



 Keep Eureka Beautiful

March 3, 2021

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via email: david.morgan@dot.ca.gov
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RE: Requested Near-Term Safety Improvements to Broadway North of Truesdale Street

Mr. Morgan:

Broadway is one of Humboldt County's critical transportation corridors. Currently, however, it does not provide safe transportation opportunities for non-vehicular road users, and it effectively blocks access to key destinations including the Waterfront Trail and the coast for many residents and visitors. As you know, rapidly and effectively addressing the bicycle and pedestrian safety crisis on Broadway is our top priority. The City of Eureka, Humboldt County Association of Governments, external stakeholders and the public have all expressed similar views in public meetings over the last year. The California Office of Traffic Safety ranks Eureka fourth among 97 comparable cities for fatal and injury collisions, second for pedestrians and 12th for bicyclists. Between 2009 and 2019, approximately 16% of fatal and severe injury collisions in Eureka occurred on just one road: Broadway.¹ 21% of fatal and severe pedestrian collisions and 27% of fatal and severe bicycle collisions occurred on Broadway. Local residents have also reported numerous collisions, near misses, and hazards on the Broadway corridor through the online Street Story platform.²

¹ UC Berkeley. 2021. Transportation Injury Mapping System. tims.berkeley.edu/.

² <https://streetstory.berkeley.edu/>.

Following up on the meeting between you, Jaime Matteoli and the Coalition for Responsible Transportation Priorities on February 19, 2021, we are writing to provide additional detail on the near-term safety improvements that we are requesting for the Eureka Broadway corridor and the justifications for those requests. We strongly support the Broadway Complete Streets project that is currently under development for the Herrick to Truesdale segment, and we will continue to engage with that project team regarding any needed changes to that segment of the Broadway corridor. Therefore, we are limiting our comments here to the section of the Broadway corridor north of Truesdale Street.

Mid-Block Pedestrian Crossings

We support the addition of mid-block pedestrian crossings at the locations previously identified by the City of Eureka (“City”) and included in the adopted Eureka Broadway Multimodal Corridor Plan’s recommendations for Near Term Safety Improvements:

- Between Vigo Street & Hawthorne Street
- Just south of Del Norte Street
- Between Clark Street & Cedar Street

We believe that the criteria used to identify these locations were appropriate, including position relative to bus stops and other pedestrian destinations, distance from other pedestrian crossing infrastructure, and history of collisions. We suggest following National Association of City Transportation Officials (NACTO) guidelines, which recommend mapping pedestrian, bicycle and vehicle patterns as the City did, and ensuring that pedestrian crossings are close enough together to discourage noncompliance.³ We appreciate that Caltrans plans to develop the Del Norte Street (“Village Pantry”) crossing in the near future, and request that your agency develop the other two identified crossings as well.

At these crossing locations, we specifically request the following improvements:

- Pedestrian Hybrid Beacons (PHBs). The adopted Eureka Broadway Multimodal Corridor Plan calls for either flashing beacons or PHBs as near-term safety improvements. Rectangular Rapid Flashing Beacons (RRFBs) are meant to increase drivers’ awareness of pedestrians but do not require drivers to stop or yield. In our experience, they are not effective at stopping heavy traffic on multi-lane roadways such as Broadway. In heavy traffic, they are completely unusable by people with blindness and low vision. PHBs, in contrast, have a red light which stops all traffic when actuated to allow any pedestrian to safely cross. Section 4F.01 of the California Manual on Uniform Traffic Control Devices (MUTCD) recommends use of a PHB where the plotted point representing vehicles per hour and pedestrian crossings per hour falls above the curve for either Figure 4F-1 or 4F-2 at the peak hour. In this case, posted speed limits in these areas of

³ NACTO. Undated. Urban Street Design Guide: Crosswalks and Crossings. <https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/>.

Broadway are 35 mph or lower, so Figure 4F-1 is the relevant standard. Each of the three identified mid-block crossing locations clearly meet this standard for recommending a PHB, as follows:

- Between Vigo Street & Hawthorne Street: The crossing distance here is approximately 80 feet, and the average peak hour traffic is approximately 2,398 vehicles.⁴ Per Figure 4F-1, a minimum of 20 pedestrian crossings in the peak hour would be required to recommend a PHB. Casual observation indicates that the number far exceeds 20 in the peak hour.
- Just South of Del Norte Street: The crossing distance here is approximately 85 feet, and the average peak hour traffic is between 2,330 and 2,398 vehicles.⁵ Per Figure 4F-1, a minimum of 20 pedestrian crossings in the peak hour would be required to recommend a PHB. Casual observation indicates that the number far exceeds 20 in the peak hour.
- Between Clark Street and Cedar Street: The crossing distance here is approximately 60 feet, and the average peak hour traffic is between 2,330 and 2,483 vehicles.⁶ Per Figure 4F-1, a minimum of 20 pedestrian crossings in the peak hour would be required to recommend a PHB. Casual observation indicates that the number far exceeds 20 in the peak hour.
- Additional Crossing Improvements. With the exception of the type of beacon, we support the crossing design developed by the City and included in the adopted Eureka Broadway Multimodal Corridor Plan’s recommendations for Near Term Safety Improvements. Specifically, we request high-visibility crosswalks, bulbouts on both sides, and pedestrian refuges. The MUTCD requires PHBs to be installed with crosswalks and other markings (Section 4F.01). High-visibility crosswalks—also known as longitudinal or “ladder” crosswalks—are one of the types of crosswalk markings allowed by the MUTCD (see Section 3B.18) and produce greater driver detection distances, improving pedestrian safety.⁷ Bulbouts and refuges reduce pedestrian crossing distance and thus exposure to vehicular collision. Bulbouts also increase driver yielding behavior and pedestrian visibility.⁸ Bulbouts should provide cut-throughs for bicyclists as needed.

