



MEMORANDUM

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TO: James Hinkamp
San Mateo County
Planning and Building Department

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SUBJECT: Determination and Evaluation of Alternatives for the
San Mateo County Comprehensive Transportation
Management Plan Draft memorandum

P#14183-000

BACKGROUND

The purpose of this memorandum is to present a set of alternatives that address the deficiencies identified in the *Buildout Analysis and Traffic Projections report* and to propose a methodology for evaluation. In the initial stages of *Connect the Coastside*, the name for the San Mateo County Comprehensive Transportation Management Plan, over 110 specific ideas have been generating by the Technical Advisory Committee, Community and prior studies for improving multi-modal transportation (e.g. vehicle, bicycle, pedestrian, transit) and to mitigate the potential impacts of future growth in the Midcoast and Half Moon Bay study area. In Task 3 of the project, the DKS team has formulated a set of alternatives to be evaluated that represent groupings of these projects.

One of the key objectives of *Connect the Coastside* is to determine whether enough improvements can be implemented in a timely manner to accommodate the expected buildout growth in the area while meeting the performance standards that have been set for transportation in the area by the San Mateo County Local Coastal Program, County Congestion Management Program and the City of Half Moon Bay. To help meet this objective, the DKS team has formulated three series of alternatives based on the expected cost associated with the projects and the potential environmental and political impact of the potential project. This memorandum presents a Low Cost/Low Potential Impact alternative, a Medium Cost/Medium Potential Impact alternative and a High Cost/High Potential Impact alternative. Each of the three alternatives are designed to be multi-modal with potential projects to address needs for pedestrians, bicyclists, transit users and automobile users.



The alternatives have been formulated around the concept of the relative cost and potential impact to allow the team to see how far the program of transportation improvement would have to go to accommodate the buildout growth while meeting the performance standards and maintaining Coastal access. The evaluation of alternatives will also allow the team to see which individual candidate projects are most cost-effective and which can be implemented without unacceptable environmental or political impact. After an analysis of the initial three alternatives has been completed and review with the Technical Advisory Committee and study area stakeholders, a hybrid alternative will be developed drawing on the best of the three alternatives in a package with affordable costs and acceptable potential impact. This hybrid alternative will then be evaluated and refined to ultimately represent the final transportation management plan for the area.

SUMMARY OF DEFICIENCIES IDENTIFIED FOR BUILDOUT CONDITIONS

The *Buildout Analysis and Traffic Projections Report* provided a detailed analysis of existing transportation issues and deficiencies in the Midcoast area of San Mateo County and Half Moon Bay. Deficiencies for the Midcoast, Half Moon Bay and SR 92 east of Half Moon Bay were identified by the policies and level of service (LOS) standards defined in the Local Coastal Program¹ (LCP) and the Half Moon Bay General Plan and Circulation Update². The deficiencies identified for each area are documented in the *Task 2 Buildout Analysis and Traffic Projections Report* and summarized separately below.

Midcoast

The increase in traffic along Highway 1 under Buildout conditions will result in the majority of unsignalized intersections within the Midcoast communities to experience high delay for vehicles trying to enter Highway 1, and to operating worse than the intersection LOS standard defined in the LCP. The entirety of Highway 1 under Buildout conditions within the Midcoast Study Area does not meet the roadway segment LOS standard as defined in the LCP based on capacity utilization.

The layout of neighborhoods in many of the Midcoast communities inhibits mobility and results in circuitous routes between nearby destinations. Additionally, beach access for pedestrians across Highway 1 is limited by infrequent crossing opportunities, heavy traffic volumes, high vehicle speeds, and unimproved pedestrian facilities. There are no stop controls or treatments at uncontrolled locations to help pedestrians and cyclists safely cross the highways.

Transit service operates at low frequencies and limited coverage. Additionally, existing bus stops lack amenities and shelter for users waiting for buses.

There is generally sufficient parking supply during the weekdays; however during weekends and special events demand for parking can exceed the available capacity. The Martini Creek and Montara State Beach lots north of

¹ County of San Mateo Local Coastal Program Policies, 2013, County of San Mateo, Planning and Building Department.

² Half Moon Bay Circulation Element, 2013, City of Half Moon Bay.



Montara and the Fitzgerald Marine Reserve lot in Moss Beach were observed to be at or above capacity during some peak periods. It was noted that public parking locations are not always easily identified or signed.

