



memorandum

date April 11, 2018

to David Rader, Senior Planner
Santa Clara County Department of Planning and Development

from Brian Boxer, Paul Mitchell, Chris Sanchez, Brian Schuster - ESA

subject **ESA Peer Review of Air Quality Technical Analysis for Housing Alternatives**

Stanford prepared and submitted an Air Quality technical memorandum in support of two additional housing alternatives to be addressed in the Stanford 2018 General Use Permit EIR. At the County's request, the following are ESA's peer review comments on the *Air Quality Technical Analysis for Housing Alternatives*, dated April 6, 2018, prepared by Ramboll for Stanford. The memorandum contains a comprehensive analysis of the Stanford's criteria air pollutant (CAP) and Toxic Air Contaminant (TAC) emissions within the General Use Permit study area under two distinct additional housing alternatives.

Page 4: The air quality analysis uses EMFAC2014 emission factors presumably to be consistent with the earlier Project analysis of the AQTR prepared in 2016. However, it should be noted that the more recently released EMFAC2017 has increases in PM and NOX, especially for HD trucks. We recommend including the rationale in the Ramboll report for use of EMFAC2014 emission factors.

Page 4: The Alternatives analysis uses CalEEMod 2013.3.2, presumably to be consistent with the earlier Project analysis of the AQTR prepared in 2016. There have been two updates to this model with the most current being CalEEMod 2016.3.2. We recommend including the rationale in the Ramboll report for use of CalEEMod 2013.3.2.

Page 5, Table 3-11: It would be helpful to also have PM2.5 in this table as it is a priority pollutant of the Clean Air Plan and BAAQMD CEQA Guidelines. Also ROG for the FO alternative is shown as 44 tons per year while Table 3-1 show 45 tons per year.

Page 8: Figure 4-2: recommend changing the X-axis to project/alternative, and group the bars by pollutant type instead of project/alternative. As it is currently presented, it is hard to tell any difference in emissions between the alternatives. Also suggest changing the maximum Y-axis value from 3 to 1.5.

Page 9 and Global: Bolded Impact Statements should acknowledge whether each less than significant finding is without or with mitigation.

Page 9, Table 5-1: Annual construction-related emissions of NO_x are 80% greater for the FO Alternative than the project. This may be excessive given that we are only considering an additional 135 units of residential construction per year. The increase of 4.1 pounds of NO_x per day is from off-road equipment is directly from the CalEEMod output and that is not questioned. But the additional 13.5 pounds per day of NO_x from on-road sources seems too big.

Table 3-4-9 of the 2016 AQTR shows that on-road NO_x from the proposed Project to total 0.82 tons per year (0.22 TPY worker trips, 0.2 TPY vendor trips and 0.4 TPY haul trips). This is equivalent to 6.3 pounds per day assuming 260 work days per year. So the NO_x data in Table 5-1 in the current technical memorandum is showing more than a doubling of NO_x emissions under the FO alternative from mobile sources compared to the Project.

Table 3-4 shows mobile NO_x emission from construction to total 1.43 tons per year (0.23 TPY worker trips, 0.2 TPY vendor trips and 1.0 TPY haul trips) under the FO alternative. This is equivalent to 11 pounds per day assuming 260 work days per year. So using data in Table 3-4-9 and Table 3-4 the FO Alternative would increase mobile NO_x emissions by 4.7 pounds per day (11 minus 6.3). This is in contrast to Table 5-1 and Table 3-6 which from which the 13.5 pound per day increase is developed. If there is a potential methodological error for this apparent discrepancy, then it should be reconciled and corrected across all pollutants.

Table 4-3: General note regarding TAC speciation values: the BAAQMD's *Recommended Methods for Screening and Modeling Local Risks and Hazards* report has been updated; there is now a 2012 version (though Table 14 hasn't changed; see: <http://www.baaqmd.gov/~media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en>)

Page 14, Table 5-4: Operational mobile PM₁₀ emissions almost double under the FO Alternative compared to the project (15.5 tons per year compared to 8.8 TPY with the Project). This appears high given that Table 3-7 only shows an 18% increase in operational VMT. What would be driving this increase.



