ATTACHMENT A

Comments on the
DRAFT DEIR of the LAX Airfield and Terminal Modernization Project

A Kanafani
February 8, 2021

Introduction

This review of the DEIR for the LAX Airfield and Terminal Modernization Project focuses on the analysis of traffic growth forecast and its relation to the airfield and gate system improvements in the project. While no attempt is made to question the socioeconomic assumptions underlying the overall demand forecasts, it should be noted that these forecasts were made prior to the onset of the current pandemic. While recovery in the aviation system is not unknown and recognized in the preamble to the DEIR, the long-term effects of this pandemic on the behavior of the aviation system and on the socioeconomic factors driving aviation demand are not well understood yet. Some of the changes being witnessed today in work habits, commerce and social activities may become long lasting if not permanent. These changes will likely alter the relation between factors such as GDP growth and air travel demand. Likewise, recent changes in airlines fleets, such as the accelerated retirement of very large aircraft will alter the relation between aircraft operations forecast and passenger traffic forecasts, and relation between airfield and landside operational capacities. These recent changes are not reflected in what is essentially a post-pandemic forecast. This review is therefore only focusing on the consistency of the analysis within the assumptions of its forecasts as documented in the DEIR, and in particular on the possible impact of the improvements in this project on growth in aircraft operations and in passenger traffic.

The review finds that the DEIR does not adequately assess the traffic growth impacts caused by the improvements in question.

Traffic Forecasting Issues

The project is based on forecasts of traffic at LAX with an unconstrained and a constrained growth scenario. The unconstrained forecast is based on socioeconomic projections for the LA Basin and projects compound annualized growth rates (CAGR) of 2.2% for passengers and 1.1% for aircraft operations. This projection is based on an assumed 80% share for LAX of the basin's total traffic. The constrained forecast is based on the assumption that as airport capacity is approached, as reflected by annualized average delay reaching 15 minute per operation, growth will slow down to defer the onset of delays in such a way that annualized average delay reaches 18 minutes by 2045. The constrained forecast results in CAGR growth rates of 1.5% for passengers and 0.7% for operations. [see Appendix B.1, Exhibit 4-2] In both scenarios, the faster growth of passenger traffic compared to operations reflects assumed changes in aircraft fleets, primarily through the increases in seating capacities of aircraft such as B737's and A320's. These increases are evidenced by recent airline aircraft orders documented in the DEIR.

The slowdown in traffic growth in the constrained forecast is assumed to begin in 2029. This assumption is based on the results of capacity simulations that show the capacity of 833,000 annual operations to be reached in 2031, and the assumption that airlines begin to adjust their schedules and fleet choices and to reduce operations approximately 2 years before the onset of the 15-minute delay that defines capacity. Constrained growth is assumed to continue in such a way that the annual average delay reaches 18 minutes in 2045 with 853,000 annual operations.

This total operations forecast for 2045 is then converted to passenger traffic (MAP) using the three operational assumptions based on observed trends at the airport, as described in section 4.4.4 of Appendix B:

1. Percent of operations that are scheduled passenger service = 90%
2. Average Load Factor = 90%
3. Average seats per departure = 190

The resulting constrained MAP forecast shown in Table 4.1 of Appendix B does not reflect these assumptions correctly. For example, the Table 4.1 estimates passenger traffic in 2045 at 127.9 MAP, when the correct number with the stated assumptions should be 131 MAP. (853,000x0.9x0.9x190 = 131,000,000). Furthermore, it is curious that the DEIR assumes and average 190 seats per departure in 2045 under the constrained scenario while using the figure of 204 under the unconstrained scenario [as shown in Table 3.6]. If the constrained scenario reflects the airlines' response to increased delays by increasing seating densities and load factors, then the average seats per departure would be higher than under the unconstrained conditions.

All this casts doubt about the validity of the forecast numbers and requires correction, and a clarification of the assumptions used about the relation between flight operations and passenger traffic forecasts.

However, the major flaw in the DEIR is that it assumes implicitly that the evolution of delays is unaffected by the proposed improvements. It assumes that average annual delay will reach 15 minutes in 2031 regardless of the improvements in the project. As shown in the operations analysis discussed in the following paragraphs, the proposed improvements are estimated to result in a reduction in average delay [See Appendix B.2 Exhibit 3-2], which means the ability of the airport to handle additional traffic before the onset of the 15-minute average and the start of the constrained growth. This means more traffic with the improvements than without, whether in 2028, 2035 or 2045.

