City of Chula Vista that it appropriates $100,000 in TransNet appropriations from CIP TRF0397 to STM0361.

[SIGNATURES ON THE FOLLOWING PAGE]

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Resolution No. 2020-015
Page No. 2

Presented by

DocuSigned by:
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William S. Valle
Director of Engineering & Capital Projects

Approved as to form by

DocuSigned by:
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Glen R. Googins
City Attorney

PASSED, APPROVED, and ADOPTED by the City Council of the City of Chula Vista, California, this 28th day of January 2020 by the following vote:

AYES:	Councilmembers:	Diaz, Galvez, McCann, Padilla, and Casillas Salas
NAYS:	Councilmembers:	None
ABSENT:	Councilmembers:	None

DocuSigned by:
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Mary Casillas Salas, Mayor

ATTEST:

DocuSigned by:
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Kerry K. Bigelow, MMC, City Clerk

STATE OF CALIFORNIA)
COUNTY OF SAN DIEGO)
CITY OF CHULA VISTA)

I, Kerry K. Bigelow, City Clerk of Chula Vista, California, do hereby certify that the foregoing Resolution No. 2020-015 was duly passed, approved, and adopted by the City Council at a regular meeting of the Chula Vista City Council held on the 28th day of January 2020.

Executed this 28th day of January 2020.

DocuSigned by:
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Kerry K. Bigelow, MMC, City Clerk

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APPENDICES *(External link to documents on City of Chula Vista website)*

Appendix A: Project Study Report (PSR) Addendum
Appendix B: Preliminary Geometric Drawings
Appendix C: Rail Corridor Modification Exhibits
Appendix D: Drainage Exhibits
Appendix E: Utility Exhibits
Appendix F: Structures Advance Planning Study
Appendix G: Preliminary Landscape Concept Plan
Appendix H: Right-Of-Way Impact Map
Appendix I: Traffic Study
Appendix J: Parking Memorandum
Appendix K: Preliminary Project Cost Estimate
Appendix L: Statutory Exemption (CEQA) / Categorical Exclusion (NEPA)

1. INTRODUCTION

The San Diego Association of Governments (SANDAG) and the City of Chula Vista (City), in coordination with the Federal Highway Administration (FHWA), are proposing to grade separate the existing Palomar Street/Metropolitan Transit System (MTS) Light Rail Transit (LRT) and San Diego & Arizona Eastern (SD&AE) freight railway at-grade railroad crossing in the City of Chula Vista, San Diego County. The project site is principally along Palomar Street between Interstate 5 (I-5) and a point approximately 1,200 feet east of Industrial Boulevard, and along Industrial Boulevard and/or the adjacent LRT/SD&AE rail right-of-way between Main Street at the south and the I-5 on and off ramps north of Moss Street at the north, as shown in **Figures 1 and 2**. The project site is located on the Imperial Beach U.S. Geological Survey (USGS) 7.5 minute topographic quadrangle.

1.1. Project History

In August 2012, SANDAG in cooperation with the City, approved a Project Study Report (PSR) for the Chula Vista Light Rail Corridor Improvements. The PSR provided the analysis of alternatives to grade separate the three at-grade rail crossings within the City of Chula Vista: E Street, H Street and Palomar Street. While the PSR addressed all three at-grade crossings, the Palomar Street grade crossing improvements have independent utility from the other grade crossing improvements, allowing it to be constructed and function independent from the other projects.

Following the completion of the PSR, SANDAG in cooperation with MTS, implemented a $50 million rail corridor improvement project, referred to as the South Line Rail Freight Capacity Project. Construction of this project was completed in 2016 and increased the freight rail capacity through this corridor, a vital connection between the San Ysidro and downtown San Diego rail yards.

The implementation of the South Line Rail Freight Capacity Project led to the need to re-evaluate the viable, and rejected, alternatives identified in the PSR. In October 2018, a Project Study Report Addendum was approved, recommending that a roadway underpass, identified as Alternative P5, be advanced as the viable build alternative for the Palomar Street grade separation. A copy of the Project Study Report Addendum is included in **Appendix A.**

This Project Report provides the engineering evaluation and technical analysis for the build alternative and supports the environmental clearance for the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

Figure 1. Regional Vicinity Map

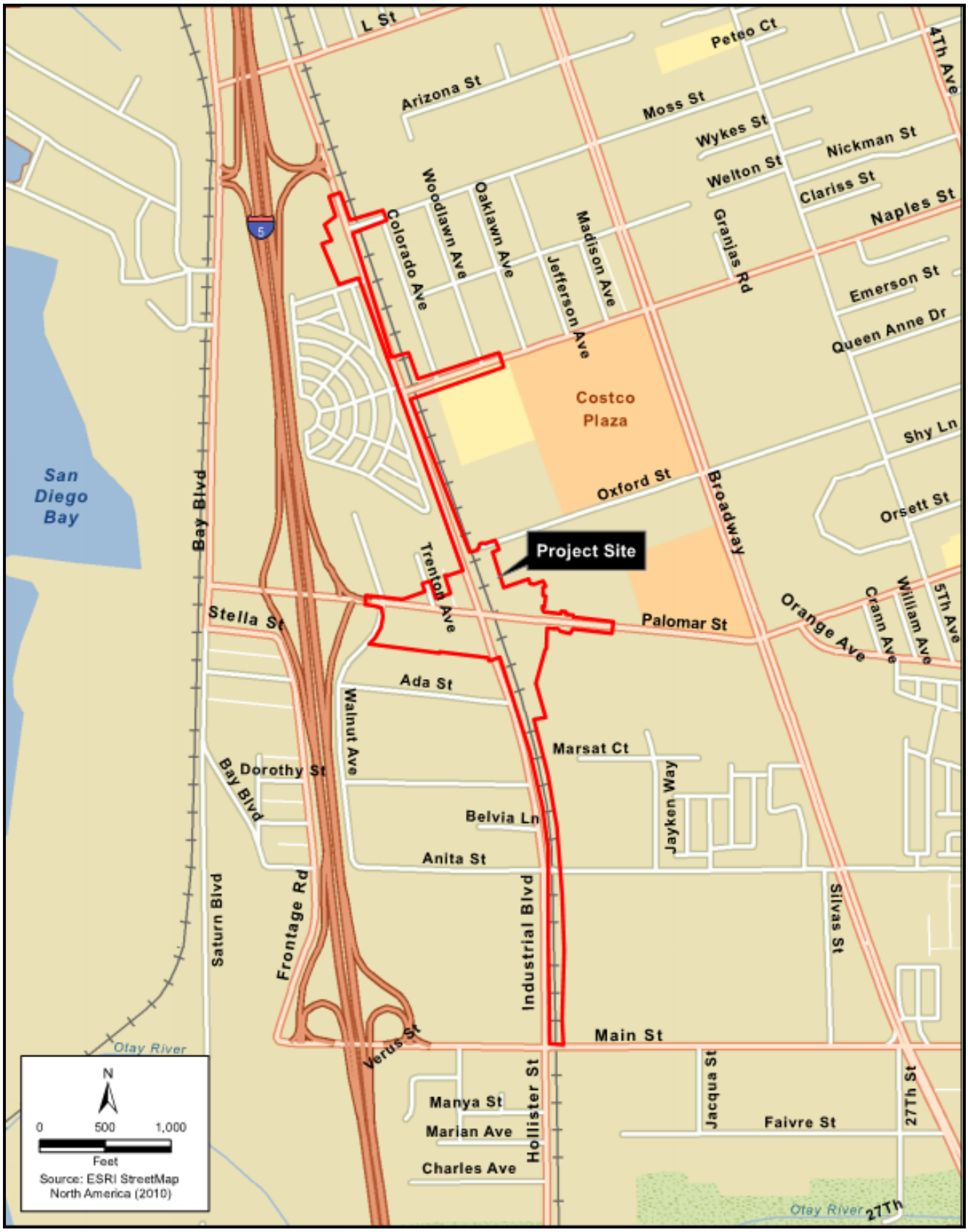

Figure 2. Project Location Map

2. RECOMMENDATION

It is recommended that the Palomar Street Grade Separation Project (Project) be approved using the build alternative and that the Project proceed to the design phase. Concurrence was achieved on the Project through consultation with the City, SANDAG and MTS with respect to the recommended Project, consideration of their views, addressing their concerns and that they are in general accord with the Project as presented and the benefits to be achieved by its execution.

The City and SANDAG entered into a Memorandum of Understanding (MOU) in 2012 for the preparation of the Project Report and the completion of environmental clearance for compliance with both CEQA and NEPA. To enter the design phase, a new MOU will be required between the City and SANDAG, with SANDAG continuing as the Lead Agency.

3. BACKGROUND

The Project is included in the 2016 cost-constrained Regional Transportation Improvement Program (RTIP) as project CHV30. SANDAG identified Palomar Street as the highest ranked at-grade crossing in need of a grade separation based upon the peak-hour vehicular traffic, total number of trains, blocking delays, pedestrian and bicycle safety and accident history. The Project is in the City of Chula Vista, San Diego County, California, along the rail corridor east of Interstate 5 Freeway (I-5).

The purpose of the proposed project is to remove the existing at-grade crossing of vehicular, pedestrian and bicycle traffic and the rail traffic. The Land Use and Transportation Element of the City's General Plan identifies the need to grade separate the road/rail at-grade crossings within the western part of the City, thus this project is consistent with that goal.

3.1. Existing Facility

Through the project area, the existing Palomar Street consists of an east/west divided six-lane arterial highway (three lanes in each direction) that crosses the existing MTS Rail Corridor tracks at-grade with an existing Average Daily Traffic (ADT) of nearly 45,000 vehicles. Palomar Street intersects with Industrial Boulevard approximately 50 feet west of the rail crossing, at a signalized intersection. Industrial Boulevard is a local collector with one lane in each direction and connects with Ada Street by a roundabout approximately 650 feet south of Palomar Street. Trenton Avenue connects with westbound Palomar Street approximately 400 feet west of the rail crossing. A signalized intersection exists approximately 600 feet east of the rail crossing at the driveway entrances to the Palomar Trolley Center and Hometown Square retail centers.

