

Cyclist-Oriented Road Safety Audits

Sarah Rocchi and Peggy Gibbs
G.D. Hamilton Associates



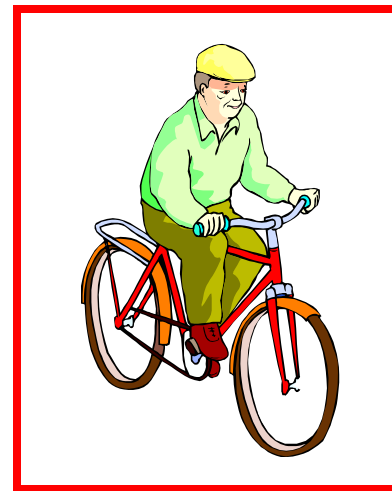
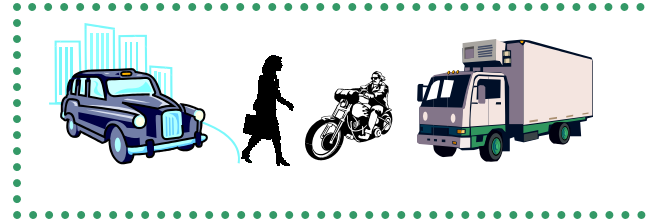
OUTLINE

- Definition
- Objective
- Audit Method
- Types/Examples
- Importance of Cycle-through
- Considerations for Cyclists



DEFINITION

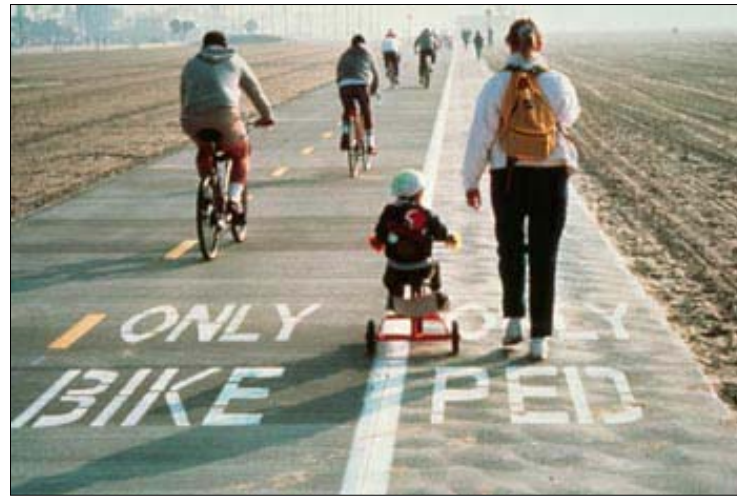
- A **formal** examination of an **existing or future** road or traffic project in which an **independent, qualified examiner** reports on the project's **safety performance** for **all road users**.



OBJECTIVES

- Identify potential safety problems **for cyclists.**
- Ensure that appropriate safety countermeasures **for cyclists** are considered.

