



**CITY OF PALO ALTO
LOCAL TRANSPORTATION IMPACT ANALYSIS POLICY**

Senate Bill (SB) 743, adopted in 2013, required the Governor’s Office of Planning and Research (OPR) to prepare amendments to the CEQA Guidelines with respect to the analysis of potential transportation effects to provide an alternative metric to traffic congestion and delay at intersections (often referred to as Level of Service (LOS)). After five years of analysis and outreach, in December 2018, the California Natural Resources Agency approved OPR’s proposed amendments to the CEQA Guidelines requiring agencies to use vehicle miles traveled (VMT) generated by a project as the metric for transportation impact analyses under CEQA effective July 1, 2020. Under SB 743 and the revised CEQA Guidelines, LOS may no longer be used to determine whether a project may have a significant environmental impact to transportation and traffic under CEQA.

While statewide implementation of VMT analysis to replace LOS analysis is required under CEQA, SB 743 did not require changes to transportation analyses outside of CEQA, including the evaluation of regionally significant intersections under the Congestion Management Program (CMP) under a separate state law. Nor did SB 743 affect the discretion of public agencies to assess impacts on local streets and intersections for compliance with adopted plans and policies. As such, in conformance with Policy T-2.3 and Program T-2.3.1 of the City’s [Comprehensive Plan 2030](#),¹ LOS standards are adopted through this policy to analyze potential local transportation impacts of projects in Palo Alto.

I. Purpose

The purpose of this Policy is to ensure consistency in reviewing and identifying transportation effects of proposed development projects for local intersections and facilities and to determine standards for necessary remediation measures.

¹ Comprehensive Plan Policy T-2.3: Use motor vehicle LOS at signalized intersections to evaluate the potential impact of proposed projects, including contributions to cumulative congestion. Use signal warrants and other metrics to evaluate impacts at unsignalized intersections.

Program T-2.3.1: When adopting new CEQA significance thresholds for VMT for compliance with SB 743 (2013), adopt standards for vehicular LOS analysis for use in evaluating the consistency of a proposed project with the Comprehensive Plan, and also explore desired standards for MMLOS, which includes motor vehicle LOS, at signalized intersections.

Policy T-2.4: Consistent with the principles of Complete Streets adopted by the City, work to achieve and maintain acceptable levels of service for transit vehicles, bicyclists, pedestrians and automobiles on roads in Palo Alto, while maintaining the ability to customize to the Palo Alto context.

Policy T-3.3: Avoid major increases in single-occupant vehicle capacity when constructing or modifying roadways unless needed to remedy severe congestion or critical neighborhood traffic problems. Where capacity is increased, balance the needs of motor vehicles with those of pedestrians and bicyclists

II. Level of Service (LOS) Analysis

LOS is the measurement of delay at intersections used to determine whether a project is consistent with the City's Comprehensive Plan and this Policy LOS is based on the Highway Capacity Manual (HCM) methodology where a letter grade is assigned to an intersection operation based on the amount of delay motorists experience in traveling through the intersection. Table 1 below shows the comparison in LOS depending on whether the intersection is signalized or not.

Table 1: Level of Service Delay – Signalized vs. Non-Signalized Intersections

Level of Service Grade	Description	Signalized Average Delay (Sec)	Unsignalized Average Delay (Sec)
A	Signal Progression is extremely favorable. Little or no traffic delay.	10.0 or less	10.0 or less
B	Operations characterized by good signal progression and/or short cycle lengths. Short traffic delays.	10.1 to 20.0	10.1 to 15.0
C	Higher delays may result from fair signal progression. Average traffic delays.	20.1 to 35.0	15.1 to 25.0
D	Congestion becomes noticeable. Long traffic delays.	35.1 to 55.0	25.1 to 35.0
E	Considered the limit of acceptable delay.	55.1 to 80.0	35.1 to 50.0
F	Level of delay is considered unacceptable by most drivers. Extreme traffic delays.	Greater than 80.0	Greater than 50.0

Source: Transportation Research Board, Highway Capacity Manual 2010

III. Standards for Determining Transportation Analysis

1. Within the CMP System

Traffic Impact Analysis (TIA) reports vary in scope depending on the use of the report and size of the project.

