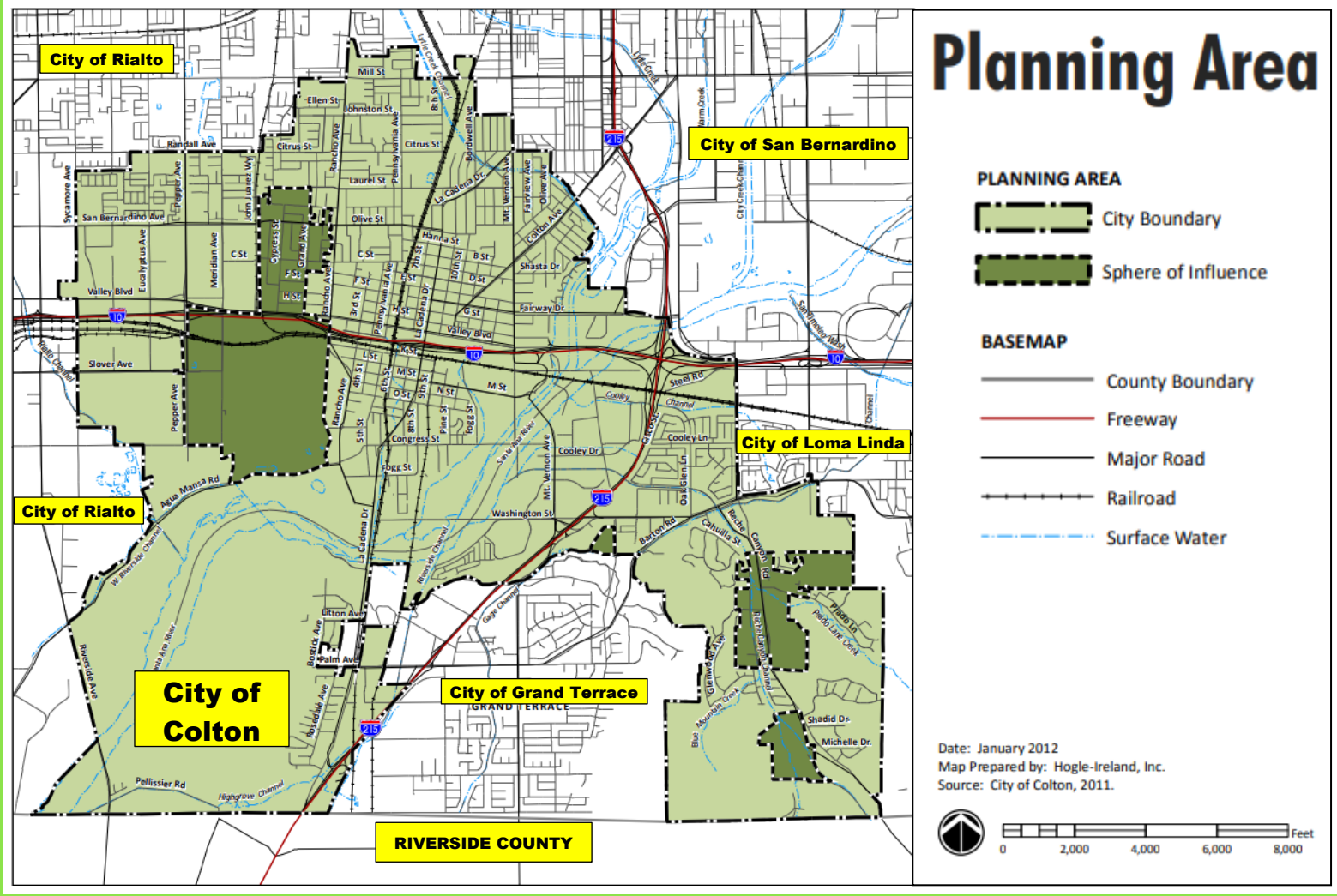
TO#234

City of Colton VMT (Vehicle Miles Traveled) Guidelines

for the

City of Colton, CA



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27 Years of Excellence

June 2, 2020

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1.0 – Introduction

Following the passage of Senate Bill 743 (SB 743), which created the 2019 amendments to the California Environmental Quality Act (CEQA) Guidelines by the Natural Resources Agency, the City of Colton developed Vehicle Miles Traveled (VMT) Guidelines as dictated in the amendment.

The primary purpose of SB 743 was to change the primary methodology of Environmental Traffic Impact Analysis to revolve around the metric of VMT indexed to population and / or employment, as opposed to the previous methodology focusing on Level of Service (LOS), which was based on delay or capacity. By switching from LOS to VMT, the analysis shifts from analyzing the environmental impact of congested streets and / or intersections to the impact of vehicle trip lengths. This methodology was developed to aid in reaching the Greenhouse Gas (GHG) emission goals passed in the California Global Warming Solutions Act of 2006 (Assembly Bill 32 or AB 32).

The City of Colton will utilize the VMT methodology for various projects (e.g. Land Development, Planning, etc.) by analyzing the VMT per capita, employee, and / or per service population, as required by the specific project type and land use type (if applicable). Additionally, the City of Colton will continue to utilize LOS analysis methodology for all projects to ensure the safety and efficiency of City roadways. The LOS analysis would require the applicant to submit a separate traffic study document using City and County guidelines.

This report focuses primarily on VMT methodology, however a section on local traffic assessment has been provided.

1.1 – Executive Summary

Minagar and Associates, Inc. recommends the City of Colton proceed with the VMT screening criteria recommended by *San Bernardino County Transportation Authority's City VMT Guidelines* Decision Checklist and generate a project VMT using Productions / Attractions and Origin / Destination VMT methodology. Additionally, VMT benchmarks are to be determined by City boundaries and OPR Technical Advisory Thresholds, which is set to 15% below the existing baseline City VMT for Residential, Office, and Mixed-Use Projects. For Transportation and Retail projects, the significance is determined by the net change of City VMT with the Project. In order to ensure mobility, safety, and efficiency Minagar also recommends the City to maintain its existing Level of Service (LOS) analysis procedures for Traffic Impact Analyses and Mitigation Measures Assessments.

1.2 – VMT Background

Currently in the recommendations given by San Bernardino County Transportation Authority (SBCTA), four (4) VMT methodologies may be used for the purpose of VMT analysis. The methodologies recommended by SBCTA are based on the guidelines set by the California Governor's Office of Planning and Research (OPR), Southern California Association of Governments (SCAG), and California Air Resources Board (CARB).

The California Governor's Office of Planning and Research was created in 1970, which oversees assisting the Governor and Cabinet in long-range planning and research. It is classified as the

comprehensive state planning agency and provides, but is not limited to, conflict resolution to state agencies, coordination of environmental monitoring, and drafting of CEQA guidelines.

California Air Resources Board is a government agency dedicated to promoting and protecting public health and the environment through management of air pollutants. CARB works with the United States Environmental Protection Agency (EPA) and local air pollution districts to set state air quality standards, identify critical pollutions, etc.

Southern California Association of Governments is a Metropolitan Planning Organization (MPO), which is classified as a Regional Transportation Planning Agency and a Council of Governments. The association includes six (6) Southern California Counties and 191 cities. The agency is responsible addressing regional issues such as growth forecasting, housing needs, transportation improvements, etc.

OPTION 1 – OPR Technical Advisory Thresholds

As given in the Governor's Office of Planning and Research, a recommended threshold for the VMT is fifteen (15) percent below the existing baseline conditions. The fifteen (15) percent is applicable to residential and office land use projects, whereas retail projects requires judgement on whether the net increase in total VMT generated by the project constitutes a significant transportation impact. Retail projects is based off of the net change in total VMT, due to retail projects likely redirecting traffic, rather than generating new trips.

The OPR also recommends using the fifteen (15) percent threshold for proposed land use plans within the City. Each individual land use project of the proposal must follow the guidelines in the RTP / SCS and the overall land use plan must be fifteen (15) percent below the existing baseline conditions of the proposed region without the proposed land use project.

Similarly to retail projects, it is recommended that for transportation projects, an insignificant transportation impact occurs when there is no net increase in City VMT.

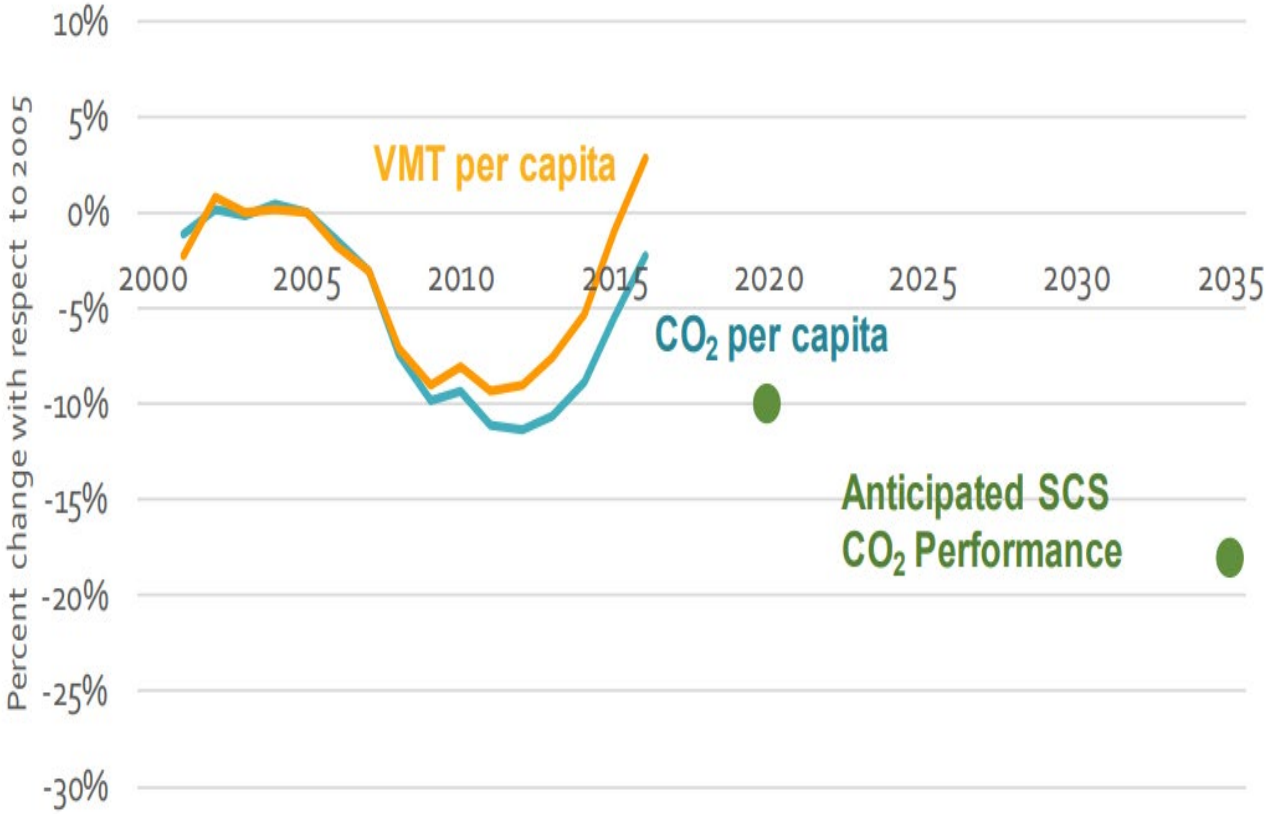
OPTION 2 – Air Quality, Green House Gas (GHG) Reduction, and Energy Conservation Goals

The basis of this methodology are the greenhouse gas reduction goals set in Executive Order S-3-05 passed in June 1, 2005 and the related Senate Bill 375 passed September 30, 2008. Executive Order S-3-05 established future year greenhouse gas emission goals based on previous California GHG measurements which are the following:

- By 2010, reduce GHG emissions to 2000 levels
- By 2020, reduce GHG emissions to 1990 levels
- By 2050, reduce GHG emissions to eighty (80) percent below 1990 levels

Senate Bill 375 had given authority to the California Air Resources Board (CARB) to set regional targets to reach the State's GHG emission goals. **Figure 1** shows the existing trends for VMT per capita and carbon dioxide (CO_2) per capita.

