TRANSPORTATION TRANSFORMED

NEW REGULATIONS AND NEW ENPHASES ON SAFETY AND MULTIMODALITY ARE REFORMING THE PARAMETERS OF CEQA TRANSPORTATION ANALYSES
SPEAKERS

• Fernando Sotelo, PE, PTP - Senior Associate, PlaceWorks
• Meghan Macias, PE – Transportation Planning Manager, TranspoGroup
• Wade Wietgrefe, AICP – Senior Planner, City of San Francisco
• Mike Bagheri, PE, TE – Transportation Manager, City of Pasadena
OVERVIEW

• CHANGING ENVIRONMENT, LEGISLATION UPDATES
• NEW TOOLS AND METHODS
• TRENDS AND TIA REQUIREMENTS
• COMPLETE STREETS AND SAFETY
• PASADENA’S VMT EXPERIENCE
• SAN FRANCISCO CASE STUDIES
• Q&A
CHANGING ENVIRONMENT

- URBANIZATION
- INCREASED PUBLIC INVOLVEMENT
- SMART GROWTH AND MULTI-MODAL TRANSPORTATION
- SPOTLIGHT ON SUSTAINABILITY
LEGISLATION, PLANS AND GUIDELINES

- SB 743
  - VMT metrics
  - Safety
  - Induced Travel

- COMPLETE STREETS ACT (AB 1358)

- LONG RANGE PLANS

- TRANSPORTATION STUDY GUIDELINES UPDATES
EMERGING TOPICS

• SAFETY
  o Safe Routes to Schools
  o Vision Zero

• NEIGHBORHOOD TRAFFIC

• MaaS/ TNC

• AUTONOMOUS VEHICLES

Source: Vision Zero Network
IMPROVED TOOLBOX

- ITE Trip Generation Manual Update
- Trip Generation for Mixed Uses
- Manuals and Guidelines Constantly Evolving
- More Sophisticated Traffic Models:
  - Trip Based to Activity-Based Models
  - Advanced mode choice components - bike, pedestrian, transit boardings
PEDESTRIAN EVALUATIONS

• Normally an Afterthought
• Qualitative Analyses
• Tools Available:
  o MMLOS
  o PEQI
  o HCM
PEQI

Key Indicators:
- Intersection Safety
- Traffic Volume
- Street Design
- Land Use
- Perceived Safety

Source: San Francisco Department of Public Health
# HCM 2010

## PEDESTRIAN LOS- URBAN STREETS
- Pedestrian Space
- Pedestrian Speed
- Travel Environment

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### Pedestrian LOS Scores

<table>
<thead>
<tr>
<th>Pedestrian LOS Score</th>
<th>LOS by Average Pedestrian Space (ft² / p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 2.00</td>
<td>A (≥ 60)</td>
</tr>
<tr>
<td>&gt; 2.00-2.75</td>
<td>B</td>
</tr>
<tr>
<td>&gt; 2.75-3.50</td>
<td>C</td>
</tr>
<tr>
<td>&gt; 3.50-4.25</td>
<td>D</td>
</tr>
<tr>
<td>&gt; 4.25-5.00</td>
<td>E</td>
</tr>
<tr>
<td>&gt; 5.00</td>
<td>F</td>
</tr>
</tbody>
</table>

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**Note:**

1. Pedestrian LOS scores are determined using mathematical equations modeling pedestrian perceptions of sidewalk operations. A lower pedestrian LOS score represents a "better" quality of service.

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MULTI-MODAL EXAMPLE

- Vehicular Levels of Service:
  - Intersection
  - Roadway Segments
  - Freeway Ramps
  - Freeway Mainline
- VMT

