Pacific Coast Highway Safety Study: Final Report

City of Malibu

Stantec

Prepared for:
City of Malibu
and
Southern California Association
of Governments

May 15, 2015

This Final Report was approved by
the Malibu City Council on June 22, 2015

Sign-off Sheet

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1.0 INTRODUCTION

Within the City of Malibu, State Route 1 (SR-1), also known as Pacific Coast Highway and as PCH, travels for approximately 21 miles and contains 19 signalized intersections. As a State Highway, PCH is controlled, maintained, and operated by the California Department of Transportation (Caltrans).

Because of the various land-uses, activity areas, and corridor traffic demands, PCH is congested during peak hours and for peak seasonal uses of the coastline. Vehicle speeds appear to be higher than desirable for safety and resident experience, and traffic collisions have become all too frequent. Due to high traffic volumes and other factors, the roadway experiences a high number of traffic collisions, approximately one per day. The incidents can result in injuries or death and also can cause the roadway to be frequently closed or congested around collision sites.

In response to these concerns, the Southern California Association of Governments (SCAG) implemented a contract for safety studies along the corridor to identify remedies to reduce the frequency and severity of collisions. This study was conducted in two phases by two different study teams. This final report summarizes and highlights activities completed under this study which are largely presented in a more comprehensive manner in a series of appendices that are described in this final report. Reviewers more interested in details of these studies are directed to these appendices.

Study Background

Starting in 2012, a previous firm, LSA Associates Inc., contracted with SCAG to produce a series of reports quantifying and analyzing the PCH corridor for potential safety improvements. These reports provide comprehensive documentation about existing traffic and safety conditions and provided a series of high level and programmatic recommendations for addressing safety issues in the corridor. These analyses comprise Phase I of the full and complete study process.

At the conclusion of the Phase I of the PCH Safety Study, the City of Malibu reviewed the reports and determined that greater analysis was desirable to closely and precisely identify specific actions that could be undertaken at this time to improve safety and reduce the frequency of collisions. Such actions would include precise and constructible or implementable plans or programs that could be initiated in the near future. These actions would potentially allow for engineering studies to design and construct physical improvements or target measures that do not involve construction.

At the end of 2014, SCAG, in association with the City of Malibu, contracted with Stantec Consulting Services Inc. to complete Phase II of the study. The previous studies done for Phase I are incorporated by reference here. Specific elements of the previous studies, including existing

traffic information and stakeholder comments and concerns are specifically included as appendices to the Phase II study.

A Project Steering Committee was assembled and led by the City of Malibu for the study. This steering committee consists of key stakeholders representing government engineering and enforcement agencies, organized interest groups, and other appropriate organizations. The Project Steering Committee included representatives from the City of Malibu, the offices of Senator Fran Pavley, Assemblymember Richard Bloom, and County Supervisor Sheila Kuehl, Caltrans, SCAG, Metro, L.A. County Department of Public Works, L.A. County Sheriff's Department, California Highway Patrol, L.A. County Department of Beaches & Harbors, L.A. County Fire Department, Malibu Public Works Commission, Malibu Public Safety Commission, Santa Monica-Malibu Unified School District, Pepperdine University, A Safer PCH, L.A. County Bike Coalition, and the Malibu Chamber of Commerce. A total of five Project Steering Committee Meetings were held over the course of the project. The steering committee met during the course of both study phases to review work products and provide direction.

2.0 EXISTING CONDITIONS

A variety of locations, conditions, and deficiencies were identified in the Draft Existing Condition Report prepared for the Phase I study. This report is defined as **Appendix 1**. The report, completed in February 2013, described PCH's existing mobility and safety setting, based on information obtained from several sources. The City's land use, roadway infrastructure, traffic volumes, collisions, transit, bicycle use, and pedestrian issues were summarized and evaluated. This work included extensive public participation, in which multiple public meetings were held.

All traffic volume data for the analysis was obtained from the February 2013 Existing Conditions Report, including intersection turning movement volumes, pedestrian and bicycle volumes. The 2013 report also contained collision information primarily derived from the UC Berkeley Traffic Injury Mapping System (TIMS). While this data was used to inform the Phase II study, the collision information compiled for the 2013 study was deemed to require update and was more deeply refined to develop project recommendations and alternatives.

3.0 PUBLIC OUTREACH

The public and project stakeholders provided critical feedback in the completion of the previous PCH Safety Study. During Phase I, public meetings were held in September and October 2012 during the initial evaluation phase of the study (**Appendix 1**), in May 2013 during the safety assessment phase (**Appendix 2**), and in August 2013 during the alternatives analysis phase. A total of eight public meetings were held. In addition, the public was given the opportunity to provide comments through an online system.

A public workshop was conducted on February 19, 2015 for the Phase II Safety Study to solicit additional public input and begin to consider suggestions and alternatives based upon the

Stantec team's analysis and assessment of conditions. Approximately 50 public participants attended the workshop and provided comments to the Study Team. The comments covered subjects such as bicycle travel, safety of bus stops, Caltrans involvement, collision statistics, engineering measures, enforcement, lighting, cut-through traffic, parking, pedestrians, shoulder improvements, seasonal traffic, and vehicle speeds.