Figure 1: Statewide CO_2 and VMT (Vehicle Miles Traveled) per Capita Trend with Respect to Anticipated Performance of Current SB 375 SCSs

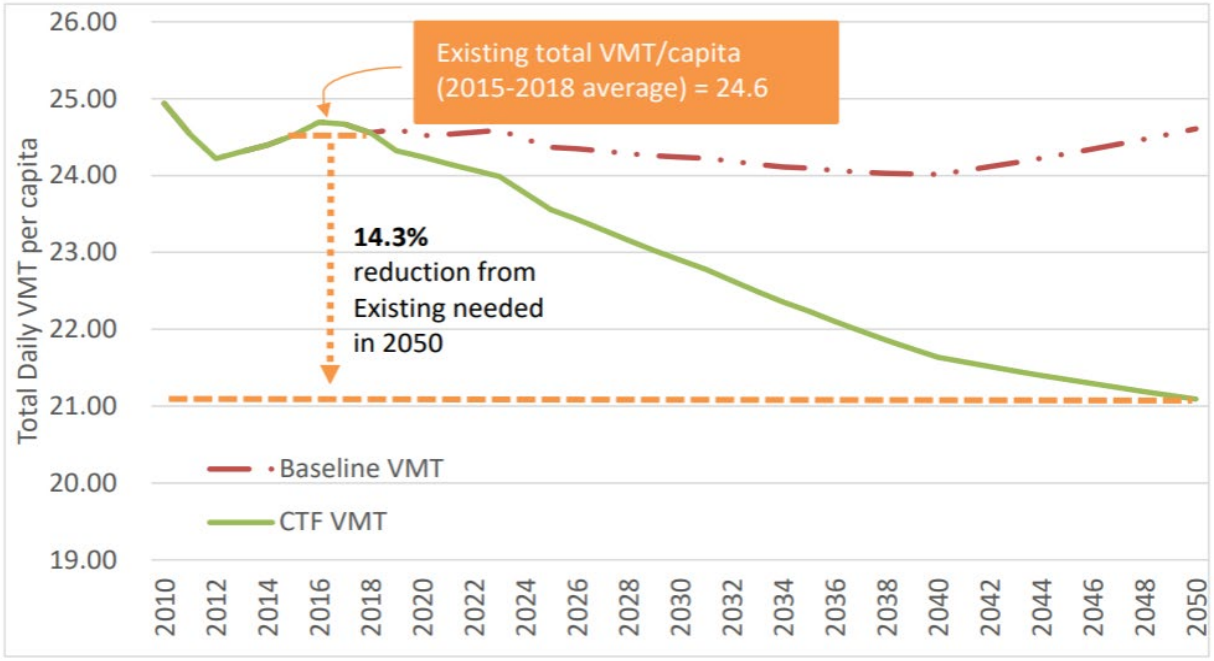


Source: *2018 Progress Report California's Sustainable Communities and Climate Protection Act,* California Air Reserves Board, 2018

In order to achieve these goals, the California Air Resources Board (CARB) published the *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals* in January 2019, which dictates a 14.3 percent reduction for total VMT from baseline conditions or a 16.8 percent reduction when applied to only passenger cars and light trucks from the baseline conditions.

Figure 2 shows the baseline State VMT against the Cleaner Fuels and Technologies (CTF) scenario that models the VMT reductions from the CARB regulations to achieve a 14.3 percent reduction by 2050.

Figure 2: California VMT Trends and Cleaner Fuels and Technologies (CTF) Scenario



Source: *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, January 2019

OPTION 3 – RTP / SCS Future Year VMT

The thresholds for future year VMT based off of the *2016-2040 Regional Transportation Plan (RTP) and Sustainable Communities Strategies (SCS)* thresholds set by the Southern California Association of Governments (SCAG) in April of 2016 for the San Bernardino County. The future year baseline levels can be found through the SCAG VMT Screening Model by Fehr and Peers (the link is provided in **Section 2.1 – Screening Analysis)**

OPTION 4 – Baseline VMT

When utilizing this methodology, any proposed projects for the region would be required to ensure that the VMT for the project is below the existing baseline levels. The existing baseline levels can be found through the SCAG VMT Screening Model by Fehr and Peers.

1.3 – Existing City Conditions

As the VMT of a project is heavily influenced by the location, size, and land use mix, the General Plan for the City of Colton and specific plans within Colton are provided in **Figures 3 through 7**. Factors such as shopping, school, recreational, housing, and employment availability affect whether the City population and nearby regions will be using the project as an alternative to a farther facility (decreasing VMT), serving populaces that generate higher / lower VMT, etc.

NOTE: Reche Canyon Specific Plan was not included as there was not a *legible* copy available as of writing this technical memorandum.
https://www.ci.colton.ca.us/DocumentCenter/View/276/Reche-Canyon-Specific-Plan?bidId=