Half Moon Bay and SR 92 east of Half Moon Bay

Based on the increase in traffic along Highway 1 under Buildout conditions, the majority of the unsignalized intersections within the City of Half Moon Bay are expected to experience high delay and to operate worse than the intersection LOS standard defined in the Half Moon Bay Circulation Element. Highway 1 within the City of Half Moon Bay has several sections with four lanes which operate within the roadway segment LOS standard, however two-lane sections between Mirada Road and Grandview Boulevard, between Kelly Avenue and Seymour Street, and between Redondo Beach Road and Fairway Drive do not meet the roadway segment LOS standard as defined in the LCP based on capacity utilization. All study intersections along SR 92 and the two-lane portion of SR 92 east of Main Street do not meet the LOS standards.

A lack of consistent pedestrian and bicycle trails and crossings results in decreased mobility and accessibility within and between communities within the City of Half Moon Bay. Additionally, pedestrian access along the Highway 1 and SR 92 corridor is limited by infrequent crossing opportunities, heavy traffic volumes, high vehicle speeds, and unimproved pedestrian facilities. There are no stop controls or treatments at uncontrolled locations to help pedestrians and cyclists safely cross the highways.

Transit service operates at low frequencies and limited coverage. Additionally, existing bus stops lack amenities and shelter for users waiting for buses.

The majority of beach access parking lots were observed to operate at over 100% capacity during peak periods.

DETERMINATION OF ALTERNATIVES

Improvements included in each alternative were selected from a list of potential improvements compiled from community suggested improvements, proposed projects identified in recent relevant reports and improvements suggested by the DKS team to address identified deficiencies.. A complete list of potential improvements is provided in **Appendix A** with sources. The complete list of potential improvements was analyzed to determine which improvements were feasible and addressed deficiencies identified in the *Buildout Analysis and Traffic Projections Report*.

The feasible improvements were grouped into three alternatives for this preliminary alternative study. The identification of projects and improvements included in each alternative is based on cost and expected impact to existing infrastructure and surrounding communities as well as the overall effect to residents of the Midcoast Communities and City of Half Moon Bay. The three alternatives described in this section are as follows:

- Alternative 1 – Low Cost/Low Impact and Planned Improvements
- Alternative 2 – Medium Cost/Medium Impact and Planned Improvements
- Alternative 3 – High Cost/High Impact and Planned Improvements

Because relatively few of the proposed or suggested improvements are mutually exclusive, each successive alternative represents additional improvements to be included in the evaluation of each alternative. As the



alternatives group improvements by cost and impact across all modes, the end result of the alternative analysis will be a hybrid alternative, potentially taking improvements from multiple alternatives.

Alternatives are defined by proposed improvements and modifications to the following categories:

- Roadway and intersections/access points
- Bicycle and Pedestrian facilities
- Transit

Alternative 1 – Low Cost/Low Impact and Planned Improvements

Alternative 1 mainly focuses on improvements that can be made within the existing right of way and without significant cost or environmental impact. These projects address deficiencies that can be improved with signage and striping changes as well as improvements already planned such as the expansion of the multiuse trail parallel to Highway 1. Projects currently being planned and designed are bolded.

Roadway and Intersection Improvements

- **Addition of left-turn bay and acceleration lane at Gray Whale Cove parking lot**
- Signage to restrict turning movements to consolidate traffic at key intersections within Midcoast communities and Half Moon Bay
- Stop signs added to unsigned intersections along Highway 1
- Defined curb and paved shoulder along Highway 1 to provide a consistent cross section for vehicle and pedestrian safety

Bicycle and Pedestrian Facility Improvements

- Striped crossing with beacons to alert traffic at the following high demand and bus stop locations:
 - **Gray Whale Cove**
 - Montara State Beach
 - **2nd Street**
 - **7th Street**
 - **Moss Beach Lighthouse (16th Street)**
 - **Virginia Street**
 - **California Street**
 - **Cypress Avenue**
 - HMB Airport
 - North Capistrano Road
 - Surfer's Beach Parking area, north of Coronado Street
 - Medio Avenue
 - **Mirada Road**
 - Kehoe Avenue
 - Terrace Avenue/Grand Boulevard
 - Quarry Road (along SR 92)
 - Pilarcitos Creek Road (along SR 92)



- SR 35 (along SR 92)
- Sidewalks along Highway 1 in Montara, Moss Beach, Miramar, and developed areas of Half Moon Bay
- Sidewalk on Coronado Street and Avenue Alhambra in El Granada
- Continuous Parallel Trail adjacent to Highway 1 for the entire study area
- Multi-use path along Airport Street
- Traffic signal updates throughout Half Moon Bay including:
 - Pedestrian count-down indicators on all signalized crosswalks
 - Crosswalk signal crossing adjustments to accommodate slower walking speeds
 - Bicycle signal detector loops
 - Pedestrian refuge spaces on wide road crossings
- Designation of Main Street as a Class III bike route with sharrows

Transit Improvements

- Shuttle service, during seasonal events with high regional traffic increases, connecting Midcoast communities, Half Moon Bay, and high demand locations.
- Cabrillo Unified School District School Bus Service

Alternative 2 – Medium Cost/Medium Impact and Consolidation of Access Improvements

Alternative 2 addresses intersection LOS at intersections that do not meet the standard by reducing the number of locations where traffic can have unrestricted access to Highway 1. This is done through the addition of medians restricting left turns off of and on to Highway 1 or by blocking access to Highway 1 completely. These improvements require a moderate amount of capital investment and minimal environmental impact.