Therefore, the DEIR fails to assess the effect of the improvements on traffic growth and on the resulting environmental impact of this growth. The analysis in the forecasting section of the DEIR should be performed with and without the ATMP in order to correctly assess the impact of the improvements on traffic growth.

Operational and Capacity Issues

The DEIR adopts the industry standard approach of defining capacity in terms of delay. Capacity is assumed to be reached when a particular level of "tolerable delay" is reached. In the DEIR the annualized average delay of 15 minutes per operation is adopted as the standard, although for determining the long-term constrained forecast traffic 18 minutes was assumed to be reached in 2045. The industry standard simulation model, SIMMOD, is used to calculate delay given a set of assumptions about the operational characteristics (runway operations, fleet mixes, gate assignments, weather conditions, etc.).

The improvements in this project include the improvement of exit taxiways on runway 6L/24R with the reconfiguration of 2 existing exit taxiways and the addition of 2 new high-speed exit taxiways and the improvements of taxiways D and C. [1] These improvements, by streamlining the exit process in both directions on runway 6L/24R will reduce runway occupancy time and increase the throughput, or capacity of the runway.

As shown in Appendix B.2 of the DEIR, this SIMMOD simulation was run for the years 2018 and 2028, but not beyond. It was used to estimate the annualized annual average delay per operation with and without the improvements. The results show a reduction of annualized total average delays of 0.5 minutes per operation in 2018 and 1.3 minutes per operation in 2028. [see Tables 3-2 and 3-3 and Exhibit 3-2].

Thus, the analysis clearly demonstrates that by reducing delays the capacity of the airfield, which is the limiting capacity of the airport, is increased by the proposed improvements. As mentioned earlier, this increase in capacity has not been taken into account in the estimation of impacts of the improvements on traffic growth and on the development of the constrained traffic forecast.

The analysis shown in the DEIR and reported in Exhibit 3-2 fails to adequately assess the impact of the improvements on airport capacity and on traffic growth for two reasons.

First, given the exponential nature of delay growth with increasing traffic as acknowledged earlier in the DEIR, the 1.3 minutes savings per operation in 2028, which may seem to be too small to have an impact on traffic growth, would increase rapidly past 2028 resulting in a significant impact from the improvements. By limiting the analysis to 2028, the DEIR fails to assess these savings due to the project and their impact on traffic growth.

Second, the detailed results of the simulation [Tables 3-2 and 3-3] show wide variations in delay around the annualized total average delay for the various operational conditions and around the average savings from the project. Thus, while the savings in the overall average

[1] The improvement of taxiway C is not identified explicitly as an input into the simulation modeling, and may have been included under "…and other taxiway and taxi-lane improvements". This needs to be clarified. It should be noted that the DEIR incorrectly labels the proposed extension of Taxiway C as a "Terminal Area Element" rather than an "Airfield Element." [See DEIR at p. 2-28] LAWA previously proposed the Taxiway C extension in 2013 associated with improvements to the Runway 7L/25R Runway Safety Area (RSA), but ultimately did not approve the taxiway extension.

delay are 1.3 minutes per operations, savings for some of the operating configurations are far more significant. For example, under West IFR operations the average delay drops due to the improvements from 42.9 to 35.2 or 7.7 minutes per operation. For East MVFR conditions the delay drops due to the improvements from 64.2 to 19.5 or 44.7 minutes per operation. Such gains are significant and are masked when using only the annualized total average. This is especially serious since as the DEIR correctly recognizes, airlines adjust their schedules to adapt to large increases in delay. These large variations in delay savings due to the project will be even more significant when the analysis is carried beyond 2028.

Summary and Recommendation

The DEIR for the LAX ATMP project incorrectly ignores the traffic growth effects of the project. It incorrectly ignores the fact that capacity improvements, as reflected by reduced delays with the project, will result in faster traffic growth than without it. Since, as the DEIR indicated, the capacity of the runway system is the limiting capacity of the airport, the increase in the number of gates with this Project to 177 and the resulting expansion of the terminal system capacity makes little business sense, were it not for the runway capacity increases expected from this Project.

The DEIR should clarify the forecast assumptions used in projecting flight operations and passenger traffic under the constrained and unconstrained scenarios and correct any calculation errors in these forecasts.

The DEIR should extend the traffic modeling analysis to quantify the effect of the project improvements on airport delays and consequently on traffic growth. The SIMMOD model simulations should be conducted with and without the project, and extended beyond 2028. The results of the model should be carefully analyzed to take into consideration potential large delay savings during specific operational conditions and their potential impact on traffic growth.

