Attachment 3

Modified Auto Level of Service Analysis

Consistent with the provision of SB743 that the restriction on the use of vehicle capacity or delay measures in CEQA "does not preclude addressing traffic congestion in local General Plan Policies, Zoning Codes, Conditions of Approval, Thresholds, or Fee Programs," staff is proposing that the following modified Auto Level of Service (LOS) and Street Segment Analyses be used for "Projects of Communitywide Significance" which are defined as 50,000 square feet of new commercial use, 50 residential units or more, or any combination of the two.

A 2010 *Highway Capacity Manual* (HCM) intersection Level of Service (LOS) analysis will be applied to proposed new development projects that meet or exceed the size thresholds to be Projects of Communitywide Significance and the results will be measured for compliance with the following intersection LOS caps:

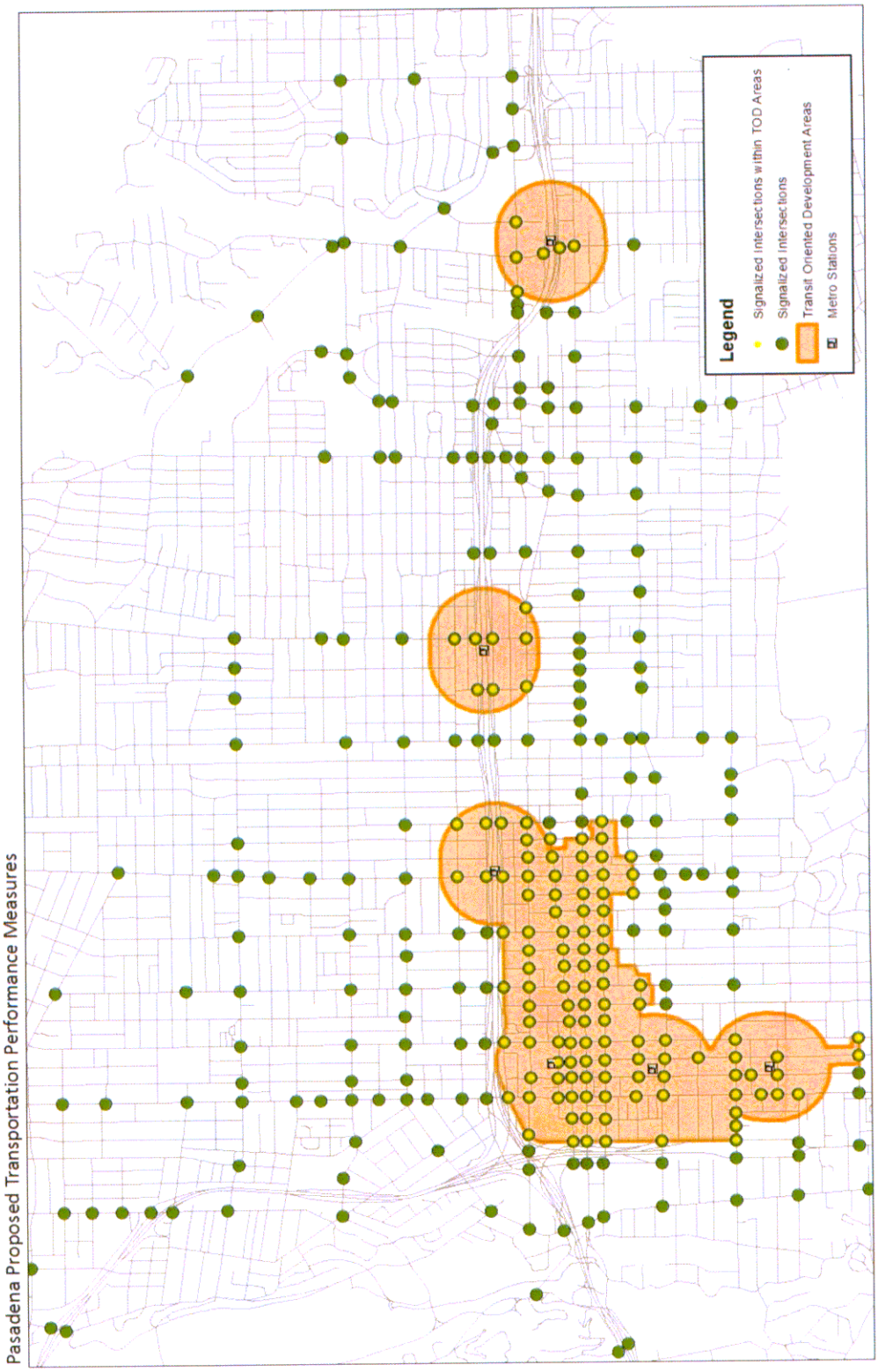
Study Intersections	**LOS Cap**
Citywide	D
Transit Oriented District (TOD)	E

Auto LOS is a qualitative description of traffic flow from a vehicle driver's perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined, ranging from LOS A (best operating conditions) to LOS F (worst operating conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result and operations are designated to LOS F.

