



2023 Implementation of Vehicle Miles Traveled (VMT) & CEQA Thresholds



PREPARED FOR:



CITY OF IMPERIAL
Community Development Department
400 South Imperial Avenue, Suite 101
Imperial, CA 92251



PREPARED BY:



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ITS – Traffic/Civil/Electrical Engineering – Transportation Planning – Homeland Security – CEM
23282 Mill Creek Drive, East Tower, East Tower, Suite 120
Laguna Hills, CA 92653



MAY 9, 2024

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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 Imperial is now developing a **Vehicle Miles Traveled (VMT)** based methodology for evaluating transportation impacts under the revised CEQA guidelines.

The City of Imperial will utilize this VMT methodology for various projects (e.g., Land Development, Planning, etc.) by analyzing the VMT per service population, residential home-based VMT per capita, employment home-based work VMT per employee, as well as truck VMT and total VMT (including trucks and automobiles).

This report has been prepared to provide guidance to consultants on how to prepare Vehicle Miles Traveled (VMT) Analyses in the City of Imperial. VMT Analyses are intended to identify potential VMT impact of a proposed development project and determine the need for any improvements or mitigations to the project or nearby road system. Though this report focuses primarily on VMT methodology, a section on **Local Mobility Assessment Analysis (LMA)** guidelines has also been provided.

1.1 – Background

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).

In addition to the VMT metric, the City of Imperial will continue to utilize LOS analysis methodology in the Local Mobility Analysis for all projects to ensure the safety and efficient of City roadways.

1.2 – Existing City Conditions

As the VMT of a project is heavily influenced by the location, size, and land use mix, the Zoning Map for the City of Imperial is shown in **Figure 2**. Factors such as shopping, school, recreational, housing, and employment availability affect

CEQA – refers to the California Environmental Quality Act. This act requires identification of any significant environmental impacts of state or local action, including discretionary approval of new development or infrastructure projects. The process of identifying these impacts is typically referred to as the environmental review process.

VMT – refers to “Vehicle Miles Traveled”, a metric that accounts for the number of vehicle trips generated and the length or distance of those trips.

LOS – refers to “Level of Service”, a metric that assigns a letter grade to network performance. The typical application of LOS in cities is to measure the average amount of delay (in seconds) experienced by vehicle drivers at an intersection during the most congested time of day and to assign an LOS from A to F.





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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.

California State Route 86 (SR 86) is the only principal arterial/major highway that passes through the City of Imperial. SR 86 is a north-south state highway connecting the Imperial and Coachella valleys, beginning at State Route 111 south of the Cities of Imperial and El Centro.

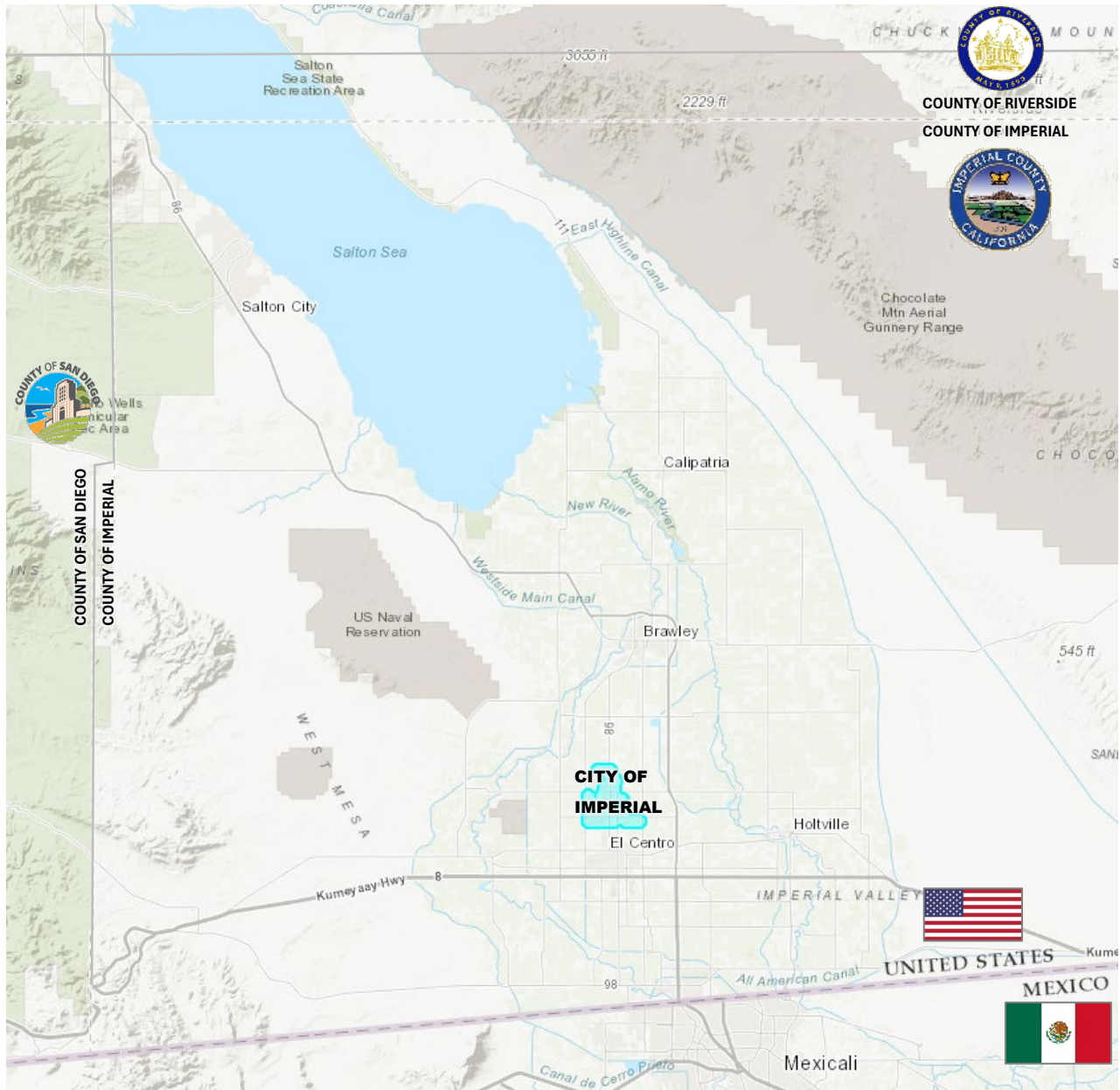
The City's Circulation Element of the General Plan (June 2017) prefers to utilize classification of street typologies rather than roadway classifications, as it better addresses pedestrian, transit, and bicycle traffic in addition to vehicle traffic. However, in the preparation of a VMT Analysis, which primarily considers vehicle traffic, roadway classifications will be used rather than typologies. Nevertheless, to provide a comprehensive understanding of a development site's surroundings and conditions, the City of Imperial's existing and proposed bikeways are shown in **Figure 3**. Roadway classifications in the City are provided in **Figure 4**.

Typical street cross-sections have been incorporated from Imperial County's *Engineering Design Guidelines Manual for the Preparation and Checking of Street Improvement, Drainage and Grading Plans Within Imperial County* (Sept 2008) for these VMT guidelines. These cross-sections are shown in **Figures 5.1-5.3**.





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LEGEND

 City Limits



Figure 1: City of Imperial Regional Map



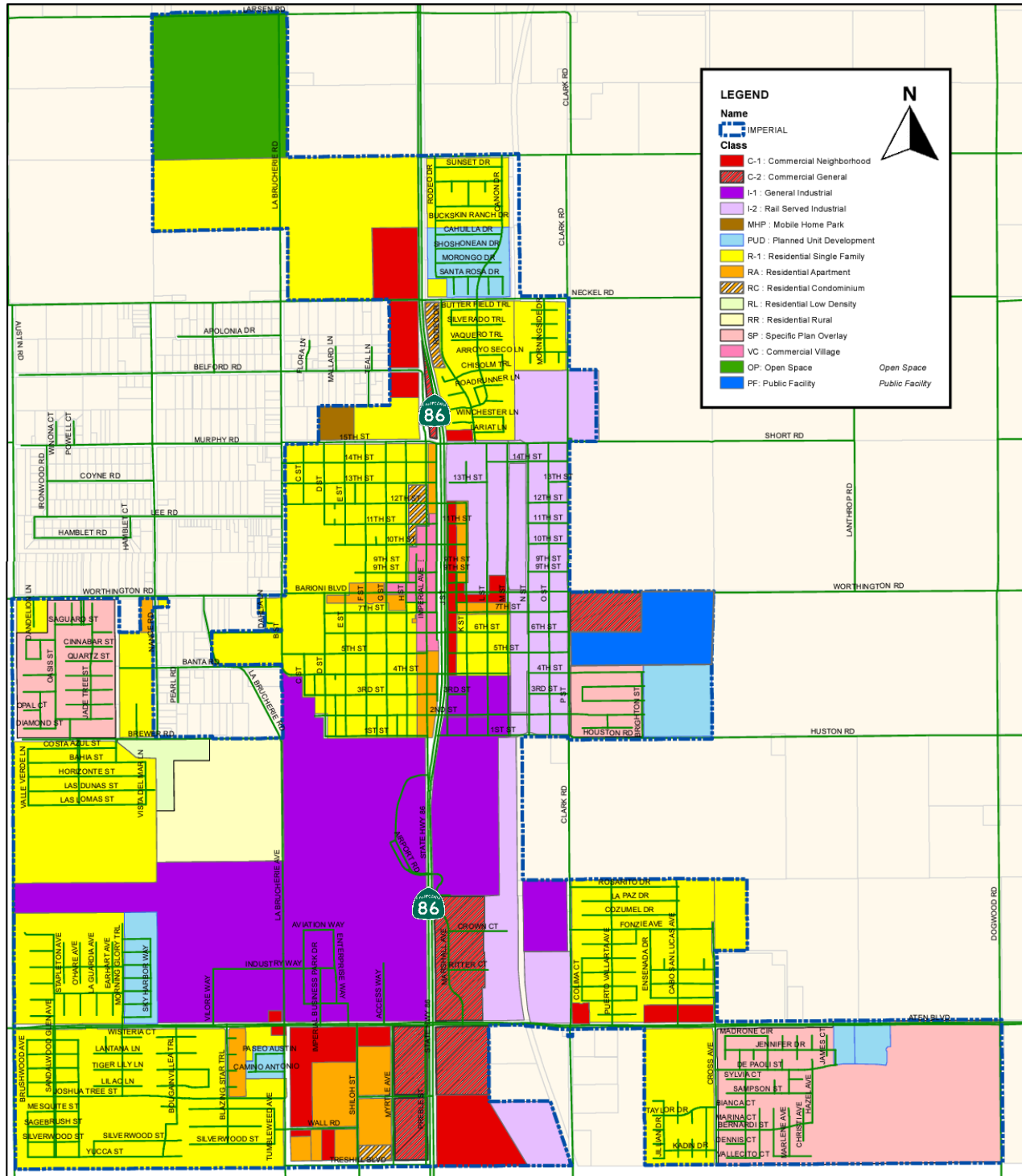
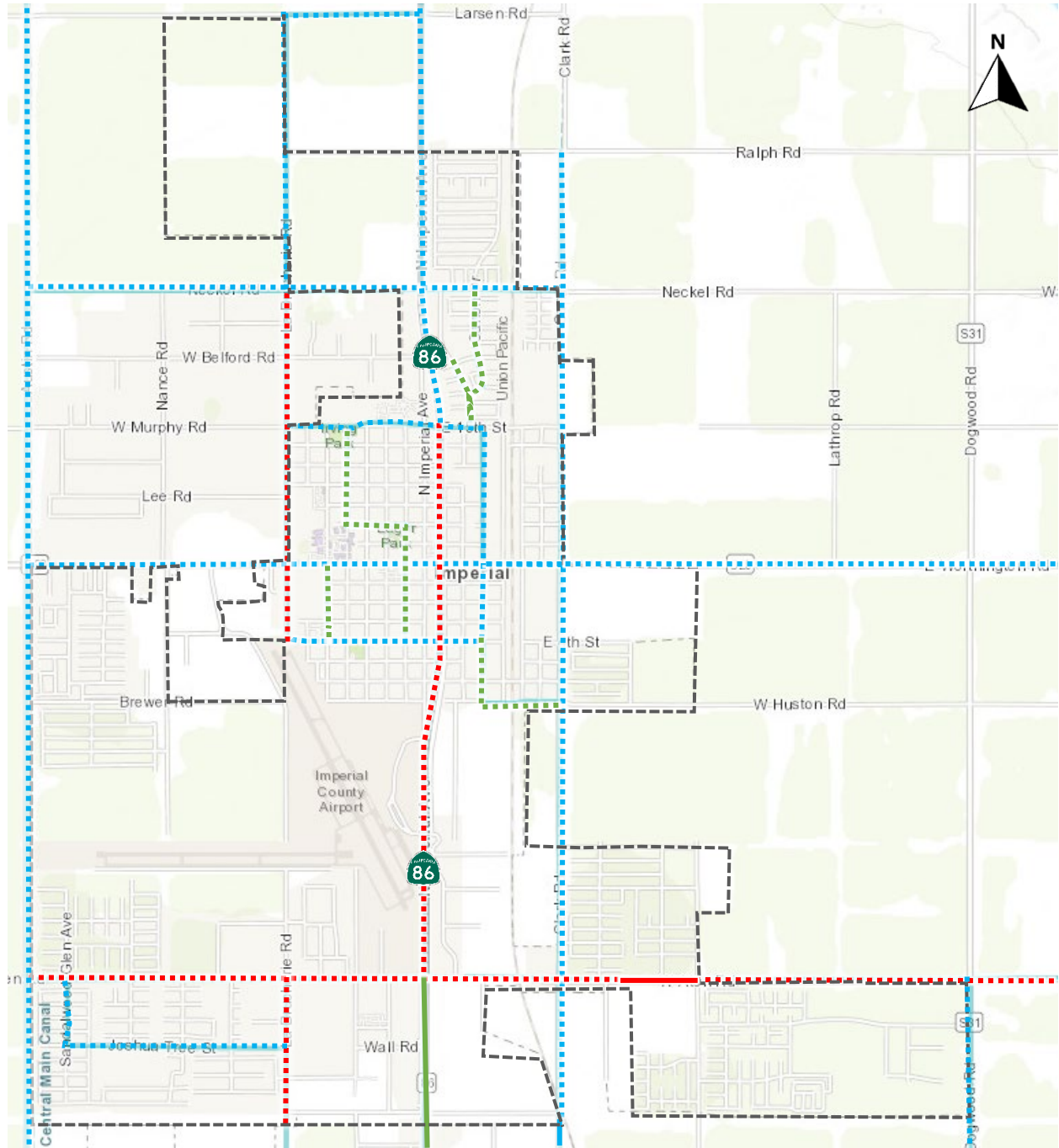


