

# Assessing Paved Trails for Compliance with Standards and Best Practices



## Session Presenters:

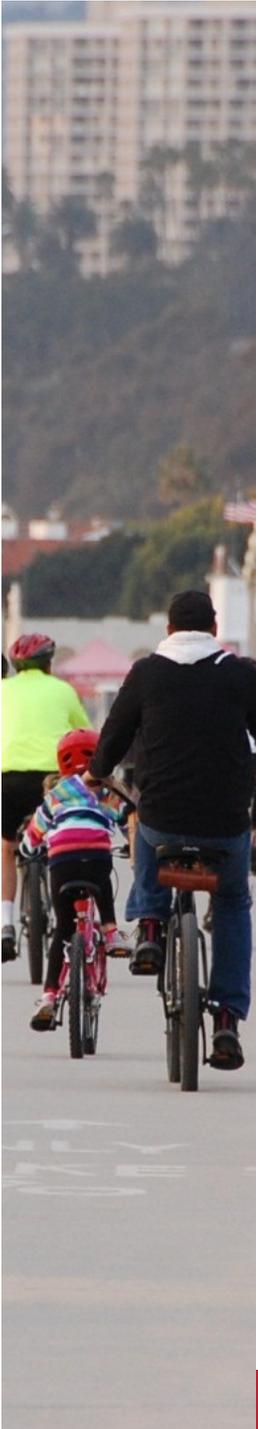
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- Masters in City and Regional Planning (UC Berkeley)
- BA Environmental Studies (UC Santa Barbara)

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- BLA Landscape Architecture (Cal Poly San Luis Obispo)





# Presentation Outline

1. Introduction
2. Overview of Current Guidelines
3. Grey Areas
4. Applying the Guidelines
5. References



# 1. Introduction

Trail Design Guidelines  
Seek to:

- Improve safety
- Improved user functionality and enjoyment
- Ease maintenance and management
- Limit liability





## 2. Overview of Current Guidelines

### U.S. Department of Transportation

- National MUTCD --> CA MUTCD



### California Department of Transportation (Caltrans)



- CA Manual of Uniform Traffic Control Devices (CA MUTCD)
- CA Highway Design Manual (HDM)

### American Association of State Highway and Transportation Officials (AASHTO)

- Guide for the Development of Bicycle Facilities





## 2. Overview of Current Guidelines

### Federal Highway Administration (FHWA)

- Designing Sidewalks and Trails for Access

### U.S. Access Board (ADAAG)

- Draft Final Guidelines for Outdoor Developed Areas
- Proposed Public Right-of-Way Accessibility Guidelines (PROWAG)