Rail Corridor

Currently, MTS operates the Blue Line LRT with more than 200 trains daily crossing Palomar Street at this location on weekdays, and an additional two freight trains at night when the LRT is not running. The Blue Line has the highest ridership in the San Diego Region. Headways are 7.5 minutes peak hour and 15 minutes off peak. Ridership is expected to continue to increase which will lead to reduced headways as well as extended peak hours. This will lead to increased vehicular delays on Palomar Street. Regionally, to provide more transit service there is a planned Purple Line LRT that will potentially use this MTS rail corridor through Palomar Street. There is no funding yet identified for the Purple Line LRT.

SD&AE, owned by MTS and operated by San Diego and Imperial Valley Railroad (SDIV), currently operates two trains in the early morning hours when the LRT is not operating. Freight trains run from the San Ysidro rail yard to the downtown San Diego rail yard as well as services numerous customers through the corridor on spur tracks. The capacity improvements implemented allow for two track operation through this corridor and an expansion of an additional two trains, for a total of four trains, during the operational window. Upon Project completion, two tracks must be maintained that meet freight rail design requirements.

The at-grade crossing is identified by the Federal Railroad Administration's (FRA) as crossing number DOT 662038Y and the California Public Utilities Commission (CPUC) identification is SD-1153, located at Milepost 9.70.

Active Transportation

There are significant pedestrian volumes within the Project limits. The Blue Line Trolley Station is in the southeast quadrant of Palomar Street and the rail crossing. Site observations and traffic intersection counts indicate a high volume of pedestrians crossing Palomar Street at the Industrial Boulevard and Palomar Trolley Center intersections, in part due to the Blue Line Trolley Station and the County Health Services facility that is located on Oxford Street. Both Palomar Street and Industrial Boulevard have Class II on-street bike lanes throughout the limits of the Project.

Land Use

The land use adjacent to Palomar Street includes the following and is shown in **Figure 3** on the following page.

Northwest Quadrant: Single-family and multi-family residential housing units. To the north of the residential neighborhood is a large SDG&E overhead electrical transmission corridor which also crosses Palomar Street, west of the MTS Rail Corridor.

Northeast Quadrant: Commercial/Retail with three shopping centers, the Palomar Center, Sun/Moon Plaza and Hometown Square. MTS owns a parcel that includes a connector road between Oxford Street and Palomar Street along with a stormwater retention basin. Along the north side of Oxford Street is the County Health & Human Services Agency, located at 690 Oxford Street at the west end of Oxford Street.

Southeast Quadrant: The MTS Blue Line Trolley Station is located immediately adjacent to the rail crossing. The Palomar Trolley Center is a commercial/retail center that is also used for vehicular and bus access to the Trolley Station.

Southwest Quadrant: On November 13, 2019, the Planning Commission approved the Palomar Gateway Shopping Center, 58,000 square foot commercial retail shopping center consisting of a grocery market and three commercial/restaurant building pads on a 4.76-acre parcel that is currently vacant. Parking will be provided for 233 vehicles. Commercial plazas and pedestrian pathways are proposed throughout the center to encourage pedestrian activity and interconnection to the trolley to the east. Construction anticipated to commence in 2020. The shopping center will include a driveway and a traffic signal at the Trenton Avenue intersection.

Palomar Gateway District Specific Plan (PGDSP): The PGDSP, which encompasses the project site, was adopted by the City Council of the City of Chula Vista on August 13, 2013 thru Ordinance No. 2013-3274. EIR-10-05 prepared for the PGDSP was certified by City Council of the City of

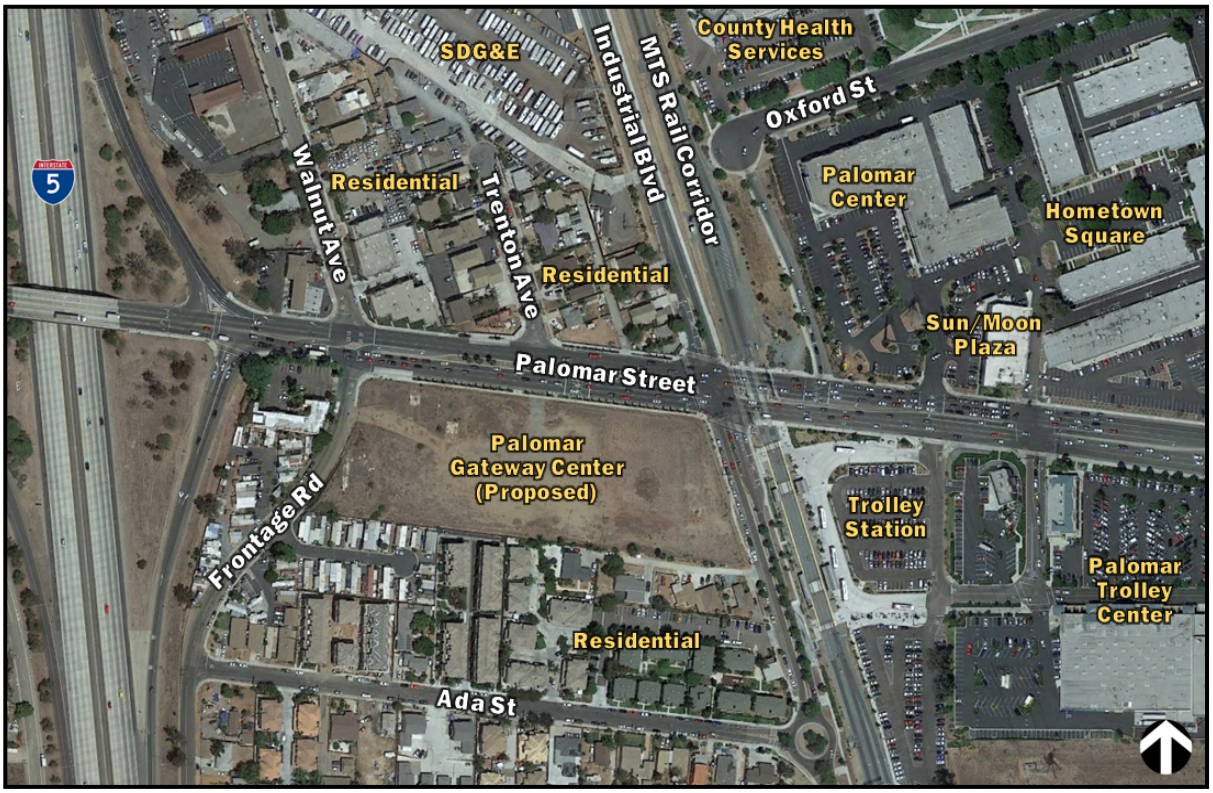

Figure 3. Adjacent Land Use

Chula Vista on August 6, 2013 thru Resolution No. 2013-160. The Specific Plan is an overlay to the City's General Plan Element that allows for increased density of land use along with a reduction in parking needs due to the available of transit alternatives. With the densification, it is anticipated that an increase of vehicular, pedestrian and bicycle traffic will occur within the Project limits.

3.2. Community Interaction

The project alternatives were presented in the following public forums. All City Council and Commission meetings provided public notification. The community open house included notifications via mailers, door hangers, and the City website. All meetings provided opportunity for community input and feedback and are summarized in **Table 1** below.

Table 1. Summary of Community Interaction

Date	Meeting
November 5, 2014	**City of Chula Vista, Safety Commission** A PowerPoint presentation was made to the Safety Commission. Commissioners provided comments and staff responded to their questions. The roadway underpass was received favorably by the Commission.
November 12, 2014	**Community Open House** Display boards were provided for PSR Alternatives. Project staff were located at each board to answer questions from the community. The public was encouraged to place post-it notes with comments or questions on each board as well as submit a comment card. A PowerPoint presentation was made, and public questions were addressed. The meeting was well attended by the community and over 30 comments and/or questions were received. The community expressed concerns over the PSR alternatives that raised or lowered the tracks related to the visual impact, inconvenient access to the station, graffiti, transients and that the station was currently being reconstructed. The roadway underpass was well received for its overall aesthetics, improved pedestrian/bicycle facilities and ease of station access. Concerns included maintaining driveways and the Trenton extension over the vacant parcel.
December 16, 2014	**City of Chula Vista, City Council** A PowerPoint presentation was made to City Council. Comments were received, and staff responded to questions. City Council direction was to advance the roadway underpass further in the project development process.
February 5, 2015	**City of Chula Vista, City Council Transportation Workshop** Display boards were set up for the community to review, comment and ask questions ahead of the Transportation Workshop. A PowerPoint presentation was made to City Council, providing a project update and reaffirming the decision to proceed with the roadway underpass.

4. PURPOSE AND NEED

Currently, more than 200 trains cross Palomar Street at this location on weekdays (including two freight trains). The purpose of the proposed project is to remove the existing at-grade conflict between vehicular, pedestrian and bicycle traffic and rail traffic. The Project will reduce delay and provide a significant safety improvement. The Land Use and Transportation Element of the City's General Plan identifies the need to grade separate the road/rail at-grade crossings within the western part of the City, thus this project is consistent with that goal.

5. PROJECT DESCRIPTION

A grade separation is proposed to eliminate the MTS Blue Line LRT and SD&AE freight rail (MTS Rail Corridor) at-grade crossing of Palomar Street, in the City of Chula Vista, San Diego County, California.

Through the project area, the existing Palomar Street consists of an east/west divided six-lane roadway (three lanes in each direction) that crosses the existing MTS rail corridor at-grade. To the west of the at-grade crossing, Palomar Street intersects with Industrial Boulevard, approximately 50 feet west of the rail crossing. Trenton Avenue connects with westbound Palomar Street approximately 400 feet west of the rail crossing. Industrial Boulevard connects with Ada Street by a roundabout approximately 650 feet south of Palomar Street.

