

**COUNTY OF SAN MATEO
PLANNING AND BUILDING DEPARTMENT**

DATE: November 4, 2015

TO: Planning Commission

FROM: Planning Staff

SUBJECT: EXECUTIVE SUMMARY: INFORMATIONAL ITEM: Status update on the Comprehensive Transportation Management Plan (“Connect the Coastside”).

County File Number: PLN 2014-00430 (County of San Mateo)

PROPOSAL

This is an informational report on the current Comprehensive Transportation Management Plan (“Connect the Coastside”). Connect the Coastside is a long range planning effort required by San Mateo County Local Coastal Program (“LCP”) Policy 2.53, which stipulates the need to evaluate future development impacts on the regional transportation system, including coastal access, within the unincorporated Midcoast area and the City of Half Moon Bay (“study area”).

The County of San Mateo Planning and Building Department manages Connect the Coastside and has contracted DKS Associates to conduct a technical analysis, develop strategic alternatives, and produce a plan to help manage long-term development and transportation in the study area.

RECOMMENDATION

Receive staff’s presentation on the status of Connect the Coastside Community and provide input regarding the next steps for moving forward.

SUMMARY

Since staff’s last update to the Planning Commission on December 10, 2014, the project team has received community feedback regarding the proposed development forecast and transportation standards for the project. There was significant stakeholder feedback focused on the level of potential residential and non-residential development identified in the Buildout Analysis and Traffic Projections Report. Stakeholders were concerned with the high level of development that may exceed the transportation, water and wastewater systems capacity. The proposed horizon for a revised development forecast is 25 years, for a target year of 2040, consistent with existing regional land use

and transportation planning models. The forecasted development levels, under existing land use policies, would supplement the prior Buildout Analysis and Traffic Projections Report and provide the basis for revised Transportation Alternatives and land use policies.

Development Forecast

A zoning-based Buildout Analysis was completed in the fall of 2014. This analysis identified vacant and underutilized sites, and applied potential densities and intensities of future residential and non-residential development on those sites to estimate the amount of possible future development. However, in response to feedback from stakeholders, an alternative development forecast has been developed to project the next 25 years of development. This Constrained Development Forecast recommends a development forecast that accounts for growth control under LCP regulations as well as a market analysis done for Half Moon Bay, and uses the most constraining of these factors as they apply to residential and non-residential development and to the unincorporated Midcoast and the City of Half Moon Bay. The Constrained Development Forecast will supplement the zoning-based Buildout Analysis.

Alternative Transportation Standards

Existing LCP transportation standards are vehicle-based standards which measure deficiencies such as road capacity (how full Highway 1 and SR 92 are and how much delay vehicles entering onto Highway 1 experience). There is no consideration given to other modes of travel and, as a result, developers are not responsible for addressing the indirect and cumulative impacts of development on pedestrians, bicycles, transit, and parking.

The lack of multimodal standards encourages continued growth in automobile use while not providing safe and efficient non-automotive options. Additionally, there are no standards to identify deficiencies in parking availability, and inadequate parking can result in parking spillover into residential areas. Mitigations resulting from new standards should avoid causing deficiencies to occur in different modes.

The Alternative Transportation Standards propose that existing roadway segment and intersection standards be revised to provide exemptions for facilities that do not add significant volumes to minor approaches and for those that prioritize other modes of transportation. The Alternative Standards would also implement multimodal standards to identify deficiencies that occur as increased automotive demand hinders the ability of pedestrians and bicycles to operate safely and efficiently, and implement standards to identify deficiencies in transit and parking services that do not adequately meet demand.

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**COUNTY OF SAN MATEO
PLANNING AND BUILDING DEPARTMENT**

DATE: November 4, 2015

TO: Planning Commission

FROM: Planning Staff

SUBJECT: INFORMATIONAL ITEM: Briefing on the Comprehensive Transportation Management Plan ("Connect the Coastside")

County File Number: PLN 2014-00430 (County of San Mateo)

INTRODUCTION

This is an informational report on the current Comprehensive Transportation Management Plan ("Connect the Coastside"). Connect the Coastside is a long range planning effort required by San Mateo County Local Coastal Program ("LCP") Policy 2.53, which stipulates the need to evaluate future development impacts on the regional transportation system, including coastal access, within the unincorporated Midcoast area and the City of Half Moon Bay ("study area").

The County of San Mateo Planning and Building Department manages Connect the Coastside and has contracted DKS Associates to conduct a technical analysis, develop strategic alternatives, and produce a plan to help manage long-term development and transportation in the study area.

RECOMMENDATION

Receive staff's presentation on the status of Connect the Coastside Community and provide input regarding the next steps for moving forward.

BACKGROUND

Report Prepared By: Rob Bartoli, Planner II, Telephone 650/363-1857

Applicant: County of San Mateo Planning and Building Department

Owner: Unincorporated Midcoast and City of Half Moon Bay

Location: Land area south of Tom Lantos Tunnels (Devil's Slide), extending to the southern terminus of the City of Half Moon Bay, including areas west and east of

Highway 1 (to Interstate 280), as well as land areas proximate to Highway 92, from Highway 1 to Interstate 280.

Chronology

<u>Date</u>	<u>Action</u>
August 8, 2012	- Coastal Commission certifies Midcoast LCP Update, including new LCP Policy 2.53 calling for the development of a Comprehensive Transportation Management Plan.
May 20, 2014	- Board of Supervisors approves contract with DKS to prepare the Comprehensive Transportation Management Plan.
May 29, 2014	- Project Initiated: Scope of Work finalized and data collection commenced.
August 27, 2014	- Project introduction and status update to the Midcoast Community Council.
September 30, 2014	- Draft Buildout Analysis and Traffic Projections Report presented at Technical Advisory Committee (TAC) Meeting #1.
October 22, 2014	- Presentation to Midcoast Community Council on draft Buildout Analysis and Traffic Projections Report.
November 10, 2014	- Public workshop at Half Moon Bay Brewery.
December 10, 2014	- Project status report to Planning Commission.
March 4, 2015	- Hybrid Transportation Alternative presented to Technical Advisory Committee (TAC).
April 8, 2015	- Midcoast Community Council Briefing.
April 15, 2015	- Public Workshop #2 – Evaluation of Alternatives.
April 21, 2015	- Half Moon Bay City Council Update.
July 7, 2015	- Amendment to agreement with DKS to allow for additional analysis and public outreach regarding development forecast and transportation alternatives.
September 9, 2015	- Draft Development Forecast and Alternative Transportation Standards presented to TAC.

- October 14, 2015 - Presentation to Midcoast Community Council.
- October 20, 2015 - Presentation to Half Moon Bay City Council.
- October 22, 2015 - Public Workshop #3 – Land Use Forecast and Alternative Transportation Standards.
- November 4, 2015 - Project status report to Planning Commission.

DISCUSSION

In August 2012, the California Coastal Commission approved the LCP Midcoast Update with conditions described in LCP Policy 2.53, to conduct a transportation management plan. Local Coastal Program Policy 2.53 reads as follows:

Develop a comprehensive transportation management plan to address the cumulative traffic impacts of residential development, including single-family, two-family, multi-family, and second dwelling units, on roads and highways, in the entire Midcoast, including the City of Half Moon Bay. The plan shall be based on the results of an analysis that identifies the total cumulative traffic impact of projected new development at LCP buildout and shall propose specific LCP policies designed to offset the demand for all new vehicle trips generated by new residential development on Highway 1, Highway 92, and relevant local streets, during commuter peak periods and peak recreation periods; and policies for new residential development to mitigate for residential development's significant adverse cumulative impacts on public access to the beaches of the Midcoast region of San Mateo County.

The plan shall thoroughly evaluate the feasibility of developing an in-lieu fee traffic mitigation program, the expansion of public transit, including buses and shuttles, and development of a mandatory lot merger program.

