

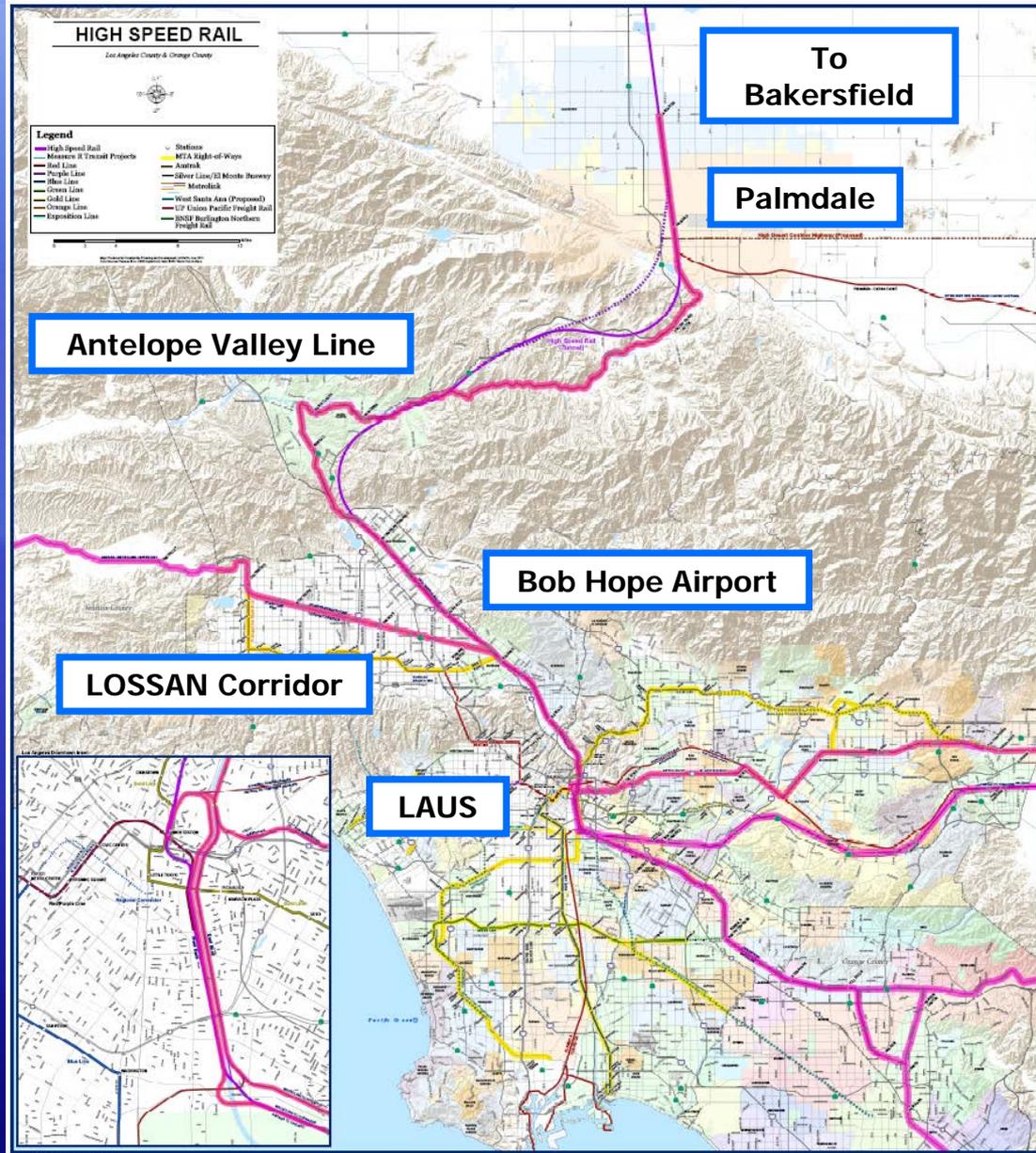
Bike Paths and Railroads Designing for Safety

**2012 Right-of-Way Fatality and Trespass Prevention Workshop
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What Does Metro Do?

- Own more than 150 miles of railroad R/W L.A. County.
- Develop capital improvement programs.
- Coordinate with Metrolink, Amtrak, CHSRA, and freight carriers.

