



# City of Emeryville

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**VIA FIRST CLASS MAIL AND EMAIL ([MacArthurMaze@dot.ca.gov](mailto:MacArthurMaze@dot.ca.gov))**

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P.O. Box 23660, MS 8B  
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Re: MacArthur Maze Vertical Clearance Project ("Project")

Dear Ms. De Pont:

On behalf of the City of Emeryville ("City"), I write to submit comments on the Initial Study with Proposed Negative Declaration/Environmental Assessment ("ND") regarding the above-referenced Project. As an initial matter, Public Resources Code section 21092.4(a) requires the lead agency to consult with transportation planning agencies and public agencies that have transportation facilities (as defined in Public Resources Code section 21092.4(b)) within their jurisdictions that could be affected by the project in the same manner as the lead agency would consult with a responsible agency. The ND was signed on January 15, 2019. However, the City received its first notification of the Project with a notice for a Project Development Team (PDT)/Stakeholders meeting on February 6, 2019. This notice is in stark contrast to the consultation efforts the agencies have undertaken with respect to the I-80/Ashby Avenue (SR-13) Interchange Improvements. The notifications Caltrans sent to the general public, which included the City, does not constitute the consultation envisioned by the Public Resources Code. The City's preference would be to partner with Caltrans to address the Project's impacts on Emeryville residents and businesses. However, because Caltrans did not consult with the City prior to the release of the ND as required by Public Resources Code section 21092.4, the City is compelled to submit these written comments<sup>1</sup> on the ND.

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<sup>1</sup> Based on their skill and expertise, City Public Works staff, Andrew Clough, PG, Public Works Director, and Ryan O'Connell, P.E., Senior Civil Engineer, and City Planning staff, Charles S. Bryant, AICP,

The traffic impacts from this Project, especially during construction, will be acutely felt by the Emeryville community. While the City of Emeryville has a relatively small residential population compared to its neighbors, the City is a regional hub for commercial and retail activity. The City's daytime population increases to approximately 32,000, and the Project's impact on these commuters will be significant. The City is also unique in that funding for City services is largely reliant on more economically sensitive revenues such as sales tax, transient occupancy tax and business license tax, unlike other cities who are able to rely on more stable property tax. Should the Project affect the City's economic drivers, it could negatively impact the City's ability to sustain services to the entire community. For all of the reasons described in detail below, the City requests that Caltrans withdraw the proposed ND and complete a more thorough, adequate analysis of the project, as required under the California Environmental Quality Act (Public Resources Code, § 21000, et seq.) and its own policies and procedures.

Due to the inadequate analysis of the ND, it remains unclear whether the City should also be named as a responsible agency. The Traffic Management Plan, a Project feature, will presumably require the City to participate in any such plan. The closure of certain segments of I-80, I-580, and I-880 as contemplated by the Project may impact major local arterials (such as Frontage Road, Powell Street, Christie Avenue, Shellmound Street, 40<sup>th</sup> Street, Ashby Avenue, 7<sup>th</sup> Street, W. Grand Avenue), nearby on and off-ramps, and public transportation, such as the Emery Go-Round, provided by the Emeryville Transportation Management Association, and will require Caltrans to reimburse the City for the expenses the City will incur as a result of such detours<sup>2</sup>. If the City is required to carry out a portion of the Project, then the City should be named as a responsible agency. In the meantime, the City's comments related to the inadequacy of the ND follow below.

**I. The ND does not adequately describe either baseline freight conditions or Project-caused freight conditions.**

The ND lacks a basis for its conclusion that the Project will have no change in capacity or configuration of the current freeways. (See, e.g., ND, pp. 23, 55.) A change in the vertical clearance is a change in the capacity and configuration of the freeways. As the ND states: "This project would allow freight vehicles more direct access to and from the Port of Oakland." (ND, p. 22; see also p. 55.) Furthermore, Appendix G to the Alameda County Transportation Goods Movement Plan (2016)<sup>3</sup> ("Goods Movement Plan") states that the Port of Oakland forecasts a 233% increase in freight tonnage from 2012 to 2040 (from 17,381 to 40,445 thousand tons per year). This Project will allow additional clearance for trucks to take new routes that they are not able to do under the current conditions. Accordingly, the Project will have an impact, and the question becomes how significant is the impact? To analyze that issue, information about baseline traffic characteristics for the Project area, such as truck routes, traffic volumes, and delays from

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Community Development Director and Diana Keena, AICP, Associate Planner have contributed to these comments.

<sup>2</sup> Streets and Highway Code § 93.

<sup>3</sup> Available at <https://www.alamedactc.org/planning/goodsmovement/>. Last visited on 3/19/19.

existing conditions is needed. The analysis should also include a comparison to the new traffic characteristics of opening these bridge spans to taller trucks. Unfortunately, the ND does not contain any information about such characteristics.

In addition, the ND's oversimplification of the purpose and need statements is problematic. The Caltrans' Draft Project Report for Route 80/580/880 Separation (EA 4K8100), dated 2/6/2019 ("Draft Project Report") for this Project states: "The purpose of this project is to increase the vertical clearances to current standard at three locations in the Maze **to eliminate lengthy, time-consuming, and costly detours of large freight vehicles transporting goods through the I-80 connectors.**" The bolded language was simplified when the purpose statement was restated in the ND. The language changed to, "**that impede the safe and efficient movement of freight vehicles through the interchange.**" The ND then only mentions the roadway vertical deficiencies as the need for the Project. However, the Draft Project Report not only includes vertical deficiencies as a purpose and need for the Project, but also elaborates on the goods movement needs as a basis for this Project. The Draft Project Report states that the current height restrictions "hinder the continuous movement of large or heavy freight loads. Because these connectors are not useable by larger or heavier loads, the trucks carrying these loads need to make lengthy detours around the bridges. Besides requiring extra time, these detours also generate extra greenhouse gas (GHG) emissions and other pollutants."<sup>4</sup> Although both the ND and Draft Project Report mention the large or heavy freight loads as a quasi-"need" for the Project, there are no metrics or information given for the baseline conditions, volumes, and routing. In addition, neither analyzes the future forecasted volumes and routing of freight traffic after this Project is completed (along with completion of other vertical clearance projects on I-80). This last sentence alone constitutes sufficient reason to withdraw the ND and to re-do the environmental analysis for this Project.

The City requests that Caltrans includes information about the current traffic characteristics of all modes (explicitly highlighting truck routes, loads, special permit frequency, and special permit routing), and the projected traffic characteristics as a result of the Project and its alternatives. The flaw in the analysis of traffic conditions permeates into the other analyses in the ND that rely on the faulty conclusion that the Project does not change the capacity or configuration of the freeways. For example, for air quality, the ND states: "The proposed project is exempt per 40 CFR 93.126 as it would not increase the capacity of the MacArthur Maze or move the alignment closer to sensitive receptors" (ND, p. 24). Caltrans should update all analyses that rely on the erroneous conclusion about no change in capacity or configuration of the freeways.

Finally, the ND concludes that the Project would not have impact on population and housing and would have no growth inducing impacts. (See, e.g., ND, p. 23 and p. 68) However, the Goods Movement Plan provides that: "Goods movement is critical to the County's economy, with about one-third employment coming from goods movement-dependent industries...." (Goods Movement Plan, p. 14.) Caltrans should analyze

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<sup>4</sup> Caltrans' Draft Project Report for Route 80/580/880 Separation (EA 4K8100), dated 2/6/2019.

whether the increased capacity for freight traffic will result in additional job creation, which in turn, could result in additional traffic, and demands on housing, as the population may increase as people move nearby to fill jobs created by the Project.

**II. The ND does not adequately analyze the Project's impact on alternative forms of transportation.**

**A. Alternative C will permanently displace a critical transit facility serving Emeryville.**

Ironically, the ND concludes that "The proposed project complies with the following plans: Sustainable Transportation Plan - The City of Emeryville." (ND, p. 22). However, the ND did not analyze the impacts of the Project and its alternatives on the Emery Go-Round. If it had, it would reach a different conclusion. Emery Go-Round is a free shuttle that is open to the public and connects the MacArthur BART station to businesses, residences, schools and other origins and destinations in Emeryville. It moves more than 5,500 passengers per day.<sup>5</sup> It is owned and operated by the Emeryville Transportation Management Association ("ETMA"). However, pursuant to the City's General Plan<sup>6</sup> Policy T-P-34, the City supports and subsidizes Emery Go-Round because it offers free transit for both local travel within the City and travel to the regional hubs located at the Amtrak station, the MacArthur BART station, and San Pablo Avenue at 40<sup>th</sup> Street.

ETMA is currently operating the fleet for Emery Go-Round at a temporary location within the City. It may only operate at its current location until April 15, 2020. ETMA has obtained a conditional use permit from the City of Oakland<sup>7</sup> for a new site for operations located on Caltrans property. Accordingly, ETMA and Caltrans are in the process of executing a long-term lease for site ALA 580-34 with the Caltrans Airspace Lease Department.<sup>8</sup> The site is adjacent to Mandela Parkway underneath the bridge spans for WB/EB 80 to EB 580.<sup>9</sup> Although the site is located in Oakland, it is the only available site that is in close enough proximity to Emeryville and of a size that will allow the ETMA to continue to operate Emery Go-Round at its current service levels. The ETMA is conducting environmental technical studies and preparing a design submittal.

The ND concludes "The project would have no permanent impacts to traffic or transportation or pedestrian and bicycle facilities." (ND, p. 23.) Similarly, the ND also concludes: "The alternatives for this project would not impact the current or future land use in this area. There will be no changes in access or permanent impacts to any parks

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<sup>5</sup> ETMA Annual Ridership Survey, available at [https://www.emerygoround.com/assets/etma-agenda-packet\\_jan2019.pdf](https://www.emerygoround.com/assets/etma-agenda-packet_jan2019.pdf). Last accessed 4/2/19.

<sup>6</sup> The General Plan is available at <https://www.ci.emeryville.ca.us/385/General-Plan-and-Supporting-Documents>. Last accessed on 3/19/19.

<sup>7</sup> Oakland CUP Approval Letter/Resolution, available at [https://www.emerygoround.com/assets/etma-agenda-packet\\_april182019.pdf](https://www.emerygoround.com/assets/etma-agenda-packet_april182019.pdf). Last accessed on 4/17/19.