Under the purview of the California Congestion Management Program (CMP) Statute, Palo Alto must follow the methodologies presented in the [VTA Transportation Impact Analysis Guidelines for intersections within the CMP system](#), to evaluate transportation effects and submit a full TIA report of all development projects that are expected to generate 100 or more net new weekday (AM or PM peak hour) or weekend peak hour trips, including both inbound and outbound trips.

CMP intersections within Palo Alto are listed below. A map of all CMP intersections can be found in Attachment A.

- i. Middlefield Rd./Oregon Exp.
- ii. Middlefield Rd./San Antonio Rd.
- iii. El Camino Real/University Ave./Palm Dr.
- iv. El Camino Real/ Sand Hill Rd./Palo Alto Ave.
- v. El Camino Real/Embarcadero Rd.
- vi. El Camino Real/Page Mill Rd.
- vii. El Camino Real/Arastradero Rd./Charleston Rd.
- viii. Foothill Exp./Junipero Serra Blvd./Page Mill Rd.
- ix. Foothill Exp./Arastradero Rd.
- x. San Antonio Rd./Charleston Rd.

2. Outside the CMP System

The City requires a Local Transportation Analysis (LTA) report for any project that is expected to generate 50 or more net new weekday (AM or PM peak hour) trips, including both inbound and outbound trips, prior to any reductions assumed for Transportation Demand Management (TDM) measures. The City may also require a LTA if in its reasonable judgement a project will potentially cause a deficiency in the operation of local intersections. A LTA report must include the following:

- i. Project description;
- ii. Existing conditions;
- iii. Site access and circulation;
- iv. Vehicle trip generation (weekday AM and PM peak);
- v. Vehicle trip distribution; and
- vi. Remediation measures (if proposed)

Depending on the size and layout of the project, additional elements listed below may be required by the City to include in the LTA report.

- i. Traffic Infusion on Residential Environments (TIRE) Analysis is an analysis of new potential traffic disturbances along a local residential streets created by a project as described in the Attachment B. When a proposed development project is expected to add 10 or more peak hour vehicles per any direction to a local residential street that is not on a project's direct route to collector or arterial streets, the project is required to submit a TIRE analysis.
- ii. Queuing Analysis that identifies queues spilling beyond their current storage bays. Improvements may include lengthening storage bays to meet projected demand or roadway capacity improvements to add additional turn pockets at

an intersection. The City typically takes the lead in identifying potential capacity improvements to help facilities site design.

- iii. Transit Analysis for projects located along a key transit route, such as El Camino Real, a focused analysis in partnership with the VTA or other transit operators is provided to determine if off-site improvement of a project should consider additional parking stop improvements such as shelters or bus duck-outs.
- iv. Bicycle and Pedestrian Circulation Study is an analysis of how the site operations may affect bicycle and pedestrian operations. Where appropriate, if a project is located along a major bicycle route in the City's [Bicycle & Pedestrian Transportation Plan](#), the project may be required to help implement a portion of the recommended facility. Additional improvements may include limiting driveway curb-cuts to minimize conflicts with pedestrians or provision of enhanced crosswalk facilities.
- v. Parking Analysis is a study to determine location, use, and adequacy of the proposed parking facility. Projects should include a parking analysis under the following conditions:
 - a. Change in the facilities' existing design or supply; or
 - b. Change in the existing parking management; or
 - c. Propose parking less than that required by the Palo Alto Municipal Code 18.52 (<https://tinyurl.com/PA-Municipal-Code>); or
 - d. Use of parking adjustments by the Director as defined in the Palo Alto Municipal Code 18.52 (<https://tinyurl.com/PA-Municipal-Code>).