Signalized Intersections
Traffic conditions at signalized intersections are evaluated using methodologies proposed by the Transportation Research Board (TRB), as documented in the 2010 Highway Capacity Manual (HCM 2010). The 2010 HCM method calculates control delay at an intersection based on inputs such as traffic volumes, lane geometry, signal phasing and timing, pedestrian crossing times, and peak hour factors and is currently state of the practice for analyzing LOS. Control delay is defined as the delay directly associated with the traffic control device (i.e., a stop sign or a traffic signal) and specifically includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. These delay estimates are considered meaningful indicators of driver discomfort and frustration, fuel consumption, and lost travel time.

TABLE A1 – SIGNALIZED INTERSECTION LOS CRITERIA		
LEVEL OF SERVICE	**DESCRIPTION**	**DELAY IN SECONDS**
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	< 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor (vehicle) progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	This level is considered oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	> 80.0
Source: 2010 *Highway Capacity Manual.*		

Figure 1 illustrates the adopted Transit Oriented Districts



Attachment 4

Modified Pasadena Street Segment Analysis for Neighborhood Protection

Pasadena currently employs a Street Segment Analysis metric to identify the amount of new auto trips a development project will add to adjacent streets. The traffic growth on a street segment is calculated as follows: Percentage of Traffic Growth on Street Segment = Net New Project Trips / Existing Daily Traffic

While the current Street Segment Analysis methodology identifies changes to vehicle volumes on all streets, including residential streets, the increase in traffic volumes on a street in itself is not an environmental impact. Absent physical barriers the City cannot reduce traffic volumes on streets. The existing methodology establishes significance on the basis of percent increase, which means that the same projected increase in traffic volume is significant on one street, but not on another street, based entirely on the existing traffic volumes on the two streets.

To identify and address traffic neighborhood traffic intrusion from new development staff explored a potential Modified Street Segment Analysis for Neighborhood Protection. By setting a decreasing scale for the percent of project traffic on a street with a minimum Average Daily Traffic the potential methodology addresses some of the issues with the current Street Segment Analysis. Under the modified methodology, the number of streets that would be affected would be reduced substantially and the level of added traffic would need to be greater. However, the modified analysis would retain the reliance on a relative change in traffic volume to determine effect.

While proposed VMT and VT metrics are vehicular-based metrics to estimate project's vehicular trips and trip lengths, the modified street segment analysis was developed to quantify neighborhood traffic intrusion from new development. To that end, the Department of Transportation developed the following criteria for street segment analysis:

- Applies to "Projects of Communitywide Significance" which are defined as 50,000 square feet of new commercial use, 50 residential units or more, or any combination of the two.
- The analysis would be limited to "Access" and "Neighborhood Connector" street types within a residential context (Street Types Map below)

Number of New Trips Requiring Neighborhood Traffic Calming Measures

Existing ADT	**Project-Related Vehicular Increase In ADT**
0 to 1500	150 or more
1,500 to 2,499	10 percent or more of final ADT
2,500 or 3,499	10 percent or more of final ADT
3,500 or more	8 percent or more of final ADT