Figure 2: City of Imperial Zoning Map



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LEGEND

----- City Limits

Existing **—** Class I
 — Class II
 — Class III

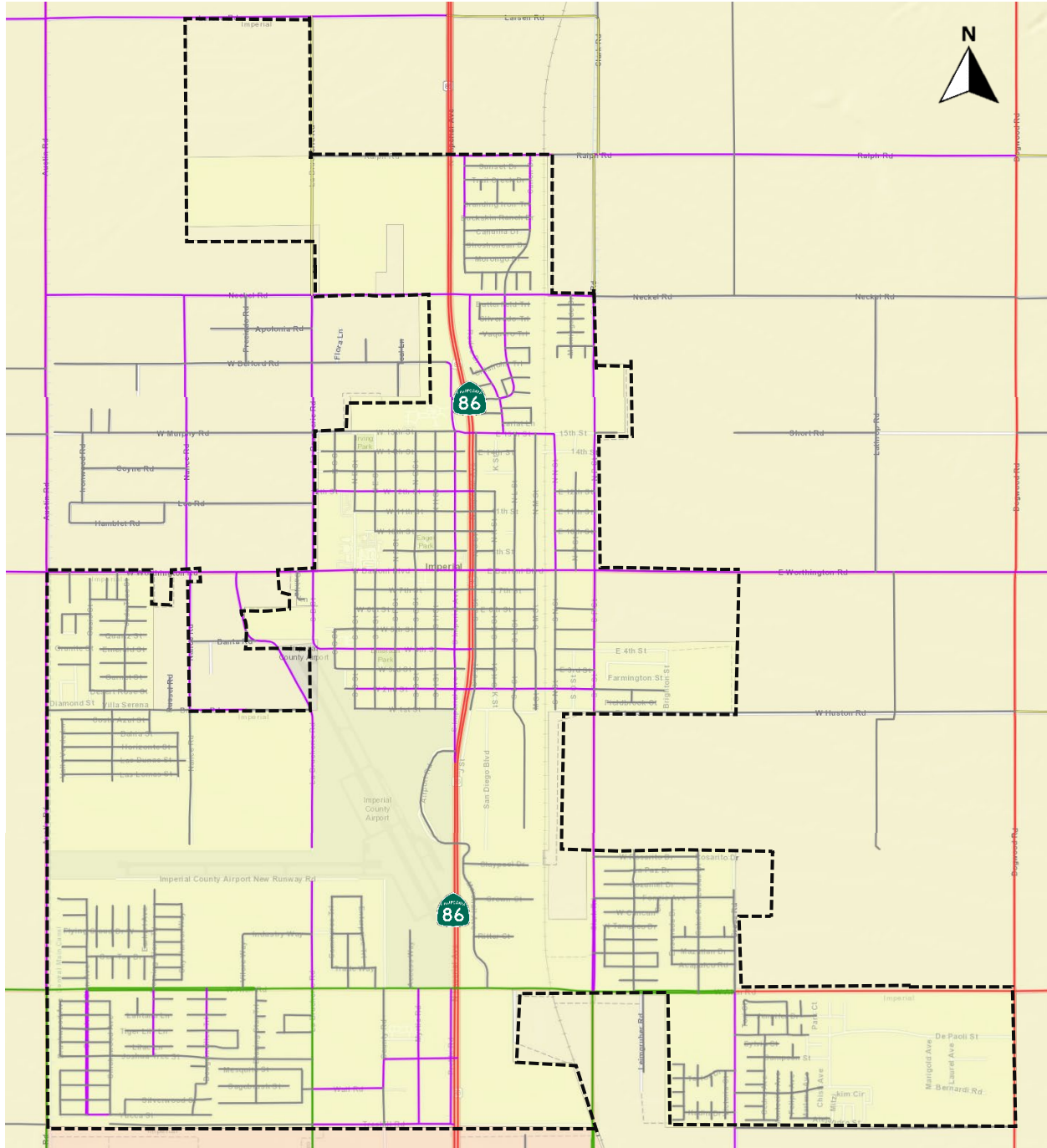
Proposed **- - - - -** Class I
 - - - - - Class II
 - - - - - Class III

Figure 3: City of Imperial Existing and Proposed Bikeways

Source: Imperial County Transportation Commission's (ICTC) [Regional Active Transportation Plan](#), Feb, 2022.



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LEGEND

- | | | | |
|--|--------------------|--|-----------------|
| | Principal Arterial | | Major Collector |
| | Minor Arterial | | Minor Collector |
| | City Limits | | Local |

Figure 4: City of Imperial Function Classification (FC) Roadway Map

Source: Caltrans' [California Road System \(CRS\)](#) Map, 2023.

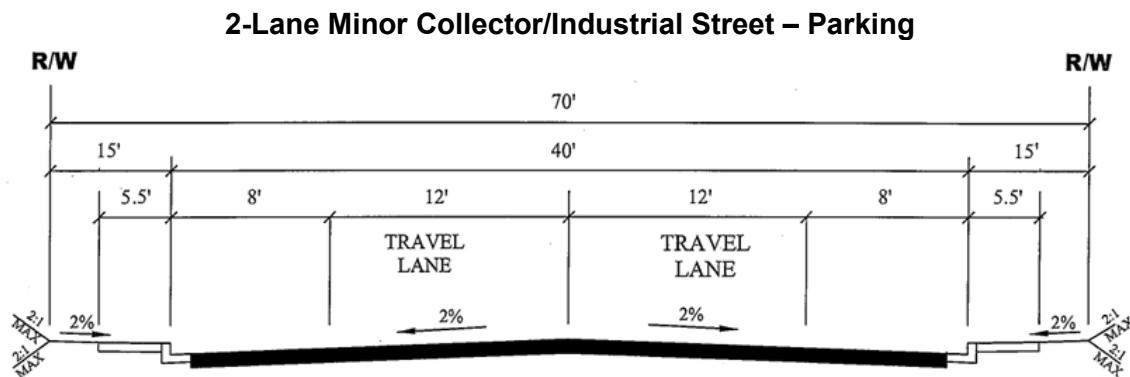
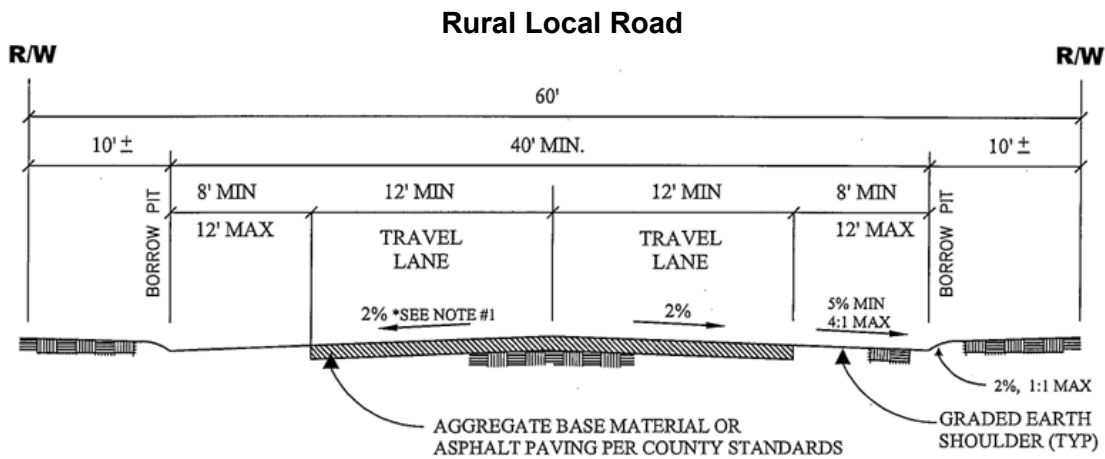
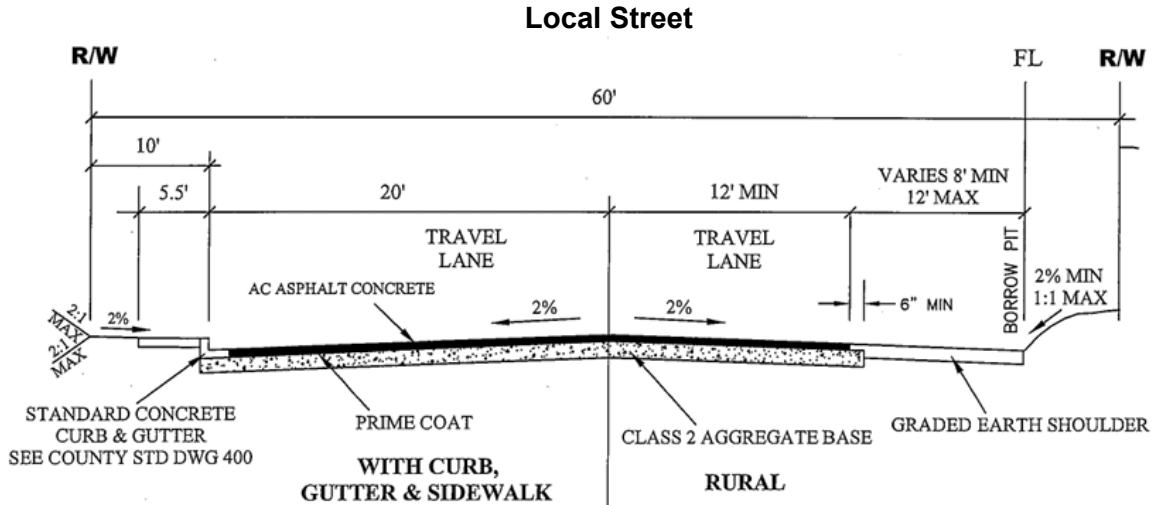