The proposed project would lower the six-lane Palomar Street under the existing MTS Rail Corridor and Industrial Boulevard, creating a roadway underpass. A new two-lane bridge for Industrial Boulevard and a double track rail bridge for the MTS rail corridor would be constructed over the lowered Palomar Street. The bridges would be approximately 200 feet in length with a minimum 16.5-foot clearance to Palomar Street.

The roadway for Palomar Street would consist of 6-lane roadway (six vehicular lanes with 7-foot shoulder/bike lanes and 8-foot sidewalks in each direction), and with a 14-foot maximum width raised median or 10-foot left turn lane with 4-foot raised median. The roadway improvements on Palomar Street would extend approximately 660 feet west and 620 feet east of MTS rail corridor railroad tracks with a total length of approximately 1300 feet.

The total length of improvements on Industrial Boulevard would extend approximately 300 feet north and 320 south of Palomar Street, with a total length of approximately 700 feet. Industrial Boulevard would be constructed with one 11-foot lane, 5-foot bike lane, and 6-foot sidewalk in each direction. The bridge would have a 10-foot striped median which tapers to double stripe north of the Industrial Boulevard Overcrossing.

The improvements on Trenton Avenue would be constructed to a point approximately 150 feet north

of Palomar Street. The grade of the intersection of Palomar Street and Trenton Avenue would be lowered to match the new Palomar Street grade.

The cul-de-sac on Oxford Street would be reconfigured into a roundabout, and the connection to Palomar Street would be widened and realigned and intersect Palomar Street near the existing retail shopping entrance. The retail shopping parking lot would be redesigned to accommodate this realigned connection from Oxford Street to Palomar Street. On-street parking would be added to the Oxford Street connector to offset the loss of parking spaces due the reconfigured parking lot.

Roadway striping would also be included along Palomar Street, Naples Street/Industrial Boulevard, and Moss Street/Industrial Boulevard. Minor widening would also occur along the eastside of Industrial Boulevard north of Moss Street.

To address the significant pedestrian volumes, stairways are provided to connect the sidewalks along Palomar Street to the Trolley Station and the Oxford Street connector. The proposed railroad bridge has additional width to accommodate an approximately 9-foot wide, barrier-separated pedestrian crossing to facilitate north/south pedestrian movement without having to cross Palomar Street intersection at grade.

The sidewalks and roadway would be separated by landscaping and retaining walls to maintain Americans with Disabilities Act (ADA) accepted maximum grades. A pedestrian activated signal would be installed on Industrial Boulevard to provide a connection to/from the Trolley Station.

The traffic signal-controlled intersection on Palomar Street and the driveway entrances to the Palomar Trolley Center and Hometown Square would be reconstructed and lowered to meet the proposed grade. The eastbound left turn lane on Palomar Street at this intersection would be extended to approximately 220 feet to accommodate the turning movement demand.

The MTS and SD&AE railroad tracks will also require a crossover track located immediately north of Palomar Street within the railroad right of way to facilitate rail operations during construction. Associated rail signaling and overhead contact wire modifications will be required.

An overview plan of the Project is included in **Figure 4**.

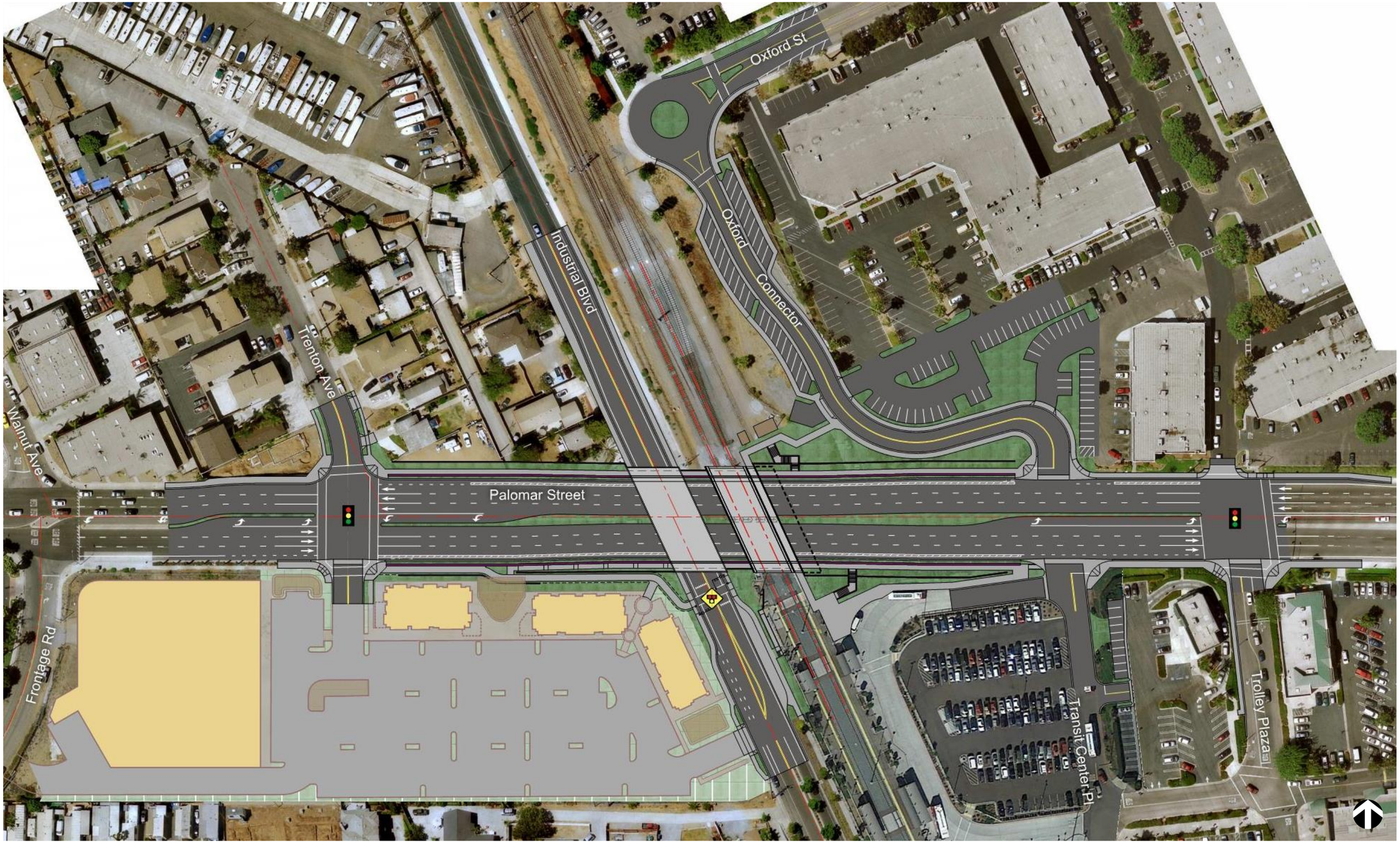

Figure 4. Overall Project Layout

6. ALTERNATIVES

There are only two alternatives for the Project: A No-Build Alternative and one Build Alternative.

No-Build Alternative

The No-Build Alternative would leave this section of Palomar Street in its present condition. This alternative would not address congestion issues within the Project limits and would not be consistent with the Land Use and Transportation Element of the City's General Plan. Thus, the No-Build Alternative is not the preferred alternative for programming.

Build Alternative – Roadway Underpass

The Build Alternative includes lowering the six-lane Palomar Street under the existing MTS LRT and SD&AE railroad tracks and Industrial Boulevard. A new two-lane bridge for Industrial Boulevard and a double track rail bridge would be constructed over the lowered Palomar Street. Road improvements would be implemented on Palomar Street and Industrial Boulevard to accommodate changed configuration. This alternative would not add capacity to the existing facility.

6.1. Roadway

Palomar Street is a divided six-lane major arterial highway that is identified as a gateway entrance to the City of Chula Vista from the I-5 freeway. The intent of the project is to maintain the current roadway configuration of six lanes as well as the on-street Class II bike lanes. The City also maintains the goal of establishing Palomar Street as a gateway with enhanced landscaping opportunities, with an open feel to the greatest extent possible by avoiding tall walls at the end of the travel way or sidewalk. Proposed Project geometric plans are included in **Appendix B**.

Horizontal Geometrics

The existing street section curb-to-curb width is 93-feet west of Industrial Boulevard and 90-feet east of the MTS rail corridor. The proposed section curb-to-curb width is 97-feet, comprised of 7-foot Class II buffered bike lanes, 11-foot No. 2 & 3 lanes, 12-foot No. 1 lanes, and a 15-foot median that provides an 11-foot left turn lane adjacent to a 4-foot raised island.

Numerous options were explored related to the horizontal alignment for Palomar Street with offsets to the north or south in an effort to minimize overall impacts. It was determined that southerly curb line would be held west of Industrial Boulevard, with a 4-foot widening occurring to the north. East of the MTS rail corridor, the widening is split with 2-feet on the south, and 5-feet to the north.

As Palomar Street goes under the two bridges, it is advantageous to narrow the raised median as this will reduce the overall bridge length and lead to cost savings. The median island width below

the bridges is 10-feet which will provide a minimum 2-feet clearance to the bridge columns. Roadway tapers are provided on the approach and exit to address the change in width and to provide a tangent under the bridges.

Parkways

With the City's desire to provide an open feel, coupled with the proposed street grades, the sidewalks located on each side of Palomar Street have been set back 4 feet to provide a twofold benefit. First is the ability to include low level landscaping at the street edge. Second is to improve the pedestrian experience through the corridor by providing a flatter grade, where feasible, with both a horizontal and vertical offset to the vehicles. The elevated sidewalk will be supported on a concrete retaining wall that will include architectural treatments. A handrailing will also be provided.