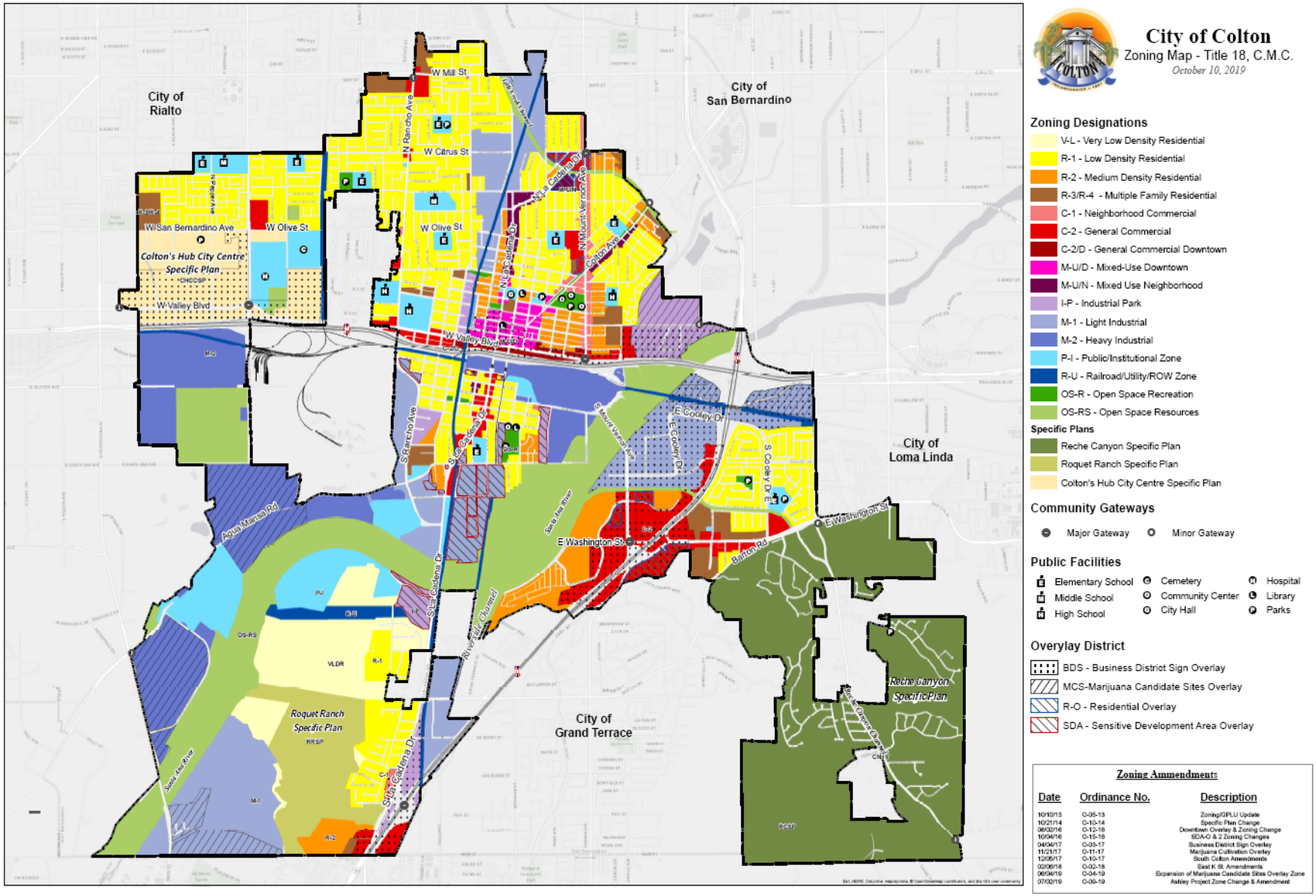


Figure 3: City of Colton General Plan

Figure 4: Downtown Colton Specific Plan

Figure 5: Colton's Hub City Centre Specific Plan

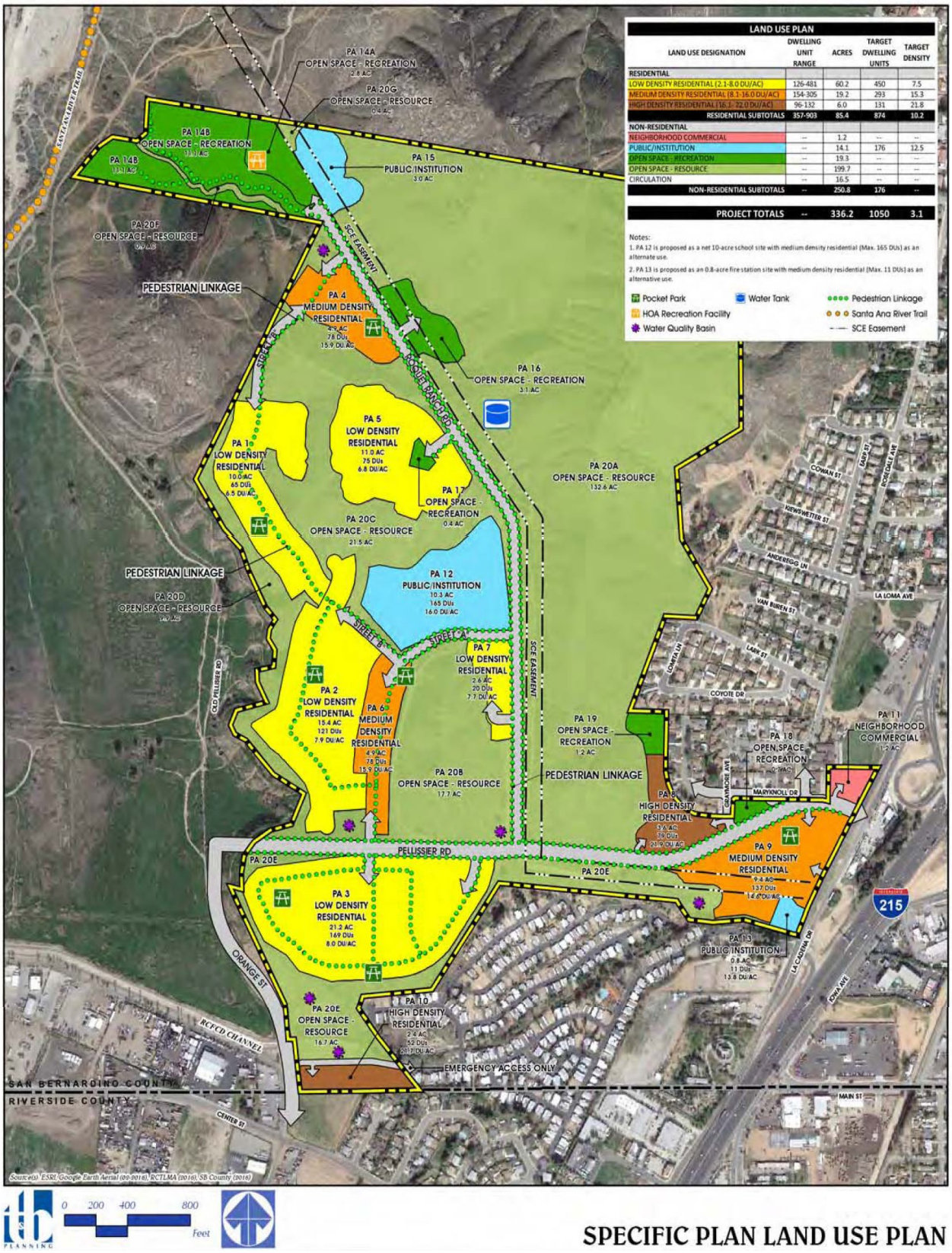


Figure 6: Roquet Ranch Specific Plan

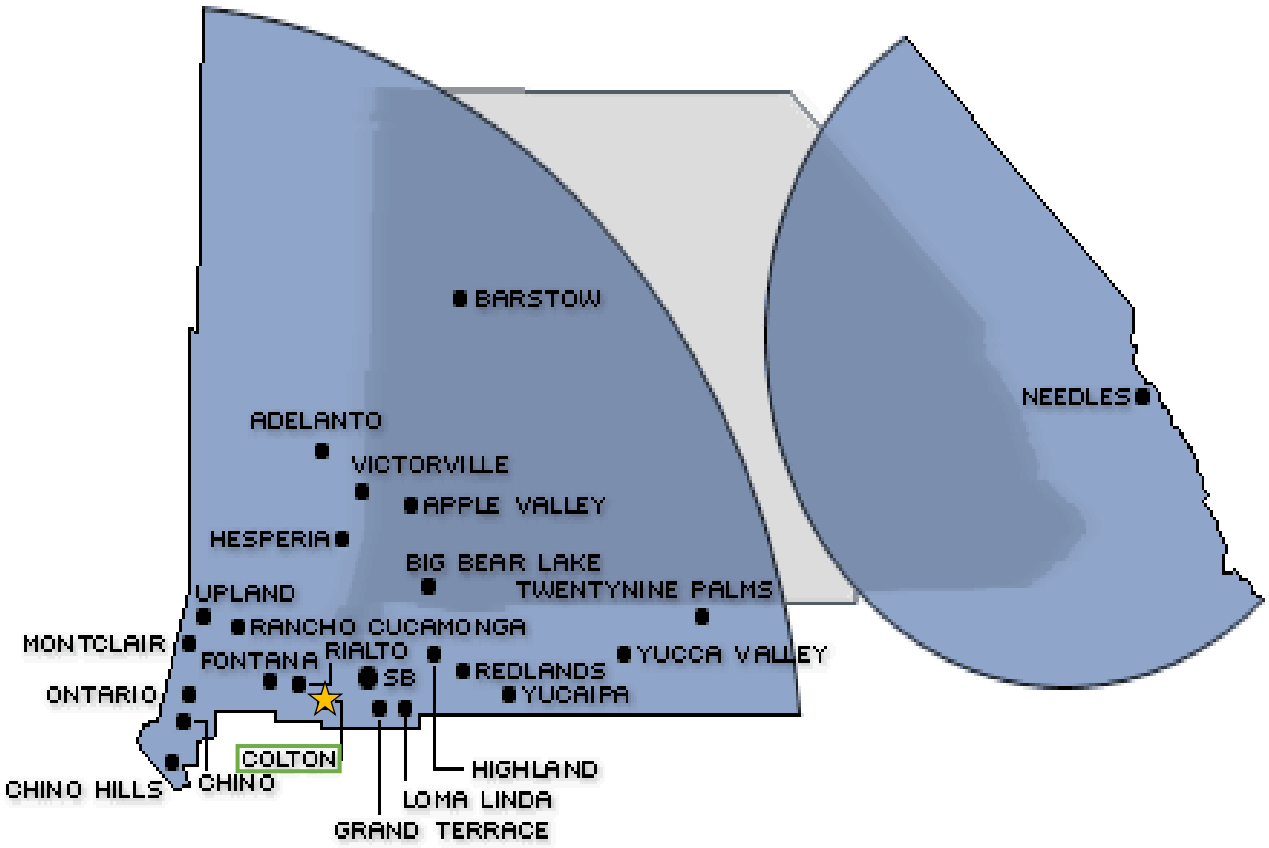


Figure 7: San Bernardino County City Map

Source: San Bernardino County City, Communities, Towns & Incorporated Cities. https://www.sbcounty.gov/main/pages/Cities.aspx

Passing through the City of Colton, are Interstate 10 (I-10) and Interstate 215 (I-215). The I-10 Freeway separates North and South Colton as a major East-West oriented freeway. In contrast, the I-215 Freeway runs through Eastern Colton as a North-South oriented freeway. The major corridors within the City of Colton consist of the following:

- La Cadena Drive (North-South oriented)
- Mill Street (East-West oriented)
- Rancho Avenue
- San Bernardino Avenue
- Valley Boulevard
- Agua Mansa Road
- Washington Street
- Barton Road
- Cooley Drive
- Mount Vernon Avenue
- Colton Avenue
- Reche Canyon Road

The map displaying the street classifications for the previously mentioned freeways and arterials are given in the City of Colton Street Classification from the City's *General Plan: Mobility Element*, shown in **Figure 8. Figure 9** provides the dimensions for the street classification standards in the City of Colton.

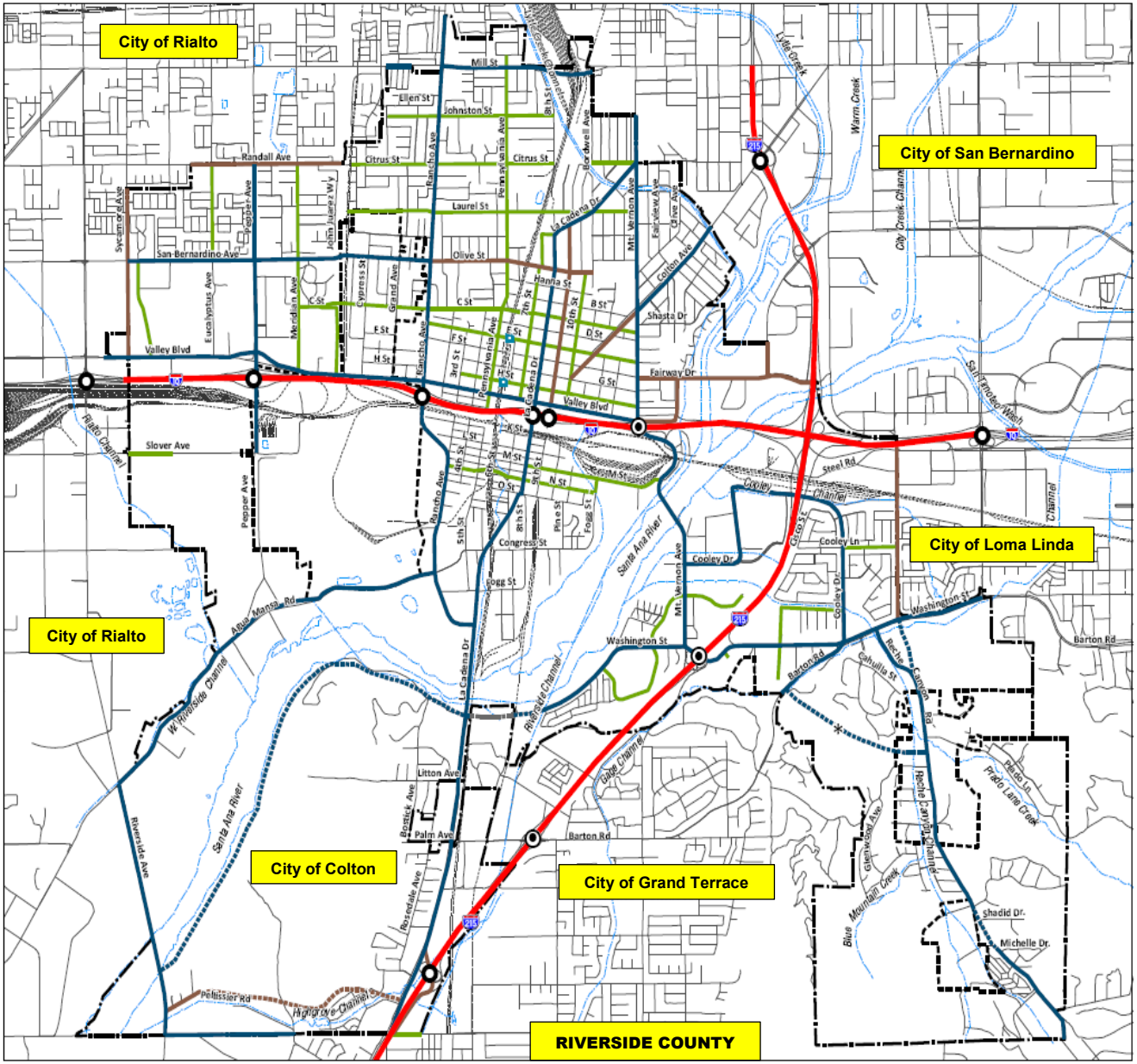


Figure 8: Street Classification Plan

Circulation Plan
- Freeway
- Major Arterial
- Planned Arterial
- Secondary Arterial
- Planned Secondary
- Collector Street
- Planned Collector
- Planned Roadway Located in Another City

* Conceptual roadway location. Final roadway location to be determined on proposed subdivision design.

Freeway Interchanges
- Interchanges
- Interchanges with Planned Improvements

Street Closure
- Street Closure (BSNF Quiet Zone Project)

Boundaries
- City Boundary
- Sphere of Influence
- Railroad Tracks
- Watercourse

Date: January 5, 2012
Prepared by: Hogle-Ireland, Inc.
Source: San Bernardino County Assessor, 2010 and City of Colton, 2011.

