RIVERSIDE COUNTY TRANSPORTATION COMMISSION

Riverside-Downtown
STATION IMPROVEMENTS

Appendix K. Energy Analysis Technical Memo

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Energy Analysis Technical Memo

March 2021

1.0 Introduction

This report presents potential energy impacts during construction and operation of the proposed Riverside-Downtown Station (RDS) Improvements Project.

The Riverside County Transportation Commission (RCTC) and Metrolink propose to improve the Riverside-Downtown Station located at Milepost 9.9 to Milepost 10.2 on the Burlington Northern Santa Fe (BNSF) San Bernardino Subdivision. Proposed improvements include additional passenger loading, enhanced pedestrian and vehicular access, and additional parking. The purpose of the project is to improve capacity, efficiency, and connectivity near the RDS.

The proposed Riverside-Downtown Station Improvements Project (Project) includes construction of an additional passenger loading platform, the extension of the existing pedestrian overcrossing and additional elevator and associated tracks, which would allow two trains to service the station off the BNSF mainline. The proposed track would be required to connect and integrate into the existing station layover tracks on the east side to improve train meet times without impacting BNSF operations. The Project would also provide additional parking and improved vehicular traffic circulation on the east side of the station (see Figure 1-1, Regional and Project Location Map).

1.1 Project Objectives

The purpose of the proposed project is to expand capacity and improve operations, efficiency, connectivity, and the passenger experience at the Riverside-Downtown Station. The following objectives support the purpose of the Project:

- Expand platform capacity to meet passenger train storage needs.
- Allow for train meets off the BNSF mainline and minimize impacts to BNSF operations.
- Improve train connectivity and passenger accessibility while minimizing impacts on improvement projects near the station that are already designed or in construction.
- Facilitate more efficient passenger flow and reduce dwell times.
- Enhance safety and access for station users.
- Accommodate projected future demand.

Figure 1-1. Regional and Project Location Map

Source: HNTB 2020

1.2 Regulatory Setting

1.2.1 Federal Regulations

The Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1502.16(e)) forms the scientific and analytic basis for considering alternatives for NEPA analysis, and it mentions that energy requirements and conservation potential of various alternatives of a proposed project as well as mitigation measures should be included. Some of the federal laws related to energy use include:

- The Energy Policy and Conservation Act of 1975 (EPCA) was enacted to increase energy production and supply, reduce energy demand, and provide energy efficiency. EPCA also assigned the executive branch additional powers to respond to disruptions in energy supply and established the Strategic Petroleum Reserve, the Energy Conservation Program for Consumer Products, and Corporate Average Fuel Economy regulations.
- Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed in 2012 and is a milestone for the U.S. economy and the Nation's surface transportation program which funds surface transportation programs at over $105 billion for fiscal years (FY) 2013 and 2014. MAP-21 creates a streamlined and performance-based surface transportation program and builds on many of the highway, transit, bike, and pedestrian programs and policies established in 1991 by transforming the policy and programmatic framework for investments to guide the system's growth and development. Fixing America's Surface Transportation (FAST) Act was signed on December 04, 2015, and authorized $305 billion over fiscal years 2016 through 2020 to provide long term funding certainty for surface transportation projects including highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs.
- The Energy Independence and Security Act of 2007 was signed in 2007 which aims to move the United States toward greater energy independence and security, increase the production of clean renewable fuels, protect consumers, increase the efficiency of products, buildings and vehicles, promote greenhouse gas research, improve the energy efficiency of the federal government, and improve vehicle fuel economy.

1.2.2 State Regulations

California Energy Commission

The California Energy Commission (CEC) is the state's primary energy policy and planning agency and it is playing a critical role to create a clean and modern energy system. Senate Bill 1389 (Chapter 568, Statutes of 2002) requires the CEC to prepare an Integrated Energy Policy Report no less frequently than biennial. The report should include a description of the international energy market prospects and an evaluation of its export promotion activities.

Executive Order S-3-05

Executive Order (EO) S-3-05, enacted in June 2005, sets target to reduce 2050 greenhouse gas emissions to 80% below 1990 levels.

AB 32: Global Warming Solutions Act

Assembly Bill (AB) 32 (California Global Warming Solutions Act of 2006) requires the state board, California Air Resources Board (CARB), to adopt limits for the statewide greenhouse gas emissions to be equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020. The Scoping Plan was first approved by the Board in 2008 and it should be updated at least every five years. The 2017 Scoping Plan identified how the State can reach the 2030 climate target to

reduce GHG emissions by 40 percent from 1990 levels, and also plans to advance toward the 2050 climate goal to reduce GHG emissions by 80 percent below 1990 levels.

AB 2076, Reducing Dependence on Petroleum

AB 2076 (passed in 2000, Shelley, Chapter 936, Statutes of 2000) directs the ARB and the California Energy Commission (CEC) to develop and adopt recommendations for the Governor and the Legislature on a strategy to reduce California's dependence on petroleum.

1.2.3 Local Regulations

Southern California Association of Governments

SCAG is the metropolitan planning organization with six counties in California including Riverside County. SCAG's regional council adopted the 2016-2040 Regional Transportation Plan/ Sustainable Communities Strategy (2016 RTP/SCS or Plan) on April 7, 2016. The 2016 RTP/SCS includes Transportation Demand Management (TDM) strategies throughout the region to reduce the number of drive-alone trips and overall vehicle miles traveled (VMT).

Riverside County Transportation Commission

Resolution No. 21-003, policy for implementation of solar power systems at Commission-owned properties.

2.0 Alternatives Considered

2.1 Proposed Project

The RCTC and Metrolink propose to improve the RDS located at MP 9.9 to MP 10.2 on the BNSF San Bernardino Subdivision located just east of SR 91 and a short distance from the SR 60 in the City and County of Riverside, California.

Proposed improvements include construction of an additional passenger loading platform, the extension of the existing pedestrian overcrossing and additional elevator and associated tracks which would allow for two trains to service the station off the BNSF mainline. The proposed track would be required to connect and integrate into the existing station layover tracks on the east side to improve train meet times without impacting BNSF operations. The project would also provide additional parking and improved vehicular traffic circulation on the east side of the station.

2.2 No Project Alternative

2.2.1 No Project Alternative

Under the No Project Alternative, implementation of improvements at the Riverside-Downtown Station would not be constructed and the current configuration of the Riverside-Downtown Station would remain the same. Although there would be no project-related impacts to environmental resources, the No Project Alternative would not meet the Project objectives or improve operations to accommodate the 91/Perris Valley Line and the Inland Empire Orange County Lines. Train capacity and storage would be limited to the existing platforms. The No Project Alternative does provide insight on future conditions with no improvements and serves as a baseline for comparison with the Build Alternative.

2.2.2 Build Alternative

RCTC and Metrolink propose improvements to the following elements of the station: 1) Platform and Tracks; 2) Pedestrian Access; and 3) Parking, Circulation, and Streetscape. The proposed improvements include building an additional passenger loading platform and tracks on the east side of the existing station to improve Metrolink service and extending the existing pedestrian overpass to access the new proposed platform (see Figure 2-1, Build Alternative).