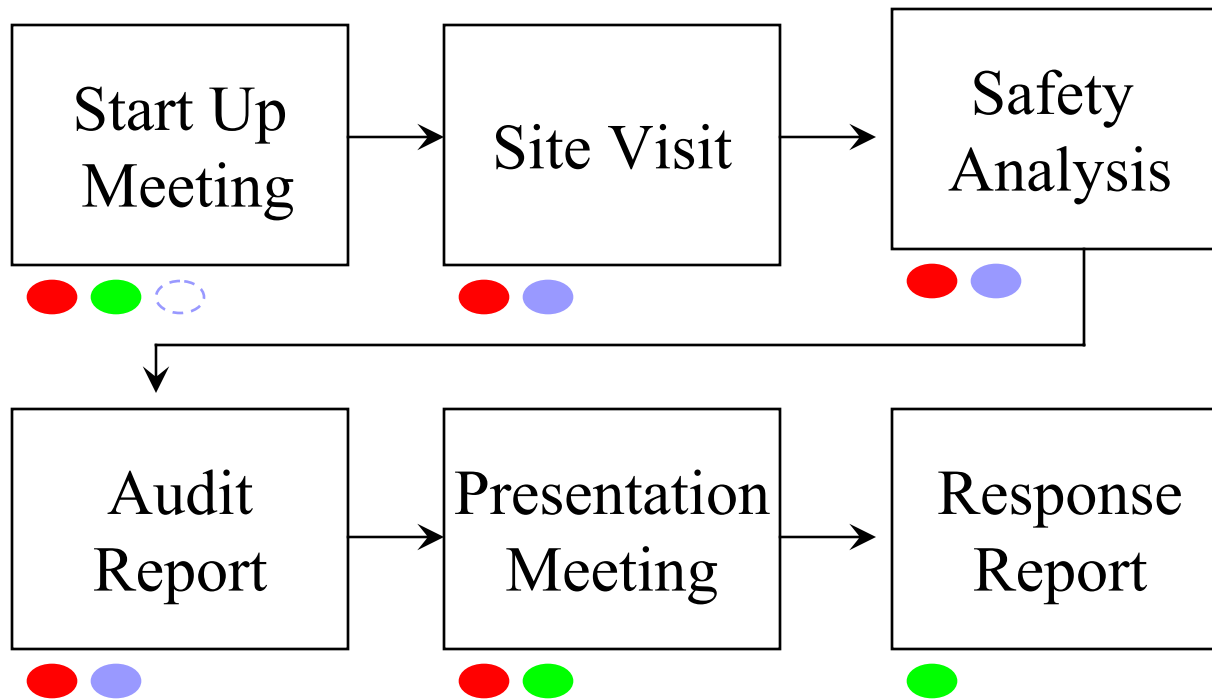




Source: www.pedbikeimages.org



TYPICAL SAFETY AUDIT PROCESS



- *Safety Audit Team*
- *Bicycle Auditor*
- *Design Team/Owner*



Road Safety Audit Team

- Team Composition
 - different and diverse backgrounds
 - encourage discussion and deliberation
- Should include a cycling specialist
 - experienced cyclist
 - knows recommended standards for the design of cycling facilities



Cycling Audits

- For all types of facilities with bicycle traffic, not just designated bicycle routes.



Source: www.pedbikeimages.org



Cycling Audits

- Three types of issues:
 - facilities designed without consideration for cyclists
 - facilities not designed to standard
 - facilities designed to standard, but site-specific characteristics or combination of minimums require a fresh eye






ROAD SAFETY AUDIT TYPES

- Feasibility / Planning Stage
- Preliminary Design Stage
 - also called Draft Design
- Detailed Design Stage
- Post-Construction Stage
 - also called Pre-Opening
- Existing Road
 - also called In-Service