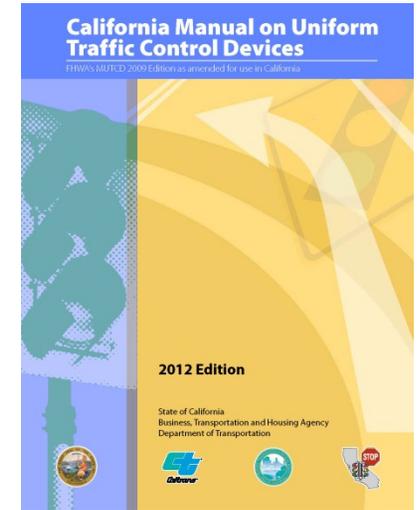
### U.S. Department of Justice

- ADA Standards for Accessible Design



# Manual of Uniform Traffic Control Devices (Caltrans)

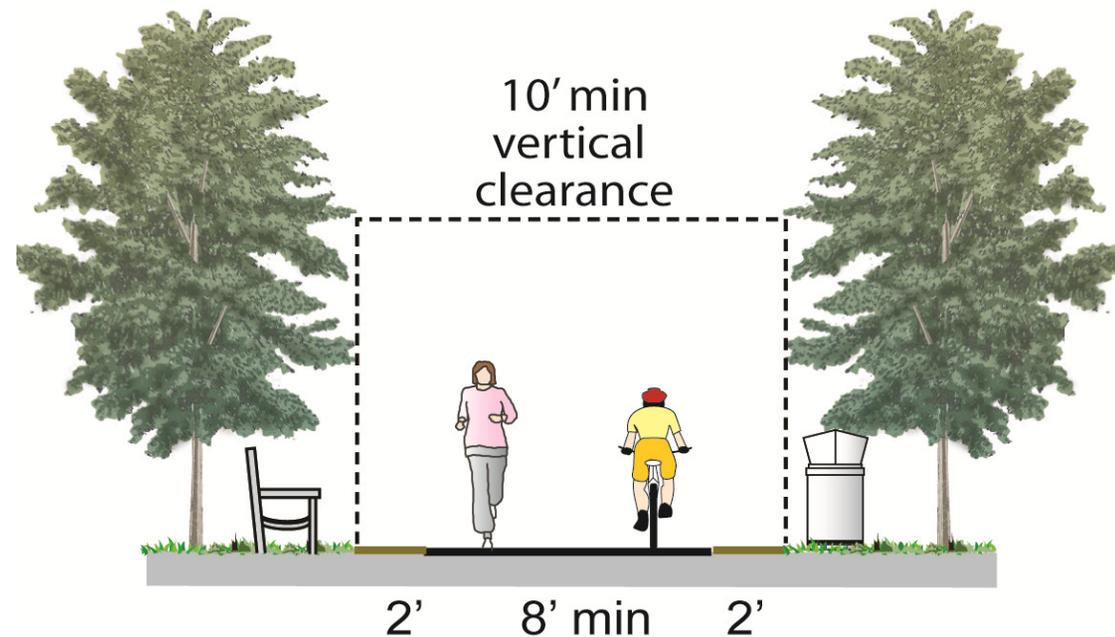
- Projects w/in Caltrans ROW or using Caltrans funding
- Items addressed:
  - Signs (application, placement)
  - Pavement markings (word messages, symbols, arrows, reflectorization, patterns and colors on shared-use paths, demarcating obstacles, dimensions)
  - Traffic signals and crossing beacons (application, placement)



# Highway Design Manual (Caltrans)



- Apply to “transportation facilities”
- Items addressed: width, clearances, grade, separation from highways, design speed, sight distance, horizontal and vertical curves

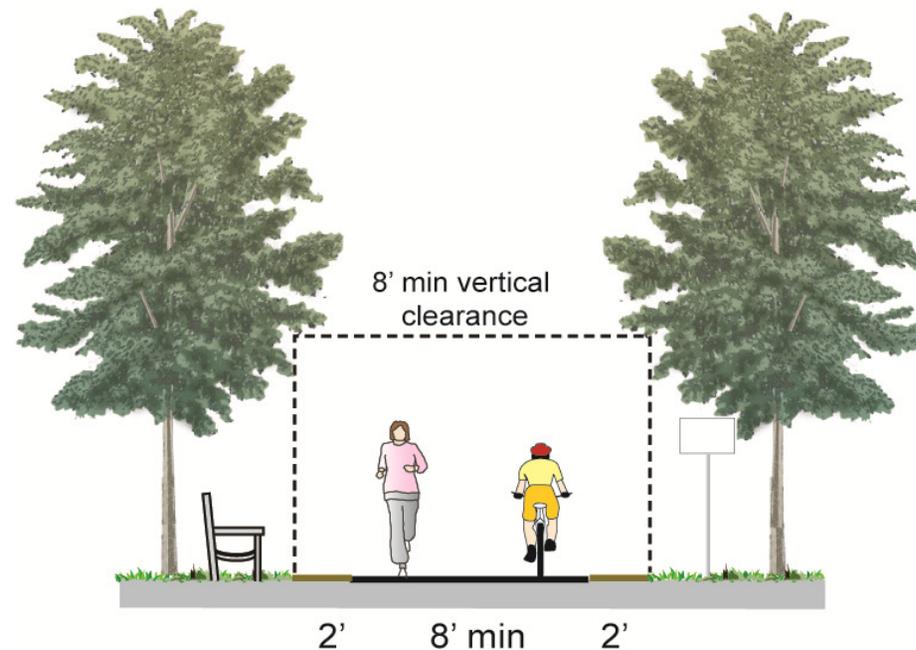




# Guide for the Development of Bicycle Facilities (AASHTO)



- Voluntary
- Items addressed: Separation from roadways, width, clearance, design speed, grade, sight distance, intersections, signing, marking, drainage)

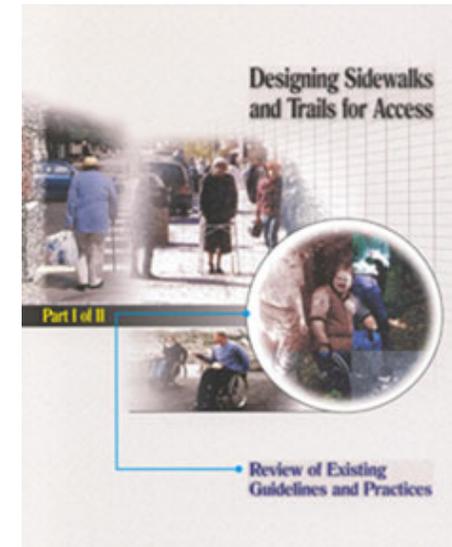




# Designing Sidewalks and Trails for Access (FHWA, 1999)



- Accessibility guidelines and practices, and construction and maintenance techniques have evolved since this report.
- More current information is available in other reports and guidance.
- Section: 5. Trail Design for Access