Behind the sidewalk is an 8-foot landscape buffer that will be sloped to the upper retaining walls. This landscape buffer will allow for the installation of shrubs and trees to screen the taller walls.

Overall, this tiered approach will provide a more open feel for the roadway users while providing the opportunity for landscaping in support of the goal to establish a gateway entrance along Palomar Street.

Oxford Connector

Currently there is a two-lane paved access road from the end of the cul-de-sac on Oxford Street that connects to Palomar Street in a right in/right out configuration. This access is located on an MTS owned parcel. The Project will acquire this MTS owned parcel and convert this access to a city street. Improvements include:

- The cul-de-sac on Oxford Street will be converted to a roundabout
- Diagonal parking will be provided to offset the loss of on-site parking on the commercial parcels and Trolley Station
- Pervious paving will be used for new parking to limit the impact to stormwater
- Two driveways will be provided to the commercial centers
- Sidewalks will be provided on both sides of the connector
- Access will be provided to the MTS corridor as well as the new storm drain pump station
- The geometrics at the connection to Palomar Street include small horizontal curves that may limit the ability for larger trucks to navigate. Restrictions on truck size may be required.

Industrial Boulevard

Early Project alternatives included a two-lane connector road between Palomar Street and Industrial Boulevard to replace the existing at-grade intersection. The connector road utilized the vacant parcel in the southwest quadrant of the intersection.

Once a development was brought forth for this vacant parcel, additional analyses evaluated numerous alternatives for connectivity between the two streets. Alternatives included lowering of Industrial Boulevard which was determined to be too impactful to the adjoining parcels.

As determined in the traffic analysis, included in **Appendix I**, the connection between the two streets could be eliminated. Minimal impact was identified, requiring minor widening along Industrial Boulevard and improvements at the I-5 northbound ramps north of Moss Street.

The improvements on Industrial Boulevard will include the continuation of the street section adjacent to the Trolley Station across the proposed Industrial Boulevard bridge with a section that includes one lane in each direction, Class II striped bike lanes and sidewalks. The section will transition to join the existing widened section north of Palomar Street.

Vertical Alignment

Alternatives for the roadway profile were evaluated in order to minimize the overall construction and right-of-way impacts. The depth of the Palomar Street profile is governed by maintaining 16-feet 6-inch clearance from the roadway to the MTS rail corridor and Industrial Boulevard bridges. The crest vertical curves are designed to meet Caltrans and AASHTO standards. The sag vertical curve is utilizing the AASHTO ‘well lit’ criteria that uses stopping sight distance, not headlight distance that is in the Caltrans standards.

With a posted speed of 35 mph, the design speed is established at 40 mph. Maximum desired grades for urban highways is 6%. Utilizing this criterion, the roadway profile was established. The resulting profile yielded unfavorable depths at Trenton Avenue, the Trolley Station driveway and the Palomar Trolley Center driveway. This would lead to additional private parcel impacts and additional challenges for construction staging of the intersection construction.

Various alternatives were evaluated and, to effectively join existing conditions at the Trenton Avenue and Palomar Trolley Center intersections, the design speed was reduced to 35 mph and the maximum grades increased to 7%.

Palomar Gateway Center Development

During the development of the Project Report, the Palomar Gateway Center development, located on the vacant 4.76 acre parcel at the southwest corner of Palomar Street and Industrial Boulevard, was brought forth, as shown in **Figure 6**. Extensive coordination with the developer was required to ensure that the projects were compatible, particularly that the grade separation was constructible with little to no impact to the proposed development.

Concurrence was reached with the developer on the configuration of the frontage along Palomar Street and Industrial Boulevard. The City of Chula Vista Planning Commission approved the Design Review Permit DR18-0001 on November 13, 2019 which included conditions related to offer of dedication for necessary permanent and temporary easements for street, sidewalk and sewer improvements required for the grade separation.

One remaining coordination item with the developer is the proposed stormwater treatment feature between Buildings 2 and 3 that remained in conflict with the proposed sidewalk and multi-use trail along the Palomar Street frontage. Through the plan check process, the City will ensure that the stormwater feature is located as such to eliminate any conflict with the grade separation.

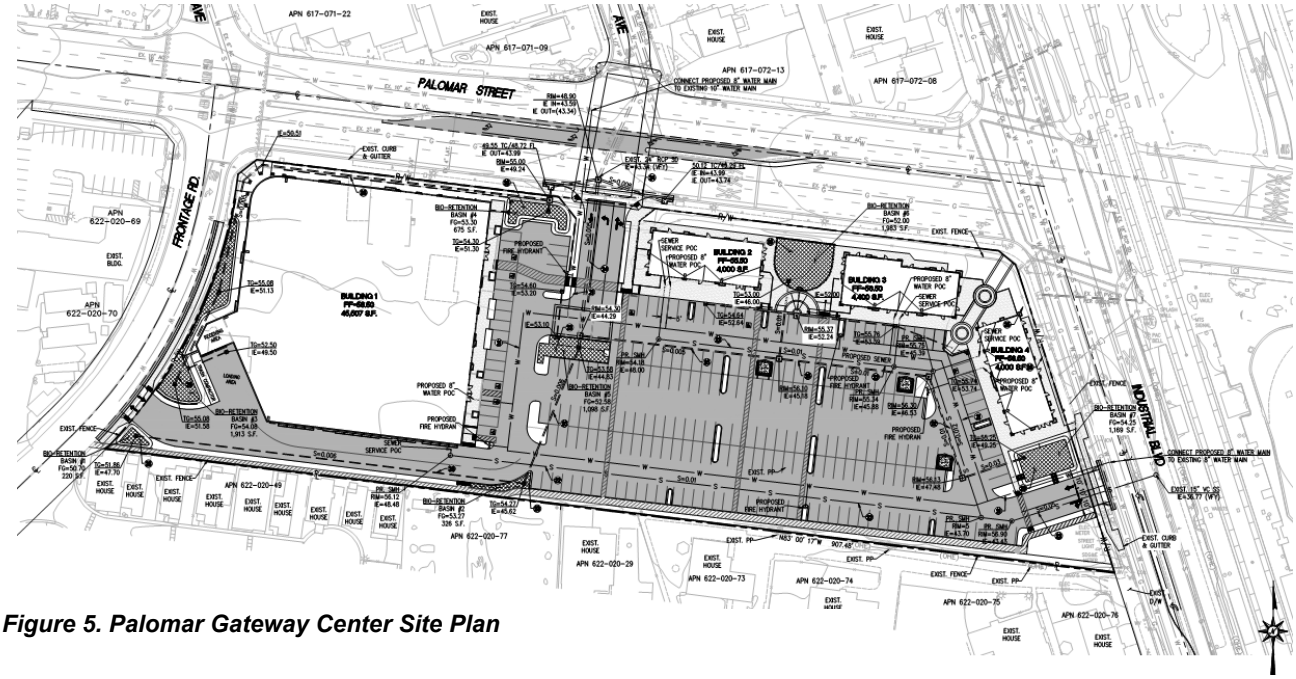

Figure 5. Palomar Gateway Center Site Plan

Commercial Parcel Impacts

The Project will have impacts to a varying degree on the adjacent commercial parcels, east of the MTS rail corridor, described as follows:

Palomar Trolley Center: The main entrance to this center is at a signalized intersection with

Palomar Street. The entrance to the center is City owned right-of-way. The intersection will require reconstruction with a minor grade differential of up to 1.5 feet, thus requiring a portion of the main entrance to be reconstructed to meet these new grades.

To facilitate pedestrian access to the station during construction, a sidewalk will be constructed along the west side of the main entrance, adjacent to Starbucks. This area is currently landscaped.

Starbucks has an entrance to their parking lot from the Trolley Station. Due to the grade change of the Trolley Station driveway, this entrance will be reconstructed further south and will align with the internal drive aisles. There is no loss of parking.

Right-of-way requirements are minimal on the parcel, limited to sliver acquisition for sidewalk, walls, and temporary construction easements.

Palomar Center & Sun/Moon Plaza: These two centers share reciprocal access through a driveway on Palomar Street. This driveway is right in/right out only. With the proposed Oxford Connector, the driveway will be relocated, and the parking lots reconfigured to minimize loss of parking. An additional driveway will be provided from the Oxford Connector.

There is a net loss of four parking stalls within these parcels. On-street parking will be provided on the Oxford Connector to offset the loss of on-site parking.

Storm drain construction is also required across these parcels. This work can be specified to be constructed outside of normal business hours to minimize impact on the shopping center. This construction involves trenching that can be plated at the end of the construction day and open for use for the shopping center.

Right-of-way requirements are required in fee or roadway easements for the Oxford Connector across these two parcels along with temporary construction easements for the reconfiguration of the on-site parking. The parking lot reconfiguration will be phased to minimize the amount of parking lost at any one time as well as avoiding on-site construction during the holiday season.

Hometown Square: Primary access to this center is a driveway at a signalized intersection, opposite of the Palomar Trolley Center. This intersection will be reconstructed as part of the Project and lowered up to 1.5 feet. This will require the reconstruction of the driveway to lower it to grade. Alternative access points exist for ingress/egress during this construction.

Storm drain construction is also required through this parcel. Similar to the Palomar Center and Sun/Moon Plaza, this work can be specified to be constructed outside of normal business hours to minimize impact on the shopping center and will be open for use for the shopping center during operating hours.

Right-of-way requirements are a sliver acquisition for sidewalk and driveway purposes, easement for the storm drain and temporary construction easement.

Design Exceptions

Through the development of the geometrics for the project, there are several design standards that were not met in an effort to reduce the overall project impacts. Requested exceptions to these standards are summarized in **Table 2** below.