0 2,000 4,000 6,000 8,000 Feet

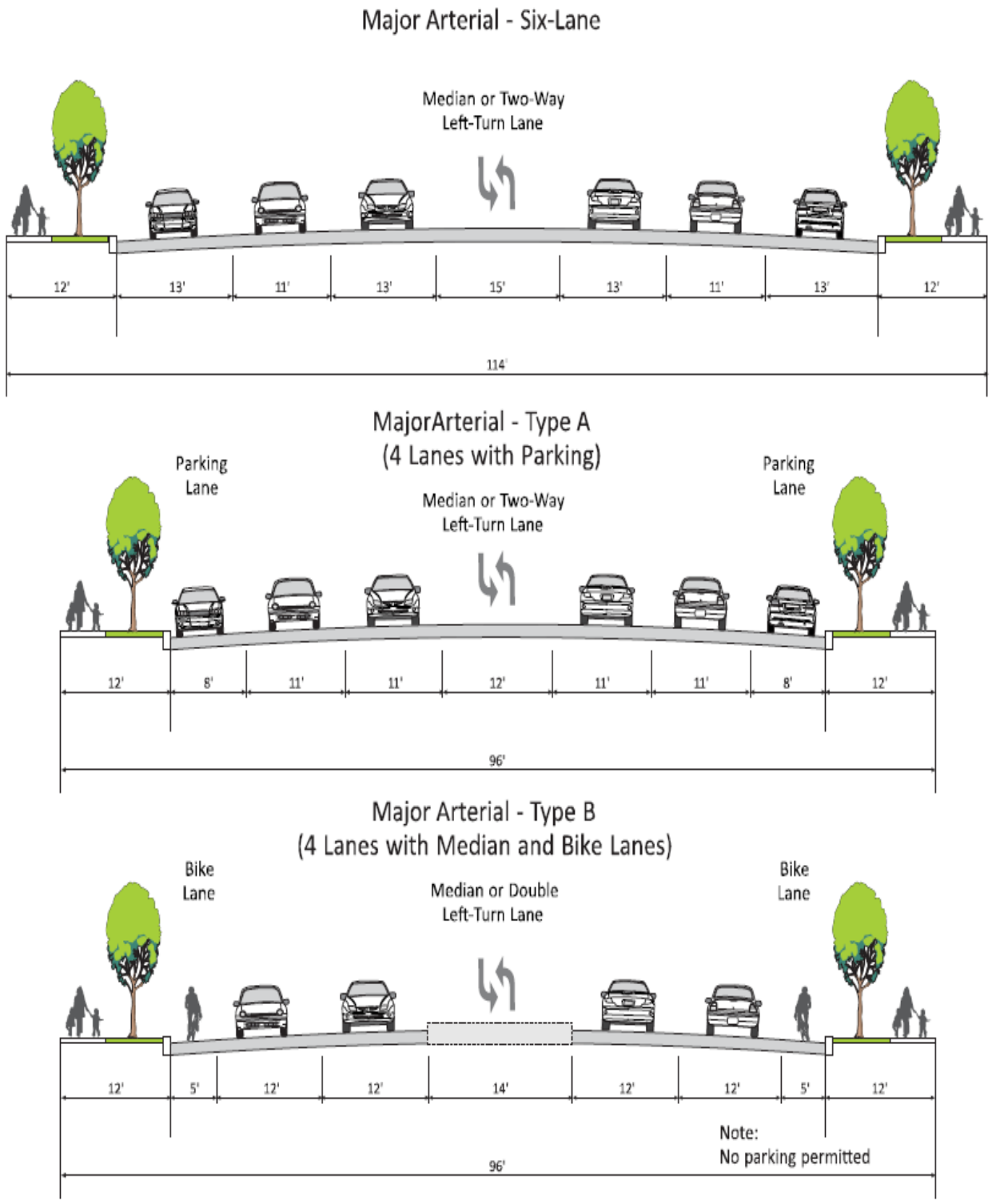


Figure 9A: Major Arterial Types and Dimension Standards

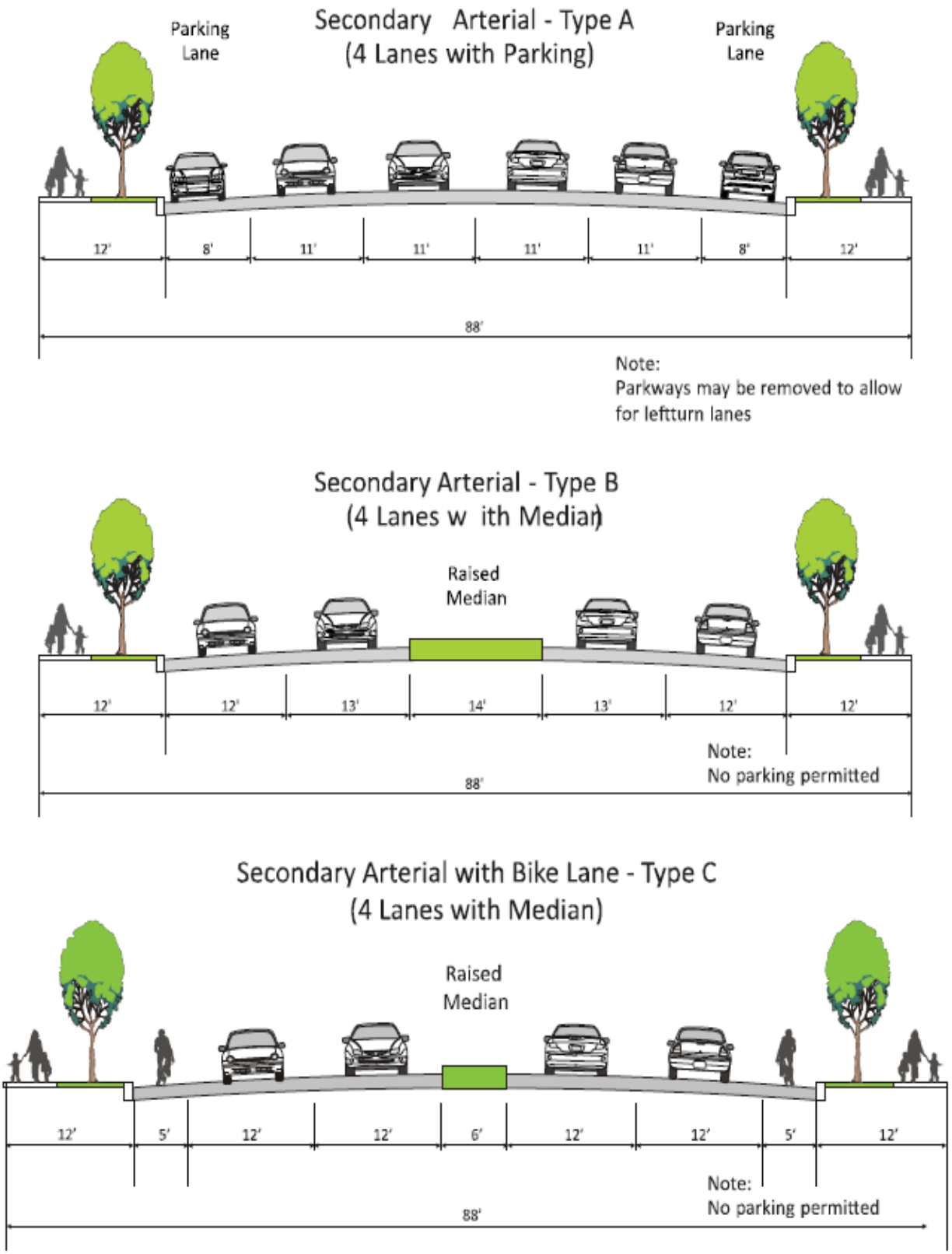
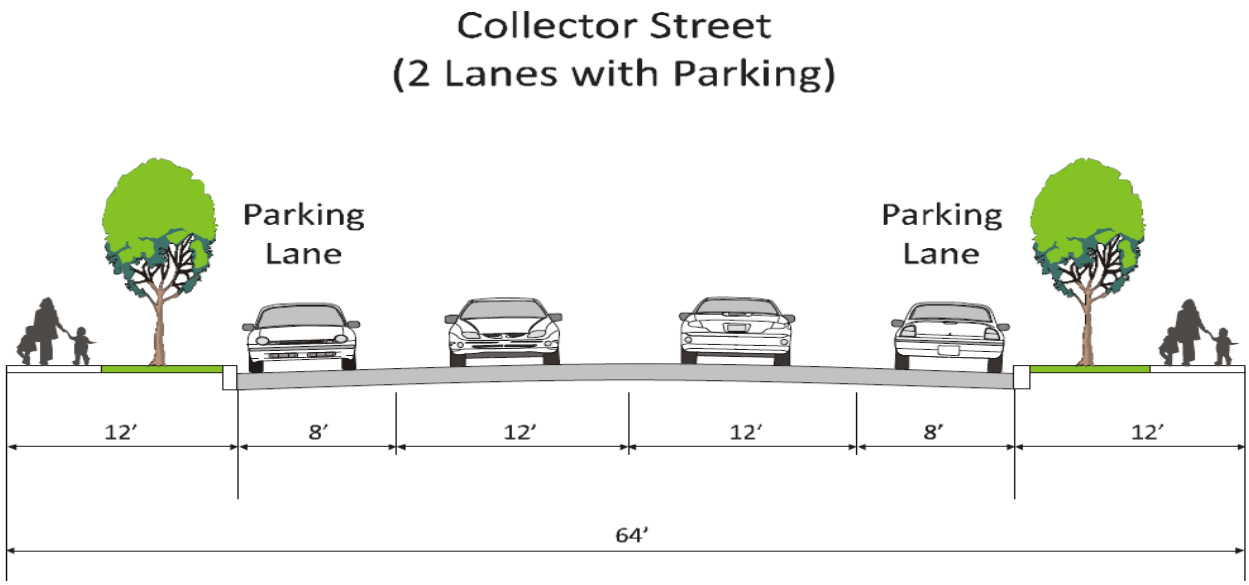
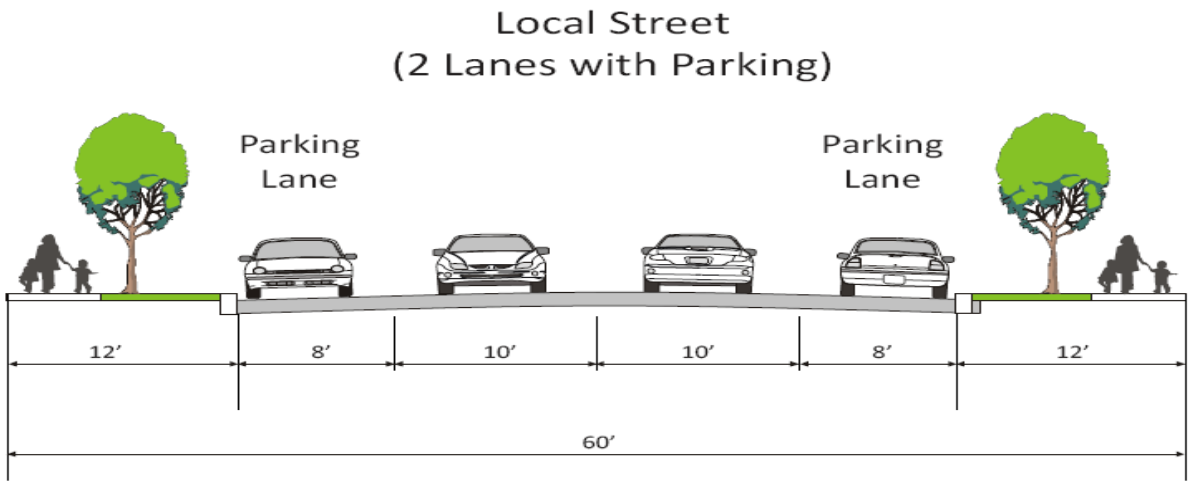


Figure 9B: Secondary Arterial Types and Dimension Standards





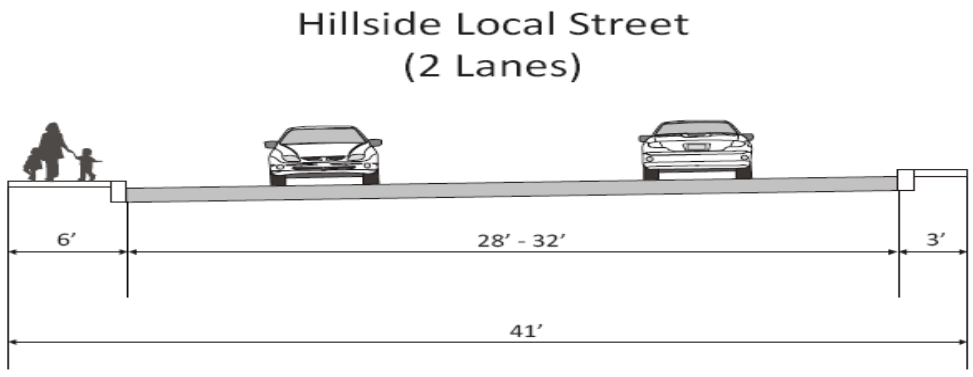


Figure 9C: Collector and Local Street Types and Dimension Standards

In order to provide a comprehensive analysis of the VMT for the City of Colton, existing SBTAM VMT values are providing for the City of Colton, Unincorporated Counties of San Bernardino Count, San Bernardino County, and the SBTAM Model for the 2016 Base Year and 2040 Horizon Year in **Table 1**. The table provides values to use for the Origin-Destination and Production-Attraction methodology recommended for the City of Colton.

SBTAM model run results for the City of Colton and the County are provided in **Appendix A**.

Table 1: San Bernardino County and City of Colton Summary of Baseline and Horizon Year VMT

Origin – Destination (OD)				
Geography	**2016 Base Year**		**2040 Horizon Year**	
	Total VMT	**VMT per Service Population**	**Total VMT**	**VMT per Service Population**
City of Colton	2,076,790	29.0	2,786,321	30.5
Unincorporated County	17,241,877	43.5	24,565,121	47.7
San Bernardino County	95,594,182	32.7	132,268,982	35.3
SBTAM Model	799,186,881	30.8	961,251,186	30.1
Production – Attractions (PA)				
City of Colton	1,674,193	23.38	2,178,585	23.83
Unincorporated County	13,811,917	34.81	9,140,681	22.39
San Bernardino County	77,654,685	28.47	99,660,396	26.58
SBTAM Model	421,498,155	16.37	777,335,024	24.32

Of the four (4) analysis regions the City of Colton has the lowest Total VMT for both the 2016 Base Year and 2040 Horizon Year using Origin / Destination and Production / Attraction methodologies, whereas the SBTAM has the highest Total VMT. For the Origin / Destination methodology, when analyzing the 2016 Base Year the City of Colton had the lowest VMT per service population of twenty-nine (29), whereas the Unincorporated counties of San Bernardino County has the largest VMT per service population of 43.5.

Alternatively, the 2040 Horizon Year for Origin / Destination has the largest VMT per service population for the Unincorporated Cities of San Bernardino County and the lowest VMT per service population for the entire SBTAM model. The 2016 Base Year using Production / Attractions methodology, has similar results with the highest VMT per service population in the Unincorporated Cities and lowest in the SBTAM model. The 2040 Horizon Year predicts the highest VMT per service population when using Production / Attractions would be in San Bernardino County and the lowest in the Unincorporated Counties of San Bernardino.

2.0 – Methodology

For the purpose of analysis, all subsequent references to Vehicle Miles Traveled (VMT) defines the automobile travel as the distance attributable to cars and light trucks. As per the Technical Considerations of the December 2018 *Technical Advisory on Evaluating Transportation Impacts in CEQA* by the California Governor's Office of Planning and Research (OPR), heavy duty trucks are excluded from the VMT analysis for modeling convenience and ease of calculation unless deemed required per City judgement. As the primary developments planned for the City of Colton consist of warehouses, distribution and logistics centers serving mainly heavy duty trucks, exemptions have been made for these development types (See 2.3 – Land Development Projects: Retail for more information).

2.1 – Screening Analysis

For **Trip Screening** per San Bernardino County & SBCTA VMT Guidelines and OPR's technical advisory, a project can be assumed to generate a less than significant impact if it is found to attract ***less than or equal to 110 project trips per day*** with exemptions for the following facilities:

- Existing facilities
- Additions to existing facilities where the addition is less than 10,000 square feet in a location where public infrastructure is available and not environmentally sensitive

The 110 project trips is based off a study finding a linear relationship between gross floor area and trip generation for office buildings, where for the first 10,000 square feet of office space, there is approximately 110 trips generated. The San Bernardino County Transportation Impact Study Guidelines' VMT also define typical project types which pass the screening criteria and are no longer required to perform a comprehensive VMT analysis:

- 11 single family housing units
- 16 multi-family, condominiums, or townhouse housing units
- 10,000 square feet of office
- 15,000 square feet of light industrial[1]
- 65,000 square feet of warehousing[1]
- 79,000 square feet of high cube transload and short-term storage warehouse[1]
- 12 hotel rooms

Land Use Type's screening criteria identifies project types which are assumed to have a negligible impact upon the City's VMT. The assumption is based upon local serving projects (e.g. local gas stations) redirecting and encouraging local traffic from traveling to further locations, lowering the VMT for the City. Project types falling under the screening criteria includes the following:

- K-12 Schools
- Local-serving retail less than 50,000 square feet

[1] Threshold is an approximation based upon the *ITE Trip Generation Manual 10th Edition* for Land Use (LU) Codes 110 (General Light Industrial), 150 (Warehousing), 154 (High-Cube Transload and Short-Term Storage Warehouse) and may vary depending on the tenant and site use.