# Draft Final Accessibility Guidelines for Outdoor Developed Areas (2009)



- Federal land management agencies and non-federal entities that construct or alter facilities on Federal lands on behalf of the Federal government
- Provisions for trails address surface; clear tread width; passing spaces; obstacles; openings; slopes; resting intervals; protruding objects; and gates and barriers
- Clear tread width: 36" min
- Passing space: 5' x 5' every 1000'
- Tread Obstacles: 2" max. protrusion
- Openings: <math>< \frac{1}{2}</math>"



# Slope: Trails vs. Shared-use Paths in ADAAG Guidelines



## Trails

- Outdoor recreation trails must reflect environmental considerations of terrain, maintenance, erosion, and surface as well as constructability and use.
- Slopes up to 12% are permitted, but steep slopes are limited in length.

## Shared-use Paths [still In development]

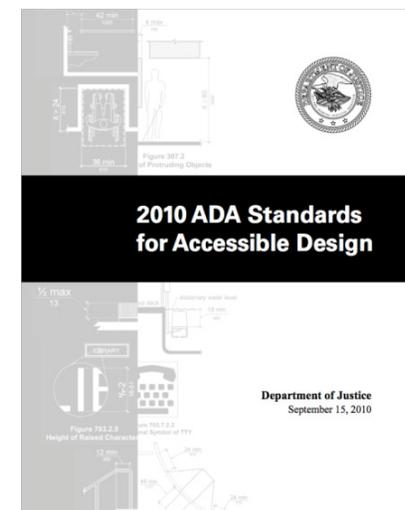
- Multi-use routes that depart from roadway alignments should be constructed to be accessible (5% currently proposed)
- Full ADAAG compliance helps projects remain eligible for state/federal transportation funds



# ADA Standards for Accessible Design (2010)



- State and local government facilities, public accommodations, and commercial facilities to be readily accessible to and usable by individuals with disabilities
- Items Addressed: slope, cross slope, clearances, clear width
- As of March 15, 2012, compliance with the 2010 Standards became required for new construction and alterations.





# Proposed Public Right-of-Way Accessibility Guidelines (PROWAG)

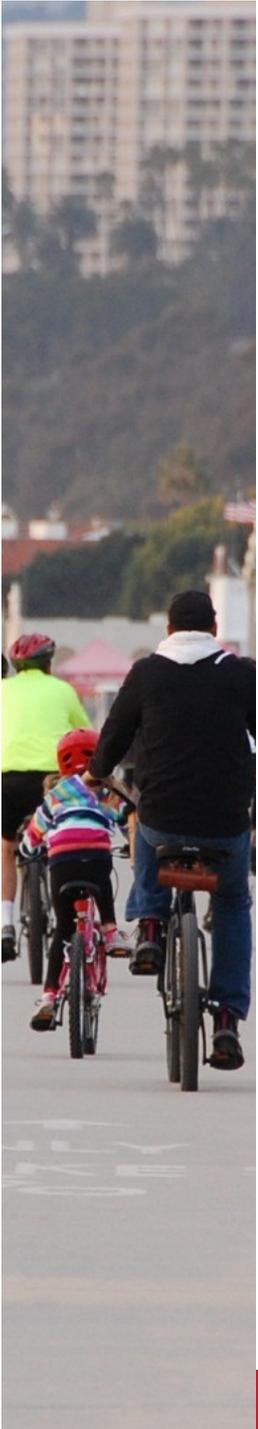


- Pedestrian facilities constructed or altered in the public right-of-way by state and local government
- Where pedestrian access routes are contained within a street or highway right-of-way, the grade of the pedestrian access route is permitted to equal the general grade established for the adjacent street or highway



# Conditional Exceptions

- “maximum extent feasible”
- Terrain
- Compliance would fundamentally alter the function or purpose of the facility or setting
- Compliance is precluded by the:
  - Endangered Species Act;
  - National Environmental Policy Act;
  - National Historic Preservation Act;
  - Wilderness Act; or
  - Other Federal, State, or local laws.
- Where full compliance is not feasible, document it and leave an obvious paper trail



## 3. Grey Areas

What don't the guidelines fully address?