Summary of Metrics Table

<table>
<thead>
<tr>
<th>Comparative Metric</th>
<th>Existing Conditions</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
<th>Scenario 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode Share</td>
<td>% Drive Alone</td>
<td>61.5%</td>
<td>59.9%</td>
<td>60.0%</td>
<td>59.7%</td>
</tr>
<tr>
<td>Transit Use</td>
<td>Number of Transit Trips</td>
<td>29,494</td>
<td>44,503</td>
<td>41,659</td>
<td>43,820</td>
</tr>
<tr>
<td>Vehicle Miles Travelled (VMT)</td>
<td>Total Palo Alto VMT</td>
<td>5,320,931</td>
<td>5,914,158</td>
<td>5,741,393</td>
<td>5,853,201</td>
</tr>
<tr>
<td>VMT Per Capita</td>
<td>Palo Alto VMT per capita</td>
<td>33.0</td>
<td>32.5</td>
<td>32.3</td>
<td>32.1</td>
</tr>
<tr>
<td>Intersection Level of Service</td>
<td>Number of Impacted Intersections</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Hexagon Transportation Consultants, Inc.,
WE MOVE COMMUNITIES FORWARD
A new era of advancing transportation solutions
1. Overview of changes to Transportation Impact Studies

2. Define minimum requirements

3. Discuss the importance of thresholds.

4. Share how complete streets can address safety and reduce vehicle travel
How have studies changed?

Short answer: Not much
Would the project:

• Conflict with an applicable *plan, ordinance or policy establishing measures of effectiveness* for the performance of the circulation system...
• Conflict with an applicable *congestion management program*…
• Result in a change in air traffic patterns…
• Substantially increase hazards due to a design feature…
• Result in inadequate emergency access?
• Conflict with *adopted policies, plans, or programs* regarding public transit, bicycle, or pedestrian facilities…
CEQA Guidelines 15064.7

- (a) Each public agency is encouraged to develop and publish thresholds of significance…
- (a) A Threshold of significance is an identifiable, quantitative, qualitative or performance level of a particular environmental effect…
- (b) Thresholds of significance…must be adopted by ordinance, resolution, rule, or regulation, and developed through a public review process and be supported by substantial evidence.
New Appendix G Checklist Questions

a) Conflict with a plan, ordinance or policy addressing the safety or performance of the circulation system, including transit, roadways, bicycle lanes and pedestrian paths (except for automobile level of service)?

b) Cause substantial additional vehicle miles traveled (per capita, per service population, or other appropriate efficiency measure)?

c) Substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e. by adding new mixed-flow lanes) or by adding new roadways to the network?

d) Result in inadequate emergency access?
WHAT DOES OPR RECOMMEND

Technical Advisory on Evaluating Transportation Impacts in CEQA:

- Emphasis on evaluating safety
- Departs from traditional emphasis on streamlining automobile flow and accommodating driver error.
- Updated approach focuses on three strategies:
  - Reduce speed and increase driver attention
  - Protect vulnerable road users
  - Reduce overall VMT and sprawl
How do Complete Streets Contribute to Safety

- Implement design features that shelter pedestrians
- Encourages safer bicycling behavior
- Reduces speed

Source: Smart Growth America, National Complete Streets Coalition
SPEED AND SAFETY

- PEDESTRIAN FATALITY & SERIOUS INJURY RISK

18%  50%  77%

- 20 MPH  30 MPH  40 MPH

CONE OF VISION

Source: Achieving Multimodal Networks
US FHWA, August 2016
CALIFORNIA TRAFFIC FATALITIES

According to NHTSA:

- There were 3,176 total traffic fatalities in California in 2015
- Of these 742 fatalities were pedestrians and 129 were bicyclists
- Pedestrians and bicyclists make up a disproportionate share of fatalities
- Low income and people of color are affected at higher rates
Children Killed While Walking

<table>
<thead>
<tr>
<th>Group</th>
<th>Risk Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>2x as likely</td>
</tr>
<tr>
<td>Latino</td>
<td>40% more likely</td>
</tr>
<tr>
<td>White</td>
<td></td>
</tr>
</tbody>
</table>

Dangerous by Design, 2011
© 2015 Safe Routes to School National Partnership
SAFETY AND EQUITY

Communities with Sidewalks

<table>
<thead>
<tr>
<th>Income</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>90%</td>
</tr>
<tr>
<td>Low</td>
<td>49%</td>
</tr>
</tbody>
</table>

Bridging the Gap. Income Disparities in Street Features that Encourage Walking. 2012