When a proposed project requests a parking reduction or exception as allowed under the Municipal Code, a robust Transportation Demand Management (TDM) Plan is typically required independent of the LTA. For projects in a Parking Assessment District, required payment of assessments to the District will be noted in the LTA report and included in the project's conditions of approval.

A project will provide an analysis of one or more of the above elements if the project is expected to substantially affect the identified local facilities, even if the anticipated number of new vehicle trips would not require a LOS analysis.

IV. Local Transportation Impacts – Standards for Determining Transportation Consistency

1. Level of Service Standard

The City of Palo Alto's Level of Service (LOS) standard is D, which is more conservative than the CMP LOS standard of E. If the LTA shows that a development project is anticipated to cause a transportation facility (intersection or roadway) to degrade below LOS D to LOS E or F, then the project will be deemed inconsistent with this Policy.

For a transportation facility determined to have been at LOS E or F under existing and background conditions without the project, a project is said to have significant local impact if the LTA shows that the project will cause LOS to deteriorate by the following amounts:

- i. Addition of project traffic increases the average delay for critical movements by four or more seconds; or
- ii. Addition of project traffic increases the critical Volume/Capacity (V/C) value by 0.01 or more; or
- iii. Affects a freeway segment or ramp to operate at LOS F or project traffic increases freeway capacity by one or more percent.

2. Selection of Study Intersections or Roadways

An intersection should be included in the LTA if it meets any one of the following conditions:

- i. Proposed development project is expected to add 10 or more peak hour vehicles per any lane to any intersection movement; or
- ii. The intersection is adjacent to the project; or
- iii. Based on engineering judgement, City staff determines that the intersection should be included in the analysis.

Additionally, a roadway segment should be included in the LTA with a TIRE analysis if a proposed development project is expected to add 10 or more peak hour vehicles per any direction to a local residential street. More details on the TIRE analysis are available in Attachment B.

3. CMP Intersection Standard

A CMP intersection must adhere to the standards set by the Congestion Management Agency² (currently LOS E), as set forth in the [VTA Transportation Impact Analysis Guidelines](#). The City's standard of LOS D would apply for determining local level impacts.. Any transportation impact triggered by VTA's standard for CMP intersections would need to be addressed following guidelines established by VTA. More information regarding mitigation measures and Multimodal Improvement Plans (MIP) are available in the VTA Guidelines for TIAs and Deficiency Plans.

4. Auto Level of Service Analysis at Unsignalized Intersections

For all-way stop control, the LOS is based on the average delay. For 1- or 2-way stop control, the LOS should be based on the critical approach movement. The above standards for determining transportation consistency remain appropriate only if traffic volumes satisfy the peak hour traffic signal warrant. Meeting a peak hour traffic signal warrant does not automatically make a traffic signal an appropriate remediation measure.

5. Other Transportation Impacts

Depending on the size and layout of the project, a LTA may require analysis to evaluate other project-related effects on the transportation system. The following is a list of elements that are considered to have project-related local impacts:

- i. Result in noticeable traffic effects on local residential streets defined as an increase of 0.1 or more using the TIRE methodology.
- ii. Impede the development or function of existing or planned pedestrian or bicycle facilities.
- iii. Increase demand for pedestrian or bicycle facilities that cannot be met by existing or planned facilities.
- iv. Impede the operation of a transit system as a result of increased traffic congestion.
- v. Create demand for transit services that cannot be met by current or planned services.
- vi. Create the potential demand for cut-through traffic or redistribution of traffic to use local residential streets, based on the TIRE methodology described above.
- vii. Create an operational safety hazard.
- viii. Result in inadequate emergency access.

² The Santa Clara Valley Transportation Authority (VTA) is the Congestion Management Agency (CMA) for Santa Clara County.