- Separation of trail users
- Traffic control/safety
- Wayfinding for trails
- Enforcement
- Access control (bollards)

# 4. Applying the Guidelines and Addressing the Grey Areas

- American River Trail
- Napa Valley Vine Trail
- Santa Monica Beach Path



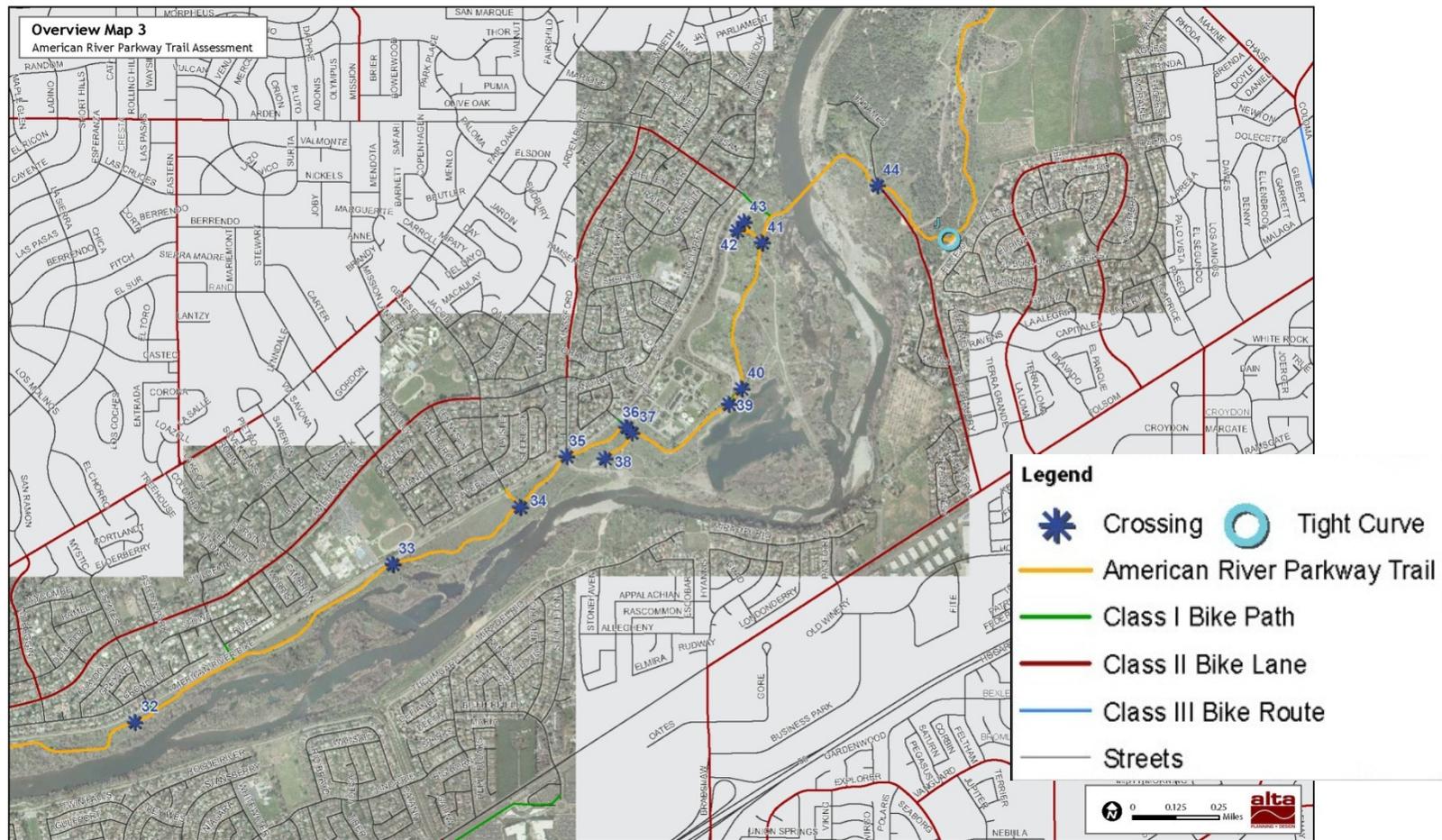
# American River Parkway Trail Assessment Sacramento, CA

- 23-mile trail corridor from Downtown Sacramento to Sacramento County Limit
- Trail assessment of:
  - Curve radii
  - Signage (location, rules of the path)
  - Striping (type, location, rules of the path)
  - Bollards (type and location)



# American River Parkway Trail Assessment Inventory Process

Basemaps created utilizing Google Earth and GIS Imagery and data



# American River Parkway Trail Assessment Inventory Process

- Toured corridor via bicycle
- Photographed and documented:
  - Intersection controls and crossing treatments
  - Trail curve-radii
  - Wayfinding signage
  - User traffic control signage



## Pedestrians

- . Use left side of trail facing on-coming bicyclists
- . When usable walk on left shoulder

# American River Parkway Trail Assessment Analysis

- The assessment compared the existing features against current trail standards
  - Caltrans' CA MUTCD and HDM
  - AASHTO's Guide for the Development of Bicycle Facilities
  - Rails to Trails Conservancy's Trails for the 21st Century
- Grey Areas
  - Rules of the path
  - Bollards