Table 2. Design Exception Table

No.	Item	Standard	Proposed	Existing
1	**Design Speed**	40mph	35mph	40mph
	Discussion: Palomar Street is currently posted 35mph, the assumed 85th percentile speed. Common practice is to establish the design speed 5mph over posted speed, or 40mph. It was determined that a reduction in the design speed resulted in a smaller project footprint and significantly minimized the grade differential at the intersections at Trenton Avenue and Palomar Trolley Center. Upon project completion, a speed survey would be performed to determine the 85th percentile speed to establish the posted speed limit post-project.			
2	**Maximum Grade**	6%	7%	<1%
	Discussion: To minimize the project footprint, reduce project costs and improve the join conditions at intersections and driveways, the roadway profile was optimized through numerous iterations. It was determined that for Palomar Street, the optimal profile grade was 7%. The length of 7% tangent grade is 150 feet on the west and 220 feet on the east side. These grades are not considered a sustained grade and it is not anticipated to have an impact on the operations.			
3	**Lane Width**	12 feet	11 feet	11 feet
	Discussion: To minimize the project footprint and reduce right-of-way impacts, the eastbound and westbound No. 2 & 3 lanes are established at 11 feet in width. This matches existing condition. The No. 1 lane is proposed at 12 feet in width as it is adjacent to a raised curb for the median island. The No. 3 lane is adjacent to the 2-foot striped buffer for the Class II bike lane.			
4	**ADA Compliance – Longitudinal Grades**	5%	7%	N/A
	Discussion: The proposed roadway grade for Palomar Street is 7%. For considerable portions of the street, an elevated sidewalk is being provided that will maintain longitudinal grades on the sidewalk less than 5%. Due to the Oxford Connector and the driveway to the Trolley Station, sidewalk grades will have to follow the street grade between Stations 105+00 and 106+25 and will exceed 5% grades. Per Caltrans Design Information Bulletin 82-06 which provides guidance for “Pedestrian Accessibility Guidelines for Highway Projects”, that for pedestrian access routes that are contained within a street right-of-way, the route shall not exceed the general grade established for the adjacent street or highway. This section applies to this short segment of Palomar Street where the sidewalk is adjacent to the street.			

6.2. Rail

The MTS owned rail corridor includes two mainline tracks that cross Palomar Street. Immediately north of Palomar Street is a right-hand turnout to a siding track that extends to L Street. The Trolley Station is located south of Palomar Street.

To maintain a two-track rail operation during construction, temporary rail shoofly tracks would have to be constructed. With the proximity of the Trolley Station, this would require the construction of a temporary platforms as well as utilizing Industrial Boulevard for the shoofly tracks.

An alternative to the construction of shoofly tracks is to stage the bridge construction, reducing operations to a single-track during construction. This would be accomplished by building the rail bridge in quadrants.

In discussions with MTS, it is allowable to reduce the operation at the Trolley Station to a single-track during construction of the new rail bridge. However, the extent of a single-track operation has to be minimized to maintain the headways along the corridor. In order to do so, a new double crossover track is proposed to be installed north of Palomar Street. This will allow the single-track operation on either main line track during construction.

Signaling

The double crossover track would be integrated into the existing S48 Interlocking. At the S48 Interlocking, the signal work will consist of the removal of the S48RB cantilever signal, insulated joints and impedance bonds at STA 529+50, the installation of the double crossover with four M23A power switch machines and the installation of a new signal cantilever, insulated joints and impedance bonds for S48RA and S48RB signals at STA 525+76. Intermediate signal S984 at STA 539+60 and S916 at STA 504+12 will be removed from service. The new switches and signals will be controlled out of the existing S962RC and S984RC enclosures. Software modifications to the S7 and wiring changes may be required at approximately 8 rail cases.

Overhead Contact System (OCS)

There are several impacts to the existing OCS of poles, electrical supply and contact wires. These include:

- The installation of the double crossover track will require a modification to the system to provide OCS through the crossover. This will require additional poles and anchorage.
- OCS poles in direct conflict with the proposed project that will require relocation or reconfiguration.

- To facilitate staging and provide clearance for the contractor's equipment for bridge construction, conversion from center OCS poles feeding both tracks to outside OCS poles feeding each track separately will provide the necessary flexibility to address the staging needs.
- Potentially, additional sectionalization of the system may be required to facilitate the construction and staging. This would allow one system for one track to be shut down during construction activities when a track is out of service.

6.3. Trolley Station

The Trolley Station will remain open throughout the Project construction. Pedestrian access from Palomar Street and Industrial Street will be provided at all times. Temporary closures of the driveway are required, and vehicles will be detoured to use the signalized intersection at the Palomar Trolley Station entrance.

The Project will require the construction of retaining walls along the frontage of the Trolley Station as well as lowering of the driveway to meet the new Palomar Street grade. The lowering of the driveway will require a minor reconfiguration of the parking lot and a minimal loss of parking, as noted in the Parking Memorandum included in **Appendix J**. The bus aisle will be reconstructed to join the lowered driveway grade. There is no loss of utility for the bus aisle.

Walkways adjacent to the bus aisle and adjacent to the platform will be reconstructed as necessary to meet the Project grades as well as provide connection to the following new facilities:

- An 8-foot walkway will be provided on the new MTS rail bridge to provide direct connection to and from the north side of Palomar Street and the Oxford Connector. This alleviates pedestrians from having to cross Palomar Street at an at-grade signalized intersection.
- A stairwell will be provided that will connect the platform to the elevated sidewalk along Palomar Street. An ADA compliant path of travel is provided through the use of the sidewalk connection at the Trolley Station driveway.

6.4. Active Transportation

Currently, both Palomar Street and Industrial Boulevard have concrete sidewalks and striped on-street Class II bike lane facilities. The Project will incorporate these facilities. Additionally, the project will include the following features:

- As Palomar Street and Industrial Boulevard will be grade separated at the completion of the Project, an 8-foot multi-use trail will be provided between Trenton Avenue and Industrial Boulevard on the south side of Palomar Street. This will restore connectivity between Palomar Street and Industrial Boulevard for pedestrians and bicyclists. As this is a multi-use path, ADA compliance is provided with a maximum grade of 5%. Additionally, 2-foot clear zones are provided on either side for a total width of 12-feet.
- The Class II bike lanes on Palomar Street will be reconfigured with 5-foot bike lanes along with a 2-foot striped buffer to the vehicular lanes.
- A HAWK signal will be installed for pedestrians and bicyclists to cross Industrial Boulevard immediately south of the new bridge and will provide connections for the Class II bike lanes, the new multi-use path and the Trolley Station.
- Sidewalks along Palomar Street will be elevated that will provide both horizontal and vertical separation from the vehicular traffic as well as lowering the grades for pedestrians.
- An 8-foot walkway will be provided on the new MTS rail bridge to provide direct connection to and from the north side of Palomar Street and the Oxford Connector. This alleviates pedestrians from having to cross Palomar Street at an at-grade signalized intersection.
- Stairwells are provided on each side of Palomar Street, east of the MTS rail bridge, to provide connectivity between the elevated sidewalk and the walkway on the new MTS rail bridge.
- Sidewalks along the Oxford Connector to provide an improved path of travel between Palomar Street and Oxford Street.

6.5. Construction Staging

The construction of an underpass is a significant undertaking that can impact the local community and commuters. With over 45,000 daily vehicles on Palomar Street and over 200 daily trains, the potential for disruption must be minimized through the construction staging of the Project. Key factors in the development of the conceptual construction staging scenario include:

- Maintain a minimum of four lanes of traffic on Palomar Street without constructing a bypass road that would significantly impact right-of-way.
- Through meetings with MTS, the corridor may be reduced to a single track for limited windows of time to facilitate bridge construction without having to construct a rail shoofly that would require a temporary station.
- Select construction methods that accelerate construction while minimizing the right-of-way impacts such as top/down methodology.
- Maintain access to the greatest extent feasible to the adjoining parcels.
- Maintain access to the Trolley Station for pedestrians.

To specifically address the maintenance of vehicular and rail traffic, the basic premise of the staging is to build the MTS rail bridge in four quadrants, starting with the north half in Stage 1. Four lanes of vehicular traffic would be shifted to the south utilizing temporary pavement, TCEs, and temporary at-grade crossing modifications.

In Stage 2 vehicular traffic would be shifted onto the completed north half of Palomar Street, now grade separated from the MTS rail. As additional temporary pavement width is required to maintain four lanes of traffic, final curb and gutter, sidewalk, and lower retaining walls on the north half of Palomar Street would be completed in the final stage. Stage 2 would complete the south half the MTS rail bridge and lower the south side of Palomar Street to its final grade. Stage 3 would complete the Industrial Boulevard bridge as well as the remaining ancillary improvements.

Table 3 provides more details of the construction activities and rail and traffic configuration for each stage and is shown in **Appendix A**.

Table 3. Construction Staging Activities

Stage 1 (12 Months)	Stage 2 (12 months)	Stage 3 (6 months)
Construction Activities • Storm drain improvements • Storm drain pump station • Sewer lift station • NE & NW quadrants of MTS rail bridge • North abutment for Industrial Blvd bridge • North retaining walls • North half of Palomar Street • Oxford Connector • Trenton Avenue • Install rail crossover track and signal improvements	**Construction Activities** • Continue storm drain pump station • Continue sewer lift station • SW & SE quadrants of MTS rail bridge • South abutment for Industrial Blvd bridge • South retaining walls • South half of Palomar Street • Trolley Station Driveway • Palomar Gateway Center driveway • Traffic signal modification	**Construction Activities** • Lower retaining walls • Raised median island • Industrial Blvd superstructure • Industrial Blvd improvements • HAWK signal • Planting and irrigation • Final striping configuration upon completion
Rail • Single track operation on ML2 (Southbound) during NE quadrant bridge construction • Single track operation on ML1 (Northbound) during NW quadrant bridge construction	**Rail** • Single track operation on ML1 (Northbound) during SW quadrant bridge construction • Single track operation on ML2 (Southbound) during SE quadrant bridge construction	**Rail** • Two track operation
Traffic • Four lanes on Palomar Street shifted southerly, utilize TCE as necessary • Provide barrier separated 6-foot pedestrian walkway on south side, utilize TCE as necessary • Temporary at-grade crossing modifications • Access to/from Industrial Blvd to the south is open • Industrial Blvd to the north is closed • Trolley Station driveway is open	**Vehicular Traffic** • Four lanes on Palomar Street shifted northerly under completed north half of MTS rail bridge, utilize temporary paving as necessary • Provide barrier separated 6-foot pedestrian walkway on north side, utilize temporary paving as necessary • Access to/from Industrial Blvd is closed • Trolley Station driveway is closed	**Vehicular Traffic** • Four lanes on Palomar Street, two on each side of the lowered Palomar Street • Access to/from Industrial Blvd is closed • Trolley Station driveway is open

6.6. Drainage

Surface runoff within the project area is collected and conveyed in roadways and culverts westerly to the San Diego Bay. The area north of Palomar Street and Industrial Boulevard generally flows northerly toward Trenton Avenue and then westerly to the San Diego Bay. The remaining project area generally drains to the south. Runoff is collected in a series of culverts that cross the MTS right-of-way, then flows northerly connecting with flows from the northerly project area before discharging to the bay.