In May of 2014, a contract was signed with DKS Associates to develop the Comprehensive Transportation Management Plan (the "Plan"). Since that date, there have been public workshops, presentations to elected bodies, and a number of advisory meetings. After the second workshop for the Plan in April of 2015, there was significant stakeholder feedback focused on the level of potential residential and non-residential development identified in the Buildout Analysis and Traffic Projections Report. Stakeholders were concerned with the high level of potential development that may exceed the transportation, water and wastewater systems capacity. LCP Policy 2.53 requires that the Plan analyze cumulative traffic impacts based on LCP Buildout; however, stakeholders have requested, and staff agrees, that further information is needed regarding forecasted development on the Midcoast.

The proposed horizon for a revised development forecast is 25 years, for a target year of 2040, consistent with existing regional land use and transportation planning models.

The forecasted development levels, under existing land use policies, would supplement the prior Buildout Analysis and Traffic Projections Report and provide the basis for revised Transportation Alternatives and land use policies.

Development Forecast

A zoning-based Buildout Analysis was completed in the fall of 2014. This analysis identified vacant and underutilized parcels, and applied existing densities of future residential and non-residential development on those sites to estimate the amount of possible future development. However, in response to feedback from stakeholders, an alternative development forecast was developed to project the next 25 years of development. The Constrained Development Forecast recommended to the Planning Commission is a development forecast that accounts for growth control under LCP regulations as well as the market analysis done for Half Moon Bay, and applies the most constraining of those factors as they apply to residential and non-residential development and to the unincorporated Midcoast and the City of Half Moon Bay. The Constrained Development Forecast will supplement the zoning-based Buildout Analysis.

The Constrained Development Forecast uses the updated zoning-based Buildout Analysis as a starting point, and then takes into account the following potential constraints:

1. The growth management limitations in the San Mateo County Midcoast Local Coastal Plan and the City of Half Moon Bay's Measure D.
2. The market demand for new housing and non-residential development in Half Moon Bay based on the market analysis conducted in 2014 for the Half Moon Bay General Plan Update.

This Constrained Development Forecast is a 25-year forecast, consistent with other local and regional forecasts being produced. With regard to growth control measures, Policy 1.23 in the Midcoast LCP limits residential development in the unincorporated Midcoast to 40 units per year, while Measure D limits residential growth to 1 percent annually in Half Moon Bay, or 1.5 percent growth in the downtown area. For Half Moon Bay, the zoning-based forecast resulted in a lower level of residential development than would be allowed under Measure D. Thus, zoning would be the most limiting factor for residential development in Half Moon Bay, while the LCP's growth management protocol would be the most limiting growth factor in the unincorporated Midcoast.

The Constrained Development Forecast also takes into account projected growth rates for residential and non-residential development from the market study conducted in 2014 for the Half Moon Bay General Plan Update. These growth rates reflect our best understanding of the interaction between market demand and development constraints in Half Moon Bay. The market study indicates the least amount of non-residential development in Half Moon Bay.

In developing the Constrained Development Forecast, the County and Consultant Team also analyzed potential constraints related to water and sewer capacity under current public works and urban water management plans. However, it was determined that this potential constraint may be adjusted over time, and may not be an appropriate basis on which to undertake long-term transportation and land use planning.

The amount of residential and non-residential development expected based on the Constrained Development Forecast is summarized below:

Residential Development

As of 2014, there were 8,781 residential units in the Study Area, including 4,300 in the unincorporated Midcoast, and 4,481 in Half Moon Bay. The Constrained Development Forecast finds an estimated capacity for 1,094 future units in the unincorporated Midcoast and 694 future units in Half Moon Bay. Together with units currently in the development pipeline, this would result in a total of 5,416 units in the unincorporated Midcoast and 5,335 units in Half Moon Bay, or 10,750 housing units in the Study Area by 2040. This represents a 26% increase in residential units in the unincorporated Midcoast, a 19% increase in Half Moon Bay, and a 22% increase overall, or 76 units per year in the Study Area. Existing housing, pipeline development, future development, and total residential development are summarized in Table 1 of the Forecast, including the proportion of development in unincorporated San Mateo County and Half Moon Bay, and the proportion of single- and multi-family units.

The Study Area would be expected to have 1,980 fewer units in 2040 using the Constrained Development Forecast, compared to the updated zoning-based buildout analysis. The Constrained Forecast results in 1,620 fewer units in the unincorporated Midcoast and 400 fewer units in Half Moon Bay compared to the zoning-based buildout.

**Table 1
Constrained Residential Development Forecast for the CTMP (2040)**

Subarea	Existing			Pipeline ⁴			CTMP Forecast (2040)			Total (2040)			% Change
	Total Units ¹	Single-Family ²	Multi-Family ³	Total Units	Single-Family	Multi-Family	New Units ^{5, 6}	Single-Family ⁷	Multi-Family ⁷	Total Units (2040)	Single-Family	Multi-Family	
<u>Unincorporated Midcoast</u>	4,300	4,005	295	22	19	3	1,094	716	378	5,416	4,740	676	26%
<u>Half Moon Bay</u>	4,481	3,493	988	160	105	55	694	508	186	5,335	4,106	1,229	19%
Total	8,781	7,498	1,283	182	124	58	1,787	1,224	564	10,750	8,846	1,905	22%

Notes:

1. Existing development in Half Moon Bay has been corrected since November 2014 Existing Conditions Report. Existing mobile homes were not accounted for in that report; this results in increase of 409 single-family units.
2. Includes manufactured homes.
3. Includes housing in mixed-use buildings and caretaker units.
4. Development projects under review as identified by San Mateo County in 2013-2015 and the City of Half Moon Bay in 2014.
5. New residential development in unincorporated Midcoast limited to 40 units per year under Policy 1.23 of the San Mateo County Midcoast LCP (2014). In the City of Half Moon Bay, Measure D limits residential growth to 1% per year, or 1.5% in the downtown area. However, in Half Moon Bay, existing zoning is projected to result in less development than would be allowed under Measure D.
6. Future development in Half Moon Bay is based on a 0.7% average annual growth rate projected in the Economic and Real Estate Conditions and Trends report (2014) prepared by EPS for the Half Moon Bay General Plan Update.
7. Assumes single-family/multi-family split found for zoning-based buildout analysis: 67% single-family and 33% multi-family in the unincorporated Midcoast, and 75% single-family and 25% multi-family in Half Moon Bay.

Sources: *San Mateo County Assessor, 2014; San Mateo County, 2014; City of Half Moon Bay, 2014; EPS, 2014; Dyett & Bhatia, 2015.*

Non-Residential Development

ABAG estimates that there are currently approximately 2,500 jobs in the urbanized unincorporated Midcoast and 5,330 in Half Moon Bay, as well as a small number in the remainder of the unincorporated County. The Constrained Development Forecast finds a capacity for an increase of 2,443 new jobs in the unincorporated Midcoast, for a total of 4,994 jobs by 2040. This represents a 96% increase in the current jobs in the unincorporated Midcoast. In Half Moon Bay, this would translate to an increase of 370 jobs, for a total of 5,704 by 2040. This would be a 7% increase in jobs in Half Moon Bay. Overall, there would be a 36% increase in jobs for the Study Area. Existing, pipeline, future, and total non-residential development projections are summarized in Table 2 of the Forecast Memo, including the proportion of development in unincorporated San Mateo County and Half Moon Bay.

The Study Area would be expected to have 2,837 fewer jobs in 2040 using the Constrained Development Forecast compared to the updated zoning-based buildout analysis. The Constrained Development Forecast results in 165 fewer jobs in the unincorporated Midcoast and 2,672 fewer jobs in Half Moon Bay compared to the zoning-based buildout.