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Adib Kanafani
Professor of the Graduate School.
Edward G, and John R. Cahill Professor of Civil Engineering Emeritus
University of California at Berkeley
www.ce.berkeley.edu/kanafani/
E-mail: kanafani@berkeley.edu

Professor Kanafani obtained his Ph.D. in Transportation Engineering from the University of California at Berkeley in 1969. Since joining the faculty at Berkeley in 1970 he has taught and conducted research on transportation systems, transportation engineering, airport planning and design, and air transportation economics. He has served on a number of national and international advisory panels to Government and industry. He served as Chairman of the Department of Civil and Environmental Engineering at Berkeley, as Director of Berkeley's Institute of Transportation Studies, and as Founding Co-Director of the National Center of Excellence in Aviation Operations Research, a University/Industry partnership funded by the Federal Aviation Administration and headquartered at Berkeley.

Kanafani's important contribution to air transportation include air transportation demand analysis, airport capacity analysis methods, and airline network analysis. His research on airline hubbing and on the relation between aircraft technology and airline network structure laid the ground for much of the work aimed at understanding the implications of airline deregulation in the late 1970's. He was a member of the research team that developed airport capacity analysis methods that are in widespread application in airport planning and design.

As Director of Berkeley's Institute of Transportation Studies from 1983 to 1998 he played an important role in establishing the Intelligent Transportation Systems research effort in the U.S. and was a founding member of Mobility 2000, the precursor organization to today's national program in ITS. He also founded the PATH program at the Institute of Transportation Studies, a program that has evolved to become the premier academic research program in ITS. In this area, he made contributions to the study of the economics of traffic information and to the impact of advanced traffic information systems on urban traffic patterns. He also made contributions to the emerging field of computer aided transportation planning.

Professor Kanafani has authored over 170 publications on transportation, including a book on Transportation Demand Analysis, and one on National Transportation Planning. He has graduated about 40 doctoral students who are making their mark on the profession in academia, government, and industry. He is a recipient of numerous awards including the American Society of Civil Engineers' Walter Huber Research Prize in 1982, and Horonjeff Award in 1988, and the James Laurie Prize in

2000. He was elected to the National Academy of Engineering in 2002, and was designated a Life-time Affiliate of the National Academies in 2004. He was elected to the Academy of Distinguished Alumni of Berkeley's Civil and Environmental Engineering Department in 2012 and served as member of its Founding Board of Directors.

Kanafani has served on a number of study panels of the National Academy of Engineering dealing with airport capacity, air transportation safety, and the effects of airline deregulation. He advises many agencies, in industry and Governments on transportation issues and has participated in the planning and design of a number of airports around the world. He has a long and distinguished record of service to professional societies, including the American Society of Civil Engineers, where he served as Chairman of the Air Transport Division; and the Transportation Research Board (TRB) of the National Research Council, where he served as Chairman of the Executive Committee.

ATTACHMENT B

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 East Cotati Avenue Cotati, California 94931
Tel: 707-794-0400 Fax: 707-794-0405
www.Illingworthrodkin.com illro@illingworthrodkin.com

January 7, 2021

Mr. Joseph D. Petta, Attorney
Shute, Mihaly & Weinberger LLP
396 Hayes Street
San Francisco, CA 94102-4421

Via email: **Joseph D. Petta (petta@smwlaw.com)**
CC: **Laurel L. Impett (Impett@smwlaw.com)**

Subject: **LAX Airfield and Terminal Modernization Project Draft EIR Noise Comments**

Dear Mr. Petta:
Following is Illingworth & Rodkin, Inc's (I&R) review of the Noise Sections and the Appendix F Noise Report contained in the LAX Airfield and Terminal Modernization Project Draft Environmental Impact Report (DEIR) with respect to environmental noise issues.

Section 4.7.1 (Aircraft Noise)

Typical Ambient noise levels
The Community Noise Equivalent Level (CNEL) discussion in section 4.7.1.1.2 reports the typical outdoor noise levels for developments adjacent to major freeways at 85 dBA CNEL, a level which I&R considers quite high. In discussions of typical environmental noise levels, I&R and others commonly considers noise levels of 75-80 dBA to be normal at the first row of developments outside a freeway right-of-way[1,2]. Overstating typical levels may result in the high noise project operational noise levels being interpreted as being a normal condition and thus understate the relative impact of project generated noise on surrounding uses.