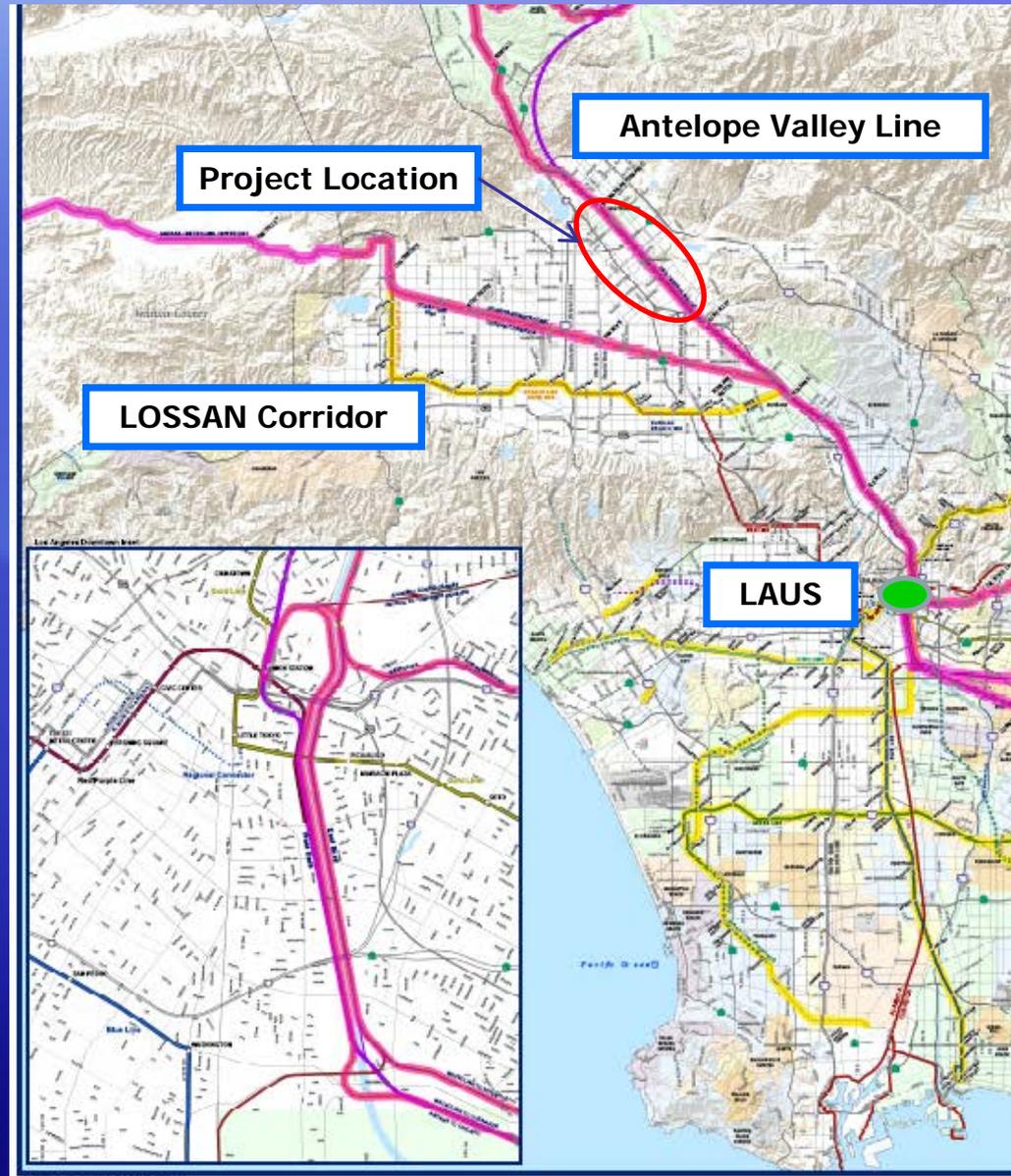


The Project

- **Construct a continuous bike path on the railroad right-of-way that will draw users.**
- **Multi-phased project in the city of Los Angeles.**
- **Funded through a grant from Metro.**
- **Original funding only included bike path construction costs.**
- **Railroad signal costs and other related grade crossing improvements increased the scope and costs of the project significantly.**

The Corridor

- Located on the Antelope Valley Line.
- Dense urban area – industrial, residential.
- Future HSR corridor
- Approximately 6000 passengers a day.
- 30 passenger trains/day plus freight.



Corridor Challenges

- Significant motor vehicle and large truck traffic.
- Many crossings did not have pedestrian amenities – including sidewalks.
- Signaling did not include preemption for a crosswalk paralleling the railroad on the R/W.
- Railroad right-of-way sandwiched between two roads.
- Some intersections at the crossings did not have traffic signals.