<sup>8</sup> In December 2018, the California Transportation Commission authorized District 4 to negotiate the terms of the lease with the ETMA; see also ETMA Board Agenda for April 18, 2019, at [https://www.emerygoround.com/assets/etma-agenda-packet\\_april182019.pdf](https://www.emerygoround.com/assets/etma-agenda-packet_april182019.pdf)

<sup>9</sup> Emery Go-Round Yard Location Map (Attachment A).

or trails, residences, or undeveloped land from this project.” (ND, p. 22; see also p. 23). However, Alternative C would permanently block access to site ALA 580-34. Without this site, ETMA will have no future facility to base its operations. If Emery Go-Round ceases to operate, the 5,500 passengers that are moved daily by Emery Go-Round will need to find alternative means of transportation, which may include single rider vehicle trips, leading to worsening traffic conditions, and air quality conditions. Accordingly, the City requests that Caltrans analyze the impacts that the Project and its alternatives may have on the operations of Emery Go-Round.

Finally, Alternative C, which requires completely rebuilding the structures, should be abandoned. Such a rebuild would only be required if there were structural deficiencies. However, at the community meeting held in Emeryville on April 10, 2019, Caltrans’ staff stated that all of the bridges have been seismically retrofitted recently and that there are no structural deficiencies. Accordingly, Alternative C is not necessary.

#### **B. The Project will impact regional transit provider AC Transit.**

Detour traffic could impact AC Transit routes, reducing reliability and increasing travel times. Impacted routes on Shellmound and 40<sup>th</sup> streets include the 57 and 36 local routes and the F, J and C Transbay routes. Together, these routes move over 10,000 riders on a daily basis. The 29 local route on Hollis Street could also be affected, which would impact an additional 1,348 daily riders.

Also, the Caltrans TMP Guidelines call for “special arrangements with local transit services to encourage transit trips and contributing funds to accommodate a significant increase in ridership.” The City stresses the importance of Caltrans working closely with all local transit agencies to develop strategies to encourage alternate modes of transportation. Fewer vehicles on the roadway improves the safety of the Project’s construction workers and commuters alike.

#### **C. The Project will impact bicycle/pedestrian facilities.**

In addition to failing to identify the impacts on Emery Go-Round and AC Transit, the ND does not adequately analyze the impacts of the Project on the Regional Bay Trail. First, all Project alternatives include using the existing Bay Bridge Trail segment for staging and site access, and such use “may require rerouting, realignment, and/or overhead protection during construction.” (ND, p. 11.) The ND should analyze whether this impact on the Bay Bridge Trail will result in additional traffic if there is closure of the trail and users use other modes of transportation.

In addition, the ND does not analyze the impacts of the Project on a planned segment of the Regional Bay Trail. Figure 3-5 of Emeryville’s General Plan is a map of the planned Regional Bay Trail, which shows the Bay Trail making a connection from Emeryville to West Oakland by way of Halleck/Beach/Wood to Mandela Parkway. The ND concludes that the Project does not impact any current or future land uses (ND, p. 22), but such conclusion is not supported without an analysis of how the Project impacts the planned

Regional Bay Trail. Accordingly, the ND should analyze the Project's impacts on this planned segment of the Regional Bay Trail.

**III. The ND fails to analyze the significance of the traffic impacts during construction of the Project.**

**A. The Project description is inadequate without any information about the Traffic Management Plan.**

A feature of the project includes the *development* of a Traffic Management Plan (TMP). (ND, p. 49.) This TMP will be developed during the design/construction phase of the Project. There is no analysis of why the development of the TMP is deferred until after Project approval, when it is a Project feature. The deferral of the development of the TMP violates existing Caltrans policy. Major TMPs may include the full spectrum of strategies, including lane requirement charts, special provisions for unique project characteristics, a large-scale public awareness campaign (with brochures, public meetings, project website, telephone hotline), COZEEP services, FSP, detours to alternate highways or surface streets, and special arrangements with local transit services to accommodate a significant increase in ridership. Accordingly, Caltrans Transportation Management Plan Guidelines<sup>10</sup> (2015) (TMPG) policy states that TMPs are to be considered early during the project initiation or planning stage, and that they need to be refined and further developed as the project progresses through the various stages of development.<sup>11</sup> The TMPG further states that TMP development is part of the normal project development process and must be considered in the project initiation document (PID) or the planning stage.<sup>12</sup> This means that the project team needs to assess the potential work zone implications of a project early enough in planning so that they have an understanding of the TMP needs and costs for that project. The extent of a TMP is determined by the District Traffic Manager (DTM) during the preliminary studies of a capital project, namely the Project Study Report (PSR) or Project Study Scoping Report (PSSR).<sup>13</sup> This decision-making on the extent of the TMP is driven by the DTM's understanding of the expected work zone impacts of a project.

The TMPG further states that since projects are generally programmed, budgeted, and given an expenditure authorization upon PSR or PSSR approval, it is important to allow for the proper cost, scope, and scheduling of the TMP activities at this early stage of development.<sup>14</sup> For all TMPs, an itemized estimate of the proposed strategies and their respective costs are included in the PSR for proper funding consideration.

The small amount of information that Caltrans has provided about this Project since publication of the ND, regarding detours, night-time closures, weekend closures, and "extended" closures, has been inconsistent. At the Caltrans/City stakeholder meeting in

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<sup>10</sup> Available at: [http://www.dot.ca.gov/trafficops/tm/docs/TMP\\_Guidelines.pdf](http://www.dot.ca.gov/trafficops/tm/docs/TMP_Guidelines.pdf). Last accessed on 3/19/19.

<sup>11</sup> Available at: [http://www.dot.ca.gov/trafficops/tm/docs/TMP\\_Guidelines.pdf](http://www.dot.ca.gov/trafficops/tm/docs/TMP_Guidelines.pdf). Last accessed on 3/19/19.

<sup>12</sup> Available at: [http://www.dot.ca.gov/trafficops/tm/docs/TMP\\_Guidelines.pdf](http://www.dot.ca.gov/trafficops/tm/docs/TMP_Guidelines.pdf). Last accessed on 3/19/19.

<sup>13</sup> Available at: [http://www.dot.ca.gov/trafficops/tm/docs/TMP\\_Guidelines.pdf](http://www.dot.ca.gov/trafficops/tm/docs/TMP_Guidelines.pdf). Last accessed on 3/19/19.

<sup>14</sup> Available at: [http://www.dot.ca.gov/trafficops/tm/docs/TMP\\_Guidelines.pdf](http://www.dot.ca.gov/trafficops/tm/docs/TMP_Guidelines.pdf). Last accessed on 3/19/19.

Emeryville on April 3, 2019, CalTrans Corridor Manager Laurie Lau described night-time closures as westbound 10 pm to 4 am and eastbound 12am to 6am, but at the April 10, 2019, community workshop meeting in Emeryville, she described the closures as being from 10 pm to 4 am. Also, at the April 10th community workshop, closures for Alternatives C and D were described as “night and extended”. Inconsistencies between PDT Meetings, Caltrans/City stakeholder meetings, and community workshops need to be resolved.

Furthermore, without a TMP during the planning phase for this Project, Caltrans cannot adequately analyze the Project’s air quality impacts. The City agrees with Bay Area Air Quality Management District’s comment that CalTrans is required to “conduct a robust analysis of potential air quality impacts, including: emissions from construction equipment; ***emissions from re-routed traffic during construction, particularly traffic impacting local streets***, and; emissions from long term operations of the re-built interchange.”<sup>15</sup> There is no analysis regarding the air quality impact during construction from traffic diverted to local streets, nor could there be, until Caltrans develops the TMP. Given that the TMP is a feature of the Project, and critical to adequately analyzing the air quality impacts of the Project, Without such information, the Project description is inadequate because the impacts to the environment as a result of the detoured traffic cannot be analyzed.

The City requests that the TMP for this Project be included in the planning phase, so that the City can opine on proposed strategies before the project enters into Preliminary Engineering. In accordance with Sections 1.3 and 1.4 of the TMPG, the preliminary information and memorandums regarding the TMP should be disclosed to the public as part of any environmental review.

#### **B. The Project will impact residential streets and schools.**

The TMP for this Project must consider when and where traffic will be re-routed during major construction closure events. The City of Emeryville has many low-volume, low-speed residential roadways that cannot accommodate the influx of diverted trips going around the construction zone. Improvements on streets and intersections for the roadway or alternate routes may be necessary to provide increased capacity to handle the traffic through the work zone or within the adjacent corridor. Pedestrian, bicycle, emergency vehicles and transit needs should be carefully considered to maximize the positive impact of alternative modes.

The major corridors of Emeryville that traffic will likely get routed towards (directly or indirectly) are classified as Transit Priority Streets per Emeryville’s General Plan<sup>16</sup>. Signal timing and coordination improvements should be part of the TMP plan and described in the ND. This strategy involves retiming traffic signals to increase vehicle throughput of

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<sup>15</sup> Letter dated April 5, 2019, from Greg Nudd, Deputy Air Pollution Control Officer, BAAQMD to Tony Tavares, Director, Caltrans District 4. Emphasis added.

<sup>16</sup> Available at: <https://www.ci.emeryville.ca.us/385/General-Plan-and-Supporting-Documents>. Last accessed on 3/28/19.



the roadway(s), improve traffic flow, and optimize intersection capacity in and around the work zone. Signal timing and coordination could include transit vehicle priority equipment and plans.

If construction detours route traffic towards San Pablo Avenue, there are schools on or adjacent to San Pablo Avenue between Powell Street and 40<sup>th</sup> Street, including Emeryville Center of Community Life at 4727 San Pablo Avenue, and Escuela Bilingüe Internacional at 4550 San Pablo Avenue. Detours described in the TMP must take into consideration the start and end times of each of these schools so as to not send additional vehicular traffic towards school at their traffic peak periods. Additionally, diverted traffic on corridors near schools should be monitored, measured, and mitigated if found to be causing impacts to safety and levels of traffic stress (LTS)<sup>17</sup> for school children traveling to/from school.

**C. Temporary rerouting of traffic for Project construction could result in permanent impacts to the safety of bicycle and pedestrian users.**

Caltrans' Deputy Directive 64-R2<sup>18</sup> requires full consideration of non-motorized travelers including pedestrians, bicyclists, and persons with disabilities in all programming, planning, maintenance, construction, operations, and project development activities and products. The failure to discuss the impact on non-motorized travelers in the ND is discouraging and does not give local agencies nor the public the confidence that Caltrans will follow their own policies for this Project.