Table 2
Constrained Non-Residential Development Forecast for the CTMP (2040)

	Existing	Pipeline ³		CTMP Forecast (2040)		Total (2040)	
Subarea	Existing Jobs ²	Pipeline Non-Residential Sq. Ft.	Pipeline Jobs ²	Potential Non-Residential Sq. Ft. ^{4,5}	Potential Jobs	Total Jobs	% Change
<u>Unincorporated Midcoast</u>	2,551	303,000	439	851,800	2,003	4,994	96%
<u>Half Moon Bay</u>	5,334	37,500	94	294,000	276	5,704	7%
Total	7,885	340,500	533	1,145,800	2,279	10,698	36%

Notes:

1. Combines the total "known" square footage from the County Assessor data with estimated square footage of other parcels with non-residential development. Estimated intensity of existing development is based on that of "known" development.
2. Estimated based on assumed ratio of jobs per square foot of non-residential development in different categories (e.g., visitor-serving commercial, retail commercial, industrial).
3. Development projects under review as identified by San Mateo County in 2013-2015 and the City of Half Moon Bay in 2014.
4. Future development in unincorporated Midcoast is based on an analysis of vacant and underutilized land, average FAR of existing development in each zoning district, and other factors. Development in Neighborhood Commercial and comparable zones is adjusted downward in proportion to reduction in residential units to account for lower demand.
5. Future development in Half Moon Bay is based on average annual growth rates by the employment sector as projected in the Economic and Real Estate Conditions and Trends Report (2014) prepared by EPS for the Half Moon Bay General Plan Update. Square footage estimated is based on assumed ratio of jobs per square foot of non-residential development in different categories (e.g., visitor-serving commercial, retail commercial, industrial), using the same assumptions as in the zoning-based buildout analysis.

Sources: The *San Mateo County Assessor, 2014*; *San Mateo County, 2014*; *City of Half Moon Bay, 2014*; *EPS, 2014*; *Dyett & Bhatia, 2015*.

Alternative Transportation Standards

The identification of adequate measures and standards for both the Midcoast and the City of Half Moon Bay is vital to providing an accurate assessment of current and forecasted transportation deficiencies and determining the most efficient and feasible improvements to address those deficiencies without disrupting the unique context and character of the Coastside area. Evaluation of the transportation network, using proposed standards and improvements to address any identified deficiencies, will occur during the later stages of this project.

The purpose of transportation standards is to provide a framework with which to identify existing deficiencies in the transportation network and to identify what deficiencies will be caused by future development, including single-family, multi-family, and second unit residential development, and non-residential development.

Under existing LCP standards, impacts are only defined by vehicle-based standards which measure deficiencies such as road capacity (number of vehicles on Highway 1 and on SR 92 and how much delay experienced by those vehicles entering Highway 1). There is no consideration given to other modes and, as a result, developers are not responsible for addressing the indirect and cumulative impacts of development on pedestrians, bicycles, transit, and parking.

The lack of multimodal standards encourages continued growth in automobile use by prioritizing capacity and control improvements that interrupt the flow along Highway 1 and interfere with the existing context and character of the study area while not providing safe and efficient non-automotive options. Additionally, there are no standards to identify deficiencies in parking availability, and inadequate parking can result in parking spillover into residential areas. Mitigations resulting from new standards should avoid causing deficiencies to occur in different modes.

The Alternative Transportation Standards propose that existing roadway segment and intersection standards be revised to provide exemptions for facilities that do not add significant volumes to minor approaches and for those that prioritize other modes. The Alternative Standards would also implement multimodal standards to identify deficiencies that occur as increased automotive demand hinders the ability of pedestrians and bicycles to operate safely and efficiently, and to implement standards to identify deficiencies in transit and parking services that do not adequately meet demand.

Staff's preliminary recommendation is that the following alternative standards be used to measure roadway congestion regarding:

Roadway Segments

The Midcoast offers a unique transportation network with only one main road in each direction (Highway 1 in the north-south direction and SR 92 in the east-west direction) and little support for widening to increase capacity throughout the corridor. Instead of basing Level of Service (LOS) on roadway capacity, the use of a Delay Index to measure roadway congestion addresses how users experience congestion and how it affects their time spent in congestion. Depending on how segments are defined, it would allow for the identification of deficiencies and improvements, to address specific bottlenecks, and causes of congestion within a segment, instead of requiring full scale widening improvements. Segment boundaries should be defined by any change in number of lanes or change in land use (i.e., at gateway intersections, defining the bounds of Midcoast Communities).

Implementation of this standard would require the collection of travel time runs during peak hours and modeling to determine how proposed improvements or growth would affect travel time at various levels of congestion during AM Peak Hours, PM Peak Hours, and Weekend Peak Hours. Proposed improvements that affect intersections would also affect travel times, allowing for an accurate representation of the tradeoff between intersection LOS and roadway LOS.

Staff's preliminary recommendation is to change the existing LOS standard to a Delay Index standard during the Weekday AM and PM commute peak hours and during the Weekend midday recreational peak hour of 2.0. This would mean that a segment that took 10 minutes to drive with no congestion would be deficient if it took over 20 minutes to drive the same segment during peak commute times. For segments that have adjacent Class I bicycle facilities or Class II bicycle facilities that are connected to Class I trails, a Delay Index of 3.0 would be acceptable.

Intersections

Because the majority of intersections within the study area are unsignalized and only controlled by stops signs for minor approaches, any proposed improvements should appropriately balance the need of minor street traffic with the flow of traffic along Highway 1 and SR 92. Allowing exceptions to the standard based on the context of the intersection within the network and the volume of traffic using the minor approach would address the concerns of the community that the flow of traffic not be overly affected by the addition of the unnecessary signalization. Staff's preliminary recommendation is that any unsignalized intersection, with a minor approach operating below the existing LOS standard of D, that does not meet a peak hour signal warrant, would not be considered deficient. This would mean that intersections without a large enough demand on the side street would not require any improvement.

For unsignalized intersections that meet a Caltrans peak hour signal warrant, or for signalized intersection, the preliminary recommendation is that the LOS standard should remain the same, allowing for identification of locations where roundabouts or traffic signals should be implemented or where the efficiency of a signal could be improved through more efficient signal timing, or the addition of turn lanes and acceleration lanes to separate turning traffic from through traffic.

Staff also anticipates recommending the following multimodal standards to better understand the need and use of other modes of transportation within the project area, such as pedestrian, bicycle, public transit, and parking.

Pedestrian

The San Mateo County Comprehensive Bicycle and Pedestrian Plan presents a Pedestrian INDEX Walking Demand Score to model walking demand throughout the County. Another element that will be reviewed is the Pedestrian Environmental Quality Index. This index will allow staff to measure the level of pedestrian service in the

project area. These two combined indexes will establish locations where pedestrian standards are required and what the level or quality those standards must meet. Based upon certain Walking Demand scores, segments along Highway 1 would need to meet a Pedestrian Environmental Quality Index score of a certain amount. This methodology is explained in greater detail by the attached Alternative Transportation Standards memo.

Bicycle

Similar to the pedestrian model, a Bicycle Environmental Quality Index would be established to score segments of road on Highway 1. The score would then be used to see if improvements to the segment would be required for bicycles. The standard would also look at bike parking at any beach point and recreational facility or major trip generator.

Transit

To avoid overcrowding of transit services, staff recommendation is to set a standard for the transit capacity utilization of buses standing capacity to not exceed a two-hour average of 85% during the weekday commute peak period and the weekend recreational peak period.

While SamTrans has existing ridership standards for when benches or shelters are placed at bus stops, staff is recommending that the standards would recognize the lower transit demand of a rural coastal setting to provide safe and comfortable bus stops for transit users.

Parking

To ensure that there is adequate parking at Coastside recreational facilities and other attractions, staff is recommending that the standard for any beach access point is that no more than 85% parking occupancy shall occur during an average weekend midday peak within 1/4 mile of a recreational parking facility.