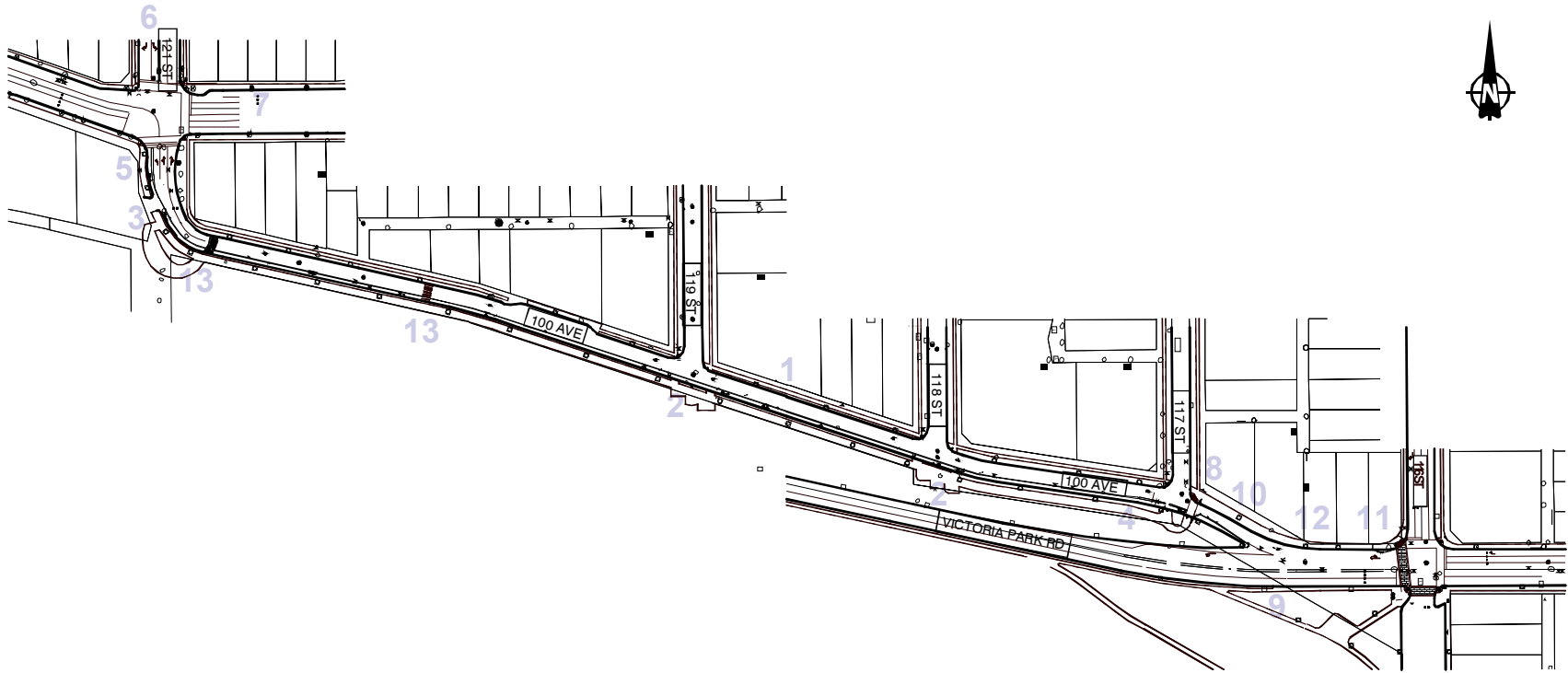


FEASIBILITY / PLANNING STAGE

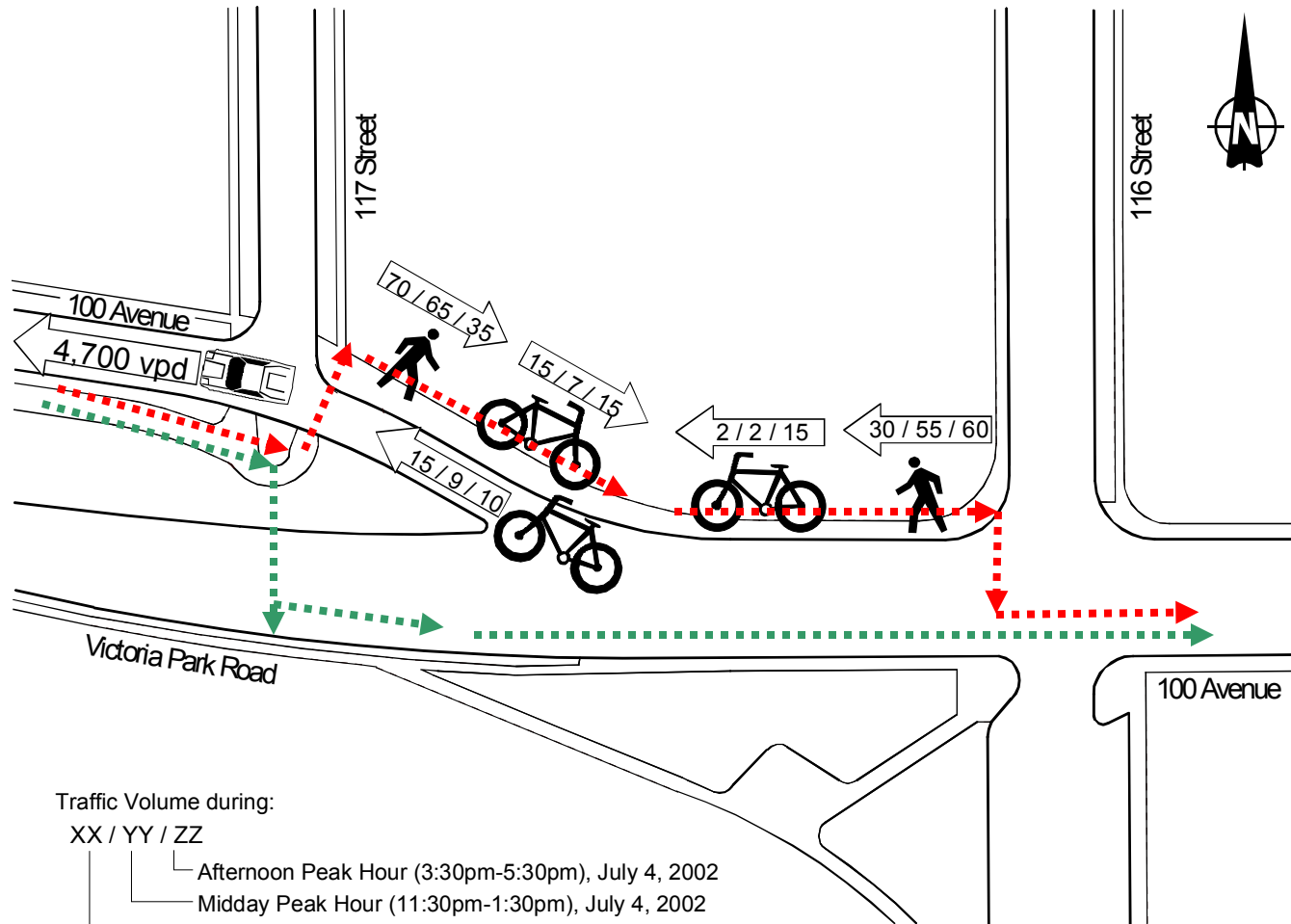
- **Route Options** 
- **Layout Options** 
- Treatment Options
- Project Limits
- Road Classification
- **Design Criteria** 