Figure 5.1: Typical Street Cross Sections in Imperial County

Source: County of Imperial's [Engineering Design Guidelines Manual for the Preparation and Checking of Street Improvement, Drainage and Grading Plans Within Imperial County](#), Sept. 2008.

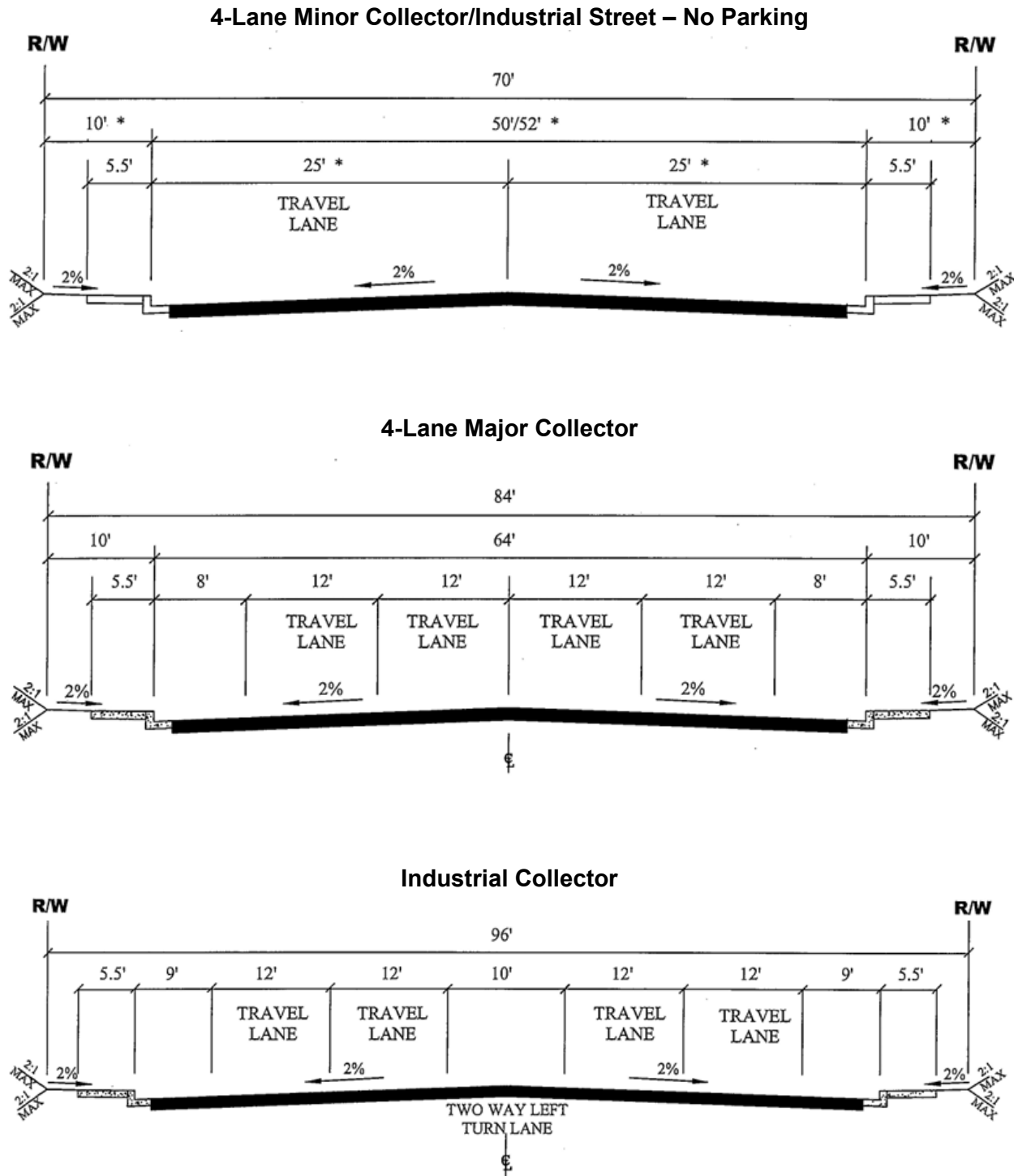
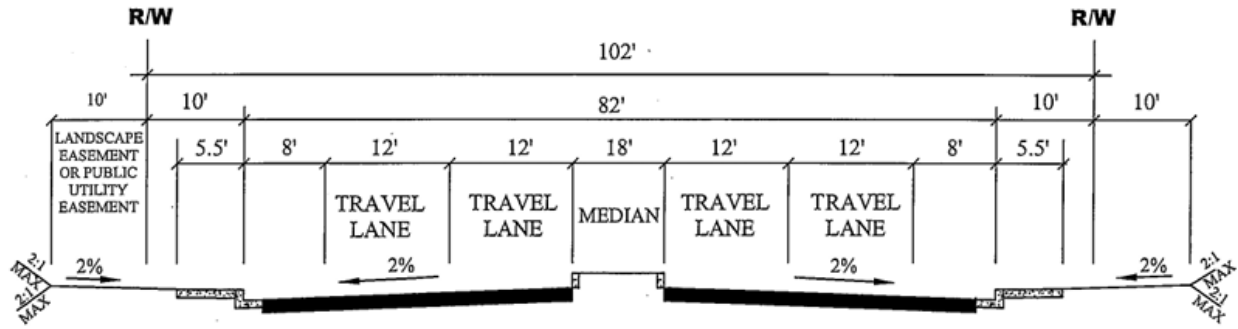
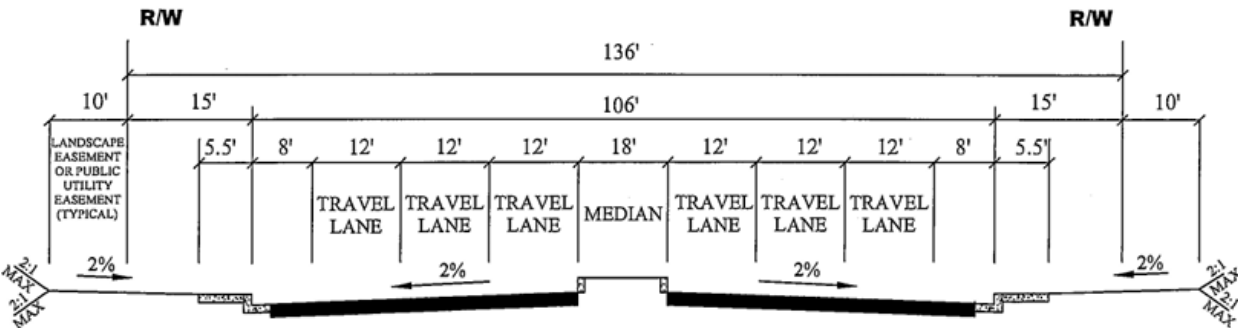
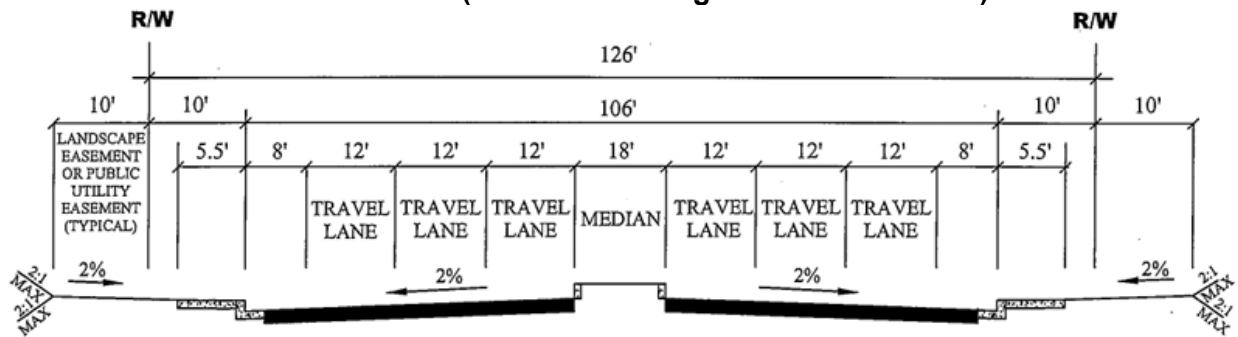


Figure 5.2: Typical Street Cross Sections in Imperial County

4-Lane Minor Arterial (Median with Single or Dual Left Turn)



Prime Arterial (Median with Single or Dual Left Turn)