NEXT STEPS

Following the feedback received from members of the public, the San Mateo County Planning Commission, the Half Moon Bay City Council, and the Midcoast Community Council on the alternative transportations standards and the development forecast, the next project phases include evaluation of the revised transportation forecast and development land use policy concepts, with the intent to identify a preferred alternative that could achieve an effective, productive balance between future transportation demand and land use development on the Midcoast, consistent with LCP Policy 2.53. The forecast and policies will be subject to review and feedback from the TAC, as well as the public, through meetings and a workshop, to occur in spring of 2016.

The following chronology lists anticipated actions, which includes expected project culmination in summer 2016:

<u>Date</u>	<u>Action</u>
December 2015	- Board of Supervisors Update
January 2016	- Technical Advisory Committee Meeting for Revised Transportation Forecast
February 2016	- MCC and Half Moon Bay City Council updates
March 2016	- Public Workshop #4 for Revised Transportation Forecast Technical Advisory Committee Meeting for Land Use Policy Concepts
April 2016	- MCC and Half Moon Bay City Council update; Public Workshop #5 for Land Use Policy Concepts
June 2016	- Planning Commission Adoption of Draft Plan; CEQA analysis released
July 2016	- Board of Supervisors Adoption of Draft Plan

ATTACHMENTS

- A. Development Forecast Memo
- B. Alternative Transportation Standards Memo

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Development Forecast for the San Mateo County Comprehensive Transportation Management Plan

Public Review Draft

October 2015

Produced by

DYETT & BHATIA

Urban and Regional Planners

for DKS Associates and the County of San Mateo

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Development Forecast for the San Mateo County Comprehensive Transportation Management Plan - Public Review Draft

Background

This report summarizes an assessment of potential development in the Study Area for the San Mateo County Comprehensive Transportation Management Plan (CTMP), as required by the San Mateo County Midcoast Update to the Local Coastal Program. The resulting Development Forecast is based on an analysis of potential development allowed under existing zoning; Local Coastal Program (LCP) regulatory constraints; development trends; and regional growth projections. The assumptions used for the Development Forecast are being prepared in consultation with County staff and in coordination with the City of Half Moon Bay.

Recommended Methodology

The recommended development forecast accounts for growth control under LCP regulations as well as the market analysis done for Half Moon Bay, and uses the most constraining of those factors as they apply to residential and non-residential development and to the unincorporated Midcoast and the City of Half Moon Bay. The Consultant Team recommends that this Constrained Development Forecast be used as a basis for planning for the CTMP. The Constrained Development Forecast will supplement the Zoning-based Buildout Analysis.

BACKGROUND

A zoning-based Buildout Analysis was completed in the fall of 2014. This analysis identified vacant and underutilized sites, and applied potential densities and intensities of future residential and non-residential development on those sites to estimate the amount of possible future development. Expected densities and intensities were based on the residential density allowed by zoning and the average density of development in the zoning district. Jobs were estimated using assumed ratios of square feet per job for various categories of development (e.g., retail commercial, visitor-serving commercial, industrial). For more detail on the identification of potential development sites and the assumptions used in projecting future development, please refer to the *Connect the Coastside Buildout*

Analysis and Traffic Projections Final Report from November 2014. The zoning-based Buildout Analysis has been modified to account for updated data and assumptions.

CONSTRAINED DEVELOPMENT FORECAST

The Constrained Development Forecast uses the updated Zoning-based Buildout Analysis as a starting point, and then takes into account the following potential constraints:

- The growth management limitations in the San Mateo County Midcoast Local Coastal Plan and the City of Half Moon Bay’s Measure D;
- The market demand for new housing and non-residential development in Half Moon Bay based on the market analysis conducted in 2014 for the Half Moon Bay General Plan Update.

This Constrained Development Forecast is a 25-year forecast, consistent with other local and regional forecasts being produced. With regard to growth control measures, Policy 1.23 in the Midcoast LCP limits residential development in the unincorporated Midcoast to 40 units per year, while Measure D limits residential growth to 1 percent annually in Half Moon Bay, or 1.5 percent Downtown. For Half Moon Bay, the zoning-based forecast resulted in a lower level of residential development than would be allowed under Measure D. Thus, zoning would be the most limiting factor for residential development in Half Moon Bay, while the LCP’s growth management protocol would be the most limiting growth factor in the unincorporated Midcoast.

The Constrained Development Forecast also takes into account projected growth rates for residential and non-residential development from the market study conducted in 2014 for the Half Moon Bay General Plan Update. These growth rates reflect our best understanding of the interaction between market demand and development constraints in Half Moon Bay. The market study indicates the least amount of non-residential development in Half Moon Bay.

POTENTIAL WATER AND SEWER CONSTRAINTS

In developing the Constrained Development Forecast, the County and Consultant Team also analyzed potential constraints related to water and sewer capacity under current public works and urban water management plans, and based on the Midcoast LCP. However, it was determined that this potential constraint may be adjusted over time, and may not be an appropriate basis on which to undertake long-term transportation and land use planning.

DEVELOPMENT TRENDS AND ABAG PROJECTIONS

Two other factors were also studied. These were:

- Development trends in the unincorporated Midcoast and Half Moon Bay between 1990 and 2015;
- Association of Bay Area Governments (ABAG) projections for growth in the unincorporated Midcoast and Half Moon Bay for the year 2040.

Analysis of growth trends over the past 25 years and understanding of regional growth forecasts provide good measuring sticks. The results of these analyses fell within a similar range as the Constrained Development Forecast.

For the purposes of the CTMP, it would be most appropriate to move forward with an analysis based on a forecast that accounts for growth control measures paired with the market study prepared for the City of Half Moon Bay in 2014. The regulatory limits on residential development created by the San Mateo County Midcoast LCP and Half Moon Bay's Measure D provide the best assessment of the potential future development because they are concrete and enforceable growth constraints. The recent market analysis represents the best available professional assessment of future development potential in Half Moon Bay.

Summary of Expected Development in the CTMP Study Area

The amount of residential and non-residential development expected based on the Constrained Development Forecast is summarized below.

RESIDENTIAL DEVELOPMENT

As of 2014 there were 8,781 residential units in the Study Area, including 4,300 in the unincorporated Midcoast and 4,481 in Half Moon Bay. The Constrained Development Forecast finds an estimated capacity for 1,094 future units in the unincorporated Midcoast and 694 future units in Half Moon Bay. Together with units currently in the development pipeline, this would result in a total of 5,416 units in the unincorporated Midcoast and 5,335 units in Half Moon Bay, or 10,750 housing units in the Study Area by 2040. This represents a 26% increase in residential units in the unincorporated Midcoast, a 19% increase in Half Moon Bay, and a 22% increase overall, or 76 units per year in the Study Area. Existing housing, pipeline development, future development, and total residential development are summarized in Table 1, including the proportion of development in unincorporated San Mateo County and Half Moon Bay, and the proportion of single- and multifamily units.

The Study Area would be expected to have 1,980 fewer units in 2040 using the Constrained Development Forecast compared to the updated zoning-based buildout analysis. The Constrained Forecast results in 1,620 fewer units in the unincorporated Midcoast and 359 fewer units in Half Moon Bay compared to zoning-based buildout.

NON-RESIDENTIAL DEVELOPMENT

ABAG estimates that there are approximately 2,500 jobs in the urbanized unincorporated Midcoast and 5,330 in Half Moon Bay, as well as a small number in the remainder of unincorporated County. Applying ratios of jobs per square feet to the existing land use pattern, we estimate 2,551 jobs in the unincorporated Midcoast and 5,334 in Half Moon Bay. The Constrained Development Forecast finds a capacity for an increase of 2,443 jobs in the unincorporated Midcoast, from an estimated 2,551 jobs in 2015 to 4,994 jobs in 2040. This represents a 96% increase in jobs in the unincorporated Midcoast, or an average of 94 new

jobs per year. In Half Moon Bay, this would translate to an increase of 370 jobs, from 5,334 in 2015 to 704 in 2040. This would be a 7% increase in jobs in Half Moon Bay, or an average of 14 per year. Overall, there would be a 36% increase in jobs for the Study Area, or an average of 108 per year. Existing, pipeline, future and total non-residential development are summarized in Table 2, including the proportion of development in unincorporated San Mateo County and Half Moon Bay.