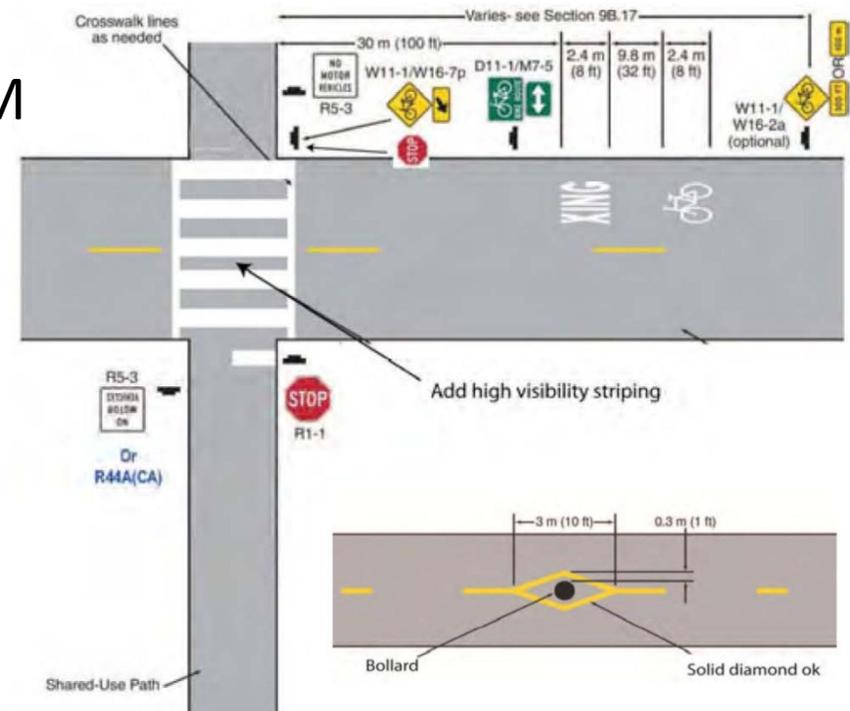


Figure 3-5: Path Crossing Roadway Design Example

# American River Parkway Trail Assessment Recommendations

- Provided intersection-specific recommendations



Photo of Existing Conditions



| LEGEND |                                     |
|--------|-------------------------------------|
|        | EXISTING SIGN TO REMAIN             |
|        | REMOVE EXISTING BOLLARDS            |
|        | RECOMMENDED BICYCLE/PEDESTRIAN SIGN |
|        | HIGH VISIBILITY CROSSWALK           |

# American River Parkway Trail Assessment Recommendations

- Identified areas where curve radii did not conform



# Napa Valley Vine Trail Alignment Study



- Study Area
  - 4.5-mile corridor along Devlin Road in Napa County Airport Industrial Area
- Scope
  - Identify the most feasible/least constrained side of the street for a path, based on general review of conditions