Caltrans' TMPG states that there should be an analysis of the existing traffic volume and user mix, such as pedestrians, bicyclists, trucks, and buses in the corridor both on the freeway and surface streets<sup>19</sup>. This will provide the basis for establishing the goal of the TMP and in determining the capability of the surrounding surface streets to handle the additional vehicular demand and the impact on bicycle and pedestrian traffic.

Construction detours and long-term construction duration windows must consider bicycle and pedestrian users. Improvements on streets and intersections for the roadway or alternate routes may be necessary to provide increased safety and provide better levels of stress due to the traffic being diverted around the work zone or within the adjacent corridors. For example, it is anticipated that the intersection at Powell and Christie will be impacted by traffic detoured due to the construction of the Project. In 2016, there was a pedestrian fatality at this intersection, and another bicyclist injury at the I-80 off ramp near this intersection.

Within the City, the combination of very high traffic volumes and increasing pedestrian and bicycle traffic raise concerns about safety for pedestrians and bicyclists. Taking a

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<sup>17</sup> Available at: [https://www.cityofberkeley.info/uploadedFiles/Public\\_Works/Level\\_3\\_-\\_Transportation/Berkeley-Bicycle-Plan-2017\\_AppendixC\\_Level%20of%20Traffic%20Stress.pdf](https://www.cityofberkeley.info/uploadedFiles/Public_Works/Level_3_-_Transportation/Berkeley-Bicycle-Plan-2017_AppendixC_Level%20of%20Traffic%20Stress.pdf). Last accessed on 4/17/19

<sup>18</sup> Available at: [http://www.dot.ca.gov/hq/tpp/offices/ocp/docs/dd\\_64\\_r2.pdf](http://www.dot.ca.gov/hq/tpp/offices/ocp/docs/dd_64_r2.pdf). Last accessed on 3/28/19.

<sup>19</sup> Available at: [http://www.dot.ca.gov/trafficops/tm/docs/TMP\\_Guidelines.pdf](http://www.dot.ca.gov/trafficops/tm/docs/TMP_Guidelines.pdf). Last accessed on 3/19/19.



proactive stance, the City decided to intensify analysis and planning for pedestrian and bicycle safety. As part of this effort, the City partnered with the UC Berkeley Safe Transportation and Education Center (SafeTREC) to conduct an in-depth review of pedestrian and bicycle safety issues at six key intersections in the heart of Emeryville. The 2018/2019 study includes field observations, community input, SafeTREC corridor recommendations and professional traffic engineering review. The study area includes the pedestrian/bicycle experiences at and between six intersections within or near the Powell Street Corridor in Emeryville:

- Powell Street and Frontage Road
- Powell Street and I-80
- Powell Street and Christie Avenue
- Christie Avenue and Shellmound Way
- Christie Avenue and Shellmound Street
- Powell Street and Hollis Street

The TMP stakeholder/workgroup team meetings need to include discussions on the 2018/2019 SafeTREC study, and how elements recommended in that study could be incorporated as part of this project. The vehicles on the Powell Street corridor being detoured through official means or GPS navigation routing should be measured and mitigated if found to be exceeding thresholds, or if causing impacts to safety and levels of stress for bicycle and pedestrian users.

Additionally, Emeryville has a robust bicycle network that includes the use of bicycle boulevards. The bicycle boulevards in Emeryville have volume and speed thresholds that are maintained by the use of traffic calming elements installed on the street.<sup>20</sup> The diverted traffic on corridors on bicycle boulevards should be measured and mitigated if found to be exceeding thresholds, or if causing impacts to safety and levels of stress.

**D. The construction of the Project has the potential to significantly reduce access to the Emeryville Police Department and Fire Station No. 34.**

The Project will likely involve full facility closures and/or lane closures on major emergency routes. Consideration must be given to the impact on emergency services and the project must provide adequate alternatives for emergency vehicles. Additionally, any full or partial closures must consider emergency services access and parking in or through the construction zone.

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<sup>20</sup> Available at: <https://www.ci.emeryville.ca.us/923/Pedestrian-Bicycle-Plan>. Last accessed on 3/28/19.

The ND cannot simply refer to the TMP to handle the impacts to emergency services. Per Caltrans' TMPG<sup>21</sup>, local fire, law enforcement, and emergency services agencies shall be identified and made part of the TMP workgroup team. Identification of local emergency service facilities should be identified in the ND, and the baseline emergency response times should be discussed. This is especially significant for Emeryville. The Emeryville Police Station and Fire Station No. 34, both located on Powell on the peninsula, are west of I-80/580 on Powell Street. Any detours need to consider the impacts of construction traffic on Powell Street and the effect on emergency response times for police and fire to incidents east of I-80/580 within Emeryville, as well incidents on Caltrans' own highways.

**E. The ND failed to analyze the cumulative impacts from Caltrans' other projects along the I-80 Corridor.**

The ND is inadequate due to the implicit assumption that this Project is Caltrans' only project in the area. Due to the Project's location and the high potential for major regional traffic impacts, the City recommends extra focus on the "Concurrent corridor (including conflicting) construction projects in the area" section from Table 1.0 of the TMPG document. This would include the analysis and discussion of each of the 11 planned projects presented by Caltrans at a Project Stakeholder meeting on February 6<sup>th</sup>, 2019.<sup>22</sup> Many of the projects' construction windows overlap, and traffic delays of concurrent/overlapping project areas could have significant adverse impacts to businesses and residents. While this Project alone will create a "temporary condition", the local community may be slated for a constant state of "temporary condition."

The impacted communities and local agencies must know the baseline TMP strategies for the various Project alternatives. The baseline strategies may include, but are not limited to, planned detour routing, night/weekend work schedules, pedestrian/bicycle access improvements, incentive/disincentive clauses, coordination efforts with the adjacent construction projects, signal timing/coordination improvements for alternate routes, and street/intersection improvements for alternate routes.

The combined comments from the community, local agencies, and other key stakeholders will help refine the TMP as the project goes into the Preliminary Engineering phase. Per Caltrans' own policies and procedures, as noted above, the TMP should not start in the Preliminary Engineering phase as it is indicated in the ND. The City requests Caltrans to explain why the TMP was not initiated during the Project Initiation Document (PID) phase. "It is extremely important to identify the proper scope and cost of the TMP activities in the PID, as significant post-PID approval changes will be difficult to obtain."<sup>23</sup> A TMP during the PID phase allows for further TMP refinement during the PA&ED process, and stakeholders can begin to be brought in to help handle the planning, implementation, monitoring, and evaluation details of specific elements. Finally, the City requests that this TMP be officially classified as a "Major TMP". This Project is multijurisdictional in scope,

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<sup>21</sup> Available at: [http://www.dot.ca.gov/trafficops/tm/docs/TMP\\_Guidelines.pdf](http://www.dot.ca.gov/trafficops/tm/docs/TMP_Guidelines.pdf). Last accessed on 3/19/19.

<sup>22</sup> I-80 Corridor Projects Overview Map (Attachment B).

<sup>23</sup> Available at: [http://www.dot.ca.gov/trafficops/tm/docs/TMP\\_Guidelines.pdf](http://www.dot.ca.gov/trafficops/tm/docs/TMP_Guidelines.pdf). Last accessed on 3/19/19.

multifaceted in corridor impacts and project delivery methods, and could potentially be in place over an extended time.

The I-80 Corridor has long been identified as one of the most congested corridors in the Bay Area and has been the recipient of large state/federal/regional funds to improve traffic flow. “The I-80 SMART Corridor Project took a “smart” approach to the management of one of the busiest interstates in the Bay Area and used technology and active management strategies to improve traffic flow along the I-80 corridor from the Carquinez Bridge to the Bay Bridge within Alameda and Contra Costa Counties, without requiring the construction of new roads or the widening of existing ones. Through the coordination of several project components, the corridor is managed as one integrated system. Safer, more efficient and reliable traffic flow along I-80 is essential to the current and future vitality of the Bay Area. I-80 carries as many as 270,000 vehicles a day and has approximately 25 accidents per week. On westbound I-80 between Richmond and Emeryville, the accident rate is twice as high as the statewide average for similar highways (such as I-405 in Southern California). Motorists experience as much as 25-35 minutes of delay during typical commute hours. Currently, when a traffic incident occurs, motorists traveling at high speeds may not stop in time for the sudden slowdown or may be forced to change lanes abruptly, resulting in secondary accidents that worsen congestion. Emergency vehicle access is impacted, resulting in slower incident response and recovery times.”<sup>24</sup> The ND does not adequately explain the Project’s relation to the I-80 SMART Corridor Project and its direct impact to the usage of the elements implemented with it. The I-80 SMART Corridor Project was not intended to bring relief or even help minimize the impacts of major construction detours that are likely from the Project’s TMP.

As indicated in the project documents of the I-80 SMART Corridor Project, “some motorists may choose to exit onto San Pablo Avenue to avoid the traffic jam, but the traffic signals on San Pablo Avenue and other arterials are not currently equipped to handle the resulting increase in traffic. Gridlock occurs, impacting bus operations and traffic flow on these streets. Without knowledge of the accident location, diverted motorists stay on city streets, and traffic jams persist. Even if motorists don’t detour, they don’t know how long it will take them to reach their destination due to inconsistent and unreliable travel times.”<sup>25</sup> The I-80 SMART Corridor Project documents and traffic studies showed that many local arterial intersections in the direct vicinity of the Project are already in an “oversaturated” condition.<sup>26</sup> These intersections were re-timed and coordinated to be used by the I-80 SMART Corridor Project for incident management and traffic routing, but they still remain in an oversaturated condition. The ND needs to address the impacts of TMP detours at these crucial intersections.

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<sup>24</sup> Available at: <http://www.dot.ca.gov/80smartcorridor/faqs.html>. Last accessed on 3/21/19.

<sup>25</sup> Available at: <http://www.dot.ca.gov/80smartcorridor/faqs.html>. Last accessed on 3/21/19.

<sup>26</sup> I-80 ICM Signal Re-timing – Final Existing Conditions Memorandum (Attachment C).