The Study Area would be expected to have 2,837 fewer jobs in 2040 using the Constrained Development Forecast compared to the updated zoning-based buildout analysis. The Constrained Forecast results in 165 fewer jobs in the unincorporated Midcoast and 2,672 fewer jobs in Half Moon Bay compared to zoning-based buildout.

Table 1: Constrained Residential Development Forecast for the CTMP (2040)

<i>Subarea</i>	<i>Existing</i>			<i>Pipeline⁴</i>			<i>CTMP Forecast (2040)</i>			<i>Total (2040)</i>			<i>Percent Change</i>
	<i>Total Units¹</i>	<i>Single-Family²</i>	<i>Multi-family³</i>	<i>Total Units</i>	<i>Single-Family</i>	<i>Multi-family</i>	<i>New Units^{5, 6}</i>	<i>Single-Family⁷</i>	<i>Multi-family⁷</i>	<i>Total Units (2040)</i>	<i>Single-Family</i>	<i>Multi-family</i>	
Unincorporated Midcoast	4,300	4,005	295	22	19	3	1,094	716	378	5,416	4,740	676	26%
Half Moon Bay	4,481	3,493	988	160	105	55	694	508	186	5,335	4,106	1,229	19%
Total	8,781	7,498	1,283	182	124	58	1,787	1,224	564	10,750	8,846	1,905	22%

Sources: San Mateo County Assessor, 2014; San Mateo County, 2014; City of Half Moon Bay, 2014; EPS, 2014; Dyett & Bhatia, 2015.

Notes:

1 Existing development in Half Moon Bay has been corrected since November 2014 Existing Conditions Report. Existing mobile homes were not accounted for in that report; this results in increase of 409 single-family units.

2 Includes manufactured homes.

3 Includes housing in mixed-use buildings, and caretaker units.

4 Development projects under review as identified by San Mateo County in 2013-15 and the City of Half Moon Bay in 2014.

5 New residential development in unincorporated Midcoast limited to 40 units per year under Policy 1.23 of the San Mateo County Midcoast LCP (2014). In City of Half Moon Bay, Measure D limits residential growth to 1% per year, or 1.5% in downtown area. However, in Half Moon Bay, existing zoning is projected to result in less development than would be allowed under Measure D.

6 Future development in Half Moon Bay is based on 0.7% average annual growth rate projected in the Economic and Real Estate Conditions and Trends report (2014) prepared by EPS for the Half Moon Bay General Plan Update.

7 Assumes single-family/multifamily split found for zoning-based buildout analysis: 67% single-family and 33% multifamily in the Unincorporated Midcoast, and 75% single-family and 25% multifamily in Half Moon Bay.

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Table 2: Constrained Non-Residential Development Forecast for the CTMP (2040)

<i>Subarea</i>	<i>Existing Existing Jobs²</i>	<i>Pipeline³</i>		<i>CTMP Forecast (2040)</i>		<i>Total (2040)</i>	<i>Percent Change</i>
		<i>Pipeline Non-Residential Sq. Ft.</i>	<i>Pipeline Jobs²</i>	<i>Potential Non-Residential Sq. Ft.^{4, 5}</i>	<i>Potential Jobs</i>	<i>Total Jobs</i>	
Unincorporated Midcoast	2,551	303,000	439	851,800	2,003	4,994	96%
Half Moon Bay	5,334	37,500	94	294,000	276	5,704	7%
Total	7,885	340,500	533	1,145,800	2,279	10,698	36%

Sources: San Mateo County Assessor, 2014; San Mateo County, 2014; City of Half Moon Bay, 2014; EPS, 2014; Dyett & Bhatia, 2015.

Notes:

1 Combines the total "known" square footage from County Assessor data with estimated square footage of other parcels with non-residential development. Estimated intensity of existing development is based on that of "known" development.

2 Estimated based on assumed ratio of jobs per square foot of non-residential development in different categories (e.g., visitor-serving commercial, retail commercial, industrial).

3 Development projects under review as identified by San Mateo County in 2013-15 and the City of Half Moon Bay in 2014.

4 Future development in Unincorporated Midcoast based on analysis of vacant and underutilized land; average FAR of existing development in each zoning district, and other factors. Development in Neighborhood Commercial and comparable zones is adjusted downward in proportion to reduction in residential units, to account for lower demand.

5 Future development in Half Moon Bay is based on average annual growth rates by employment sector as projected in the Economic and Real Estate Conditions and Trends report (2014) prepared by EPS for the Half Moon Bay General Plan Update. Square footage estimated based on assumed ratio of jobs per square foot of non-residential development in different categories (e.g., visitor-serving commercial, retail commercial, industrial), using same assumptions as in zoning-based buildout analysis.



MEMORANDUM

DATE: September 23, 2015

TO: Rob Bartoli
San Mateo County
Planning and Building Department

FROM: Bill Loudon, PE
Josh Pilachowski, PE
DKS Associates

SUBJECT: Recommendation of Alternative Transportation Standards for the
San Mateo County Comprehensive Transportation Management Plan

P#14075-000

1. INTRODUCTION

The purpose of this memorandum is to summarize the existing vehicle Level of Service (LOS) standards utilized in the Connect the Coastside study area and to present alternative standards that better describe the ability of the transportation system to accommodate growth. The identification of adequate measures and standards for the both Midcoast and the City of Half Moon Bay are vital to providing an accurate assessment of current and forecasted transportation deficiencies and determining the most efficient and feasible improvements to address those deficiencies without disrupting the unique context and character of the Coastside area. Evaluation of the transportation network using proposed standards and improvements to address any identified deficiencies will occur during later stages of this project.

The purpose of transportation standards is to provide a framework with which to identify existing deficiencies in the transportation network and to identify what deficiencies will be caused by future development, including single family, multi-family, and second unit residential development, and non-residential development. The County's Local Coastal Program (LCP) states in Policy 2.52 that applicants for new development that increase net vehicle trips on Highway 1 or State Route (SR) 92 must "develop and implement a traffic impact analysis and mitigation plans (TIMP)", which will require "specific provisions to assess, and mitigate for, the project's significant adverse cumulative impacts". Currently impacts are only defined by vehicle-based standards which measure deficiencies such as road capacity (how full Highway 1 and SR 92 are and how much delay vehicles entering Highway 1 experience). There is no consideration given to other modes, and as a result developers are not responsible for any improvements that address the effect that increased demand has on pedestrians, PI bicycles, transit, and parking.



2. EXISTING STANDARDS

Both the San Mateo County LCP and the Half Moon Bay (City) General Plan contain stricter standards for determining traffic impacts in the Midcoast than those standards contained in the San Mateo County Congestion Management Program. Therefore, these stricter standards are used for determining congestion impacts associated with current and future growth. Level of Service (LOS) is a qualitative measure ranking levels of congestion on a given roadway or intersection. LOS can range from “A” representing free-flow conditions to “F” representing congested conditions with long delays. Roadway segments are defined by the portion of road between two endpoints, usually intersections, and performance metrics tend to measure how well the roadway allows vehicles to travel through it. Intersections are defined by two intersecting roadways and performance metrics tend to measure how much delay is added to vehicles at the intersection as it processes the two competing directions.