© 2015 Safe Routes to School National Partnership

Photo: ADOT
SAFETY AND EQUITY

Pedestrian deaths by race/ethnicity relative to U.S. population, 2005-2014

- Native American: 2.7% (0.7% of population)
- Asian: 4.3% (5.1% of population)
- African American: 12.2% (19.3% of population)
- Hispanic: 21.5% (16.9% of population)
- Non-white (incl. Hispanic): 34.9% (46.1% of population)
- White, non-Hispanic: 53.1% (62.8% of population)

Source: Smart Growth America, National Complete Streets Coalition
WHY IS SAFETY IMPORTANT
A PERSONAL PERSPECTIVE ON SAFETY
A PERSONAL PERSPECTIVE ON SAFETY
COMPLETE STREETS

Source: Smart Growth America
National Complete Streets Coalition
COMPLETE STREETS

Source: Smart Growth America
National Complete Streets Coalition
COMPLETE STREETS

Source: Smart Growth America
National Complete Streets Coalition
What types of project elements are affected by project improvements?

- Intersection Crossing Distance (mitigation at intersections)
- Access Management
- Interface with roadway network
- Roadway network design (subdivisions, Master Plans, etc.)

Source: Model Design Manual for Living Streets, 2011
COMPLETE STREETS IMPLEMENTATION AND CEQA

Practical Ways to Include Safety into a TIA?

• Include pedestrian and bicycle counts
• Evaluate pedestrians and bicycles when evaluating intersection LOS
• Look for opportunities to improve the site plan
• Consolidate driveways where possible
THRESHOLDS ARE IMPORTANT

**Agencies with thresholds that support Complete Streets:**

- Pasadena
- San Francisco
- San Marcos
- Oakland
- San Luis Obispo
- Berkeley
THANK YOU
City of Pasadena’s Transportation Impact Analysis Guidelines - VMT Experience

Mike Bagheri, P.E.
Transportation Manager
Guiding Principles

• Growth Will Be Targeted to Serve Community Needs and Enhance the Quality of Life,
• Change Will Be Harmonized to Preserve Pasadena’s Historic Character and Environment,
• Economic Vitality Will Be Promoted To Provide Jobs, Services, Revenues And Opportunities,
• Pasadena Will Be Promoted as a Healthy Family Community,
• **Pasadena Will Be A City Where People Can Circulate Without Cars,**
• Pasadena Will Be Promoted as a Cultural, Scientific, Corporate, Entertainment and Educational Center for the Region,
• Community Participation Will Be A Permanent Part Of Achieving A Greater City.
Aligning Metrics and Policies

City of Pasadena Department of Transportation

**Decreasing Emphasis**
- Evaluating only street operations and traffic volume changes
  > Individual intersection performance
    - Level of Service
- Mitigating only impacts to auto travel
  > Adding vehicular capacity via street widening

**Increasing Emphasis**
- Reduce Greenhouse Gas
  > Vehicle Miles of Travel metrics
- Elevating priorities for transit, pedestrian and bicycle travel
  > Enhance conditions for vulnerable users
- Network performance
  > Travel time reliability
  > Speed management
• 2010 Highway Capacity Manual Multi-Modal Level of Service (MMLOS) approach was used to assess new development projects
• Smoother transition to SB743
Guiding Principles

- Target growth to Central District and transit/neighborhood villages
- Preserve historic character and environment
- Promote economic vitality
- A healthy family community
- A city where people can circulate without cars
- Cultural, scientific, corporate, entertainment and educational center for the region
- Community participation
- Commitment to public education

Mobility Elem. Objectives

- Enhance livability
- Encourage walking, biking, transit, and other alternatives to motor vehicles
- Create a supportive climate for economic viability
Accessibility and Environmental Performance

- VMT per capita
- Vehicle Trips (VT) per capita
- Service population is residents + employees
- Thresholds are existing citywide levels

Promote Pedestrian, Bicycle and Transit Mobility

- Pedestrian access to destinations
- Access to Transit routes (by frequency)
- Access to Bike facilities (by type)
- Thresholds are ¼ mile to quality facilities
## Adopted Metrics with CEQA Thresholds