**F. The ND failed to analyze the cumulative impacts from other development in the vicinity of the Project area.**

The ND also fails to analyze the cumulative impacts of the Project as it relates to nearby development. There are several approved developments in the City, which are expected to be completed before the Project's construction begins. The nearest development, at 1500 feet (0.3mile) north of the Maze, is the Sherwin-Williams mixed used project at 1450 Sherwin Avenue at Horton Street, which will include 500 dwelling units and 6,000 square feet of commercial uses. The Intersection mixed use project is 4,000 feet (.75 mile) from the Maze at 3800 San Pablo Avenue at 39<sup>th</sup> Street and will include 105 dwelling units and 18,000 square feet of commercial space. The Marketplace redevelopment, within a mile of the Maze at 5900-6285 Shellmound Street at 65<sup>th</sup> Street, will include 456 dwelling units and 44,000 square feet of commercial space. The Nady site residential project, 1.36 mile from the Maze at 6701 Shellmound Street at 67<sup>th</sup> Street, will include 186 apartments. Approved development projects are listed in the City of Emeryville 2018 General Plan Annual Progress Report.<sup>27</sup>

**IV. The Project does not include any features or mitigation measures to address potential impacts on Cultural Resources.**

As stated in the Emeryville General Plan EIR, "according to the NWIC at Sonoma State University, there is a high possibility of uncovering and identifying additional archaeological deposits almost anywhere in the entire city. ... In general, projects in the vicinity of ...alluvial flats ... have the greatest possibility of encountering a prehistoric archaeological resource."<sup>28</sup>

Given the fact that it is on an alluvial flat, there is potential that a prehistoric archaeological resource exists under the Project's site area. However, the Environmental Consequences section of the Cultural Resources discussion on (ND, p. 33) fails to analyze whether the seismic soil treatments could affect any subsurface cultural materials that exist below the site. Furthermore, the ND states: "If previously unidentified cultural materials are unearthed during construction, work shall be halted in that area until a Caltrans qualified archaeologist can assess the significance of the find." (ND, p. 33.) This provision of the Monitoring and Post-Review Discovery Plan stops short of mitigation, and there are no Project features that would ensure that archaeological resources and sites will be protected from damage.

**V. The ND does not adequately address noise impacts on sensitive receptors.**

"Figure 2-6 shows the residential study areas where the noise analysis was conducted" (ND, p. 42). The residential study areas neglected to study the residential units in Southwest Emeryville. Specifically, no measurements were taken in the neighborhoods

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<sup>27</sup> Available at: <http://www.emeryville.org/DocumentCenter/View/11314/Item-71---General-Plan-Annual-Progress-Report>. Last accessed on 3/21/19.

<sup>28</sup> Emeryville General Plan, adopted October 2009, <https://www.ci.emeryville.ca.us/385/General-Plan-and-Supporting-Documents>.

north of 40<sup>th</sup> Street and west of Horton Street (an area which also includes a soon to be built Lennar Development site described above). Additionally, the Extended Stay America Hotel located near the intersections of Mandela Parkway and Horton Street was not included in the analysis. Caltrans should analyze the Project's noise impacts on these sensitive receptors.

## **VI. Notice Requested**

As a reminder, the City requests mailed notice of any and all hearings and/or actions related to the Project. These requests are made pursuant to Public Resources Code section 21092.2, 21080.4, 21083.9, 21092, 21108, 21161, and Government Code section 65092, which requires lead agencies and state agencies to mail such notices to any person who has filed a written request for them with the director of the agency. Please send the above-requested notices by U.S. mail and email to:

Christine Daniel  
City Manager  
City of Emeryville  
1333 Park Avenue  
Emeryville, CA 94608  
[cdaniel@emeryville.org](mailto:cdaniel@emeryville.org)

## **VII. Conclusion**

The proposed ND erroneously concludes that there is no impact from the MacArthur Maze Vertical Clearance Project. Unfortunately, the ND lacks an adequate description of the baseline environmental setting, and any analysis of the impacts from detours and re-routing. Without that minimal information, there simply cannot be adequate analysis of the Project's impacts. The City of Emeryville respectfully requests that Caltrans withdraw the proposed ND, adequately analyze the issues and impacts raised in this letter, including disclosing any written documents that it relies upon in such analysis, and partner with the affected local agencies in the delivery of this major project as anticipated by Caltrans longtime policies and procedures. We look forward to receiving Caltrans' response to this comment letter and to continuing to work with the agency on this and many other projects in and around Emeryville.

Very Truly Yours,



Christine S. Daniel  
City Manager

**ATTACHMENTS:**

- A. Emery Go-Round Yard Location Map
- B. I-80 Corridor Projects Overview Map
- C. I-80 ICM Timing Review Final Existing Conditions Memorandum

**cc:   *via email only***

Emeryville Mayor Ally Medina, Vice Mayor Christian Patz and City Council Members John Bauters, Scott Donahue and Dianne Martinez

Emeryville City Attorney Michael Guina

Emeryville Transportation Management Association Director Roni Hatrup

Emeryville Unified School District Superintendent Dr. Quiauna Scott

Bay Area Rapid Transit District General Manager Grace Crunican

Alameda-Contra Costa County Transit General Manager Michael Hursh

City of Oakland Mayor Libby Schaff, City Administrator Sabrina Landreth and Director of Department of Transportation Ryan Russo

City of Berkeley Mayor Jesse Arreguin, City Manager Dee Williams-Ridley and Public Works Director Phil Harrington

Alameda County Transportation Commission Executive Director Arthur Dao

Metropolitan Transportation Commission Executive Director Therese McMillian

Bay Area Air Quality Management District Executive Gregory Nudd

West Oakland Environmental Indicators Project Co-Director Margaret Gordon

Bike East Bay Advocacy Director Dave Campbell

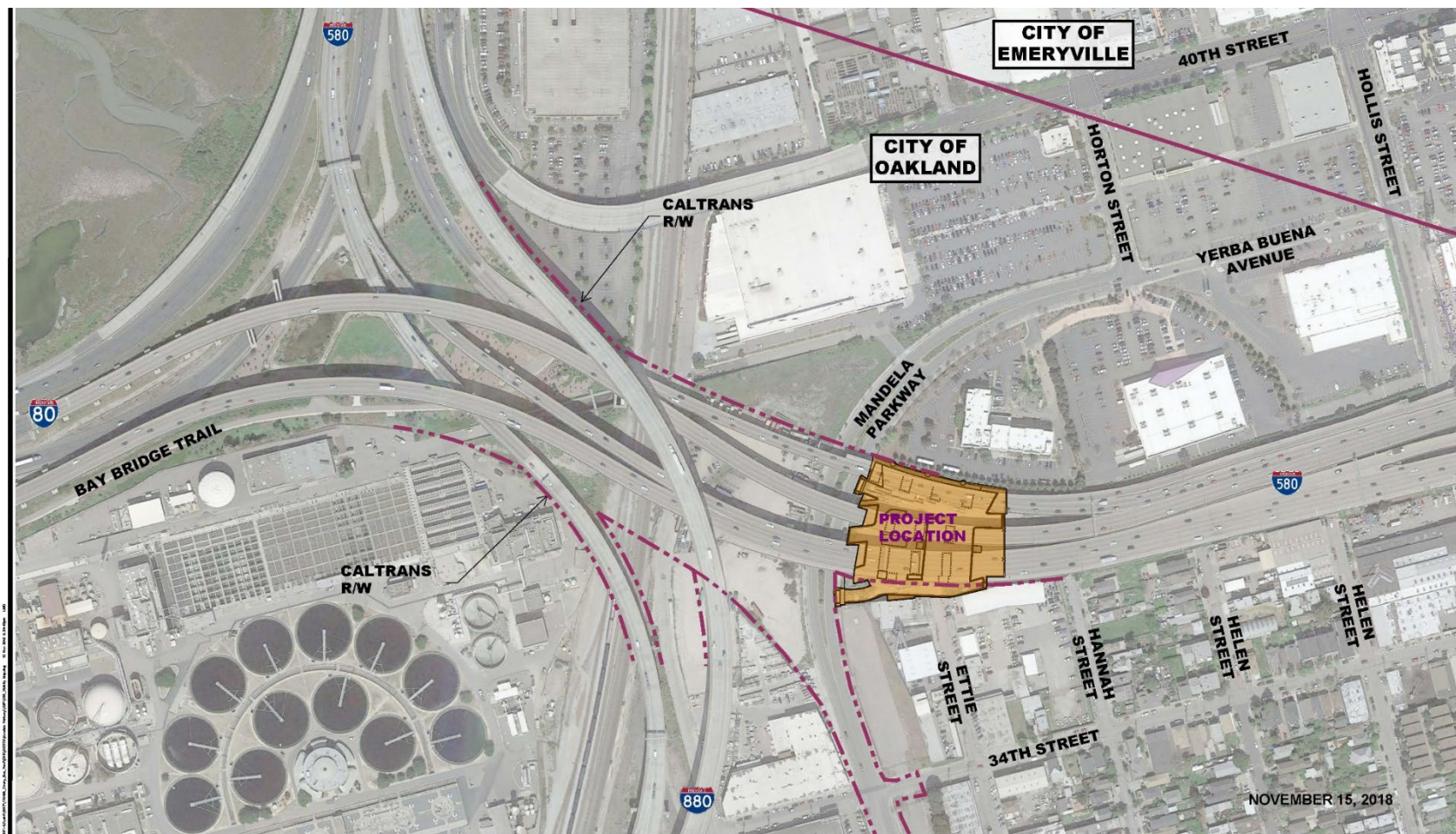
California Air Resource Board Executive Officer Richard Corey