There are two existing storm drain systems that are within the project limits:

- System 1: 48-inch RCP that crosses Palomar Street at the driveway to the Trolley Station. This system flows southerly and discharges into the earthen channel between Ada Street and Dorothy Street.
- System 2: 24-inch RCP at the Palomar Street and Trenton Avenue intersection. This system flows to the north on Trenton Avenue and continues through the SDG&E parcel.

The grade separation project will lower Palomar Street and create a sump condition at the low point below Industrial Boulevard. The goal of the project will be to reduce the drainage area tributary to the sump condition in order to minimize the size the storm drain pump station that is required.

Based on the City of Chula Vista 2004 Drainage Master Drainage Plan, System 1 will need to be upgraded to adequately convey runoff. Existing storm drains at Trenton Avenue to the west and Oxford Street to the east will be reconfigured to maintain existing gravity flow and limit the flow area tributary to the sump in Palomar Street to a total of 3.3 acres.

The project will construct a storm drain pump station at the low point to collect and convey the peak 50-year storm event away from the low point to maintain a flood-free roadway. Roadway runoff will be pumped to an expanded detention basin between Industrial Boulevard and Oxford Street along the Oxford Connector. Flow rates will be controlled at the outlet of the detention basin to maintain peak flows less than or equal to the existing condition.

Approximately 0.3 acres of Palomar Street within the northerly sub-basin will be redirected to the southerly sub-basin. A new storm will be constructed westerly across the MTS right-of-way at the northerly extension of Oxford Street to collect and convey 0.3 acres of tributary flow area from the southerly basin to balance the total areas of both sub-basins.

A conceptual hydrology and hydraulics assessment was completed to identify drainage constraints and quantify improvements needed in support of the Project. Drainage flow patterns, outflows, capacities and deficiencies of the existing system were identified based on existing as-built

information, the City's drainage master plan, and/or record data from the City, County and Caltrans. Preliminary pump station sizing is provided, along with preliminary alignments and pipe sizes for new and realigned systems. Existing and Proposed Drainage Basin Maps are included to show limits of the project sub basins and existing and proposed drainage facilities are outlined on the Proposed Drainage Basin Map. Both existing and proposed conditions are shown on the Existing and Proposed Storm Drain exhibit that are included in **Appendix D**.

Methodology and Calculations

The City of Chula Vista 2004 Drainage Master Plan was completed in February of 2005 to assess capacities and deficiencies in the existing system and recommended improvements. Analysis of the drainage master plan was based on the rational method in accordance with the San Diego County Drainage Design Manual. The design storm is defined as the 50-year, 6-hour storm event. The results of the drainage master plan were used as the basis of this preliminary assessment. The existing condition peak flow rates for each of the sub-basins was estimated based on the peak flow rates defined for each of the overall basins.

The proposed project will add landscaping and bio-filtration resulting in a slightly lower coefficient of runoff compared to the existing condition. The proposed improvements will modify the sub-basin configuration; however, the time of concentration within the sub-basins will be similar to the existing condition. For purposes of assessing overall impacts resulting from the proposed project, the same methodology is used for proposed conditions peak flow rates.

Existing Conditions

The project site is located in the City of Chula Vista within the Southwest Basin 1, Preferred Alternative Hydrology, 50 Year event shown in the City of Chula Vista 2004 Drainage Master Plan. The project site contributes to four (4) sub-basins within Southwest Basin 1. The sub-basins are designated as Basins A, B, C and D as shown on the Existing Basin Map in **Appendix D** and described below.

Basin A: 72.4 acres generally flows northerly and westerly. Surface and gutter flows are collected in inlets at Palomar Street and Trenton Avenue. The existing storm drain flows northerly and outlets to an open channel, just east of Interstate 5 where it crosses under the freeway through a closed storm drain and discharges to another open channel, which eventually drains to the San Diego Bay.

Basin B: 35.5 acres of fully developed commercial/industrial land generally flow southerly. Surface flows are collected in a series of inlets and small storm drains. The existing smaller underground storm drain systems drain to a 48-inch RCP system that crosses under Palomar Street and outlets

to a 60-inch CMP culvert (see node 10150 on the Existing Basin Map). Portions of the 48-inch storm drain are undersized.

Basin C: 8.0 acres of commercial development and public streets flow westerly and northerly. The surface and gutter flow along Oxford Street drains to an inlet at the west end of the cul-de-sac which then drains into a detention basin (see node 70010 on the Existing Basin Map).

Basin D: 4.7 acres of commercial and rail development flow southerly. This area includes portions of Palomar Street and the MTS parking lot. Surface and gutter flows are collected in a storm drain inlet. Drainage and stormwater management improvements were completed as part of the Blue Line Trolley project in 2017 and are considered adequate for treating and conveying runoff. The existing 48-inch north-south drainage system east of the trolley parking lot is undersized for the existing flows. The existing storm drain system south of the project site is not defined and will need further analysis.

Overall, the project area drains to the San Diego Bay. The point of confluence of the project area sub-basins is an open channel west of Interstate 5, designated as node 10390 on the Existing Basin Map. The peak 50-year flow rate at the confluence is 629 CFS.

Proposed Conditions

The project will lower Palomar Street below Industrial Boulevard, creating a sump condition at the low point in Palomar Street. Approximately 0.3 acres of existing Basin A will be redirected to the low point in Palomar Street. In order to maintain the overall sub-basin areas, Basins A and C will be reconfigured to redirect 0.3 acres of Oxford Street to the west. Basin E has been added to define the area tributary to the low point of Palomar Street. The proposed drainage basins are described below:

Basin A: Approximately 0.3 acres of existing Basin A will be redirected to the low point in Palomar Street. The proposed Basin A will be reconfigured to include the north half of Oxford Street in order to maintain the overall basin area of 72.7 acres. A new 18-inch storm drain system will be constructed from the westerly end of the Oxford Street cul-de-sac to the existing storm drain system at the northerly end of Trenton Avenue. The peak flow tributary to the existing storm drain will remain the same. Based on the City of Chula Vista 2004 Drainage Master Plan and record plans, the existing storm is adequate for the existing and proposed flows.

Basin B: A total of 34.9 acres will remain as gravity flow to the south. The majority of the drainage basin will remain in its existing developed condition. Parking lots and access roads within the westerly portion of the basin will be reconfigured as shown on the project site plan with added

landscaped areas. The overall runoff coefficient will remain the same or slightly lower than existing. A new 60-inch diameter storm drain will be constructed to the east to replace the existing storm drain that is impacted by the lowered Palomar Street profile. The new storm drain is sized in accordance with the drainage master plan and will connect to the existing 60-inch CMP storm drain at the south end of the MTS parking lot.

Basin C: A total of 6.0 acres will remain as gravity flow to the west. The existing commercial development and Oxford Street to the east will remain the same as existing. New parking areas will be paved using pervious pavement. The overall runoff coefficient will remain the same as existing.

Basin D: A total of 4.0 acres will remain as gravity flow to the south. A portion of the MTS parking lot and Starbucks parking lot will be reconstructed. The overall impervious surfaces will decrease slightly compared to the existing condition. The overall drainage patterns and time of concentration within the basin will be similar to the existing condition. The recently constructed storm water treatment and drainage improvements in the MTS parking lot are adequate to serve the minor reconfigurations. The existing 48-inch storm drain east of the MTS parking lot will be upsized to a 60-inch system to convey runoff from Basins B and C to the north, as well as runoff from the easterly portion of Basin D.

Basin E: A total area of 3.3 acres will be redirected to the sump in Palomar Street created by the lowered roadway profile. All the flow in Basin E will be pumped out of the “Low Point” to an expanded detention basin as shown on the Proposed Basin Map. The pump station will be designed to convey the peak 50-year flow from Basin E. Flows from the detention basin will be discharged to the gravity storm drain. The outlet structure from the detention basin will be designed to limit flows to less than or equal to the existing flows.

The overall tributary area from the Southwest Basin 1 at the outlet to the open channel Node 10390 as shown on the Proposed Basin Map will remain the same as the existing conditions.

Calculations

Table 4 below summarizes the existing and proposed drainage conditions.

Table 4. Existing and Proposed Drainage Basins

Basin	Existing Area (ac)	Q-50 (cfs)	Proposed Area (ac)	Q-50 (cfs)
A	72.4	433.0	72.4	433.0
B	35.5	212.0	34.9	209.0

C	8.0	47.9	6.0	35.6
D	4.7	28.1	4.0	23.7
E	-	-	3.3	19.7
Total	120.6	721.0	120.6	721.0

The storm drain pump station will be designed to accommodate the peak 50-year flow at the low point in Palomar Street. The peak flow at the low point of the roadway will occur ahead of the peak flow within the overall basin. The peak flow is estimated to occur at a Time of Concentration of approximately 5 minutes equivalent to a 50-year intensity of 6.3 inches per hour. **Table 5** provides the peak design flow for the pump station.