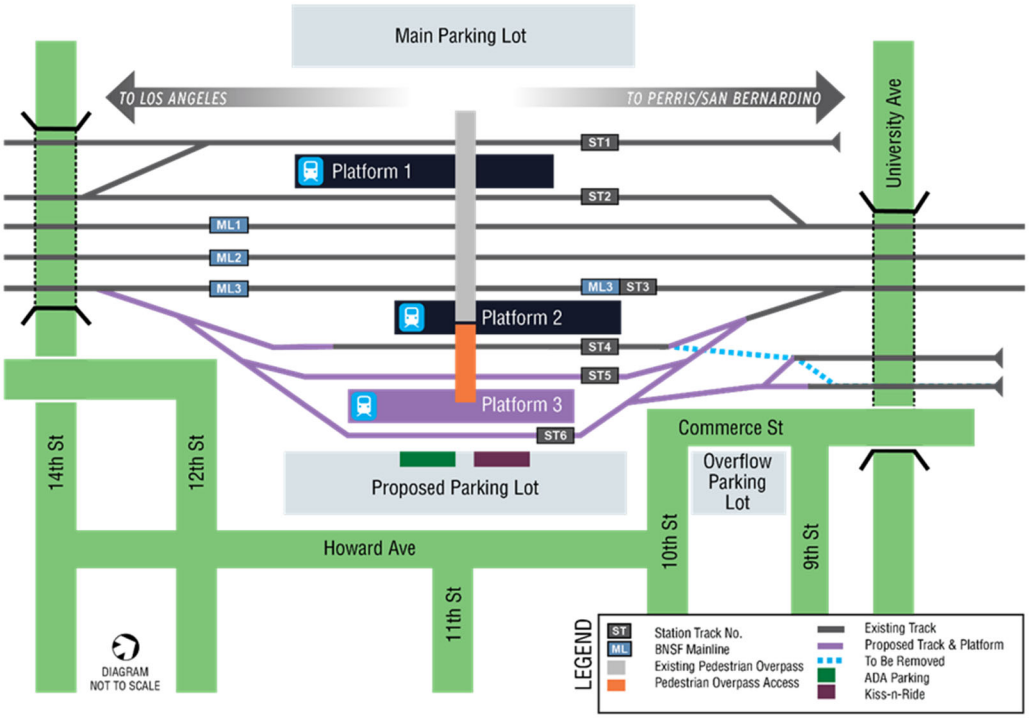


Figure 2-1. Build Alternative

Source: HNTB 2020

The proposed track would connect into the existing station layover tracks on the north end of the station, provide additional parking, and improve traffic flow on the east side of the station. A summary of the proposed Build Alternative (Project) improvements is presented in Table 2-1.

Table 2-1. Summary of Proposed Build Alternative Improvements

Element	Description
Station Platform and Track Improvements	• Add new center platform (Platform 3) • Add new station tracks (Tracks 5 and 6) • Modify railroad signal system
Pedestrian Access Improvements	• Extend pedestrian access to new Platform 3 • Provide emergency egress at three locations
Parking, Circulation and Streetscape Improvements	• Relocate ADA parking • Modify the bus drop-off area • Add sidewalks and trees • Add up to 560 additional parking spaces

ADA = Americans with Disabilities Act

The proposed improvements would enhance Metrolink train connections without affecting BNSF services. The improvements would be designed in accordance with the most recent applicable codes and the standards and guidelines issued by the Southern California Regional Rail Authority, BNSF, ADA, American Railway Engineering and Maintenance-of-Way Association, Federal Rail Administration, and California Public Utilities Commission.

2.2.3 Common Features of Build Alternative

Station Platform and Track Improvements

The Build Alternative includes the following station platform and track improvements as part of the proposed project (see Figure 2-1, Build Alternative):

- Add a new center platform (Platform 3) that is approximately 680 feet long and 30 feet wide with direct access from the new parking area to the east and access from the west using the at-grade crossings from Platform 2.
- Add new station tracks (Tracks 5 and 6) and other track improvements.
- Modify the railroad signal system.

Platform 3 would be located between station Tracks 5 and 6. Platform 3 would be able to service seven 85-foot passenger cars. The centerline to centerline spacing of the parallel tracks at the platform would be approximately 40 feet. Demolition of existing structures and other ancillary improvements would be required to facilitate construction of the station platform and track improvements.

Pedestrian Access Improvements

The Build Alternative includes the following pedestrian access improvements as part of the proposed project:

- Extend the existing pedestrian overpass access (see Figure 2-1, Build Alternative).
- Add pedestrian at-grade access from the proposed surface parking lot on the east side of proposed station improvements to Platforms 2 and 3 through an extension of the existing pedestrian at-grade crossing on the north end of the platforms and a new pedestrian at-grade rail crossing on the south end of the platforms. The pedestrian at-grade crossings would include safety enhancements such as proper channelization and automated gates and flashers.
- Provide emergency egress at the following three locations from Platform 3:
  - Pedestrian at-grade crossing (existing at-grade crossing to be extended) on the northern end of Platform 3
  - Pedestrian access to Platform 3
  - Pedestrian at-grade crossing (new) on the southern end of Platform 3

Parking, Circulation, and Streetscape

The Build Alternative includes the following parking, circulation, and streetscape improvements as part of the proposed project:

- Relocate ADA parking.
- Modify the bus drop-off area.
- Add sidewalks and trees.
- Add up to 560 additional parking spaces (proposed surface parking lot) with access to the east side of the station via at-grade pedestrian crossings.

2.2.4 Design Options

As part of the Build Alternative, there is a design option related to a longer extension of the pedestrian overpass access from the new proposed platform to the new surface parking lot.

Another design option is associated with the new surface parking lot and combining this new parking lot with the existing overflow parking lot on the east side of the station. This parking option includes traffic circulation improvements along Howard Avenue, 9th Street, 10th Street, and Commerce Street. A summary of the proposed design options is presented in Table 2-2.

Table 2-2. Summary of Proposed Build Alternative with Design Options

Build + Design Option	Description
Pedestrian Overpass Access Improvements	
Pedestrian Overpass Access Design Option 1	Extend pedestrian overpass access to the new Platform 3 and to the new surface parking lot
Parking, Circulation and Streetscape Improvements	
Parking Design Option 1A	New surface parking lot east of the station. Requires acquisition and demolition of existing structures and other ancillary structures and residential parcels on the corner of 12th Street and Howard Avenue to facilitate construction of the proposed improvements
Parking Design Option 1B	Same as Parking Design Option 1A but avoids relocation impacts to residential parcels on the corner of 12th Street and Howard Avenue
Parking Design Option 2A	New surface parking lot east of the station combined with existing overflow parking lot with the extension of Howard Avenue through to 9th Street Requires acquisition and demolition of existing structures and other ancillary structures and residential parcels on the corner of 12th Street and Howard and requires acquisition of additional parcels directly east of the existing overflow parking lot
Parking Design Option 2B	Same as Parking Design Option 2A but avoids relocation impacts to residential parcels on the corner of 12th Street and Howard Avenue
Parking Design Option 3A	Same as Parking Design Options 1A and 2A but avoids impacts to additional parcels east of the existing overflow parking lot by routing Howard Avenue around the parcels
Parking Design Option 3B	Same as Parking Design Options 1B and 2B but avoids relocation impacts to additional parcels east of the existing overflow parking lot

Pedestrian Overpass Access Improvements

Access from the existing station area would be provided by the proposed extension of the pedestrian overpass (see Figure 2-2, Build Alternative with Pedestrian Overpass Access Design Option 1). The Build Alternative with Pedestrian Overpass Access Design Option 1 includes a longer extension of the pedestrian overpass to Platform 3 and new surface parking lot (two spans, two towers/elevators).

The new pedestrian overpass elevator tower would be located 14 feet clear of both Tracks 5 and 6 on Platform 3. Access from the proposed surface parking lot would be provided by two 10-foot wide, at-grade pedestrian crossings at the north and south end of Platform 3.

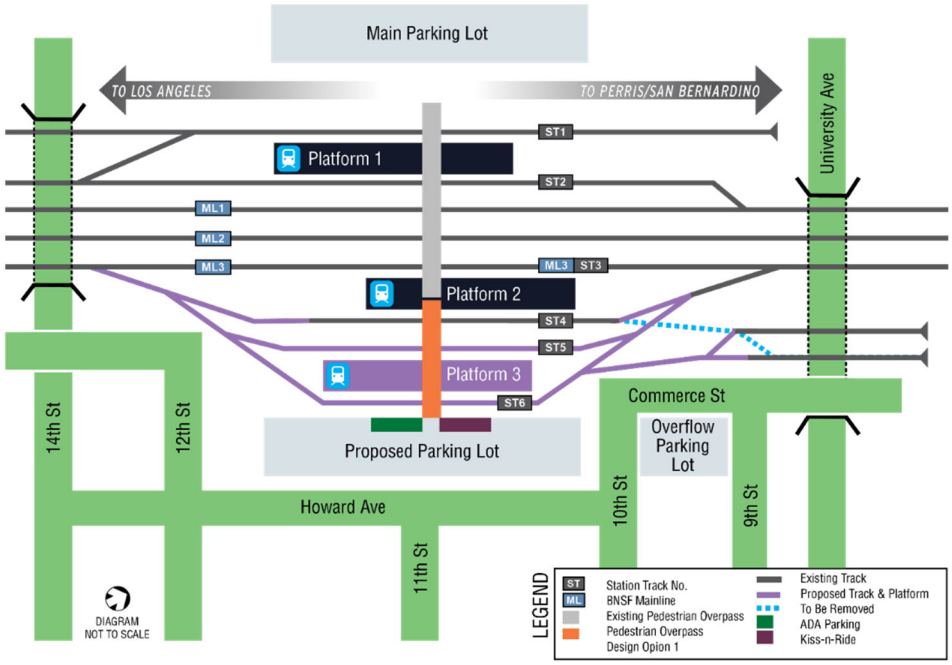


Figure 2-2. Build Alternative with Pedestrian Overpass Access Design Option 1

Source: HNTB 2020

Parking, Circulation and Streetscape Improvements

All parking design options would require the acquisition of parcels directly east of the station and demolition of existing structures and other ancillary structures to facilitate construction of the proposed Build Alternative improvements:

- Parking Design Option 1A would require the acquisition of residential parcels on the corner of 12th Street and Howard Avenue. Parking Option 1B would avoid the residential properties.
- Parking Design Options 2A and 2B would have similar right of way (ROW) impacts as Options 1A and 1B but would require acquisition of additional parcels directly east of the existing overflow parking lot.
- Parking Design Options 3A and 3B would have similar ROW impacts as Options 2A and 2B but would avoid parcel acquisitions directly east of the overflow parking lot.
- Parking Design Options 1A and 1B would add a new surface parking lot and maintain separation from the existing overflow parking lot on the eastside of the station (see Figure 2-3, Build Alternative with Parking Design Option 1A and Figure 2-4, Build Alternative with Parking Design Option 1B).

Parking Design Option 1A – Proposes new surface parking lot and maintain separation from existing overflow parking lot on the east side of the station. Acquisition and demolition of residential parcels on the corner of 12th Street and Howard Avenue would be required (see Figure 2-3, Build Alternative with Parking Design Option 1A).

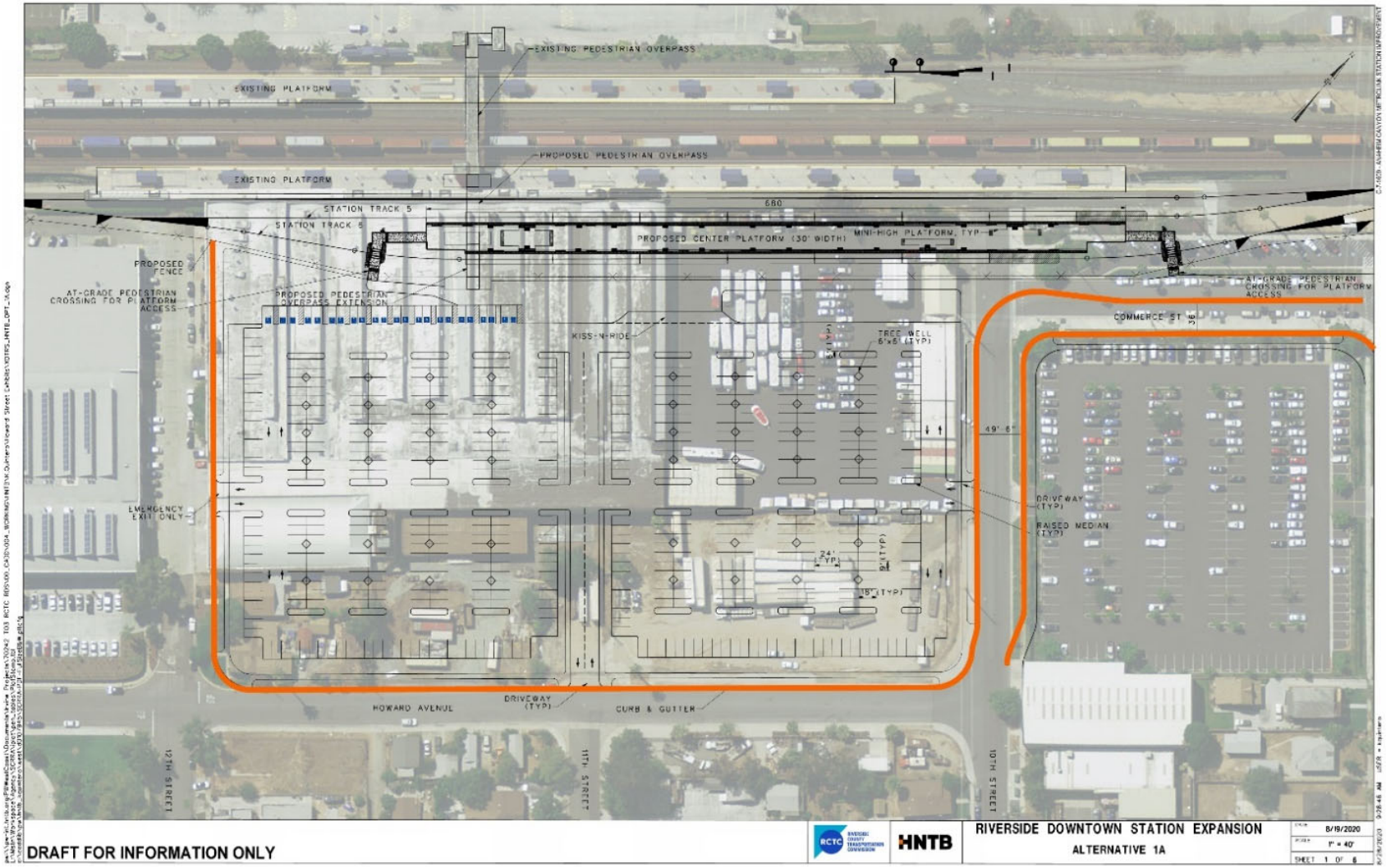


Figure 2-3. Build Alternative with Parking Design Option 1A
Source: HNTB 2020

Parking Design Option 1B – Proposes adding surface parking lot and maintain separation from existing overflow parking lot on the east side of the station and avoid impacts to residential parcels at the corner of 12th Street and Howard Avenue (see Figure 2-4, Build Alternative with Parking Design Option 1B).