Alameda County Fire Department Chief David Rocha



## Emeryville Transportation Management Association – Mandela Shuttle Vehicle Yard Project

Location of Emery Go-Round Yard Approved for Occupancy in April of 2020

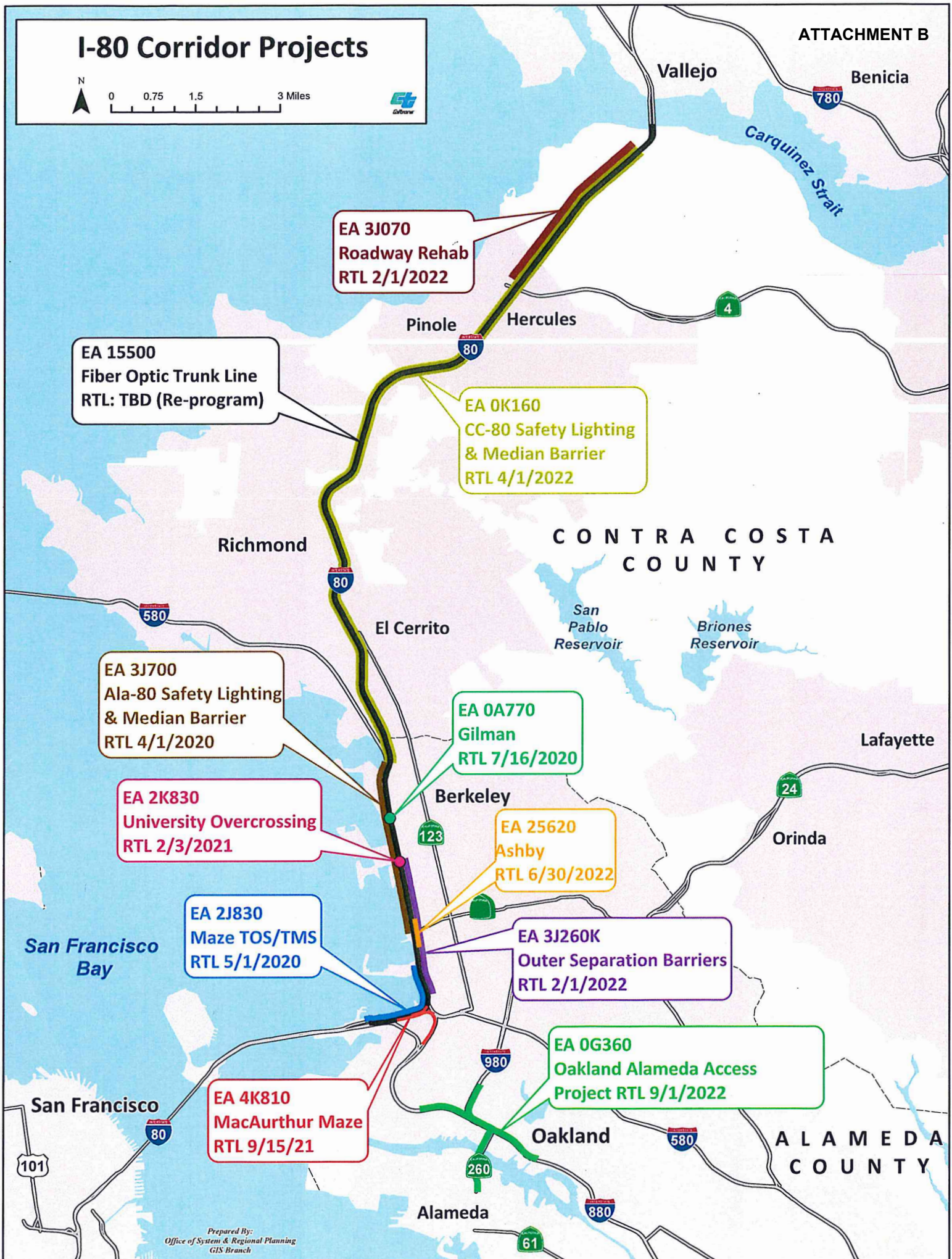




# I-80 Corridor Projects



0 0.75 1.5 3 Miles





## MEMORANDUM

**To:** Aleida Andrino-Chavez, City of Albany  
 Hamid Mostowfi, City of Berkeley  
 Melissa Tigbao, City of El Cerrito  
 Maurice Kaufman, City of Emeryville  
 Mike Roberts, City of Hercules  
 Si Lau, City of Oakland

Tamara Miller, City of Pinole  
 Steven Tam, City of Richmond  
 Barbara Hawkins, City of San Pablo  
 David Man, Caltrans  
 Mark de la O, Contra Costa County

**From:** Robert Paderna and Brian Sowers, Kimley-Horn

**Cc:** Kanda Raj, Alameda CTC  
 Hisham Noeimi, CCTA

**Date:** April 4, 2017

**RE:** ***I-80 ICM Signal Re-timing – Final Existing Conditions Memorandum***

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### Introduction and Project Area

The I-80 Integrated Corridor Mobility (ICM) program consists of multiple traffic operations systems and strategies, working collectively, to manage traffic congestion along the I-80 corridor. A key component of the I-80 ICM strategies is the management of traffic to and from I-80 during incidents on the freeway, which consists of deployment of special signal timing plans along crossing arterials to handle additional diverting traffic from the freeway. Incident management signal timing plans are developed based upon the existing signal coordination plans that operate under typical daily traffic conditions. This project also includes a signal timing study for **166** traffic signals along San Pablo Avenue and crossing arterial roadways to update peak period signal coordination plans.

The project limits and intersections for each corridor are as follows:

- **San Pablo Avenue (92 signals):** from Pomona Street/I-80 WB Ramps to MLK Jr./Castro Street
- **Parker Avenue (4 signals):** from 2nd Street to 7th Street
- **Willow Avenue (3 signals)** from Hawthorne Drive to I-80 EB Ramps
- **Pinole Valley Road (6 signals):** from Ellerhorst Street to Estates Avenue
- **Appian Way (4 signals):** from Mann Drive to I-80 EB Ramps
- **Richmond Parkway (5 signals):** from Lakeside Drive to I-80 EB Ramps
- **Hilltop Drive (7 signals):** from Research Drive to I-80 EB Ramps
- **El Portal Drive (6 signals):** from Road 20 to I-80 EB Ramps



- **San Pablo Dam Road (3 signals):** from Contra Costa Avenue to I-80 EB Ramps
- **McBryde Avenue (2 signals):** from I-80 WB Ramps to Amador Street
- **Barrett Avenue (1 signal):** at I-80 WB Ramps
- **Cutting Boulevard (2 signals):** from I-80 HOV Ramp to I-80 WB Ramps
- **Potrero Avenue (1 signal):** at I-80 Ramps/Eastshore Street
- **Carlson Boulevard (2 signals):** from I-80 EB Ramps to I-80 WB Ramps
- **Central Avenue (4 signals):** from Carlson Boulevard to I-80 WB Ramps
- **Buchanan Street (4 signals):** from Jackson Street to I-80 WB Ramps
- **Gilman Street (3 signals):** from 9th Street to 6th Street
- **University Avenue (2 signals):** from 9th Street to 6th Street
- **Ashby Avenue (2 signals):** from 9th Street to 7th Street
- **Powell Street (6 signals):** from Beaudry Street to Frontage Road/I-80 WB Ramps
- **West Grand Avenue (7 signals):** from Brush Street to Maritime Street

**Figure 1** illustrate the project area, with each intersection labelled by agency.

The San Pablo Avenue corridor spans ten jurisdictions and extends from Castro Street/MLK Jr. Way in the City of Oakland to Willow Avenue, just north of Highway 4, in Contra Costa County. Traveling north, the corridor crosses the Cities of Oakland, Emeryville, Berkeley, Albany, El Cerrito, Richmond, San Pablo, Contra Costa County, and the Cities of Pinole and Hercules. San Pablo Avenue, State Route 123 from Cutting Avenue in El Cerrito to Highway 580 in Oakland, is a major north/south arterial, consisting of four to six (4-6) lanes. San Pablo Avenue serves as a regional route as well as a significant local arterial. The corridor provides access to major arterials and regional freeways including Highways 80, 580, 980, 24, and 4 with AC Transit and WestCAT services operating along this major multi-modal corridor. The surrounding land uses are varied along the corridor and include residential, commercial, and schools.

The northern section of San Pablo Avenue, between Merchant Street/I-80 Westbound Ramps in Contra Costa County and Richmond Parkway in the City of Richmond, is a four (4) lane arterial roadway with an average daily traffic (ADT) ranging from 12,400 to 19,950 vehicles per day. The roadway runs east-west between Richmond Parkway and Sycamore Avenue and the remainder of this section of the corridor runs north-south with low pedestrian and bike activity present throughout the day. This section of San Pablo Avenue provides connectivity to Route 4 and the surrounding land uses include commercial and retail throughout the entire length and residential housing at the northern end. The speed limit for the northern section ranges from 25 to 45 mph. The speed limit is 45 mph north of Parker Street and south of the City of Pinole. Along Parker Street the speed limit is 30 mph and in the downtown Pinole area the speed limit is 25 mph. The remaining stretches of the northern section have 40-mph speed limits. The main direction of travel on the northern section of San Pablo Avenue is southbound in the AM peak period,



Figure 1: Project Area Map

I-80 ICM ARTERIAL RETIMING

balanced in the midday peak period and northbound in the PM peak period.

The central section of San Pablo Avenue, between Richmond Parkway in the City of Richmond and Carlson Boulevard in the City of El Cerrito, runs north-south and is a four (4) lane arterial roadway. South of Cutting Boulevard, San Pablo Avenue is classified as State Route 123. The primary surrounding land uses along this section of the corridor include commercial, retail and restaurants. Access to Interstate 80, via multiple side corridors, two BART stations, which are located near the intersections of Cutting Boulevard and Fairmount Avenue in the City of El Cerrito, and many residential neighborhoods are located along the central section of San Pablo Avenue. The speed limit along this portion of San Pablo Avenue is 45 mph from Richmond Parkway to Hilltop Drive, 40 mph near Robert Miller Drive, 35 mph from Rivers Street to Rheem Avenue, and 30 mph for the rest of the section. There is moderate pedestrian and bicycle activity throughout the day and the ADT volumes range from 15,290 to 23,630 vehicles per day. The main direction of travel on this section of San Pablo Avenue is southbound in the AM peak period, balanced in the midday peak period and northbound in the PM peak period.

The southern section of San Pablo Avenue, between Carlson Boulevard in the City of El Cerrito and Castro Street/MLK Jr. Way in the City of Oakland, is a four (4) lane arterial with an ADT ranging between 16,110 and 28,370 vehicles per day. North of Adeline Street, San Pablo Avenue is classified as State Route 123. The speed limit along the southern section of the corridor is 30 mph. The main land uses surrounding the corridor include residential, commercial, restaurants and office buildings. Moderate to high pedestrian and bicycle activity is present throughout the day, with very high pedestrian and bicycle activity near the intersection of University Avenue in Berkeley. The peak direction of travel on this section of San Pablo Avenue is southbound in the AM and balanced during the midday and PM peak periods.

