

Mill Valley to Corte Madera  
Bicycle and Pedestrian Corridor Study

Appendix E:  
Emergency Response Analysis

Prepared by  
Alta/LandPeople and Parisi Associates



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**Appendix E: Emergency Response Analysis**

**Table of Contents**

1.1 Conditions and Issues ..... 1  
1.2 Emergency and Safety Features ..... 2  
Emergency Services Meeting #1 Notes ..... 10  
Emergency Services Meeting #2 Notes ..... 12

## **Appendix E: Emergency Response Analysis**

*Prepared by Parisi Associates and Alta/LandPeople*

This analysis details strategies to address emergency response for the three alignments of the Mill Valley – Corte Madera Bike and Pedestrian Corridor Study. It is based on the Study team's past experience with similar projects, field work, meetings with responsible local emergency services staff, and the preliminary Feasibility Study of the Alto Tunnel.

To better understand the needs, questions, and recommendations of the area's emergency services, the Study team held two meetings with the County of Marin, Corte Madera Fire Department, Twin Cities (Corte Madera and Larkspur) Police Department, and Mill Valley Police Department. Notes and comments from these meetings are reflected in the issues and proposed emergency response features of the three alternative routes as described below. Meeting notes are attached after the Analysis.

### **1.1 Conditions and Issues**

#### ***Horse Hill Route***

Most of the route is along public roads and is fully accessible. The existing Horse Hill Path bikeway parallel to Highway 101 has no access from the highway. Emergency services and maintenance personnel must park at either end to enter the corridor. Providing immediate access to the path from the Highway could improve emergency response time. Additionally, marking the path with town limit signs and mileposts would help path users know where they are when calling for assistance.

#### ***Alto Tunnel Route***

Access will be a significant concern for the central portion of this route. If the tunnel is improved for bicycles and pedestrians, it would be a 2,172' long converted single track rail tunnel, approximately a net 12' wide by 16' tall. There would be approximately 12' wide access for pedestrian and bicycle use. The tunnel would be lined with shotcrete or concrete; there will be no timber or other combustibles.

The tunnel will not be accessible to emergency vehicles. Even an ambulance would be impractical to fit into the 12' wide tunnel. Emergency and basic maintenance and operation access will need to be on foot or potentially with a small electric vehicle. Opening the Alto Tunnel to public use will require access and parking for emergency vehicles as close as possible to the tunnel. Turnarounds for emergency vehicles located directly adjacent to the Tunnel portals are not possible due to topographic constraints.

A full complement of firefighting and safety/security enforcement, monitoring and response equipment should be provided in the tunnel.

Emergency access for safety, security, or maintenance purposes should be based on an established protocol by local agencies and the fire and police departments. The initial responding party will notify the other relevant departments as soon as possible. Based on management models for other local paths, including the Cal Park Tunnel, County Park Rangers may take primary responsibility for incidents on the trail and in the tunnel and immediately contact other local agencies as needed and appropriate.

### ***Camino Alto/Corte Madera Avenue Route***

This route is entirely accessible by public roads. Speed of bicyclists on the existing Camino Alto/Corte Madera Avenue route is an issue for police as is the lack of sidewalks for pedestrians. Bicyclists travel at low speeds up the grade and high speeds down the grade. Bicycle and pedestrian facilities along this route would improve the existing conditions and provide non-motorized transportation space in the right-of-way. With bicycle and pedestrian improvements along this route, emergency access is not an issue. Bicycle and pedestrian facilities would be immediately adjacent to the roadway, allowing emergency services access if there is an issue. If improvements do occur along Camino Alto, street lights should be considered to increase visibility.

## ***1.2 Emergency and Safety Features***

### ***Horse Hill Route***

Widening of the path to approximately 16 feet would accommodate emergency and maintenance vehicle access, as well as improve aesthetics and function for users. A system of route and milepost signs would help users identify their location, and aid emergency services personnel in coordinating and responding.

### ***Alto Tunnel Route***

Access improvement is important to support emergency response as well as maintenance. “Hammerhead” turnarounds near the tunnel portals will provide a staging area and space large enough for fire engines to turn around, per Mill Valley standards. Due to topographic constraints, the staging areas must be located approximately 130 feet from the south portal and 80 feet from the north portal. Figures 2 and 3 show schematic concepts of how these turnarounds would fit within the constrained topography.

For tunnel security lockable gates should be provided on both ends. In the tunnel there should be emergency call stations at the portals and at the tunnel midpoint. The tunnel should allow radio communication and if possible cell phone coverage. For fire prevention, the tunnel should have a sprinkler system and fire alarm pull stations and fire hydrants at both portals.