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memorandum

date April 11, 2018

to David Rader, Senior Planner
Santa Clara County Department of Planning and Development

from Brian Boxer, Paul Mitchell, Chris Sanchez, Jeff Caton - ESA

subject **ESA Peer Review of GHG Technical Analysis for Housing Alternatives and Energy Technical Analysis for Housing Alternatives**

Stanford prepared and submitted separate Greenhouse Gas (GHG) Emissions and Energy technical memoranda in support of, and related to, housing alternatives for the proposed 2018 General Use Permit EIR. At the County's request, the following are ESA's peer review comments on the *GHG Technical Analysis for Housing Alternatives*, and the *Energy Technical Analysis for Housing Alternatives*, both dated April 6, 2018, prepared by Ramboll for Stanford. The memoranda contain a comprehensive analysis of the Stanford's GHG emissions and energy consumption within the General Use Permit study area under two distinct additional housing alternatives.

GHG Technical Analysis for Housing Alternatives

Page 3: The GHG Alternatives analysis uses EMFAC2014 emission factors, not the more recently released EMFAC2017), presumably to be consistent with the earlier analysis initiated in 2016. We recommend including the rationale in the Ramboll report for use of EMFAC2014 emission factors.

Page 3: The GHG Alternatives analysis uses CalEEMod 2013.3.2 to estimate construction-related off-road equipment emissions, presumably to be consistent with the earlier analysis initiated in 2016. There have been two updates to this model with the most current being CalEEMod 2016.3.2. We recommend including a rationale in the Ramboll report for use of CalEEMod 2013.3.2.

Table 3-6: On-road construction GHG emissions under the FO alternative only increase by 13% compared to the project based on Table 3-6 of the GHG Alternatives Report and Table 3.6-17 of the 2017 GHG Technical Report. This contrasts sharply to the increase in nitrogen oxides (NOx) reported in Table 5-1 of the Air Quality Technical Memo. While some variations in percentage increases in GHG's versus NOx from these sources would be expected, the reported variations are pronounced.

Energy Technical Analysis for Housing Alternatives

Table 3-4: This table indicates an increase in construction-related diesel use under the FO Alternative of approximately 86% compared to the proposed project. Using the data in the GHG technical Memo (using GHG emissions as a rough proxy for energy use), on-road construction GHG emissions under the FO alternative only increase by 13% compared to the project based on Table 3-6 of the GHG Alternatives Report and Table 3.6-17 of the GHG Technical Report from 2017. Off-road construction GHG emissions under the FO alternative only increases by 65% compared to the project based on Table 3-1 of the GHG Report. The combined increase is only 25%, which is substantially less than the 86% in Table 3-4 of the Energy Memo. This variation is marked given that GHG emissions from construction and construction fuel use should correlate fairly consistently.



memorandum

date March 23, 2018

to David Rader, Senior Planner, Santa Clara County Department of Planning and Development

from Cory Barringhaus; Jennifer Brown; Paul Mitchell, ESA

subject Peer Review of the Stanford University of Housing Alternatives for Housing Alternative Description; Population and Housing; Student Generation; Water Supply Assessment; Wastewater; Solid Waste; and Parks and Recreation

At the County's request, ESA peer reviewed the following documents prepared by Stanford in support of new housing alternatives to be included in the Stanford 2018 General Use Permit EIR:

- Stanford University 2018 General Use Permit EIR: Housing Alternative Description *Revised*
- Stanford University 2018 General Use Permit EIR: Housing Alternative Population and Housing Analysis, March 16, 2018;
- Stanford University 2018 General Use Permit EIR: Housing Alternatives Student Generation Analysis, March 16, 2018;
- Water Supply Assessment for the Stanford 2018 General Use Permit EIR Analysis of Housing Alternatives, prepared by Shaaf & Wheeler, March 16, 2018;
- 2018 General Use Permit EIR: Wastewater for Housing Alternatives, March 16, 2018;
- Stanford University 2018 General Use Permit EIR: Solid Waste for Housing Alternatives, March 16, 2018; and
- Stanford University 2018 General Use Permit EIR: Housing Alternative Parks and Recreation Analysis, March 19, 2018.

These comments are presented generally in chronological order as found within each document, not according to order of significance.

Stanford University 2018 General Use Permit EIR: Housing Alternative Description Revised

1. Page 2, second full paragraph, second sentence, reference to total project daily population growth should be revised from 8,132 to 8,162.

2. Table 3, third column, under Residential Population under 2018 GUP within Project Site Boundary 2035, Other Family Members should be revised from 2,535 to 2,335.
3. We recommend explaining in the memo that the additional “faculty/staff housing” could be available other Stanford population categories, including postdoctoral and other workers categories.
4. Since the Draft EIR included all population categories, including nonmatriculated students, in its population tables (e.g., Table, 3.2, Table 5.12-4, Table 5.12-7, and Table 5.12-9), Stanford should explain somewhere in the memo why it is not including nonmatriculated students in the tables in its memo.