The initial phase of the project included collecting and analyzing existing conditions information and updating existing conditions traffic models. This memorandum summarizes the existing conditions along the corridors and includes the following:

- Traffic data collection and reduction;
- Travel time survey information;
- Field observations; and
- Traffic model updates

## **Traffic Data Collection and Reduction**

Data collection for this project included coordinating with the various Cities, Contra Costa County, and Caltrans to obtain timing sheets and other references, collecting traffic volumes, conducting field review, and performing travel time surveys along the project corridors.



Weekday turning movement counts, including vehicular, pedestrian, and bicycle counts, were collected in November 2016 at one hundred fifty-six (156) of the Project intersections. The turning movement counts were collected during the following peak periods, with small variations by corridor based on historic daily traffic data.

- AM Peak 7:00 am to 9:00 am
- Midday Peak 11:30 am to 1:30 pm
- PM Peak 3:30 pm to 6:00 pm

Copies of the turning movement counts will be provided to each agency separately.

To understand daily and weekday traffic volumes along the corridors, 24-hour tube counts were collected at thirty (30) segments. The 24-hour tube counts were collected for seven (7) consecutive days from Saturday, November 12, 2016 through Sunday, November 20, 2016.

It was observed that the volume along the project corridors fluctuates on a day-to-day basis depending on I-80 operations. The Average Daily Traffic (ADT) volumes were calculated for each location and are presented in **Table 1**. The ADT count sheets and summaries are provided in the **Appendix**.

**Table 1: 24-hour Average Daily Traffic Volumes Summary**

Locations	Period	EB/NB Average	WB/SB Average	Total
<b>San Pablo Avenue</b> (between John Muir Parkway and Linus Pauling Drive)	Weekday (M-F)	5,805	6,598	12,403
	Weekend (S-S)	3,730	4,325	8,055
<b>San Pablo Avenue</b> (between Sycamore Avenue and Hercules Avenue)	Weekday (M-F)	10,260	9,030	19,290
	Weekend (S-S)	6,320	5,225	11,545
<b>San Pablo Avenue</b> (between Appian Way and Sunnyview Drive)	Weekday (M-F)	10,410	9,545	19,955
	Weekend (S-S)	6,365	5,420	11,785
<b>San Pablo Avenue</b> (between Richmond Parkway and Hilltop Drive)	Weekday (M-F)	7,900	8,105	16,005
	Weekend (S-S)	5,670	5,965	11,635
<b>San Pablo Avenue</b> (between El Portal Drive and Rumrill Boulevard)	Weekday (M-F)	7,340	7,950	15,290
	Weekend (S-S)	6,775	6,960	13,735
<b>San Pablo Avenue</b> (between Church Lane and Van Ness Street)	Weekday (M-F)	9,145	Missing Data*	
	Weekend (S-S)	7,955		
<b>San Pablo Avenue</b> (between Garvin Avenue and Esmond Avenue)	Weekday (M-F)	9,895	10,825	20,720
	Weekend (S-S)	7,610	9,230	16,840
<b>San Pablo Avenue</b> (between Conlon Avenue and Knott Avenue)	Weekday (M-F)	11,185	11,050	22,235
	Weekend (S-S)	9,440	9,935	19,375

\* Due to count tube displacement, some data was not available

**Table 1 (Continued): 24-hour Average Daily Traffic Volumes Summary**

Locations	Period	EB/NB Average	WB/SB Average	Total
<b>Willow Avenue</b> (between San Pablo Avenue and Hawthorne Road)	Weekday (M-F)	6,490	7,530	14,020
	Weekend (S-S)	4,755	5,705	10,460
<b>Pinole Valley Road</b> (between Ellerhorst Drive and Henry Avenue)	Weekday (M-F)	6,825	6,770	13,595
	Weekend (S-S)	5,225	4,885	10,110
<b>Appian Way</b> (between Mann Drive and Tara Hills Drive)	Weekday (M-F)	8,630	8,230	16,860
	Weekend (S-S)	6,615	6,470	13,085
<b>Richmond Parkway</b> (between Lakeside Drive and Blume Drive)	Weekday (M-F)	16,875	19,175	36,050
	Weekend (S-S)	Missing Data*	15,330	Missing Data*
<b>Hilltop Drive</b> (between Robert Miller Drive and Shane Drive)	Weekday (M-F)	10,155	8,490	18,645
	Weekend (S-S)	7,230	6,510	13,740
<b>El Portal Drive</b> (between Church Lane and Fordham Street)	Weekday (M-F)	13,495	10,430	23,925
	Weekend (S-S)	Missing Data*	9,440	Missing Data*
<b>San Pablo Avenue</b> (between Manila Avenue and Portero Avenue)	Weekday (M-F)	10,360	9,955	20,135
	Weekend (S-S)	8,280	7,550	15,830
<b>San Pablo Avenue</b> (between Central Avenue and Fairmont Avenue)	Weekday (M-F)	12,285	11,345	23,630
	Weekend (S-S)	10,475	9,730	20,205
<b>San Pablo Avenue</b> (between Gilman Street and Monroe Street)	Weekday (M-F)	11,780	13,870	25,650
	Weekend (S-S)	9,305	12,265	21,570
<b>San Pablo Avenue</b> (between University Avenue and Delaware Street)	Weekday (M-F)	11,080	11,730	22,810
	Weekend (S-S)	9,495	10,505	20,000
<b>San Pablo Avenue</b> (between Ashby Avenue and Grayson Street)	Weekday (M-F)	11,785	12,005	23,790
	Weekend (S-S)	9,440	10,505	19,945
<b>San Pablo Avenue</b> (between Stanford Avenue and 63 <sup>rd</sup> Street)	Weekday (M-F)	9,540	11,025	20,565
	Weekend (S-S)	7,595	9,280	16,875
<b>San Pablo Avenue</b> (between 47 <sup>th</sup> Avenue and 53 <sup>rd</sup> Street)	Weekday (M-F)	11,700	12,255	23,955
	Weekend (S-S)	8,825	9,985	18,810
<b>San Pablo Avenue</b> (between Market Street and 27 <sup>th</sup> Street)	Weekday (M-F)	7,680	8,430	16,110
	Weekend (S-S)	6,195	6,845	13,040
<b>San Pablo Avenue</b> (between I-80 EB Ramps and Jackson Street)	Weekday (M-F)	14,035	14,335	28,370
	Weekend (S-S)	14,155	12,890	27,045

\* Due to count tube displacement, some data was not available

**Table 1 (Continued): 24-hour Average Daily Traffic Volumes Summary**

Locations	Period	EB/NB Average	WB/SB Average	Total
<b>San Pablo Avenue</b> (between I-80 EB Ramps and Jackson Street)	Weekday (M-F)	14,035	14,335	28,370
	Weekend (S-S)	14,155	12,890	27,045
<b>Central Avenue</b> (between Carlson Boulevard and San Luis Street/Pierce St)	Weekday (M-F)	9,805	11,370	21,175
	Weekend (S-S)	8,790	11,000	19,790
<b>Cutting Boulevard</b> (between San Pablo Avenue and I-80 WB On-Ramp)	Weekday (M-F)	13,500	12,435	25,935
	Weekend (S-S)	9,590	9,740	19,330
<b>Gillman Street</b> (between 6 <sup>th</sup> Street and 8 <sup>th</sup> Street)	Weekday (M-F)	8,165	8,655	16,820
	Weekend (S-S)	7,605	7,885	15,490
<b>University Avenue</b> (between 6 <sup>th</sup> Street and 9 <sup>th</sup> Street)	Weekday (M-F)	15,380	16,280	31,660
	Weekend (S-S)	14,880	15,745	30,625
<b>Powell Street</b> (between I-80 EB Ramps and Christie Avenue)	Weekday (M-F)	21,955	20,985	42,940
	Weekend (S-S)	20,965	19,160	40,125
<b>West Grand Avenue</b> (between Market Street and Adeline Street)	Weekday (M-F)	8,575	11,310	19,885
	Weekend (S-S)	5,820	8,985	14,805
<b>West Grand Avenue</b> (between Broadway and Telegraph Avenue)	Weekday (M-F)	9,490	7,480	16,970
	Weekend (S-S)	6,340	6,185	12,525

\* Due to count tube displacement, some data was not available

## Travel Time Surveys

"Before" implementation floating vehicle surveys were conducted along the project corridors to measure the existing travel time and delays and to observe general traffic operations and conditions. The travel time surveys were primarily conducted on Wednesday, November 30, 2016 and Thursday, December 1, 2016, with supplemental runs collected thereafter when necessary. Travel time surveys were collected in both directions along the project corridors between the following limits:

- **Appian Way** from Fitzgerald Drive to San Pablo Avenue
- **Ashby Avenue** from 7<sup>th</sup> Street to San Pablo Avenue
- **Buchanan Street** from I-80 WB Ramps to San Pablo Avenue
- **Carlson Boulevard** from I-80 WB Ramps to I-80 EB Ramps
- **Central Avenue** from I-80 WB Ramps to San Pablo Avenue
- **Cutting Boulevard** from I-80 WB Ramps to San Pablo Avenue
- **Gilman Street** from 6<sup>th</sup> Street to San Pablo Avenue
- **Hilltop Drive** from San Pablo Avenue to I-80 EB Ramps

- **Pinole Valley Road** from Estates Avenue to San Pablo Avenue
- **Potrero Avenue** from San Pablo Avenue and Eastshore Boulevard
- **Powell Street** from Frontage Road to San Pablo Avenue
- **Richmond Parkway** from San Pablo Avenue to I-80 WB Ramps
- **Fitzgerald Drive** from I-80 HOV Ramps to Appian Way
- **El Portal Drive** from San Pablo Avenue to I-80 EB Ramps
- **Willow Avenue** from I-80 EB Ramps to San Pablo Avenue
- **San Pablo Avenue/Willow Road (Segment 1)** from 7<sup>th</sup> Street to Cummings Skyway
- **San Pablo Avenue (Segment 2)** from Tennent Avenue to Willow Avenue
- **San Pablo Avenue (Segment 3)** from Hilltop Drive to Tennent Avenue
- **San Pablo Avenue (Segment 4)** from Broadway Avenue/El Portal Drive to Hilltop Drive
- **San Pablo Avenue (Segment 5)** from Cutting Boulevard to Broadway Avenue/El Portal Drive
- **San Pablo Avenue (Segment 6)** from Gilman Street to Cutting Boulevard
- **San Pablo Avenue (Segment 7)** from Stanford Avenue to Gilman Street
- **San Pablo Avenue (Segment 8)** from West Grand Avenue to Stanford Avenue
- **San Pablo Dam Road** from San Pablo Avenue to I-80 EB Ramps/Amador Street
- **University Avenue** from 6<sup>th</sup> Street to San Pablo Avenue
- **West Grand Avenue** from Wake Avenue to San Pablo Avenue

The results of the “Before” study for each of the project corridors are summarized in **Tables 2 through 24**. Detailed travel time summaries for the corridors are included in the **Appendix**.