# Napa Valley Vine Trail Alignment Study



Google earth



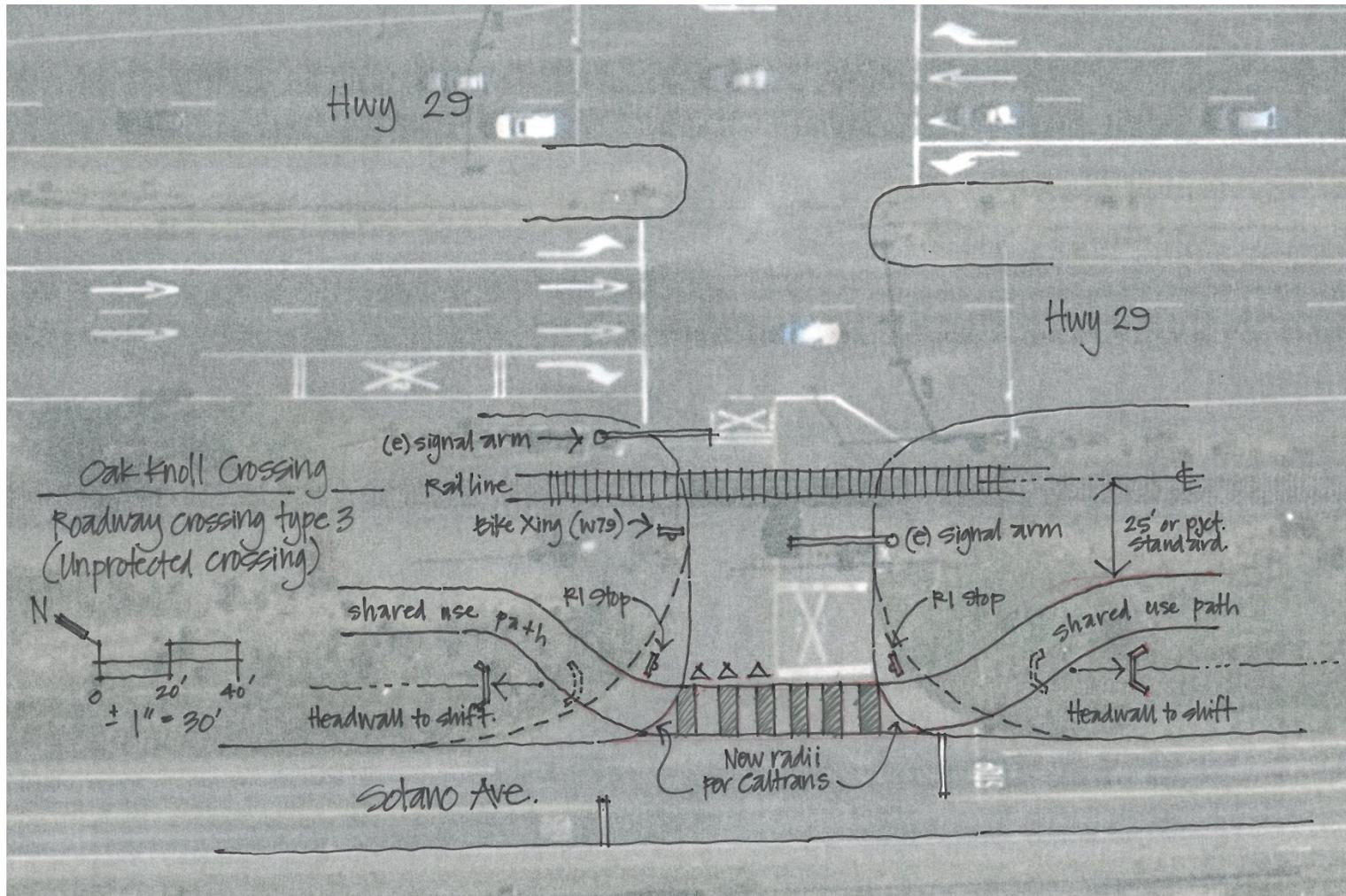
# Napa Valley Vine Trail Alignment Study



Google earth



# Napa Valley Vine Trail: Road Crossings



# Santa Monica Bike and Pedestrian Beach Path Ground Graphics and Wayfinding Plans

- Approx. 3.5-mile path
  - Owned by LA County
  - Operated/maintained by City of Santa Monica
- Trail assessment of:
  - Signage (type, working, location, rules of the path, wayfinding)
  - Striping (type, location, rules of the path, ground graphics)



# Santa Monica Bike and Pedestrian Beach Path Ground Graphics and Wayfinding Plans Inventory Process

- Created base sheets with high res aerials in AutoCAD
- Added City's sign inventory
- Field-reviewed path on foot
- Photographed and documented:
  - Intersection controls and crossing treatments
  - Wayfinding signage
  - Pavement markings



# Santa Monica Bike and Pedestrian Beach Path

## Ground Graphics and Wayfinding Plans

### Analysis

- Challenge to create signing and striping that's understood by diverse group of path users (use less words and more symbols)
- MUTCD wasn't always applicable. Mixed and matched different symbols to be used on path