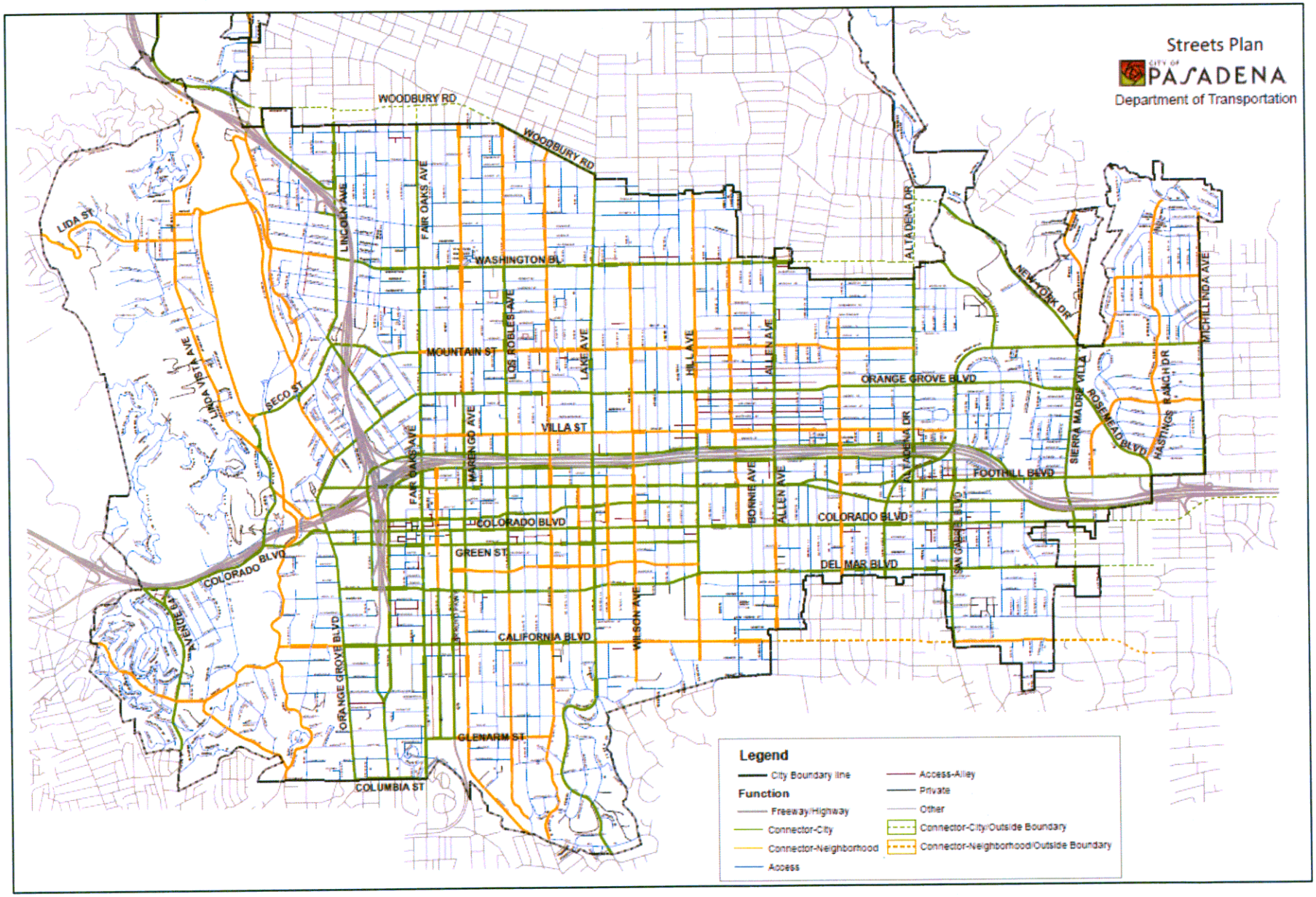
If project-related trips exceed the caps in the table above conditions of approval would require the project applicant to develop and implement a targeted Complete Streets Plan with input from the affected residents, council districts and DOT to encourage use of non-vehicular modes by the project's patrons, and implement measures to discourage use of residential streets to-and-from the project site. Below is a list of typical measures that would be included in a Complete Streets Plan.

Project specific measures:

- Establish a more aggressive Average Vehicle Occupancy (AVO) target that exceeds city's AVO average by enhancing the required TDM plan under City's Trip Reduction Ordinance (TRO)
- Project turn-restrictions
- Revised project access and circulation

Complete Streets measures

- Curb Extensions
- Pedestrian and Bike Traffic signal upgrades/enhancements
- Turn-restrictions
- Neighborhood Gateways (raised medians)
- Traffic circles
- Speed humps
- Signal metering