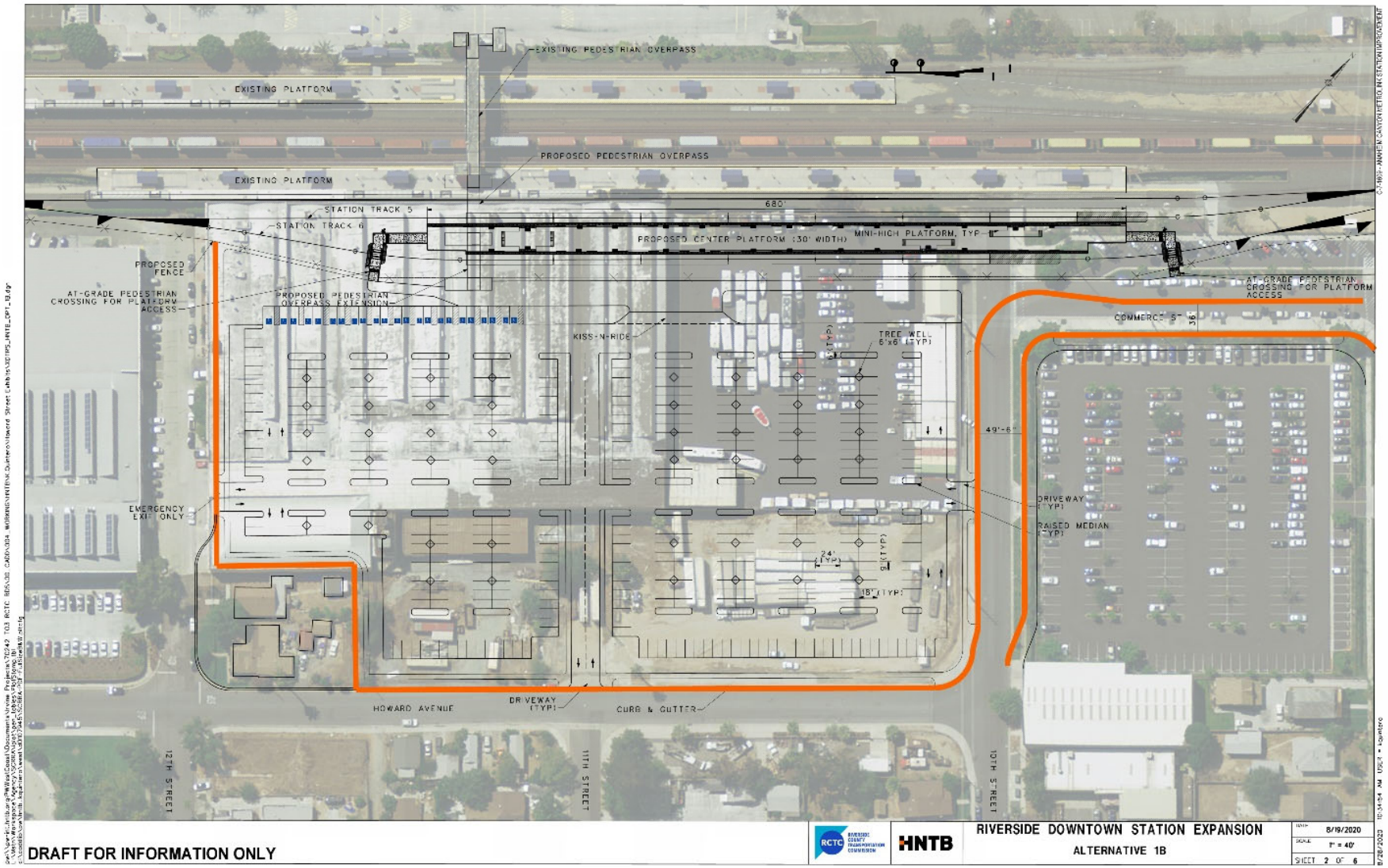


Figure 2-4. Build Alternative with Parking Design Option 1B

Source: HNTB 2020

Parking Design Option 2A – Proposes a new surface parking lot directly east of the station combined with the existing overflow parking lot. This option combines the proposed surface parking lot with existing overflow parking lot on the east side of the station which would require acquisition and demolition of residential parcels on the corner of 12th Street and Howard Avenue. This option would also include extending Howard Avenue through to 9th Street and would require additional acquisition of parcels directly east of the existing overflow parking lot as well as partial street vacations for 10th Street and Commerce Street (see Figure 2-5, Build Alternative with Parking Design Option 2A).

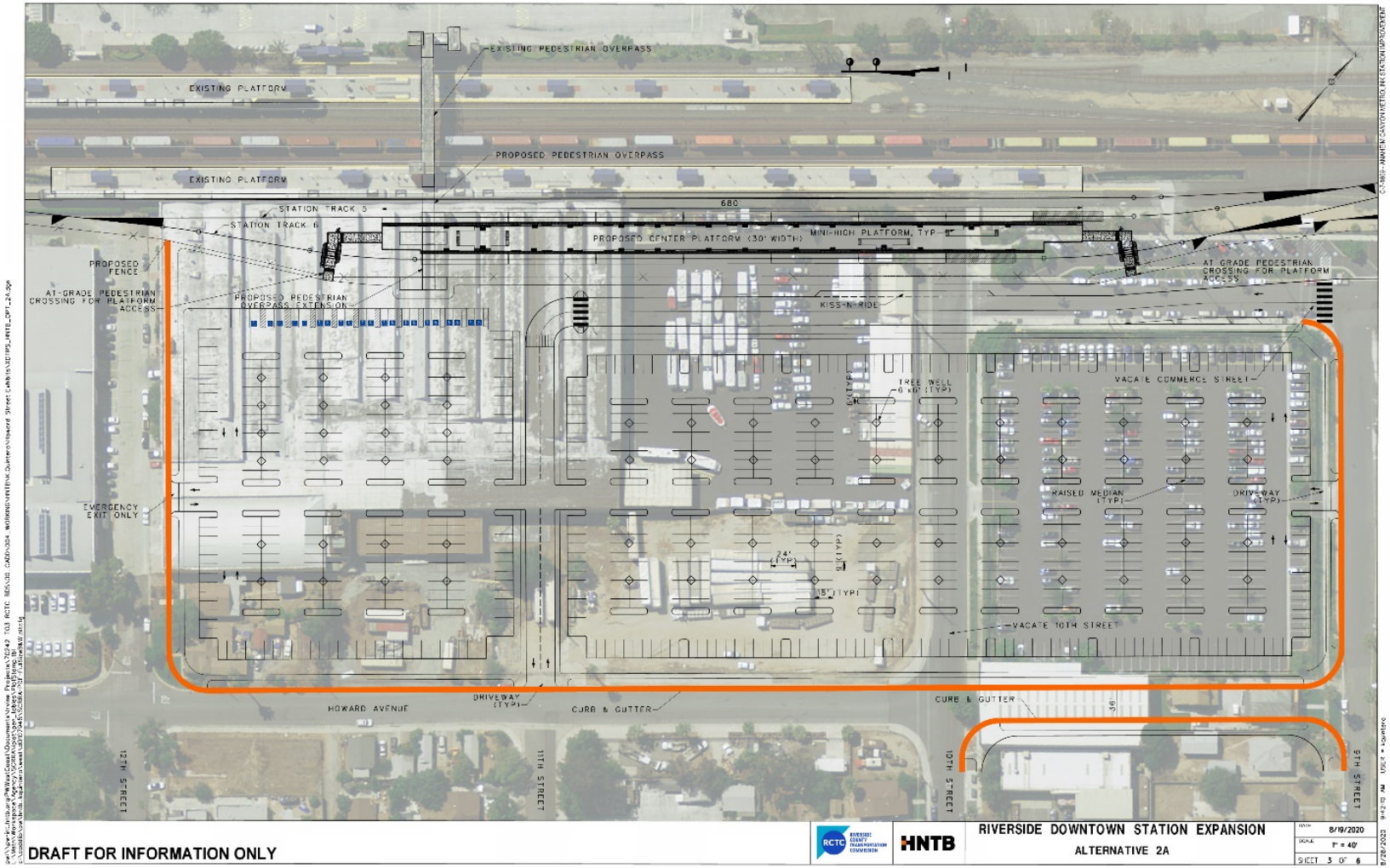


Figure 2-5. Build Alternative with Parking Design Option 2A
Source: HNTB 2020

Parking Design Option 2B – Proposes a new surface parking lot directly east of the station combined with the existing overflow parking lot. This option combines the proposed surface parking lot with the existing overflow parking lot on the east side of the station and avoid impacts to residential parcels at the corner of 12th Street and Howard Avenue. This option would also include extending Howard Avenue through to 9th Street and would require additional acquisition of parcels directly east of the existing overflow parking lot as well as partial street vacations for 10th Street and Commerce Street (see Figure 2-6, Build Alternative with Parking Design Option 2B).