Expressway

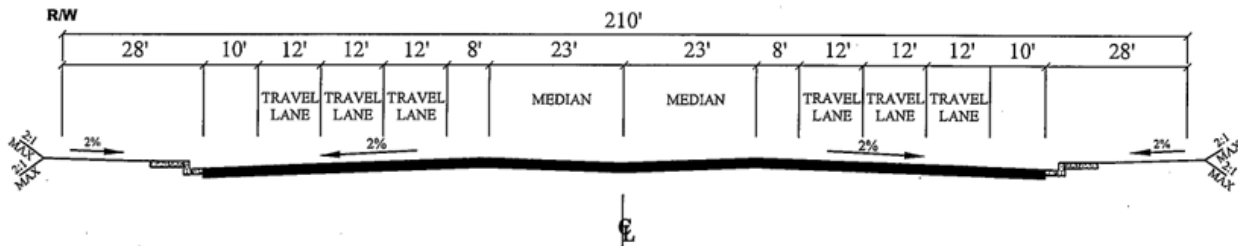
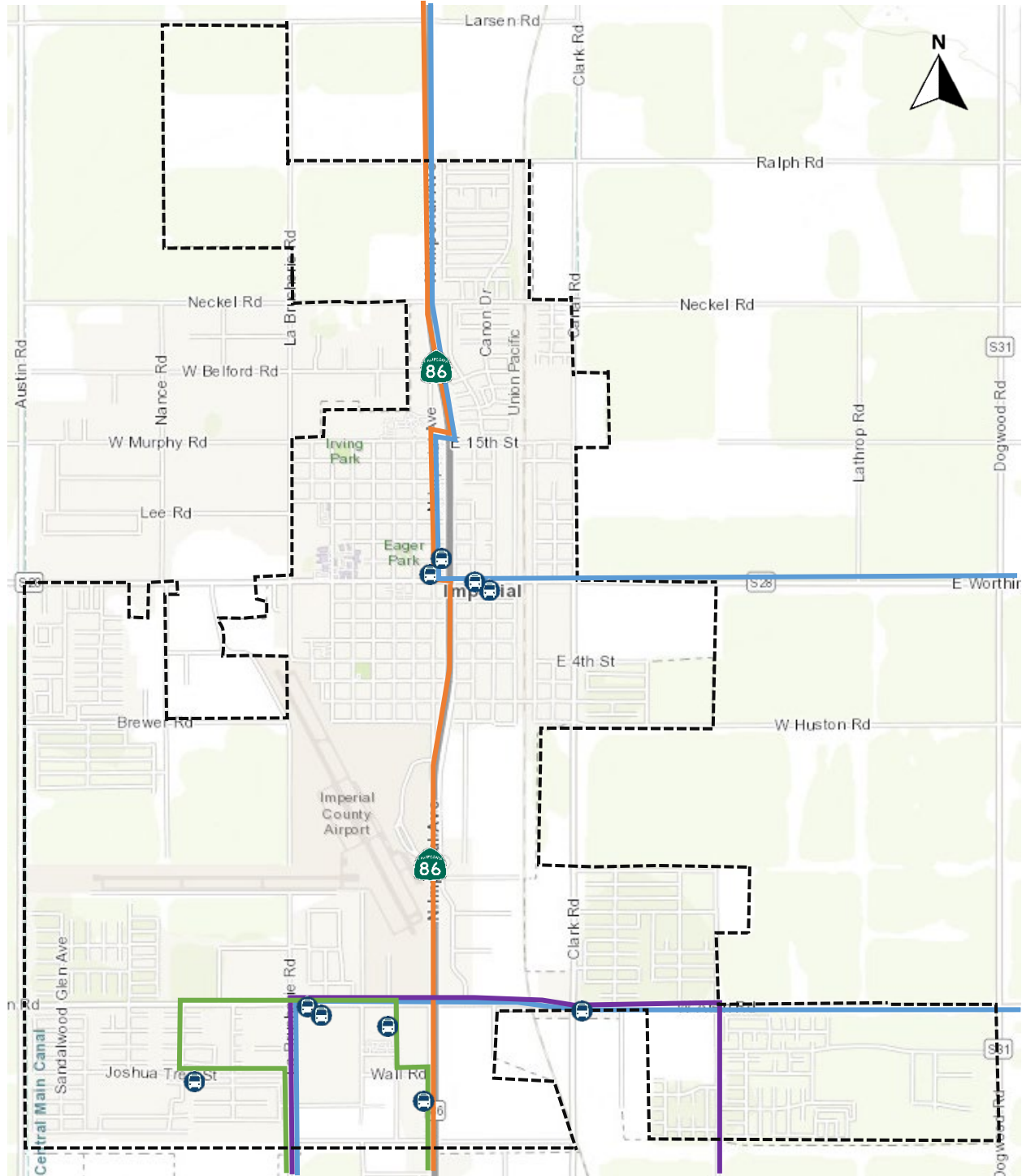


Figure 5.3: Typical Street Cross Sections in Imperial County



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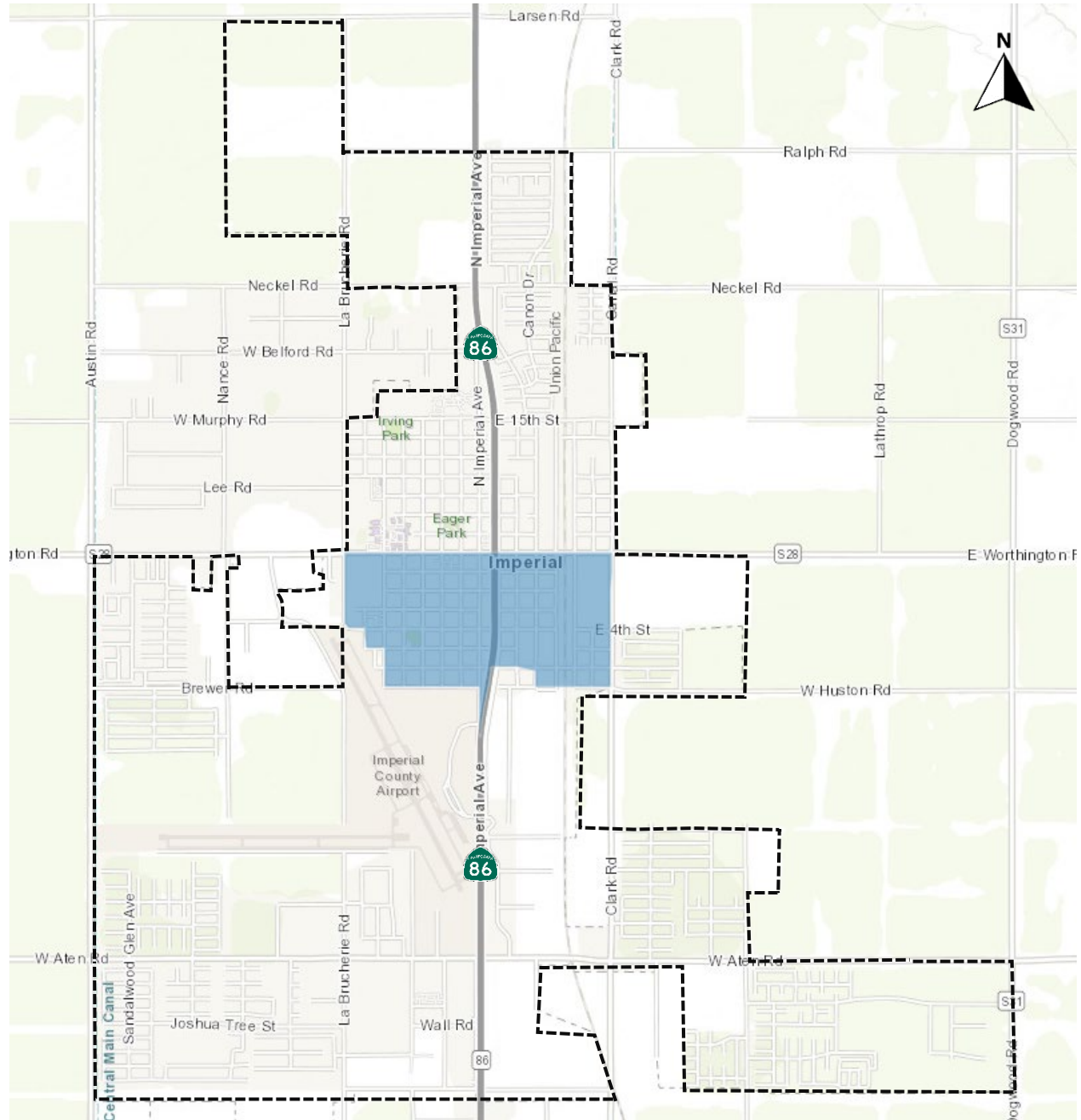
- | | | |
|--------------|---------|------------|
| Transit Stop | Route 2 | Route 41 |
| City Limits | Route 3 | Green Line |

Figure 6: City of Imperial Transit Routes

Source: [Imperial Valley Transit](https://www.imperialvalleytransit.com/)



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LEGEND

- Neighborhood Mobility Area**
- City Limits**

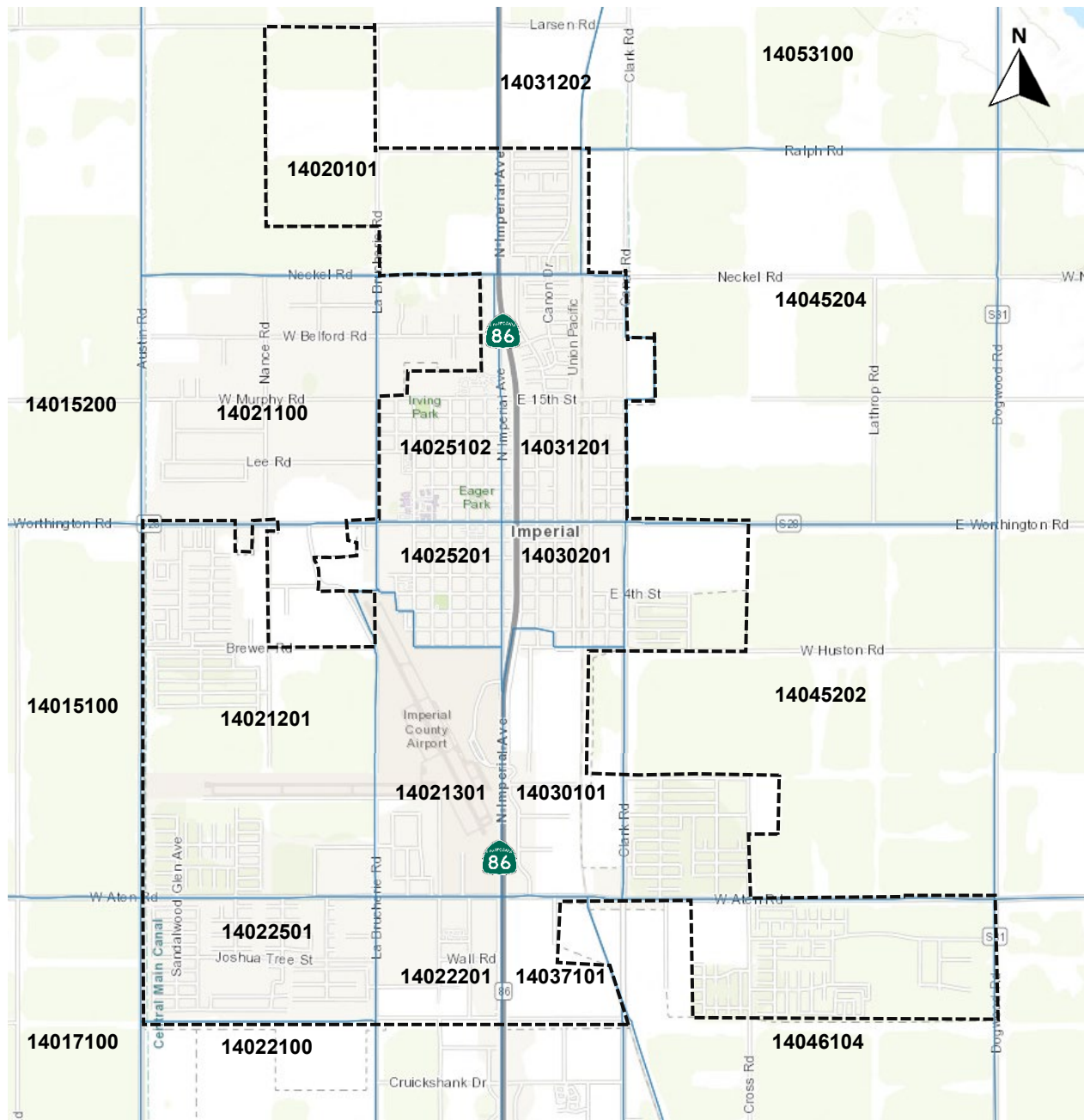
Neighborhood Mobility Area (NMA) – defined by the Southern California Association of Governments (SCAG) as an area in a City targeted to encourage more transportation alternatives. These areas are characterized by homes surrounded by local retail establishments, with short blocks and multiple intersections.