### City of Pasadena Department of Transportation

<table>
<thead>
<tr>
<th>METRIC</th>
<th>DESCRIPTION</th>
<th>IMPACT THRESHOLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. VMT Per Capita</td>
<td>Vehicle Miles Traveled (VMT) in the City of Pasadena per service population (population + jobs).</td>
<td>CEQA Threshold: An increase over existing Citywide VMT per Capita of 22.6</td>
</tr>
<tr>
<td>2. VT Per Capita</td>
<td>Vehicle Trips (VT) in the City of Pasadena per service population (population + jobs).</td>
<td>CEQA Threshold: An increase over existing Citywide VT per Capita of 2.8</td>
</tr>
<tr>
<td>3. Proximity and Quality of Bicycle Network</td>
<td>Percent of service population (population + jobs) within a quarter mile of each of bicycle facility types</td>
<td>CEQA Threshold: Any decrease in existing citywide 31.7% of service population (population + jobs) within a quarter mile of Level 1 or 2 Bike Facilities.</td>
</tr>
<tr>
<td>4. Proximity and Quality of Transit Network</td>
<td>Percent of service population (population + jobs) located within a quarter mile of transit facility types.</td>
<td>CEQA Threshold: Any decrease in existing citywide 66.6% of service population (population + jobs) within a quarter mile of Level 1 or 2 Transit Facilities.</td>
</tr>
<tr>
<td>5. Pedestrian Accessibility</td>
<td>The Pedestrian Accessibility Score uses the mix of destinations, and a network-based walk shed to evaluate walkability.</td>
<td>CEQA Threshold: Any decrease in the Citywide Pedestrian Accessibility Score.</td>
</tr>
</tbody>
</table>


• Threshold for requiring Transportation Analysis
• Adopted CEQA Metrics & Thresholds
• Project Review Metrics & Caps (Approval Conditions)
  > Auto Level of Service (LOS)
  > Street Segment Analysis
  > Pedestrian Environmental Quality Index (PEQI)
  > Bicycle Environmental Quality Index (BEQI)
## Thresholds for Determining Level of Transportation Review of Projects

### City of Pasadena Department of Transportation

#### Category 1: BELOW COMMUNITYWIDE SIGNIFICANCE

<table>
<thead>
<tr>
<th>TYPE OF PROJECT</th>
<th>EXEMPTION</th>
<th>Category 1: BELOW COMMUNITYWIDE SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential (Net # of units)</td>
<td>10 units or less</td>
<td>11 – 49 units</td>
</tr>
<tr>
<td>Non-Residential use (Net)</td>
<td>10,000 Sq. Ft or less than 300 daily trips</td>
<td>10,001 to 49,999 Sq. Ft</td>
</tr>
</tbody>
</table>

#### Category 2: COMMUNITYWIDE SIGNIFICANCE

<table>
<thead>
<tr>
<th>TYPE OF PROJECT</th>
<th>EXEMPTION</th>
<th>Category 2: COMMUNITYWIDE SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential (Net # of units)</td>
<td>50+ units</td>
<td></td>
</tr>
<tr>
<td>Non-Residential use (Net)</td>
<td>50,000+ Sq. Ft</td>
<td></td>
</tr>
</tbody>
</table>

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**Outside of CEQA Analysis**

- Residential: 10 units or less
- Non-Residential: 10,000 Sq. Ft or less than 300 daily trips

**CEQA Analysis**

- Residential: 11 – 49 units
- Non-Residential: 10,001 to 49,999 Sq. Ft
- Residential: 50+ units
- Non-Residential: 50,000+ Sq. Ft
Pasadena Travel Demand Model

- Built on Southern California Association of Government’s (SCAG) regional model using TransCAD
- On average, 10 Pasadena TAZs within 1 SCAG’s TAZ
- 349 TAZs covering Pasadena and 139 TAZ’s covering sounding areas
- 25 land-use types used in the model
- Eight trip purposes used in the model
- Staff uses the model for transportation impact analysis
Recent EIRs Based on Modified Metrics