V. Remediation Measures

All Local Transportation Impacts under Section VI of this Policy must be addressed through the project's adoption or use of appropriate local remediation measures, including funding their associated costs. The LTA must include proposed remediation measures and identify any potential impacts of such measures. Remediation measures shall reduce the project-related local impacts to a level without the proposed project, and should not themselves create potentially significant CEQA impacts. These remediation measures will be incorporated in the project conditions of approval and not as part of the CEQA analysis. The following is a list of potential remediation methods in priority order:

1. Projects and programs that reduce a project's vehicle trip generation, including, but not limited to Transportation Demand Management (TDM) programs, capital improvements to transit, bicycle, and pedestrian facility enhancements within an influential project area.³ The following is a non-exhaustive list of potential remediation methods:
 - i. Provide new or upgrade existing access to, from, and through the project for pedestrians and bicyclists.
 - ii. Provide improvements to transit facilities or services.
 - iii. Implement TDM programs such as flexible at-place working hours, telecommuting, carpools, shuttles, transit passes, parking cash-out, among others.
2. Multimodal operational or facility improvements including intersection operational efficiency treatments. Proposed improvements or treatments with geometric changes to an intersection are limited to features that would not likely lead to substantial or measurable increase in vehicle travel.
3. If project impacts cannot be remediated through methods 1 and 2 above, a fair share of the cost for multimodal network remediation shall be contributed to the City's transportation improvement funds.

While the remediation measures in method 1, above, should be proposed within an influential project area, methods 2 and 3 may apply outside the area. However, these proposed improvements should substantially contribute to the City's Comprehensive Plan goals in expanding the City's multimodal transportation system. By implementing or funding these types of improvements, the project would therefore be consistent with the Comprehensive Plan and this Policy.

³ Area of influence of a project is defined as up to half-mile for pedestrian facilities and up to three miles for bicycle facilities, or bicycle facilities that provide a connection to the local or regional bicycle network.

Unacceptable Measures

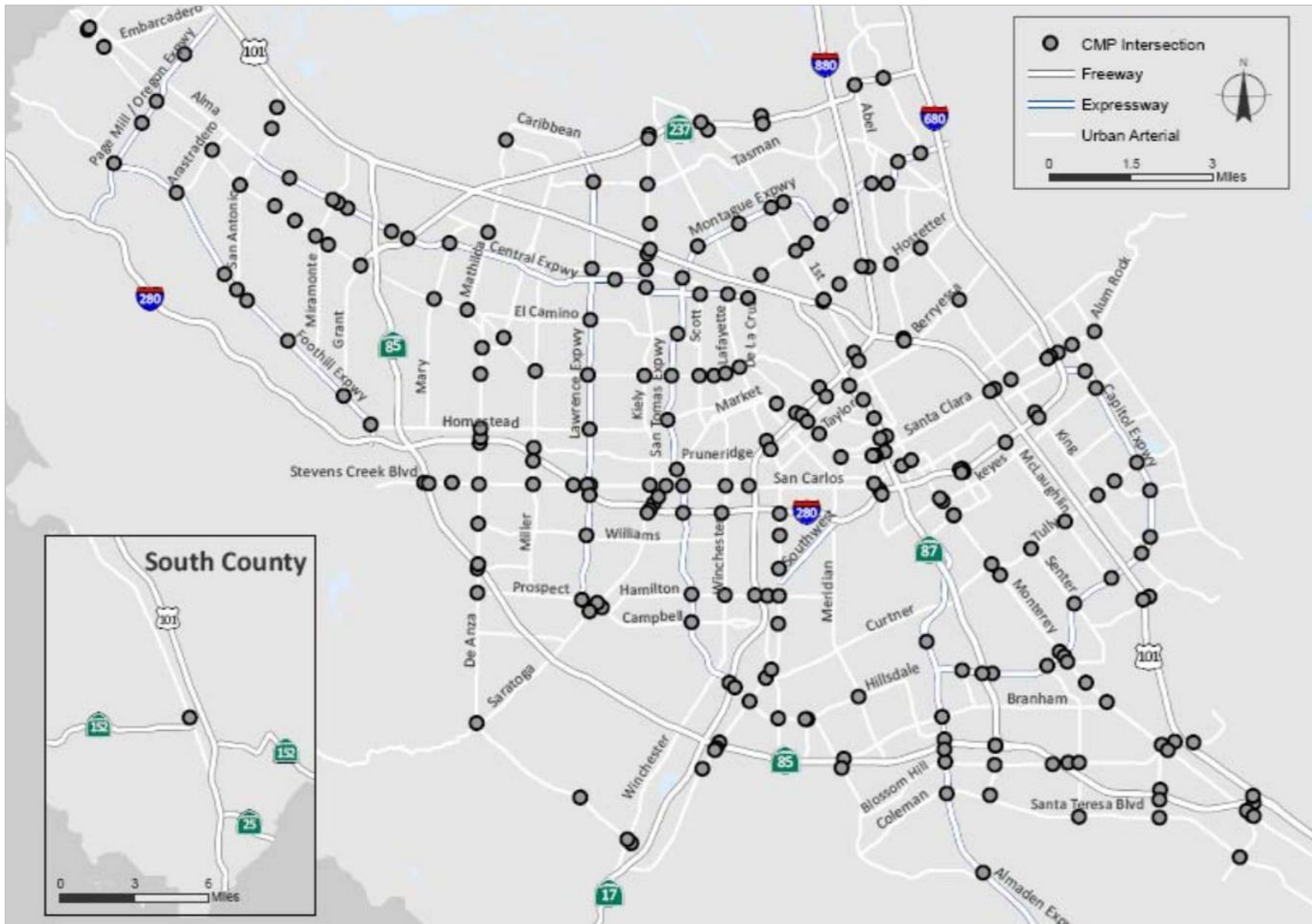
In addition, remediation measures that will result in a physical reduction in the capacity and/or deterioration in the quality of any existing or planned transportation facilities are unacceptable. The following is a list of remediation methods that would be considered generally unacceptable without special justification, but are not limited to:

1. Roadway widening not directly related to site access and circulation, or specific conditions that reduce local impacts as a result of the project.
2. Negatively affecting a sidewalk or reducing the width of a sidewalk without substantial improvement to the overall pedestrian circulation.
3. Maintaining an existing sidewalk in the immediate vicinity that is below the current city standard.
4. Negatively affecting existing bicycle infrastructure or reducing the length of a bicycle infrastructure.
5. Maintaining existing bicycle infrastructure that is below the current city standard.
6. Eliminating a bus stop without adequate replacement or improvement to the system.
7. Encouraging neighborhood cut-through traffic (intrusion effects along local residential streets).

VI. Authority to Adopt Guidelines

The Chief Transportation Official is authorized to adopt guidelines to implement this Policy.

**ATTACHMENT A
CONGESTION MANAGEMENT PROGRAM INTERSECTIONS**



Source: Santa Clara Valley Transportation Authority Congestion Management Program Document 2017

ATTACHMENT B**CITY OF PALO ALTO – TRAFFIC INFUSION ON RESIDENTIAL ENVIRONMENTS (TIRE) ANALYSIS**

Excessive vehicular speed and traffic volume on residential streets pose a major threat to quality of life. Most Palo Alto streets are bordered by residential uses, and it is the City's priority to preserve local neighborhood characteristics. Additionally, the City has designated some streets as residential arterials to recognize that they carry large traffic volumes of through-traffic but also have residential uses on both sides of the streets. The objective of this analysis is to address the desires of residents of these streets who prefer slower vehicular speeds and to determine if implementation of a project would cause a substantial change in the character of these streets.

The City of Palo Alto uses the Traffic Infusion on Residential Environments (TIRE) methodology to estimate residential perception of traffic effects based on anticipated average daily traffic growth. Although not required under the California Environmental Quality Act (CEQA) or pursuant to the Santa Clara Valley Transportation Authority (VTA) guidelines, this methodology intends to determine new potential traffic disturbances – cut-through traffic (*intrusion effects*) and direct traffic (*infusion effects*) – along local residential streets due to a proposed development project.