Figure 7: City of Imperial Neighborhood Mobility Areas (NMAs)

Source: Southern California Association of Governments' (SCAG) [Neighborhood Mobility Areas \(NMA\) – SCAG Region](#) Map, Updated Feb. 8, 2022.



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- 000000** TAZ Number
- TAZ Boundary
- City Limits

Traffic Analysis Zone (TAZ) – unit of geography commonly used in conventional transportation planning models, usually assigned information such as socioeconomic data. Though the size and spatial extent of a TAZ varies, a zone of under 3,000 people is common.

Figure 8: Traffic Analysis Zones (TAZs) in the City of Imperial

Source: SCAG's [Transportation Analysis Zones \(TAZs\) – Tier 2](#) Map, Updated Feb. 14, 2022.

2.0 – Vehicle Miles Traveled (VMT) Analysis Methodology

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), Vehicle Miles Traveled (VMT) defines the automobile travel as the distance attributable to cars and light trucks and does not assess the impact of larger heavy-duty trucks and vehicles.

Per the City’s request, impact from large trucks will also be considered in VMT analysis of projects in the City of Imperial. This will be achieved through conversion of large truck trips to Passenger Car Equivalents (PCEs). For the purpose of this analysis, “large” trucks are defined as all vehicles exceeding 10,000 lbs.

Passenger Car Equivalent (PCE) – metric used to assess traffic flow impact. It represents the impact of a large vehicle (such as semi-trucks, city transit buses, or school buses) by expressing it as the number of equivalent passenger vehicles.

2.1 – Screening Analysis

OPR’s technical advisory provides guidance on several opportunities for screening projects that would generate a low VMT. A project can be screened from VMT analysis if it satisfies one (1) or more of the four (4) screening criteria below:

1. Project Size
2. Retail Nature
3. Low VMT Area
4. Transit Priority Area

Specific requirements for satisfying each screening criteria are elaborated on in the following sections. Additionally, certain transportation projects do not require VMT analysis. A complete list of these projects is provided in **Appendix A**.

2.1.1 – Project Size

If a Project is found to generate fewer than 110 daily vehicular trips, it can be assumed that there is an insignificant VMT impact and the project is exempt from further analysis. 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 following facilities are exempt from this consideration:

- 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

Daily vehicle trips can be calculated using trip generation rates specified in the ITE *Trip Generation Manual, 11th Edition* (Sept 2021) or the latest edition.

For projects such as warehouses or distribution centers that are expected to attract a majority of traffic from large trucks, a PCE factor of 2.0 can be multiplied to the expected number of these

truck trips in the calculation of the Project’s total daily trips. The following table shows the PCE conversion rates for various vehicles to be used in the calculation of daily vehicle trips.

Table 2: Passenger Car Equivalent (PCE) Factors for VMT Analysis

Vehicle Classification	PCE Factor
Class 1 (6,000 lbs or less) Full Size Pickup Mini Pickup Minivan SUV Utility Van	1.0
Class 2 (6,001 to 10,000 lbs) Crew Size Pickup Full Size Pickup Mini Bus Minivan Step Van Utility Van	1.0
Class 3 (10,001 to 14,000 lbs) City Delivery Mini Bus Walk In	2.0
Class 4 (14,001 to 16,000 lbs) City Delivery Conventional Van Landscape Utility Large Walk In	2.0
Class 5 (16,001 to 19,500 lbs) Bucket City Delivery Large Walk In	2.0
Class 6 (19,501 to 26,000 lbs) Beverage Rack School Bus Single Axle Van Stake Body	2.0
Class 7 (26,001 to 33,000 lbs) City Transit Bus Furniture High Profile Semi Home Fuel Medium Semi Tractor Refuse Tow	2.0
Class 8 (33,001 lbs and over) Cement Mixer Dump Fire Truck Fuel Heavy Semi Tractor Refrigerated Van Semi Sleeper Tour Bus	2.0

2.1.2 – Retail Nature

Certain locally serving retail projects, public facilities, community purpose facilities, and transportation projects are excluded from VMT analysis, as they are presumed to have a less than significant impact unless there is substantial evidence suggesting otherwise. The following list of projects and facilities are excluded from VMT analysis:

Table 3: Projects Excluded from VMT Analysis

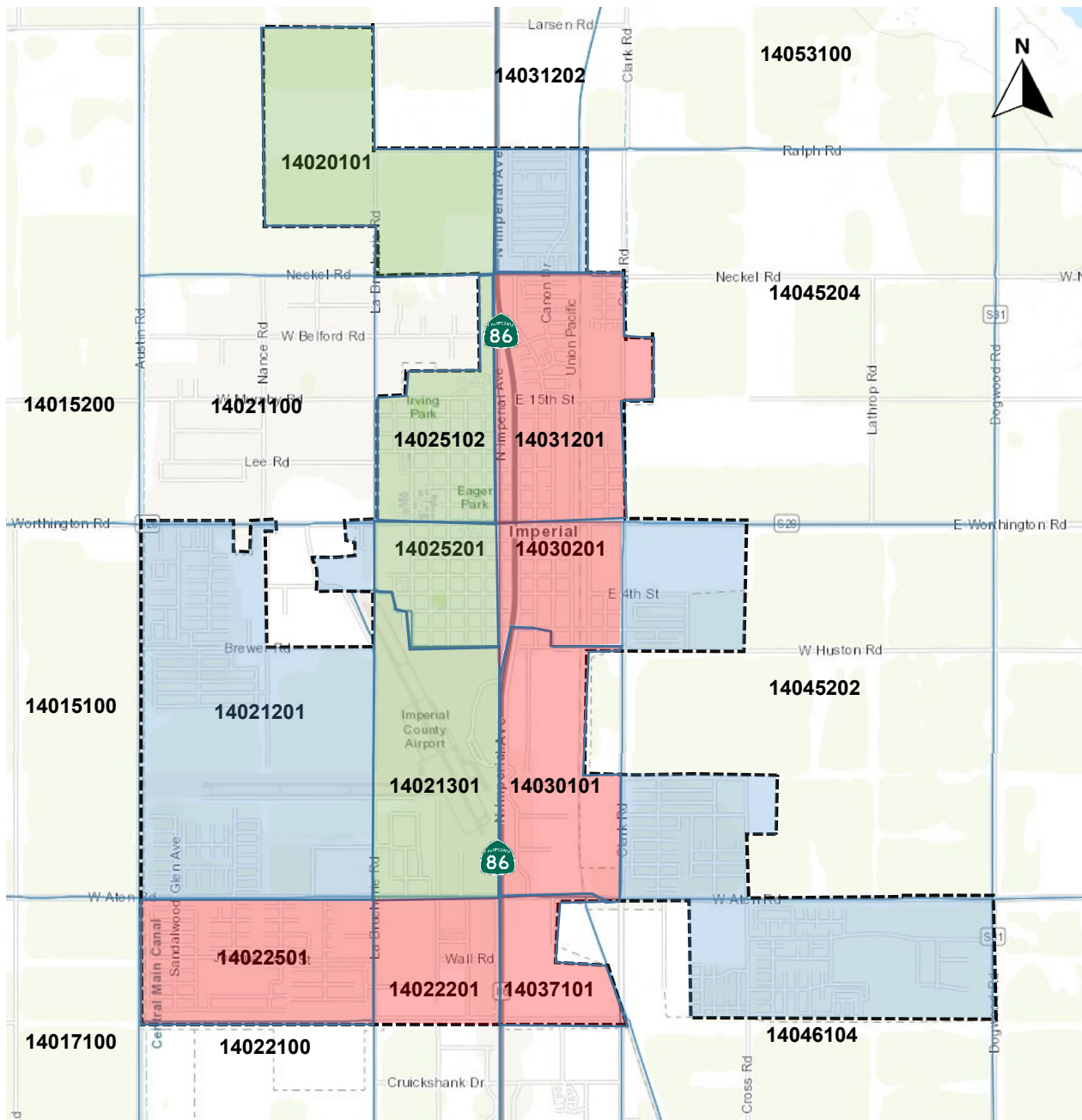
Retail Projects	
<ul style="list-style-type: none"> • Locally serving retail projects <50,000 square feet serving the local community <ul style="list-style-type: none"> ○ Example, gas stations ○ Restaurants ○ Commercial shops ○ Grocery stores 	
Public Facilities/Community Purpose Facilities	
<ul style="list-style-type: none"> • K-12 public schools • Libraries • Senior housing • Affordable housing projects • Police and fire facilities • Government offices <ul style="list-style-type: none"> ▪ Example, City Clerk office ▪ Parks & Recreation office 	<ul style="list-style-type: none"> • Post offices • Daycare centers • Assisted living facilities • Student housing on/adjacent to college campuses • Parks and trailheads • Passive public uses <ul style="list-style-type: none"> ▪ Example, Water sanitation ▪ Waste management
Other public uses as determined by the City	
Transportation Projects	
<ul style="list-style-type: none"> • Transit projects • Pedestrian projects • Safe Routes to School 	<ul style="list-style-type: none"> • Bike projects • Safety improvement projects

This screening criteria applies to the entirety of a retail project and would not be applied to multiple tenants at a retail site separately. For mixed-use projects, this criterion should be applied to the retail/commercial/community facility separately to determine if that portion of the project screens out of a detailed VMT analysis.

2.1.3 – Low VMT Area

Residential projects can be exempt from further VMT analysis if the project’s VMT per capita is 15% or more below the average regional residential home-based VMT per capita (see **Figure 9**). Employment projects can be exempt if the project’s VMT per capita is 15% or more below the average regional employee home-based VMT per employee (see **Figure 10**).