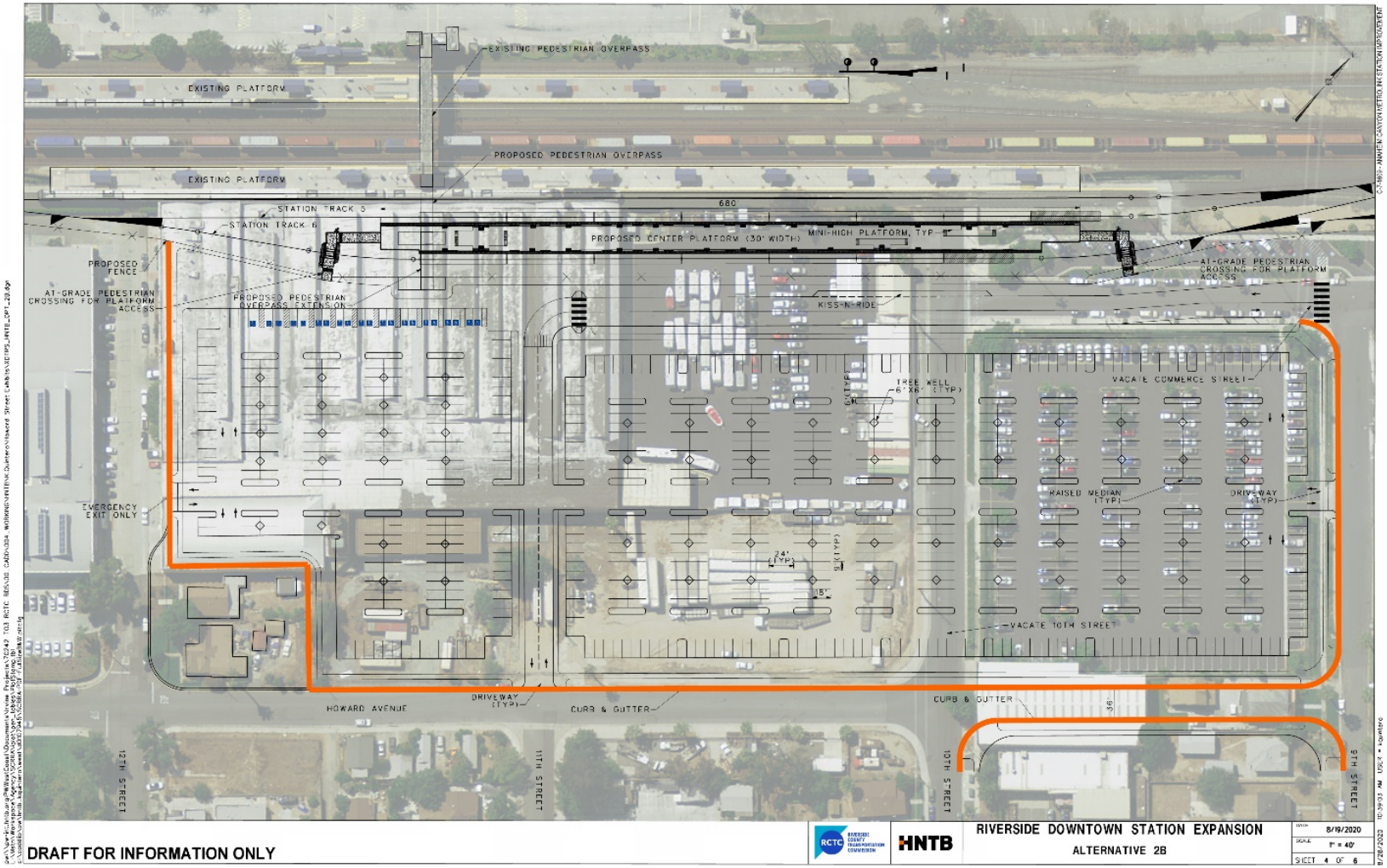


Figure 2-6. Build Alternative with Parking Design Option 2B
Source: HNTB 2020

Parking Design Option 3A – Proposes a new surface parking lot directly east of the station combined with the existing overflow parking lot and extension of Howard Street through to 9th Street. This option combines the proposed surface parking lot with existing overflow parking lot on the east side of the station, which would require demolition of residential parcels on the corner of 12th Street and Howard Avenue. In addition, this option would also include extending Howard Avenue through to 9th Street and partial street vacations for 10th Street and Commerce Street while avoiding additional acquisition of parcels directly east of the existing overflow parking lot (see Figure 2-7, Build Alternative with Parking Design Option 3A).

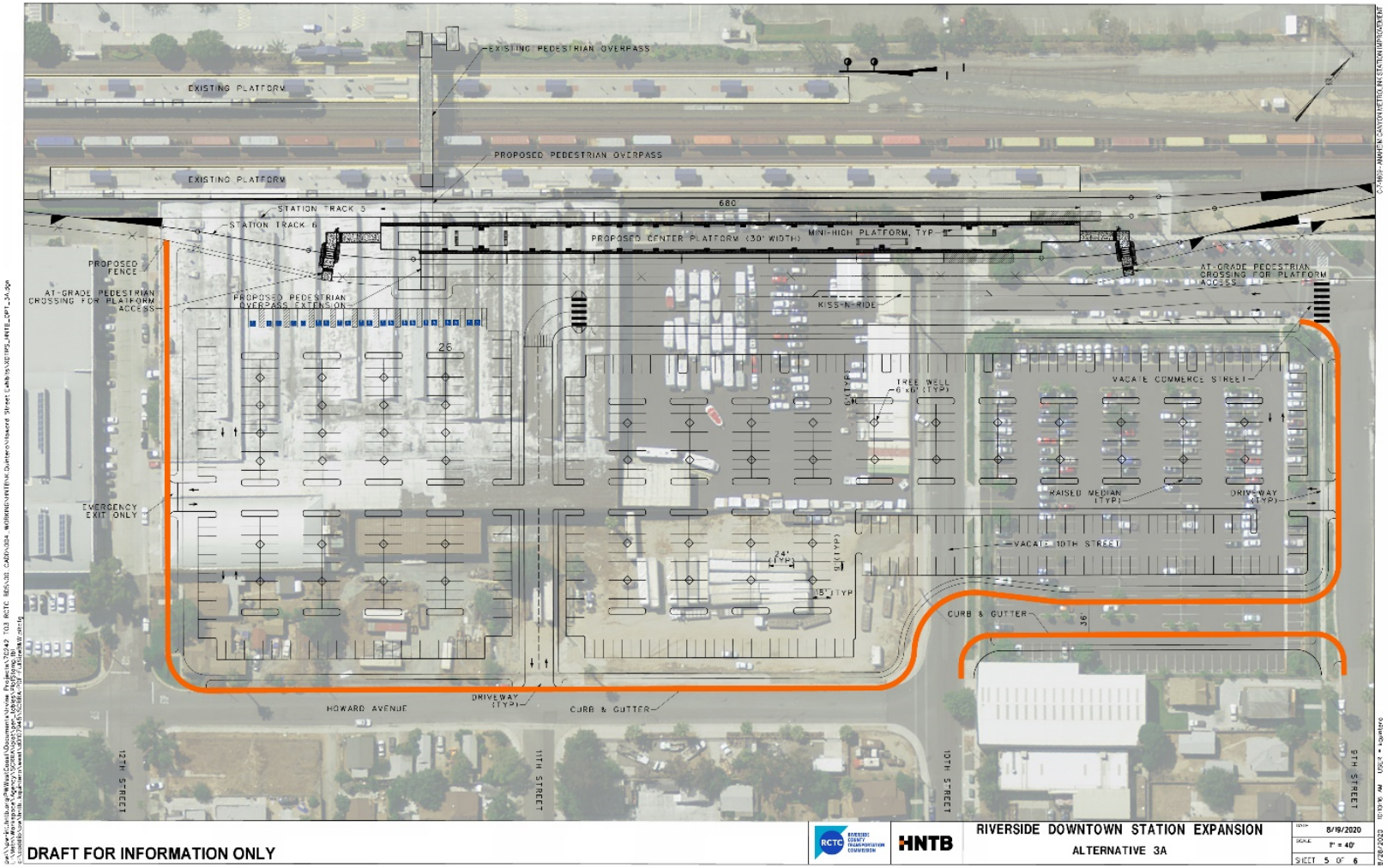


Figure 2-7. Build Alternative with Parking Design Option 3A
Source: HNTB 2020

Parking Design Option 3B - Proposes a new surface parking lot directly east of the station combined with the existing overflow parking lot and extension of Howard Street through to 9th Street, which would avoid impacts to residential parcels at the corner of 12th Street and Howard Avenue. This option would also include extending Howard Avenue through to 9th Street as well as partial street vacations for 10th Street and Commerce Street while avoiding additional acquisition of parcels directly east of the existing overflow parking lot (see Figure 2-8, Build Alternative with Parking Design Option 3B).

