PASADENA

Department of Transportation

Pasadena's Complete Streets Performance Metrics

2013 NAEP | AEP Joint Conference

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Policy Basis for Metrics

- General Plan policies emphasize
  - > Quality of travel experience for travelers on all modes
  - > Importance of safety, livability and sustainability

Guiding Principles (Seven)

3. **Economic vitality will be promoted to provide jobs, services, revenues, and opportunities**
4. **Pasadena will be promoted as a healthy family community**
5. **Pasadena will be a city where people can circulate without cars**

Mobility Objectives

- **Operations Strategies to Expand Mobility**
- **Enhance Livability**
- **Encourage Walking, Biking, Transit**

Aligning Metrics and Policies

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

- Network performance
  - > Travel time
- Evaluating impacts to all users
  - > Multimodal Level of Service
  - > PEQI/BEQI
- Elevating priorities for transit, pedestrian and bicycle travel
  - > Enhance conditions for vulnerable users

Livability/Sustainability Metrics

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- Accessibility
  - > Incorporating Livability via walking conditions
- Sustainability
  - > Focus on Greenhouse Gas production
- Multi-Modal metrics
  - > Traveler Experience
    - Incorporating Livability via Quality of Service for Transit, Bicycle, and Pedestrians

Pasadena Accessibility Score

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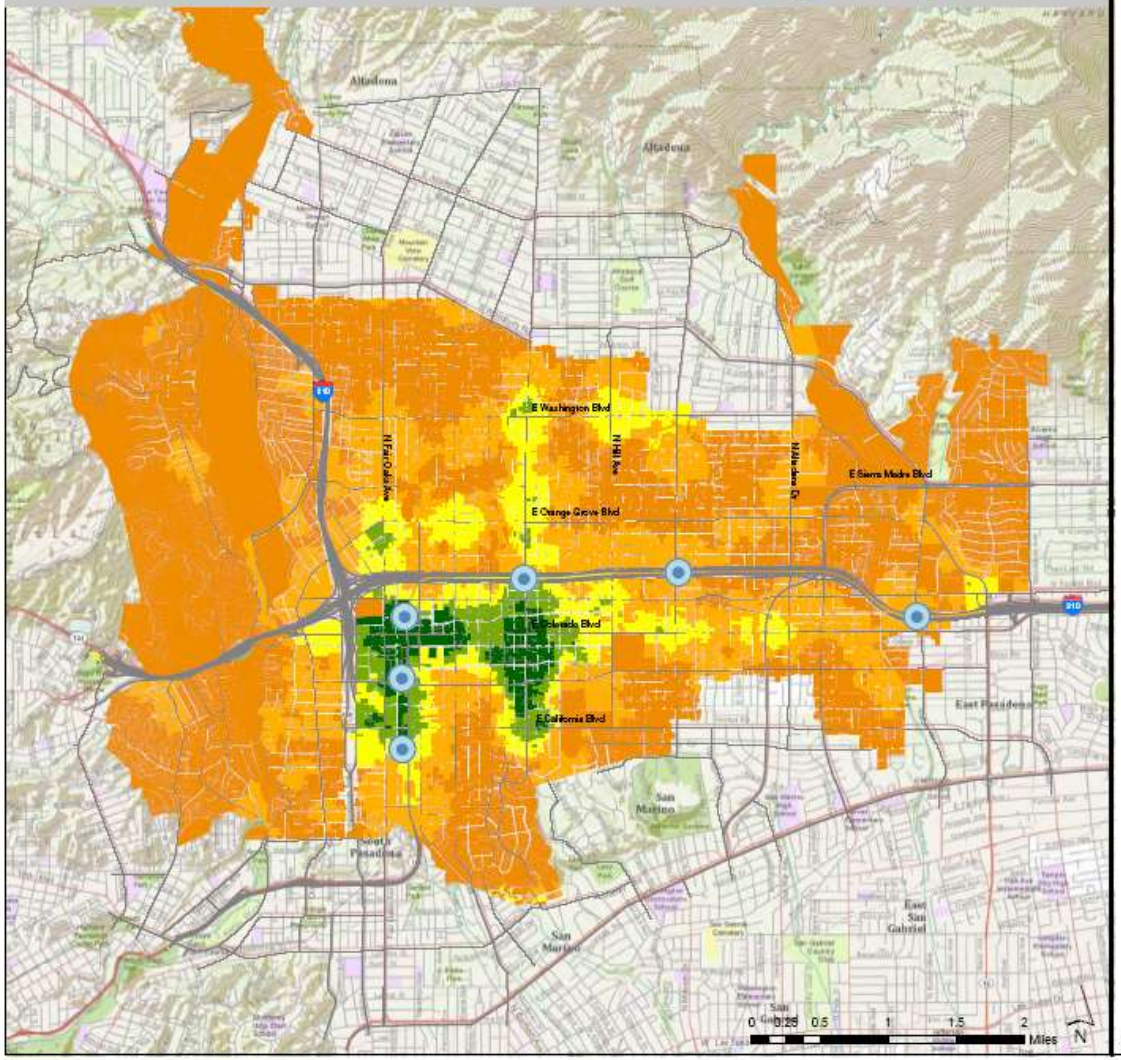
PacScore: 1/4 Mile Walk to Work/Play/Shop/Learn



What's "PacScore"?

Measure of 1/4 Mile Walk to Places for Work, Play, Shop, and Learn, such as Grocery stores, Restaurants, Parks, Schools, Shopping, Coffee Shops, Bookshops, Banks and Entertainment venues

PacScore

100

Very High — All or most destination types are within a quarter-mile walk from all parcels with very high PacScore.

80

High — Many destination types are within a quarter-mile walk from all parcels with high PacScore.

57

Medium — A variety of destination-types are within a quarter-mile walk from all parcels with medium PacScore.

31

Low — A few destination types are within a quarter-mile walk from all parcels with low PacScore.

6

0

Very Low — One or no destination type is within a quarter-mile walk from all parcels with very low PacScore.