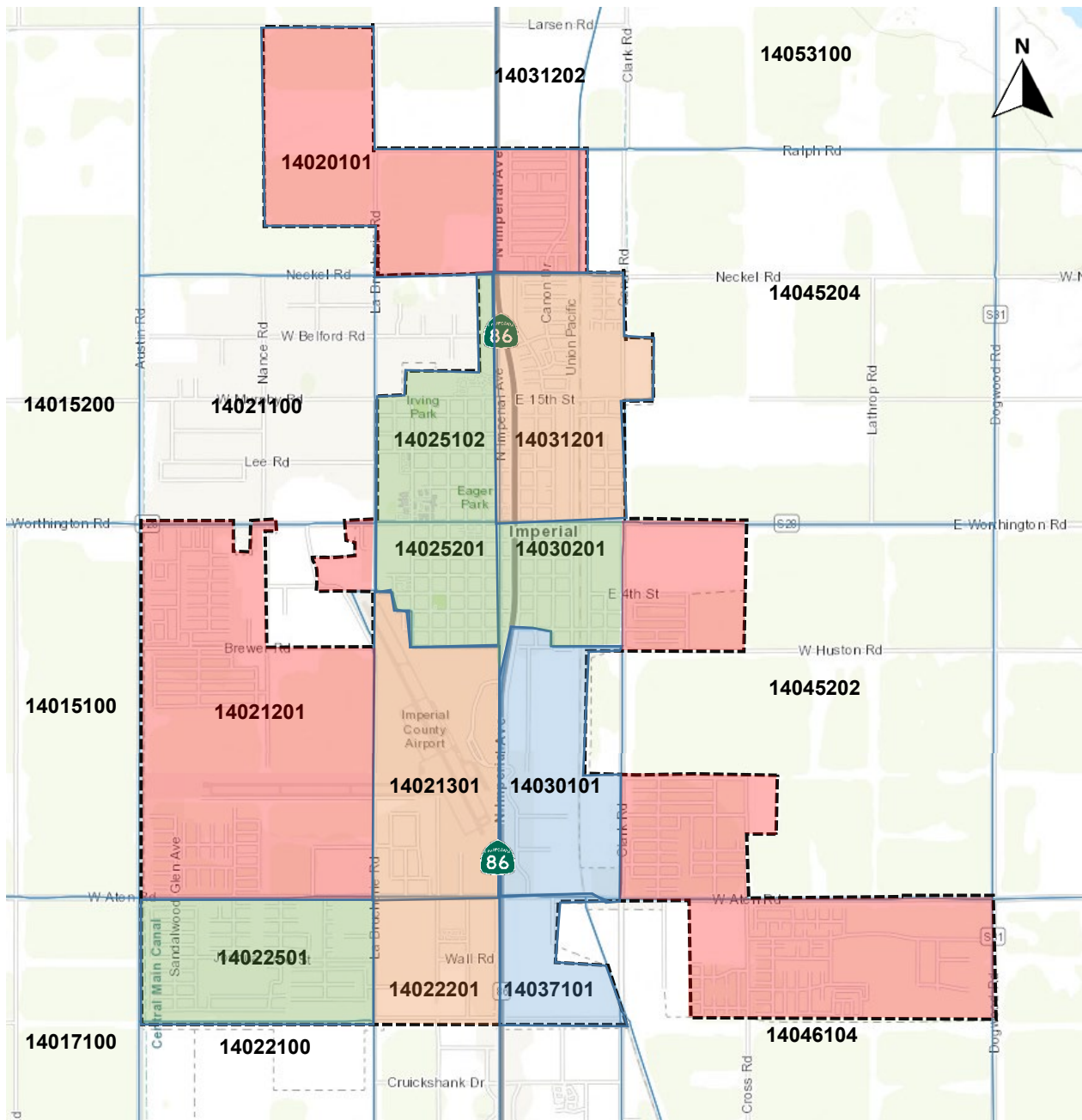
Figure 8 identifies low-VMT areas in the City of Imperial.



**Figure 8: Low VMT Traffic Analysis Zones (TAZs) in the City of Imperial (2024)
(VMT/Service Population)**

LEGEND

- 15% or More Below City Average
- 0-15% Below City Average
- 0-15% Above City Average
- 15% or More Above City Average



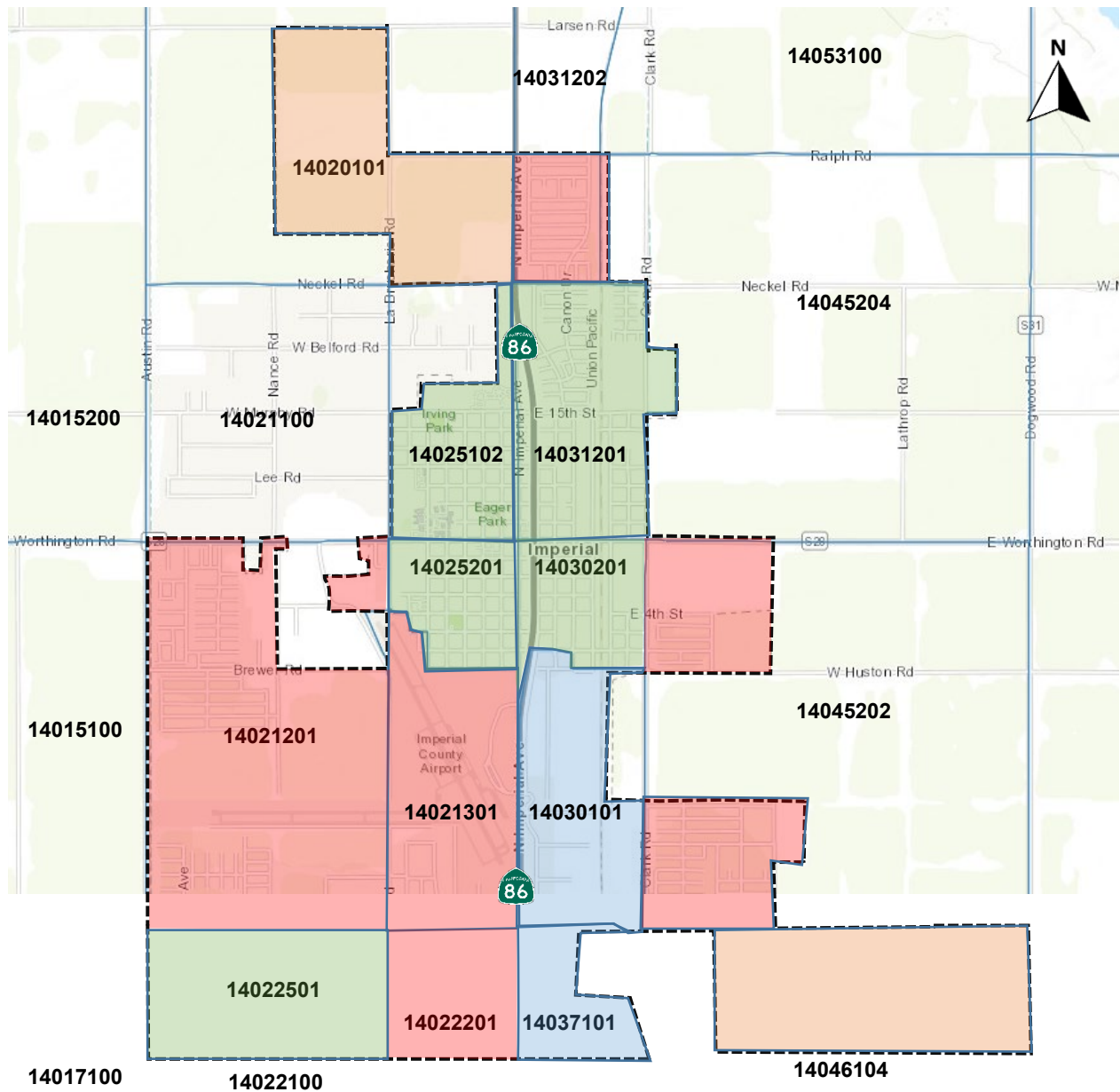
**Figure 9: Low VMT Traffic Analysis Zones (TAZs) in the City of Imperial (2024)
(Residential Home-Based VMT/Capita)**

LEGEND

- 15% or More Below City Average**
- 0-15% Below City Average**
- 0-15% Above City Average**
- 15% or More Above City Average**



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**Figure 10: Low VMT Traffic Analysis Zones (TAZs) in the City of Imperial (2024)
(Employee Home-Based VMT/Employee)**

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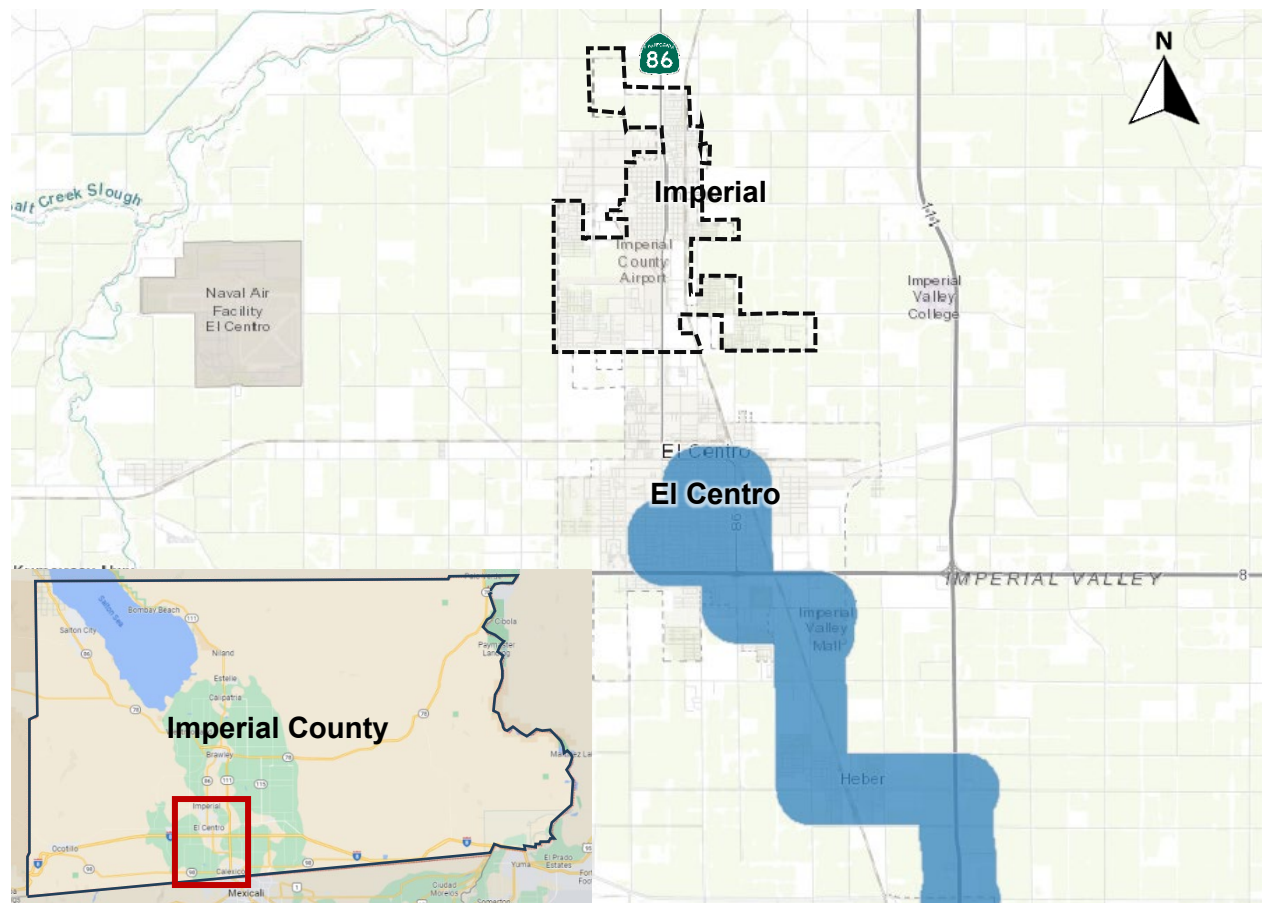
- 15% or More Below City Average
- 0-15% Below City Average
- 0-15% Above City Average
- 15% or More Above City Average



2.1.4 – Transit Priority Area

A Project can be exempt from further VMT analysis if the Project has a close proximity (within ½ mile) to a High-Quality Transit Corridor. Per California Public Resources Code – PRC Division 13 – Environmental Quality Chapter 2.5 - Section 21064.3, this is defined as “a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during morning and afternoon peak commute periods.

As shown in **Figure 11**, the City of Imperial does not contain any High Quality Transit corridors; thus, no developments will be screened through this criterion.



LEGEND

- High Quality Transit Area
- City Limits

High Quality Transit Area (HQTA) – defined by the Southern California Association of Governments (SCAG) as an area within one half-mile from a well-served transit stop or a transit corridor with 15-minute or less service frequency during peak commute hours.