The meeting minutes for the February 19, 2015 public workshop are provided in **Appendix 3**. All public comments received from Phase I and Phase II are summarized for the entire corridor by geographic location. In addition, aerial maps with the comments from Phase I along with field observation notes that were presented at the February 2015 workshop are also provided.

During Phase I, Project Steering Committee Meetings were held in September and November 2012 and in April and July 2013. During Phase II, a Project Steering Committee Meeting was held on April 14, 2015. Comments and questions by the committee covered many of the subjects raised at the public workshop. Additional comments and questions included consideration of residents, funding, maintenance, medians, pedestrian tunnel passageways, the content and timing for the final report document, project priorities, and project specific locations.

A common theme of the public comments was concern that if accommodation for one group of roadway users (motorists, bicyclists, pedestrians) is improved or increased it would negatively impact the usage by other user groups. Another common theme expressed in the comments was that PCH is generally not safe, and that vehicle speeds are excessive. The public's and steering committee's input was utilized in finalizing the analysis and development of a list of recommended projects and policy recommendations for both phase I and II of the study.

4.0 SAFETY ASSESSMENT

During Phase 1, LSA Associates Inc. assessed the safety along the project corridor based on the existing conditions. The Corridorwide Safety Assessment Report (**Appendix 2**) defines safety concerns and identifies potential safety issues. A list of potential problems was identified to form the base for subsequent components of the PCH Safety Study.

Safety assessment is strongly dependent upon complete and accurate information on the location and relevant information from reported collisions. Traffic collision data is available in different formats. Reproductions of individual collision reports can be analyzed on both a qualitative and quantitative basis. These reports ultimately are the best source for unique information about each collision, but they do not lend well to assessment of recurring problems or issues unless aggregated into a database that summarizes collisions by location, date, and time, plus categories of collision factors, such as injuries, collision factors, and movements prior to collision. This information allows for greater ability to identify common problems that can point toward effective solutions.

Collision data for the past three years (2012 through 2014) was obtained from Statewide Integrated Traffic Records System (SWITRS) and the LA County Sheriff Department for the current Safety Study. The data provided from these sources provides much greater information about collision locations and characteristics, but some unique factors about PCH through Malibu pose challenges, especially regarding the precise location of collisions. Collisions are normally located based upon the distance and direction from the nearest intersection. The use of compass distance poses challenges because Caltrans considers PCH to be a north/south route, while it travels almost due east/west through Malibu. The same location can be mapped by some as 1000 feet west of an intersection or by others as 1000 feet north of the same intersection.

Additional challenges can arise from the distance between intersections and the presence of collision hotspots (such as mid-block crosswalks and crossing signals) that are not clearly defined by a single intersection. For these reasons, the Stantec team placed great emphasis upon preparing a clean database for collisions that included information from the SWITRS reports but located all collisions more precisely by a post mile system that is also used by Caltrans for locating improvements and defining points along the route.

Safety concerns were defined and potential safety issues were identified. A total of about 1,000 collisions were reported during the three-year period, with collisions reported along the entire length of PCH through the City. These included 376 injury collisions and 9 fatal collisions. The most common type of collisions were rear end collisions approaching signalized intersections. Collisions involving hitting parked cars and involving left or U-turns were also frequent categories.

Pedestrian collisions were much fewer in number and tended to involve pedestrians crossing PCH away from intersections or crosswalks. Pedestrian collisions almost always result in injuries and pedestrians were involved in a majority of the fatal collisions.

The majority of collisions involving bicycles consisted of the bicycle travelling straight and the vehicle turning across the cyclist's path. There are various places along PCH where there is not satisfactory room for bicyclists to travel on the shoulder due to narrowness or parked vehicles, but this condition did not appear regularly in collisions involving bicycles. These narrow conditions can contribute to collisions that did not directly involve bicyclists, such as lane changes or sudden slowing behind bicyclists that result in rear end collisions between vehicles.

A summary of the collisions and collision factors is contained in **Appendix 4**. This information is contained within a spreadsheet furnished to the City that can be sorted or filtered to do refined analysis by location or collision type.

5.0 ALTERNATIVES ANALYSIS

The Alternatives Analysis presents potential solutions and recommendations to improve safety along the PCH corridor. The alternatives analysis is based upon information derived from the collision summaries, information from specific collisions, and strategies that are widely known to be effective for reducing collisions of the type being experienced. For example, when rear end collisions were found to be about 1/3 of all collisions, strategies that are effective for reducing rear end collisions become promising.

Collisions involving fatalities, pedestrians, or bicycles do not tend to reveal concentrations. Measures to reduce the potential for these types of collisions that are more systematic and can be applied at multiple locations are often suggested. An example might be to improve street lighting at a dark uncontrolled intersection where pedestrian crossings may occur, because collisions involving pedestrians occur at this type of location.

