

# Memorandum

**Date:** March 11, 2024  
**To:** City of Palo Alto - Philip Kamhi, Chief Transportation Official and Sylvia Star-Lack, Transportation Planning Manager  
**From:** Fehr & Peers - Steve Davis, PE and Meghan Mitman, AICP, RSP<sub>21</sub>  
**Subject:** **Review of El Camino Real Proposed Repaving Design in Palo Alto, California**

*SJ21-2081.10*

We have performed a review of the proposed repaving/restriping plan from Caltrans for the El Camino Real (State Route 82) Corridor in the City of Palo Alto. Our review considered the consistency of the proposed design with Caltrans' complete streets and safety policies<sup>1</sup> and national complete streets design best practices<sup>2</sup>, as well as the City's ongoing Bicycle Pedestrian Transportation Plan (BPTP) update and safety action plan efforts. It also considered the role of the El Camino Real Corridor in the City's land use plans, in particular planned high-density housing along the corridor, and the compatibility of the proposed design with the land use context and mode shift goals to meet the City's sustainability, affordable housing, and climate goals.

The best practice references for our review are rooted in the Safe System Approach, which recognizes the role of kinetic energy (speed and vehicle mass) and exposure as the root causes of severe injuries and fatalities, and requires a redundant, holistic, and proactive approach to address systemic risk. The core principles of the approach are to first reduce speed, and then to separate users in space and time consistent with the contextually appropriate speed. Caltrans has committed to Vision Zero and adopted the Safe System Approach as the roadmap to achieving that goal.<sup>3</sup>

---

<sup>1</sup> In particular, Caltrans newly-released Design Information Bulletin 94 (DIB 94), "Complete Streets Contextual Design Guidance: <https://dot.ca.gov/-/media/dot-media/programs/design/documents/dib-94-010224-a11y.pdf>

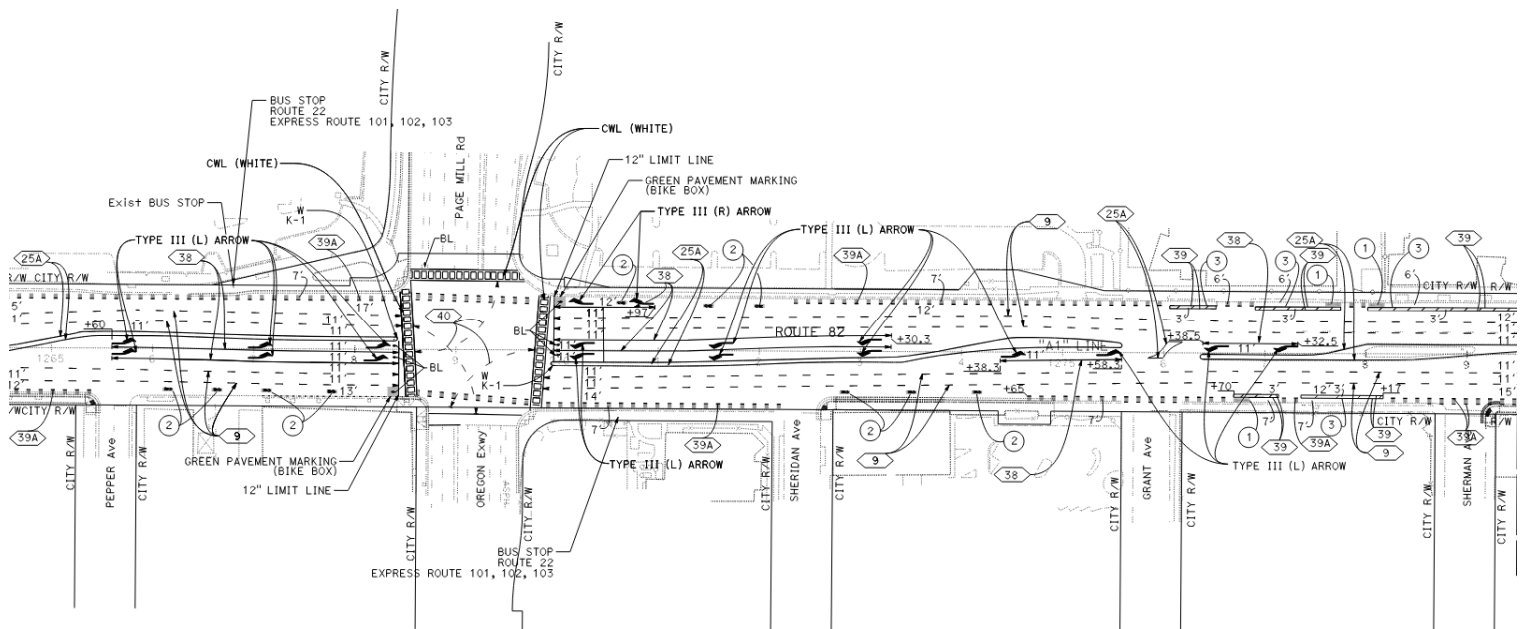
<sup>2</sup> In particular, the newly-released NCHRP 1036: Roadway Cross-Section Reallocation Guide: <https://www.trb.org/Publications/Blurbs/182870.aspx> and FHWA Safe System Roadway Design Hierarchy: [https://highways.dot.gov/sites/fhwa.dot.gov/files/2024-01/Safe\\_System\\_Roadway\\_Design\\_Hierarchy.pdf](https://highways.dot.gov/sites/fhwa.dot.gov/files/2024-01/Safe_System_Roadway_Design_Hierarchy.pdf)