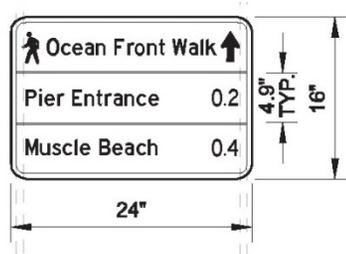


# Santa Monica Bike and Pedestrian Beach Path Ground Graphics and Wayfinding Plans Recommendations

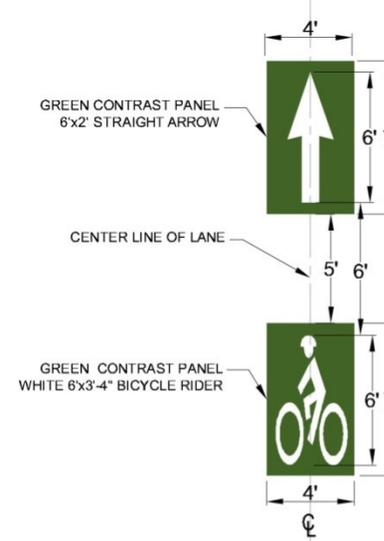


# Santa Monica Bike and Pedestrian Beach Path Ground Graphics and Wayfinding Plans Recommendations

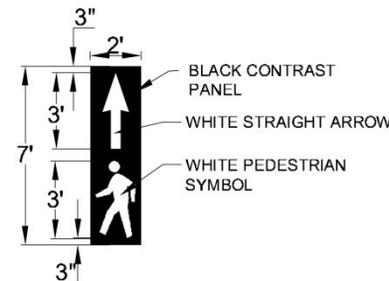
- Rules of the path
- Wayfinding



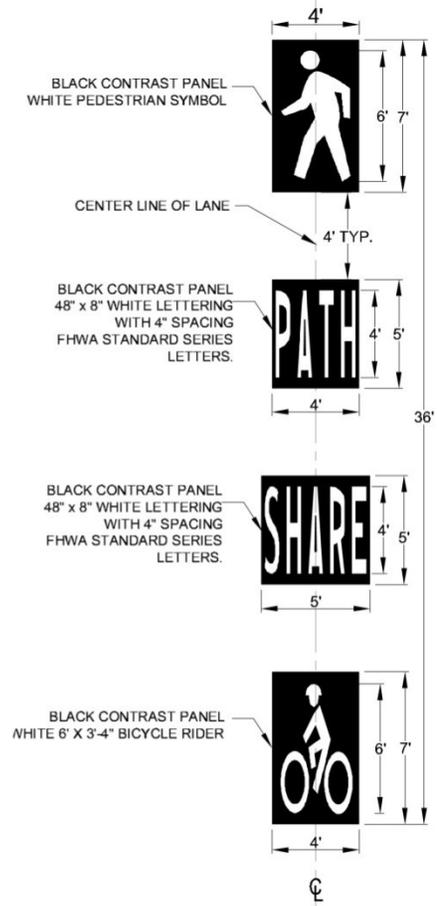
| KEY                 | SIZE AND COLOR                                   | SIGN                                   |
|---------------------|--|--|
| R4-3-MOD1<br>CUSTOM | 24"X30"<br>BACKGROUND: WHITE<br>LETTERING: BLACK | <b>SLOWER</b><br><br><b>KEEP RIGHT</b> |
| R4-3-MOD2<br>CUSTOM | 24"X30"<br>BACKGROUND: WHITE<br>LETTERING: BLACK | <b>SLOWER</b><br><br><b>KEEP RIGHT</b> |
| SM-R9-7             | 12"X18"<br>BACKGROUND: WHITE<br>LETTERING: BLACK | <br><br>(A)      (B)                   |



6 BICYCLE RIDER WITH ARROW  
1/4" = 1'-0"



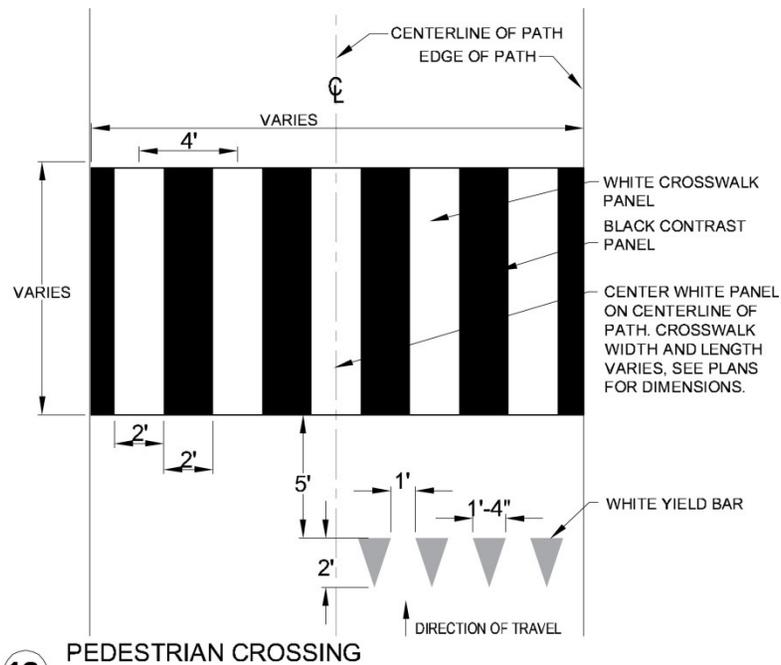
11 PEDESTRIAN WITH ARROW  
1/4" = 1'-0"