Stanford University 2018 General Use Permit EIR: Housing Alternative Population and Housing Analysis

1. Table 1 and Table 2: Please add for clarity and consistency the corresponding footnotes shown in Table 12 of Draft EIR Appendix PHD.
2. In addition, it would be useful to clarify that the 918 graduate student beds shown on row 2 of both tables includes 18 student spouses per page 5.7 of Draft EIR Appendix POP.
3. Since the Draft EIR included all population categories, including nonmatriculated students, in its population tables (e.g., Table, 3.2, Table 5.12-4, Table 5.12-7, and Table 5.12-9), Stanford should explain somewhere in the memo why it is not including nonmatriculated students in the tables in this memo.

Stanford University 2018 General Use Permit EIR: Housing Alternatives Student Generation Analysis

1. On page 2, at the end of the first paragraph, we recommend Stanford adding text explaining that additional on-campus housing under the project alternatives would be multi-family units, similar to that analyzed under the Proposed 2018 General Use Project, and therefore, this student generation rate would remain applicable under both the Full Offset and Half Offset Alternative.
2. The first sentence in paragraph 2, on page 2, we recommend clarifying that Table 1 summarizes the estimated enrollment in PAUSD schools based on the proposed faculty/staff housing units from the proposed 2018 General Use Permit and each of the two housing alternatives.”
3. Table 1: PAUSD Student Yield Under Housing Alternatives, the last row under should be revised to read: “Total Student Yield for ~~Full~~ Half Offset Alternative.”

Water Supply Assessment for the Stanford 2018 General Use Permit EIR Analysis of Housing Alternatives, prepared by Shaaf & Wheeler

1. Page 2, Table 1, for clarity, ESA suggests revising the third column heading which currently just states “Add” to “2018 GUP Adds.”
2. Page 3, Table 4, there is an asterisk in the fourth column heading (2020 Projected), but no asterisk note is provided at the bottom of this table (should be same as that note in April 2017 WSA Table 2-4?).

3. Page 3, last paragraph, last sentence – for context we recommend you identify what the actual ISG value is that you are referring to here.
4. Page 5, Table 6, under columns “Single Dry Year” and “Multiple Dry Year (for Year 1)” the 2035 Demand for Potable Water that are met by ISG and groundwater (2.51 and 0.48, respectively) add up to 2.99 not 3.00. We realize this is likely a small rounding discrepancy, but since the 2035 potable demand actually exceeds the SFPUC ISG supply in this year, please ensure the numbers add up correctly. So it would appear either the 0.48 mgd potable demand met by groundwater should get rounded up to 0.49, or the 3.00 mgd potable water demand should get rounded down to 2.99, whichever is correct.
5. Page 5, second paragraph last sentence, recommend deleting this sentence. While there would not be a large buffer for differences between the projected and final conditions for the Full Housing Offset Alternative, it would be inaccurate to say there is no buffer; the WSA is also based on a number of conservative assumptions anyway.
6. Page 7, Table 9, there is an asterisk in the fourth column heading (2020 Projected), but no asterisk note is provided at the bottom of this table (should be same as that note in April 2017 WSA Table 2-4?).
7. Page 7, Table 9, please revise title to Project Total Water Demands, 2020-2035 (mgd) for Half Offset Alternative.
8. There is a small discrepancy between the total 2035 Projected Water Demand for the Half Offset Alternative in Table 9 (which reports 4.07) and Table 11 and Table 12 (both report 4.06).
9. Page 7, first paragraph, last sentence – for context we recommend you identify what the actual ISG value is that you are referring to here.
10. Page 7, Table 10, please revise title to Summary of Projected Demands and Projected Supply (mgd) for Half Offset Alternative.
11. Page 8, Table 11, please revise title to Dry Year Supply and Demand Summary (mgd) for Half Offset Alternative.
12. Similar to Comment 3 above, on Page 8, Table 11, under columns “Single Dry Year” and “Multiple Dry Year (for Year 1)” the 2035 Demand for Potable Water that is met by ISG and groundwater (2.51 and 0.21, respectively) add up to 2.72 not 2.73. So it would appear either the 0.21 mgd potable demand met by groundwater should get rounded up to 0.22, or the 2.73 mgd potable water demand should get rounded down to 2.72, whichever is correct.