As dictated by the San Mateo County Congestion Management Program 2009, roadway capacity for multi-lane highways is assumed to be 2,200 vehicles per lane per hour while capacity is 1,400 vehicles per lane per hour for two lane highways. LOS definitions, considering the ratio of traffic volume to capacity for two- and multi-lane highways, are shown in **Table 1**. LOS definitions, considering vehicle delay for signalized and unsignalized intersections, are shown in **Table 2**.

Table 1 - Roadway Segment LOS Thresholds and Definitions

LOS	Two-Lane Highway		Multi-Lane Highway	
	Max v/c ratio ^a	Average Travel Speed ^b	Max v/c ratio ^c	Average Travel Speed ^b
A	0.00 – 0.04	54	0.00 – 0.30	50
B	0.04 – 0.16	51	0.30 – 0.50	50
C	0.16 – 0.32	48	0.50 – 0.70	50
D	0.32 – 0.57	46	0.70 – 0.84	49
E	0.57 – 1.00	41	0.84 – 1.00	47
F	> 1.00	< 41	> 1.00	< 47

Source: San Mateo County Congestion Management Agency, 2009

a. Ratio of flow rate to an ideal capacity of 2,800 passenger cars per hour in both directions.

b. Average travel speed of all vehicles for highways with design speed 60 mph; for highways with lower design speeds, reduce speed by 4 mph for each 10-mph reduction in design speed below 60 mph; assumes that speed is not restricted to lower values by regulation.

c. Ratio of flow rate to an ideal capacity of 2,200 passenger cars per lane per hour.

Table 2 – Intersection LOS Thresholds and Definitions

Level of Service	Average Control Delay (seconds/vehicle)		Description
	Signalized Intersections	Unsignalized Intersections	
A	≤ 10	≤ 10	Free flow/ Insignificant Delay
B	> 10 and ≤ 20	> 10 and ≤ 15	Stable Operation/ Minimal Delay
C	> 20 and ≤ 35	> 15 and ≤ 25	Stable Operation/ Acceptable Delay
D	> 35 and ≤ 55	> 25 and ≤ 35	Approaching Unstable/ Tolerable Delay
E	> 55 and ≤ 80	> 35 and ≤ 50	Unstable Operation/ Significant Delay
F	> 80	> 50	Forced Flow/ Excessive Delay

Source: 2010 Highway Capacity Manual, Transportation Research Board, 2010.

Notes: Worst Approach Delay (in seconds per vehicle) for Unsignalized Intersections

a. Roadway Segment Congestion Standards

The County LCP defines the roadway segment LOS standard for Highway 1 and SR 92 as LOS D, except during commuter peak periods and recreation peak periods, during which LOS E is acceptable. The City’s Circulation Element defines the LOS standard for Highway 1 and SR 92 as LOS C, except during the commuter peak periods and recreational peak periods when LOS E is acceptable. “Recreational peak period” refers to the weekend midday peak when regional recreational demand is greatest. Roadway segment LOS is based on the ratio between observed volume during peak periods and the capacity of the roadway segment. As such, the roadway segment LOS measure does not take into account observed congestion and delay experienced by users (as a result of intersections and other sources of increased travel time) and only offers improvements that divert significant volume to other parts of the network or that increase capacity through road widening.

b. Intersection Congestion Standards

The *San Mateo County Traffic Impact Study Requirements* defines the intersection LOS standard for San Mateo County as LOS C with no individual movement operating at worse than LOS D. For unsignalized intersections, this represents the delay experienced by minor street traffic entering Highway 1. The City’s Circulation Element (adopted 2013) has established a desired LOS C at intersections along Highway 1 and SR 92, except during the two-hour commute periods, when LOS E is acceptable. The Circulation Element states that this decision was made in order to be consistent with the CMP. As the majority of intersections within the study area are



unsignalized and only controlled by stop signs for minor approaches, the existing standards prioritize the delay experienced by the relatively low volumes entering Highway 1 or SR 92 over the higher volume of through traffic along Highway 1 or SR 92. In order to address long delays, either signalization and/or roundabouts, or consolidation of access points to concentrate access to Highway 1 at specific locations would be required.

c. Multimodal Standards

There are currently no multimodal standards for pedestrian, bicycle or bus transit modes for the Midcoast, County or City. Additionally, there are no standards for availability of parking. As a regional attractor and recreational area that serves a wide range of transportation modes, a lack of multimodal standards can result in a transportation network that tends to prioritize vehicular LOS over other modes of transportation.

d. Conclusion

The existing standards for the study area are focused only on the automobile mode and do not take into account the corridor-based environment of the roadway network. As a result, deficiencies are identified at facilities that are operating as desired, such as at low-volume minor street experiencing delay in order to maintain flow along Highway 1.

The lack of multimodal standards encourages continued growth in automobile use by prioritizing capacity and control improvements that interrupt flow along Highway 1 and interfere with the existing context and character of the study area while not providing safe and efficient non-automotive options. Additionally, as regional growth in recreational travel continues, there are no standards to identify deficiencies in parking availability, and inadequate parking can result in parking spillover into residential areas. Mitigations resulting from new standards should be chosen such that they avoid causing deficiencies to occur in different modes.

e. Recommendation:

- 1. Revise the existing roadway segment and intersection standards to provide exemptions for facilities that do not have significant minor approach volumes and for those that prioritize other modes;***
- 2. Implement multimodal standards to identify deficiencies that occur as increased automotive demand hinders the ability of pedestrian and bicycle to operate safely and efficiently; and***
- 3. Implement standards to identify deficiencies in transit and parking services that do not adequately meet demand.***

3. ALTERNATIVE ROADWAY CONGESTION STANDARDS

There are multiple alternative approaches available to measuring congestion. Since California passed SB 743, it is increasingly acceptable to measure congestion with methods other than vehicle LOS. The various alternatives presented here provide options that include the use of LOS and other measures. These approaches are based on the context of the region and the level of congestion expected by roadway users. They allow for congestion management to be more flexible and meet the goals and objectives of the community (increased safety and lower emissions, delay, congestion, etc.)



a. Roadway Segments

LOS with context specific exemptions

Many different jurisdictions use roadway segment LOS as it is used in this study area, but allow a lower LOS to be acceptable when the segment meets certain criteria. The City of Monterey has an LOS standard of D; however, if the corridor has either Class I bicycle facilities or Class II bicycle facilities that are connected to Class I trails, or if the segment is served by transit with a headway (the time between buses) of less than 20 minutes and operates during AM and PM peak hours year round, then the City allows LOS E as an acceptable standard for the corridor. If the corridor has both bicycle and transit facilities that meet the criteria mentioned previously, then it is acceptable for the corridor to have LOS F for up to 2 hours on a typical weekday. This allows for a road diet (a reallocation of existing right of way to serve multiple modes of transportation) which constrains the amount of right-of-way used for automobiles in order to provide right-of-way for bicycle or pedestrian facilities.

Fort Collins, CO, has similar standards. In Fort Collins's case, if the corridor is in a mixed-use district the acceptable standard is LOS E, but it is allowed to drop below LOS E if the City provides congestion mitigation through alternatives to motor vehicle travel (a high level of bicycle and transit facilities).

Delay Index

Recent changes to the subarea Action Plans in Contra Costa County have included the use of a Delay Index as a congestion measure for defined Routes of Regional Significance. The Delay Index is calculated as the ratio between travel time during the peak hour and free flow travel time. Depending on the area, acceptable delays are typically between 2-5 times what the trip takes under free flow conditions.

In Massachusetts, MassDOT uses a variation of this method to determine the hours of delay experienced by the average driver for every 1000 Vehicle Miles Traveled (VMT). By not focusing on the peak periods, this method is more applicable for regions that have longer periods of congestion instead of regions that have sharp increases in demand during peak periods. This method allows for MassDOT to predict the delay and set standards for acceptable change over time.

b. Intersections

LOS with Change in Standard

Many jurisdictions use intersection LOS as currently used in the study area, but allow exceptions to the standard based on the role/importance of the intersection to the network. In Merced County, LOS E or worse is allowed on a minor component of the system, such as a minor left turn if the mitigation of this effort could compromise a major component, such as through traffic along Highway 1.

