

Exhibit A

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EXHIBIT A DISCUSSION

INTRODUCTION

The California Department of Transportation (Caltrans) proposes to remove and replace the bridge rails on the Garrapata Creek bridge. This bridge is one of seven historic bridges in Big Sur, six of which have open spandrel designs. All seven bridges are part of the Carmel San Simeon Historic District (CSSHD), a non-contiguous district named after the rural state highway constructed between 1922 and 1938, which stretches approximately 75 miles from the San Carpoforo Creek in San Luis Obispo County to the Carmel River in Monterey County. The Garrapata Creek Bridge is also individually eligible for listing on the National Register of Historic Places (NRHP) and the California Register of Historic Resources (CRHR).

PROJECT JUSTIFICATION AND ALTERNATIVES

Manual for Assessing Safety Hardware (MASH)

The Manual for Assessing Safety Hardware, also known as “MASH” is a set of design and testing parameters for bridge rails and other highway safety devices. One of the requirements of the MASH is that the rail designs be physically crash tested by running vehicles of different sizes into the rail based on existing traffic speeds. The current railings do not meet current MASH standards and could not be easily modified to comply with the standards.

Throughout this process, Caltrans staff have maintained that compliance with MASH is mandatory without exception, submitting the 2019 MASH Implementation Memo and references to the Caltrans Highway Design Manual (HDM), Supplemental Design Information Bulletin No. 79-04, and Traffic Safety Systems Guidance. Staff’s analysis is that exceptions to the MASH standards may be feasible. Staff reached out to various agencies but could not get a clear answer on exceptions to the standards. There is also no evidence that CalTrans pursued an exception to the standards that was rejected. Deciphering the information available, it appears that exceptions were not pursued because CalTrans is unwilling to jeopardize liability and health and safety of drivers and passengers in this case in exchange for avoiding impacts to visual and historic resources. Rather, CalTrans proposes to minimize impacts to visual and historic resources to the extent feasible while providing a bridge rail meeting current standards.

Traffic Speeds

This discussion relies on two different definitions of traffic speeds:

- The posted speed (or regulatory speed) is the speed limit at a particular location.
- The operating speed is the speed which drivers are driving at a location. The 85th percentile operating speed is the speed at which 85 percent of drivers are driving at or below.

One of the alternatives discussed in the EIR was reducing the speed limit to 45 miles an hour and using a replacement rail which more closely aligns with the historic appearance of the existing rails, such as the “C411”, a standard rail which is rated for a lower crash test level.

There are both statutory and safety reasons why the speed limit cannot be reduced in this location. The California Vehicle Code Section 22349(b) sets the speed limit on a two-lane undivided highway at 55 miles per hour. Section 22354 does allow Caltrans to reduce speed limits on the State Highway System, but they must make the finding that the reduction in speed

limit is “*most appropriate to facilitate the orderly movement of traffic and is reasonable and safe*”.

Caltrans conducted a speed survey in 2019 which determined the 85th percentile operating speed of drivers at Garrapata Creek Bridge was 58 miles an hour. The California Manual for Setting Speed Limits indicates that this 85th percentile operating speed is the speed that should be used to establish the speed limit. The studies cited in this manual indicate that reducing the speed limit below the 85th percentile generally results in increased collision rates. Therefore, it would not be possible to make the necessary findings to allow reducing the speed limit.

Additionally, the operating speed of a roadway is influenced by several factors, including but not limited to lane width, curve, line of site, obstructions, pedestrians, advisory speeds, and the posted speed (speed limit). The approach at Garrapata is straight and there doesn't appear to be any ability to alter the road geometry to induce lower speeds. The relationship between the posted speed and operating speed is also complex. Whether and how much posting a speed limit influences drivers' behavior is based on enforcement and other social and psychological factors. Even if the speed limit is reduced, which it can't be in this case, it would not necessarily reduce the operating speed of the highway. If the operating speed remains at around 58 miles an hour, designing a rail for 45 miles an hour would not be safe.

Replacement With a Different Rail Type

Looking at the possibility of using an alternative rail than the currently proposed 86-H more closely, MASH establishes different standards for different rail types based on the site-specific constraints, including speed. While not the only factor in selecting a rail at a particular location, the proposed 86-H is a rail designed for high speeds (greater than 45 miles an hour) to meet the MASH “TR-4” standard, while an alternative rail like the C411, was designed for low speeds (less than 45 miles an hour) to meet the MASH “TR-2” standard.