**Table 2: Appian Way “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Northbound	2:36	0:47	2.0	21.5
	Westbound	3:50	1:56	3.5	14.6
<b>Midday Peak</b>	Northbound	2:25	0:40	1.7	23.2
	Westbound	3:07	1:11	2.4	18.0
<b>PM Peak</b>	Northbound	2:56	1:05	2.5	19.1
	Westbound	3:45	1:49	2.8	14.9

Note: Travel time survey conducted between Fitzgerald Drive and San Pablo Avenue

**Table 3: Ashby Avenue “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	0:55	0:22	0.7	9.1
	Westbound	1:40	1:07	1.0	5.0
<b>Midday Peak</b>	Eastbound	0:52	0:18	0.8	9.7
	Westbound	0:59	0:25	1.3	8.6
<b>PM Peak</b>	Eastbound	1:02	0:25	0.9	8.1
	Westbound	0:50	0:09	0.6	10.1

Note: Travel time survey conducted between 7<sup>th</sup> Street and San Pablo Avenue

**Table 4: Buchanan Street “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	2:55	1:25	2.3	14.0
	Westbound	2:05	0:41	1.7	19.4
<b>Midday Peak</b>	Eastbound	3:25	1:52	3.0	11.9
	Westbound	2:05	0:40	1.3	19.5
<b>PM Peak</b>	Eastbound	3:43	2:05	2.5	10.9
	Westbound	2:33	1:01	2.0	15.9

Note: Travel time survey conducted between I-80 WB Ramp and San Pablo Avenue

**Table 5: Carlson Boulevard “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	0:08	0:00	0.0	27.1
	Westbound	0:21	0:14	0.7	10.1
<b>Midday Peak</b>	Eastbound	0:09	0:01	0.2	24.6
	Westbound	0:16	0:09	0.5	13.3
<b>PM Peak</b>	Eastbound	0:18	0:10	0.5	12.3
	Westbound	0:08	0:00	0.0	27.1

Note: Travel time survey conducted between I-80 WB Ramp and I-80 EB Ramp

**Table 6: Central Avenue “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	2:25	1:24	2.3	11.1
	Westbound	1:51	0:54	1.8	14.5
<b>Midday Peak</b>	Eastbound	2:21	1:21	2.2	11.4
	Westbound	7:05	6:18	2.3	3.8
<b>PM Peak</b>	Eastbound	2:59	1:48	2.0	9.0
	Westbound	6:49	5:52	2.5	4.0

Note: Travel time survey conducted between San Joaquin Street and San Pablo Avenue

**Table 7: Cutting Boulevard “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	1:00	0:37	0.9	10.1
	Westbound	0:33	0:12	1.0	18.3
<b>Midday Peak</b>	Eastbound	1:01	0:39	0.9	10.0
	Westbound	0:27	0:07	0.3	22.1
<b>PM Peak</b>	Eastbound	0:51	0:27	0.9	11.8
	Westbound	0:28	0:05	0.4	21.6

Note: Travel time survey conducted between I-80 WB Ramp and San Pablo Avenue

**Table 8: Gilman Street “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	1:10	0:27	0.9	15.8
	Westbound	0:59	0:09	0.7	19.0
<b>Midday Peak</b>	Eastbound	1:29	0:37	1.0	12.6
	Westbound	1:01	0:13	0.8	18.1
<b>PM Peak</b>	Eastbound	2:19	1:25	1.4	8.0
	Westbound	2:05	1:03	1.6	9.0

Note: Travel time survey conducted between Sixth Street and San Pablo Avenue



**Table 9: Hilltop Drive “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	5:00	2:16	3.3	18.0
	Westbound	3:58	1:21	2.8	22.7
<b>Midday Peak</b>	Eastbound	4:32	1:54	3.1	19.9
	Westbound	3:53	1:24	2.9	23.2
<b>PM Peak</b>	Eastbound	4:17	1:36	3.2	21.0
	Westbound	4:29	1:55	4.6	20.1

Note: Travel time survey conducted between San Pablo Avenue and I-80 EB Ramp

**Table 10: Pinole Valley Road “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	2:53	0:58	2.7	16.0
	Westbound	2:46	0:49	1.8	16.8
<b>PM Peak</b>	Eastbound	3:11	1:13	2.5	14.5
	Westbound	3:18	1:18	3.3	14.0

Note: Travel time survey conducted between Estates Avenue and San Pablo Avenue

**Table 11: Potrero Avenue “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	0:55	0:38	0.7	8.1
	Westbound	0:33	0:16	0.6	13.4
<b>Midday Peak</b>	Eastbound	0:38	0:20	0.6	11.5
	Westbound	0:35	0:19	0.7	12.6
<b>PM Peak</b>	Eastbound	0:39	0:20	0.6	11.2
	Westbound	0:44	0:25	0.7	10.1

Note: Travel time survey conducted between Eastshore Boulevard and San Pablo Avenue

**Table 12: Powell Street “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	3:33	1:45	2.0	13.5
	Westbound	3:02	1:12	2.0	15.8
<b>Midday Peak</b>	Eastbound	3:33	1:44	2.7	13.5
	Westbound	3:07	1:23	2.0	15.3
<b>PM Peak</b>	Eastbound	5:24	3:36	2.8	8.9
	Westbound	4:15	2:23	2.3	11.2

Note: Travel time survey conducted between Frontage Road and San Pablo Avenue

**Table 13: Richmond Parkway “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	5:15	1:31	3.4	22.8
	Westbound	5:47	2:07	3.5	20.7
<b>Midday Peak</b>	Eastbound	5:50	2:00	4.4	20.5
	Westbound	5:13	1:41	3.6	23.0
<b>PM Peak</b>	Eastbound	9:37	5:30	4.7	12.5
	Westbound	5:54	2:18	4.0	20.3

Note: Travel time survey conducted between San Pablo Avenue and Appian Way

**Table 14: San Pablo Avenue/Willow Road (Segment 1) “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Northbound	6:11	0:44	3.4	30.1
	Southbound	6:15	0:41	2.8	29.8
<b>Midday Peak</b>	Northbound	5:43	0:26	2.0	32.5
	Southbound	5:58	0:31	2.6	31.2
<b>PM Peak</b>	Northbound	5:59	0:32	2.3	31.1
	Southbound	6:08	0:39	3.0	30.3

Note: Travel time survey conducted between Willow Road/San Pablo

**Table 15: San Pablo Avenue (Segment 2) “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	5:08	1:12	3.9	25.8
	Westbound	5:04	1:01	3.3	26.2
<b>Midday Peak</b>	Eastbound	5:12	1:14	4.0	25.5
	Westbound	4:35	0:46	2.9	28.9
<b>PM Peak</b>	Eastbound	6:41	2:35	3.7	19.8
	Westbound	5:31	1:29	3.0	24.0

Note: Travel time survey conducted between Tennent Avenue and Willow Avenue

**Table 16: San Pablo Avenue (Segment 3) “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Northbound	6:50	1:30	4.2	26.8
	Southbound	7:14	1:47	3.8	25.3
<b>Midday Peak</b>	Northbound	6:40	1:21	2.8	27.5
	Southbound	6:56	1:23	4.2	26.5
<b>PM Peak</b>	Northbound	9:53	4:24	4.2	18.6
	Southbound	7:54	2:05	4.8	23.2

Note: Travel time survey conducted between Hilltop Drive and Tennent Avenue

**Table 17: San Pablo Avenue (Segment 4) “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Northbound	3:36	1:12	2.4	23.1
	Southbound	3:14	0:53	1.7	25.6
<b>Midday Peak</b>	Northbound	3:18	0:53	2.1	25.1
	Southbound	2:57	0:41	1.2	28.1
<b>PM Peak</b>	Northbound	3:42	1:11	2.5	22.4
	Southbound	3:10	0:49	1.5	26.3

Note: Travel time survey conducted between Broadway Avenue/El Portal Drive and Hilltop Drive

**Table 18: San Pablo Avenue (Segment 5) “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Northbound	11:04	3:45	8.8	18.1
	Southbound	15:53	8:13	10.3	12.7
<b>Midday Peak</b>	Northbound	11:21	3:54	8.5	17.7
	Southbound	13:09	5:40	10.8	15.3
<b>PM Peak</b>	Northbound	17:26	9:16	12.8	11.5
	Southbound	13:13	5:15	10.5	15.2

Note: Travel time survey conducted between Cutting Boulevard and Broadway/El Portal Drive

**Table 19: San Pablo Avenue (Segment 6) “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Northbound	10:45	3:28	5.8	18.8
	Southbound	13:44	5:49	8.7	14.7
<b>Midday Peak</b>	Northbound	11:20	4:10	5.8	17.8
	Southbound	11:31	4:03	6.5	17.5
<b>PM Peak</b>	Northbound	18:16	9:55	9.2	11.0
	Southbound	13:55	5:58	7.7	14.5

Note: Travel time survey conducted between Gilman Street and Cutting Boulevard

**Table 20: San Pablo Avenue (Segment 7) “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Northbound	10:23	3:37	6.8	16.3
	Southbound	10:52	4:07	6.7	15.6
<b>Midday Peak</b>	Northbound	09:58	3:16	6.8	17.0
	Southbound	11:07	4:30	6.3	15.2
<b>PM Peak</b>	Northbound	19:16	11:46	10.0	8.8
	Southbound	11:12	4:05	6.7	15.1

Note: Travel time survey conducted between Stanford Avenue and Gilman Street

**Table 21: San Pablo Avenue (Segment 8) “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Northbound	6:21	1:36	3.0	18.9
	Southbound	6:48	1:56	3.8	17.7
<b>Midday Peak</b>	Northbound	6:55	2:08	4.0	17.4
	Southbound	7:31	2:17	4.5	16.0
<b>PM Peak</b>	Northbound	9:23	3:24	4.5	12.8
	Southbound	9:12	3:29	4.7	13.1