Planning Audit – Route Option



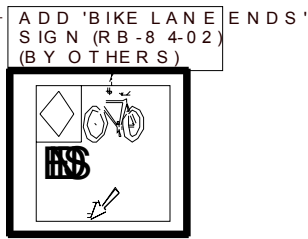
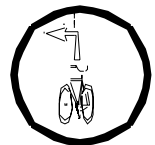
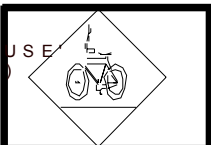
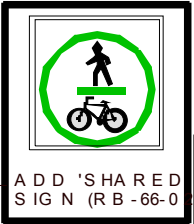
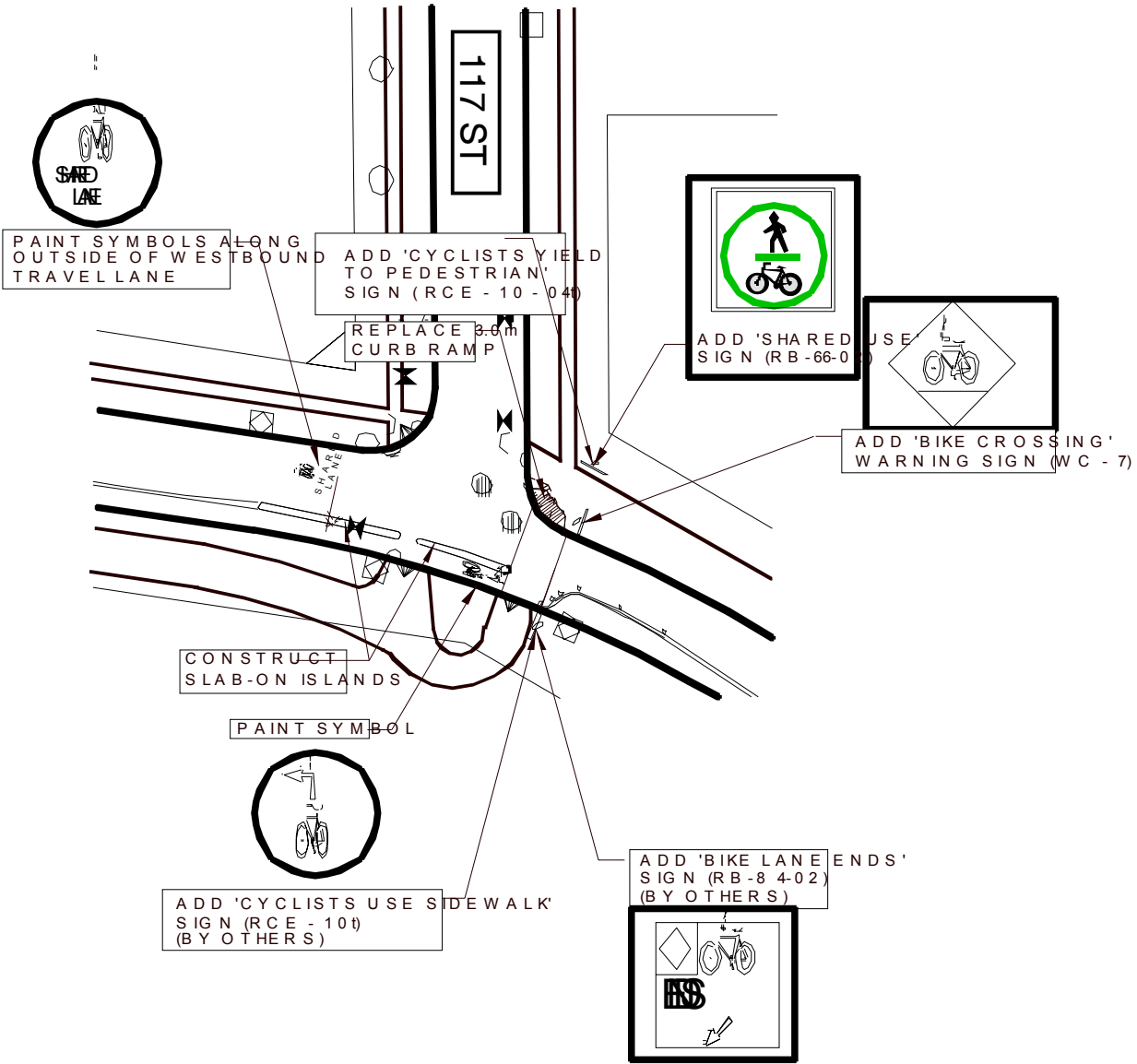
Proposed Transition at End Point






Traffic Volume during:
XX / YY / ZZ

- Afternoon Peak Hour (3:30pm-5:30pm), July 4, 2002
- Midday Peak Hour (11:30am-1:30pm), July 4, 2002
- Morning Peak Hour (7:00am-9:00am), June 26, 2002








PRELIMINARY DESIGN STAGE

- Design Values
- Horizontal & Vertical Alignments
- **Cross Section** 
- Clear Zone
- Traffic Operations & Efficiency
- Positive Guidance
- Lighting
- **Combinations of Factors** 
- **Facilities for All Road Users** 