Installation of standardized regulatory signs at regular intervals along the path and tunnel will help users internalize the rules. This could include “Bicyclists Yield to Pedestrians,” “Pass on the Left,” “Slower Traffic Stay Right” and speed limits. Signs should be installed on the path accessing the tunnel including the hours of operation and an alternate route shown on a map for reference when the tunnel is closed. The tunnel portals should have signs including: No Loitering, No Vandalism, and No Trespassing when Pathway and Tunnel Closed. A system of

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## Mill Valley to Corte Madera Bicycle and Pedestrian Corridor Study

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route and milepost signs would help users identify their location, and aid emergency services personnel in coordinating and responding.

Specific proposed safety and security features for the approaches to the tunnel include:

- Clear and trim existing vegetation to provide a 20' wide clear corridor to the tunnel is required.
- Construct A.C. paved paths – 10' wide for bikes with 2' shoulders, 6' wide for pedestrians.
- Construct emergency vehicle parking and turn-around as illustrated in Figures 2 and 3, as close as possible to the tunnel portal. Reinforced concrete or soil nail type concrete retaining walls will be required. At the south end the turnaround would be approximately 130 feet from the portal, and at the north end approximately 80 feet from the portal.
- Provide fire hydrants (1,000 GPM) at portal side of emergency access turnarounds.
- Extend water line for fire hydrant at turnaround, and up to tunnel portal for connection to wet-standpipe system in tunnel. A 10" water line was required for the Cal Park Tunnel.
- Install bollards to block unauthorized vehicle entry (location TBD between path entry and tunnel portal).
- Construct drainage improvements as detailed in the Drainage Analysis, including:
  - Improve and relocate ditch on west side of path to provide major conduit for drainage. This may be designed as a vegetated swale to minimize habitat loss.
  - A culvert to conduct drainage under the path to the east to connect to Sutton Manor Branch Creek, which flows to the east.
- Additional traffic control and warning signs, route wayfinding signs, and milepost signs.

Specific proposed security and safety features and measures at the portals and within the tunnel include:

- Lockable gates at each end, with open hours sunrise to sunset.
- Extend electrical service 1300' to tunnel portal.
- A lighting system with emergency backup.
- Emergency call and fire alarm stations at regular (200') intervals including at portals, tunnel midpoint.
- Video surveillance similar to Cal Park Tunnel (not face recognition). MOU will determine who will monitor.
- "Leaky wire" system for radio communication, and if possible, cell phone.
- Fire hose connections every 200'.
- Sprinkler system throughout, as an option.
- Regulatory signs at portals - traffic control, hours, alternate route(s).
- System for user notice when maintenance vehicle or other blockage is in tunnel (signboard at each end that can be locked open or closed).
- Ventilation system.
- Bollards at tunnel portal to prevent unauthorized vehicle entry.
- Protective graffiti coating on tunnel walls.
- Construction impact mitigation measures, including, noise, dust, and traffic control.
- Building protection and settlement monitoring of residential structures along the tunnel alignment near portal.

### ***Camino Alto/Corte Madera Avenue Route***

No special emergency response features are required. The proposed trail crossing improvements near the city limit line would improve safety. A system of route and milepost signs would help users identify their location, and aid emergency services personnel in coordinating and responding.

### ***Example MOU***

An example Memorandum of Understanding (MOU) for a similar tunnel facility is the agreement between the County of Marin, the City of San Rafael, the City of Larkspur, and the Twin Cities Police Department for the Cal Park Tunnel. This MOU is included in this report as an attachment. The MOU addresses the following topic areas: design, construction, access, maintenance, security, first responders to emergencies, data collection, path regulations, and insurance and risk allocation. The MOU outlines the terms of the agreement and most importantly the responsibilities of each party. It is recommended that if the Alto Tunnel moves forward with design, construction, and use, a similar MOU should be enacted between relevant stakeholders

### ***Community Emergency Evacuation Routes***

The potential bicycle and pedestrian route improvements also have a relationship to community emergency evacuation and access routes. The City of Mill Valley has an Evacuation Map that designates primary and secondary evacuation routes within the City. Figure 4 shows the portion that covers the current study area. Camino Alto is a primary evacuation route. Lomita Avenue is a secondary evacuation route. Edna Maguire School is a designated Assembly Area, as is the Mill Valley Community Center. The existing Mill Valley to Sausalito pathway that leads past to the Alto Tunnel is shown as a pedestrian route. Potential bicycle and pedestrian route improvements to Lomita and Camino Alto might have modest benefits for emergency evacuation and access, but opening the Alto Tunnel and improving a 20' wide emergency access corridor to the tunnel and the associated turnarounds could have significant benefit as an emergency evacuation or equipment access route in the event of a flood, fire, or other disaster that made it necessary to move people from Mill Valley toward Corte Madera, or the opposite.