Note: Travel time survey conducted between West Grand Avenue and Stanford Avenue

**Table 22: San Pablo Dam Road “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	2:28	1:45	1.5	8.0
	Westbound	1:23	0:35	1.4	14.1
<b>Midday Peak</b>	Eastbound	2:28	1:40	1.8	8.0
	Westbound	1:47	0:59	1.7	11.0
<b>PM Peak</b>	Eastbound	3:13	2:24	2.0	6.1
	Westbound	1:46	0:56	1.4	11.2

Note: Travel time survey conducted between San Pablo Avenue and Amador Street/I-80 EB Ramp

**Table 23: University Avenue “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	1:03	0:21	1.1	17.9
	Westbound	1:16	0:31	1.1	14.7
<b>Midday Peak</b>	Eastbound	1:41	0:52	1.1	11.2
	Westbound	0:59	0:12	0.5	18.8
<b>PM Peak</b>	Eastbound	1:59	1:01	1.1	9.5
	Westbound	1:57	1:09	1.6	9.6

Note: Travel time survey conducted between 6<sup>th</sup> Street and San Pablo Street

**Table 24: West Grand Avenue “Before” Travel Time Summary**

Time Period	Direction	Average Travel Time (min:sec)	Average Stop Delay (min:sec)	Average Stops (#)	Average Speed (mph)
<b>AM Peak</b>	Eastbound	4:52	1:35	4.3	20.0
	Westbound	4:14	1:07	2.7	22.9
<b>Midday Peak</b>	Eastbound	4:56	1:39	4.0	19.7
	Westbound	3:43	0:36	2.4	26.1
<b>PM Peak</b>	Eastbound	7:06	3:22	5.6	13.7
	Westbound	4:30	1:04	3.6	21.5

Note: Travel time survey conducted between Wake Avenue and San Pablo Avenue

### **Oversaturated Intersection Locations**

An intersection with oversaturated conditions can be defined as one where the approach volume is greater than the intersection capacity, resulting in traffic during a specific amount of time (typically an hour) not being served. The goal is to identify these locations to determine if there is a need to adjust the turning movement volumes to capture the actual approach volume rather than just those vehicles that are being served (counted).

**Table 25**, on the next page, highlights some of the critical intersections identified from the field review and where the traffic models indicate the intersections or movements are at or nearing capacity during various peak periods. Careful consideration will be taken at these locations during the timing analysis and in selection of optimum cycle lengths and splits. At most of the intersections, the movements cleared within the peak hour that counts were collected, thus adjustments to the volumes aren't necessary. There were specific movements observed to be at or just over capacity at various intersections, but it is estimated that adjustments to the signal timing would increase the effective capacity of these movements.



**Table 25: Near or Over Capacity Locations Summary**

<b>Time Period</b>	<b>Intersection – Movement At or Near Capacity</b>
<b>AM</b>	San Pablo Avenue/Richmond Parkway – WB left
	San Pablo Avenue/Robert Miller Drive - WB left
	San Pablo Avenue/Vale Road - SB through
	San Pablo Dam Road/I-80 EB Ramp - WB through
	San Pablo Avenue/Potrero Avenue - WB left
	Central Avenue/Pierce Street - NB through
	Central Avenue/San Joaquin Street - SB through
	San Pablo Avenue/Solano Avenue - SB through
	San Pablo Avenue/Gilman Street - SB through
	San Pablo Avenue/University Avenue - SB through
	San Pablo Avenue/Ashby Avenue - WB left
	Powell Street/I-80 EB Ramp - NB left
<b>Midday</b>	San Pablo Dam Road/I-80 Ramps - NB left (EB Ramp)
	Central Avenue/I-80 EB Ramp - WB through
	San Pablo Avenue/Carlson Avenue - SB left
	San Pablo Avenue/University Avenue - SB left
<b>PM</b>	San Pablo Avenue/John Muir Parkway - SB left
	San Pablo Avenue/Sycamore Avenue - NB through
	San Pablo Avenue/Richmond Parkway - EB left
	San Pablo Avenue/Robert Miller Drive - WB left, NB through
	San Pablo Avenue/Vale Road - EB left
	San Pablo Avenue/I-80 Ramps - EB through, NBTL (Amador St)
	San Pablo Avenue/Solano Avenue - EB left
	Central Avenue/San Joaquin Street - SB through, NB through
	Central Avenue/I-80 EB Ramp - WB through
	Buchanan Street/I-80 WB Ramp - SB left
	San Pablo Avenue/Cedar Street - NB through
	University Avenue/6th Street - NB left
	Ashby Avenue/7th Street - SB through, WB through
	San Pablo Avenue/Ashby Avenue - NB through
	Frontage Road/I-80 WB Ramps - EB through
	West Grand Avenue/Mandela Parkway - WB left, EB through/left

## Actuated Settings Review

A review of the existing “actuated” (initial timing) settings was conducted to identify opportunities to minimize delay during non-peak, free or non-coordinated periods and to enhance pedestrian and bicycle safety. The analysis included a review of the pedestrian intervals, minimum and maximum green intervals, and yellow intervals.

Phase sequence changes and conditional service will also be reviewed during the coordination analysis. The following sections outline the recommendations for the various actuated settings.

### Pedestrian Timing

A review of the existing pedestrian timing, including pedestrian clearance intervals (flashing don’t walk or FDW) and Walk intervals, was conducted at each of the project signals. FDW intervals were reviewed based on the California MUTCD (CA MUTCD) guidance. CA MUTCD guidance for determining pedestrian clearance intervals, as provided in Section 4E.06 paragraph #8, is as follows:

*“...the pedestrian clearance time should be sufficient to allow a pedestrian crossing in the crosswalk who left the curb or shoulder at the end of the WALKING PERSON (symbolizing WALK) signal indication to travel at a walking speed of 3.5 feet per second to at least the far side of the traveled way or to a median of sufficient width for pedestrians to wait.”*

The methodology for calculating FDW intervals varies by agency. The methodology used for each agency is included in the **Appendix** along with a table summarizing the crosswalk lengths and existing and recommended FDW pedestrian intervals.

### Yellow and Red Intervals

The latest CA MUTCD guidelines call for establishment of the yellow interval based on the 85th percentile speed (if available), as shown in **Table 26**, with the 85th percentile speed rounded up to the nearest 5 miles per hour. For locations where 85th percentile speeds were not available, the yellow was reviewed based on posted speed using the values as shown in **Table 27**.

**Table 26: Minimum Yellow Clearance Based on 85<sup>th</sup> Percentile Speed**

Approach Speed – 85 <sup>th</sup> Percentile (mph)	Yellow Interval (seconds)
25 or less	3.0
30	3.2
35	3.6
40	3.9
45	4.3

**Table 27: Minimum Yellow Clearance Based on the Posted Speed Limit**

Approach Speed – Posted (mph)	Yellow Interval (seconds)
15	3.0
20	3.2
25	3.6
30	3.7
35	4.1
40	4.4
45	4.8

A summary of the existing speeds and resultant yellow intervals is provided in the **Appendix**.

Currently, the signals have varying red clearance intervals. CA MUTCD indicates that red clearance is not required, although generally a minimum of 0.5 seconds of all red clearance time for protected left turns and 1.0 second of red clearance time for through movements is used. Red clearance intervals for all locations are provided in the **Appendix**.

#### Minimum and Maximum Green Intervals

Typically a minimum of four (4) seconds and a maximum of ten (10) seconds of green time should be used. In special circumstances, where the main-street phase is very heavy, a minimum green time of greater than ten (10) seconds is acceptable.

The CA MUTCD, within section 4D.105 (CA), requires that minimum green time be sufficient for a stopped bicycle to cross the road when the light turns green at locations where bicycle sensitive detection exists. Even where bicycle sensitive detection does not exist, it is recommended the minimum green to be sufficient for bicycle crossing at locations with dedicated Class II bicycle lanes. The minimum green times were reviewed to confirm the existing times, with the following methodology used:

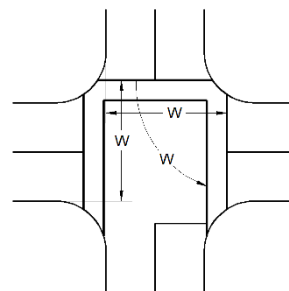
$$G_{\min} + Y + R_{\text{clear}} \geq 6\text{sec} + \frac{W + 6\text{ft}}{14.7 \frac{\text{ft}}{\text{sec}}}$$

$G_{\min}$  = Length of minimum green interval (sec)

$Y$  = Length of yellow interval (sec)

$R_{\text{clear}}$  = Length of red clearance interval (sec)

$W$  = Distance from limit line to far side of last conflicting lane (ft)



The results of the review of minimum green times for bicycles is included in the **Appendix**. Based on the review, changes to the minimum green times are recommended at several project

intersections. In addition, the agencies may want to consider raising the minimum green times at the locations with less than four (4) seconds. These locations are also highlighted in the **Appendix**. At all other intersections, the minimum green times appear to be reasonable and no changes are recommended.

There is a wide range in maximum green intervals throughout the project intersections. Adjustments may be necessary once the recommended splits are developed to ensure that the maximum split times accommodate the new splits or to reduce the amount of time a phase receives. Additional review of the minimum and maximum green times will be completed during the coordination analysis and implementation of the coordination plans. Adjustments to these parameters can typically be identified more often during the detailed coordination analysis and fine-tuning review.

### **Existing Conditions Traffic Model**

Once all the data was collected, the existing conditions traffic models were developed using the Synchro 8 software for the AM, midday, and PM peak periods. Peak hour turning movement volumes, lane information, and travel speeds were used for development of the models. In addition, existing phasing timing parameters were coded in the model.

The models were calibrated by verifying that the model data, such as queue lengths, degree of saturation, average delay, and travel time reasonably matched the observed conditions in the field. Adjustments to input data such as saturation flow rates, travel speeds, traffic volumes, and lane geometry (i.e. locations where vehicles use a wide single lane as two lanes), were reviewed to achieve a reasonable match between the model and observed conditions. Existing timing outputs from the Synchro Models are included in the **Appendix**.

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