The Solution

- **Develop a plan that creates a safe environment for cyclists and pedestrians.**
- **Adequate fencing and channelization was needed.**
- **Advance the traffic control at the intersections to account for the cyclists.**
- **Develop channelization through the railroad crossing that allow for cyclists exiting and entering the bike path**
- **Create a free flowing path for all users.**



Bike Paths Can Exist Within Railroad R/W

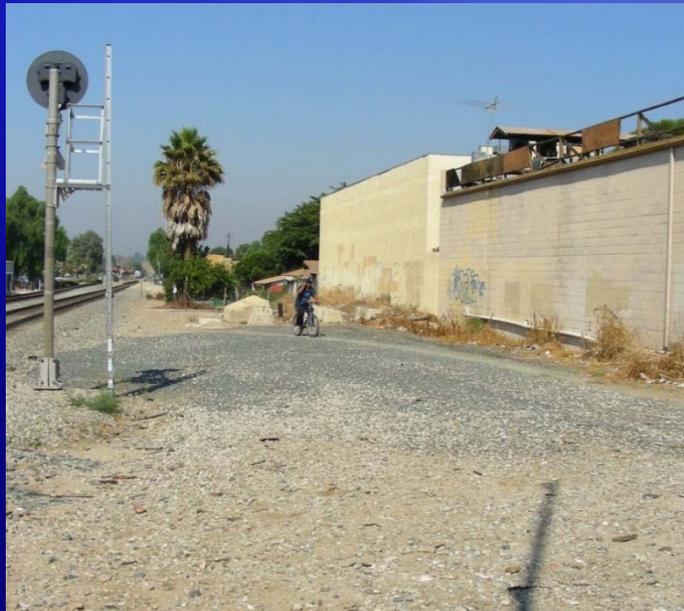
- **Requires a paradigm shift in thinking regarding design.**
- **Understand that cyclists of different demographics act differently.**
- **Design must create controlled flow throughout the bike path – including entrances and exits.**
- **The railroad crossing now has recreational users.**
- **Remember that the ultimate goal of the bike path project is to draw cyclists and pedestrians.**

General Rules

- Pedestrians and cyclists will take the shorter route across the tracks.
- Pedestrians and cyclists will move into all areas unless specifically channeled to where they should go.
 - Signage is not always effective
- Pedestrians and cyclists are “creatures of habit”
 - They will stick to what is familiar.
- Pedestrians and cyclists can be directed to safety.

Pedestrian and Cyclist Behavior

Foot path indicates a lot of activity.



Cyclists will tend to take the shorter route.

Crosswalks - Challenges

- The addition of a parallel crosswalk creates queuing concerns.
- Vehicles now have to wait for pedestrians before leaving the crossing.
- Traffic signal work is needed to minimize the chances of trapping a car on the crossing.
- Preemption now must allow pedestrians to clear the crosswalk.
- Requires additional track circuitry to provide adequate warning.



Crosswalks

Vehicles stopped for pedestrians – notice that this is not a marked crosswalk



Vehicles queuing across the tracks – notice that there is no escape.



Lack of Direction Creates Hazards



Notice the tire tracks
– Where are the
cyclists going to go?



Poor sidewalks and
obstructed paths.

Pedestrian Treatments

- Crossings associated with bike paths need to have adequate surfaces.
- Additional treatments may be needed to enhance the overall safety.
- Proper channelization is a must.
- Possible need for exit gates.



Pedestrian Crossing Features

Tactile warning strips are important to indicate when leaving the safety of the bike path.



Pedestrian and swing gates may minimize “hot dogging”.

Railroad Signals

- The addition of pedestrians at the crossing can affect preemption time.
- Can add significant time to the overall signal timing at the crossing.
- Creates farther “looks” in the railroad circuitry.
- Can add significant costs to the overall project.
 - Additional preemption can be very costly to incorporate into the signal system.

Lessons Learned

- **Partner with the railroad and regulatory agencies to develop the project.**
 - Will account for those “unforeseen” costs.
 - Will adequately scope the project.
 - Will address outstanding issues existing at the crossing.
- **Establish the “ground rules” for construction**
 - permitting and design reviews.
- **Include all costs in the grant application.**
- **Identify right of way impacts early.**

Summary

- **Bike paths are an integral part of the traffic situation at a railroad crossing.**
- **All users at the crossing are a consideration in the design of the crossing or a change in the operation of the crossing.**
- **Bike paths are developed to attract users and should be developed accordingly.**
- **Railroad related amenities are not a “betterment”.**
- **Coordinate early with the host railroad to ensure success.**

Questions?