Figure 1: Section Through Original Tunnel

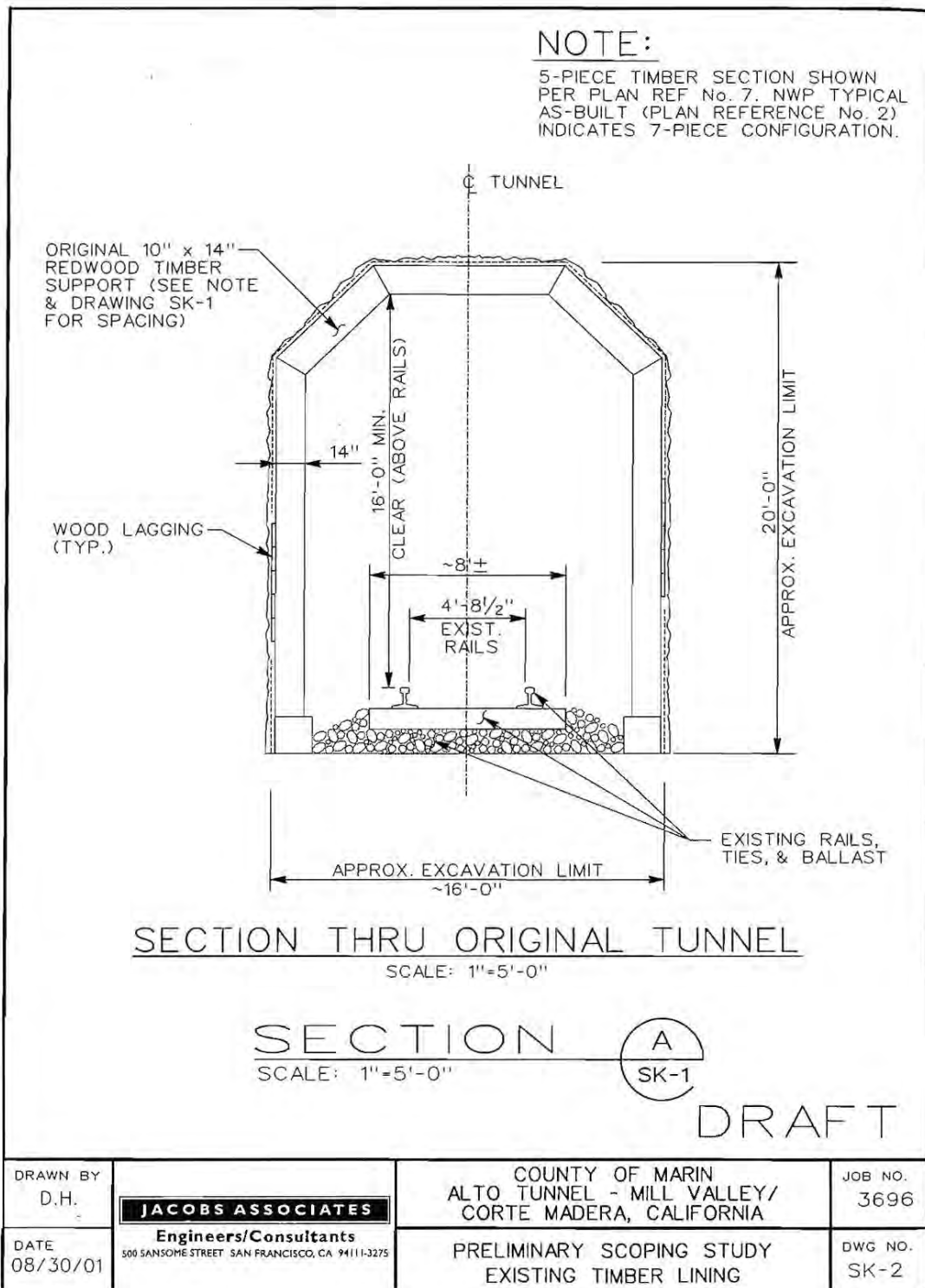


Figure 2: North Portal