Streets Plan
CITY OF PASADENA
Department of Transportation
WOODBURY RD
WOODBURY RD
LIDA ST
LINCOLN AVE
FAIR OAKS AVE
WASHINGTON BL
ALTADENA DR
NEW YORK DR
MICHILLINDA AVE
MOUNTAIN ST
LOS ROBLES AVE
LAKE AVE
HILL AVE
ALLEN AVE
ORANGE GROVE BLVD
LINDA VISTA AVE
SECO ST
VILLA ST
MARENGO AVE
FAIR OAKS AVE
ALTADENA DR
SIERRA MADRE VILLA
ROSEMEAD BLVD
HASTINGS RANCH DR
FOOTHILL BLVD
BONNIE AVE
ALLEN AVE
COLORADO BLVD
SAN GABRIEL BLVD
COLORADO BLVD
GREEN ST
DEL MAR BLVD
COLORADO BLVD
ARROYO PKWY
ORANGE GROVE BLVD
CALIFORNIA BLVD
WILSON AVE
GLENARM ST
COLUMBIA ST
Legend
City Boundary line
Function
Freeway/Highway
Connector-City
Connector-Neighborhood
Access
Access-Alley
Private
Other
Connector-City/Outside Boundary
Connector-Neighborhood/Outside Boundary

The following is a comparison of the Existing Street Segment Analysis to the Modified Street Segment Analysis.

Existing Street Segment Analysis	**Modified Street Segment Analysis**
CEQA Threshold at >4.9% increase in ADT	8% to 10% above 1500 ADT with a minimum of 150 for ADT <1500
Applied to Commercial and Residential Projects	Applied to Commercial Projects 50,000 sq. ft or larger and Residential Projects with 50 units or more
Applied on All Street Types	Applied on "Access" and "Neigh. Con." with Residential Context
No Minimum ADT Increase	Minimum of 150 ADT Increase
Required Measures No Longer Adequate as CEQA Mitigations	Traffic Intrusion into residential areas addressed with enhanced trip reduction and NTMP Traffic Calming Measures

Attachment 5

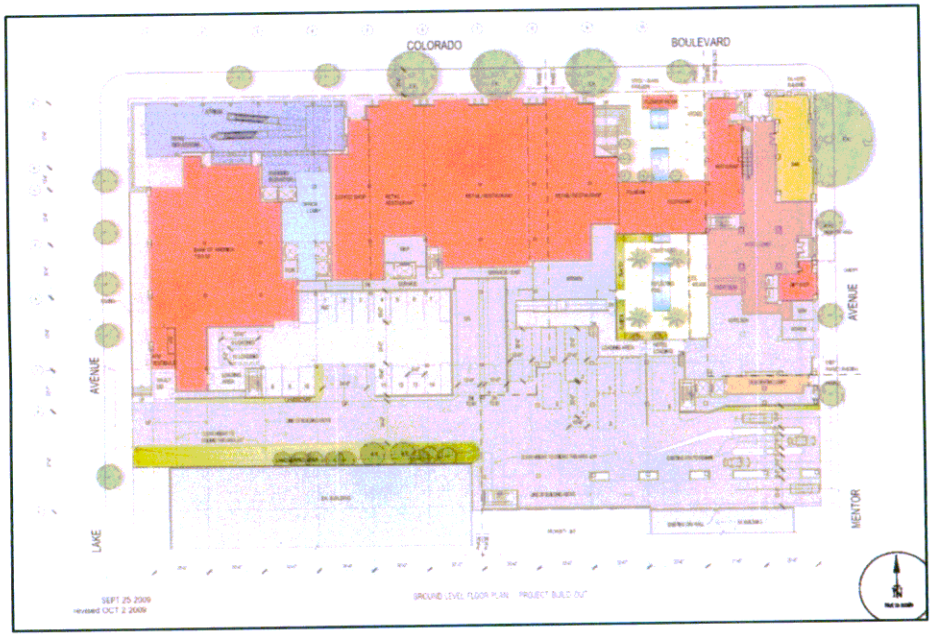
Case Study 1

Location: 880 East Colorado Boulevard
Land Use Type: Mixed-use, Transit Oriented
Project Description: 156-room hotel, 14 KSF of retail, 8 KSF of personal services, 38 KSF of restaurant space, 103 KSF of office space, and 5 residential units.
Previous Land Use: 18,325 square feet of office, 6,560 square feet of bank with three ATM drive-through lanes at the Mentor Avenue driveway, 6,075 square feet of specialty retail, 4,936 square feet of restaurant and 164-room hotel which is currently vacant that previously operated as senior adult housing.