The reduced opening size was a concern of both the Land Use Advisory Committee (LUAC) and HRRB, and although it would still not match the dimensions of the existing rail, using the C411 rail would allow for taller (although it does not appear wider) openings. However, the C411 rail would not be appropriate at Garrapata Creek Bridge because of the design requirements for a rail rated to withstand impact at a higher speed.

The TR-4 standard used for the 86-H requires a higher base, thicker top rail, and the narrower arched openings. This is based on the fact that if a vehicle were to collide with the rail, the opening window can act as a “catch point” which hooks a cars bumper, causing it to rotate or flip and increasing the severity of accidents. The taller base height of the new rail increases the likelihood that a modern vehicle traveling at high speed would be redirected back into the lane after hitting a rail, and the reduced opening sizes mitigate the potential for catch points.

Repair

County staff asked if the bridge rails could be rehabilitated, generally, and notwithstanding Caltrans standards. In the Caltrans response December 6, 2022, District Chief of Maintenance and Caltrans' Structures Maintenance & Investigations (SM&I) states “Because the bridge rail is a safety feature, it must be brought up to MASH standards. Therefore, replacement is the only

repair strategy.”

Nevertheless, the evidence indicating that repair would likely be infeasible at Garrapata Creek Bridge is:

- The railings are in a significantly deteriorated state as evidenced from the 2021 report and photos Caltrans have submitted;
- Caltrans Structures and Maintenance Division reports from as early as 2009 recommended replacement due to the on-going deterioration of the rail, and their current analysis is that it the rail is unsafe at any speed; and
- County staff conducted a site visit on December 13, 2022. The observed deterioration was extreme, particularly on the south side, and, despite discussion that repair was not an option, it appeared that spawl and section repairs had been attempted at different locations in previous years and were not successful in stopping the on-going corrosion.





Figure 1: Photos of Bridge Rails dated December 13, 2022

DISTRICT & CUMULATIVE IMPACTS

Carmel San Simeon Highway Historic District

As stated in the introduction, this bridge is one of seven historic bridges in Big Sur, six of which have open spandrel designs. All seven bridges are part of the Carmel San Simeon Highway Historic District (CSSHHD), a non-contiguous district named after the rural state highway constructed between 1922 and 1938, which stretches approximately 75 miles from the San Carpoforo Creek in San Luis Obispo County to the Carmel River in Monterey County. The district includes 241 contributing elements, primarily engineering features which are a part of or adjacent to the highway, including culverts, fountains, stone wall features, and the seven Big Sur bridges.

The Carmel-San Simeon Highway Historic District is significant under National Register of Historic Places (NRHP) criteria A “... *associated with events that have made a significant contribution to the broad patterns of our history*” for its association with the highway beautification movement during the 1920’s and 30’s, and under criteria C “... *embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction*”, as representative of the extensive use of handcrafted masonry, generally executed by skilled by skilled masons.



Figure 2: An arcade-style masonry parapet and battlement parapet

The historical report prepared for the project describes the seven bridges as “*The most iconic and visually prominent historic engineering features located within the CSSHHD*”. Essential to understanding of the CSSHHD is its fundamental discontinuity. The highway itself is not a contributing feature due to its numerous alterations over time, and its boundary is defined around each of its 241 individual contributing elements. The 7 bridges and railings themselves already have discrete designs. Examples include Malpaso Creek Bridge, which has gabled railing openings, and Wildcat Creek Bridge, with closed spandrels and no rail openings whatsoever.

Therefore, while the project will adversely impact a contributing structure, the bridge will still be able to convey its historical significance and be a contributing structure to the CSSHHD; and Garrapata Creek Bridge having a distinct railing design will not affect the overall integrity of the district.



Figure 3: Wildcat Creek and Malpaso Creek Bridge

Future Bridge Rail Projects

Slightly distinct from the district itself, and while this permit is only for the Garrapata Creek Bridge, inclusion of the not yet proposed replacements on the other 5 other historic Big Sur Arches in the Tier I EIR and historical reports has brought into sharp focus how the decision on this project could influence the decision-making processes on the other bridges. Staff’s analysis is that it should not, and that all of the same questions that have been asked in this review process will still be relevant in consideration of each bridge rail.