For projects on a local residential street, new traffic disturbances along that specific street will likely be unavoidable. Thus, the potential infusion effects generated along a specific local residential street of which a project is proposed will be used only for informational purposes. A map of Palo Alto's local residential streets can be found in Map 1 in this attachment.

The City aims to reduce potential adverse *intrusion effects* along local residential streets. Significant amount of vehicle intrusion on these streets may need to be addressed through traffic management strategies.

Traffic Infusion on Residential Environments (TIRE) Index

The TIRE methodology assigns a numerical value to "residents' perception of traffic effects on activities such as walking, bicycling, and maneuvering out of a driveway on local residential streets." The TIRE index scale ranges from 0 to 5 depending on daily traffic volume. An index of 0 represents the least traffic disturbances and 5 the greatest, and thereby, the poorest residential environment. Streets with a TIRE index of 3 and above are considered to function primarily as a traffic street and exhibit an impaired residential environment. Therefore, streets with a TIRE index below 3 are better suited for residential activities.

Any projected change in the TIRE index of 0.1 or less is considered to have no noticeable effects. A change of 0.1 would be barely noticeable, and a change of 0.2 or greater would be noticeable. The TIRE Index can be found in Table 1 in this attachment.

I. Standards for Determining Analysis

A proposed development project expecting to add 10 or more peak hour vehicles per any direction to a local residential street.

II. Selection and Data Collection of Roadway Segments

Roadway segments should be included in the LTA if a proposed development project is expected to add 10 or more peak hour vehicles per any direction to a local residential street. Data collected under the TIRE methodology must be supported by 24-hour weekday traffic counts.

For projects on a local residential street including both single- or multi-family, as defined in the City's Comprehensive Plan 2030, the TIRE analysis must include the following:

1. Direct routes to the project;
2. Immediate connections to a project's direct collector or arterial streets; and
3. Based on engineering judgement, City staff determines what roadway segments should be included in the analysis.

A Palo Alto land use map can be found in Map 2 in this attachment.

III. Standards for Determining Noticeable Effect

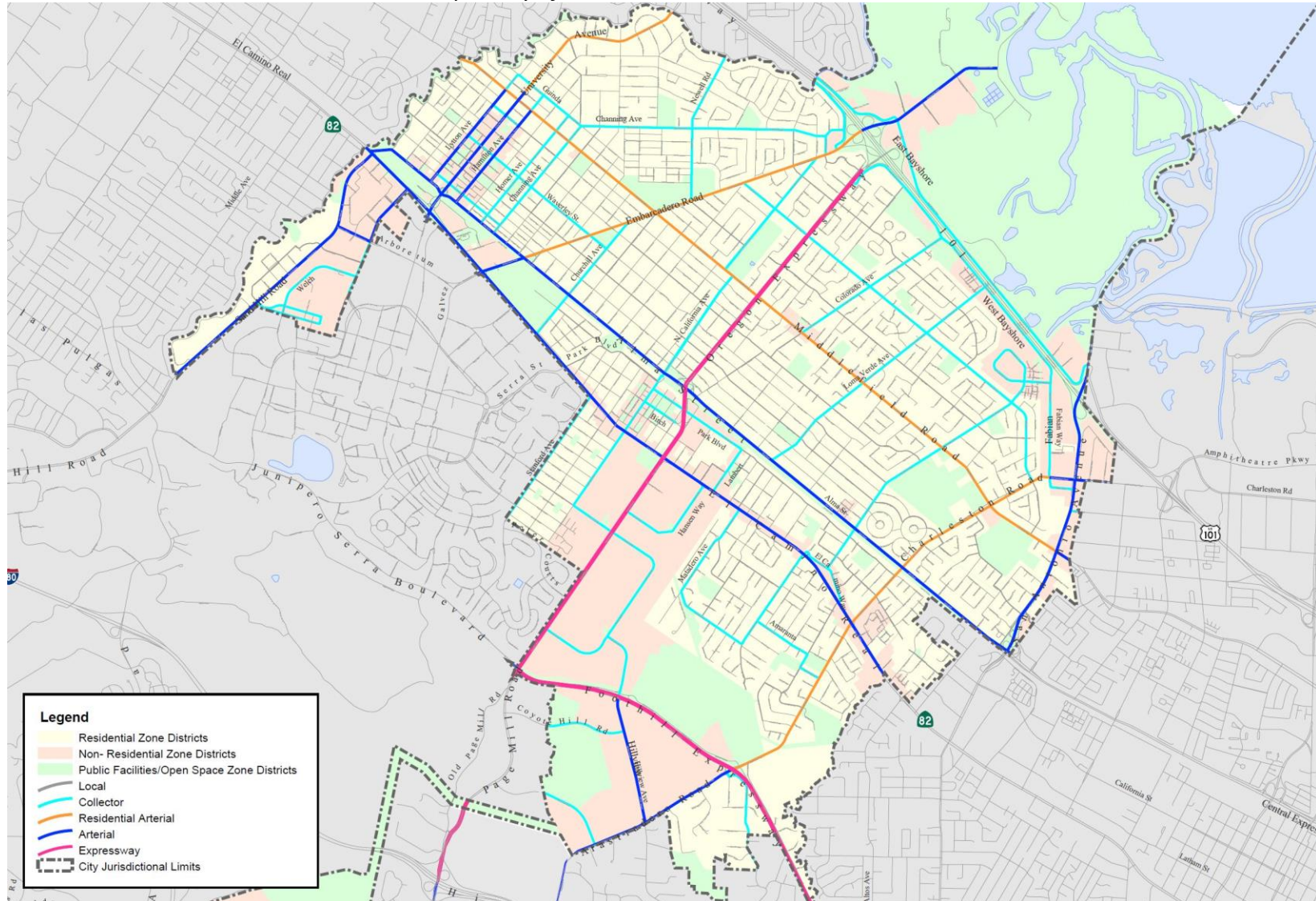
Projected change in the TIRE index of 0.1 or more under existing and background conditions, is considered to cause noticeable effects on the character of local residential streets. These traffic effects may need to be addressed through traffic management strategies.