Emergency Turnaround Concept

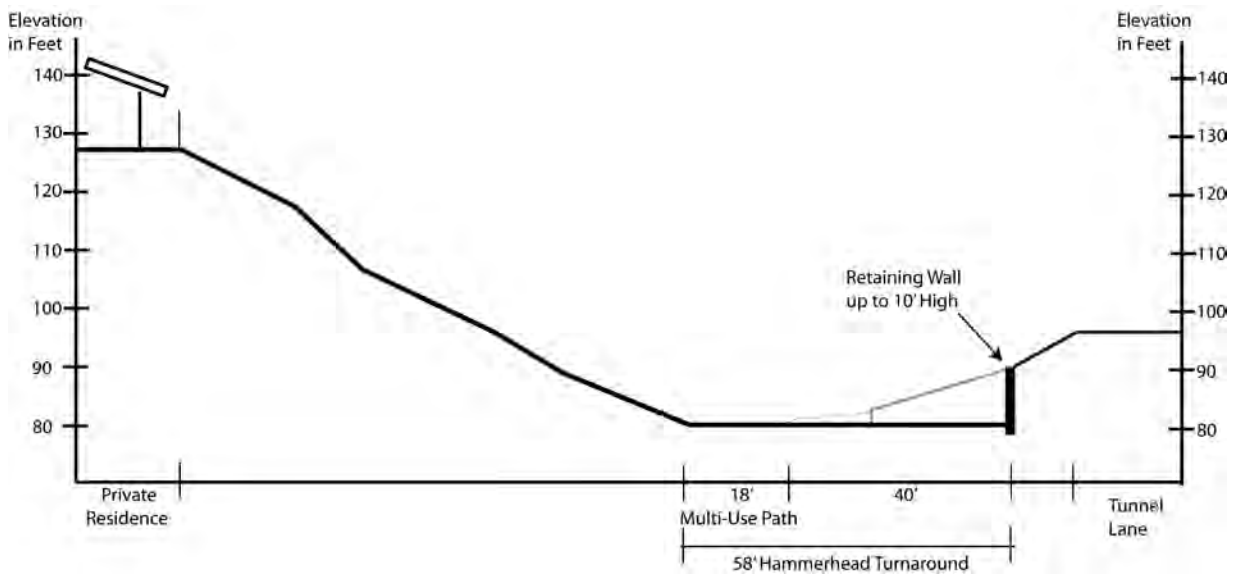
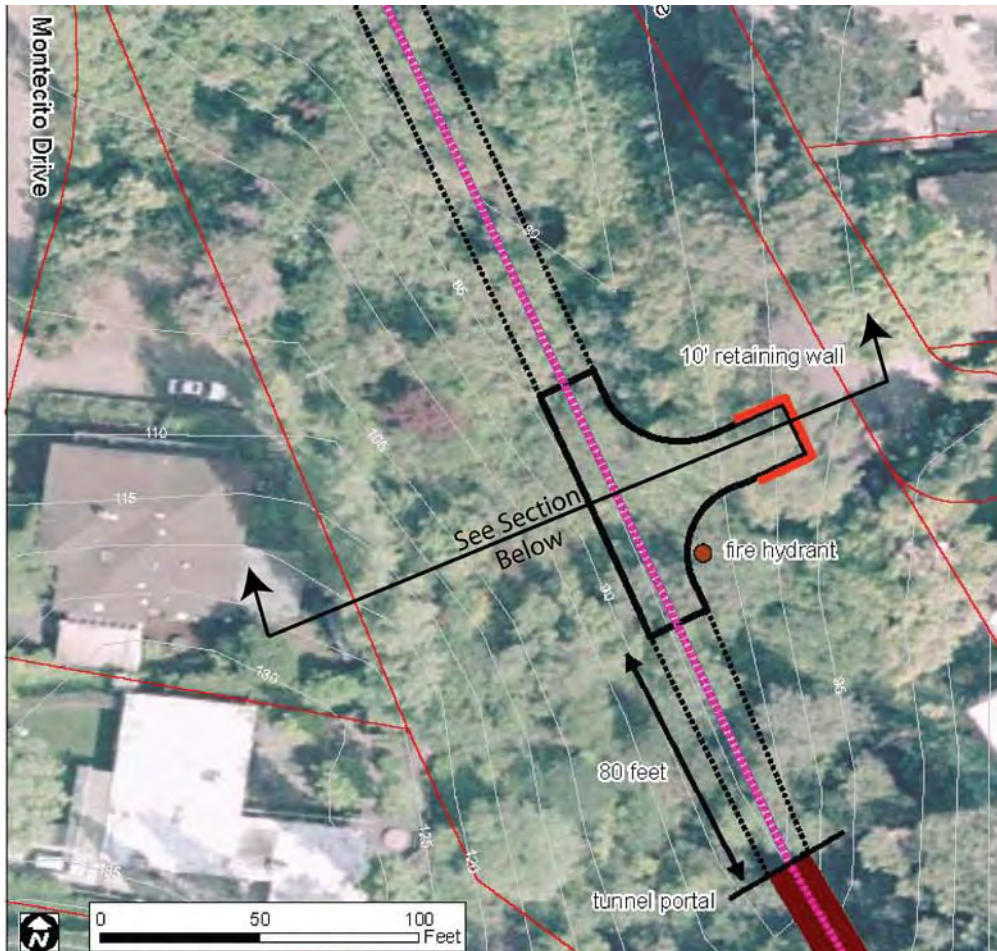