- Local parks
- Day care centers
- Local serving gas stations
- Local serving banks
- Student housing projects
- Local serving community colleges

High Quality Transit Areas (HQTA). Projects which are located within half (1/2) of a mile from an existing major transit stop or within half (1/2) of a mile from an existing stop along a high quality transit corridor. The criteria uses the assumption that the project service population's primary mode of transportation will be the existing City transportation infrastructure and is therefore excluded from generating additional VMT for the project. The OPR lists exceptions to this criteria where specific projects where found to generate significant amounts of VMT regardless of being located near an existing major transit stop / existing stop along a high quality transit corridor:

- Floor-to-Area Ratio (FAR) of the project is less than 0.75
- Constructs a smaller number of moderate or high-income residential units than the existing number of affordable residential units

The Southern California Association of Governments' RTP / SCS provides a map of the high quality transit corridors and major transit stops within San Bernardino County and is shown in **Figure 10** below.

Low VMT Areas. A similar region dependent threshold is used for the identification of low VMT areas, where the project construction's VMT generation, due to being located in an already low VMT area, is assumed to be negligible. The threshold for consideration of "low" VMT is determined to be 15% below the City of Colton's average from the 2016 Baseline of 23.30 VMT, however some TAZs within the City of Colton are not under the jurisdiction of the City and will use a 15% threshold for the dictating City.

Figure 11 identifies the Traffic Analysis Zones (TAZ) within the City of Colton and **Figure 12** provides the analysis results of the low VMT TAZ within the City of Colton.

The screening tool developed by *Fehr and Peers* for the San Bernardino County Transportation Authority performs the initial screening for individual parcels and the parcel's respective threshold for each option. The screening tool can be found at the following: https://devapps.fehrandpeers.com/sbctavmt/

Figures 13 and 14, also given in the appendix, provide flowcharts summarizing the VMT analysis methodology.

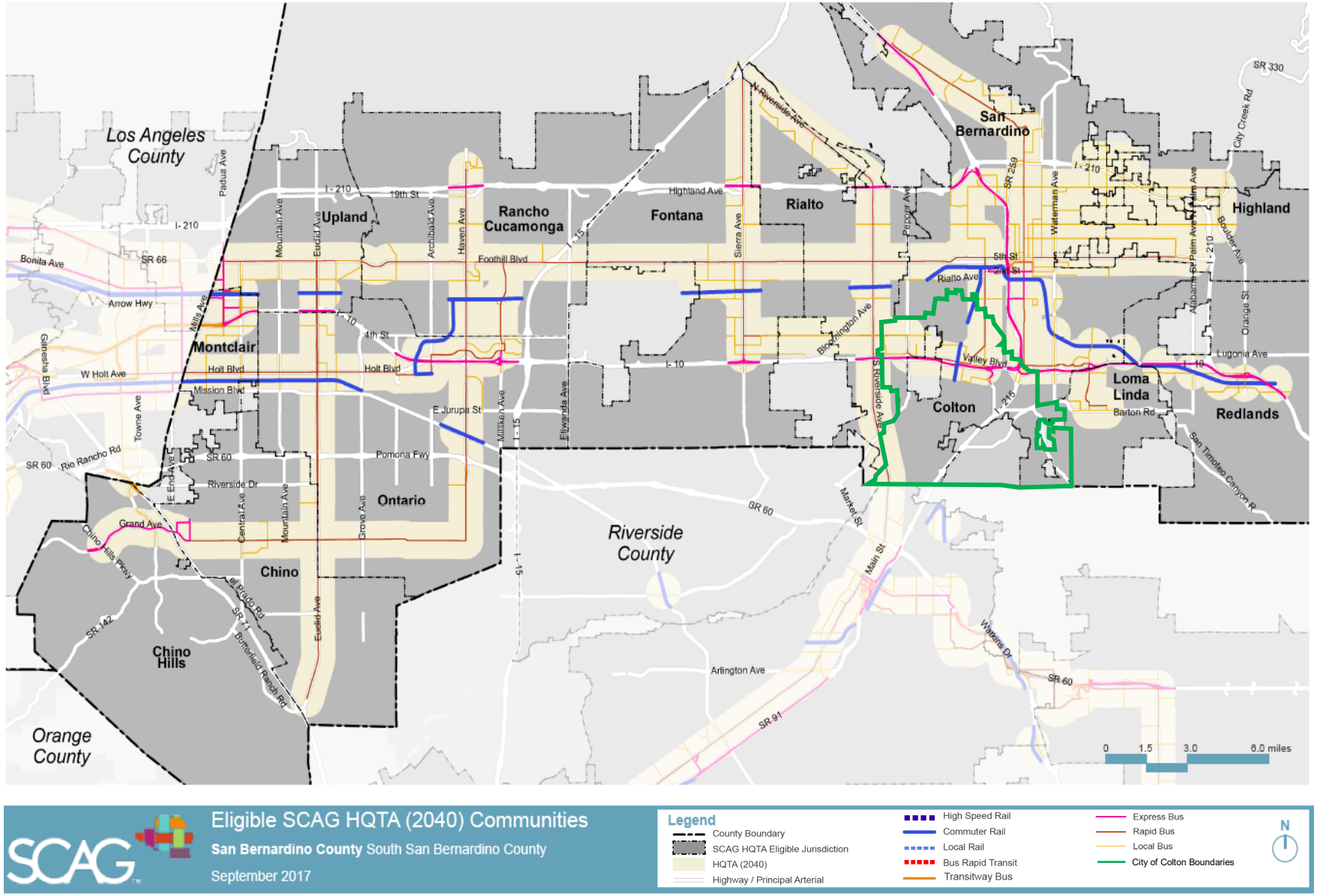


Figure 10: Southern California Association of Governments (SCAG) High Quality Transit Area (HQTA) Map

City of Colton
Traffic Analysis Zones (TAZ)

A - 53766101	X - 53778401
B - 53773201	Y - 53778402
C - 53766201	Z - 53778302
D - 53766102	AA - 53787101
E - 53775101	AB - 53797201
F - 53775201	AC - 53774101
G - 53757301	AD - 53762101
H - 53766202	AE - 53774201
I - 53766301	AF - 53789301
J - 53775301	AG - 53789302
K - 53775401	AH - 53774501
L - 53778201	AI - 53762101
M - 53778101	AJ - 53774202
N - 53757302	AK - 53774401
O - 53765101	AL - 53789201
P - 53765201	AM - 53769301
Q - 53775302	AN - 53780101
R - 53775402	AO - 53780201
S - 53778202	AP - 53788202
T - 53765102	AQ - 53799201
U - 53765202	AR - 53809201
V - 53772101	AS - 53788201
W - 53772201	

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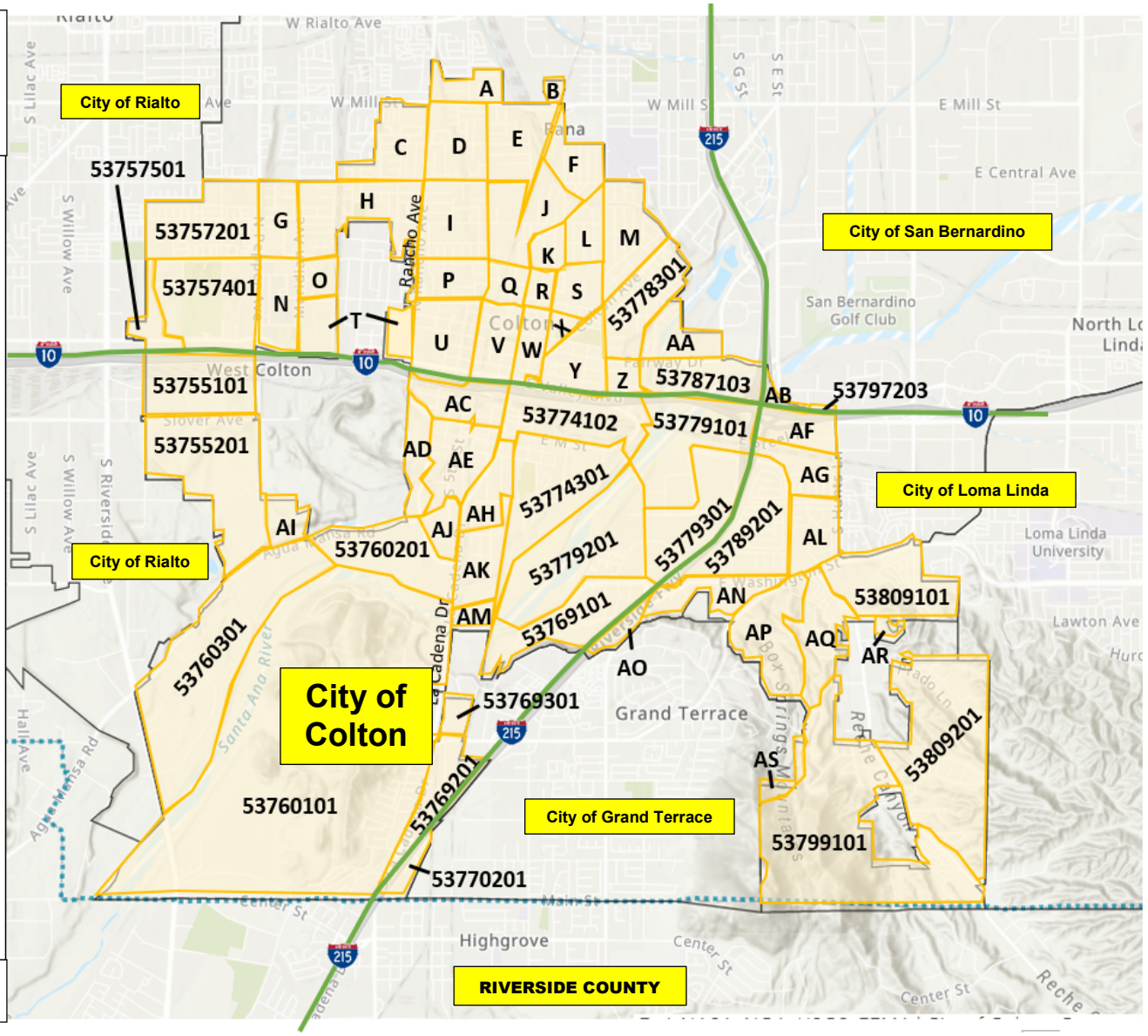


Figure 11: City of Colton Traffic Analysis Zones (TAZ)