Gold Line Station

GENERAL PLAN UPDATE
PASADENA
Guiding Our Community's Future

June 2011

ARUP

Sources: Google Earth Pro, Los Angeles County GIS Portal, WalkScore.com

Accessibility Metric

- Relevant to all trip types to all destinations within the City
- Used to help people understand why different parts of Pasadena “work” differently
- Easily communicated and intuitive
- Used to identify and in solving deficiencies
- Supportive of Sustainability goals

Accessibility Methodology

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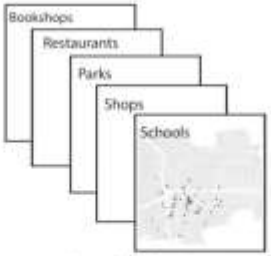
City Parcels & Streets

- A city street database allows for distance measures.
- PacScore can measure accessibility at any geographic level, including neighborhoods, census tracts and individual parcels.

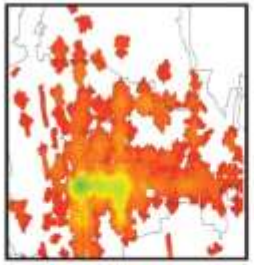


Destination Layers

- Destination type and place data were collected from Google Earth and LA County.
- Destination types include: Grocery stores, Restaurants, Parks, Schools, Shopping, Coffee Shops, Bookshops, Banks, and Entertainment venues

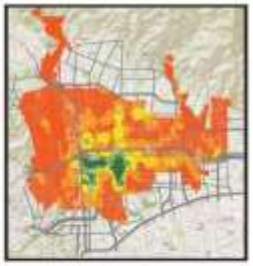
Walksheds

- A walkshed showing 1/4 mile walking distance from each destination was mapped.
- Destinations were counted in overlapping walksheds.



Total destinations

- Weights were assigned to reflect the number and choice of destinations from each parcel.
- This map shows the number of total destinations accessible in 1/4 mile from each parcel. Green represents more; orange represents less.



PacScore

- The PacScore data were generalized to create five categories from very low to very high, as shown on the citywide map.
- PacScore can be further customized to reflect transit accessibility, street quality and other factors, or to assign different weights to destination types.

Sustainability Metric: VMT/HH

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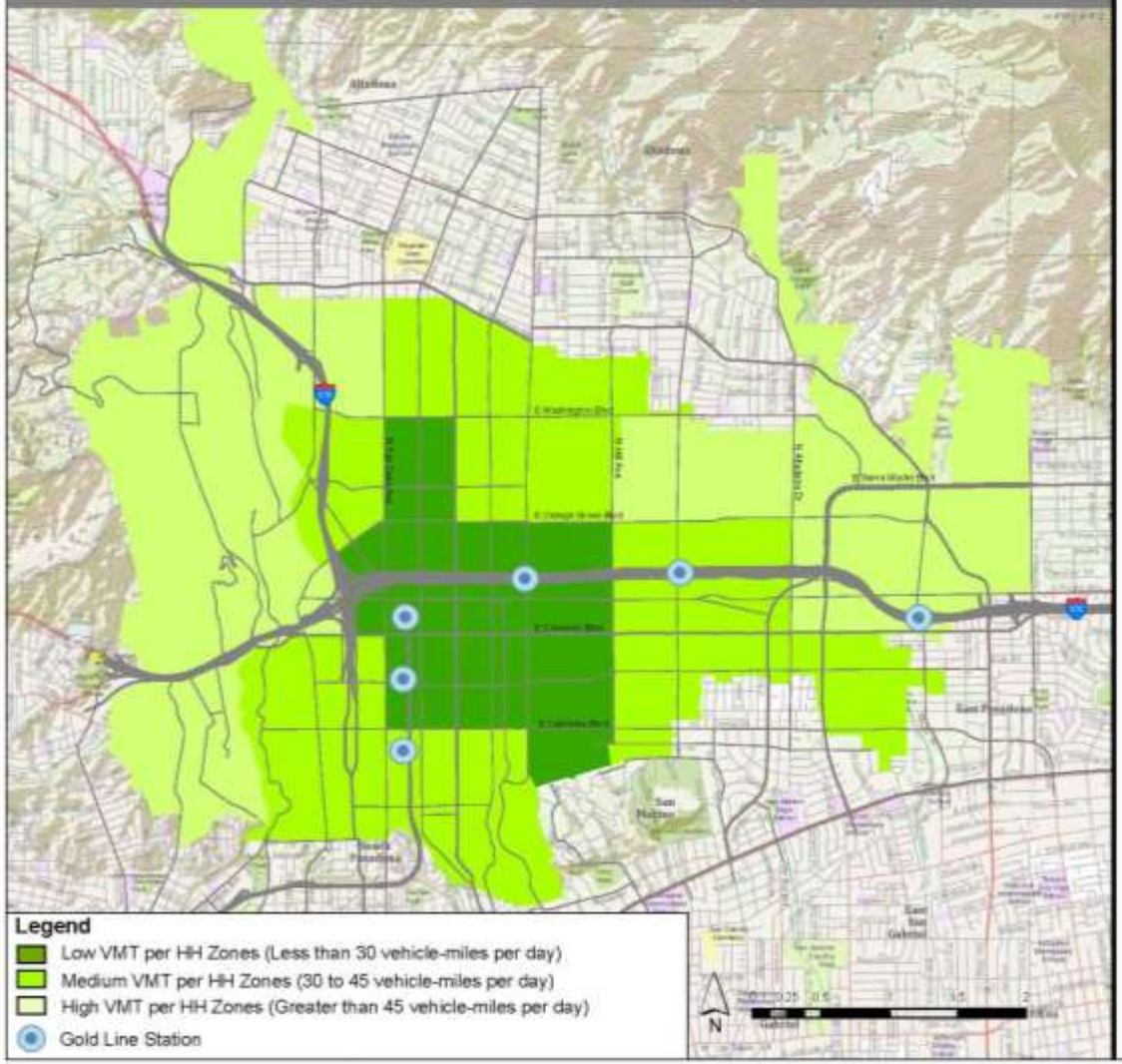
Estimated Vehicle-Miles Traveled by Census Tract

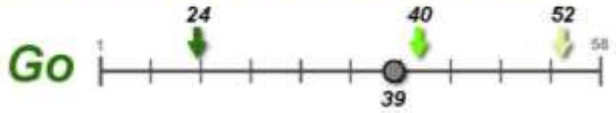


Pasadena Households On the *Go*

What is VMT per Household (VMT / HH)?