Sleep Disturbance, Physiological Response and Annoyance Discussions
Section 4.7.1.1.3 of the DEIR includes a fairly extensive discussion of the effects of noise on sleep disturbance, physiological response and annoyance with the effect of maximum noise and single event levels on these subjects presented in each case. However, following these discussions, the DEIR concludes that, since there is a debate in the scientific community and/or definitive correlations to how these effects are related to environmental noise, and that there is no established regulatory criteria specific to these noise effects, the evaluation of noise impacts in terms of appropriate event based noise metrics (L_{max}, SEL, or TA noise metrics) can be ignored.

The text further posits that the nighttime and evening noise penalties in the time averaged CNEL noise metric, which accounts for the increased sensitivity to noise events happening during hours when most sleep occurs, make the use of this metric acceptable for use in evaluating sleep disturbance and residential awakenings. While average day/night noise metrics such as the CNEL

[1] Corbisier, Chris, "Living with Noise", Federal Highway Administration Research and Technology, https://www.fhwa.dot.gov/publications/publicroads/03jul/06.cfm
[2] Noise Elements of Alameda County (Eden Area), Marin County, City of San Jose, and the City of Berkeley.

are useful in evaluating noise and land use compatibility on a programmatic basis, in I&R's experience the actual (project level) impacts of loud events, which is the dominant noise produced by aircraft operations, are generally experienced by community members on an event and not on an average basis (e. g. individuals typically experience loud distinct events on a per event basis not as an overall average level over time).

Whereas it is true that there are no established noise regulatory criteria specific to sleep disturbance, annoyance, and other physiological responses and that there is debate in regarding the relationship between aircraft noise and these subjects, as noted on pages 4.7.1-12 to 4.7.1-13, there are documented correlations between aircraft event noise and significant sleep disturbance, physiological response and annoyance. Therefore, it would follow that the fully evaluate the effect of aircraft noise due the project, the DEIR should present and discuss aircraft event based noise data such as the L_{max}, SEL, and TA noise metrics.

Intermittent and impulsive noises, such as aircraft overflights, have been found to be more disturbing to sleep than continuous noise sources. Additionally, aircraft noise is more annoying when it occurs at times when people expect to rest or sleep and can produce short-term adverse effects, such as mood changes and poor performance at work the next day. The possibility also exists for more serious effects on health and well-being when sleep interference continues over long periods of time.

Though studies of aircraft noise-induced sleep disturbance have noted that while the use absolute event-based sound levels such as SELs are less likely to accurately predict awakenings than other noise effects from airport to airport, it has been established that the consideration of habituation and the noise environment of the existing properties neighboring an airport in conjunction with event-based noise levels such that the relative change in single event noise levels is a strong predictor of sleep disturbance[3]. This would indicate that the analysis of existing and project generated single event levels is specially needed to fully evaluate noise impacts in areas which will be newly exposed to aircraft noise due to future project aircraft operations or temporary construction related aircraft noise increases.

In terms of precedent for this approach, it should be noted that recent the noise analyses of the Bob Hope (Burbank) Airport and the San Jose International Airport (SJC) present and discuss event-based aircraft noise data.

- The Noise Analysis of the Burbank Airport - Replacement Terminal EIR[4] contains SEL contours and SEL data tables to compare the SEL values for the noisiest passenger aircraft at the Airport at selected noise-sensitive receptors. Though the discussion of this analysis notes that this provided for informational purposes only disclosing this information, it is noted in this document that aircraft SEL data is valuable in demonstrating the spatial extent of noise events resulting from aircraft operations for various project alternatives.
- The Noise Assessment for the SJC Master Plan EIR[5] also presents Time Above (TA) values

[3] Fidell S., Tabachnick B., Mestre V., and Fidell L. "Aircraft noise-induced awakenings are more reasonably predicted from relative than from absolute sound exposure levels," The Journal of the Acoustical Society of America 134, 3645 (2013)
[4] RS&H, Inc for the Burbank-Glendale-Pasadena Airport Authority, Appendix K Noise Analysis, Environmental Impact Report for a Replacement Airline Passenger Terminal at Burbank Bob Hope Airport, June 2016
[5] BridgeNet International for David J. Powers and Associates, Norman Y. Mineta San Jose International Airport Noise Assessment for the Master Plan Environmental Impact Report, October 2019

for aircraft noise levels are greater than 75 dB and 85 dB at various receiver points, along with the overall land area exposed the SEL values for the departure and arrival of various aircraft types. It is also noted in SJC EIR that an earlier (2003) EIR contained a similar analysis comparing existing and future SEL conditions and identified increases in SEL values in the airport vicinity.

