VIEWS

VIEW LOOKING SOUTH ALONG 5TH STREET

VIEW LOOKING NORTH-WEST ALONG 5TH STREET
July 5, 2017

Immanuel Bereket
Land Use Planning Division
City of Berkeley
1947 Center Street
Berkeley, CA 94704

Re: Response to Comments on the 5th and Channing Project Transportation Impact Analysis

Dear Mr. Bereket,

This letter was prepared to summarize our response to the comments on 5th and Channing Transportation Impact Analysis (TIA) from Dipan Shaw, dated April 24, 2017. The majority of the comments in the peer review have simply been addressed by revising the report as recommended. However, to go along with the revised report this letter was also prepared because there were several comments that warranted additional explanation. Responses to comments that weren’t addressed with changes to the report and/or comments that required additional explanation are provided below.

Response to Comment #8 – Please note that the project studied in the first draft of the TIA was originally proposing to have apartment units rather than condominiums. At the time we verified that the change to the low rise condominium rates would not change the peak hour trip generation by more than three trips. Given that all study intersections are forecast to continue operating at LOS B or better under cumulative plus project conditions there was no reason to believe that revising the analysis for an increase of three trips could potentially yield additional useful information about the project’s potential for significant impacts on transportation facilities in the area. In addition, as discussed below, traditionally the use of the apartment trip generation rates has been commonly accepted as a reasonable assumption for forecasting trips from condominiums and townhomes.

The ITE rates being suggested from the Low-Rise Condominium/Townhouse (Land Use Code 231) category are clearly identified by ITE as being based on a very small sample size. Because of the limited sample size the trip generation data for this particular category is marked “Caution – Use Carefully”. We would not recommend that the City require the analysis to rely only on the data from this category since its trip generation rates are based on only five studies that were conducted in the late 1970’s and the 2000’s, throughout the United States. The general ITE category that is normally applied to most condominium/townhouse projects (Land Use Code 230) has rates that are based on over 60 different trip generation surveys. This category is based on surveys of condominiums and townhome developments that did not identify whether or not they
were high-rise or low-rise projects. It is also important to note that both the AM and PM peak hour trip rates for apartments are actually higher than the standard ITE rates most cities used for condominiums and townhomes (Land Use Code 230). This is another reason why the City staff has authorized the use of apartment rates instead of the condominium rates for many previous City transportation impact studies. The ITE apartment rates are based on almost four times as many project trip generation surveys than the condominium/townhouse rates are. The ITE apartment rates are based on trip generation surveys of over 230 different apartment projects and over the past 20 years our firm has had numerous opportunities to verify their accuracy with our own trip generation surveys, conducted as part of other apartment project traffic studies. For the above reasons we continue to recommend that the apartment trip generation rates be used for this analysis.

Response to Comment #16 – Please note additional information about the Berkeley Municipal Code requirements is provided at the very beginning of the parking section and the additional data from ITE and the US Census is something has typically been requested by City staff on many previous studies. This data is for informational purposes only and we are definitely not suggesting it should supersede the City’s municipal code requirements. The additional information from ITE and the US Census can certainly be removed or abbreviated if requested.

Response to Comment #22 – The study intersections were approved by the previous City Traffic Engineer and at the time the decision to include only the adjacent intersections was, in part, based on the fact that the project trip generation would be less than 25 peak hour trips. Please note the City staff also gave consideration to the fact that the 25 peak hour trip estimate number does not include any discounts for potential traffic from existing parking lot that currently occupies a portion of the site. As per the City of Berkeley Guidelines for Development of Traffic Impact Reports, projects that generate less than 25 peak hour trips are normally only required to study the adjacent intersections. That being said, it is acknowledged that the City’s guidelines are merely a starting point for development of the traffic study scope of work and the City staff clearly has the authority to require analysis of additional intersections.

Please don’t hesitate to contact me if you have any questions about these comments.

Sincerely,

Stephen C. Abrams
President
Abrams Associates
T.E. License No. 1852
Transportation Impact Analysis

5th and Channing Mixed Use Project

City of Berkeley

Prepared by:
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1875 Olympic Boulevard, Suite 210
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July 5, 2017
5th and Channing Mixed Use Project in the City of Berkeley

TRANSPORTATION AND CIRCULATION

1) EXECUTIVE SUMMARY
The 5th and Channing mixed use project is proposed to include 15 apartment units, five of which would be live/work lofts. The project is planned to be developed on the northwest corner of the intersection of Channing Way and 5th Street in the City of Berkeley. About half of the site is undeveloped and the other half is currently occupied by a surface parking lot. Figure 1 shows the location of the project and the surrounding roadway network and Figure 2 shows the ground floor site plan for the project. Based on the trip generation forecasts the project would generate approximately 10 vehicle trips during the AM peak hour and 19 trips during the PM peak hour.