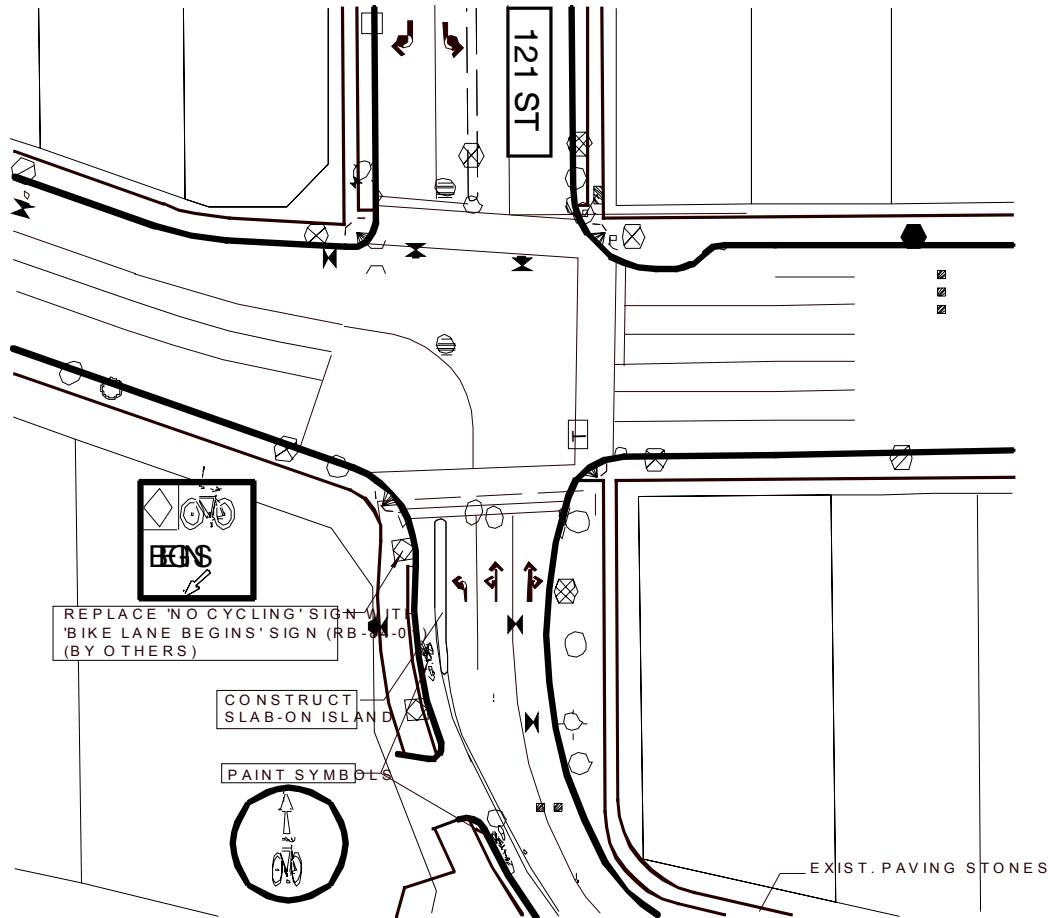


DETAILED DESIGN STAGE

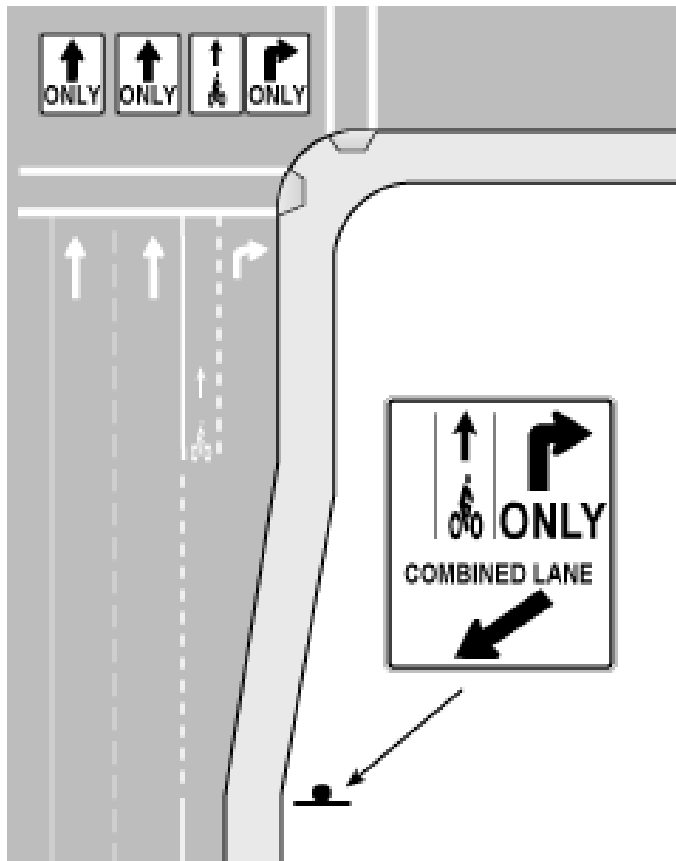
- Design Details for all Road Users
- Hazard Protection
- **Signing Plan** 
- **Marking Plan** 
- **Delineation Devices** 
- Drainage Details
- **Connections at Project Limits** 