Table 1: Traffic Infusion on Residential Environments (TIRE) Index

TIRE Index	Existing Daily Traffic Volume	Volume to Cause +0.1 Change in TIRE Index	Volume to Cause +0.2 Change in TIRE Index	Volume Description
1.5	29-35	6	15	Low
1.6	36-44	8	20	
1.7	45-56	10	25	
1.8	57-70	13	32	
1.9	71-89	17	41	
2.0	90-110	22	52	Moderate
2.1	111-140	29	65	
2.2	141-180	40	80	
2.3	181-220	52	100	
2.4	221-280	65	125	
2.5	281-350	79	160	
2.6	351-450	94	205	
2.7	451-560	114	260	
2.8	561-710	140	330	
2.9	711-890	170	415	
3.0	891-1,100	220	520	High
3.1	1,101-1,400	290	650	
3.2	1,401-1,800	380	800	
3.3	1,801-2,200	500	1,000	
3.4	2,201-2,800	650	1,300	
3.5	2,801-3,500	825	1,700	
3.6	3,501-4,500	1,025	2,200	
3.7	4,501-5,600	1,250	2,800	
3.8	5,601-7,100	1,500	3,500	
3.9	7,101-8,900	1,800	4,300	
4.0	8,901-11,000	2,300	5,300	Very High
4.1	11,001-14,000	3,000	6,500	
4.2	14,001-18,000	4,000	8,000	
4.3	18,001-22,000	5,200	10,000	
4.4	22,001-28,000	6,600	13,000	
4.5	28,001-35,000	8,200	17,000	
4.6	35,001-45,000	10,000	22,000	
4.7	45,001-56,000	12,200	28,000	
4.8	56,001-71,000	14,800	35,000	
4.9	71,001-89,000	18,000	43,000	

Source: Goodrich Traffic Group

Map 1 City of Palo Alto Local Residential Streets



Source: City of Palo Alto Comprehensive Plan 2030