Based on the project’s design and a detailed analysis conducted according to the City’s guidelines there would be no significant transportation impacts according to established traffic engineering standards and no off-site traffic or transportation mitigations would be required. The City’s base zoning ordinance requirement for the project is 15 parking spaces. The project is proposing to accommodate its parking demand by providing 16 off-street parking spaces on site. The project is also proposing to meet or exceed the requirements for on-site bicycle parking.

2) INTRODUCTION
This transportation impact analysis describes the existing and future conditions for transportation and circulation both with and without the proposed project. The study presents information on the regional and local roadway networks, the pedestrian and transit conditions, and provides an analysis of the effects on transportation facilities associated with the project.

This study also describes the regulatory setting; the criterion used for determining the significance of environmental impacts; and summarizes potential environmental impacts and appropriate mitigation measures when necessary. This study has been conducted in accordance with the requirements and methodologies set forth by the City of Berkeley, Alameda County, Caltrans, and the applicable provisions of CEQA.

3) ENVIRONMENTAL SETTING
This section of the report describes the roadways, traffic conditions and other existing transportation characteristics in the vicinity of the project. The primary basis for the traffic operations portion of the analysis is the peak hour level of service at the key study intersections. In this report, these peak commute hours will be identified as the AM and PM peak hours.

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3.1 Project Study Intersections

Based on the project’s trip generation and the potential for traffic impacts, an analysis of the intersections of Channing Way at 4th Street, 5th Street and the project entrance was required. Figure 1 presents the location of the project study intersections where a detailed level of service analysis was prepared.

3.2 Traffic Analysis Scenarios

The study intersections were evaluated for the following four scenarios:

- **Scenario 1:** *Existing Conditions* – Level of Service (LOS) based on existing peak hour volumes and existing intersection configurations.

- **Scenario 2:** *Existing Plus Project* – Existing traffic volumes plus trips from the proposed project.

- **Scenario 3:** *Baseline (No Project) Conditions* – The Baseline scenario is based on the existing volumes plus growth in background traffic (for two years) plus the traffic from all reasonably foreseeable developments that could substantially affect the volumes at the project study intersection.

- **Scenario 4:** *Baseline Plus Project Conditions* – This scenario is based on the Baseline traffic volumes plus the trips that would be generated by the proposed project.

3.3 Existing Roadway Network

As shown on Figure 1, the roads that would be primarily affected by the project are Channing Way Street and 4th and 5th Streets. The following is a brief description of these roadways:

- **Channing Way** – Channing Way is a two lane roadway in the City of Berkeley. It extends east from Berkeley Aquatic Park and terminates near the University of California Campus at Prospect Avenue. It is designated as a local street and a bicycle boulevard in the City’s General Plan and has a speed limit of 25 mph.

- **4th and 5th Streets** – 4th and 5th Streets are two lane roadways that extend south from Harrison Street to terminates to the south at Parker Street. They are designated as local streets in the City’s General Plan and have a speed limit of 25 mph.

3.4 Intersection Analysis Methodology

Existing operational conditions at the study intersection were evaluated according to the requirements set forth by the City of Berkeley. Analysis of traffic operations was conducted using the 2010 *Highway Capacity Manual (HCM)* Level of Service (LOS) methodology with Synchro software.¹

Level of service is an expression, in the form of a scale, of the relationship between the capacity of an intersection (or roadway segment) to accommodate the volume of traffic and the traffic moving through it at any given time. The level of service scale describes traffic flow with six ratings ranging from A to F, with “A” indicating relatively free flow of traffic and “F” indicating stop-and-go traffic characterized by traffic jams.

As the amount of traffic moving through a given intersection or roadway segment increases, the traffic flow conditions that motorists experience rapidly deteriorate as the capacity of the intersection or roadway segment is reached. Under such conditions, there is general instability in the traffic flow, which means that relatively small incidents (e.g., momentary engine stall) can cause considerable fluctuations in speeds and delays that lead to traffic congestion. This near-capacity situation is labeled level of service (LOS) E.