Figure 3: South Portal Emergency Turnaround Concept

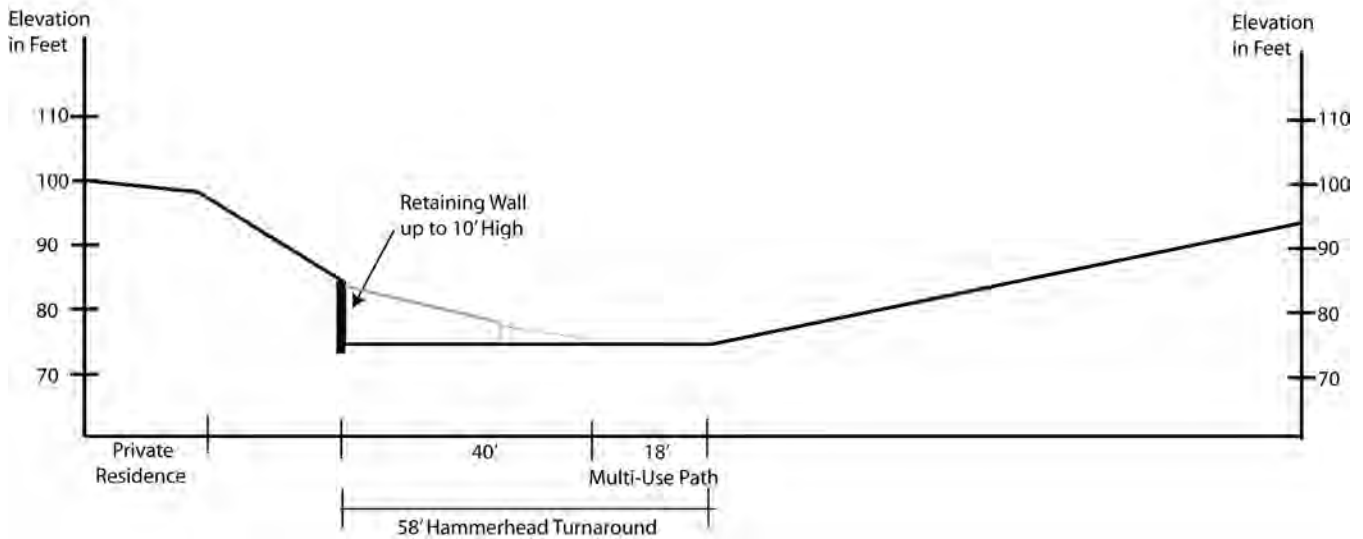