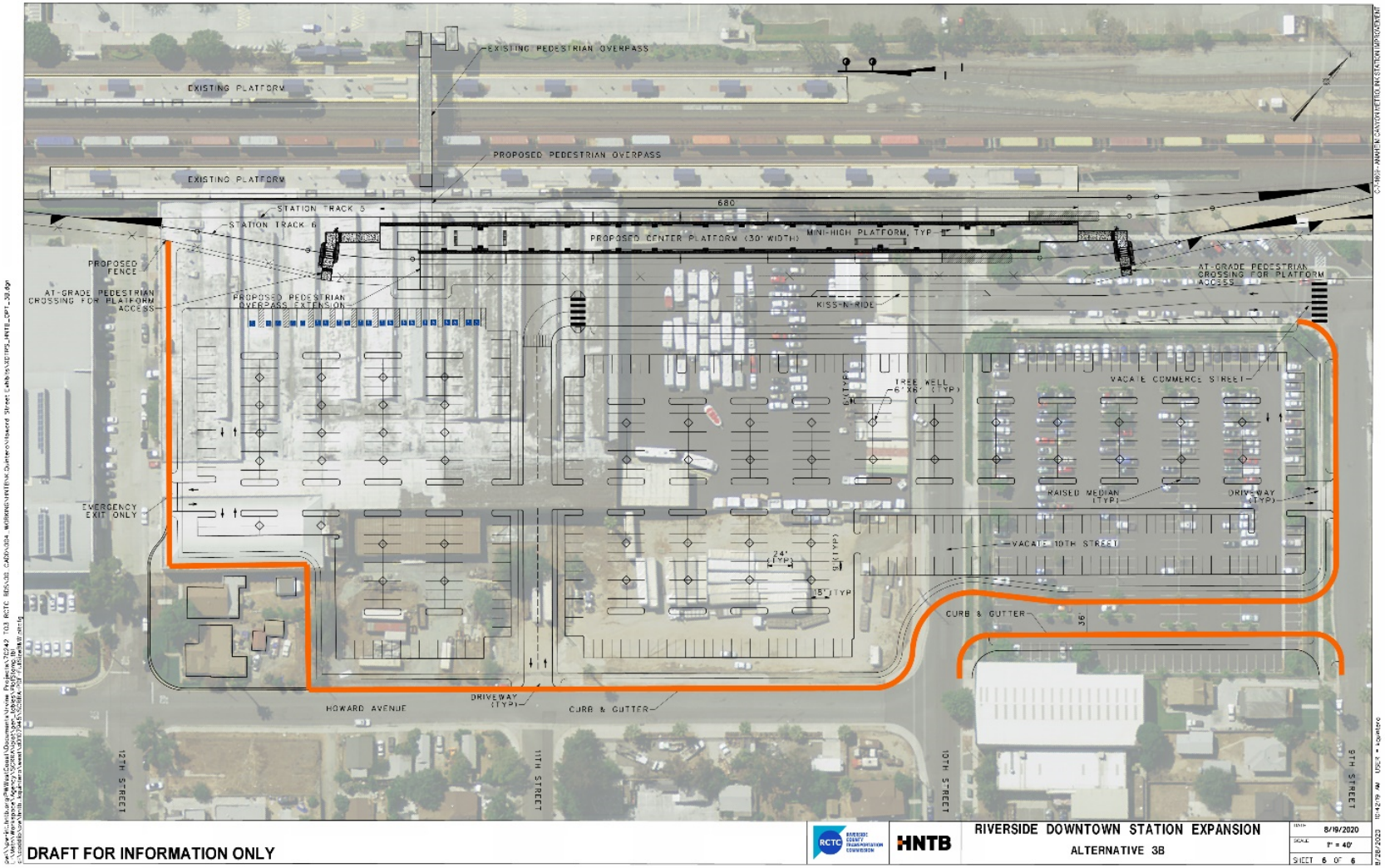


Figure 2-8. Build Alternative with Parking Design Option 3B

Source: HNTB 2020

2.2.5 Construction

Project construction activities will occur for an estimated 24 months. Construction activities would include the following:

- Importing and exporting fill material
- Clearing and grubbing trees, shrubs, stumps, and rubbish
- Removing pavement and concrete
- Excavating, grading, paving, and demolishing existing structures

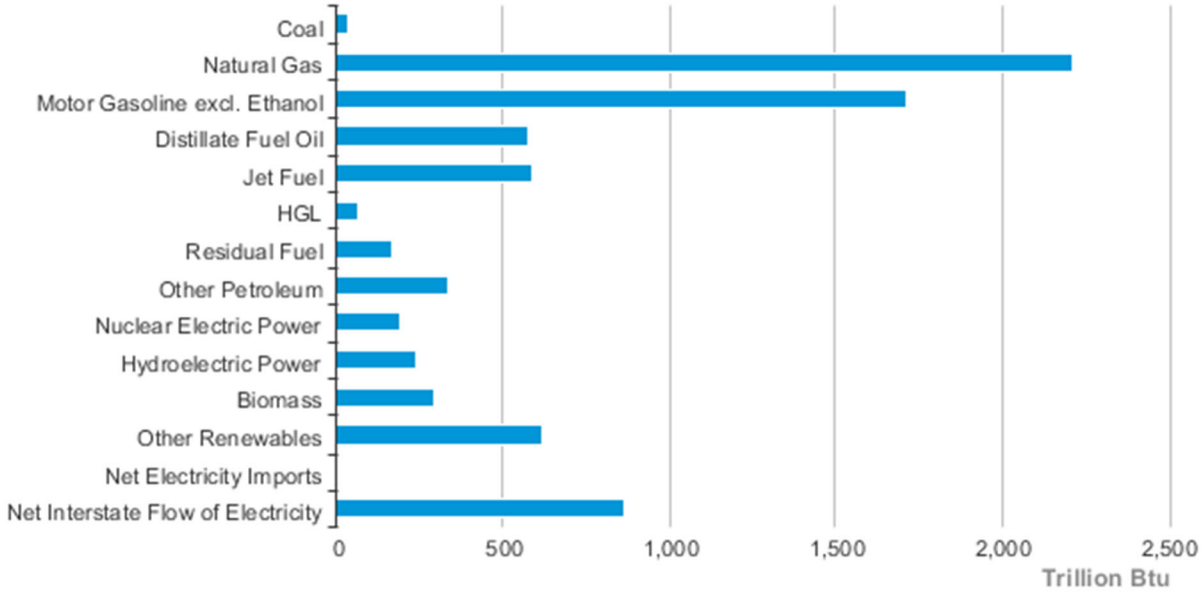
Other ground-disturbing activities prior to commencement of construction may include subsurface investigations, excavation and removal of contaminated soil, and utility relocations.

Temporary construction easements would be required to accommodate the construction of project features. Construction staging areas would be located within the existing Riverside-Downtown Station and/or adjacent properties subject to acquisition.

3.0 Affected Environment/Existing Conditions

3.1 Statewide Energy Consumption

Energy consumption can be grouped into several categories, by fuel source and by end-use sector. According to Figure 3-1 and Table 3-1, natural gas is California's most prevalent fuel source, representing 28% of the state's energy consumption, and it is the fuel source responsible for over 40% of in-state electricity generation. [1,2] Motor gasoline accounts for 22% of statewide energy consumption and petroleum-based fuels other than motor gasoline represent a combined 22% of California's energy use.



Source: U.S. Energy Information Administration. 2018.

Figure 3-1: California Energy Consumption Estimates by Source, 2018

Table 3-1. Energy Consumption in California

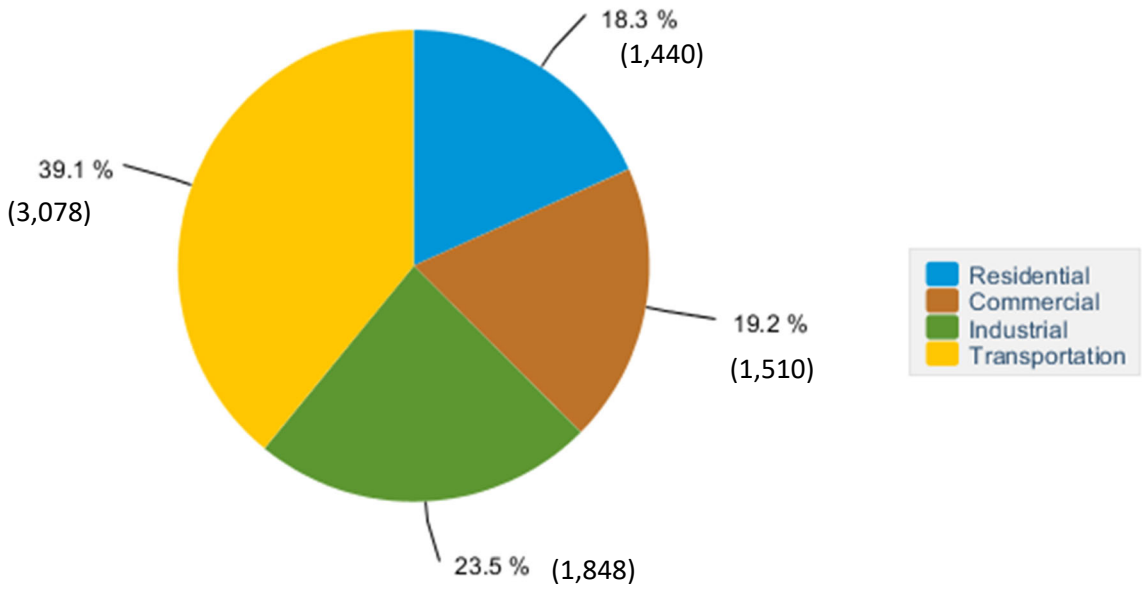
Fuel Type	Energy Consumption (Trillion BTU)	Percent of Total Energy Consumption
Coal	33	0.4%
Natural Gas	2,210	28.0%
Motor Gasoline excl. Ethanol	1,716	21.7%
Distillate Fuel Oil	576	7.3%
Jet Fuel	593	7.5%
HGL	58	0.7%
Residual Fuel	169	2.1%
Other Petroleum	332	4.2%
Nuclear Electric Power	190	2.4%