Beyond LOS E, the intersection or roadway segment capacity has effectively been exceeded, and arriving traffic will exceed the ability of the intersection to accommodate it. Table 1 summarizes the relationship between LOS, average control delay, and the volume to capacity ratio at signalized intersections. Table 2 summarizes the relationship between LOS and delay at unsignalized intersections.

For signalized intersections, The City of Berkeley’s LOS standards are based on the average delay for the entire intersection. The HCM methodology determines the capacity of each lane group approaching the intersection. The LOS is then based on average control delay (in seconds per vehicle) for the various movements within the intersection. A combined weighted average control delay and LOS are presented for the intersection. A summary of the HCM results and copies of the detailed HCM LOS calculations are included in the appendix to this report.

For unsignalized (all-way stop controlled and two-way stop controlled) intersections, the average control delay and LOS operating conditions are calculated by approach (e.g., northbound) and movement (e.g., northbound left-turn) for those movements that are subject to delay. Operating conditions for unsignalized intersections are presented for the worst approach.
### TABLE 1

**SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS**

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Description of Operations</th>
<th>Average Delay (sec/veh)</th>
<th>Volume to Capacity Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Insignificant Delays: No approach phase is fully used and no vehicle waits longer than one red indication.</td>
<td>≤ 10</td>
<td>&lt; 0.60</td>
</tr>
<tr>
<td>B</td>
<td>Minimal Delays: An occasional approach phase is fully used. Drivers begin to feel restricted.</td>
<td>&gt; 10 to 20</td>
<td>&gt; 0.61 to 0.70</td>
</tr>
<tr>
<td>C</td>
<td>Acceptable Delays: Major approach phase may become fully used. Most drivers feel somewhat restricted.</td>
<td>&gt; 20 to 35</td>
<td>&gt; 0.71 to 0.80</td>
</tr>
<tr>
<td></td>
<td>Tolerable Delays: Drivers may wait through no more than one red indication. Queues may develop but dissipate rapidly without excessive delays.</td>
<td>&gt; 35 to 55</td>
<td>&gt; 0.81 to 0.90</td>
</tr>
<tr>
<td>D</td>
<td>Significant Delays: Volumes approaching capacity. Vehicles may wait through several signal cycles and long vehicle queues from upstream.</td>
<td>&gt; 55 to 80</td>
<td>&gt; 0.91 to 1.00</td>
</tr>
<tr>
<td>E</td>
<td>Excessive Delays: Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.</td>
<td>&gt; 80</td>
<td>&gt; 1.00</td>
</tr>
</tbody>
</table>


### TABLE 2

**UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS**

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Description of Operations</th>
<th>Average Delay (seconds/vehicle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No delay for stop-controlled approaches.</td>
<td>0 to 10</td>
</tr>
<tr>
<td>B</td>
<td>Operations with minor delays.</td>
<td>&gt; 10 to 15</td>
</tr>
<tr>
<td>C</td>
<td>Operations with moderate delays.</td>
<td>&gt; 15 to 25</td>
</tr>
<tr>
<td>D</td>
<td>Operations with some delays.</td>
<td>&gt; 25 to 35</td>
</tr>
<tr>
<td>E</td>
<td>Operations with high delays and long queues.</td>
<td>&gt; 35 to 50</td>
</tr>
<tr>
<td>F</td>
<td>Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.</td>
<td>&gt; 50</td>
</tr>
</tbody>
</table>

3.5 Existing Intersection Capacity Conditions

The existing intersection geometry at the project study intersections is presented in Figure 3. The existing traffic volumes at these intersections for the weekday AM and PM peak hours are presented in Figure 4. Traffic counts at the intersection were conducted in October, 2016. Table 3 summarizes the associated LOS computation results for the existing weekday AM and PM peak hour conditions at these intersections. As shown in Table 3, the project study intersections currently have acceptable conditions (LOS D or better) during the weekday AM and PM peak hours. Please note the detailed LOS calculations are included in the technical appendix to this report.

3.6 Pedestrian and Bicycle Facilities

Bicycle paths, lanes and routes are typical examples of bicycle transportation facilities, which are defined by Caltrans as being in one of the following three classes:

*Class I* – Provides a completely separated facility designed for the exclusive use of bicyclists and pedestrians with crossing points minimized.

*Class II* – Provides a restricted right-of-way designated lane for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and cross-flows by pedestrians and motorists permitted.

*Class III* – Provides a right-of-way designated by signs or permanent markings and shared with pedestrians and motorists.