Figure 11: High Quality Transit Areas (HQTA) in Imperial County

2.2 – VMT Analysis Requirements

To provide a comprehensive analysis of the VMT for the City of Imperial, existing VMT values generated from the Imperial County Transportation Model (ICTM) are provided for the City of Imperial and Imperial County for the 2014 Base Year and 2040 Horizon Year in **Table 4**. The table provides values to use for the Production-Attraction methodology recommended for the City of Imperial.

Table 4: City and County of Imperial Baseline and Horizon Year VMT Summary⁷

	City of Imperial		County of Imperial	
	2014 Base Year	2040 Horizon Year	2014 Base Year	2040 Horizon Year
VMT per Service Population	5.73	3.23	4.63	4.32
Residential Home-Based VMT per Capita	5.32	2.85	4.57	4.32
Employee Home-Based VMT per Employee	1.46	2.38	1.90	1.49

The VMT threshold used will depend on the proposed project’s land use. For example, residential projects will refer to the *Residential Home-Based VMT per Capita* values. If the project’s VMT is 15% or more below the baseline VMT value in the opening year, calculated through linear interpolation from the 2014 and 2040 values, the project can be assumed to have insignificant VMT impact. Alternatively, residential projects would refer to the *Employee Home-Based VMT per Employee* values. Warehouses, manufacturing centers, distribution centers, or other similar projects may refer to the *VMT per Service Population* values.

Alternatively, one may refer to the Low VMT Area maps (**Figures 8-10**) to determine if the project resides in a low VMT area that is 15% or more below the baseline VMT. If so, the project can be assumed to have less than significant impact and no further calculations are necessary.

⁷ Source: Caltrans District 11’s Imperial County Transportation Model (ICTM).

2.3 – Land Development Projects

The types of trips used for the VMT analysis is dependent upon the project development type. The following project development types and their respective guidelines will be used for the analysis. The project’s analysis of resulting VMT rate will be evaluated and compared against the VMT rate threshold calculated below.

The VMT rate for residential and non-residential projects may 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:

$$(1) \text{ Project VMT Rate} = \frac{VMT_{Project} - VMT_{Existing}}{Pop \text{ or } Emp_{Project} - Pop \text{ or } Emp_{Existing}}$$

Project VMT can be calculated with Equation (2), as provided on the following page.

Existing VMT can be calculated through linear interpolation with the values provided in **Table 4**.

An estimate of the **Project Population/Employment** can be found by multiplying the employment density by the project parcel size, while **Existing Population/Employment** will depend on the time of the VMT analysis’ preparation and the most current data available at that time. As of SCAG’s *Employment Density Study Summary Report*, October 31, 2001, the employment density is dependent on the land use category and is summarized in **Table 5: Imperial County Employment Density Summary**. 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.

Table 5: Imperial County Employment Density Summary

	Land Use Type	Average Employees Per Acre*
Commercial	Regional Retail	N/A**
	Other Retail	15.07
	Low-Rise Office	17.90
	Hotel/Motel	32.20
	Misc. Commercial	0.38
Industrial	Light Manufacturing	4.80
	Heavy Manufacturing	N/A**
	Warehouse	16.17
	Government Office	3.63
Public/ Other	Residential	1.37
	Transportation	0.66
	Open Space	0.05

* 1 Acre = 43,650 Square Feet

** N/A: Not Available

Source: SCAG’s [Employment Density Study Summary Report](#), Oct. 31, 2001.



The project VMT rate will be compared against the project’s respective thresholds to determine whether the additional VMT created by the project is significant. The project VMT can be calculated with the following equation:

$$(2) \text{ VMT}_{\text{Project}} = [\text{Avg. Trip Length}] \times [\text{Project Trip Generation}]$$

Average Trip Length depends on the type of project. Average trip length values to be used in the project VMT calculation, derived from the 2012 SCAG Regional Travel Demand Model and 2010-2012 California Household Travel Survey, are provided below in **Table 6**.

Table 6: Imperial County Average Trip Length

Project Type	Average Trip Length (Miles)
Residential	8.56
Employment/Office	25.8
Retail	17.7
Distribution Centers/ Warehouses/Logistic Centers	17.7
Mixed-Use	3.96

Project Trip Generation depends on the size and land use of the project, and can be calculated using trip generation rates specified in the ITE *Trip Generation Manual, 11th Edition* (Sept 2021) or the latest edition.

2.4 – Transportation Projects

As mentioned in the OPR, transportation projects that will not significantly impact the amount of vehicle travel can be excluded from VMT analyses. A complete list of transportation projects that are exempt from VMT analysis is provided in **Appendix A**. However, transportation projects that increase roadway capacity and induce travel are subject to VMT analysis.

OPR provides the following equation to determine a transportation project’s VMT:

$$[\% \text{ increase in lane miles}] \times [\text{existing VMT}] \times [\text{elasticity}] = [\text{VMT resulting from the project}]$$

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://travelcalculator.ncst.ucdavis.edu> or <https://blinktaq.com/induced-travel-calculator>.

If a project is expected to create a net increase in City VMT, it is found to have a significant impact, and mitigations may be required.

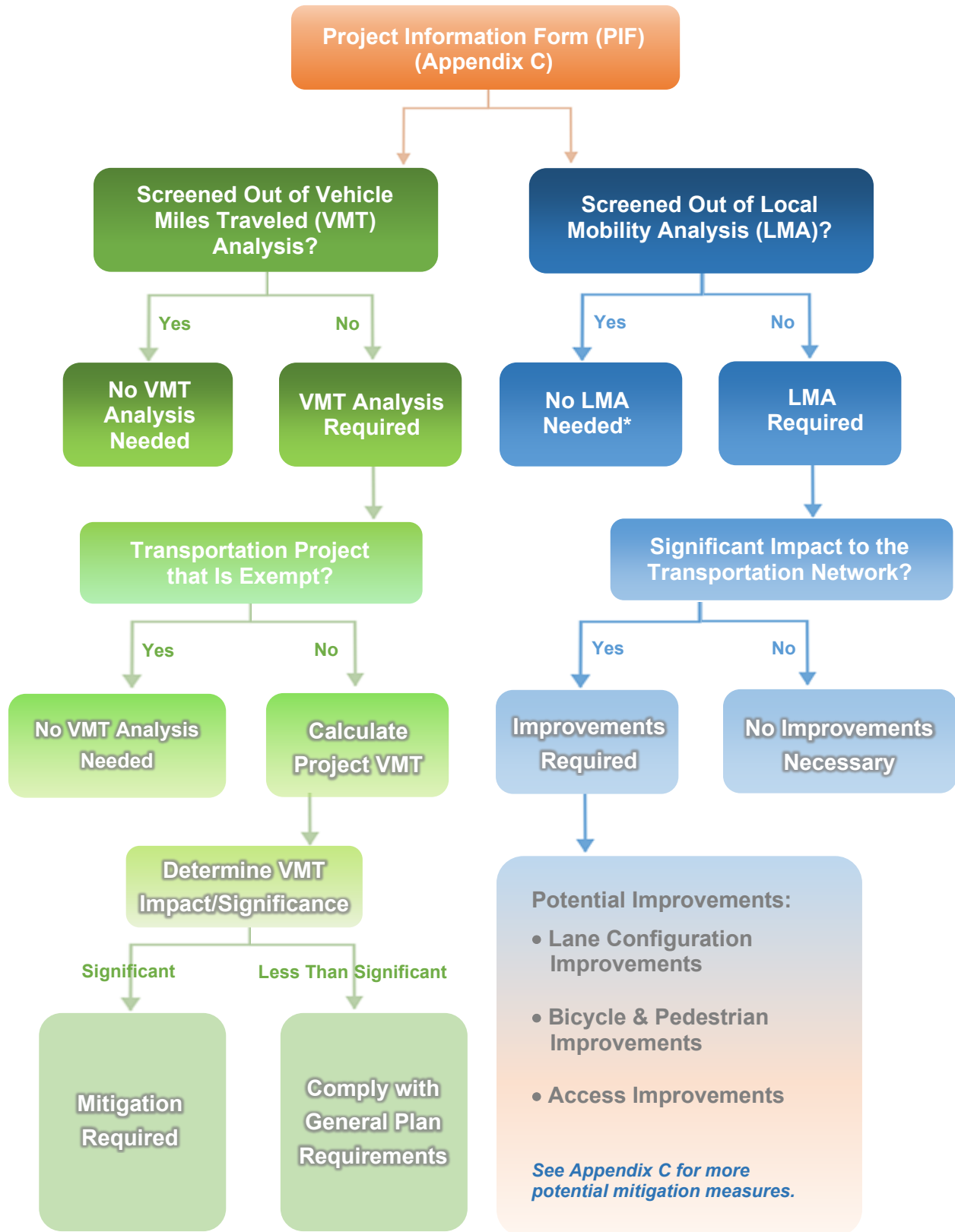
2.5 – VMT Analysis Format

A VMT Analysis report must contain the following components at a minimum:

- **Introduction:** Briefly summarizes the report’s purpose and methodology used.
- **Executive Summary:** Provides a 1- or 2-page summary of the Project description, trip generation, screening criteria analysis, any proposed mitigations, and the expected % VMT reduction due to these mitigations (if applicable).
- **Project Description:** Provides information on the proposed Project site’s existing conditions, such as location, land use, and local transportation network. This can include information on the regional highway system, local roadway system, transit routes, and pedestrian/bicycle networks.
- **VMT Analysis:**
 - **Project Trip Generation:** Calculates the Project’s expected Daily Vehicle Trips, utilizing information such as the land use, quantity, unit, and appropriate land use code from the latest ITE *Trip Generation Manual*. Calculated values for AM Peak Hour Trips (In, Out, and Total) and PM Peak Hour Trips (In, Out, and Total) should also be provided in addition to Daily Vehicle Trips.
 - **Screening Analysis:** Describes the Project’s fulfillment (or unfulfillment) of each of the four screening criteria, with the appropriate calculations, maps, or visual exhibits provided for justification.
- **Mitigation Measures** (if needed): Provides a list of applicable mitigation measures that can lower the Project’s VMT to the necessary threshold, if none of the screening criteria are satisfied. This section should calculate the proposed mitigations’ expected % VMT reduction. The threshold to be reached is 15% or more below the regional average VMT for the Project’s respective target population (VMT per capita, VMT per employee, etc.)
- **Conclusion:** Summarizes the Project’s VMT impact, cumulative VMT impact, and reiterates the screening analysis results and any proposed mitigations.

Depending on the conditions and environment of each Project, additional sections may be included to provide additional information or justification.

Figure 12: VMT Analysis and LMA Flowchart



*Other studies such as driveway sight distance, queuing, safety analysis, etc. may be required as per the City's discretion.

3.0 – Local Mobility Analysis (LMA) Methodology

Although VMT is now the metric used for determining the significance of vehicle travel-related impacts under CEQA, the transportation network must be overall consistent with adopted standards and policies while considering impact from pedestrians, bicycles, and transit.

Thus, the Local Mobility Analysis (LMA) is required with the submittal of a VMT Analysis to provide an understanding of the existing and future transportation network surrounding a newly implemented development, and identify any facilities that may need improvement to maintain acceptable operating conditions.

3.2 – LMA Requirements

Projects that generate less than 800 daily vehicle trips are not required to prepare an LMA. However, the City may request additional analysis, such as an access, parking, or circulation assessment for the site, due to the Project’s location, complexity, or other characteristics.