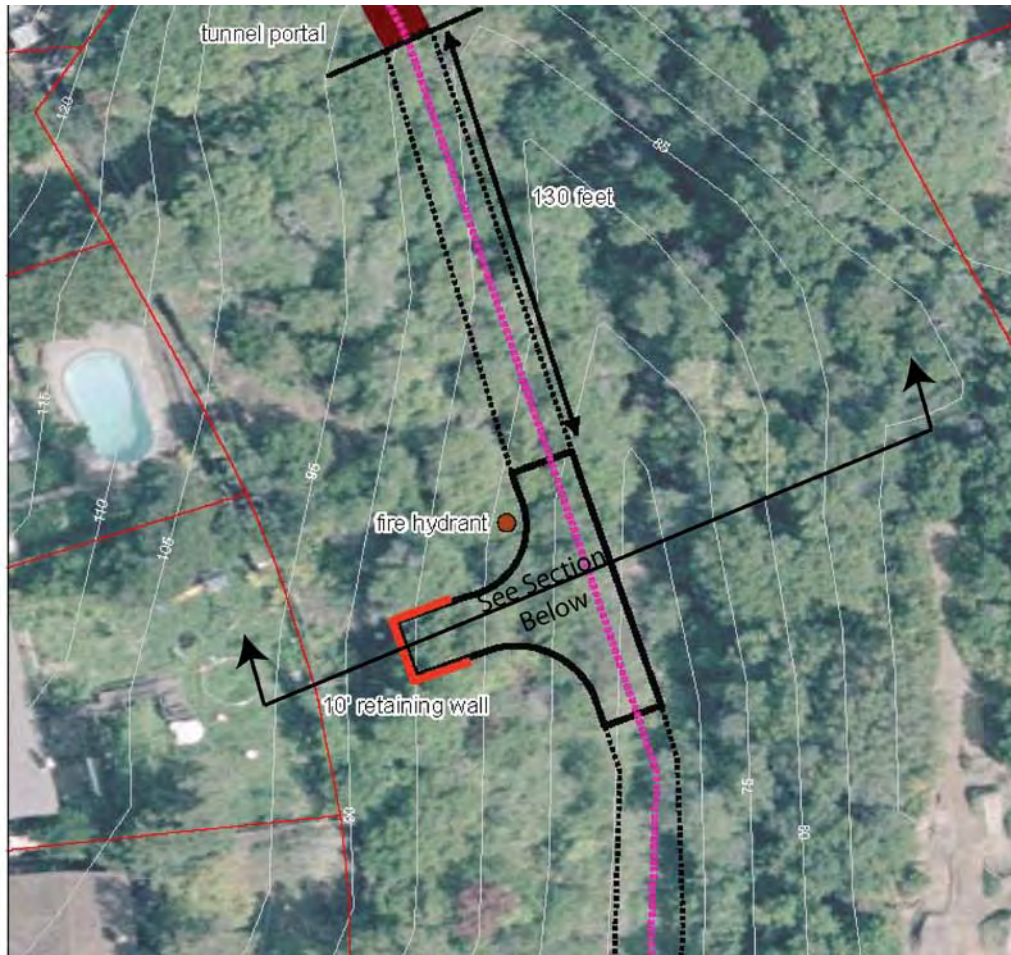
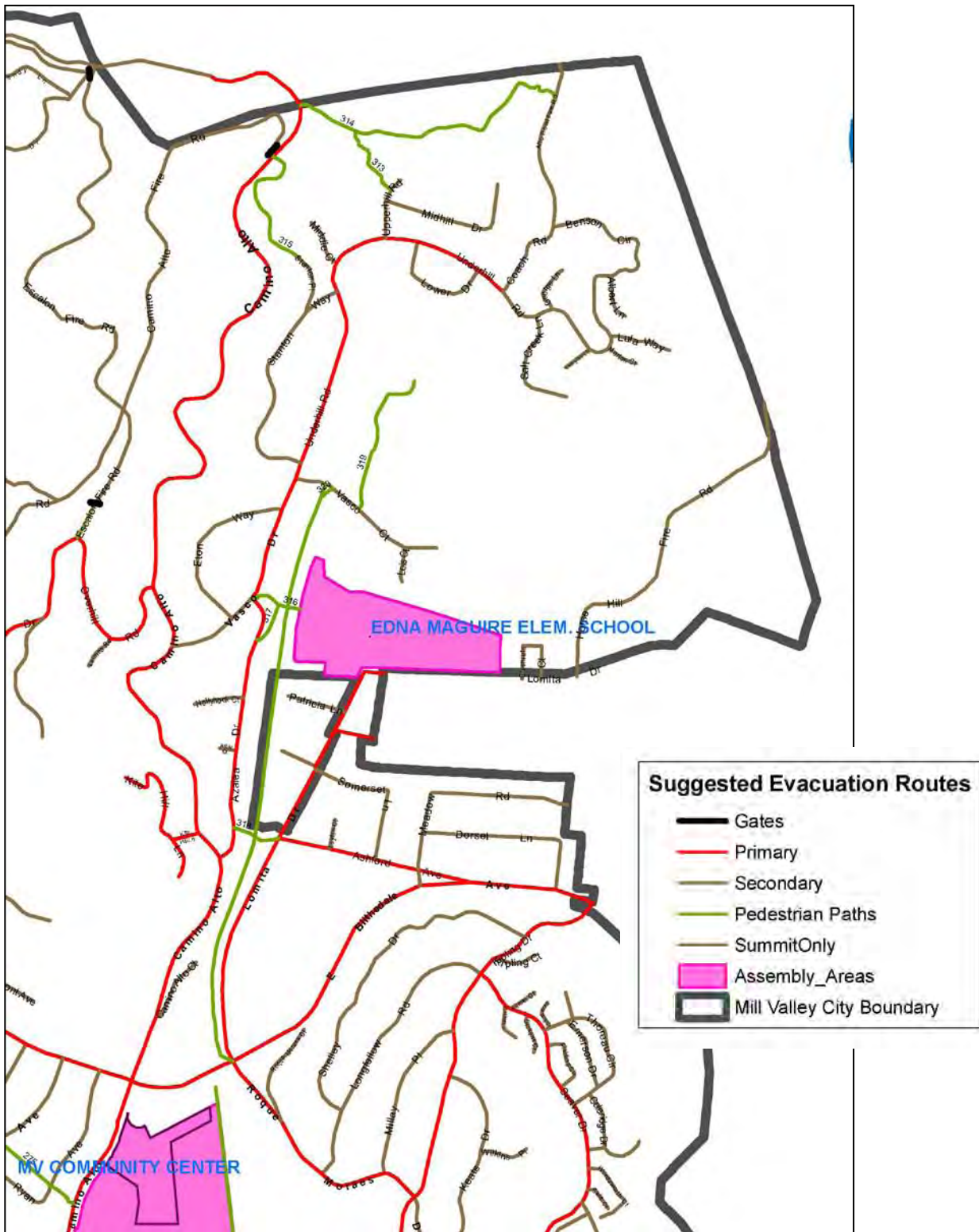