For an unsignalized intersection operating at LOS E or F an appropriate method would be to test the intersection using Caltrans signal warrants. If the intersection does not warrant a signal, then the volume on the minor street would not be high enough to warrant conversion to a signalized intersection or roundabout. This allows for focus to be placed on intersections with higher cross street traffic. The City of Santa Clara only considers impacts to intersections if a signal warrant is met, otherwise it is exempt.



c. Recommendation

Roadway Segment – Delay Index

The Midcoast offers a unique transportation network with only one main road in each direction (Highway 1 in the north-south direction and SR 92 in the east-west direction) and little support for widening to increase capacity throughout the corridor. Instead of basing LOS on roadway capacity, the use of a Delay Index to measure roadway congestion addresses how users experience congestion and how it affects their time spent in congestion. Depending on how segments are defined, it allows for the identification of deficiencies and improvements to address specific bottlenecks and causes of congestion within a segment instead of requiring full scale widening improvements. Segment boundaries should be defined by any change in number of lanes or change in land use (i.e. at gateway intersections, defining the bounds of Midcoast Communities)

Implementation of this standard would require the collection of travel time runs during peak hours and modeling to determine how proposed improvements or growth would affect travel time at various levels of congestion during AM Peak Hours, PM Peak Hours and Weekend Peak Hours. Proposed improvements that affect intersections would also affect travel times, allowing for an accurate representation of the tradeoff between intersection LOS and roadway LOS.

Our recommendation would change the existing LOS standard to a Delay Index standard during the Weekday AM and PM commute peak hours and during the Weekend midday recreational peak hour of 2.0. This would mean that a segment that took 10 minutes to drive with no congestion would be deficient if it took over 20 minutes to drive during peak commute times. For segments that have adjacent Class I bicycle facilities or Class II bicycle facilities that are connected to Class I trails, a Delay Index of 3.0 would be acceptable.

Intersection – LOS with change in standard

Because the majority of intersections within the study area are unsignalized and only controlled by stop signs for minor approaches, any proposed improvement should appropriately balance the need of the minor street traffic with the flow of traffic along Highway 1 and SR 92. Allowing exceptions to the standard based on the context of the intersection within the network and the volume of traffic using the minor approach would address the concerns of the community that the flow of traffic not overly affected by the addition of unnecessary signalization. Our recommendation is that any unsignalized intersection with a minor approach operating below the existing LOS standard of D that does not meet a peak hour signal warrant would not be considered deficient. This would mean that intersections without a large enough demand on the side street would not require any improvement.

For unsignalized intersections that meet a Caltrans peak hour signal warrant¹ or for signalized intersections, our recommendation is that the LOS standard should remain the same, allowing for identification of locations

¹ California MUTCD 2012, Chapter 4

where roundabouts or traffic signals should be implemented or where the efficiency of a signal could be improved through more efficient signal timing or the addition of turn lanes and acceleration lanes to separate turning traffic from through traffic.

4. MULTIMODAL STANDARDS

While not widespread, multimodal LOS standards are currently being studied and implemented in many communities across the US. The various measures presented below provide options that include the mobility and accessibility as well as how non-vehicular modes interact with traffic. These approaches are based on the context of the region and how the level of congestion affects all users of the transportation network. They allow for congestion management to be more flexible and meet the goals and objectives of the community.

a. Pedestrian

The San Mateo County Comprehensive Bicycle and Pedestrian Plan presents a Pedestrian INDEX Walking Demand Score² to model walking demand throughout San Mateo County. Segments were scored on a combination of variables that identified the “density and diversity of land uses, proximity to walking destinations, transit accessibility and pedestrian supportiveness of the street network.” This process combines land use and demographic data in order to identify the areas with the most potential or demand for pedestrian use. The following variables were used to create the Pedestrian Walking Demand Score:

- Population Density
- Employment Density
- Land Use Mix
- Schools
- Parks/Benches
- Transit Proximity
- Neighborhood Shopping Districts
- Social and Recreational Destinations
- Employment Centers
- Resident Demographics (Age, Income, Vehicle Ownership)
- Priority Development Areas
- Street Segment length
- Intersection Density
- Connectivity

² San Mateo County Comprehensive Bicycle and Pedestrian Plan, Appendix C: Figure C-3 includes scores for the study area

A map of the Walking Demand Score for the study area from the San Mateo County Comprehensive Bicycle and Pedestrian Plan is included as an attachment. Based on roadway classification, different standards for required pedestrian treatments can be set based on the Walking Demand Score. Standards for pedestrian facility design would include ADA compliance and vertical or lateral separation (through a buffer or a curb) from traffic lanes.

The Pedestrian Environmental Quality Index (PEQI)³ is a frequently used method of measuring pedestrian service. This method is easier for the public to visualize and removes confusion caused by comparing pedestrian scores to Auto LOS. **Table 3** shows the indicators used in generating the PEQI.

Table 3 - Pedestrian Environmental Quality Index

Intersection Safety	Traffic Volume	Street Design	Land Use	Perceived Safety
<ul style="list-style-type: none"> • Crosswalks • High Visibility Crosswalks • Intersection lighting • Traffic control • Pedestrian/ Countdown signal • Wait time • Crossing speed • Pedestrian refuge island • Curb ramps • Intersection traffic calming features • Pedestrian engineering countermeasures 	<ul style="list-style-type: none"> • Number of vehicle lanes • Posted speed limit • Traffic volume • Street traffic calming features 	<ul style="list-style-type: none"> • Continuous sidewalk • Width of sidewalk • Width of throughway • Large sidewalk obstructions • Sidewalk impediments • Trees • Driveway cuts • Presence of a buffer • Planters/ gardens 	<ul style="list-style-type: none"> • Public seating • Public art/ historic sites • Retail use and public places 	<ul style="list-style-type: none"> • Pedestrian scale lighting • Illegal graffiti • Litter • Empty spaces

³ San Francisco Department of Public Health, Pedestrian Environmental Quality Index

For a list of projects that have used PEQI, see the following link:

<http://www.sfhealthequity.org/elements/24-elements/tools/106-pedestrian-environmental-quality-index>

The PEQI Score combines these indicators to give the segment or intersection a score out of 100, organized as follows:

- 0-20 is considered unsuitable for pedestrians;
- 21-40 is a segment where poor pedestrian conditions exist;
- 41-60 is a segment where basic pedestrian conditions exist;
- 61-80 is a segment where reasonable pedestrian conditions exist; and
- 81-100 is a segment where ideal pedestrian conditions exist.

The Pedestrian Demand Score can establish the locations where pedestrian standards are required and the PEQI can determine the level or quality those standards must meet.

Because pedestrian facilities and parking areas are located on both sides of Highway 1 along the length of the study area, it is important to provide safe opportunities for pedestrians to cross the highway. Standards could be set for a required density of pedestrian crosswalks based on the type of land use and nearby destinations. Areas of high pedestrian demand (such as major trip generators and access streets for recreational facilities) could require adjacent crosswalks. Alternatively, a standard could be set for the distance between crossing opportunities where the distance has a different impact for different area types (urban, suburban, semi-rural and rural). Safe pedestrian crossings are also affected by the time a pedestrian is required to wait for a sufficient gap in the vehicle flow to allow for safe crossing. The recreational areas and beach access points receive high pedestrian demand. Any recreational area or beach access point should have a direct unbroken ADA compliant facility connecting the recreational facility with Highway 1.