- General Plan Land Use Element and Mobility Element Update FEIR (approved)
- Rose Bowl Music and Arts Festival FEIR (approved)
- 500-room Hotel near Pasadena City College FEIR (PC recommend approval by Council)
  > Bike Impact – mitigated through fair share contribution to planned bicycle facility
- 150-room Hotel near Civic Center DEIR (approved)
Proposed Medical Offices in the East Pasadena

- 224K Sq. Ft Medical Offices
- VMT of 32.3 > 22.6 Impact
- VT 3.0 > 2.8 Impact
- Pedestrian Accessibility Impact

Recommended Mix of Land uses to eliminate impacts

- 200 Senior Citizen Housing and 200K Sq. Ft of Medical Offices
• Relatively high thresholds for study limits the burden on small projects
• Streamlines the CEQA process for urban infill and TOD projects
• Shifts the focus of analysis from traffic congestion to more holistic environmental impacts (air quality/GHG emission, urban sprawl considerations, etc.)
• Allows for congestion to be considered outside the confines of CEQA
Challenges - General

- Learning curve/lack of practical experience
- Unfamiliar to community and decision makers
- Limited mitigation options
- CMP still requires LOS analysis for certain facilities
- People are still concerned with traffic congestion
Challenges – Technical

- Model output contains limited information
- Static baseline that requires regular updating
- Existing land use in model doesn’t always match what is on the ground
- Can be difficult to predict outcomes (reducing project scale does not always reduce impacts)
Lessons Learned

City of Pasadena Department of Transportation

Good Fit for Pasadena

• Built-out City with In-Fill Opportunities

• Metrics Support General Plan Goals and Policies
  > Emphasis on getting around without cars

Notes on Implementation

• Transportation Impact Fee already in place
  > Updating to include bicycle and walking network

• Investment in forecasting model platform/process
  > Linked to Land Management System
  > Staff development to operate and update
Notes on Implementation

- Worked with Caltrans to incorporate state highway concerns into analytics
  > Aligned with project circulation review

- Modified metrics for project circulation review
  > Traffic intrusion
  > Traffic operations
  > Pedestrian/Bicycle conditions
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MEASURE WHAT MATTERS:
TRANSPORTATION
VEHICLE MILES TRAVELED (VMT)

HIGH VMT

30 MILES

MORE SPACE

HOW DO YOU TRAVEL?

HOW FAR DO YOU TRAVEL?

WHO DO YOU TRAVEL WITH?

AIR POLLUTION, GREENHOUSE GASES, ENERGY

LOW VMT

4 MILES

LESS SPACE
CEQA Transportation Review

Walking
- Capacity
- Hazards
- Accessibility

Bicycling
- Hazards
- Accessibility

Transit
- Capacity
- Delay or Operations

Loading
- Hazards
- Transit Delay

Cumulative for all topics
Emergency Vehicles
Accessibility

Traffic Hazards

Construction
Interference and accessibility that leads to hazards

Parking (sort of)
Substantial parking deficit that leads to hazards

Cumulative for all topics
Travel Demand

[Map of San Francisco with streets and Golden Gate highlighted]

[Image of Fury, the SF-CHAMP Mascot]
Development Example – 1500 Mission Street
Development Example – 1500 Mission Street

- **Residential**: 560 units
- **Office**: 450,000 SF
- **Retail**: 38,000 SF
- **Parking**: 420 spaces
- **Loading**: 6 full size spaces

**Off-street loading**
Infrastructure Example – Safer Market Street

Transit vehicles, bicycles, taxis, and licensed commercial vehicles exempt from restrictions
Area Plan Example – Central SoMa

LAND USE AND PUBLIC ROW CHANGES
RESIDENTIAL 5,500 UNITS
NON-RESIDENTIAL 7.4 MILLION SF
PARKS & OPEN SPACES
STREET CHANGES
Transportation Impact Analysis Guidelines Updates Underway

2018 Mode Split Potential

- 50% (-18%)
- 19-21% (+18%)
- 8-10% (+157%)
- 1% (+25%)

Capacity?
align

Sustainable San Francisco
THANK YOU

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