Figure 4: Portion of Mill Valley Evacuation Route Map



## Mill Valley to Corte Madera Bicycle and Pedestrian Corridor Study

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### Attachments:

Emergency Services Meeting Notes, January 12, 2009

Emergency Services Meeting Notes, July 14, 2009

Cal Park Tunnel MOU

## Emergency Services Meeting #1 Notes

**Date/Time:** Monday January 12, 2009, 2:00 p.m.

**Location:** Corte Madera Town Council Chambers

**Attendees:**

Cities:

- Roger Sprehn - Director of Emergency Services, Corte Madera Fire Dept.
- Sean Smith - Twin Cities Police
- James Wickham - City of Mill Valley (Fire?)

Marin County

- Carey Lando, Senior Transportation Planner, Marin County DPW

Consultants

- Randy Anderson – Alta/LandPeople, Project Manager
- David Parisi, Traffic Engineer

**Meeting objectives:**

- Review Hot Spots on routes (areas with problems, needing improvements)
- Familiarize team with issues and conditions regarding Alto tunnel
- Get input regarding emergency response needs and ideas

1. Project Overview:

- Carey and Randy described Study scope and objectives; evaluate pros and cons, improvements needs and costs for all three parallel routes.

2. Data Needs:

- David is looking for accidents involving bikes, pedestrians and cars in the last 5 years along these routes
- Sean will provide accident data, including bikes and pedestrians
- Who monitors 101 bike route? Roger: Both cities get dispatched
- CHP contact? James will send contact to David

3. Hot Spots on routes:

- Sean
  - Downhill on Corte Madera Ave.-for bikes – can be gravel
  - Speed downhill is an issue
  - CM Ave.-No sidewalks creates a safety issue for pedestrians
- David
  - Climbing lanes are minimal on CM Ave.
- Roger
  - Access to freeway (Horse Hill) path is poor- have to park at end
  - They need min 12' width for access
  - Marking on path, town limit signs, would help aid callers know where they are,
  - Bikers complain about Tamalpais jog at Tunnel Vista
- Jim
  - Speed of bikes is an issue
  - Camino Alto - CM Ave –is most heavily used- takes bikes to corridor to Ross and Marin Headlands
  - Would spend money putting uphill bike lane on CA-CM Ave rather than tunnel
  - There is feasibility for 5% connection from E. Blithedale to Azalea (not part of Study scope)

## Mill Valley to Corte Madera Bicycle and Pedestrian Corridor Study

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- Sausalito bike path is very popular-opening tunnel would be as well

### 4. Tunnel questions and comments:

- Randy
  - Reviewed Jacobs Associates memo re. Tunnel conditions and questions
  - Is 2100 L.F. ok for natural ventilation?
- Roger
  - A driveway would require turnouts at intervals, but understood that' not feasible for tunnel
- Carey
  - A space for staging is needed at each end
- Roger
  - Can we provide template for fire engine turn-around (need 20' wide access up to tunnel portals, and 80' dia. turnaround with no parking)
  - Fire Hydrants
  - He would opt for sprinklers in the tunnel. What do standards say?
  - Who would maintain? (e.g. debris clean up)
- Carey
  - Co. park rangers would be responsible
- Sean
  - Gate at midnight?
  - Security Cameras?
  - Call boxes?
- Roger
  - If sprinklers- don't need fire extinguishers or stand pipes. Hose boxes are thing of the past – just an invitation to vandalism
  - Lighting, gates closed at night, sprinklers, call boxes are important
- David
  - Cameras- not useful for crime prevention, but helpful for identification on crime
- James
  - Tunnel would open up route to new user groups- esp. kids
  - Camino Alto is primarily an adult bicyclist route
  - Get a large number of SF tourists on rental bikes in MV - need an info kiosk at MV- Sausalito path
  - Objective is to get ready to apply for grants?
- Carey
  - Yes, depending on interest of agencies to pursue
  - Homeowners Assoc. on CM side?
- Sean
  - Informal Tunnel Lane Group
- James
  - Had a series of meetings about tunnel in 1998-1999 with much input.