Similar comment also in Table 11 about Multiple Dry Year (for Year 2). The 2035 Demand for Potable Water that is met by ISG and groundwater (2.18 and 0.12, respectively) add up to 2.30, not 2.31 So it would appear either the 0.12 mgd potable demand met by groundwater should get rounded up to 0.13, or the 2.31 mgd potable water demand should get rounded down to 2.70, whichever is correct.

13. Page 8, second paragraph last sentence, recommend deleting this sentence, as it may not be accurate for all reported dry years. For instance, Table 11 shows the potable water supply in Dry Year 3 exceeds the estimated potable water demand.
14. Page 9, first partial sentence, similar to comment above, under the Half Offset Alternative, during Dry Year 1 and 2, the potable water demand would exceed the SFPUC water supply; however, in Dry Year 3, the potable water demand does not exceed the available SFPUC water supply. Please check if your sentence needs to be clarified.

2018 General Use Permit EIR: Wastewater for Housing Alternatives

1. Page 3, under Option 1, the memo indicates that if using the methodology from the Draft EIR (that 100 percent of the net increase in indoor domestic water demand becomes wastewater) both housing alternatives would exceed Stanford's current allocation in the wastewater treatment plant. ESA agrees that using the methodology from the Draft EIR, the Full Offset Housing Alternative would exceed Stanford's current allocation in the wastewater treatment plant of 2.11 mgd. However, ESA finds that using this methodology the Half Offset Housing Alternative would not exceed Stanford's current allocation in the wastewater treatment plant. See summary below:
 - With Full Offset Housing Alternative: Would add an additional 0.54 mgd wastewater (from the additional 207 graduate beds and 2,342 faculty staff units) to the total reported in the Draft EIR (1.7 mgd) for a total estimated Stanford wastewater generation in 2035 of 2.24 mgd wastewater. This estimate would be over the 2.11 mgd allocation by 0.13 mgd.
 - With Half Offset Housing Alternative: Would add an additional 0.27 mgd wastewater (from the additional 104 graduate beds and 1,171 faculty staff units) to the total reported in the Draft EIR (1.7 mgd) for a total estimated Stanford wastewater generation in 2035 of 1.97 mgd wastewater. This estimate would be under the 2.11 mgd allocation, by 0.14 mgd.

Accordingly, we recommend revising the discussion of Option 1 in the memo to not conclude that the Half Offset Housing Alternative would exceed Stanford's current allocation in the wastewater treatment plant using the DEIR methodology.

2. ESA has reviewed the new information provided in Option 2 discussion on page 3 and Attachment A on page 4, which indicate that based on this new information provided by Stanford, that future Stanford wastewater demand is expected to be approximately 70 percent of total future domestic water demand.

If using this approach for the proposed Project, ESA finds that with the 2018 GUP, the total Stanford wastewater generation in 2035 would be less than that estimated in the Draft EIR, and similarly would not exceed Stanford's current allocation in the wastewater treatment plant, as follows:

- With proposed 2018 GUP: 70 percent of 2.44 mgd (total projected Stanford potable water demand in 2035 with proposed 2018 GUP) = 1.71 mgd wastewater.

ESA also agrees with Stanford that, as discussed in Option 2 in Stanford's memo, if this approach were to be used for the Full Offset Housing Alternative and the Half Offset Housing Alternative, the total Stanford wastewater generation in 2035 with either alternative would not exceed Stanford's current allocation in the wastewater treatment plant, as follows:

- With Full Offset Housing Alternative: 70 percent of 2.98 mgd (total projected Stanford potable water demand in 2035 with Full Offset Housing Alternative) = 2.09 mgd wastewater.
 - With Half Offset Housing Alternative: 70 percent of 2.71 mgd (total projected Stanford potable water demand in 2035 with Half Offset Housing Alternative) = 1.90 mgd wastewater.
3. To support the EIR, please explain how the historical wastewater generation was estimated in Table A-1 (e.g., is this based on actual metering of sanitary sewer flows; other?).
 4. To support the EIR, please provide the basis for how Stanford is confident that the wastewater demand would continue to be projected at 70 percent of future domestic water demand through the duration of the proposed 2018 GUP (and the Additional Housing Alternatives).

Stanford University 2018 General Use Permit EIR: Solid Waste for Housing Alternatives

1. Page 3, Stanford only estimates the increase solid waste associated with additional family members that would live on-campus under the housing alternatives, presumably because the Draft EIR considered the total Stanford affiliate population solid waste in 2035 (e.g., including off-campus faculty, staff, postdocs, grad students) in its analysis.