Some consternation has been developed in the process of the consideration of this project. The consternation has been caused in part by a lack of clear project justification. Health and safety on the highway is paramount, but application of a standard for its own sake is a more nebulous justification. Standards are, however, often adopted for a reason. So bridging analytical gap between health and safety and the use of a standard in each case needs to be done in a clear, comprehensible, and succinct way.

Staff believes we have, though the EIR, and supplemental packages, received the necessary information for the Garrapata Creek Bridge. We have not for the other bridges, which will receive their own environmental and Coastal Development Permit review.

Consideration of the operating speed and speed limit at the other locations will be particularly important at all the other locations in this effort, as it will allow consideration of a MASH compliant rail rated for lower speeds that more closely maintains the historic character of the existing rails, such as the “TR-2” rated C411 rail. This would be in line with the stated purpose of the EIR, using a current safety standard compliant rail to ensure the reliability of the highway. To ensure the decision on this project does not preclude this kind of analysis, staff are recommending a condition to require a traffic report with a speed study and evaluation of possible ways of reducing speeds at a particular location as a requirement for the submittal of Coastal Development Permits for each rail project.

While not recommended as required because the timing of each proposal is unknown, a programmatic speed study of all the other bridges could be beneficial. If there are several bridges in a row which have significantly reduced speeds, lowering the speed along a contiguous stretch is something staff believes is worth exploring, as it could allow the use of a “TR-2” rail, be in line with the general traffic engineering principle that a uniform speed is preferable along a singular stretch of roadway, and prevent proliferation of additional signage along Highway 1, an aesthetic concern noted by a commenter at the last HRRB meeting.

HISTORIC ASSESSMENT – INDIVIDUAL BRIDGE

On December 1, 2022 Caltrans submitted an updated version of the historical report which included the “Finding of Adverse Effect” (FAE). This finding is a term of art specific to historical projects which require “Section 106” consultation under the National Historic Preservation Act, and includes the historic analysis requested at the previous hearing and in accordance with Monterey County Coastal Implementation Plan (CIP) section 20.145.110.B.



Figure 4: Garrapata Creek Bridge, February 1932

Garrapata Creek Bridge is one of seven iconic concrete arch bridges known as the “Big Sur Arches” on Highway 1. The bridge was constructed in 1931 by the Hanran Construction Company for the California Division of Highways Bridge Department and is the first concrete arch bridge constructed on the scenic Carmel-San Simeon Highway. The bridge was seismically retrofitted in 1987 and 1998.

The bridge is eligible for listing in the National Register of Historic Places (NRHP) and the California Register of Historic Places (CRHR), both under Criteria A/1, “*Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States*” for its association with the Highway Beautification Movement and construction of the Carmel-San Simeon Highway, and under Criteria C/3, “*Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values*” as an example of reinforced concrete bridge design and engineering from the 1920s-30s.

The bridge's character defining features are:

- Its use of re-enforced concrete materials;
- Its open spandrel;
- Fixed parabolic arch;
- Its six concrete T-beam approach spans;
- Its decorative cantilevered walkway; and
- Its decorative reinforced concrete railings with arched window design and smooth textured finish.

National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation is used evaluating the integrity of historical resources. Integrity is the ability of a property to convey its historical significance, and it contains seven aspects, which are defined and discussed

in relation to the project in the table below:

Aspect		Definition	Relation to Project
1.	Location	The place where the historic property was constructed or the place where the historic event occurred. The original location of a property, complemented by its setting, is required to express the property's integrity of location.	The bridge will retain its original location.
2.	Design	The combination of elements that create the form, plans, space, structure and style of the property. Features which must be in place to express a property's integrity of design are its form, massing, construction method, architectural style, and architectural details (including fenestration pattern).	The replacement of the rails will diminish the design integrity as the new bridge railings will have smaller openings and a larger base and baluster. The bridges substructure and spans will not be impacted.
3.	Setting	Addresses the physical environment of the historic property inclusive of the landscape and spatial relationships of the building(s). Features which must be in place to express a property's integrity of setting are its location, relationship to the street, and intact surroundings (e.g., neighborhood or rural).	The surrounding landscape and spatial relationships are not being modified, so there will be no impact to the setting.
4.	Materials	Refer to the physical elements that were combined or deposited during a particular period of time and in a particular pattern of configuration to form the historic property. Features that must be in place to express a property's integrity of materials are its construction method and architectural details.	The original material of the rails will be removed, but the bridge will still utilize concrete.
5.	Workmanship	Is the physical evidence of the crafts of a particular culture or people during any given period in history. Features that must be in place to express a property's integrity of workmanship are its construction method and architectural details.	The integrity of workmanship will be diminished as the original rails and end treatments to be removed will be replaced with modern precast elements.
6.	Feeling	Is the property's expression of the aesthetic or historic sense of a particular period of time. Features that must be in place to express a property's integrity of feeling are its overall design quality, which may	The feeling will be somewhat diminished as the original more minimal rail evokes a sense of time for drivers, pedestrians, and passengers.

		include form, massing, architectural style, architectural details, and surroundings.	
7.	Association	Is the direct link between an important historic event or person and a historic property. Features that must be in place to express a property's integrity of association are its use and its overall design quality.	The bridge will retain integrity its association with the construction of the highway and remain a contributing element to the Carmel San Simeon Historic

Table 1: Summary of Integrity Impact Assessment

Despite impacts to individual elements of integrity and one of its character defining features, after the project the bridge would still retain its overall integrity, remaining individually eligible for listing on the NRHP and CRHR.

In order to minimize adverse effects associated with the bridge, the architectural historian recommended developing a railing type that is visually compatible with the original bridge railing as possible. The result of this design effort has been the 86-H, which attempts to preserve as many of the features of the original railing as possible while still complying with the dimensional requirements of the MASH "TR-4" standard (See further discussion of this standard in the "Justification" section below). The design has been iterated several times to advance this goal and: it retains an arched opening type, which has been chamfered to maximize visibility while maintaining the maximum 6" width requirement of the standard; uses a rounded top pilaster consistent with the original rail with a similar vertical seam; locates major pilasters above the support structure, maintaining the same symmetry and visual relationships of the bridge; and maintains the same low 42" height of the original rails.

This is consistent with the development standard in CIP section 20.145.110.C.1., that development be modified to be compatible with a historical site through appropriate design, structural and architectural features, and other techniques recommended by the historian. The color in the conceptual renderings has been similarly iterated, with the original color being a darker grey, and more recent renderings using a warmer "sandier" beige tone. In accordance with this standard and CIP section 20.145.110.C.2., staff are recommending a condition of approval requiring a final color selection mockup be done, which shall match the existing rail color as closely as possible.



Figure 5: Proposed 86-H Rail



Figure 6: Existing Rail

VIEWSHED & VISUAL IMPACTS

Within Big Sur, development that is visible from Highway One is prohibited. Policy 3.2.5.C.1 of the Big Sur Land Use Plan provides an exception to the Critical Viewshed Policies for Highway One. This Policy states in relevant part: *“Road capacity, safety and aesthetic improvements shall be allowed, as set forth below, provided they are consistent with Section 4.1.1, 4.1.2, and 4.1.3 of this plan. Signs, guardrails, and restrooms shall be of a design complementary to the rural setting and character of Big Sur, with preference for natural materials. Protective barriers constructed by Caltrans should utilize boulders or walls of rock construction.”*

Policies 4.1.1, 4.1.2, and 4.1.3 are policies specific to Highway one in the Big Sur area. These policies establish a principal objective to maintain the highest possible standard of visual beauty and interest in the management, maintenance, and construction activities within the Highway 1 right-of-way. This particular project is a safety improvement and does not affect road capacity.

The proposed guardrail will be bulkier than the existing guardrail making views through the rail less accessible. This is in most part due to the smaller sizes of openings in the guard rail and the introduction of more posts and shorter spans of the open railing style. The height of the rail will remain the same. Efforts have been made by CalTrans to bevel the smaller openings giving them the appearance of larger openings and the final design retains the same general style of rail (concrete rail with arched openings between posts).

The proposed design is sensitive to the historic character and attempts to preserve views while still meeting current traffic safety standards. This appears to be consistent with the Big Sur Land Use Plan Policies.

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