Table 5. Pump Station Design Flow

Basin	Area (ac)	C	I (in/hr)	Q 50 (cfs)	Q 50 (gpm)
E	3.3	0.95	6.3	19.75	8,865

Based on preliminary assessments, the overall tributary area from the proposed conditions will remain the same as the existing conditions. Storm drain improvements will be added to allow for the reconfiguration of Basin A to maintain the same tributary area for the existing and proposed conditions. The development type will remain the same.

Landscaping and bio-filtration systems will be added, which will slightly decrease the overall impervious areas in the developed condition; therefore, no increase in the total volume of runoff is anticipated as a result of development. The flow types and flow patterns within Basins A, B, C and D will remain similar to existing conditions. No localized changes in the peak rates of runoff or contribution to the overall basin peak rates of runoff are anticipated.

Flow to the low point in Basin E will be pumped to an expanded detention basin north of Palomar Street. The pump station will be designed to convey the higher short-term peak rate of runoff that would occur at the low point to maintain a flood-free roadway condition. The volume of the expanded detention basin and the outlet structure will be designed to maintain a similar contributary flow to the overall Southwest Basin 1.

The final design phase of the project will include a detailed hydrology and hydraulic analysis to confirm the results of the City of Chula Vista 2004 Drainage Master Plan and further define the drainage design details of the project consistent with the conclusions for this preliminary assessment.

6.7. Utilities

A composite existing utility plan was developed to show underground and overhead facilities based on information received from the City and parent utility companies. The composite existing utility plan and proposed relocation plans are included in **Appendix E.** Impacts to these utilities are identified below, and a conceptual relocation plan is discussed.

Gas

There is an existing 2-inch gas main that runs east and west on the south side of Palomar Street, between Walnut Avenue and Industrial Boulevard. This gas main will be relocated to the north side of Palomar Street with connections to Walnut Avenue and Trenton Avenue as a result of the grade separation. The connection to Industrial Boulevard will be completed through the alley between Palomar Street and Industrial Boulevard. Local gas service lines will be placed on the south side of Palomar Street as needed, to serve properties fronting Palomar Street.

There is an existing 2-inch gas line that runs north and south on Industrial Boulevard. This gas line will be reconstructed across Palomar Street within the Industrial Boulevard bridge.

Electric and Communication

Existing overhead electric transmission mains cross Industrial Boulevard and Palomar Street from northwest to southeast. There are three separate electric transmission lines crossing Palomar Street, with multiple conductors on each. The southern transmission line is 69 kV on wooden pylons. The middle transmission line is 130 kV on tubular steel poles. The northern transmission line is 230 kV on lattice towers. The existing transmission lines will be protected in place.

Existing underground electric and communication lines run east and west on Palomar Street and are located on the south side of the street. Underground service connections to adjacent streets including Walnut Avenue, Trenton Avenue and Industrial Boulevard extend beyond the limits of the intersections and connect to existing overhead systems. Electric and communication systems on Palomar Street will be reconstructed on the north side of Palomar Street as part of the first phase of construction. Underground service will be extended to the end of the new surface improvements on Walnut Avenue and Trenton Avenue with connections to nearest pole beyond the new improvements.

Underground electric and communication connections between Palomar Street and Industrial Boulevard will be constructed in the alley with connections to Industrial Boulevard completed north of Palomar Street, as shown the on the proposed utilities exhibit. Electric and communication lines across Palomar Street will be placed within the Industrial Boulevard bridge.

A second corridor for dry utilities will be maintained for future service connections on the south side of Palomar Street in the second phase of construction.

During construction, temporary gas, electric and communication service will be provided as required for continuous service.

Water

Water services are provided by the Sweetwater Authority. Water mains serving the area include the following:

- 10-inch AC on the north side of Palomar Street
- 16-inch PVC near the center median of Industrial Boulevard
- 8-inch AC on the east side of Industrial Boulevard between Palomar Street and Oxford Street
- 8-inch AC on Trenton Avenue north of Palomar Street

The 10-inch main on Palomar Street is cross connected with the 16-inch and 8-inch mains on Industrial Boulevard. The main provides service connections for the residential and commercial properties fronting on Palomar Street, including a 10-inch private fire service and four public mains serving the adjacent commercial properties between Palomar Street and Broadway.

The 8-inch main on Industrial Boulevard provides private service and fire connections north of Palomar Street.

The lowering of Palomar Street along with the construction of the new roadway and railway bridge will impact the existing water mains. Temporary connections and highlining may be required to maintain service during construction. Temporary shut downs will be subject to review and approval by the Sweetwater Authority. All new main construction will be PVC. The preliminary relocation plan is shown on the proposed conditions exhibit and described below.

- The existing 10-inch main on Palomar Street will be lowered to match the new grade and may be shifted approximately 10 feet to the north.
- A new main will be constructed in the alley between Trenton Avenue and Industrial Boulevard to complete cross connections with the existing 16-inch and 8-inch mains on Industrial Boulevard.
- Abandon a portion of the existing 8-inch main south of the last private service lateral.
- The 16-inch main within the work on Industrial Boulevard will be reconstructed.

- The portion of the main over Palomar Street will be constructed in the Industrial Boulevard bridge.
- A new main will be constructed in the development site south of Palomar Street and connect to the existing 16-inch main on Industrial Boulevard.

Modeling of the water system will be completed in the final design phase to confirm that replacing existing mains in kind is adequate. An increase in pipe size for the Palomar Street segment or increasing the pipes size for the 8-inch connection on Oxford Street may be considered.

Sewer

The City owns and maintains the sewer mains serving the area, include the following:

- 8-inch VCP along the median of Palomar Street
- 15-inch PVC near center median of Industrial Boulevard along the project limits
- 15-inch VCP on the east side of Industrial Boulevard
- 8-inch VCP on Trenton Avenue north of Palomar Street

The 8-inch main on Palomar Street is connected with the 15-inch PVC and 15-inch VCP mains on Industrial Boulevard. The main provides service connections for the residential and commercial properties fronting on Palomar Street.

The lowering of Palomar Street along with the construction of the new roadway and railway bridge will impact the existing sewer mains during construction. The two 15-inch mains in Industrial Boulevard flow from north to south and will be severed due to the lowering of Palomar Street.

The preliminary relocation plan is shown on the proposed conditions exhibit and described below.

- A 10-inch main will be constructed in the development site south of Palomar Street and connect to the existing 15-inch main on Industrial Boulevard.
- A portion of the existing 8-inch main along the median of Palomar Street will be removed or abandoned.
- A proposed 15-foot sewer easement is to be granted by the developer to the City of Chula Vista.
- Based on discussions with the City, sewer siphons are not allowed, therefore the two 15-inch mains in Industrial Boulevard will require the construction of a lift station to collect the flow and discharge via a force main across the Industrial Boulevard bridge.

The proposed sewer lift station is to be located on northwest corner of Palomar Street and Industrial Boulevard on a parcel that would be acquired for the project. The preliminary lift station layout is shown on the proposed conditions exhibit and described below.

- 10-foot by 10-foot sump at the pump station with 4 x 45 HP Pumps. Two pumps will handle max flow and the other two pumps are for redundancy.
- Depth of pump station will be approximately 27 feet (top elevation 52 feet, bottom of elevation 25 feet).
- A 21-inch main will be constructed on the north side of the proposed pump station to collect the flows from the existing 15-inch mains on Industrial Boulevard north of Palomar Street.
- An 8-inch force main will be constructed on the south of the proposed pump station and transition into gravity flow 21-inch main and connect to the exist 15-inch main on Industrial Boulevard south of Palomar Street.
- A portion of the existing 15-inch main on the east side of Industrial Boulevard will be abandoned.

6.8. Structures

The Project will require the construction of two bridges and retaining walls to address the change in grade when Palomar Street is lowered. An Advanced Planning Study (APS) has been developed for the two bridges, one for the two LRT tracks and one for vehicular traffic on Industrial Boulevard, and is included in **Appendix F**. This section provides a summary of the structures.

With the physical constraints along the Palomar Street corridor and the need to maintain two lanes in each direction open due to the traffic volumes, all structures are utilizing a top-down construction methodology. This facilitates construction within tight confines, eliminating the need for deep excavations that require temporary shoring, that expands the project footprint.

Palomar Street Underpass (MTS Rail Bridge)

A two-span structure will be constructed to carry the two mainline rail tracks over Palomar Street. The bridge will be a steel deck plate with steel W40 girders. This is a common rail structure that affords a reduced structure depth from top of rail to the soffit of the bridge, yielding benefits for the vertical clearance and Palomar Street roadway profile.

The bridge will be built in quadrants, starting with the northeast, northwest, southwest and finishing with the southeast. One rail track will always be in operation. 5-foot diameter cast-in-drilled-hole (CIDH) piling will be utilized for the center bent. The abutments will include 36-inch secant pile

foundation. All piling will be constructed adjacent to live rail traffic.

An 8-foot wide pedestrian pathway is included on the east side of the bridge. This will allow pedestrians to cross over Palomar Street connecting to and from the Trolley Station.

Concrete fascia panels will be utilized to allow for aesthetic treatment along the face of the bridge.

Industrial Boulevard Overcrossing

The bridge types being considered for the Industrial Boulevard vehicular bridge is a single-span structure that uses precast CA wide flange girders with a 5-foot 10-inch structure depth. The foundations are similar to the rail bridge, with 36-inch secant piling abutments to facilitate top-down construction. Being a single span, a center bent is not required.