- The total miles travelled by all vehicles operated by a household on a typical day.
- Estimated as an average for households living in Pasadena "zones" (Census Tracts).

What does VMT / HH look like in Pasadena?



Estimated VMT / HH in Pasadena zones

- Low VMT per HH (Less than 30 vehicle-miles per day)
- Medium VMT per HH (30 to 45 vehicle-miles per day)
- High VMT per HH (Greater than 45 vehicle-miles per day)
- Estimated Pasadena Average

Why does VMT matter?

- Lower VMT / HH indicates less vehicle travel which results in...

- ***Less congestion***
- ***Less air pollution***
- ***Fewer greenhouse gas (GHG) emissions***

Sources: National Household Travel Survey, 2001
US Census 2000
City of Pasadena Parcel Database 2010

November 10, 2010

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Relative to Accessibility

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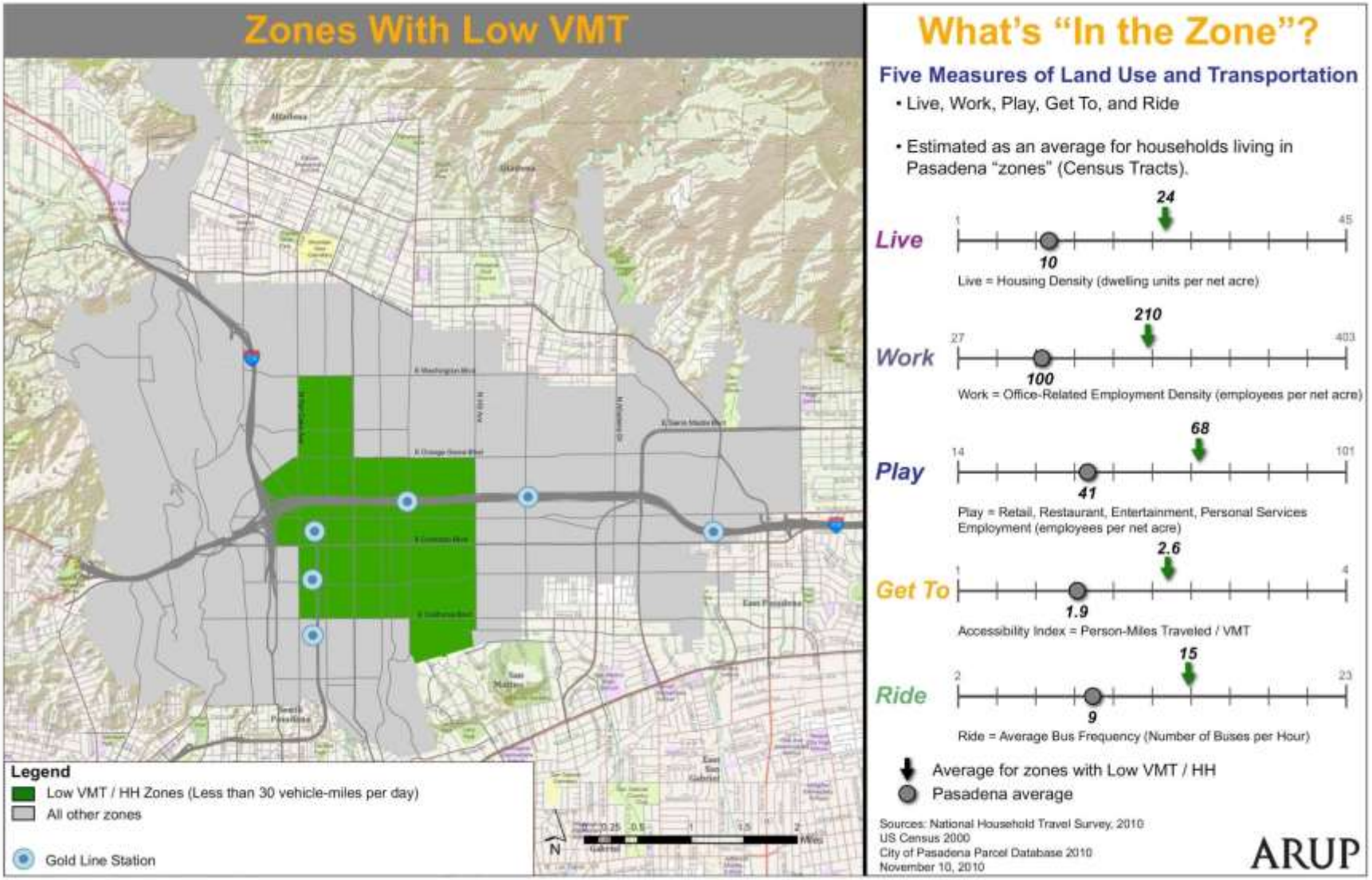

Traveler Experience

- Recognize dominant mode
  - > Reflect people's experiences traveling in Pasadena
- Move attention towards corridors and trips
  - > De-emphasize delay at individual intersections
  - > Improve traffic assignment in Impact Studies
- Incorporate elements of livability
  - > Mode-specific
  - > Quality of Service