Roadway and Intersection Improvements

- **Addition of left-turn bay and acceleration lane at Gray Whale Cove parking lot**
- Signalization of the following intersections meeting signal warrants:
 - Highway 1 and California Avenue in Moss Beach
 - Highway 1 and Cypress Avenue in Moss Beach
 - Highway 1 and Kehoe Avenue in Half Moon Bay
 - Highway 1 and Main Street (S) in Half Moon Bay
- Restricting access to Highway 1 within communities through the following measures:
 - **Addition of a median between 7th Street and 9th Street in Montara**
 - Addition of a median between Carlos Street and Highway 1 between St. Etheldore Street and Vermont Avenue in Moss Beach
- **Addition of a median with northbound left-turn bay at the Lighthouse in Montara (16th Street)**



- **Addition of left-turn bay and acceleration lane at 8th Street in Montara**
- Stop signs added to unsigned intersections along Highway 1
- Consolidation of access to Highway 1 at the following locations:
 - Nurseryman’s Exchange driveways between Mirada Road and Young Avenue
 - Realign Frenchman’s Creek Road to consolidate intersections at Frenchman’s Creek Road and Venice Boulevard
 - Grand Avenue and Terrace Avenue
- Defined curb and paved shoulder to provide a consistent cross section for vehicle and pedestrian safety

Bicycle and Pedestrian Facility Improvements

- **Striped crossing with beacons to alert traffic at high demand locations as defined in Alternative 1**
- Sidewalks along Highway 1 in Montara, Moss Beach, Miramar, and developed areas of Half Moon Bay
- Sidewalk on Coronado Street and Avenue Alhambra in El Granada
- Continuous Parallel Trail adjacent to Highway 1 for the entire study area
- Continuous Coastal Trail adjacent to Highway 1 through entire study area
- Class II bike lane along Capistrano Road (Currently being evaluated for Plan Princeton)
- Class II bike lane along Airport Street (Currently being evaluated for Plan Princeton)
- Traffic signal updates throughout Half Moon Bay including:
 - Pedestrian count-down indicators on all signalized crosswalks
 - Crosswalk signal crossing adjustments to accommodate slower walking speeds
 - Bicycle signal detector loops/video recognition technology
 - Pedestrian refuge spaces on wide road crossings
- Designation of Main Street as a Class III bike route with sharrows

Transit Improvements

- Expanded (frequency and geographic coverage) SamTrans local Midcoast and Half Moon Bay bus service
- Shuttle bus service on weekends during peak recreational times and special events
- Park and Ride locations
- Cabrillo Unified School District School Bus Service

Parking Improvements

- Separate parking facilities from Highway, formalized parallel Montara State Beach parking
- Parking lot for Rancho Corral de Tierra access east of highway (also available for beach overflow)



Alternative 3 – High Cost/High Impact and Capacity Increasing Improvements

As roadway segment LOS is defined by capacity utilization, the only way to improve roadway segment LOS is to increase capacity or divert traffic to a parallel route. Alternative 3 builds on the improvements provided in Alternative 2 by increasing capacity through the addition of travel lanes between Midcoast communities and by providing an alternative route through the addition of a frontage road east of highway 1 within Half Moon Bay. While the existing terrain would make it difficult to provide additional travel lanes along SR 92, capacity can be improved by the addition of occasional passing/climbing lanes to reduce bottlenecks caused by truck traffic along SR 92. These improvements require a large amount of capital investment, potentially require acquisition of right of way and will result in a significant impact to Midcoast communities and Half Moon Bay.