Two other bridge types were considered:

- A two-span structure using a precast concrete I-girders with a structure depth of 4-foot 3-inch. This structure would have a center bent using 4-foot diameter columns. While providing a smaller structure depth, this has no bearing on the clearances below the bridge as the MTS rail bridge is the contributing factor on the Palomar Street roadway profile. To maintain a positive profile grade on Industrial Boulevard and eliminate a low point occurring on the bridge, this bridge would be built higher than necessary yielding excess vertical clearance to Palomar Street.
- A single-span cast-in-place concrete structure with a depth of 5-feet 10-inches. This structure type is typically the most cost effective. However, due to the construction staging sequencing, vehicular traffic will be operating on the lowered Palomar Street. Two options are available to address this. First is the use of falsework for the construction of the superstructure. Factoring in depth of the falsework and temporary clearances to the roadway, this would affect the finish grade of Industrial Boulevard. The second option would be to cast the superstructure high, then lower upon completion to its final location. Both options carry construction cost implications that offset the initial cost benefit.

The single-span precast concrete structure provides the optimum solution for Industrial Boulevard.

Retaining Walls

To minimize right-of-way impacts, the outer retaining wall will be a secant pile wall, installed for top-down construction. This wall will have heights up to 16-feet and it is expected to have 48-inch diameter piling at the taller heights or where rail loading is encountered. The secant pile wall will have a concrete fascia constructed that will allow for aesthetic treatments. **Figure 6** shows an

example secant pile wall during and after construction.

The elevated sidewalk along Palomar Street will be a standard Caltrans Type I cantilever retaining wall, with heights up to 8-feet. This is a common, cost efficient wall type for this purpose.

Figure 6. Secant Pile Wall Construction In-Progress and Completed

6.9. Project Landscape & Aesthetics

Conceptual plant palette image boards for the underpass alternative have been developed and are included in **Appendix G**. The landscape concept is based upon the City of Chula Vista landscape and water usage guidelines for developments. The proposed palette will incorporate trees, shrubs, groundcover and vines to provide unity and consistency through the Project corridor and acknowledge that Palomar Street is a gateway entrance to the City from the I-5 freeway.

The Project will have significant vertical elements as it relates to the bridges and retaining walls along Palomar Street. The two bridges will include concrete fascia panels that provide an opportunity for aesthetic enhancements through the use of patterns and formliner treatments.

The concrete retaining walls, with heights up to 16 feet, will also include patterns and formliner treatments. Vines will also be located adjacent to the retaining walls to help deter graffiti.

Railings or fencing along the bridges and retaining walls may also include decorative patterning depending on the final selection of materials.

Figures 7 and 8 depict the existing condition and after Project rendering for both Palomar Street and Industrial Boulevard. The final aesthetic plan will be developed during the final design phase of the project.

Figure 7. Palomar Street Before & After

Figure 8. Industrial Boulevard Before & After

6.10. Right-of-Way

A preliminary Right-of-Way Impact Map was prepared that depicts fee acquisition, easements, and temporary construction easements. See **Appendix H** for the Parcel Impacts Exhibit. Each parcel was identified utilizing Assessor Parcel Numbers (APN) and quantified noting square footage of acquisition, business or residential impact, and any specific impact such as loss of parking or access. Full takes were acquired for permanent use of facilities, such as the sewer pump station which will be located northwest of Industrial Boulevard and Palomar Street. Partial takes were acquired for additional grading and access of utilities, along with the reconfiguration of the roadway. Temporary Construction Easements (TCE) were acquired to accommodate construction of the double track and reconstruction of facilities, as well as utility easements. An additional 5-foot TCE was acquired in some areas for the reconstruction of frontage improvements. **Table 6** below summarizes the parcel impacts.

Table 6. Right-of-way Parcel Impacts

Parcel No.	APN	Land Use	Type of Impact	Need/Comments
1	617-071-10	Residential	TCE	Driveway reconstruction
2	617-071-09	Residential	TCE Roadway Easement	Partially constructed residence
3	617-072-05	Residential	TCE	Frontage improvements
4	617-072-13	Residential	TCE Roadway Easement	Street improvements and grading activities
5	617-072-12	SDG&E	TCE Roadway Easement	Provide new alley access from Industrial Blvd
6	617-072-08	Residential	Full Acquisition	Widening impacts, location of sewer lift station
7	618-200-27	SDG&E	TCE Drainage Easement	Relocation of storm drain systems
8	618-200-42	MTS	TCE Drainage Easement	Relocation of storm drain systems
9	618-280-31	MTS	Full Acquisition	Acquisition for City right-of-way for the Oxford Connector, pump station, and retention basin
10	618-280-35	Commercial	TCE Roadway Easement Utility Easement	Reconfiguration of parking lot for Oxford Connector
11	618-280-36	Commercial	TCE Roadway Easement Utility Easement	Reconfiguration of parking lot for Oxford Connector and frontage improvements along Palomar Street
12	618-280-33	Commercial	TCE Roadway Easement Utility Easement	Driveway and frontage improvements along Palomar Street

13	622-020-68	Commercial	TCE Roadway Easement Utility Easement	Excluded as Project needs will be addressed in the development agreement
14	622-081-29	MTS	TCE Roadway Easement	Frontage improvements along Palomar Street, construction of rail track, signaling and OCS systems.
15	622-081-28	MTS	TCE Roadway Easement	Frontage Improvements along Palomar Street, grading and reconstruction of Trolley Station improvements and parking lot
16	622-081-27	MTS	TCE Roadway Easement	Frontage Improvements along Palomar Street, grading and reconstruction of Trolley Station improvements and parking lot
17	622-031-05	Commercial	TCE Roadway Easement	Frontage Improvements along Palomar Street, relocation of driveway access to Starbucks, construction of sidewalk
18	618-280-30	MTS	TCE Roadway Easement	Frontage improvements along Palomar Street, construction of rail track, signaling and OCS systems.
19	618-280-34	Commercial	Drainage Easement	Relocation of storm drain systems

7. ENVIRONMENTAL

The Project will conform with the following State and Federal environmental requirements:

California Environmental Quality Act

Pursuant to section 21080.13 of the California Environmental Quality Act (CEQA), the state legislature has determined that railroad grade separations shall be statutorily exempt from CEQA documentation and public disclosure requirements. Accordingly, a more formal CEQA environmental document is not required for this project. The City of Chula Vista is the lead agency for CEQA and will file a Notice of Exemption.

National Environmental Policy Act

Due to the use of Federal SAFETEA-LU funding for the current phase of the Project, the Project must conform to the National Environmental Policy Act (NEPA) requirements. Caltrans, as assigned by FHWA, is the Lead Agency under NEPA for this project. As the Project has a single build alternative and determined to pose no significant impacts on the environment, the Project qualified as a Categorical Exclusion under 23 CFR 771.117(c); activity (c)(1).

The following technical studies have been prepared in support of the Categorical Exclusion and have been provided under separate cover.

- Natural Environment/Minimal Impact
- Noise Study Memorandum
- Cultural Resources Study/Section 106 Consultation
- Community Impact Assessment
- Storm Water Data Memorandum
- Initial Site Assessment /Preliminary Site Investigations
- Visual Impact Assessment
- Relocation Impact Memorandum

8. PERMITTING & AGREEMENTS

It is anticipated that the following permits and agreements will be required as shown in **Table 7** below.

Table 7. List of Permits & Agreements

Agency	Item	Status/Timing
California Public Utilities Commission (CPUC)	General Order 88-B Grade Crossing Modification (GO88-B)	A GO88-B will be required for both the temporary modifications to the at-grade crossing during construction and for the elimination of the at-grade crossing upon completion of the Project. Application will be submitted during the final design phase.
San Diego Regional Water Quality Control Board	General Order No R9-2013-001 and amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit)	Preparation of a Stormwater Quality Management Plan will be prepared during the final design phase to address MS4 Permit requirements for treatment of runoff. Contractor will prepare a Stormwater Pollution Prevention Plan (SWPPP) prior to commencement of construction.
Metropolitan Transit System (MTS)	Construction and Maintenance of Way Agreement (C&M)	A three-way C&M agreement will be prepared with MTS, SANDAG and the City for the construction, ownership and maintenance of the proposed grade separation facilities within the MTS right-of-way. C&M must be completed prior to the approval of the CPUC GO88-B.
SANDAG and City of Chula Vista	Memorandum of Understanding (MOU)	An MOU, or amendment to an existing MOU, will be required between SANDAG (as the Lead Agency) and the City for each phase of the project.
City of Chula Vista	Encroachment Permit	The Contractor will be required to apply for a construction encroachment permit for temporary access onto public rights-of-way prior to the start of construction.

9. FUNDING, PROGRAMMING AND ESTIMATE

The SANDAG 2050 RTP allocated funding for Blue Line rail grade separation projects. A rough order of magnitude project cost estimate has been prepared, included in **Appendix K**. The estimate is inclusive of construction and right-of-way costs with contingency, in 2020 dollars with no escalation. Programming is shown in **Table 8** below, contingent upon the funding availability.

Table 8. Project Programming

Component	Current Estimate	Fiscal Year Estimate ($1,000,000)								
		Prior 18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	Total
PA/ED	$0.7	$1.2								$1.2
PS&E	$5.0		$0.7	$2.15	$2.15					$5.0
ROW	$22.0				$11.0	$11.0				$22.0
Const Mgmt	$5.0						$7.0	$7.0	$1.0	$15.0
Const	$45.0						$23.0	$23.0	$9.0	$55.0
Total	**$78.2**	**$1.2**	**$0.7**	**$2.15**	**$13.15**	**$11.0**	**$30.0**	**$30.0**	**$10.0**	**$98.2**

10. DELIVERY SCHEDULE

Table 9 lists the projected milestones for the proposed Project and assumes the availability of funding for each activity.

Table 9. Project Milestone Schedule

Project Milestone	Tentative Milestone Date
Project Report/Environmental Clearance	January 2020
Begin PS&E	July 2020
Begin Right-of-Way Acquisition	July 2021
PS&E Completion	June 2022
Right-of-Way Certification	December 2022
Advertise for Construction	January 2023
Award Construction Contract	June 2023
Begin Construction	July 2023
End Construction	December 2025
Open to the Public	FY 25/26
Project Closeout	June 2026

11. PROJECT PERSONNEL

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