Some recommendations are made to bring conditions up to accepted standards to meet legal standards or reduce liability. Improvements for disabled pedestrians are generally required legally when improvements are made for other purposes. These improvements can also improve safety for fully able pedestrians.

The Alternatives Analysis Report (**Appendix 4**) includes recommended alternative improvements that consist of generally buildable projects that would be effective in reducing collisions and injuries or that bring the roadway up to current standards. The corridor is, however, currently in compliance with legal standards. This appendix also includes analysis of the most frequently occurring collision types and an explanation for why the suggested improvements can be effective in addressing the problems noted.

The projects can be separated into four categories:

- Corridor-wide projects
- Projects that can be constructed readily at specific locations
- Complex projects that require further evaluation
- Projects that are primarily maintenance projects.

Over 130 measures are specifically suggested in the Alternatives Analysis report. All except for the more complex projects can potentially be implemented with assistance from Caltrans, but will require design, permitting, and construction. Projects that can be constructed readily must still go through a project-by-project evaluation to insure that they are in compliance with accepted practices and regulations, but their costs can be estimated reliably for budgeting purposes at this time. It should be noted that even the simplest of projects may require 12-24

months or more for completion, where procurement of services, design, bidding, and construction is required.

Complex projects generally require further feasibility study because of high and uncertain costs, involvement of multiple parties, the potential for effective alternative improvements to be identified through the analysis process, or feasibility questions. The cost to initiate and complete feasibility studies is suggested. Final construction costs will rely upon the results of the feasibility studies, and alternatives may arise from this process.

Approximately 25% of the recommended projects are classified as maintenance projects. These can be implemented readily and would normally be done by state maintenance forces. These mostly involve restoring sites to their intended condition and can involve replacement of faded signs, trimming of vegetation, or repair of damaged existing facilities. These can also include installation of new traffic signs, where justified.

While complete implementation of the alternatives is expected to improve safety for PCH, the safety improvement process will evolve continuously. Potential improvements that are not listed may emerge in the future or be suggested by stakeholders. The process should continue to be open to future suggestions or to the results of future studies.

6.0 PROJECTS PRIORITY AND GROUPING

Recommended improvements were generally rated to identify a point-based project merit score to allow for ranking by effectiveness, which may be used to guide implementation strategy. The point system placed an emphasis on alleviating existing safety issues (up to 5 points), with additional points for level of community support (up to 5 points), and benefits from congestion relief (up to 3 points). Negative points were assigned to projects based on complexity issues or institutional challenges, such as deviating from normal practices or requiring special permissions. Projects with no negative points are generally considered ready for implementation most readily while projects with negative points have greater uncertainty.

The Alternatives Analysis Report contains a list of recommended projects ordered by total merit score minus constraints. The highest ranked projects generally can be constructed readily and have potential to alleviate conditions contributing to greater numbers of collisions. These projects should potentially be undertaken first based upon funding available and expectation of minimal difficulty of implementation.

The project team generally recommends consideration of implementation or further evaluation of as many of the projects as possible. Some projects may be contingent upon other projects, but most projects have "independent utility" and can be done in isolation or in combination with others.

As a result of the ranking process, a prioritized list of recommended projects was developed. These individual projects were then grouped together to produce larger-scale project combinations which will make funding easier to obtain and implement. The projects were grouped based on their locations, scale, and similarities. For example, all projects involving modification of traffic signals located near each other should be grouped together for maximum effectiveness.

Conceptual design and construction costs were assigned to the grouped projects and are presented in **Appendix 4.** Additionally, a list of recommended project groupings sorted by priority is shown in **Appendix 4**.

7.0 FUNDING PLAN

Following approval of the study and recommendations by the City of Malibu, the City anticipates pursuing study recommendations for funding and implementation based largely upon the priority and logical grouping of individual alternatives. The City has already secured funding commitments for many projects. Some of these funding commitments are non-specific and can likely be applied to the project alternatives presented in this report.

Local, county, state, and federal funding sources are summarized in **Appendix 5**. Safety improvements that address existing safety issues often compete well for a variety of funding sources. To the extent that project features are directly connected to safety, project funding should not be difficult to find. Project features that are not as directly tied to safety can be more challenging for funding. These would include projects elements intended for aesthetics, new traffic capacity, or projects where high costs are not in proportion to existing safety issues.

8.0 CONCLUSION

The improvements recommended here are deemed by the Study Team to be the most effective measures for early action to address safety issues and the public's concerns along PCH in the City of Malibu. Other measures not specifically recommended by this study but identified by previous or future studies may also be feasible and effective.

A Public Safety/Public Works Commission Meeting will be held on May 21, 2015 to present and receive comment on the improvements recommended by the Study Team. After that meeting, the list of recommended improvements will be finalized based on input received, and this Draft Final Report will be updated.

The project team has appreciated the opportunity to work with the City of Malibu, SCAG, and Caltrans on this project. We are very confident that the implementation of project measures will produce a measurable decline in the number of collisions and their severity for Pacific Coast Highway and the City of Malibu.