Considering this, I&R believes that the aircraft noise analysis should at least provide event-based noise data such as maximum noise levels, single event levels, and/or time above information for existing and future aircraft operations at residential and other noise sensitive uses in the airport vicinity. Additionally, we would note that the modeling software used in the noise analysis (FAA AEDT), has the ability to create a grid analysis graphic of changes in event based (Lmax) aircraft noise levels at residential and other noise sensitive uses in the airport vicinity. The inclusion of such a graphic and event-based noise data in combination with information provided on awakenings, sleep disturbance, and physiological effect of aircraft noise would allow the surrounding communities to be more fully informed as to the potential effects and impacts of aircraft noise.

<u>Aircraft Noise Modeling</u>
I&R concurs that the use of the FAA AEDT computer model as discussed in section 4.7.1.2.1 is appropriate for analyzing aircraft noise in the surrounding communities. However, we are surprised that the future analysis study year is only 10 years from the baseline year (2028), whereas many large projects include study years which are 20 years in the future so as to avoid a future year too close to the current year once the project is implemented.

The SJC EIR, referenced above, used 20 years as its future analysis point future by analyzing the future noise environment due to aircraft operational levels from the approved aviation forecast in its 2017 Master Plan study to the year 2037. Many other masterplan studies and major infrastructure projects I&R has been involved with have analyzed future transportation noise impacts 20 or more years in the future. Large infrastructure projects in the local area where future noise projections of 20 or more years in the future have been analyzed include EIRs for the Port of Los Angeles Everport (Berths 226 to 236) and TraPac (Berths 136-147) Container Terminal Improvements Projects.

Additionally, Section 2.3.1.2 of the report titled, Project Future Growth at LAX, presents airport passenger forecasts for LAX to the year 2045, and over a planning period of 25 years. Considering that planning projections have been completed to this year, it seems reasonable to also analyze aircraft noise in the surrounding communities to 2045 or at least to 20 years beyond the project baseline year (2038).

We also note that project shows the same future growth rate with or without the project under future year conditions. While I&R cannot evaluate noise from future growth without quantitative projections it would seem that because the project is intended to encourage and support growth, future conditions with the project there would be an increase in airport operations over future conditions without the project. Considering this it appears to be useful to establish a study year which is 20 years in the future (2038) to fully analyze the future growth in operations allowed by the project.

Construction Related Aircraft noise increases

Section 4.7.1.2.2 notes that construction improvements to the north airfield would require the short-term (4.5 month) closure of runway 6L-24R (2023) and 6R-24L (2024) and that during these closures, aircraft take off and landings would occur at the remaining three runways. This operational modification would change the aircraft noise contours in surrounding noise sensitive areas, however as stated in the first full paragraph on page 4.7.1-17, the impact of this change was only evaluated qualitatively in the DEIR.

In keeping with the qualitative analysis of this impact (Impact 4.7.1-1 on page 4.7.1-32) the DEIR acknowledges that the temporary runway closures and reassignments would result in temporary increases in areas exposed to noise levels above 65 dBA CNEL but does not define the areas impacted or quantify the resulting noise level increases. Though, on pages 4.7.1-39 through 4.7.1-41, the DEIR discusses the effect of the temporary runway closures on residential areas currently exposed to a CNEL of 65 dBA and above as well as noise sensitive areas which would be newly exposed to levels above 65 dBA due to these changes, it also does not specifically define these areas. The areas effected, the number of noise sensitive uses exposed, and levels at these uses should be modeled and quantitatively evaluated in the DEIR so that actual impact of these operational changes can be properly evaluated.

We would further note that though the impact statement again refers to the CNEL metric accounts for sleep disturbance with the use of nighttime penalties, we again believe that the aircraft noise analysis should at least present event-based noise data such as existing and future maximum noise levels, single event levels, and/or time above information for aircraft operations at residential and other noise sensitive uses in the airport vicinity. This data, in combination with this information provided on awakenings, sleep disturbance, and physiological effect of aircraft noise would allow the surrounding communities to be more fully informed as to the potential effects and impacts of aircraft noise.

Mitigation of Construction Related Aircraft noise increases

The DEIR finds that it is not practical or feasible to implement sound attenuation improvements for temporary construction related aircraft noise increases. While this may be true, without quantitatively determining the actual noise exposure and number of noise sensitive uses newly exposed to the heightened noise levels, it does not seem adequate to simply state that mitigation is unfeasible. Once the actual noise impact is established, a more accurate determination of the reasonable and feasible mitigation may be made. If this potential impact is great enough it may be reasonable and feasible to install temporary noise treatment, such as noise barrier blankets at highly affected noise sensitive uses and/or relocate the impacted users during periods of high noise impacts.