Fuel Type	Energy Consumption (Trillion BTU)	Percent of Total Energy Consumption
Hydroelectric Power	240	3.0%
Biomass	297	3.8%
Other Renewables	618	7.8%
Net Electricity Imports	3	0.0%
Net Interstate Flow of Electricity	866	11.0%
Total	**7,900**	**100.0%**

Source: U.S. Energy Administration (2018)

Figure 3-2 shows California energy use by end-use sector. The transportation sector is responsible for largest share of the state's energy use, accounting for just under 40% of the California total. Residential, commercial, and industrial users are each responsible for roughly one-fifth of energy use.[3]

Energy resources for transportation include gasoline, natural gas, biofuels, and electricity, with petroleum-based fuels accounting for 96% of the state's transportation needs.[4]



Source: U.S. Energy Information Administration. 2018.

Figure 3-2: California Energy Consumption (percentage and absolute values (TBTU)) by End-Use Sector, 2018

3.2 Regional Energy Consumption

With the high density of population relying on highway system for mobility, two major ports serving as hubs for good movement and three large airports, Southern California's energy consumption differs from the state in that a greater proportion of the energy consumed in the region is for the purposes of transportation. According to Figure 3-3, transportation related energy consumption accounts for approximately 60% of energy used in the South Coast Air Basin (which comprises all of Orange County and the non-desert portions of Los Angeles, San Bernardino, and Riverside counties). [5]

According to SCAG's 2016-2040 RTP/SCS, by 2040, about 3.8 million people is expected to add to the six-county SCAG region (Ventura, Los Angeles, Orange, San Bernardino, Riverside, and Imperial counties).[6] This additional population growth is expected to pose transportation challenges for the region, as travel demand in California will likely increase, which will also increase the regional energy consumption level in the future.

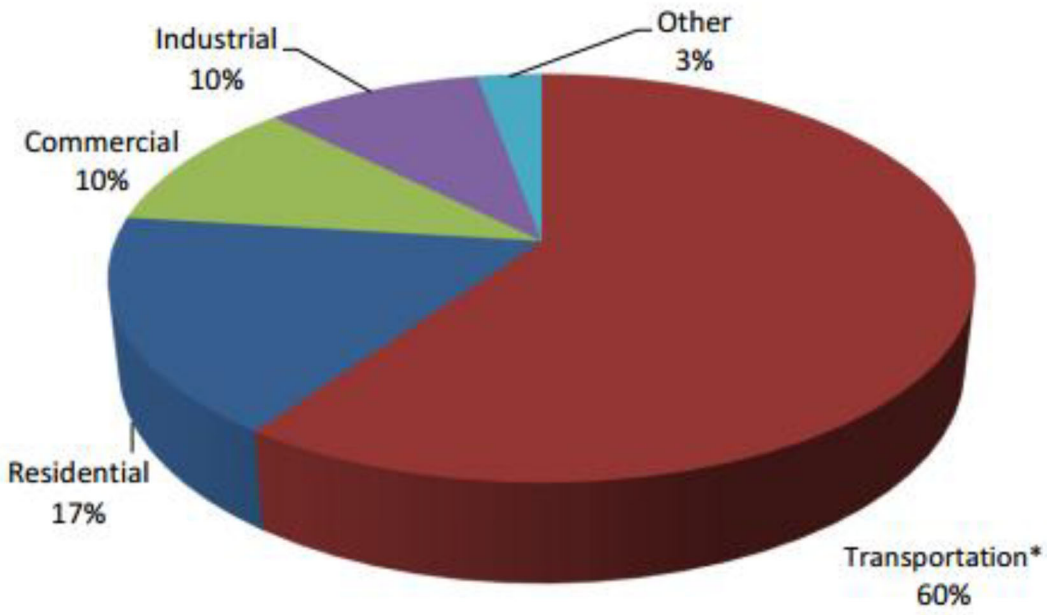


Figure 3-3: Share of Energy Use in South Coast Basin in 2008

4.0 Methodology

The energy impacts analysis considers direct energy consumption and indirect energy consumption. Direct energy consumption includes the consumption from operation and construction; indirect energy consumption includes the consumption from maintenance associated with the proposed project.

While the proposed project aims to enhance the transit ridership, this is not a roadway capacity increasing project and a qualitative discussion of energy usage will be performed for the operations.

The estimate of construction-related energy use was calculated by applying the U.S. Environmental Protection Agency (USEPA)-derived carbon dioxide (CO2) emissions per gallon of fuel to the total CO2 emissions estimated using the California Emissions Estimator Model™ (CalEEMod) in the air quality emissions analysis prepared for the proposed project. The Air Quality Technical Report includes details on construction equipment and activity assumptions that were used to estimate CO2 emissions. Emissions were then converted to million British thermal units (MMBTU) using energy unit conversion factors.

Long-term maintenance of the various roadways with the project footprint would occur under either the Build Alternative or No-Build Alternative. The Build Alternative would address these energy consumptions from maintenance by alleviating local traffic congestion, by promoting public transportation. The quantitative analysis will be adopted for the indirect energy consumption.

4.1 Significance Thresholds

Significance thresholds are used to determine whether a project may have a significant environmental effect. The significance thresholds, as defined by federal and state regulations and guidelines, are discussed below.

NEPA

Although there are no specific NEPA criteria for analyzing impacts to energy resources, 40 CFR Section 1502.16(e) and (f) direct that EISs shall include a discussion of the “energy requirements and conservation potential of various alternatives,” “natural or depletable resource requirements and conservation potential of various alternatives,” and, if applicable, mitigation measures.

State CEQA Guidelines

The State CEQA Guidelines do not describe specific significance thresholds for energy. However, Appendix G of the State CEQA Guidelines lists a variety of potentially significant effects, which are often used as thresholds or guidance in developing thresholds for determining impact significance. Appendix G of the CEQA Guidelines, VI. Energy states that a project would have a significant energy impact under CEQA if it would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

5.0 Energy Analysis

5.1 Planning Strategies

The proposed project was included in SCAG's conforming 2019 Federal Transportation Improvement Program (FTIP) as Project ID RIV141203 (SCAG 2018). The project's design concept and scope have not changed significantly from what was included in SCAG's regional emission analysis. This analysis found that the plan, which considers regionally significant projects and financial constraint, will conform to the SIP for attaining and maintaining the NAAQS as provided in Section 176(c) of the Clean Air Act. FHWA determined that the FTIP conforms to the SIP on December 17, 2018. The proposed project would not obstruct or conflict with statewide or regional planning strategies, including their requirements regarding energy usage and efficiency.