However, ESA requests clarification from Stanford if the solid waste estimates originally provided by Stanford in support of the Draft EIR accounted for the total daily solid waste generation from the off-campus Stanford affiliate population (i.e., what the off-campus population would have generated while visiting the campus, and additional solid waste that this population would have been generated at their off-campus residences). If so, ESA agrees the housing alts would only need to add the solid waste of the additional family members that would live on-campus.

If, conversely, the solid waste estimates originally provided by Stanford in support of the Draft EIR only limited its solid waste generation estimate for off-campus Stanford affiliates to that solid waste that would only be generated when they visited the Stanford campus, then we would recommend adding any additional increment of daily solid waste generation that this population would generate.

Stanford University 2018 General Use Permit EIR: Housing Alternative Parks and Recreation Analysis

1. ESA has reviewed and verified the calculations of Table 1 and Table 2.
2. ESA supports the comparison in Table 3 and Table 4 of Proposed GUP Growth in Daily Visits to the Additional Growth in Daily Visits under the alternatives, similar to Appendix REC, Table 7 and not Table D4 which factors in commuting use of facilities.

3. ESA supports the findings of visits per acre under Table 3, Table 4 and Table 5, and notes that Table 4 needs a beige line inserted following park 3 “Pearson-Arastradero Preserve”
4. ESA supports the findings on page 6, with respect to which parks would experience turf area impacts, as the Baylands Nature Preserve in Palo Alto has no turf area.
5. ESA requests additional clarification as to why Stanford proposes a onetime improvement of potential turf impacts. ESA notes that in August of 2017 the City of Palo Alto published the [Final Initial Study/Mitigated Negative Declaration for the Revised Parks, Trails, Natural Open Space, and Recreation Master Plan](#). Within this master plan, the City outlined *Goal 6: Manage Palo Alto’s land and services effectively, efficiently and sustainably utilizing quantitative and qualitative measure,*” which contains policies and programs 6.A – 6.J, which outline measures to manage their land effectively. For example:

Policy 6.D Periodically review and update existing guidance for development, operations and maintenance of Palo Alto’s parks, trails, natural open space and recreation system based on the best practices in the industry and this Master Plan, including:

- Park Rules and Regulations;
- Open Space Policy & Procedure Handbook;
- City of Palo Alto Landscape Standards;
- City of Palo Alto design guidelines and standards; and
- Tree Technical Manual

Policy 6.E Incorporate sustainable best practices in the maintenance, management and development of open space, parks and recreation facilities where consistent with ecological best practices.

Can Stanford provide a different measure that would apply to the impacted parks, based on the City’s Annual Progress Reporting of their parks (see p. 112 of [Parks, Trails, Natural Open Space, and Recreation Master Plan](#))?

6. ESA has reviewed and supports the methodology and findings of Appendix A: Calculations for Projected Visits by Campus Residents and tables B1, B2, B3 and B4 under Appendix B: Sensitivity Analysis – Calculations for Faculty, Staff and Student Commuters, and Other Population Segment Commuters.

Memorandum

To	ESA: Paul Mitchell	Pages	1
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of Stanford's 2018 General Use Permit (GUP) – Housing Alternative Project VMT Calculations		
From	AECOM: Nichole Seow and Greg Gleichman		
Date	March 8, 2018		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.¹ This peer review memo represents AECOM's review of Fehr & Peers' memo '*Responses to Comments on 2018 GUP Draft EIR - Housing Offset Alternatives Vehicle Miles Traveled (VMT) Calculations*' dated 3/5/2018.

As the VMT calculation methodology has been reviewed and commented on during the peer review stage of the process, the review at this time focused on the 'inputs' to the calculation and any new assumptions used.

1. Worker Student VMT (Commute 100% Home Based) Table - Please provide more insight to the change in the vehicle mode split for 'first mile to transit all workers (carpool)', 'first mile to transit all workers (drive-alone)', off-campus graduate students 'first mile to transit (carpool)' and off-campus graduate students 'first mile to transit (drive-alone)'; it is unclear why and how these would change as a result of increased on-campus population in 2035.
2. Worker Student VMT (Commute 100% Home Based) Table – Please elaborate how and why the commute frequency and vehicle mode split are different from the original as a result of the increase in on-campus postdoc student population. Similarly, please clarify why the daily home-work trip length changes (for on-campus postdoc students) as the result of the on-campus population increase.
3. Residential Daily VMT Table – Please clarify why the trip generation rate for on-campus post doc students changes (to be similar to that of faculty/staff) as a result of the on-campus population increase.
4. In the F&P analysis, the population of faculty/staff and postdoc students was assumed to be 1 individual per household. This seems incorrect for (at least), the number of postdoc household units was determined based on about 2 students per unit. Please clarify.