Section 4.7.2 (Traffic Noise)

Environmental Setting

While eight short term traffic noise level measurements were made on the site vicinity, there were no long-term continuous measurements, to establish the diurnal noise patterns in the project area were made. While we understand and have used short term measurement surveys to calibrate traffic noise models long-term reference noise measurements are also needed to quantify the diurnal trend in noise levels and to establish the peak hour traffic noise levels.

Thresholds of Significance

The use of the 3dBA and 5dBA CNEL is appropriate for the evaluation of city street traffic. However, the use a peak hour L increase of 12 dBA (which equate to more than a doubling of traffic noise) is really only appropriate for highway projects and is not commonly used to evaluate traffic noise impacts from non-highway type traffic. Increases of 3 dBA are commonly considered just noticeable, while increases of 6 dBA are considered a substantial change while a 10 dBA change is subjectively heard as approximately a doubling in loudness[6]. Considering this relationship and depending on the background noise environment, we would consider a peak hour Leq increase of 3 to 5 dBA appropriate for the evaluation of traffic noise impacts. With this criterion four of the receivers (R-001G, R-003G, R004G, and R007G) as identified in Table 4.7.2-4 may be exposed to significant traffic noise impact

Future Year Impacts

As with the Aircraft Noise Impact Analysis, we are surprised that the future analysis study year is only 9 years from the baseline year (2019 current, 2028 future), whereas many large projects include study years which are 20 years in the future so as to avoid a future year too close to the current year once the project is implemented. Also, as with the Aircraft noise Impact Analysis, we note that project shows the same future growth rate with or without the project under future year conditions. As noted in our comments related to aircraft impacts, we have analyzed such (20 year) future noise projections from other large local area infrastructure projects involving roadway traffic from Port of Los Angeles Container Terminal Improvements Projects.

While I&R cannot evaluate noise from future growth without quantitative projections it would seem that since the project is intended to encourage and support growth, there would be greater traffic in under future conditions with the project than future conditions without it. Considering this it appears to be useful to in a study year which is 20 years in the future (2039 or 2038 to be consistent with the Aircraft analysis) to fully analyze the future growth in operations allowed by the project.

Section 4.7.2 (Construction Noise)

The noise analysis fails to adequately analyze construction noise at noise sensitive receptors surrounding project construction areas due to a lack of establishing of ambient conditions through noise measurements and the use of what appears to be a non-realistic 24-hour average construction noise usage model.

The only method used in the noise analysis to evaluate ambient noise conditions at identified noise sensitive receptors surrounding project construction areas was aircraft noise modeling. While it is understood that aircraft noise in the project area is a primary noise source, there are other localized area noise sources, such as roadway traffic, commercial activities and other area uses which would also be expected to contribute the ambient noise. To determine these actual ambient noise levels, a noise measurement survey at the identified noise receivers should have been undertaken for the hours of the day that project construction activities are expected to take place.

Furthermore, though most of the construction activities will occur on the northern portion of the airport, where all but one of the noise modeling points are located, there will be activities such as construction at Terminal 9 and the repaving of the Taxiway C extension that may affect noise sensitive uses to the south. Accordingly, additional construction noise analysis receptors should be added in these areas.

[6] California Department of Transportation, *Technical Noise Supplement (TeNS)*, Sept.2013, Pg. 2-45 &Table 2-10,

Additionally, the output of the noise modeling is only reported in terms of the CNEL noise metric and not in terms of hourly noise levels. While the Construction Noise analysis does utilize typical source noise levels of construction equipment from the Federal Highway Administration Roadway Noise Construction Model (RCNM), the typical construction noise analyses completed using this model does not report noise levels in terms of a 24-hour average, but in terms of peak hourly average (L_{eq}) or maximum (L_{max}) noise levels. Though the construction noise analysis reportedly calculated hourly L_{eq} levels for each construction phase, these levels were not reported and instead a daily CNEL for construction occurring every hour of the day and night were reported.

While, as noted in the DEIR, this daily CNEL construction scenario is very conservative, the DEIR does not report that project construction would actually occur 24-hours a day. Further, if construction activities do occur during nighttime or early morning hours, when ambient noise levels are lower the resulting impact determination may be greater than with the use of the CNEL noise metric. Accordingly, the calculated hourly average and maximum noise level should have been reported and compared to actual (measured) ambient noise conditions at each of the identified noise sensitive receivers during daytime, evening, nighttime, and early morning hours.