There are no marked bicycle lanes in the immediate vicinity of the project but it should be noted that the adjacent street, Channing Way, is designated as a bicycle boulevard. 4th Street to the north of Channing Way is proposed to be a bike route. Currently bicycle traffic in the area is relatively light, with no more than about 20 bicycles per hour observed on any roadways in the study area during the traffic counts conducted for this study. This is, in part, due to the fact that Channing Way dead ends to the west at the railroad tracks with no access to Berkeley Aquatic Park.

**TABLE 3**

**EXISTING INTERSECTION LEVEL OF SERVICE CONDITIONS**

<table>
<thead>
<tr>
<th>INTERSECTION</th>
<th>CONTROL</th>
<th>PEAK HOUR</th>
<th>EXISTING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Side Street Stop</td>
<td>AM</td>
<td>Delay</td>
</tr>
<tr>
<td>1 FOURTH STREET AND CHANNING WAY</td>
<td>Side Street Stop</td>
<td>AM</td>
<td>9.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>11.0</td>
</tr>
<tr>
<td>2 FIFTH STREET AND CHANNING WAY</td>
<td>Side Street Stop</td>
<td>AM</td>
<td>9.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>9.9</td>
</tr>
<tr>
<td>3 PROJECT ENTRANCE AND CHANNING WAY</td>
<td>Side Street Stop</td>
<td>AM</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**SOURCE:** Abrams Associates, 2017  
**NOTES:** HCM LOS results are presented in terms of average intersection delay in seconds per vehicle.

3.7 Transit Service

There is extensive bus transit service provided by Alameda-Contra Costa County (AC) Transit along San Pablo Avenue. Routes 72, 72M, 72R and all-nighter Route 802 all operate directly adjacent to the project site. Please note the nearest bus stops are about six blocks west of the site. Route 49 also operates along Dwight Way and 7th Street about three blocks from the site. Transbay Route Z operates along 6th and 7th Streets just a couple blocks from the project site.
FIGURE 4 | EXISTING AM(PM) PEAK HOUR TRAFFIC VOLUMES
TRANSPORTATION IMPACT ANALYSIS
5th and Channing Mixed Use Project
City of Berkeley
4) REGULATORY CONTEXT

Existing policies, laws and regulations that apply to the proposed project are summarized below.

4.1 State

The California Department of Transportation (Caltrans) has jurisdiction over State highways and any improvements to these roadways would require Caltrans’ approval.

4.2 Local

City of Berkeley General Plan - The Transportation and Circulation Element the City of Berkeley General Plan addresses the location and extent of existing and planned transportation routes, terminals, and other local public utilities and facilities. The General Plan identifies roadway and transit goals and policies that have been adopted to ensure that the transportation system of the City will have adequate capacity to serve planned growth. These goals and policies are intended to provide a plan and implementation measures for an integrated, multi-modal transportation system that will safely and efficiently meet the transportation needs of all economic and social segments of the City.

4.3 Significance Criteria

The City’s level of service standard states that an impact is significant when the criteria are reduced from LOS A, B, C, or D to LOS E (with the addition of two (2) seconds of average delay) for signalized intersections. Intersections that exceed this service level threshold are considered to be impacted and should be considered for mitigation. Exceptions to the LOS D standard arise when the project is not expected to add more than two seconds at an intersection going from LOS D to LOS E or more than three seconds of delay at an intersection that is already operating at LOS E. In addition, it would also be considered a significant impact if a project would increase the volume to capacity (V/C) ratio by more than 0.01 at an intersection that is already operating at LOS F. For unsignalized intersections, additional considerations are involved, including the number of vehicles on the critical approach, vehicles contributed by the proposed project, and signal warrant analysis. At an unsignalized intersection, mitigation is required if a movement is LOS F, the peak hour signal warrant is met, and a minimum of 10 vehicles are added to the critical movement.

According to CEQA guidelines, a project would also have a significant impact if it would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths and mass transit.

- Conflict with an applicable congestion management program, including, but not limited to, level-of-service standards, and travel demand measures, or other standards established by a county congestion management agency for designated roadways.

- Result in inadequate emergency vehicle access.

- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

- Result in an internal circulation system design that does not meet City standards.