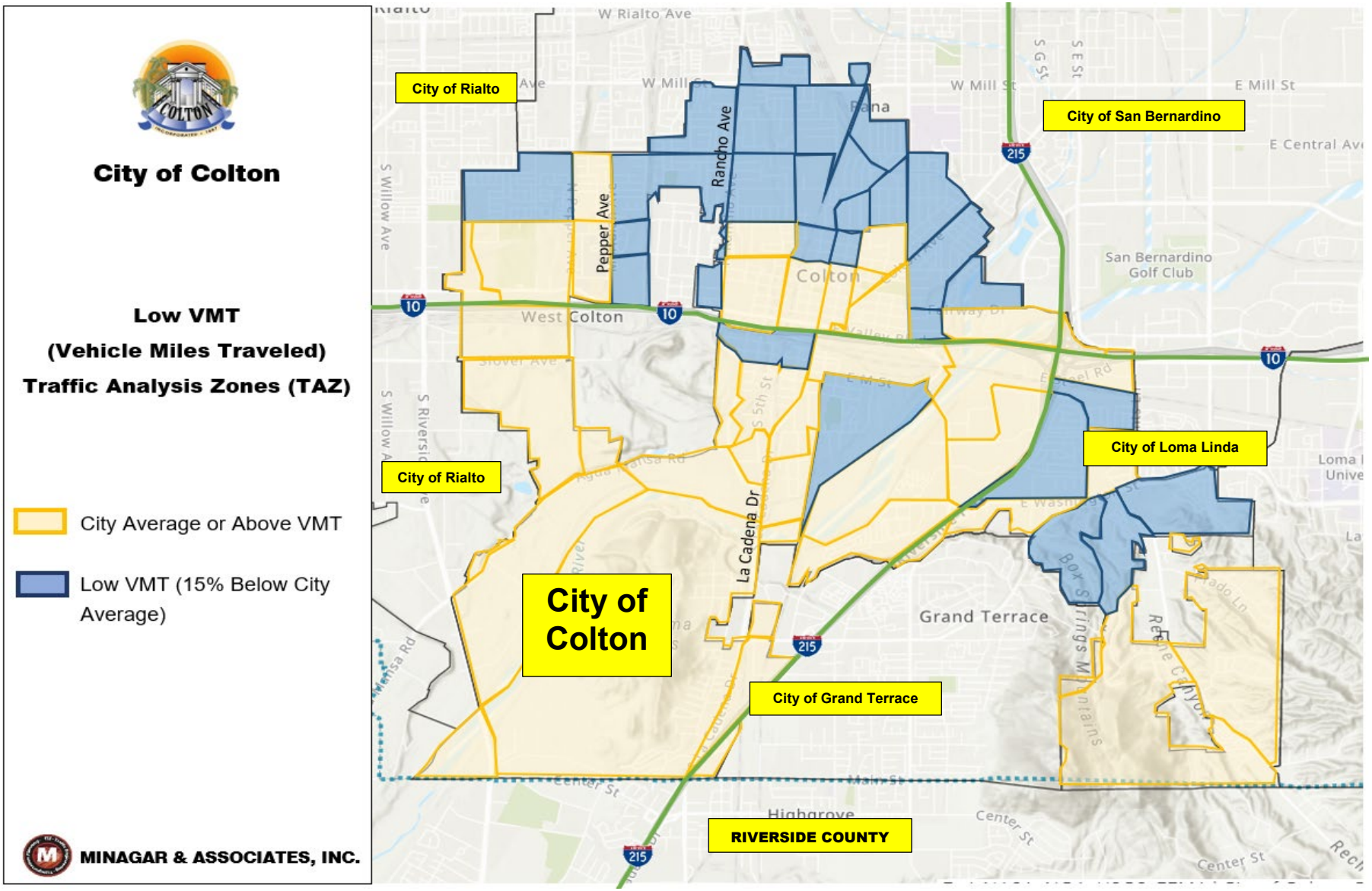
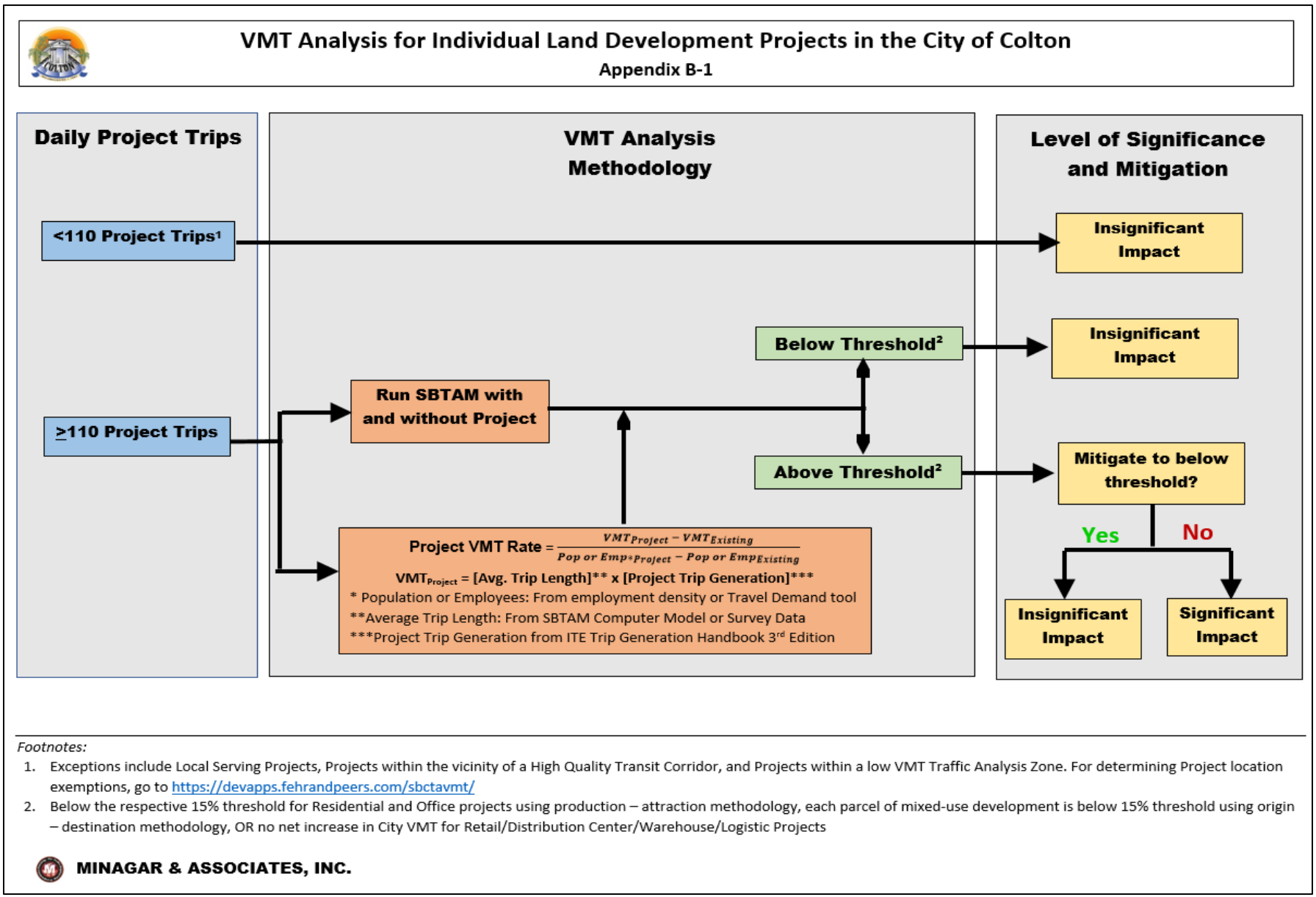


Figure 12: City of Colton Low Vehicle Miles Traveled, Traffic Analysis Zone



Footnotes:

1. Exceptions include Local Serving Projects, Projects within the vicinity of a High Quality Transit Corridor, and Projects within a low VMT Traffic Analysis Zone. For determining Project location exemptions, go to https://devapps.fehrandpeers.com/sbctavmt/
2. Below the respective 15% threshold for Residential and Office projects using production – attraction methodology, each parcel of mixed-use development is below 15% threshold using origin – destination methodology, OR no net increase in City VMT for Retail/Distribution Center/Warehouse/Logistic Projects

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Figure 13: VMT Analysis Flowchart for Land Development Projects

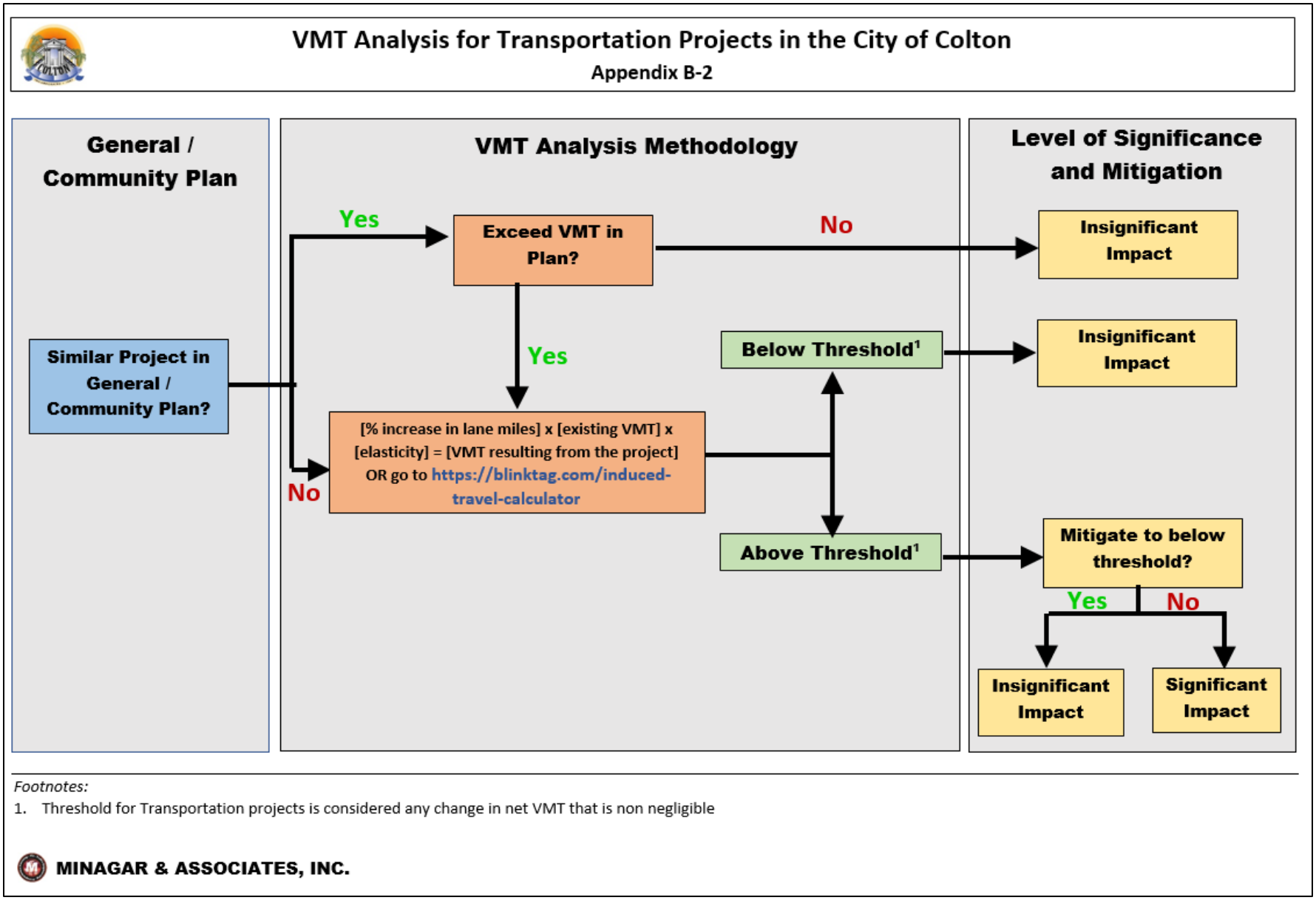


Figure 14: VMT Analysis Flowchart for Transportation Projects

2.2 – Land Use Plans

For Land Use Plans (e.g. General Plans, Specific Plans, etc.), depending on the size of the project region, may influence areas outside of the City jurisdiction. For this scenario VMT analysis should be performed for both the City and affected region outside of the City. Due to the general large scale of land use plans, the screening criteria is not applicable and requires a VMT analysis of each parcel of the land use plan. As recommended by the OPR, the overall land use plan has a significant impact on the City VMT when one or more land development projects within the Land Use Plan fails to meet the criteria established in **Section 2.3 – Land Development Projects.**

2.3 – Land Development Projects

The types of trips used for the VMT analysis is dependent upon the project development type. As described in the OPR guidelines, any VMT generated for the proposed project should not be discounted even when crossing jurisdictional boundaries, however due to the City of Colton residing in the largest county in the United States, San Bernardino County, which is primarily occupied by deserts, *a VMT analysis using citywide benchmarks is recommended*.

Consistent with the Traffic Study Guidelines by the County of San Bernardino, the following project types and their respective guidelines will be used for the analysis. To account for trips both inside and outside the model boundary, *a Production-Attraction (PA) and Origin-Destination (OD) analysis method* will be used in accordance with the San Bernardino County Transportation Authority (SBCTA) model (aka SBTAM).

The project's analysis of resulting VMT rate will be evaluated and compared against the VMT rate threshold mentioned below, using the County's VMT traffic model (SBTAM). The County's VMT traffic model can calculate County conditions with and without the proposed Project.

The VMT rate for residential and non-residential projects may also be found using the equation below, where difference in VMT with and without the Project is divided by the parcel population or number of employees with and without the Project:

$$\textbf{Project VMT Rate} = \frac{VMT_{Project} - VMT_{Existing}}{Pop\ or\ Emp_{Project} - Pop\ or\ Emp_{Existing}}$$

For residential and office projects, the project VMT rate would be compared against the project's respective thresholds to determine whether the additional VMT created by the project is significant.

The VMT for the potential project can be estimated using the *ITE Trip Generation Handbook 3rd Edition* for the project land use, using vehicle type parameters mentioned in **2.0 – Methodology.** As detailed in the OPR Guidelines, VMT should be estimated by the following equation:

$$\textbf{VMT}_{\textbf{Project}} \textbf{ = [Avg. Trip Length] x [Project Trip Generation]}$$

Where the average trip length and trip generation rates for each trip purpose are obtained using the SBTAM model and *ITE Handbook 3rd Edition*, respectively. Alternatively, an average home-based work automobile trip length of 12.6 miles may be used from the 2010-2012 California

Household travel survey for the region under the Southern California Association of Government's jurisdiction, and an average trip length of 39.9 miles can be utilized for heavy trucks based on the SCAG 2016 RTP.

Alternatively, the VMT generated by a project can be calculated through Planning / Travel Demand Tools as reviewed by Fehr and Peers *Technical Memorandum on the Review and Assessment of Existing Planning/Travel Demand Tools for SB 743.*

An estimate of the project population can be found by multiplying the employment density by the project parcel size. As of the October 31, 2001 *Employment Density Study Summary Report* by SCAG, the employment density is dependent on the land use category and is summarized in **Table 2.** Due to retail projects being highly dependent on external factors, there is not a service population density for retail projects at the time of this technical memorandum. Similarly, due to residential projects being highly dependent upon the Project location and type, there is no standard value to generate the population from housing projects, but may be offered in the Planning / Travel Demand Tools (e.g. 2016 CalEEMod).