This concludes I&R’s summary of the noise issues found in an initial review with the LAX Airfield and Terminal Modernization Project DEIR noise sections.

Sincerely,

Fred M. Svinth, INCE, Assoc., AIA
Senior Consultant, Principal
Illingworth & Rodkin, Inc.

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 East Cotati Avenue
Cotati, California 94931
Tel: 707-794-0400 *Fax: 707-794-0405*
www.Illingworthrodkin.com *fsvinth@illingworthrodkin.com*

FREDERICK M. SVINTH, INCE, Assoc. AIA

Mr. Svinth holds degrees in both architecture and engineering. With this background he has focused his professional interests and experience in room acoustics and the control of noise and vibration within the built environment. In addition to experience working as a power plant field engineer and an architectural designer, he has over 25 years of experience consulting in the U.S. and internationally on various aspects of acoustics and vibration. He has consulted on a large number of projects for public, private and government clients, ranging from the study of environmental noise and vibration related to land-use compatibility to acoustic design within and without all types of residential structures, entertainment venues, religious facilities, and industrial buildings.

Mr. Svinth's unique educational background and professional experience in architecture and engineering enables the firm to develop complete solutions for projects with acoustic and vibration requirements. Fred's focus and technical specialties are involved in architectural acoustics and encompass the design and detailing of all types of new and renovated buildings, the control of noise and vibration for mechanical systems, transportation facilities, and entertainment venues within the built environment, conventional and alternative energy power generation noise control, and noise & land-use compatibility planning.

Mr. Svinth's skills include freehand and computer aided drafting (AutoCAD), heliport and airport noise modeling (HNM & INM), and the use of commercial and in-house software tools for architectural acoustics design and the development of noise control treatment options.

PROFESSIONAL EXPERIENCE

2009 to Present: Principal & Sr. Consultant January 2000 to 2009: Senior Consultant & Sept. 1990 to Aug. 1992: Staff Consultant	Illingworth & Rodkin, Inc. Cotati, California
August. 1997 to January 2000 Senior Acoustical Consultant	Jack Evans & Associates, Inc. Austin, Texas
August 1996 to August 1997 Architectural Designer/Project Manager	Chiles Architects, Inc. Austin, Texas
March 1996 to August 1996 Architectural Designer	Madison Graham Architects, Inc. Austin, Texas
June 1989 to September 1990 Power Systems Field Engineer	General Electric Corp. Oakland, California

EDUCATION

Master of Architecture Degree (1996)	University of Texas at Austin
B.S.- Mechanical Engineering (1989)	California Polytechnic State University San Luis Obispo, California

PROFESSIONAL AFFILIATIONS

Associate, American Institute of Architects
Member, Acoustical Society of America
Member, Institute of Noise Control Engineers

ATTACHMENT C

Griffin Cove Transportation Consulting, PLLC

January 14, 2021

Ms. Laurel L. Impett, AICP
Shute, Mihaly & Weinberger LLP
396 Hayes Street
San Francisco, California 94102

Subject: ***Review of Transportation Analysis***
Draft Environmental Impact Report
Los Angeles International Airport (LAX) Airfield and Terminal Modernization Project
Los Angeles, California

Dear Ms. Impett:

As requested, Griffin Cove Transportation Consulting, PLLC (GCTC) has completed a review of the "Transportation" section of the Draft Environmental Impact Report (DEIR) completed with respect to the proposed Airfield and Terminal Modernization Project (ATMP Project) at Los Angeles International Airport (LAX) in Los Angeles, California. (Reference: Los Angeles World Airports, *Airfield and Terminal Modernization Project – Los Angeles International Airport (LAX) – Draft Environmental Impact Report (Draft EIR)*, October 2020.) The "Transportation" analysis is presented in DEIR Section 4.8, with additional, more detailed information provided at DEIR Appendix G. No separate technical report was prepared.

Our review focused on the technical adequacy of the transportation analysis presented in the DEIR, including the detailed procedures and conclusions documented there.

DRAFT ENVIRONMENTAL IMPACT REPORT REVIEW

Our review of the DEIR revealed a number of issues affecting the validity of the transportation analysis results. These issues, which are presented below, must be addressed prior to certification of the environmental document and approval of the proposed ATMP Project.