¹ This language is from the scope of work in the AECOM contract for this project.

Memorandum

To	ESA: Paul Mitchell	Pages	1
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of Stanford’s 2018 General Use Permit (GUP) – Housing Alternative Project		
From	AECOM: Nichole Seow and Greg Gleichman		
Date	March 8, 2018		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.¹ This peer review memo represents AECOM’s review of Stanford’s memo ‘2018 General User Permit EIR: Housing Alternative Project Description’ dated 3/2/2018 and Fehr & Peers’ memo ‘Responses to Comments on 2018 GUP Draft EIR: Housing Offset Alternatives Trip Generation and Distribution’ dated 2/27/2018.

Described below is AECOM’s comment on Stanford’s memo ‘2018 General User Permit EIR: Housing Alternative Project Description’:

1. Table 2 – There seems to be a typo error in the ‘Residential Population under 2018 GUP Within Project Site Boundary 2035’ column; the number of ‘Other Family Members’ should be 2,335 instead of 2,535. Please confirm.

Described below are AECOM’s comments on Fehr & Peers’ memo ‘Responses to Comments on 2018 GUP Draft EIR: Housing Offset Alternatives Trip Generation and Distribution’:

1. Table 1 – Please identify where in the DEIR/TIA can the trip generation rates for Commuter (Line 1 of Trip Type) be found.
2. The first step of the calculation assumes only 1 individual in each of the 2,342 non-graduate student household would commute to Stanford. But this seems incorrect for we already know that in each postdoctoral household, about 2 persons would commute to Stanford as each of the 449 units for postdoctoral household has 2.14 students. Please clarify.
3. We note that the trip distribution will be based on the same patterns identified in the DEIR. But please confirm that the trip assignments will be specific based on the proposed number of units allocated to the different districts.

¹ This language is from the scope of work in the AECOM contract for this project.

Memorandum

To	ESA: Paul Mitchell	Pages	1
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of Stanford's 2018 General Use Permit (GUP) – Housing Alternative Analysis		
From	AECOM: Nichole Seow and Greg Gleichman		
Date	March 28, 2018		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.¹ This peer review memo represents AECOM's review of Fehr & Peers' memos '*Responses to Comments on the Proposed Housing Offset Alternatives Trip Generation and Distribution*' dated 3/9/2018, '*Responses to Comments on the Proposed Housing Offset Alternatives VMT Analysis*' dated 3/12/2018 and the revised analysis memo '*Responses to Comments on Stanford University 2018 General Use Permit Draft EIR – Housing Offset Alternatives Vehicle Miles Traveled (VMT) Calculations*' dated 3/12/2018.

The additional information provided gave us an understanding of the analysis approach adopted by Stanford/Fehr & Peers and we find that the methodologies outlined in the memos are technically reasonable. We therefore have no further questions or comments on the three documents listed above.

¹ This language is from the scope of work in the AECOM contract for this project.

Memorandum

To	ESA: Paul Mitchell	Pages	2
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of Stanford's 2018 General Use Permit (GUP) – Housing Alternative Analysis		
From	AECOM: Nichole Seow and Greg Gleichman		
Date	April 19, 2018		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.¹ This peer review memo represents AECOM's review of the *'Stanford University 2018 General Use Permit Housing Alternatives Transportation Impact Analysis'* dated April 2018.

Our review comments are as follow:

1. It appears that the second sentence of the second to last paragraph of Section 4.2 refers to the section of southbound I-280 between Foothill Expressway and SR 85. As such, it should read 'In addition, the Half Offset Housing Alternative would, while the proposed 2018 General Use Permit would ~~not~~ result in a significant impact to that freeway segment in only the PM peak hour.' Please confirm.
2. Please clarify if Table 5-5 will be updated to reflect the trips for the Housing Alternatives, as described by the preceding text, as opposed to presenting the data for the 2018 GUP (original) project? In addition, we would like to suggest that the numbering for Table 5-5 and Table 5-6 be switched. The new Table 5-5 (College Terrace Neighborhood TIRE Index Results) and Figure 5-1 could be moved up to page 96 and 97 respectively. In that case, all the discussion for College Terrace will be consolidated. Page 98 will have the last paragraph of Section 5.3.1.1 followed by the start of Section 5.3.1.2. The new Table 5-6 (Crescent Park Neighborhood Trip Distribution Calculations), the last paragraph of Section 5.3.1.2 and Section 5.3.2 will be on page 99. Similarly, this will consolidate all the discussion for Crescent Park, making it easier for readers to follow.
3. Please clarify why the percentage distribution for Cornell St, shown on Figure 5-1, is 20% instead of 21% from the base 2018 GUP project.
4. The first paragraph of Section 5.4.1 referenced Sections 6.3 and 7.3 (from the Project's TIA). Please change the references to Sections 3.3 and 4.3. In addition, the last sentence of this paragraph seems redundant. Please clarify.
5. As the Housing Alternatives resulted in a net increase in project trips in both directions (in & out of project site) during both peak hours, please provide explanation on why would the volume for certain movements at some intersections decrease. In particular, please explain

¹ This language is from the scope of work in the AECOM contract for this project.

- why the through volumes along Embarcadero Road decreased for the Full Offset Alternative at intersection #48.
6. Transit delay impacts of the Alts to the Project are not compared in text, only in the tables in Sections 3.3 and 4.3. While the Housing Alts would have LTS impacts to transit delays, the same as for the Project, ESA requests the TIA to provide some supporting text speaking to this as well.
 7. There is no written discussion comparing QOS for Ped/Bike impacts between the Alts and the Project in text, it is only in number form in Table 5-1 and Table 5-3. ESA requests the TIA provide some supporting text speaking to this as well.
 8. The TIA does not say anything about Safety (Hazards) Impacts or Emergency Access Impacts for the Housing Alts (let alone any comparison of the impacts to the Project). Page 41 of the TIA (in the Introduction paragraph for Chapter 5 [Transportation Impact Assessment]) says "This chapter discusses the Housing Alternatives' impacts to the study intersection,, and safety and emergency access.", but it does not do so for the latter topics. The TIA needs to provide this.

Memorandum

To	ESA: Paul Mitchell	Pages	2
For	Santa Clara County: David Rader		
Subject	AECOM Peer Review of Stanford's 2018 General Use Permit (GUP) Application: Cumulative (2035) Conditions with Four-Lane Page Mill Road from I-280 to Junipero Serra Boulevard		
From	AECOM: Greg Gleichman and Nichole Seow		
Date	December 29, 2017		

As part of the 2018 General Use Permit application (dated November 2016), Stanford prepared and submitted a memo dated December 13, 2017, presenting the results of a sensitivity test performed to evaluate the effects of reducing Page Mill Road from 6 lanes to 4 lanes between I-280 and Foothill Expressway under the Cumulative Conditions in 2035. In the Traffic Impact Assessment (TIA) performed by Fehr & Peers to determine the effects of the proposed 2018 GUP, Page Mill Road was assumed to be widened to 6 lanes between I-280 and Foothill Expressway in the year 2035. This was based on the VTA-CCAG model received by Fehr & Peers. However, the Roads and Airport Department of the County requested that Fehr and Peer re-evaluate the Cumulative Conditions in 2035 with Page Mill Road still remaining at 4 lanes.

At the request of the County, AECOM, as a member of the ESA team, conducted an independent peer review of this report to verify the technical accuracy of the information, and identify any apparent deficiencies, errors and omissions affecting the completeness, methodologies, findings and adequacies of the report. The ultimate goal of the peer review is to help ensure that the information contained in the report met accepted professional standards for use in the EIR.

AECOM generally agrees with the procedure of the sensitivity test to evaluate if there are new or different impacts due to the lane reduction along Page Mill Road. Fehr & Peers re-ran the 2040 VTA CCAG model with Page Mill Road having only 4 lanes and determined that traffic got re-routed to parallel roadways such as Arastradero Road and Foothill Expressway as well as other connecting roadways. With the new traffic volumes, detailed intersection analysis was performed and the levels of service (LOS) results were used to determine if the proposed GUP would cause any significant impacts on the study intersections.

While AECOM agrees that no new study intersections would be required for this sensitivity test, it would be useful for Fehr & Peers to present the basis of the '25 trips change' intersection selection criterion.