It should again be noted that this project has not been found to have any significant impacts according to CEQA and the above mentioned criteria are presented for informational purposes.
5) IMPACTS AND MITIGATION MEASURES

5.1 Project Trip Generation

The vehicle trip generation for the project is shown in Table 4. The trip generation rates are based on the ITE rates for apartments (Land Use 220) and retail (Land Use 820) taken from the 9th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual. Based on the trip generation forecasts the project generate about 10 new vehicle trips during the AM peak hour and 18 trips during the PM peak hour. The trips generated by this proposed development are estimated for the peak commute hours which represent the peak of adjacent street traffic. Please note that to be conservative the trips from 2,500 square feet of retail space was also assumed on top of the trip generation from the 15 units to account for the commercial portion of the live/work lofts. This is based on the square footage of the ground floor for the live/work units. To be conservative no reductions were taken to account for the existing parking lot on the site in the analysis of traffic operations. Based on field observations during the traffic counts it was concluded the existing trip generation from the property is very low.

5.2 Project Trip Distribution

The trip distribution assumptions have been based on the existing traffic count data including daily directional volume and peak-hour turning movements, the Alameda County travel demand model, and knowledge of the surrounding area such as commute patterns and the overall land use patterns in the area. Figure 5 shows the project traffic that would be added at the project study intersections.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>ITE Code</th>
<th>Size</th>
<th>ADT</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITE Apartment Rates - Trips per Unit</td>
<td>220</td>
<td>6.65</td>
<td></td>
<td>0.10</td>
<td>0.22</td>
</tr>
<tr>
<td>Apartment Trip Generation</td>
<td>15 units</td>
<td>100</td>
<td>2</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>ITE Retail Rates - Trips per ksf</td>
<td>820</td>
<td>127.15</td>
<td>5.62</td>
<td>5.19</td>
<td>9.85</td>
</tr>
<tr>
<td>Retail Trip Generation</td>
<td>2,500 sq. ft.</td>
<td>107</td>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Net New Trip Generation for the Proposed Project</td>
<td>207</td>
<td>3</td>
<td>7</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

**SOURCE:** Institute of Transportation Engineers Trip Generation Manual (9th Edition) and the Trip Generation Handbook (2nd Edition)
FIGURE 5 | PROJECT AM/PM PEAK HOUR TRIPS
TRANSPORTATION IMPACT ANALYSIS
5th and Channing Mixed Use Project
City of Berkeley
5.3 Existing Plus Project Intersection Capacity Conditions

This scenario evaluates the existing conditions with the addition of traffic from the proposed project. A comparison of the capacity calculations for the conditions with the addition of traffic from the project is shown in Table 5. Figure 6 presents the existing plus project volumes used in the analysis. The corresponding LOS analysis calculation sheets are presented in the Traffic Analysis Appendix. As shown in Table 5, the project study intersections would continue to have acceptable conditions (LOS D or better) during the weekday AM and PM peak hours. Please note the detailed LOS and queuing calculations have been included in the technical appendix to verify there would be no queuing problems expected with addition of traffic from the proposed project.

| TABLE 5 |
| EXISTING PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS |
| INTERSECTION | CONTROL | PEAK HOUR | EXISTING | EXISTING PLUS PROJECT |
| | | | Delay | LOS | Delay | LOS |
| 1 | FOURTH STREET AND CHANNING WAY | Side Street Stop | AM | 9.8 | A | 9.9 | A |
| | | | PM | 11.0 | B | 11.0 | B |
| 2 | FIFTH STREET AND CHANNING WAY | Side Street Stop | AM | 9.1 | A | 9.2 | A |
| | | | PM | 9.9 | A | 10.0 | B |
| 3 | PROJECT ENTRANCE AND CHANNING WAY | Side Street Stop | AM | N/A | N/A | 9.2 | A |
| | | | PM | N/A | N/A | 9.8 | A |


NOTES: HCM LOS results are presented in terms of average intersection delay in seconds per vehicle.

5.4 Baseline Intersection Capacity Conditions

Trip generation and trip assignment assumptions for the approved projects were based on the traffic study reports prepared for each project, where available. Approved projects include developments that are either under construction, built but not fully occupied, or not built but have final development approval from the City. To account for background growth from approved developments that could potentially affect the volumes at the project study intersections were added to the existing intersection turning movement counts. To account for the growth in background traffic the existing traffic volumes were forecast to increase by 1% per year for two years based on the assumption that the project completion date would be 2018.

Figure 7 presents the resulting baseline volumes at each of the project study intersections. Table 6 summarizes the LOS results for the Baseline and Baseline Plus Project weekday AM and PM peak hour conditions. The corresponding LOS analysis calculation sheets are presented in the Traffic Analysis Appendix. As shown in Table 6, the project study intersections would continue to have acceptable conditions (LOS D or better) during the weekday AM and PM peak hours.