Corridor Travel Time

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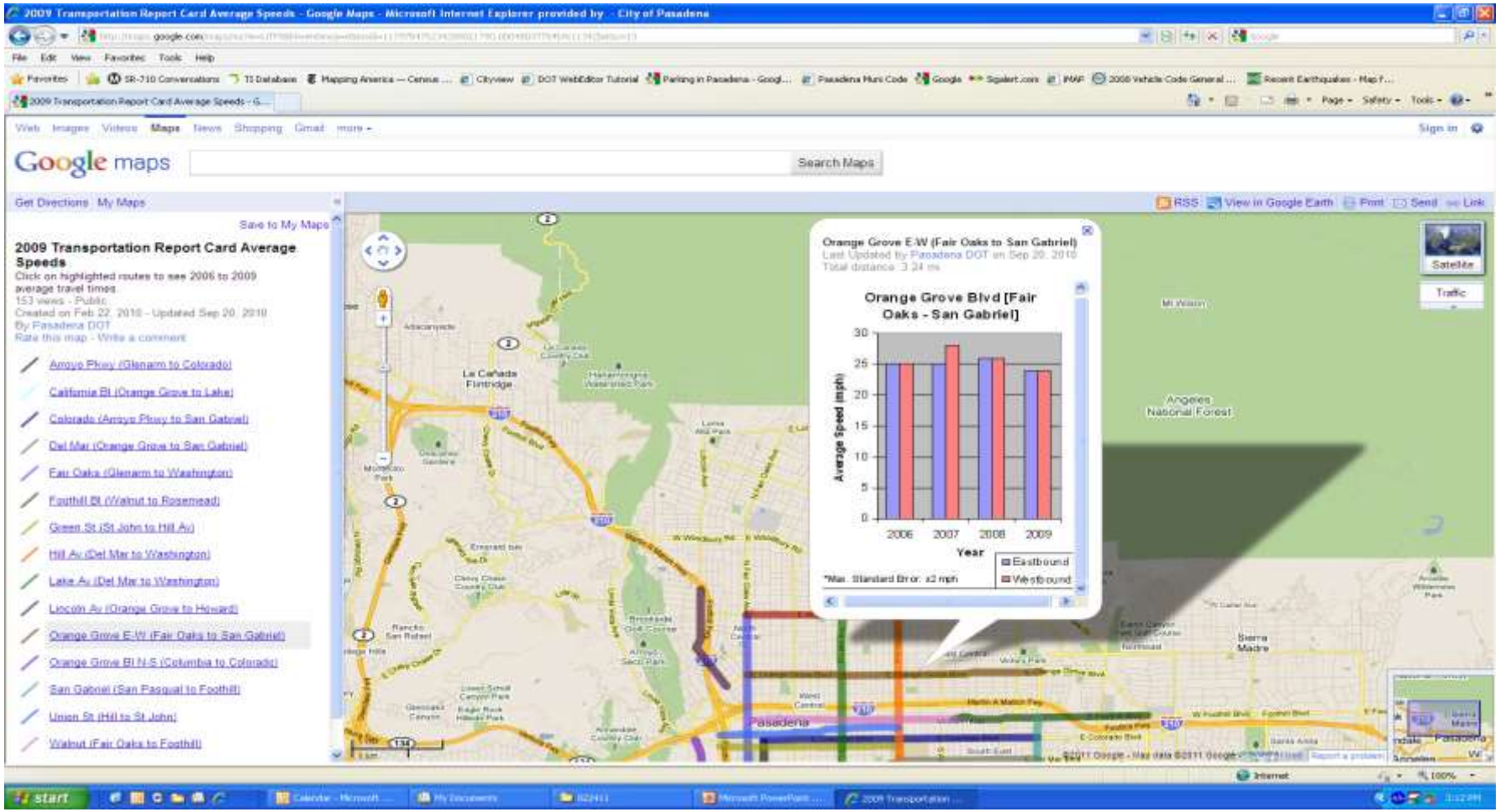

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Evaluation of Approaches

- Network-based Metrics
  - > Vehicle Miles of Travel (VMT)
  - > Travel Time
- Traveler Experience Metrics
  - > S.F. Pedestrian Environment Quality Index (PEQI)
  - > S.F. Bicycle Environment Quality Index (BEQI)
  - > Multi-Modal Level of Service (MMLOS)

MMLOS Case Studies

- Two project types selected
  - > Detailed analysis with the MMLOS approach
  - > Comparison with the current Transportation Impact Study approach
- Case I - Road Diet in lower density residential area
- Case II - Mixed Use Development in Central District

Road Diet Case Vicinity Map

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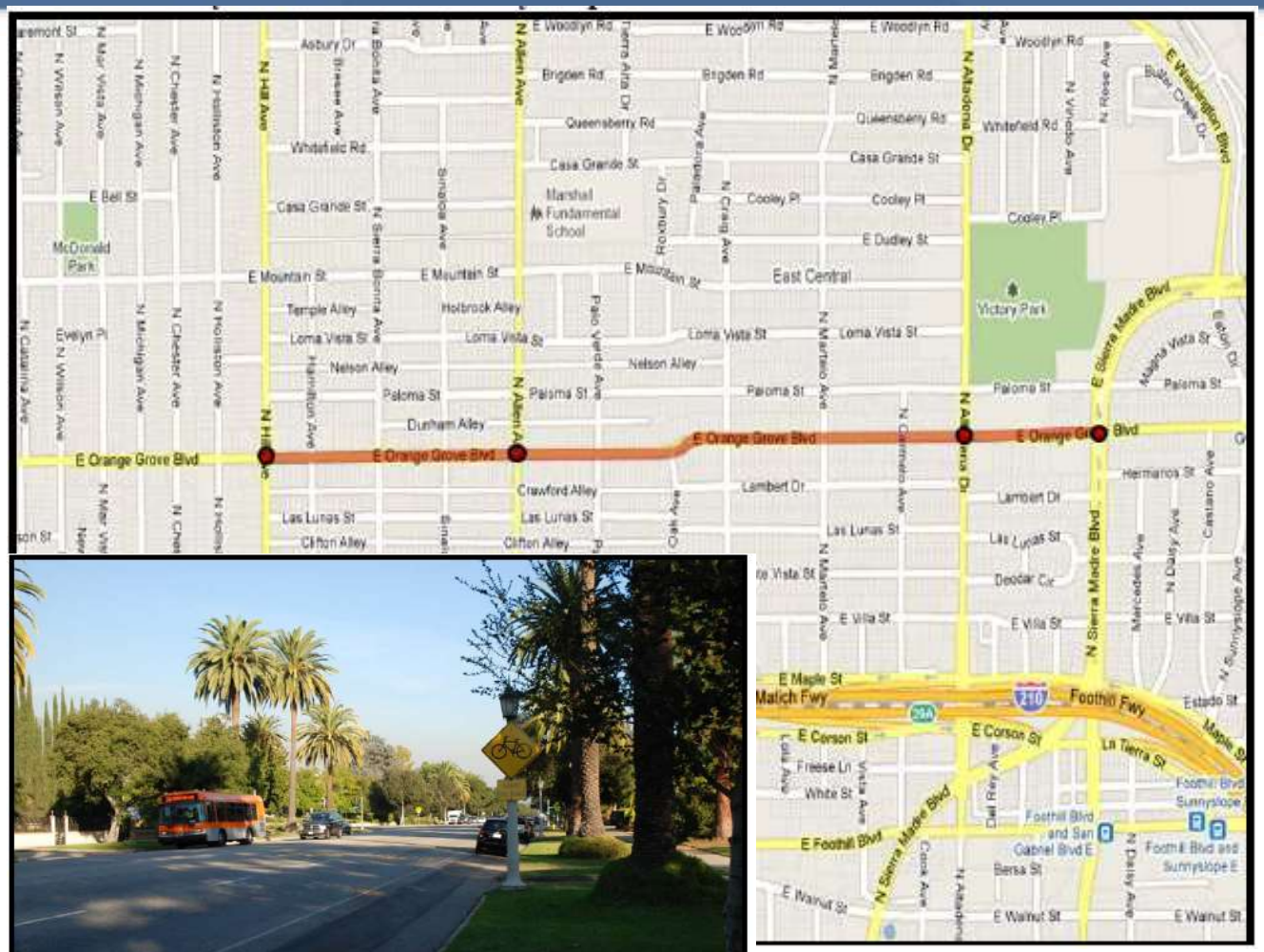