In addition, selecting only the 18 intersections with a volume change of at least 25 trips may underestimate the effect of the lane reduction. Several intersections in the Page Mill Road vicinity are forecast to operate near or at unacceptable LOS by 2035. A slight change in traffic volumes (even less than 25 trips) could trigger a significant impact. Limiting the sensitivity test to only intersections with a change of 25 trips or more may not provide a complete picture of the lane reduction effect. It will also be useful to know to what extent the intersections performing within acceptable levels will fare under the lane reduction scenario. As such, it is recommended that Fehr & Peers evaluate all study intersections along and east of Page Mill Road / Oregon Expressway (this is less than 10

additional intersections) to be certain that there are no new impacts due to the Page Mill Road Lane Reduction.

Please also clarify if the configuration and phasing details of the intersections along Page Mill Road affected by the lane reductions used in the test are therefore be based on existing and other approved improvements.

Memorandum

To	ESA: Paul Mitchell	Pages	2
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of Stanford's 2018 General Use Permit (GUP) – Housing Alternatives SB 743 VMT Analysis		
From	AECOM: Nichole Seow and Greg Gleichman		
Date	April 10, 2018		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.¹ This peer review memo represents AECOM's review of the '*Housing Alternatives SB 743 VMT Analysis*' report dated April 2018 as prepared by Fehr & Peers.

Our comments are as follows:

1. The paragraph following Table 1 on page 2 of the document is repeated in the first paragraph on page 3. Please remove.
2. Please clarify if the population numbers presented in the last paragraph on page 4 were extracted from Table 3 of the GUP Application VMT analysis document (Tab 8 of Application). If so, please provide the corresponding reference in the text. In addition, the text should clarify if the 6,288 employees/contractors and 2,900 students are additional from those of year 2018 (including Escondido Village).
3. In the first paragraph on page 5, the statement of the expected residential population increase of 12,571 is not clear. What is the baseline? Please clarify. The text should provide the source, reference or background.
4. Please confirm if the information presented in Table 4 is extracted from the Daily VMT Summary in Appendix A. If so, the workers population would be 49,479, instead of 49,428. Similarly, from Appendix B, the workers population would be 49,451 and not the 49,428 presented in Table 5. Please clarify.
5. Table 7 - Please clarify why the number of workers who commute (all employee types including all resident F/S) for the Full Offset and Half Offset alternatives is 29,966 and 29,938 respectively, but it is not the original number of 29,915 people. This difference appears to be caused by a new assumption that more construction workers would be coming to campus under the housing alternatives, as shown on row 24 of the Worker Student tables in the appendices. This assumption needs to be explained in the text.
6. It is noted that on the GHG sheets in the appendices, the truck VMT for both housing alternatives were increased to account for the construction traffic to build the additional housing. Is this required for the GHG calculation? While the increase does not change the conclusion of the analysis, a typical VMT calculation for traffic analysis does not include

¹ This language is from the scope of work in the AECOM contract for this project.

construction traffic. If necessary, the construction VMT is discussed separately. The traffic analysis VMT calculation generally looks at the VMT generated by a development after its completion. Please clarify. If, on the other hand, the increase in truck traffic applies to general deliveries of all types of goods, it is reasonable to expect an increase under the housing alternatives, because there would be more households on campus.

7. The Daily VMT Summary for the Half Offset Alternative is missing from Appendix B. Please provide.



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Memorandum

To	ESA: Paul Mitchell	Pages	1
For	Santa Clara County: David Rader and Kavitha Kumar		
Subject	Peer Review of Stanford's 2018 General Use Permit (GUP) – Housing Alternatives SB 743 VMT Analysis		
From	AECOM: Nichole Seow and Greg Gleichman		
Date	April 19, 2018		

AECOM, as a member of the ESA team, is tasked with conducting a peer review of each transportation-related document submitted as part of the Stanford 2018 General Use Permit (GUP) application to verify that the documents follow generally-acceptable transportation planning practice, address the appropriate study area, and were conducted using methodologies that are clear and replicable.¹

After reviewing the revised '*Housing Alternatives SB 743 VMT Analysis*' report dated April 2018 as well as the 'Response to Comments Matrix' prepared by Fehr & Peers, AECOM finds the information and clarifications provided as sufficient. We have no further questions on the two documents.

However, we do need to point out that the Table 3 referenced in footnote 1 of the revised '*Housing Alternatives SB 743 VMT Analysis*' report should be on Page 18 (not page 13) of the '*Stanford General Use Permit SB743 VMT Analysis*' dated August 2017.

¹ This language is from the scope of work in the AECOM contract for this project.