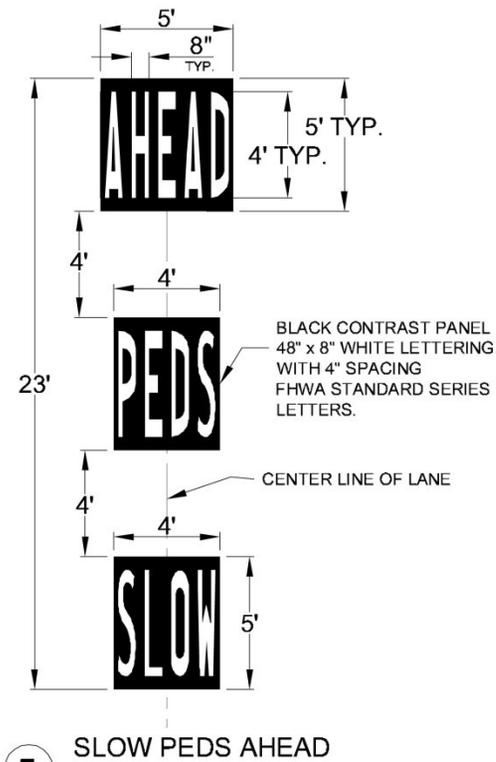
9 SHARE PATH  
NTS

# Santa Monica Bike and Pedestrian Beach Path Ground Graphics and Wayfinding Plans Recommendations

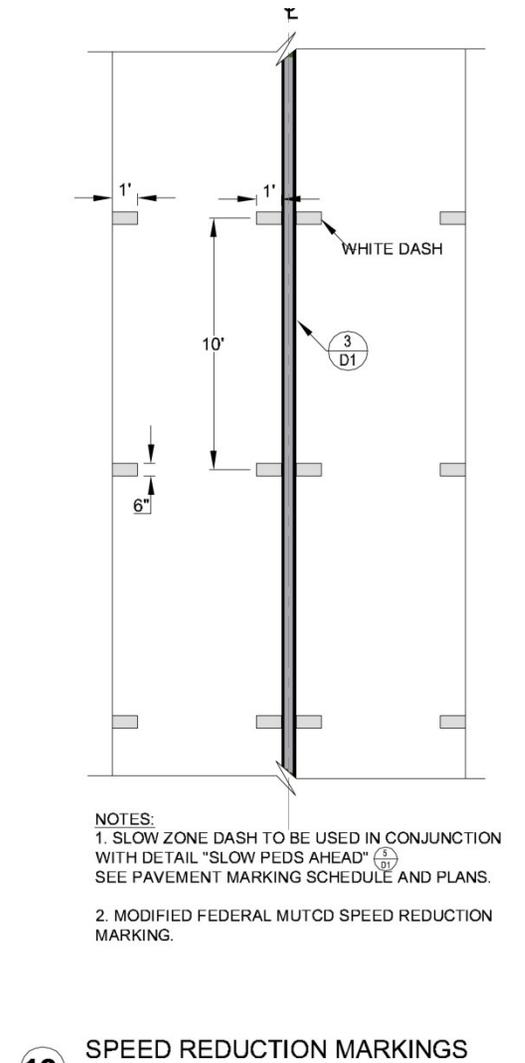
- Crossing treatments
- Speed reduction



NTS



NTS



NTS

- NOTES:
1. SLOW ZONE DASH TO BE USED IN CONJUNCTION WITH DETAIL "SLOW PEDS AHEAD" (3/5) SEE PAVEMENT MARKING SCHEDULE AND PLANS.
  2. MODIFIED FEDERAL MUTCD SPEED REDUCTION MARKING.



## 5. References

ADA Draft Final Accessibility Guidelines for Outdoor Developed Areas (including trails, trailheads, and viewing areas). Effective 3/15/12: <http://www.access-board.gov/outdoor/draft-final.htm>

ADA Shared-Use Path Guidelines [In Development]:  
<http://www.access-board.gov/sup.htm>

ADA Public Rights-of-Way Guidelines: <http://www.access-board.gov/prowac/index.htm>

Draft Final Accessibility Guidelines for Outdoor Developed Areas:  
<http://www.access-board.gov/outdoor/draft-final.htm>

ADA Standards for Accessible Design (2010):  
[http://www.ada.gov/2010ADASTandards\\_index.htm](http://www.ada.gov/2010ADASTandards_index.htm)

## 5. References

Proposed Public Right-of-Way Accessibility Guidelines (PROWAG):

<http://www.access-board.gov/prowac/nprm.htm>

AASHTO Guide for the Development of Bicycle Facilities:

[https://bookstore.transportation.org/item\\_details.aspx?ID=104](https://bookstore.transportation.org/item_details.aspx?ID=104) (for purchase)

California Highway Design Manual:

<http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm>

California Manual of Uniform Traffic Control Devices:

<http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/>

FHWA Designing Sidewalks and Trails for Access:

<http://www.fhwa.dot.gov/environment/sidewalks/>





## 5. Additional Resources

- American Trails <http://www.americantrails.org/>
- Bondurant, J., Thompson, L., et al. (2009). *Trail Planning for California Communities*.
- Flink, C.A., Searns, R.M., Olka, K. (2001). *Trails for the Twenty-First Century: Planning, Design, and Management Manual for Multi-use Trails*.
- Flink, C.A., Searns, R.M. (1993). *Greenways: A Guide to Planning, Design, and Development*.
- Rails-to-Trails Conservancy  
<http://www.railstotrails.org/index.html>

# Questions?



## Contact Info

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