Improvements to Existing Signalized Intersections

⁴ GHD. 2021. Eureka Broadway Multimodal Corridor Plan, Table 4.8.
<https://www.eurekabroadwaycorridorplan.com/>.

⁵ Ibid.

⁶ Ibid.

⁷ US Department of Transportation. 2011. Evaluation of Pedestrian and Bicycle Engineering Countermeasures: Rectangular Rapid-Flashing Beacons, HAWKS, Sharrows, Crosswalk Markings, and the Development of an Evaluation Methods Report. https://nacto.org/wp-content/uploads/2015/04/pedestrian_and_bicycle_engineering_countermeasures_fitzpatrick.pdf.

⁸ Oregon Department of Transportation. 2005. Pedestrian Safety Impacts of Curb Extensions: A Case Study. file:///C:/Users/Admin/AppData/Local/Temp/dot_22856_DS1.pdf.

Existing pedestrian infrastructure at many signalized intersections on Broadway is insufficient. Improving signalized intersections would both increase the safety of pedestrians crossing in those locations and encourage more pedestrian compliance. We request the following improvements:

- **Bulbouts and Pedestrian Refuges:** Bulbouts should be provided on all corners of all signalized intersections for the same reasons identified above for mid-block crossings, and pedestrian refuges on all legs. Additionally, bulb-outs at intersections increase pedestrian safety by slowing vehicular turning movements and provide greater opportunities for leading pedestrian intervals.⁹ Bulbouts should provide cut-throughs for bicyclists as needed. Intersection bulbouts and pedestrian refuges are identified as near-term safety improvements in the adopted Eureka Broadway Multimodal Corridor Plan.
- **Signal Reprogramming:** Traffic signals should be reprogrammed to provide leading pedestrian intervals. Leading pedestrian intervals are specifically allowed by MUTCD Section 4E.06 and are identified as a near-term safety improvement in the adopted Eureka Broadway Multimodal Corridor Plan. Leading pedestrian intervals can reduce vehicle-pedestrian collisions by up to 60%.¹⁰ Leading bicycle intervals should also be provided as needed. In addition, signals should be reprogrammed to reduce pedestrian delay. Delays of greater than 40 seconds at signalized intersections can reduce pedestrian compliance.¹¹ The intersections at 14th Street, Wabash Avenue, and Henderson Street all have particularly high concentrations of fatal or severe bike or pedestrian crashes from 2009 to 2019, suggesting that these are particularly high priority intersections. However, pedestrian collisions are spread relatively evenly throughout the corridor over time, demonstrating the need for widespread improvements. Therefore, we request that all signals on Broadway be reprogrammed according to these principles.
- **High-Visibility Crosswalks on All Legs:** High-visibility crosswalks are important at intersections for the same reasons identified above for mid-block crossings. Additionally, it is critical to mark crosswalks on all legs of a signalized intersection. Failure to mark some legs of an intersection will lead to lower compliance and greater risks for pedestrians.¹² All intersections on Broadway which currently lack high-visibility crosswalks on all legs should be upgraded.
- **No Right Turns on Red:** It has long been known that allowing right turns at red lights increases the rate of bicycle and pedestrian crashes.¹³ These turning movements should

⁹ NACTO. Undated. Urban Street Design Guide: Curb Extensions. <https://nacto.org/publication/urban-street-design-guide/street-design-elements/curb-extensions/>.

¹⁰ NACTO. Undated. Urban Street Design Guide: Leading Pedestrian Interval. <https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/traffic-signals/leading-pedestrian-interval/>.

¹¹ NACTO. Undated. Urban Street Design Guide: Crosswalks and Crossings.

¹² Ibid.

¹³ Preusser, David, William Leaf, Karen DeBartolo, Richard Blomberg, and Marvin Levy. 1982. The effect of right-turn-on-red on pedestrian and bicyclist accidents. *Journal of Safety Research* 13(2): 45-55.

be prohibited at intersections on Broadway to reduce the high crash rate. MUTCD Section 2B.54 recommends use of “No Turn on Red” signs where there are an unacceptable number of conflicts between pedestrians and turning vehicles. Although data for this type of conflict are lacking on Broadway, at least one Street Story report details a near-miss of a pedestrian by a right-turning vehicle at a signalized intersection, and many reports complain of a general failure of drivers to yield at these intersections.