CEQA guidelines require that an EIR include an analysis of a project's potential for significant environmental effects resulting from wasteful, inefficient, or unnecessary use of energy. A quantitative analysis is required for projects that increase capacity or provide congestion relief, both of which could affect the ability of a transportation facility to accommodate existing and future traffic demand. The example of congestion relief or capacity-increasing projects that would require a quantitative analysis includes new roadway or facility (bypass, new or extended highway and new interchange), additional lanes, interchange reconfiguration and auxiliary lanes more than 1 mile in length. The proposed project was not classified as a capacity increasing project and is not expected to change the existing vehicle mix. Examples of capacity increasing projects include new highways, added travel or auxiliary lanes, and new or reconfigured interchanges. However, the project will relieve congestion on regional roadways by promoting public transportation. An assessment of the proposed project's potential direct and indirect energy consumption was performed. Direct energy includes operational energy use and the one-time energy expenditure from project construction. Indirect energy includes maintenance activities required to operate or maintain the project.

5.2 Direct Energy Consumption

5.2.1 Operation Energy Consumption

Operation energy involves all energy consumed by vehicle propulsion. This is a function of traffic characteristics such as VMT, vehicle speed, and vehicle mix. The purpose of the project is to provide station improvements to enhance Metrolink service and increase transit ridership. Increased ridership would result in a reduction in regional vehicle miles traveled (VMT) and associated criteria pollutant emissions. While the project would result in increased vehicle trips to and from the station, these trips would generally be of short distances and the VMT for these trips would be offset using transit. As such, operation of the project would not result in a net increase energy consumption. Impacts on energy consumption from this project would be less than significant.

Due to the insignificant energy consumption of the project from operation, it would not conflict with California's energy conservation plans as described in the CEC's 2018 Integrated Energy Policy Report Update. The proposed project is not likely to cause inefficient, wasteful, and

unnecessary consumption of energy resources or any irreversible or irretrievable commitments of energy during operation.

5.2.2 Construction Energy Consumption

The No Project Alternative would not include construction of any project-related facilities or infrastructure; therefore, no impacts or effects under CEQA and NEPA would occur.

Direct energy consumption during construction was calculated by converting CO2 emissions into fuel consumption during construction. CO2 emissions were quantified using CalEEMod.2016.3.2, which included itemization of emissions per phase of construction. Metric tons of CO2 were then converted to fuel using GHG equivalencies (United States Environmental Protection Agency [EPA] 2020).[7]. The calculation includes the conversion of CO2 into gallons of diesel and gasoline fuel and conversion of gallons of diesel and gasoline fuel into to BTUs using the EIA (2020) conversion rates.[8]

Construction period energy consumptions were modeled for the Build Alternative with Circulation and Parking Design Option 1A (herein referred to as Design Option 1A) and for the Build Alternative with Circulation and Parking Design Option 2A (herein referred to as Design Option 2A). Based on the impact footprint and amount of demolition required, these two Build Alternative parking design options are anticipated to require the most construction activity and thus require the highest level of energy consumption.

As shown in Table 5-1 and 5-2, approximately 25,000 total MMBTU would be consumed during the construction of Option 1A and Option 2A respectively, most of which would be in the form of diesel fuel used by construction equipment and vehicles. Although an estimated 150,000 gallons of diesel fuel would be consumed by construction vehicles and equipment, the fuel consumption would be temporary in nature and would represent a negligible increase in regional demand, and an insignificant amount relative to the more than 18 billion gallons of on-road fuels used in the state in 2013 (California Energy Commission 2014b). Given the extensive network of fueling stations throughout the project vicinity and the fact that construction would be short-term, it is anticipated that no new or expanded sources of energy or infrastructure would be required to meet the energy demands due to Option 1A and Option 2A construction activities. Additionally, the construction window for the proposed project extends over a three-year window. This would result in even smaller annual energy expenditures, representing an even smaller annual energy consumption. It is anticipated that the energy expenditure required to construct the Build Alternative would be partially offset by the long-term operational reductions in energy consumption realized through more efficient public transport. Therefore, Option 1A and Option 2A would not result in the wasteful or inefficient use of energy. Impacts related to regional energy supply, demand, and conservation during the construction period would be less than significant under CEQA and under NEPA.

As indicated above, energy usage on the project site during construction would be temporary in nature, and energy impacts would be negligible at the regional level. The project would not necessitate use of any construction equipment that would be less energy efficient than others at comparable construction sites in the region or the State. Because California's energy conservation planning actions are conducted at a regional level, and because the project's total impacts to regional energy supplies would be minor, the energy consumption from construction would not conflict with California's energy conservation plans as described in the CEC's 2018

Integrated Energy Policy Report Update. In addition, as indicated above, the proposed project would comply with Title 24 and CALGreen Code standards. The proposed project is not likely to cause wasteful, inefficient, or unnecessary consumption of energy resources during project construction.

Table 5-1: Construction Annual Energy Consumption of Build Option 1A

Construction Phase	CO2 Emission (MT)		Fuel (Gallon)		Energy (MMBTU)		
	Diesel	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Total
Demolition	64	2	6,242	255	858	31	888
Site Preparation	43	2	4,249	233	584	28	612
Grading	100	3	9,860	371	1,355	45	1,399
Paving	36	1	3,585	159	493	19	512
Track Construction	116	5	11,385	572	1,564	69	1,633
Bridge/Platform Construction	1,146	303	112,555	34,110	15,463	4,103	19,566
Architectural Coating	1	1	125	148	17	18	35
TOTAL	**1,507**	**319**	**148,001**	**35,847**	**20,333**	**4,312**	**24,645**

Table 5-2: Construction Annual Energy Consumption of Build Option 2A

Construction Phase	CO2 Emission (MT)		Fuel (Gallon)		Energy (MMBTU)		
	Diesel	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Total
Demolition	67	2	6,564	260	902	31	933
Site Preparation	52	2	5,062	277	695	33	729
Grading	119	4	11,653	438	1,601	53	1,654
Paving	46	2	4,474	188	615	23	637
Track Construction	116	5	11,385	572	1,564	69	1,633
Bridge/Platform Construction	1,145	302	112,519	34,017	15,458	4,092	19,550
Architectural Coating	2	2	176	207	24	25	49
TOTAL	**1,546**	**320**	**151,832**	**35,960**	**20,859**	**4,325**	**25,184**

Note:

**EPA (2020) conversion rates: 10.180 × 10-3 metric tons CO2/gallon of diesel, 8.887 × 10-3 metric tons CO2/gallon of gasoline*

***EIA (2020) conversion rate 1 gallon diesel = 137,381 BTUs, 1 gallon gasoline = 120,286 BTUs*

5.3 Indirect Energy Usage

The Build Alternative would reduce long-term maintenance need of regional road facilities by alleviating traffic congestion through promoting public transportation. More efficient LED lighting technology could be employed in the new facilities area. This technology has a longer lifetime than is currently used in existing traffic signals and pedestrian-scale lighting, further reducing future maintenance needs. Based on this, operationally the Build Alternative would have an energy savings as compared to the No-Build Alternative.

5.4 Avoidance and Minimization Measures

No avoidance or mitigation measures would be necessary since the project would not cause significant impacts.

5.5 Impacts Remaining After Mitigation

The impacts of the project implementation would be less than significant for energy and no mitigation measures would be required.

5.6 Summary

The proposed project would not result in significant energy consumption for the following reasons:

- The proposed project would not add roadway capacity, instead it will encourage traveler to use transit, which could reduce operational energy consumption from passenger cars region wide in the long term.
- The proposed project's construction-related energy consumption would be temporary and insignificant compared with the statewide energy consumption. In addition, the energy consumption from construction would be offset by the long-term energy savings from the project by promoting public transportation.
- New traffic signals and pedestrian-scale lighting in the project area would utilize high-efficiency LED technology. Any replaced or modified traffic signals or pedestrian-scale lighting would also utilize LED technology.

6.0 References

[1]. U.S. Energy Information Administration. 2021a. California Energy Consumption Estimates by Source, 2018. http://www.eia.gov/state/?sid=CA#tabs-1 .

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[3] U.S. Energy Information Administration. 2021b. California Energy Consumption Estimates by Source, 2018. http://www.eia.gov/state/?sid=CA#tabs-2 .

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[5] South Coast Air Quality Management District. 2012. 2012 Air Quality Management Plan. Chapter 10: Energy and Climate, http://www.aqmd.gov/aqmp/2012aqmp/Final/Ch10.pdf .

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[8] United States Environmental Protection Agency. 2020. Greenhouse Gases Equivalences Calculation – Calculations and References. https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references.