Table 2: San Bernardino County Employment Density Summary

Land Use Type	Average Square Feet per Employee
Regional Retail	1,009
Other Retail	124
Low-Rise Office	697
High-Rise Office	N/A**
Hotel/Motel	2,544
R & D*/Flex Space	834
Light Manufacturing	705
Heavy Manufacturing	N/A**
Warehouse	1,195
Government Office	188

* R & D: Research and Development
** N/A: Not Available

The threshold values below are based upon an SBTAM model runs for the baseline and horizon year. As it is unlikely for a project to be built on the base year or horizon year provided, a linear interpolation method can be used for project years between 2016 and 2040.

Residential Projects will use a tour-based assessment of VMT focusing on home-based trips. As home based trips are more likely to remain within the City boundaries, a PA analysis method is used for residential projects. The tour-based assessment will look at the productions of the proposed project where it calculates the amount of VMT generated per person for all home-based trips.

Table 3, provides the thresholds for residential projects using Options 1-4 for the 2016 Base Year and 2040 Horizon Year.

Table 3: Residential Projects PA Thresholds

OPTION	2016 Base Year*		2040 Horizon Year	
	Total VMT	VMT per Capita	Total VMT	VMT per Capita
OPTION 1	**532,704**	**9.92**	**677,650**	**10.38**
Option 2	537,091	10.00	683,231	10.47
Option 3	N/A*	12.20	N/A*	12.20
Option 4	626,711	11.67	797,236	12.22

N/A*: Not Available

Office Projects, which includes generic office, industrial, governmental, and institutional projects, will also use a tour-based assessment with a focus on home-based-work trips for all employees. These trips are designated as attractions of the PA analysis methodology. For the case of government offices, if the amount of customer trips deems it necessary, can be analyzed as a retail project. The analysis of office projects will use the amount of VMT per employee for only home-based-work trip purposes.

Table 4, provides the thresholds for office projects using Options 1-4 for the 2016 Base Year and 2040 Horizon Year.

Table 4: Office Projects PA Thresholds

OPTION	2016 Base Year		2040 Horizon Year	
	Total VMT	VMT per Employee	Total VMT	VMT per Employee
OPTION 1	**281,162**	**15.69**	**388,835**	**14.86**
Option 2	283,477	15.82	392,037	14.99
Option 3	N/A*	17.50	N/A*	17.50
Option 4	330,779	18.46	457,454	17.49

N/A*: Not Available

Retail Projects utilize the PA analysis method where the non-home based, home-based work, and home-based other trips represent the worker and visitor attraction trips. As the City of Colton is a primarily industrial and residential City as seem in **Figure 4**, any retail developments are likely to be local-serving, therefore the VMT will be assessed per service population, which includes customers and employees.

As per the discussions for Option 1, since retail projects tend to redirect travel rather than generate traffic, a significant impact will occur when the Project causes a significant net increase in the total VMT. The total VMTs for the City of Colton are included in **Table 5** as a reference, but would require modelling to determine significance of the Project.

Table 5: Retail Projects PA Thresholds (Trucks included)

OPTION	2016 Base Year		2040 Horizon Year	
	Total VMT	VMT per Service Population	Total VMT	VMT per Service Population
Option 1	**1,674,193**	**23.38**	**2,178,585**	**23.83**

N/A*: Not Available

Distribution Centers/Warehouses/Logistic Center Projects will utilize thresholds similar to retail projects where significance is based on the net increase in total VMT. The Project will analyze the VMT impact by addressing the amount of VMT generated per employee.

Mixed-Use Projects in the City of Colton will use the OD analysis methodology for simplification of trip purposes for the proposed project. The VMT analysis for mixed-use projects may consist of Home-Based Work, Home-Based Other, and Non-Home Based depending on the analysis method of the Traffic Study, while including internal capture of the project. The mixed-use development will use a VMT analysis method where each parcel type of a land development will be analyzed independently against the threshold.

Each parcel type will be compared against the Origin-Destination threshold shown in **Table 6**, rather than the Production-Attraction thresholds.

Table 6: Mixed-Use Projects OD Thresholds

	2016 Base Year		2040 Horizon Year	
	Total VMT	**VMT per Service Population**	**Total VMT**	**VMT per Service Population**
OPTION 1	**1,765,272**	**24.65**	**2,368,373**	**25.91**
Option 2	1,799,809	24.85	2,387,877	26.12
Option 3	N/A*	30.2	N/A*	30.2
Option 4	2,076,790	29.0	2,786,321	30.5

N/A*: Not Available

2.4 – Transportation Projects

As mentioned in the OPR, transportation projects that will not significantly impact the amount of vehicle travel and can be excluded from VMT analyses, which include but is not limited to rehabilitation, maintenance, roadside safety devices, reducing capacity, etc. When a project is determined to create a net increase in City VMT, it is found to have a significant impact.

Transportation Projects that increase roadway capacity typically induce travel and VMT analysis methodologies are applied. The SBTAM will be used to assess the total VMT within the City of Colton before the project and after project opening.

OPR offers an alternative methodology for determining the project VMT using the following equation:

[% increase in lane miles] x [existing VMT] x [elasticity] = [VMT resulting from the project]

Where the *elasticity* is an estimate of the percent change in VMT for every percent change in miles to the roadway system. Based off studies performed by the Governor's Office of Planning and Research, an *elasticity* of 1% can be assumed. The National Center for Sustainable Transportation offers an analysis tool, utilizing the aforementioned equation for Caltrans maintained facilities: https://blinktag.com/induced-travel-calculator

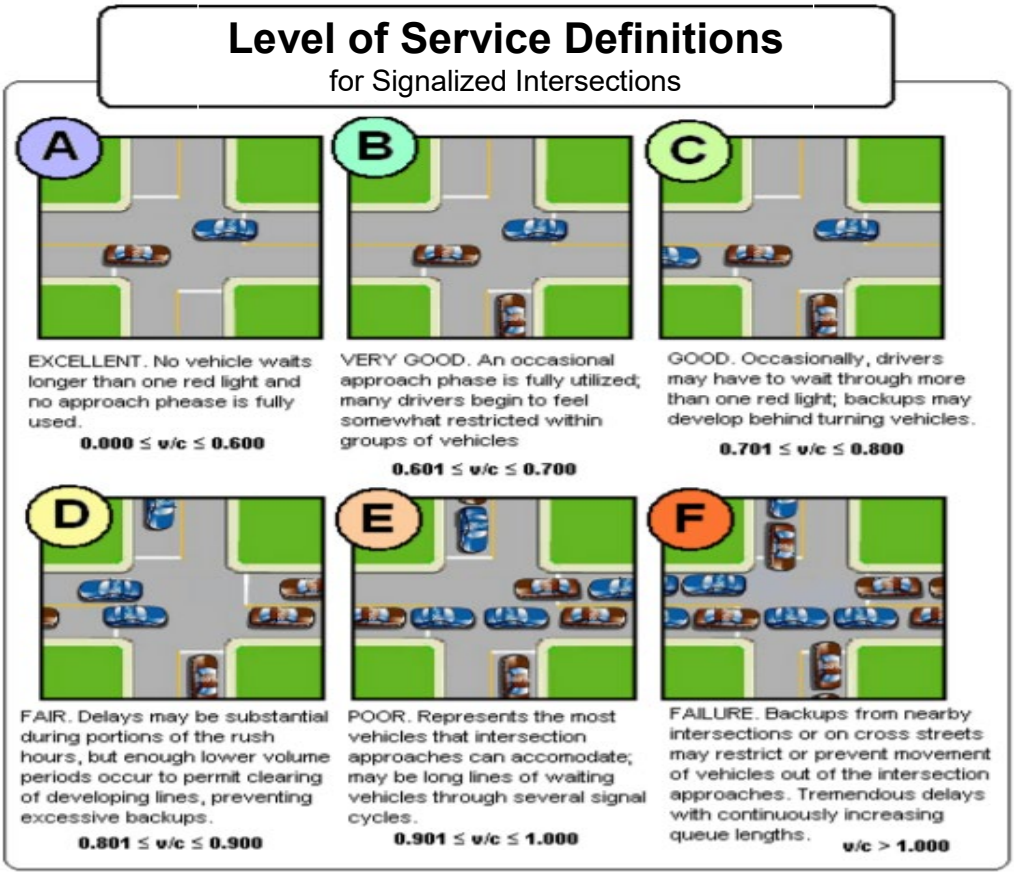
2.5 – Local Traffic Assessment Methodology

Although the Level of Service (LOS) is not required by the VMT Guidelines, it is an important factor to determine the operational impact of the project on nearby intersection. Determining the operational impact is critical for the City to ensure a safe and efficient roadway infrastructure and is recommended that *the City maintains Level of Service analysis for the City's Traffic Impact Analyses criteria.*

As per the City of Colton's *General Plan: Mobility Element*, revised November 2016, in order to allow for mobility within the City, a threshold of LOS D is set for most roadways and at signalized intersections. Although the threshold for LOS D, the City recognizes locations where an LOS D may not be feasible due to geometric and financial limitations.

Figure 15 provides LOS definitions.

Figure 15: LOS Definitions



Source: Table 1: Level of Service Definitions for Signalized Intersections", 2016 LADOT Transportation Impact Study Guidelines (December 2016), based on the Transportation Research Board (TRB)'s Interim Materials on Highway Capacity, Circular No. 212, Jan. 1980; and Highway Capacity Manual, 2010.

Table 7 summarizes the threshold criteria for LOS for both signalized and unsignalized intersections using the control delay.

Table 7: Control Delay Thresholds for Level of Service for Signalized & Unsignalized Intersections

Level of Service	Intersection Control Delay (Seconds/ Vehicle)	
	Signalized Intersection	Unsignalized Intersection
A	≤10.0	≤10.0
B	>10.0 to ≤20.0	>10.0 to ≤15.0
C	>20.0 to ≤35.0	>15.0 to ≤25.0
D	>35.0 to ≤55.0	>25.0 to ≤35.0
E	>55.0 to ≤80.0	>35.0 to ≤50.0
F	>80.0	>50.0

In the event that a project is found to significantly impact the Level of Service (LOS) of an unsignalized intersection, a Traffic Signal Warrant Assessment (TSWA) may be performed to determine whether signalizing the intersection is a feasible mitigation measure. The TSWA must be compliant with the methodology provided by latest CA-MUTCD (5th Revision of the 2014 CA-MUTCD as of the time this memorandum was written).

3.0 – Mitigation Methodology

As VMT mitigation measures available to projects are still being explored, potential mitigation procedures recommended by OPR and SBCTA include, but are not limited to the following:

- Relocation of the project to a more transit accessible site
- Incorporate affordable housing options
- Limit or eliminate parking for the project site
- Reduce trip lengths and / or number of trips to a project using Transportation Demand Management (TDM) Measures

4.0 – Conclusion

Minagar and Associates, Inc. recommends the City of Colton proceed with the VMT screening criteria recommended by *San Bernardino County Transportation Authority's City VMT Guidelines* Decision Checklist and generate a project VMT using Productions / Attractions and Origin / Destination VMT methodology. Additionally, VMT benchmarks are to be determined by City boundaries and OPR Technical Advisory Thresholds, which is set to 15% below the existing baseline City VMT for Residential, Office, and Mixed-Use Projects. For Transportation and Retail projects, the significance is determined by the net change of City VMT with the Project. In order to ensure mobility, safety, and efficiency Minagar also recommends the City to maintain its existing Level of Service (LOS) analysis procedures for Traffic Impact Analyses and Mitigation Measures Assessments.

5.0 – Resources

1. *Caltrans*. https://dot.ca.gov/programs/transportation-planning/office-of-smart-mobility-climate-change/sb-743 [Accessed May 20, 2020].

2. *California Air Resources Board.* https://ww2.arb.ca.gov/homepage. [Accessed May 20, 2020].

3. *Fehr and Peer's.* https://www.fehrandpeers.com/ [Accessed May 15, 2020].

4. *Fehr and Peer's.* https://www.fehrandpeers.com/wp-content/uploads/2019/12/Tools-Assessment.pdf [Accessed June 2, 2020].

5. *Governor's Office of Planning and Research*. http://opr.ca.gov/ [Accessed May 14, 2020].

6. Minagar & Associates, Inc. Unpublished Research on Impacts of VMT versus LOS Methodologies, 2019 & 2020

7. *San Bernardino County Transportation Authority.* https://www.gosbcta.com/ [Accessed May 13].

8. *Southern California Association of Governments*. http://www.scag.ca.gov/Pages/default.aspx [Accessed May 18, 2020].

9. *Western Riverside County of Governments.* http://www.wrcog.cog.ca.us/ [Accessed May 18, 2020].