Existing Transportation Metrics:

- **Level of Service:** 15 intersections analyzed; selected project alternative had no intersection impacts
- **Street Segment Volume:** 12 segments analyzed; segment daily traffic growth ranging from 0.0% to 19.5%. 2 street segments impacted.

	Metric	Case Study 1
2013 Existing	VMT	5,662,199
	VT	695,332
	Service Population (Pop + Emp)	250,616
	VMT / Capita	22.6
	VT / Capita	2.8
Scenario	VMT	5,680,262
	VT	697,052
	Service Population (Pop + Emp)	251,425
	VMT / Capita	22.6
	VT / Capita	2.8
Increment	Incremental VMT	18,063
	Incremental VT	1,720
	Incremental Service Population (Pop + Emp)	809
	Incremental VMT / Incremental Capita	22.3
	Incremental VT / Incremental Capita	2.1



Case Study 2

Location: 865 North Fair Oaks Avenue

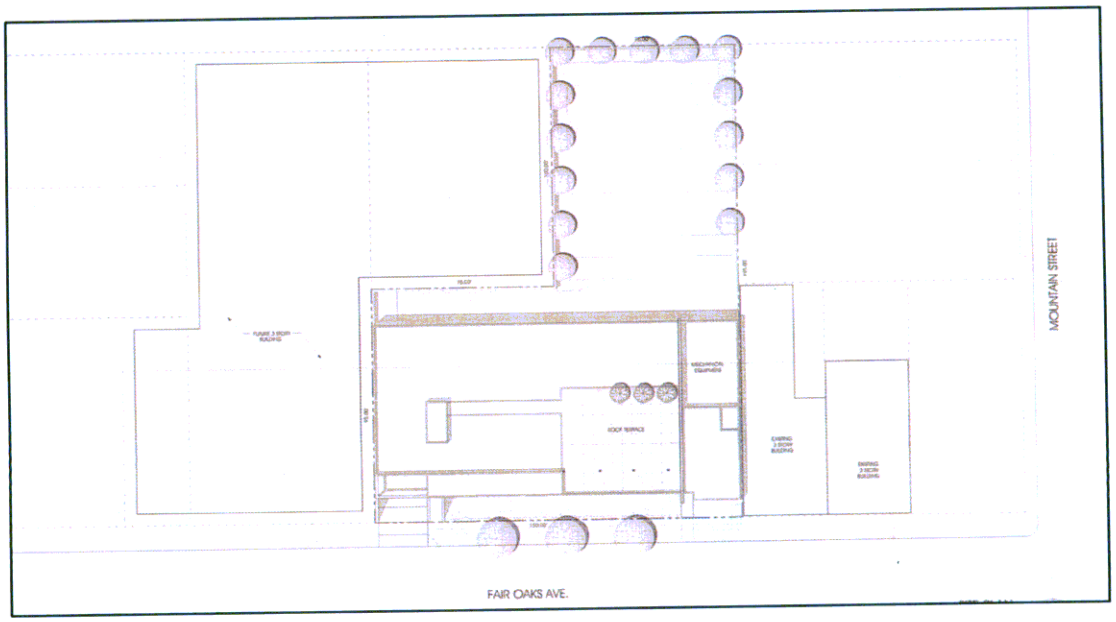
Type of Land Use: Office development

Project Description: 19 KSF of office space

Pervious Land Use: Two-story office building with a subterranean parking lot
Existing Transportation Metrics:

- **Level of Service:** 6 intersections analyzed; no impacts
- **Street Segment Volume:** No street segment impact. ; daily traffic growth of 0.37%

	Metric	Case Study 2
2013 Existing	VMT	5,662,199
	VT	695,332
	Service Population (Pop + Emp)	250,616
	VMT / Capita	22.6
	VT / Capita	2.8
Scenario	VMT	5,662,808
	VT	695,273
	Service Population (Pop + Emp)	250,675
	VMT / Capita	22.6
	VT / Capita	2.8
Increment	Incremental VMT	609
	Incremental VT	-59
	Incremental Service Population (Pop + Emp)	59
	Incremental VMT / Incremental Capita	10.3
	Incremental VT / Incremental Capita	-1.0