Meeting concluded at approx. 3:00 p.m.

## Emergency Services Meeting #2 Notes

**Date/Time:** July 14th, 2009, 1-2:30pm

**Location:** Corte Madera Town Council Chambers

**Attendees:**

Cities:

- Roger Sprehn - Director of Emergency Services, Corte Madera Fire Dept.
- Sean Smith – Twin Cities Police
- Angel Bernal – City of Mill Valley Police
- Debra Johnson – Corte Madera Public Works

Marin County

- Carey Lando, Senior Transportation Planner, Marin County DPW

Consultants

- Randy Anderson – Alta/LandPeople, Project Manager

**Meeting objectives:**

- Review proposed improvements resulting from public and Technical Advisory Council input.
- Feedback on specific proposed route improvements and emergency access/response features and measures

Randy Anderson presented a slide show highlighting proposed improvements on each of the routes under study. The following comments were made:

Horse Hill Route

Angel – Why did city put in ramp at Maguire School? Carey – It was paid for by Safe Routes to School program.

Angel – Route improvements would require ADA access? Carey – yes, all improvements will need to comply.

Sean, Roger – clarified that sharp radius turn that needs to be improved is at Meadowsweet / Casa Buena intersection at Horse Hill path, not at Casa Buena/Meadow Valley, as indicated in slide show.

Red shoulder stripes on Meadowsweet are for parking prohibition – add white line for visibility

Alto Tunnel Route

Turnaround –

Roger – shunt or hammerhead design are acceptable in lieu of 80' dia. turnaround. Corte Madera's standard is 20' wide but would go along w/ 16' as it is Mill Valley standard.

Tunnel –

Roger – Sprinklers should be all or nothing – budget for full sprinkler system as an option, not just "in the middle". Water connections every 200' is the baseline.

Angel – Would there be lights, call station, video monitoring? Carey – yes. Calpark tunnel has video monitoring, but not face recognition.

## Mill Valley to Corte Madera Bicycle and Pedestrian Corridor Study

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Who owns property in tunnel? Carey – County, Railroad, some private. A complicated issue to be studied

Angel – If a crime happens in the tunnel, who will investigate? Carey – It will be worked out in MOU. Randy – city limit line could be marked in tunnel, as with bridges.

Structure at 34 Underhill is above or adjacent to tunnel? Randy – preliminary maps and information show no structures above tunnel, only adjacent.

Carey – Study will address potential cost of maintenance on tunnel if nothing is done regarding pathway.

Sean – If tunnel is more collapsed than anticipated, can it still be rebuilt? Carey – Yes, it is a matter of engineering and money.

Are there no standards for tunnels with paths? Carey – No but there are best practices, and we are working out a local standard based on Calpark.

Angel – Is tunnel flat, or does it slope? Randy – Slopes slightly from CM to MV

### Montecito Drive Improvement Concepts

Sean – 2 way bike route on 1 way road on Montecito would require signage. Parking on Montecito is mostly parking all day, minimizes benefit. Back-in parking concept would be impractical, opposed.

Debra – Concerned about bulb-outs on Tamalpais due to bus stops. People drive slow through this corner anyway. Doesn't like Montecito 1 way or left turn lane elimination concepts. Current low use/turnover doesn't justify changes. Ped activated signal – would give a false sense of safety. Whole intersection was recently redone – is working well.

### Redwood Avenue Improvement Concepts

Whole intersection, including Redwood Avenue, was recently redone – is working well. Back-in parking concept would be impractical, opposed. Debra is in process of replacing bike loop detector. Debra provided town of CM aeriels, should use for this intersection.

Angel – Homeland security money be available for security, firefighting, water supply improvements? Sean – Potentially. Randy will ask Jacobs Associates about this.

### Camino Alto/Corte Madera Ave Route

#### Widening Corte Madera Ave. –

Debra – Bicyclists want bike climbing lane striped uphill. Randy – this will be a complex segment to widen, with many driveways and private improvements (some may be considered historic), and parking areas in the ROW. Study can only generally identify and characterize these, and acknowledge the work that would be required to address these and resolve property owner concerns.

Randy – There is a de-facto pathway crossing of Camino Alto near the city limit line connecting between open space areas, but not a safe place to formalize a crosswalk.

Prepared by Randy Anderson