Source: Dowling Associates, Inc.

A proposed road diet project removing two lanes of traffic on East Orange Grove Boulevard and installing bike lanes in both directions

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Orange Grove – AM Peak

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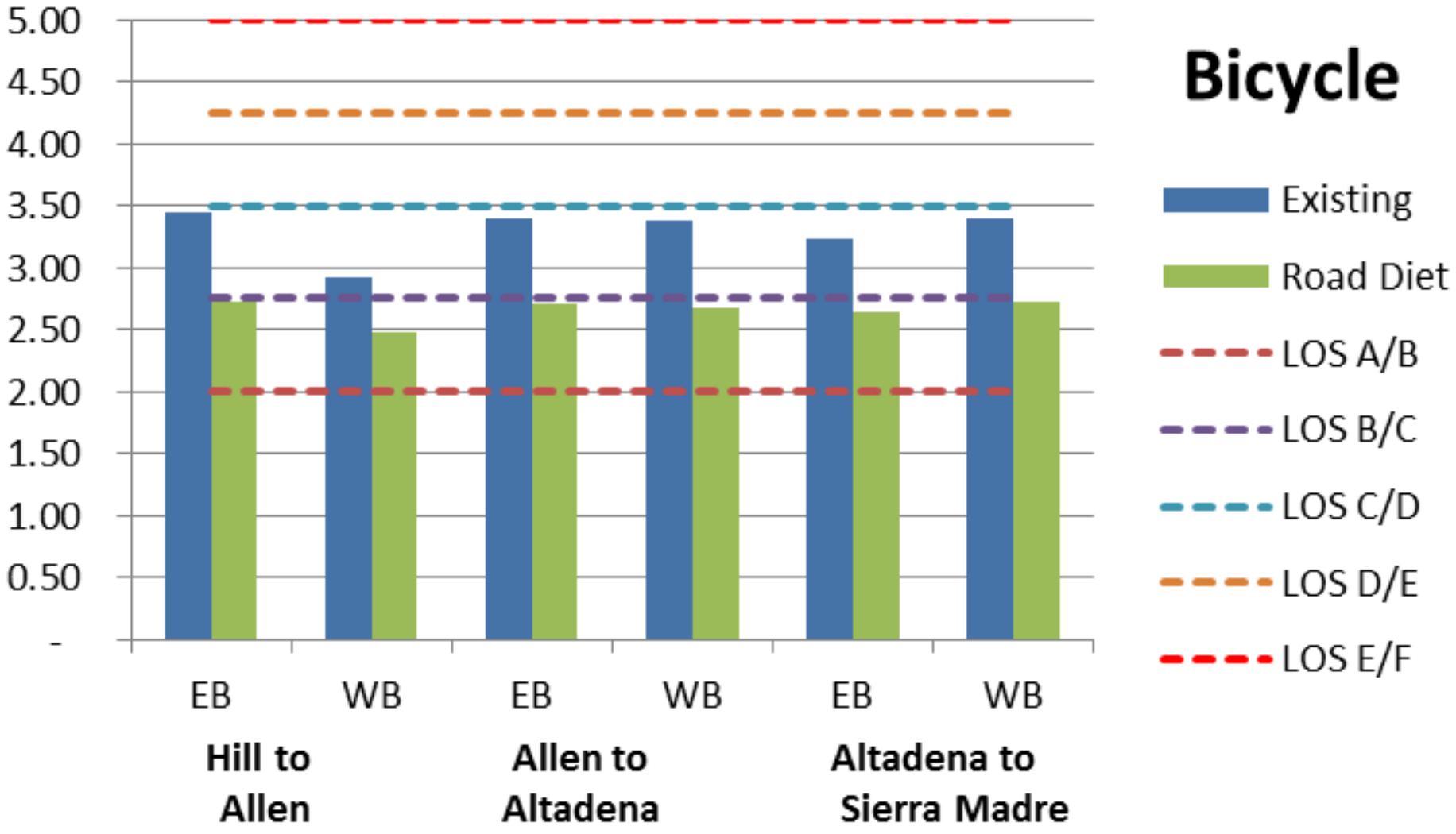
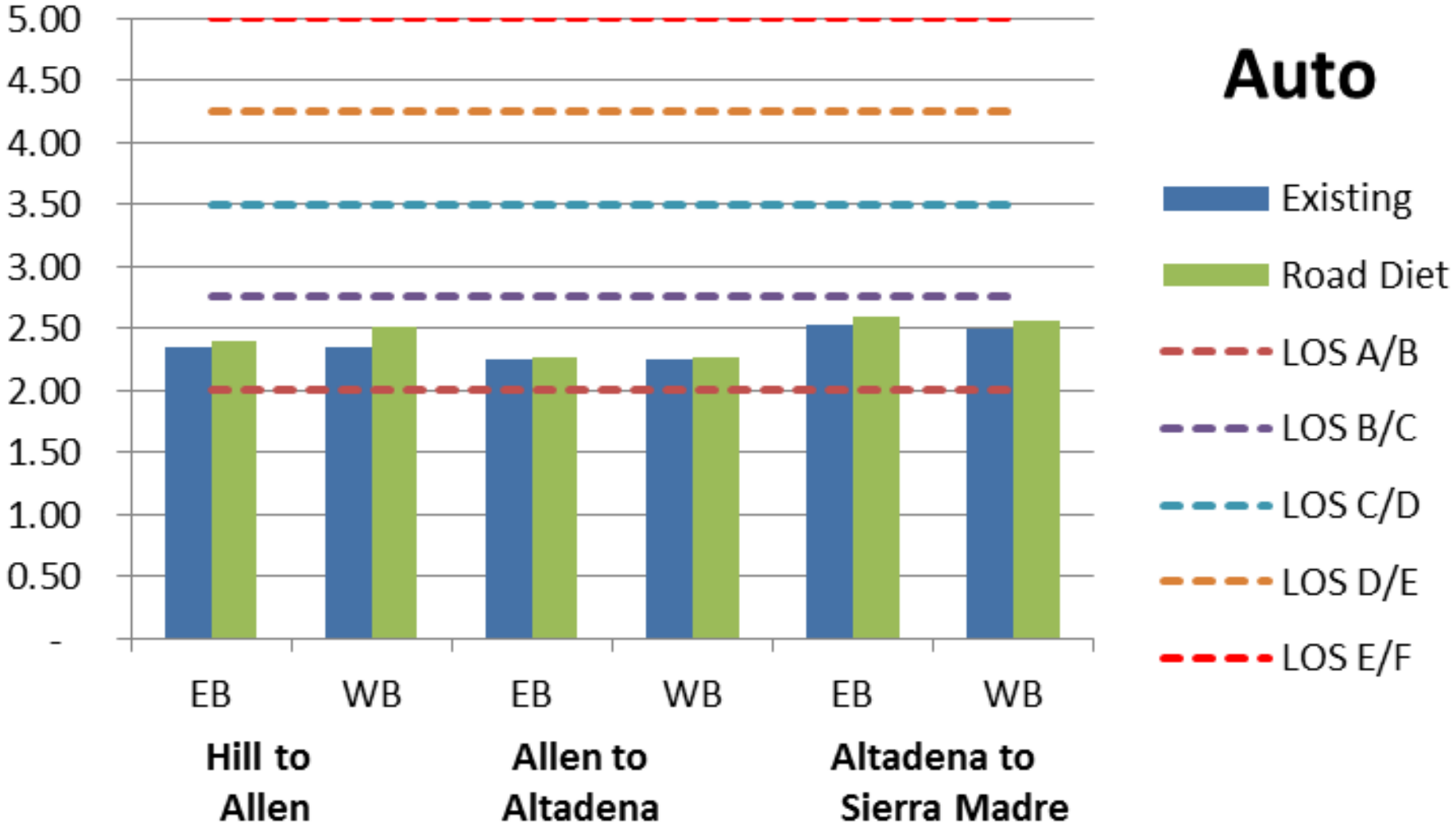