Bicycle Infrastructure

We request the construction of Class IV (separated) bikeways from Truesdale Street to 4th Street. The adopted Eureka Broadway Multimodal Corridor Plan shows that the right-of-way from Truesdale Street to Wabash Avenue is a minimum of 96 feet, and generally at least 98 feet (Appendix H). Example cross-sections created for the Plan make it clear that this is more than enough right-of-way for Class IV bikeways with horizontal buffers once the (rarely used) parking lanes are removed.

From Wabash Avenue to 4th Street, the minimum right-of-way is 65 feet, and generally at least 70 feet. If the two-way turn lane is replaced with a raised median, example cross-sections in the Plan show that this is sufficient right-of-way to provide Class IV bikeways with vertical separation (but minimal horizontal buffers).

All of the Broadway corridor provides sufficient right-of-way to provide Class IV bikeways meeting MUTCD standards (Section 9C.102). Bicycle collisions were spread relatively evenly throughout the corridor between 2009 and 2019, emphasizing the importance of comprehensive improvements. It is important to note that safe bicycle infrastructure is associated not just with increased bicyclist safety, but also with increased safety for all other road users.¹⁴ This provides an even stronger argument for implementing these improvements in the near term.

The most challenging aspect of these bicycle improvements will be at intersections with dedicated left-turn lanes north of Wabash Avenue. The adopted Plan demonstrates the possibility of shared right-hand lanes at these intersections. We request instead that bike boxes be installed covering both of the through-lanes. If these boxes are made to extend to the back of the dedicated left-turn lane, this design will minimize conflict within the existing right-of-way. Bike boxes increase safety by increasing bike visibility and reducing vehicular encroachment into crosswalks, and deeper boxes result in less vehicular encroachment.¹⁵ They can and should be marked in a way that complies with MUTCD guidance.¹⁶

¹⁴ Marshall, Wesley and Nicholas Ferenchak. 2019. Why cities with high bicycling rates are safer for all road users. *Journal of Transport & Health* Vol. 13.

¹⁵ NACTO. Undated. *Urban Bikeway Design Guide: Bike Boxes*. <https://nacto.org/publication/urban-bikeway-design-guide/intersection-treatments/bike-boxes/>.

¹⁶ *Ibid*.

To save money and time, most or all of these bicycle improvements can be made using quick-build materials and techniques. Generally, one of the only downsides of a quick-build process is the limited opportunity for public engagement.¹⁷ In this case, however, the just-adopted Eureka Broadway Multimodal Corridor Plan involved extensive public engagement which showed strong support for these concepts.

Pedestrian-Scale Lighting

Nationwide, the vast majority of pedestrian fatalities occur during night-time hours.¹⁸ On Broadway, 55% of reported fatal and severe bicycle and pedestrian collisions from 2009 to 2019 occurred during night-time or low-light conditions. While Broadway has good coverage of vehicular-scale lighting, it completely lacks pedestrian-scale lighting. Pedestrian-scale lighting is lower to the ground and brighter, and focused on increasing pedestrian comfort and safety as well as pedestrian visibility to drivers.¹⁹ We request pedestrian-scale lighting throughout the Broadway corridor.

Raised Medians & Landscaping

The adopted Eureka Broadway Multimodal Corridor Plan identifies access management through raised medians as a near-term safety measure. We support this measure, and request its implementation throughout the corridor as appropriate to reduce conflicts from turning vehicles.

We further request the installation of street trees and other appropriate landscaping, both on these raised medians and on the roadside in areas where right-of-way permits planting without obstructing the sidewalk, including on the bulbouts which we have requested above. Example cross-sections and diagrams in the adopted Plan show the great aesthetic potential of such landscaping, and research shows that it can substantially reduce the collision rate on urban arterials.²⁰

Comprehensive Changes

As noted throughout this letter, traffic safety on Broadway—particularly for pedestrians and bicyclists—is at crisis levels. Serious hazards exist throughout the corridor due to consistent design elements, as reflected in the history of fatal and severe injury collisions. In this context, making one or two changes in the corridor will likely have negligible effects. We strongly believe that the comprehensive set of changes requested in this letter is needed to significantly

¹⁷ Alta Design and California Bicycle Coalition. 2020. Quick Build Guide. <https://www.calbike.org/wp-content/uploads/2020/10/Quick-Build-Guide-White-Paper-2020.pdf>.

¹⁸ Insurance Institute for Highway Safety. 2018. Fatality Facts 2018: Pedestrians. <https://www.iihs.org/topics/fatality-statistics/detail/pedestrians>.

¹⁹ US Department of Transportation: Federal Highway Administration. Undated. Pedestrian Safety Guide and Countermeasure Selection System: Lighting and Illumination. http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=8.

²⁰ Mok, Jeong-Hun, Harlow Landphair, and Jody Naderi. 2006. Landscape Improvement Impacts on Roadside Safety in Texas. *Landscape and Urban Planning* 78:263-274.

improve safety on the corridor. We request that you implement as many of these changes as possible, as quickly as possible.

Thank you for considering our requests. We remain open and interested in further conversation.

Sincerely,

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