Preliminary/Detailed Design – Positive Guidance Example



Positive Guidance - Suggestions





RA-7

600 mm x 750 mm



POST-CONSTRUCTION STAGE

- confirmation that hazards identified earlier were properly addressed
- signing details and placement
- marking details and conspicuity
- **sight distance realities** 
- **hazard protection** 



Post-Construction: Sight Distance and Priority



Sight Distance and Priority (Suggestion)



paving reinforces cyclists' right of way at driveways

low-growing plants do not block sight-lines



Post-Construction: Transition and Delineation



Transition and Delineation (Suggestion)



improve visibility of bollards

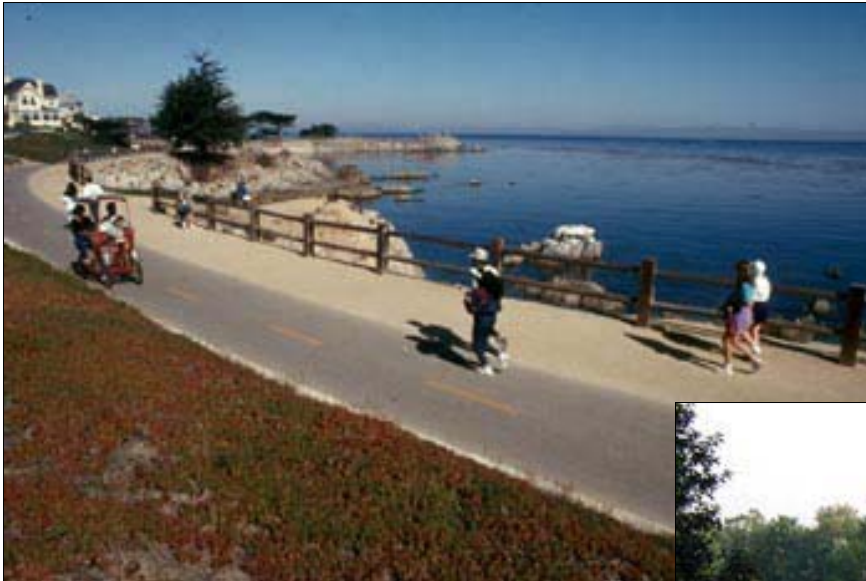
provide obstruction-free area



Post-Construction: Clear Zone






Clear Zone (Suggestion)