Orange Grove – AM Peak

Department of Transportation



Orange Grove – AM Peak

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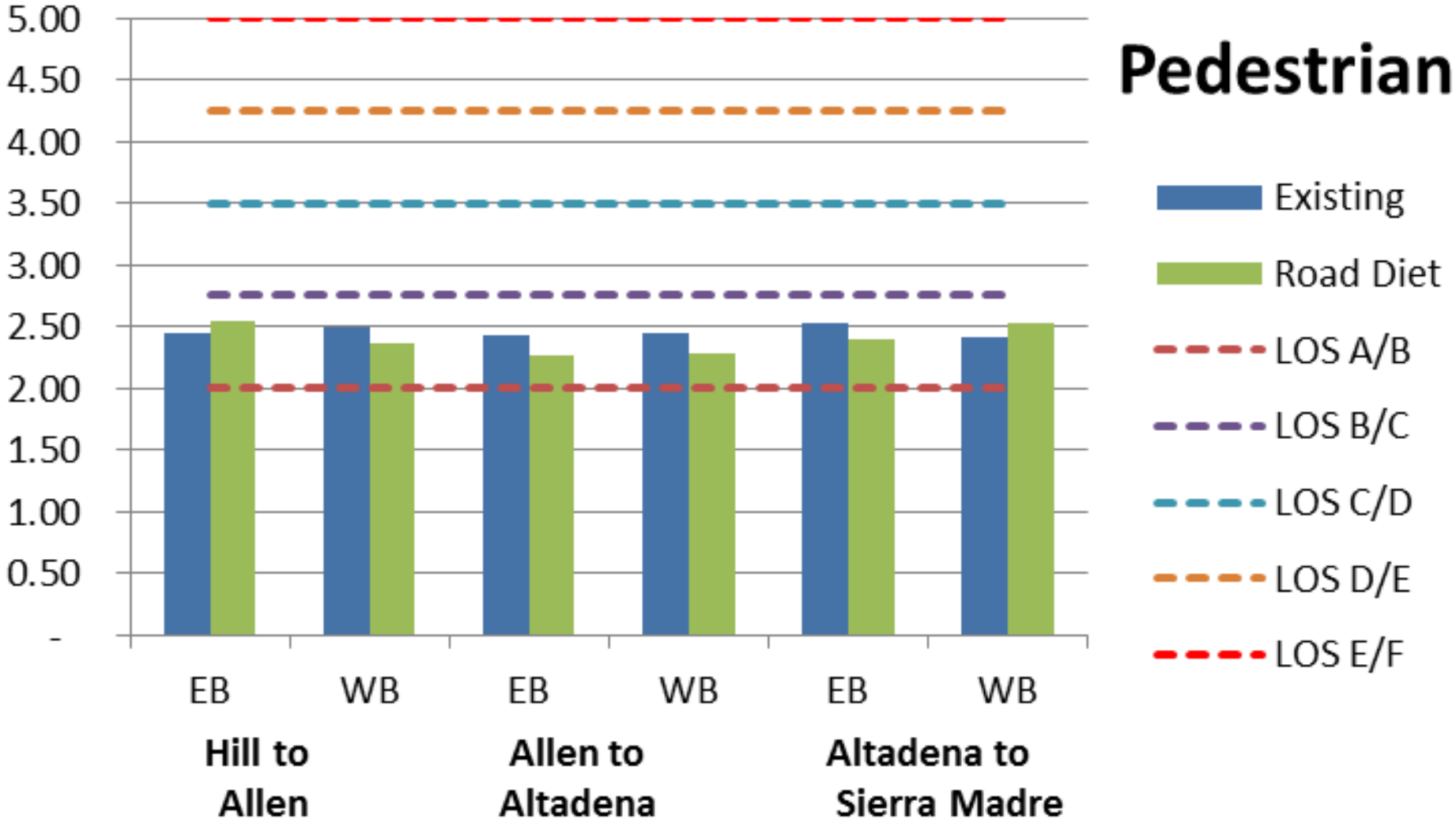