Appendix A: SBTAM Model Run for Colton

Appendix A: Production / Attraction

SBTAM Base Year - 2016

GEOGRAPHY	VMT All Vehicles		VMT Summary No Trucks		VMT Summary HB		VMT Summary HBW	
	Total VMT	VMT per Service Pop	Total VMT No Trucks	VMT per Service Pop	HB VMT	HB VMT per Capita	HBW VMT	HBW VMT per Worker
Colton	**1,674,193**	**23.38**	**1,668,718**	**23.30**	**626,711**	**11.67**	**330,779**	**18.46**
Unincorporated County	13,811,917	34.81	13,778,377	34.72	8,161,122	24.81	1,321,314	19.49
San Bernadino County	77,654,685	28.47	77,388,104	28.37	33,925,814	15.85	13,447,531	17.10
SBTAM Model	421,498,155	16.37	694,593,736	16.37	275,132,969	8.86	141,087,557	8.62

SBTAM Horizon Year - 2040

GEOGRAPHY	VMT All Vehicles		VMT Summary No Trucks		VMT Summary HB		VMT Summary HBW	
	Total VMT	VMT per Service Pop	Total VMT No Trucks	VMT per Service Pop	HB VMT	HB VMT per Capita	HBW VMT	HBW VMT per Worker
Colton	**2,178,585**	**23.83**	**2,173,109**	**23.77**	**797,236**	**12.22**	**457,454**	**17.49**
Unincorporated County	17,644,650	34.27	17,611,110	34.20	9,140,681	22.39	2,235,324	20.97
San Bernadino County	99,660,396	26.58	99,393,815	26.51	44,311,846	16.28	16,945,452	16.49
SBTAM Model	777,335,024	24.32	777,331,445	24.32	305,343,787	13.80	148,168,668	15.05

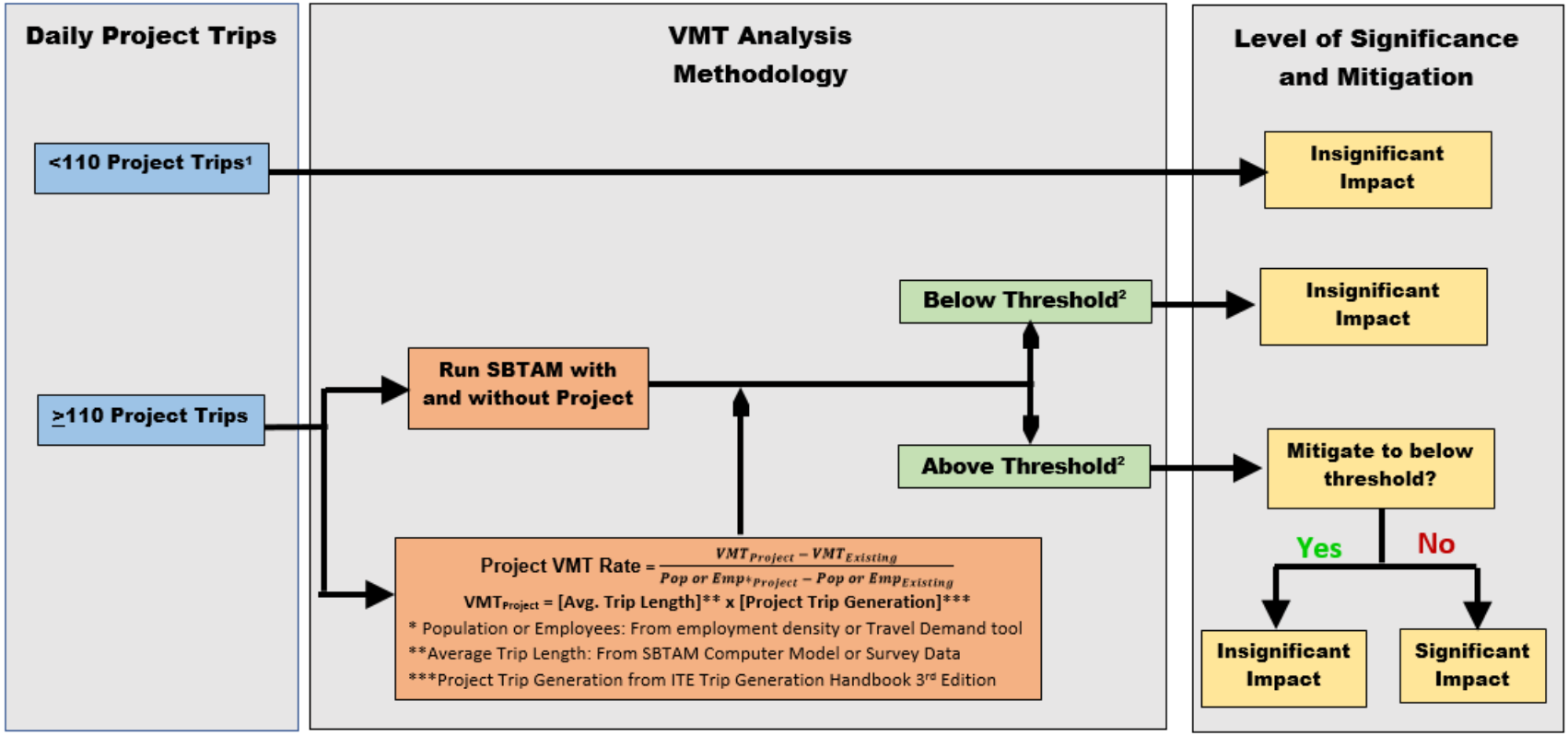
Appendix A: Origin / Destination

	SBTAM Base Year - 2016		SBTAM Horizon Year - 2040	
GEOGRAPHY	**VMT All Vehicles**		**VMT All Vehicles**	
	Total VMT	**VMT per Service Pop**	**Total VMT**	**VMT per Service Pop**
Colton	**2,076,790**	**29.0**	**2,786,321**	**30.5**
Unincorporated County	17,241,877	43.5	24,565,121	47.7
San Bernadino County	95,594,182	32.7	132,268,982	35.3
SBTAM Model	799,186,881	30.8	961,251,186	30.1

Appendix B: City of Colton VMT Analysis Flowchart

VMT Analysis for Individual Land Development Projects in the City of Colton

Appendix B-1

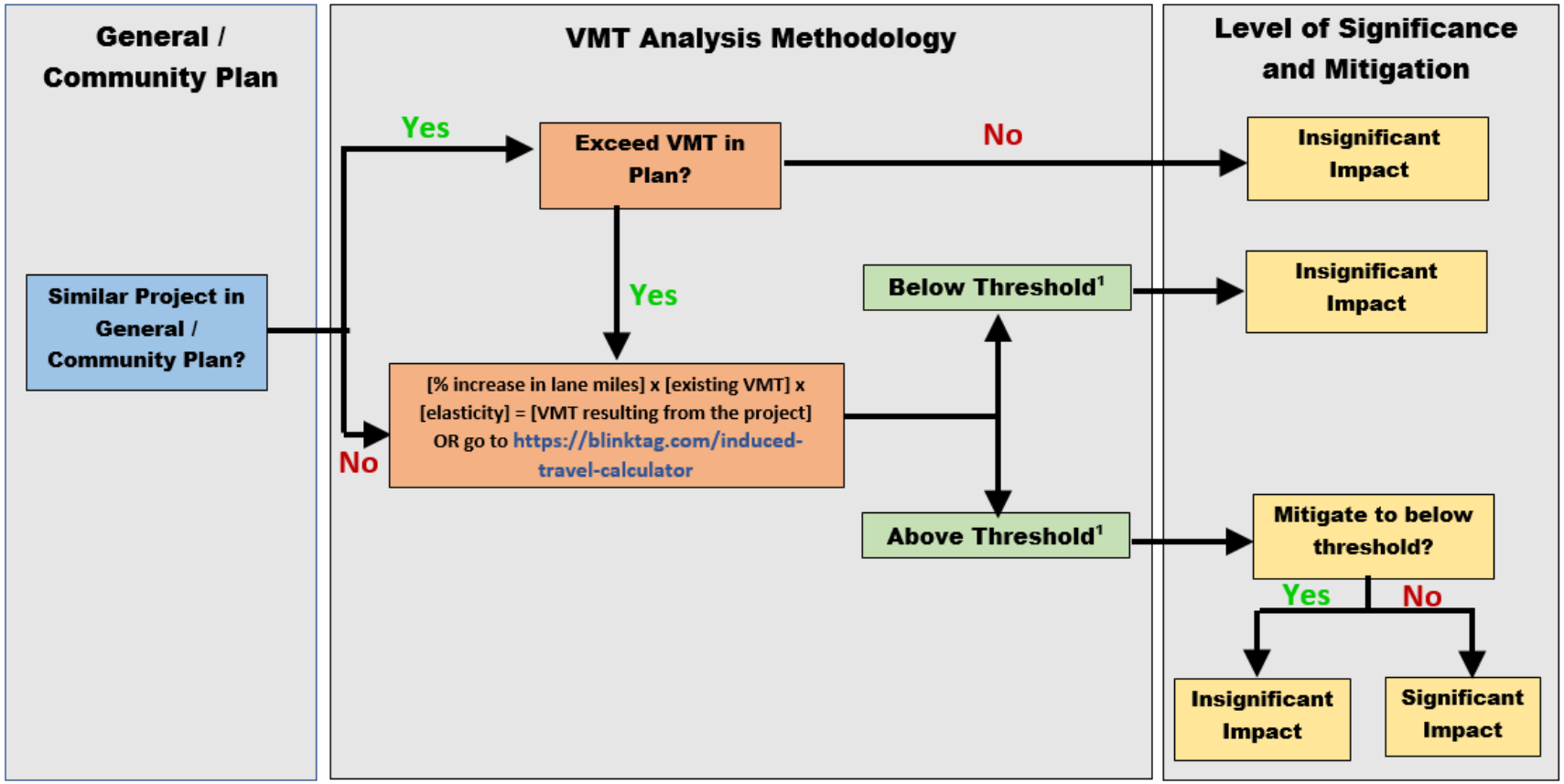


Footnotes:

1. Exceptions include Local Serving Projects, Projects within the vicinity of a High Quality Transit Corridor, and Projects within a low VMT Traffic Analysis Zone. For determining Project location exemptions, go to https://devapps.fehrandpeers.com/sbctavmt/
2. Below the respective 15% threshold for Residential and Office projects using production – attraction methodology, each parcel of mixed-use development is below 15% threshold using origin – destination methodology, OR no net increase in City VMT for Retail/Distribution Center/Warehouse/Logistic Projects

VMT Analysis for Transportation Projects in the City of Colton

Appendix B-2



Footnotes:

1. Threshold for Transportation projects is considered any change in net VMT that is non negligible

Appendix C: SBCTA VMT Guidelines Checklist

SBCTA: City VMT Guidelines Decision Checklist

Topic Area	Decision	Notes
STEP 01 **Project Screening Criteria: Daily Trip Threshold**	☐ **Yes** – Include • How many trips per day? ☐ • Instead of trip-based, VMT-based ☐ **No** – Do not include	OPR recommends a threshold of **110** daily trips for project screening. This is based on the number of trips generated by **10,000** sf of office space. As trips are only one component of VMT, this screening criteria should be carefully considered. Alternatively, a screening threshold based on VMT could be applied.
STEP 02 **Project Screening Criteria: Land Use Types**	☐ **Any changes** (subtractions or additions) to current list: • Local serving retail (50 ksf or less) • K-12 Public School • Daycare/Childcare/Pre-K • Affordable housing • Student Housing • Community Institutions (Public Library, Fire station, Local Government	Any land use types that are local serving in your community should be considered for this screening. **List changes here:**
STEP 03 **Project Generated VMT Methodology: PA or OD**	☐ **PA** – Productions/Attractions ☐ **OD** – Origin/Destination ☐ **Both** – PA when single use and OD when mixed use	PA method can isolate trip purpose and truck VMT, but does not account for trips with one trip end outside the model boundary. OD method cannot isolate trip purpose or truck VMT, but does include all trips including those with one trip end outside the model boundary. Both methods can be identified in the TIA guidelines, with the selection of method can be used based on if the project is of a single land use type (PA) or mixed use (OD).
STEP 04 **Project Generated VMT Methodology: Benchmarks**	☐ **City** ☐ **County**	Each City must choose their appropriate boundary for a regional benchmark for all impacts.
STEP 05 **Project Generated VMT Methodology: Threshold Options**	☐ **OPTION 1** – Rely on the OPR Technical Advisory Thresholds (**15%** Below Existing) ☐ **OPTION 2** – Set Thresholds Consistent with Lead Agency Air Quality, GHG Reduction, and Energy Conservation Goals (**14.3%** Below Existing) ☐ **OPTION 3** – Set Thresholds Consistent with RTP/SCS Future Year VMT Projections by Jurisdiction or Sub-Region (Better than General Plan Buildout) ☐ **OPTION 4** – Set Thresholds Based on Baseline VMT Performance (Better than Existing)	See SBCTA SB 743 Implementation Thresholds Assessment dated 11/11/19 for more information.
STEP 06 **Level of Service (LOS)**	☐ **Include** – intersection or roadway LOS analysis as part of the City's TIA Guidelines, although this analysis would not be used to determine CEQA impacts ☐ **Do not include** any LOS analysis in the City's TIA Guidelines	