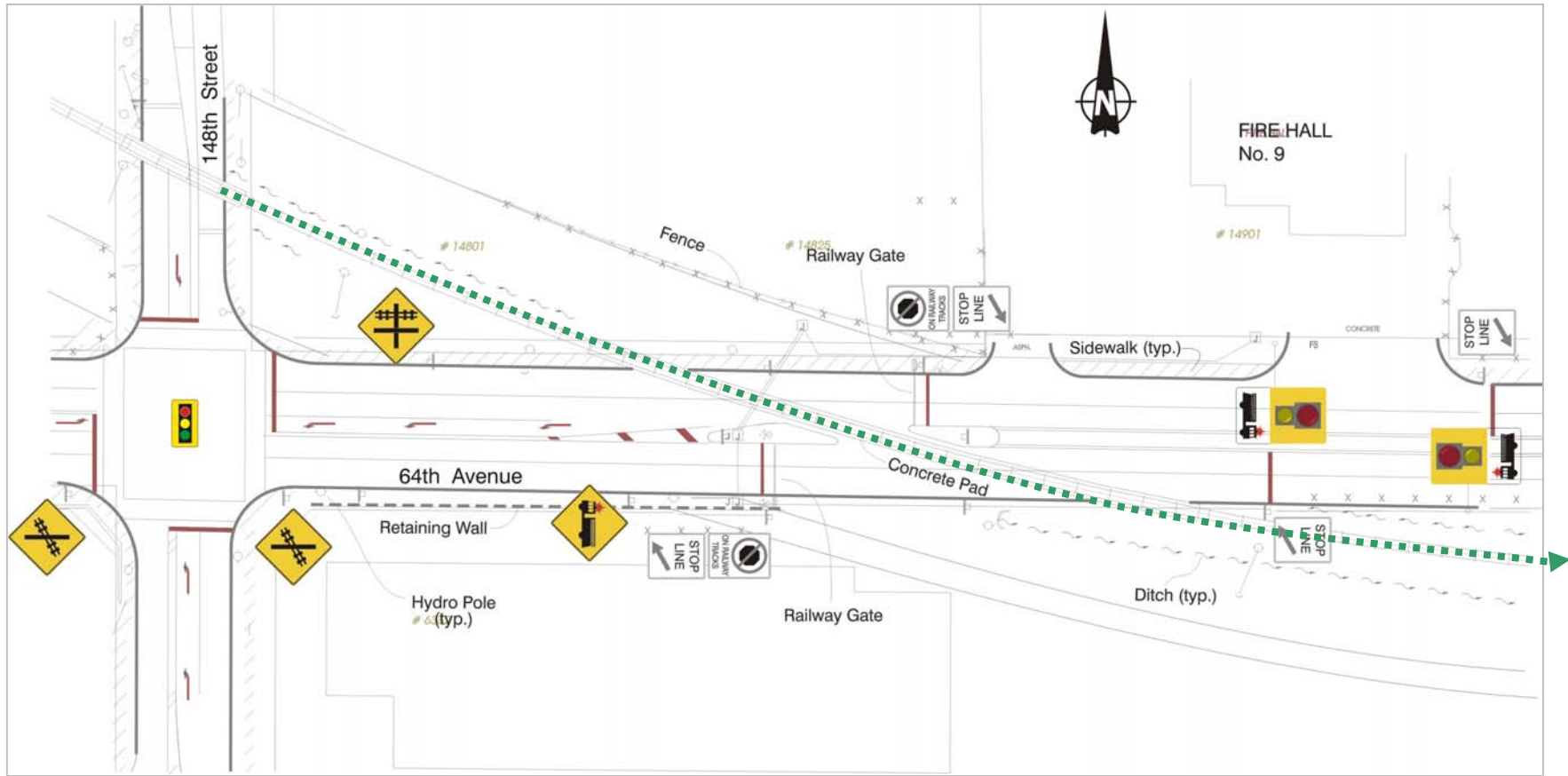
fence to delineate the edge of the pathway and prevent cyclists from going off the pathway



EXISTING ROADS (In-Service)

- **Potential hazards** 
- **Land use** 
- **Pavement condition** 
- **Traffic Volumes**
- **Device Operation / Reliability**
- **Traffic Efficiency**
- **Wear & Tear**





Existing Roads – Cycle-through



Existing Roads – Cycle-through



Existing Roads – Mitigating Measures



Considerations for Cycling Audits

- Design speed – 30 km/h for cyclists
 - Affects geometry, but also signing
- Hazards specific to cyclists
 - Drainage grates, diagonal railway crossings, parked cars, rumble strips
- Transition points
- Maintenance requirements for bikes



Considerations for Cycling Audits - Continued

- Lack of rider protection
- Stability
- Speed differential
- Illumination
- Thin profile
- Ejection
- Rider experience



INFORMATION REQUIRED

- Traffic Volumes
- Crash Records
- Other Users (cyclists, pedestrians, etc)
- Previous Safety Reports & Documents
- All Relevant Drawings & Supporting Documents
- Design Standards & Criteria

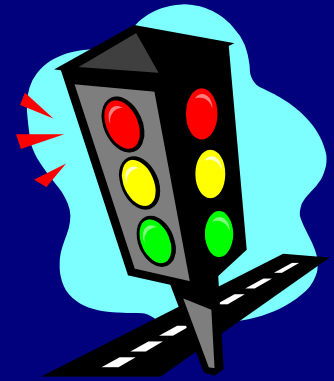


SAFETY AUDIT REPORT

- Project Background, Key Map
- Team Members and Dates
- For each identified hazard:
 - Location and Description
 - Crashes that may result
 - Risk Assessment (Frequency and Severity)
 - Recommendations
 - Practicability



End



Questions / Discussion