Recommendation

Based on the comprehensiveness of the methodology and the applicability to the objectives of this study, our recommendation is to set a standard of a minimum PEQI score for locations along Highway 1 that have a certain pedestrian demand as defined by the Pedestrian INDEX Walking Demand Score. The standard would include the following components:

- ***The standard for segments along Highway 1 with an INDEX Walking Demand Score between 20 and 29 would be a PEQI score of 41 or higher***
- ***The standard for segments along Highway 1 with an INDEX Walking Demand Score greater than 30 or streets connecting Highway 1 with a beach facility would be a PEQI score of 61 or higher***

Any segment with an INDEX Walking Demand score would not have any standard associated with it given the low number of expected pedestrians. To provide safe and efficient pedestrian crossings, our recommendation is to set a standard of a maximum spacing between pedestrian crossing opportunities of ¼ mile for segments along Highway 1 with an INDEX Walking Demand Score greater than 20. Segments along Highway 1 with an INDEX Walking Demand Score less than or equal to 20 would only require pedestrian crossing opportunities at bus stops, trail heads, and beach access points. This would mean that segments along Highway 1 with a higher concentration of pedestrians would be deficient if they did not provide a safe area for pedestrians to walk away from traffic.

We would also recommend a standard for the maximum time that a pedestrian wanting to cross should be expected to wait for a sufficient gap in the vehicle flow to allow for safe crossing to be set at 45 seconds. The measurement of the expected wait time would be defined by the type of crossing facility as shown in Table 4.

Table 4 - Time for Safe Crossing

Crossing Facility	Expected time for safe crossing
Striped pedestrian crossing	Expected wait times for an appropriate gap to appear in the bi-directional traffic stream
Roundabout	Expected wait times for an appropriate gap to appear in a single direction of traffic approaching the roundabout
Signalized Intersection	Expected time for the pedestrian phase to occur after the call button is pushed
Striped Pedestrian Crossing with flashing beacon	No waiting time

b. Bicycle

Bicycling provides an alternative way to move between the various coastal communities and recreational facilities without a car. Similar to PEQI, the Bicycle Environmental Quality Index (BEQI)⁴ presents an alternative quantitative method for establishing standards for bicycle facilities based on safety, vehicle traffic, street design, and land use. **Table 5** shows the categories that are considered when generating a final index score for a segment or intersection.

Table 5 - Bicycle Environmental Quality Index

Intersection Safety	Vehicle Traffic	Street Design	Safety/Other	Land Use
<ul style="list-style-type: none"> • Dashed Intersection Bicycle Lane • No Turn on Red Signs • Bicycle Pavement Treatment 	<ul style="list-style-type: none"> • Number of vehicle lanes • Vehicle Speed • Traffic calming features • Parallel Parking Adjacent to Bicycle Lane/Route • Traffic Volume • Percentage of Heavy Vehicles 	<ul style="list-style-type: none"> • Presence of a Marked Area for Bicycle Traffic • Width of bicycle lane • Trees • Connectivity of Marked Bicycle Network • Pavement Condition • Driveway cuts • Street grade 	<ul style="list-style-type: none"> • Presence of Street Lighting • Presence of Bicycle Lane or Share Roadway Signs 	<ul style="list-style-type: none"> • Line of site • Bicycle Parking • Retail Use

⁴ San Francisco Department of Public Health, Bicycle Environmental Quality Index



Segments and intersections are scored out of 100 to establish how suitable they are for bicycles.

- 0-20 is an environment not suitable for bicycles
- 21-40 is where poor bicycle conditions exist
- 41-60 is where basic bicycle conditions exist
- 61-80 is where reasonable bicycle conditions exist
- 80-100 is where ideal bicycle conditions exist

Adequate bicycle parking at common destinations, such as Pillar Point Harbor, future park-and-ride lots and town centers, is needed for full utilization. In order to accommodate and encourage the use of bicycles, bicycle parking availability standards could be set for such major trip generators as the ones mentioned.

Recommendation

Based on the comprehensiveness of the methodology and the applicability to the objectives of this study, our recommendation is to set a standard of a minimum BEQI score of 61 or higher for bicycle travel along Highway 1.

To encourage bicycle use, we would also recommend a standard that bicycle storage at any beach access point, and any major trip generator or recreational facility located on Highway 1 or SR 92 should have no more than 85% occupancy during an average weekend midday peak.

c. Transit

Setting and meeting mobility and access standards for transit connections to regional destinations such as BART and CalTrain for commute hours and weekends would potentially allow transit to be more competitive with other modes of transportation in the Midcoast and Half Moon Bay. Potential standards could include a maximum time between buses during peak commute times and weekends, minimum operating hours per day and maximum loading factors. While SamTrans does not currently have any maximum load factor guidelines for transit routes, they do identify routes with low ridership for potential removal. San Francisco sets a standard of 85% maximum capacity utilization for Muni service across certain neighborhood entry points during peak hours.

Potential accessibility standards for transit stops could include requiring standard recognizable signage with route number, timetable and route maps. Additionally, availability of park-and-ride lots would allow multimodal access to transit stops. Standards could be set for a maximum amount of time needed for users to drive to a park-and-ride lot and wait for a bus to board. Potential safety standards for transit stops could include requiring bus stops that operate during the evening or at night to have lighting installed. While SamTrans has guidelines that outline the minimum number of riders per day required to provide amenities such as benches and shelters at bus stops, the rural and recreational context of the Midcoast and Half Moon Bay could potentially provide an incentive for setting different ridership guidelines for bus stop amenities. Possible bus stops that would require a certain level of amenity could include major trip generators, intersections of two major roads, and any intersection of a transit route with a bike path. For bicycles to have access to transit, standards could be set for



required bicycle parking at stops with a minimum ridership such as future park-and-ride locations, for transit stops that intersect a Class I bike path, and popular destinations.

Recommendation

To avoid overcrowding of transit services, our recommendation is to set a standard for the transit capacity utilization of buses standing capacity within the study area not to exceed a two-hour average of 85% during the weekday commute peak period and the weekend recreational peak period. As regional demand in and out of the study area increases, the frequency of service would need to be increased or new bus routes would need to be added to continue to meet the capacity utilization standard.

While SamTrans has existing ridership standards for benches and shelters at bus stops, we recommend that the standard for the study area would recognize the lower transit demand of a rural coastal setting to provide safe and comfortable bus stops for transit users. The existing SamTrans ridership standard and recommended ridership standard to supplement SamTrans provided amenities is shown in Table 6. As transit demand increases, more of the existing bus stops would need to be updated with additional amenities.

Table 6 - Bus Stop Amenity Standards

Minimum Ridership Required	Bus Stop with Bench	Bus Stop with Shelter
Existing Standard used by Samtrans	125	250
Recommended Standard	25	100

d. Parking

Parking requirements or standards are often based on expected demand for adjacent and nearby land uses and standards for parking availability. Parking availability is often measured within a ¼ mile distance of the land use as it represents the distance most people are willing to walk to access a destination. Because different land uses often have different parking peaks, parking standards can allow for shared parking use to recognize more efficient use of available parking between several land uses.

Because recreational uses similar to those found in the Midcoast and Half Moon Bay often do not have formally striped parking spaces, some parking standards for recreational uses are defined by area of parking availability.

Recommendation

To ensure that there is adequate parking at Coastside recreational facilities and other attractions, our recommended standard is that any beach access point should have no more than 85% parking occupancy during an average weekend midday peak within ¼ mile of the recreational parking facilities as shown in Figure 1. As parking demand increases because of new development or increased regional demand, the standard could be met with improved signage, partnerships with existing lot owners, fees for use of the parking, increased multimodal access to recreational facilities, or with increased parking facilities,.



Figure 1 - Recreational Locations with Parking Availability Standards



Attachment:

SAN MATEO COUNTY PEDESTRIAN INDEX WALKING DEMAND SCORE FOR THE STUDY AREA



Figure C-3: San Mateo County Pedestrian INDEX Walking Demand Score –Coastal