Projects that generate over 800 daily vehicle trips are required to analyze:

- Project driveways and intersections where the project is expected to generate 50 peak hour Passenger Car-Equivalent (PCE) trips
- Roadway segments fronting the Project and between the analyzed intersections
- Bicycle, Pedestrian, and Transit facilities at the Project frontage

Traffic analysis scenarios may include:

- Existing Year Conditions
- Opening Year Conditions
- Opening Year with Project Conditions
- Horizon Year Conditions
- Horizon Year with Project Conditions

Peak hour intersection analyses shall include AM and PM peak hour. The AM peak hour is defined as the one hour of highest traffic volumes between 6:00-9:00AM, while the PM peak hour is defined as the one hour of highest traffic volume between 4:00-7:00PM. Two-hour peak hour period Turning Movement Counts (TMCs) including vehicles, bicycles, and pedestrian volumes should be collected for all study intersections, and weekday 24-hour Average Daily Traffic (ADT) counts should be collected for all study roadway segments. Traffic counts should be conducted on a Tuesday, Wednesday, or Thursday when schools are in session and not during a week of a major holiday. Traffic counts should be included as an Appendix in the LMA report.

Intersection and queuing analyses must abide by the methodologies described in the latest *Highway Capacity Manual* (HCM), or other practices developed in coordination with the City.

3.3 – Level of Service (LOS) Analysis

As per the Circulation Element of the City of Imperial’s *General Plan*, (June 2017), the acceptable LOS threshold for an intersection is C or higher. Definitions and thresholds for LOS levels are provided in the following table.

Table 7: Level of Service (LOS) Definitions

Level of Service	Roadway Performance Standard	Intersection Control Delay (Sec/Vehicle)	
		Signalized	Unsignalized
LOS A	Represents free flow. Individual drivers have a high degree of freedom to select their travel speeds and are unaffected by other vehicles.	≤10.0	≤10.0
LOS B	Represents stable flow, but individual drivers are somewhat affected by other vehicles in determining travel speeds.	>10.0 to ≤20.0	>10.0 to ≤15.0
LOS C	Represents stable flow, but the selection of the speeds of individual drivers is significantly affected by other drivers.	>20.0 to ≤35.0	>15.0 to ≤25.0
LOS D	Represents a condition of high density, stable traffic flow in which speed and freedom of movement are severely restricted by the presence of other vehicles.	>35.0 to ≤55.0	>25.0 to ≤35.0
LOS E	Represents operating conditions at or near capacity. Individual vehicles have little freedom to maneuver within the traffic stream and any minor disruptions can cause a breakdown in the flow of traffic.	>55.0 to ≤80.0	>35.0 to ≤50.0
LOS F	Represents breakdown conditions. At this level of service, speeds are low, delays are high, and there are more vehicles entering the roadway than can be accommodated.	>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 (7th Revision of the 2014 CA-MUTCD as of the time this memorandum was written).

3.3 – LMA Format

An LMA must contain the following components at a minimum:

- **Introduction:** Briefly summarizes the report’s purpose and methodology used.
- **Executive Summary:** Provides a summary of the Project description, any study intersections/roadway segments, scenarios under which they were analyzed, traffic analysis findings, any proposed mitigations, and the expected improvement in LOS or delay with these mitigations (if applicable).
- **Study Area Selection and Analysis Methodology:** Provides information on the study area’s existing conditions, such as location, land use, and local transportation network. This can include information on the regional highway system, local roadway system, transit routes, and pedestrian/bicycle networks. Additionally, this section will describe the study intersections/roadway segments and the scenarios under which they were analyzed.
- **Project Trip Generation:** Calculates the Project’s anticipated trip generation, distribution, and assignment, utilizing information such as the collected TMC/ADT/vehicle classification data, land use, quantity, unit, and appropriate land use code from the latest ITE *Trip Generation Manual* (As of March 2024, 11th Edition, September 2021). Visual exhibits such as maps may be provided to assist in the understanding of trip distribution and assignment.
- **Substantial Traffic Effects:** Documents the traffic analysis results as well as any potential substantial effects to the surrounding transportation network for the required analysis scenarios.
- **Necessary Improvements:** Identifies and describes the transportation improvements that would be necessary to accommodate the project. Sample improvements are provided in the table on the following page.
- **Conclusion:** Briefly summarizes the traffic analysis results and any proposed/necessary improvements.

Depending on the conditions and environment of each Project, additional sections may be included to provide additional information or justification.

Table 8: Potential Transportation Improvements

Transportation Improvement	
Roadway	<ul style="list-style-type: none"> • Signing/Striping • Addition of lanes
Signalized Intersection	<ul style="list-style-type: none"> • Signal retiming • Signal Upgrade/Intelligent Transportation System (ITS) • Add additional turn lane • Extend existing turn pocket
Unsignalized Intersection	<ul style="list-style-type: none"> • Implement signal • Add roundabout • Implement turn restrictions • Add additional turn lanes
Pedestrian	<ul style="list-style-type: none"> • High-visibility crosswalks • Pedestrian countdown signals • Leading Pedestrian Intervals (LPI) • Rectangular Rapid Flashing Beacons (RRFB) • Pedestrian hybrid beacons
Bicycle	<ul style="list-style-type: none"> • Addition of dedicated bicycle lanes • Additional/improved signage • End-of-trip facilities (Bicycle Parking)

Improvements shall be discussed with City staff to determine appropriate and fundable measures.



Appendix A: Transportation Projects That Do Not Require VMT Analysis



Transportation Projects That Do Not Require VMT Analysis

The following complete list is provided in the OPR Technical Advisory (December 2018, pages 20-21) for transportation projects that “would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis”:

- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
- Roadside safety devices or hardware installation such as median barriers and guardrails
- Roadway shoulder enhancements to provide “breakdown space,” dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes
- Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features



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- Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles • Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of new transit service
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage
- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve nonmotorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor





Appendix B: VMT Mitigation Measures



Vehicle Miles Traveled (VMT)/ Greenhouse Gas (GHG) Mitigation Measures

#	Measure Title	Project Site Plan/ Community	Potential VMT Reduction
Land Use			
T-1	Increase Residential Density	P/S ¹⁰	30%
T-2	Increase Job Density	P/S	30%
T-3	Provide Transit-Oriented Development	P/S	31%
T-4	Integrate Affordable & Below Market Rate Housing	P/S	28.6%
T-17	Improve Street Connectivity	P/C ¹¹	30%
Trip Reduction Programs			
T-5	Implement Commute Trip Reduction Program (Voluntary)	P/S	4%
T-6	Implement Commute Trip Reduction Program (Mandatory)	P/S	26%
T-7	Implement Commute Trip Reduction Marketing	P/S	4%
T-8	Provide Ridesharing Program	P/S	8%
T-9	Implement Subsidized or Discounted Transit Program	P/S	5.5%
T-10	Provide End-of-Trip Bicycle Facilities	P/S	4.4%
T-11	Provide Employer-Sponsored Vanpool	P/S	20.4%
T-12	Price Workplace Parking	P/S	20%
T-13	Implement Employee Parking Cash-Out	P/S	12%
T-23	Provide Community-Based Travel Planning	P/C	2.3%
Parking or Road Pricing/Management			
T-14	Provide Electric Vehicle Charging Infrastructure	P/S	11.9%
T-15	Limit Residential Parking Supply	P/S	13.7%
T-16	Unbundle Residential Parking Costs from Property Cost	P/S	15.7%
T-24	Implement Market Price Public Parking (On-Street)	P/C	30%
Neighborhood Design			
T-18	Provide Pedestrian Network Improvement	P/C	6.4%
T-19-A	Construct or Improve Bike Facility	P/C	0.8%
T-19-B	Construct or Improve Bike Boulevard	P/C	0.2%
T-20	Expand Bikeway Network	P/C	0.5%
T-21-A	Implement Conventional Carshare Program	P/C	0.15%
T-21-B	Implement Electric Carshare Program	P/C	0.18%
T-22-A	Implement Pedal (Non-Electric) Bikeshare Program	P/C	0.02%
T-22-B	Implement Electric Bikeshare Program	P/C	0.06%
T-22-C	Implement Scootershare Program	P/C	0.07%
Transit			
T-25	Extend Transit Network Coverage or Hours	P/C	4.6%
T-26	Increase Transit Service Frequency	P/C	11.3%
T-27	Implement Transit-Supportive Roadway Treatment	P/C	0.6%
T-28	Provide Bus Rapid Transit	P/C	13.8%
T-29	Reduce Transit Fares	P/C	1.2%
Clean Vehicles and Fuels			
T-30	Use Cleaner-Fuel Vehicles	P/S or P/C	100%

Source: California Air Pollution Control Officers Association (CAPCOA) [Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity](#), Dec. 2021.

¹⁰ P/S = Project/Site

¹¹ P/C = Plan/Community



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Appendix C: Project Information Form





Project Information Form (PIF)

The following is to be completed by the project applicant:

Project Information Form	
Project Description:	
Project Location:	
Land Use:	Size/Density:
Zoning and Land Use Consistent with Adopted General Plan? <input type="checkbox"/> Yes <input type="checkbox"/> No	

Owner/Applicant Information

Name:
Address:
Phone Number:
Email:

Consultant, Developer, or Project Representative

Name/Firm:	
Project Manager:	License(s):
Phone Number:	
Email:	

Required Attachments

Attach 11x17" copies of the project location/vicinity map, site plan, and project distribution/assignment map containing the following:

- Driveway locations and access type
- Pedestrian access, bicycle access, on-site pedestrian circulation, and transit stop at project frontage (if applicable)
- Location of any planned sidewalks or bicycle facilities at project frontage (if applicable)

Location/Vicinity Map	<input type="checkbox"/> Attached
Site Plan	<input type="checkbox"/> Attached
Project Trip Distribution/Assignment Map	<input type="checkbox"/> Attached
List/Map of Proposed Study Roadway Segments/Intersections <i>(If LMA is required)</i>	<input type="checkbox"/> Attached





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Vehicle Miles Traveled (VMT) Screening

	Trip Type	Total	AM Peak Hour	PM Peak Hour
1.	Daily Trips			
	Pass-By Trips			
	Internal Capture			
	Previous Use Credits			
	Net Daily Trips			
Project Generates Less than 110 Daily Vehicle Trips?				<input type="checkbox"/> Yes <input type="checkbox"/> No
2.	Project is a Public/Community-Serving Facility, Retail, Bike, Pedestrian or Transportation Project Excluded from VMT Analysis?			<input type="checkbox"/> Yes <input type="checkbox"/> No
3.	Project Located in Low VMT Area (See Figures 8, 9 & 10)?			<input type="checkbox"/> Yes <input type="checkbox"/> No
4.	Project Screened from VMT Analysis? <i>If "Yes" is checked for any of the criteria above, the project is screened out from further VMT Analysis.</i>			<input type="checkbox"/> Yes <input type="checkbox"/> No

Local Mobility Analysis (LMA) Screening

1.	Project Generates Less than 800 Daily Vehicle Trips?	<input type="checkbox"/> Yes <input type="checkbox"/> No
2.	Project Screened from Local Mobility Analysis? <i>If "Yes" is checked for criterion above, the project is screened out from further LMA Analysis.</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No

*If the project is required to complete an LMA, provide an attachment with a list or map of the proposed study roadway segments and intersections in accordance with the requirements outlined in **Sections 3.0 - 3.3** of these guidelines.*