Orange Grove – AM Peak

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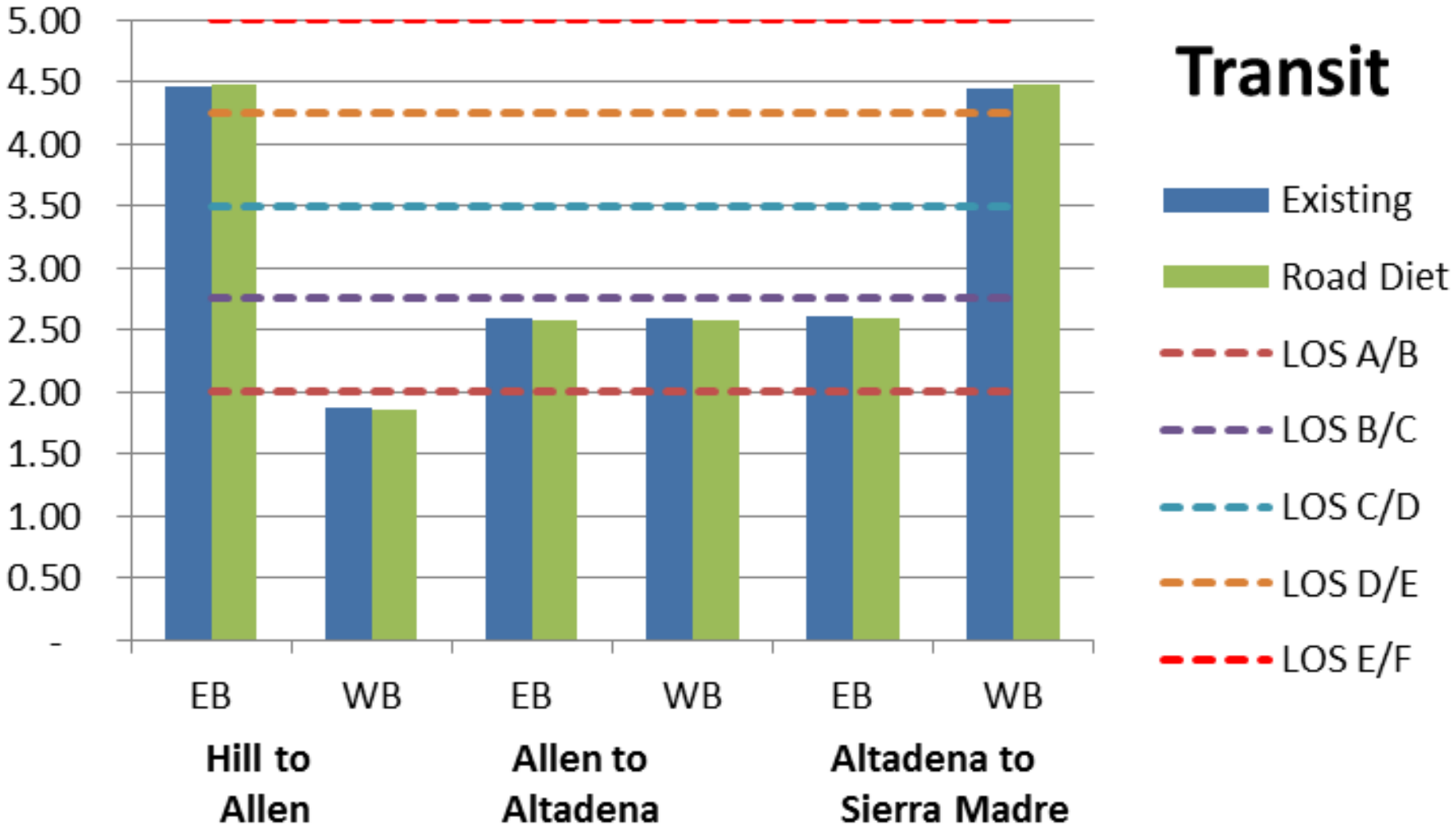
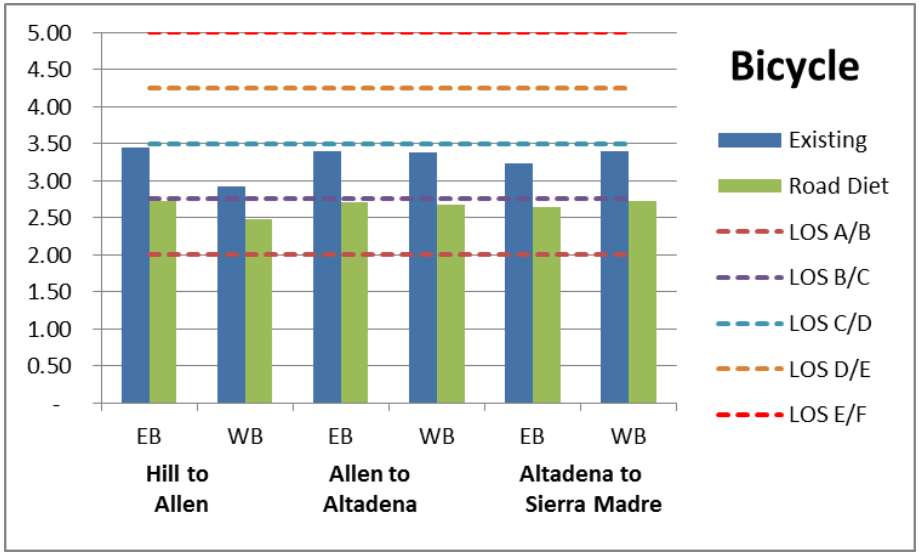