Roadway and Intersection Improvements

- **Addition of left-turn bay and acceleration lane at Gray Whale Cove parking lot**
- Roundabouts at the following intersections:
 - Highway 1 and 9th Street in Montara
 - Highway 1 and Etheldore Street (N); Highway 1 and Cypress Avenue in Moss Beach
 - Highway 1 and Capistrano Road (S); Highway 1 and Coronado Street in El Granada
 - Highway 1 and Mirada Road in Miramar
 - Highway 1 and Main Street (N)
 - Highway 1 and SR 92
 - Main Street and SR 92
 - Highway 1 and Higgins Canyon Road/Main Street (S)
 - SR 92 and SR 35
- Addition of travel lanes along Highway 1 to create a four-lane highway between the following cross roads:
 - 9th Street in Montara and Carlos Street in Moss Beach
 - Cypress Avenue in Moss Beach and Coral Reef Avenue in El Granada
- Restricting access to Highway 1 within communities through the following measures:
 - **Addition of a median between 7th Street and 9th Street in Montara**
 - Addition of a median between Carlos Street and Highway 1 between Etheldore Street and Vermont Avenue in Moss Beach
- **Addition of a median with northbound left-turn bay at the Lighthouse in Montara (16th Street)**
- **Addition of left-turn bay and acceleration lane at 8th Street in Montara**
- Highway 1 realignment in El Granada



- Stop signs added to unsigned intersections along Highway 1
- Consolidation of access to Highway one at the following locations:
 - Nurseryman’s Exchange driveways between Mirada Road and Young Avenue
 - Realign Frenchman’s Creek Road to consolidate intersections at Frenchman’s Creek Road and Venice Boulevard
 - Grand Avenue and Terrace Avenue
- Signalization of the following intersections meeting signal warrants:
 - Highway 1 & California Avenue in Moss Beach
 - Highway 1 & Kehoe Avenue in Half Moon Bay
 - Highway 1 & Main Street (S) in Half Moon Bay
- Construction of a Frontage Road along east side of Highway 1 connecting Main Street with Frenchman’s Creek Road
- Defined curb and paved shoulder along Highway 1 to provide a consistent cross section for vehicle, pedestrian, and bicyclist safety
- Left turn lanes at major businesses along SR 92 in Half Moon Bay
- Passing/Climbing lanes where feasible along SR 92

Bicycle and Pedestrian Facility Improvements

- Striped crossing with beacons to alert traffic at high demand locations as defined in Alternative 1 with the exception of the following improvements:
 - Pedestrian over/under crossing at Gray Whale Cove
 - Pedestrian over/under crossing at Montara Sanitary District building
 - Pedestrian over/under crossing at Surfer’s Beach Parking area, north of Coronado Street
 - Pedestrian over/under crossing at Kehoe Avenue
- Sidewalks along Highway 1 in Montara, Moss Beach, Pillar Point, and Miramar. Sidewalk on Coronado Street and Avenue Alhambra in El Granada.
- Continuous Parallel Trail adjacent to Highway 1 for the entire study area (Parallel Trail)
- Continuous Coastal Trail adjacent to Highway 1 through entire study area
- Class II bike lane along Capistrano Road (Currently being evaluated for Plan Princeton)
- Class II bike lane along Airport Street (Currently being evaluated for Plan Princeton)
- Traffic signal updates throughout Half Moon Bay including:
 - Pedestrian count-down indicators on all signalized crosswalks



- Crosswalk signal crossing adjustments to accommodate slower walking speeds
- Bicycle signal detector loops/video recognition technology
- Pedestrian refuge spaces on wide road crossings
- Designation of Main Street as a Class III bike route with sharrows
- Bike lane/route along SR 92

Transit Improvements

- New SamTrans local Midcoast and Half Moon Bay bus service route
- Park and Ride locations
- Transit connection to BART and San Mateo
- Cabrillo Unified School District School Bus Service

Parking Improvements

- Separate parking facilities from Highway 1, formalized parallel Montara State Beach parking
- Parking lot for Rancho Corral de Tierra access east of highway (also available for beach overflow)

PROPOSED METHODOLOGY TO EVALUATE ALTERNATIVES

Existing Standards

Alternatives will be evaluated for traffic LOS standards based on the standards defined in the LCP and Half Moon Bay Circulation Element

Proposed Standards

In order to adequately evaluate alternatives for multi-modal improvements which do not currently have defined standards, DKS recommends the following metrics for evaluation:

Vehicular and non-vehicular-based metrics

- Average Travel time/Mobility for non-motorized modes
- Multi-modal accessibility of high demand locations
- Pedestrian and Bicycle LOS as defined by HCM 2010
- Average walking distance between parking and recreational access using striped crossings

Financial metrics

- Required capital investment
- Cost effectiveness
- Time to project completion

Political metrics



- Environmental impact
- Level of public and political support

As it is impossible to define equitable weights for diverse and multimodal metrics, it is not recommended to produce a single combined score for each Alternative. Instead, a matrix detailing the performance of each defined evaluation metric will be created for each alternative and presented to the TAC for final recommendations.