<sup>3</sup> See Director's Policy on Road Safety DP-36: [https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/policy/dp\\_36-a11y.pdf](https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/policy/dp_36-a11y.pdf)



With this lens, overall we conclude the following:

- The proposed design does not address the high-speed conditions for through and turning movements, which contribute to the greatest kinetic energy risk (and therefore severe injury and fatality risk) for vulnerable road users in the corridor. In particular, the proposed design retains the number of vehicle travel lanes, retains wide travel lanes, removes the “friction” associated with on-street parking, and does not address turning movement speed at the intersections/conflict points. High speed and/or uncontrolled vehicle conflict points for pedestrians walking along and across El Camino Real are not addressed. A representative sample of design features are depicted in **Figure 1**.
- With frequent stretches of conventional bicycle lanes (Class II), some areas where bicycle lanes drop altogether (Class III), and no protected treatments for bicyclists at intersections as shown in **Figure 1**, high stress conditions persist for bicyclists traveling the corridor and these weakest links lead to an overall high stress condition that is likely to limit mode shift potential.
- As shown in **Figure 1**, new conflict points with bicyclists and buses may be introduced for bicyclists that currently ride on the sidewalk but shift to on-street riding in the new condition.



**Figure 1: Proposed El Camino Real modifications showing Class II and Class III bicycle facilities, including conflict markings through bus stops, in the vicinity of Page Mill Road / Oregon Expressway**

Source: Caltrans Draft 1/22/2024 Pavement Delineation Plans



As such, it is anticipated that the typical candidate bicycling populations would be affected in the following positive (+) or negative (-) ways:

TYPE OF BICYCLIST	EXISTING CONDITIONS	PROPOSED CALTRANS CONFIGURATION	POTENTIAL LOWER STRESS DESIGN
STRONG AND FEARLESS	Currently riding on the street	+ Will continue riding on the street and benefit from new separated (Class IV) facilities in some stretches	+ Will continue riding on the street and benefit from new separated facilities as well as easy access to turns off and on ECR
ENTHUSED AND CONFIDENT (OR BICYCLE DEPENDENT)	Currently riding on the sidewalk, at times contra-flow	+/- Will either continue to ride on the sidewalk or shift to the street and now face new conflicts with buses and more challenging turns onto and off of ECR	+ Will likely shift to on-street riding, removing the challenges associated with contra-flow sidewalk riding
INTERESTED BUT CONCERNED	Not currently riding on ECR	- Likely to continue to avoid ECR or choose to drive instead because of weakest links	+ May be open to riding on ECR, including a wider range of ages and abilities (i.e., 8-80 year olds)



Recommendations to consider regarding these concerns include:

- In the short term, as adjustments to the proposed design:
  - Eliminate the bus/bicycle conflict and long stretches of conventional bicycle lanes with conflict markings by considering/piloting stop-in-lane bus stops and shared bike lane/boarding islands (such as present in the pilot on El Camino Real in South San Francisco shown in **Figure 2**)



**Figure 2: Pilot separated bikeway with bus boarding island accommodating bicyclists implemented in South San Francisco in coordination with Samtrans and Caltrans**

Source: Silicon Valley Bicycle Coalition<sup>4</sup>

- Where sufficient width is not available for both right-turn lanes and separated bicycle lanes, consider alternative treatments based on intersection characteristics, such as restriping a through lane to a shared through-right lane to maintain separated bicycle lanes, separating signal phasing for right turning vehicles and through bicyclists, and/or implementing a protected intersection.

<sup>4</sup> <https://bikesiliconvalley.org/news/2023/8/pilot-project-pitches-protected-bike-lanes-on-el-camino-real-to-south-san-francisco-residents>



- Provide “paint and plastic” protected intersections, dedicated intersections, and two-stage turn opportunities, consistent with NACTO’s “Don’t Give Up at the Intersection”<sup>5</sup> guidance for addressing weakest links for low stress design.
- Narrow lane widths in accordance with DIB 94 to increase buffer space and/or bicycle lane width.
- Provide “paint and plastic” geometric reconfiguration at intersections to slow turning speeds and shorten pedestrian crossing distances.
- Review all signals to provide leading pedestrian intervals, protected left turn (or split) phasing where feasible, and adequate pedestrian clearance intervals.
- Provide “No Right Turn On Red” signage as required for addition of bicycle boxes, particularly where the proposed plans provide space for bicycles to stop at the front of shared through-right or dedicated right-turn lanes.
- Consider extension of separation treatments on Class IV facilities at intersections with minor side streets in lieu of 50 to 200 feet of dashed bike lane line, allowing an increase in the amount of physical separation provided on the corridor consistent with Safe System Approach goals.
- In the medium term:
  - Consider removing one travel lane in each direction and restoring on-street parking to slow traffic, allow protected corners at intersections, shorten crossing distances, provide a more substantial buffer for bicyclists, and be more compatible with the mode shift goals, context, and safety needs of the corridor.
  - Convert all quick-build enhancements to permanent treatments, including reviewing all signalized intersection geometry and controls, especially those with skewed/high speed angles and/or missing crosswalk legs.
  - Determine additional midblock crossings that may be needed to serve desire lines for pedestrians and bicyclists traveling to key destinations in the corridor, including bus stops.
  - Review access management opportunities to reduce conflict points.

---

<sup>5</sup> <https://nacto.org/publication/dont-give-up-at-the-intersection/>