Case Studies Findings - I

- Proposed Orange Grove Road Diet Project between Hill Avenue and Sierra Madre Boulevard
  - > Findings showed that road diet project would improve bicycle LOS with minimal impact on other modes LOS
  - > Adding a bike lane made a difference of one LOS on all segments (C to B)



Mixed Use Project Vicinity Map

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A mixed-use project consisting of 125,000 sq. ft. of Retail/Office with a 156-room Hotel

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Case Studies Findings - II

- Compared MMLOS with recent EIR analysis
- Segment MMLOS showed expected range of conditions for each mode
  - > Identified need to improve LOS for bicycles on Lake
- Intersection MMLOS results for auto mode were equivalent to the ICU results
  - > MMLOS approach reasonably predicted the auto drivers' perception of the conditions.

Lake Avenue MMLOS Scores

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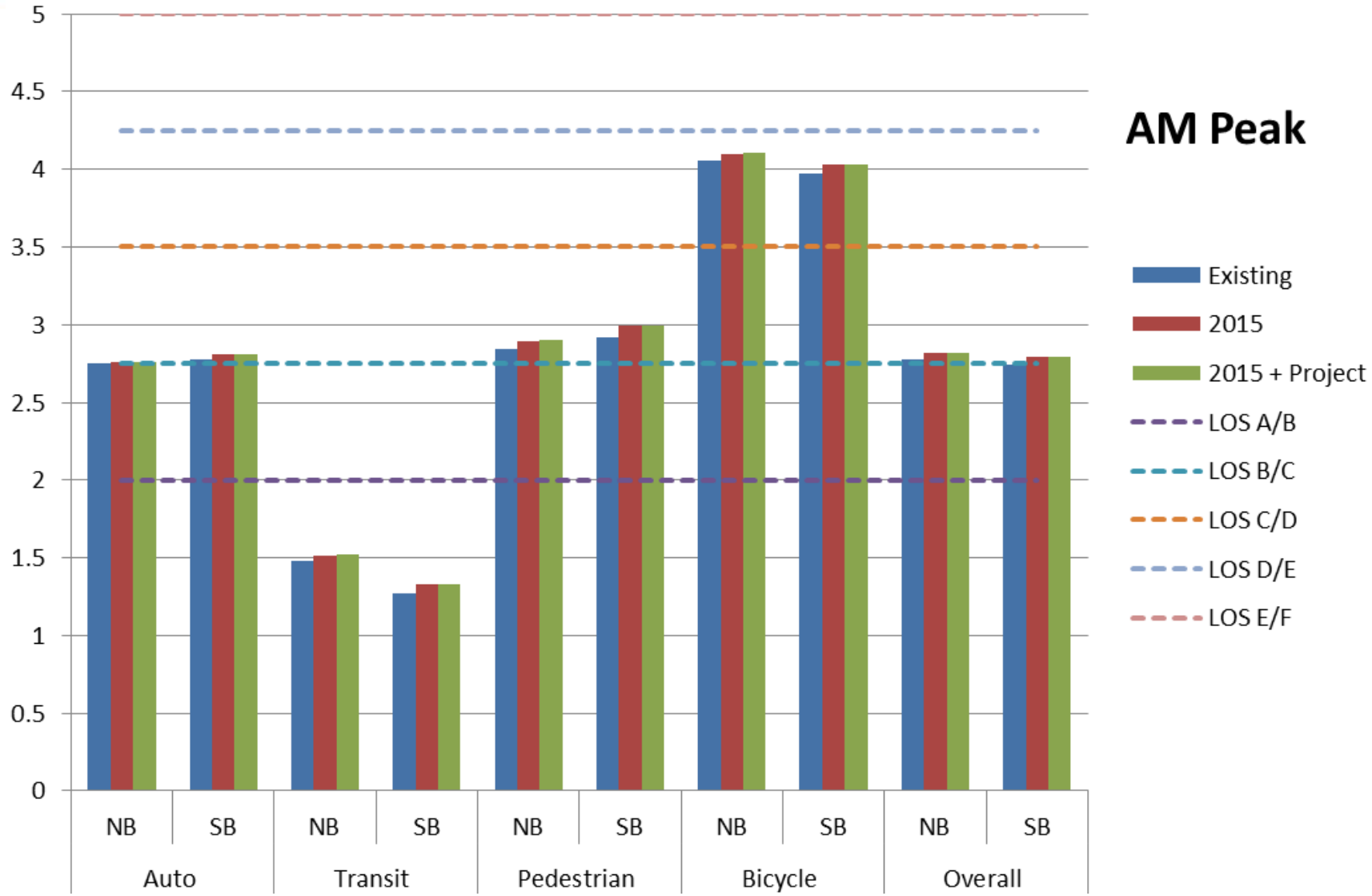

Case Study Conclusions

- Inclusion of MMLOS analysis resulted in
  - > A more robust analytical basis for requiring mitigation measures for transit, pedestrians and bicycles
  - > An analytical/quantifiable justification to reject mitigation measures that expand vehicular capacity in ways that would negatively impact other modes
- MMLOS Sensitivity (or lack of)
  - > Compared to auto-only approach, it's an improvement and not an immediate problem
  - > Going forward, further refinement will be needed

Updated Impact Methodology

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Impact Metric	Prior Methodology	Current Methodology	Significant Impact Thresholds
Intersection Auto LOS	Intersection Capacity Utilization (ICU)	ICU	No Change (sliding scale of impact)
Intersection Pedestrian LOS	None	Multi-Modal Level of Service (MMLOS)	Being evaluated (see below)
Segment Impact – Auto	$\frac{\text{Project + Existing ADT}}{\text{Existing ADT}}$	MMLOS	Concept: • LOS C as threshold for significance • Any increase at LOS D/E/F would be significant • Increment of change may be established similar to current sliding scale
Segment Impact – Pedestrian	None	MMLOS	
Segment Impact – Bicycle	None	MMLOS	
Segment Impact – Transit	None	MMLOS	

More Information

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