Case Study 3

Location: 158 – 188 South Sierra Madre Boulevard,

Land Use Type: Residential

Project Description: 60 multifamily dwelling units

Previous Land Use: Vacant Classroom Buildings

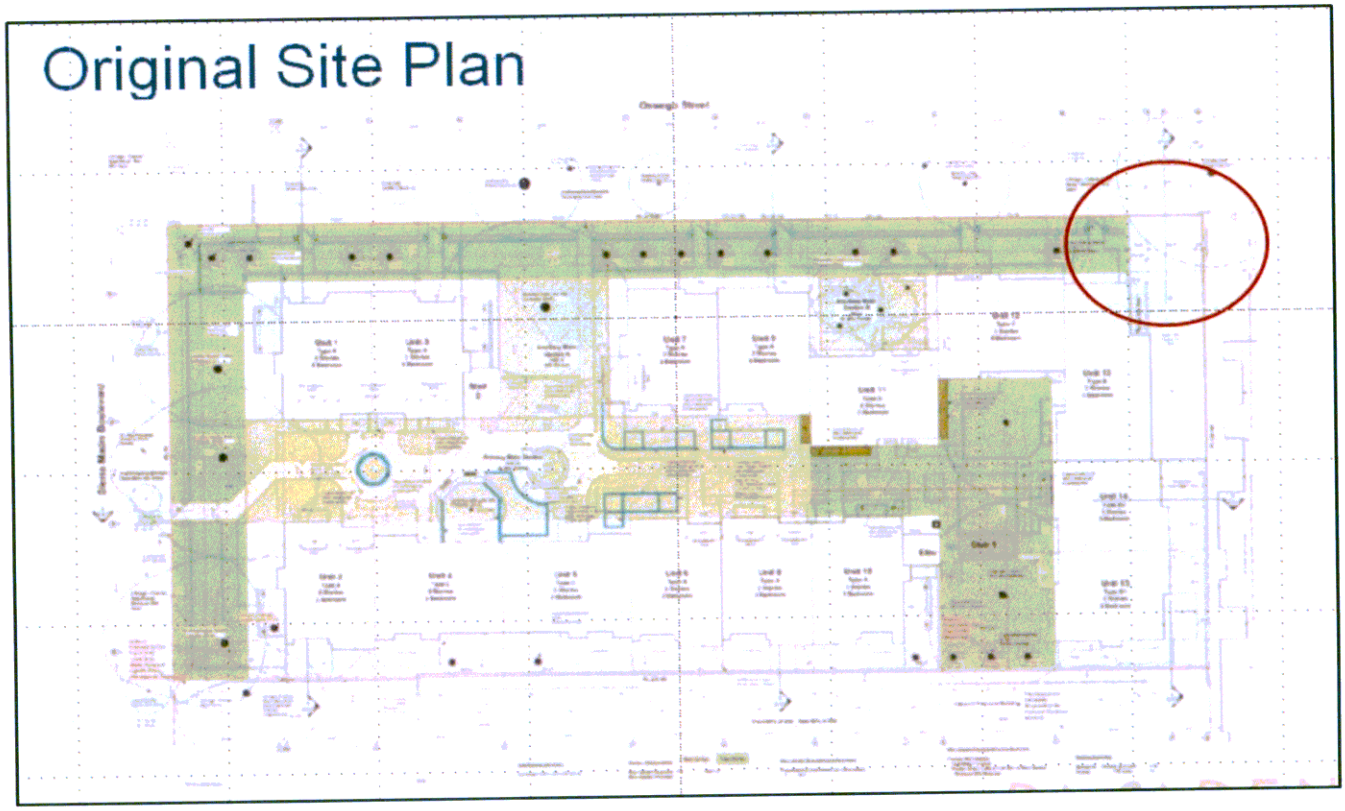
Existing Transportation Metrics

- **Level of Service:** 6 intersections analyzed; no impacts
- **Street Segment Volume:** 3 segments analyzed; site access was modified from Oswego to Sierra Madre Blvd to avoid segment impact

	Metric	Case Study 3
2013 Existing	VMT	5,662,199
	VT	695,332
	Service Population (Pop + Emp)	250,616
	VMT / Capita	22.6
	VT / Capita	2.8
Scenario	VMT	5,663,584
	VT	695,525
	Service Population (Pop + Emp)	250,722
	VMT / Capita	22.6
	VT / Capita	2.8
Increment	Incremental VMT	1,385
	Incremental VT	193
	Incremental Service Population (Pop + Emp)	106
	Incremental VMT / Incremental Capita	13.1
	Incremental VT / Incremental Capita	1.8

Case Study 3 Continued

Original Site Plan



Revised Site Plan