1. **Project Description** – DEIR Section 2 - Description of the Proposed Project inadequately describes key components of the proposed ATMP Project's transportation system, including the following:

   <u>Project Roadway System</u>

   According to the ATMP DEIR (p. 2-39), the project, ". . . would build upon improvements approved as part of the LAX Landside Access Modernization Program . . ." The DEIR (p. 2-10) also refers to "refinements" to the LAMP road system, with the proposed Project's improvements being "integrated with" the LAMP elements. This raises the following questions:

   - Will development of the ATMP project, as proposed, eliminate or significantly modify any elements of the previously-approved road system for the LAMP project?
   - What specific changes are proposed to the LAMP road system in connection with the ATMP project? A figure is needed to graphically identify the ATMP-proposed changes to the LAX road system, specifically with regard to the approved LAMP roadway system.

Project Parking System

The number of parking spaces to be provided in the Terminal 9 structure is not stated in the DEIR, nor is there a breakdown of the number of long-term vs. the number of short-term parking spaces.

2. **Vehicle-Miles-Traveled Analysis** – The DEIR analysis of vehicle-miles-traveled (VMT) addressed three forms of VMT:

   - Daily VMT per Employee: ". . . the average VMT generated by each employee at airport uses on a typical weekday." (DEIR, p. 4.8-9)
   - Daily Passenger VMT: ". . . total VMT generated by airport passengers on a typical weekday." (DEIR, p. 4.8-14)
   - Induced VMT (Short-Term and Long-Term): ". . . VMT that is unrelated to airport trips, but is rather related to the improved roadway operations on nearby surface streets as a result of the roadway improvements that are part of the proposed Project." (DEIR, p. 4.8-14)

   The DEIR concluded that the ATMP Project would cause significant impacts with respect to all three types, and that only VMT per Employee could be mitigated to a Less Than Significant level. Passenger VMT and Induced VMT were determined to be Significant and Unavoidable impacts.

   The VMT estimates documented in the DEIR were generated by the LAX Airfield and Terminal Modernization Project Travel Demand Model, which was modified to add roadway system detail, among other modifications. Travel demand forecasting models typically include fairly rudimentary, schematic-level road systems, which do not necessarily reflect the specific details of the existing or proposed road system. For example, multiple driveways serving a number of individual properties might be combined into a single "centroid connector," which is used to load the traffic associated with those land uses onto the regional road system within the model.

   The access system proposed to serve the ATMP Project in the immediate vicinity of the LAX Central Terminal Area (CTA) is rather complex requiring, in some cases, substantial "out-of-direction" travel to enter or exit the CTA. It is unclear whether the model's roadway network accurately accounts for the actual ATMP Project travel paths (and the associated distances) required of visitors to LAX. We particularly wonder about the level of precision in the VMT analysis, and the associated level of accuracy. As noted above, implementation of the ATMP Project will modify certain travel paths for traffic entering and exiting the LAX CTA, compared to the approved LAMP Phase 1 roadway system. In some cases, the travel paths proposed for the ATMP Project are substantially longer than would exist under the LAMP Phase 1 plan.

   Of particular concern are potential adverse impacts with respect to CTA traffic flowing to and from Sepulveda Boulevard, including traffic to and from the City of El Segundo. Attachments A and B present figures illustrating selected access routings for the ATMP and LAMP projects at LAX, based on information in the respective EIR documents. Included are figures showing the following travel paths for both projects:

   - From El Segundo to the CTA via northbound Sepulveda Boulevard (Figures A-1 and A-2),
   - From the CTA to El Segundo via southbound Sepulveda Boulevard (Figures A-1 and A-2),
   - From southbound Sepulveda Boulevard to the CTA (Figures B-1 and B-2), and

- From the CTA to northbound Sepulveda Boulevard (Figures B-1 and B-2).

From El Segundo to the CTA via Northbound Sepulveda Boulevard

The traffic patterns for vehicles traveling from El Segundo to the CTA vary substantially between the two projects. For LAMP Phase 1, the existing route will continue to be in place, as shown in Attachment A, Figure A-1 using red arrows. That route involves a relatively short ramp that diverges from northbound Sepulveda Boulevard immediately north of the Sepulveda Tunnel and connects directly to the upper and lower level roadways within the CTA.

For the ATMP project, though, drivers will continue northward on Sepulveda Boulevard past the existing ramp (which will be demolished) and exit the road on a new off-ramp beginning at approximately 98th Street, as shown on Figure A-2 in Attachment A (red arrows). The new ramp will curve to the east, following the approximate alignment of 96th Street before curving to the south, then east again at about 98th Street, before curving back to the south along the general alignment of a new "A" Street, and finally curving back to the west to enter the CTA. As indicated by this description, the proposed ramp roadway between northbound Sepulveda Boulevard and the CTA is quite circuitous with several curves, which could potentially create a safety issue.

Based on scaling distances from Google Earth, we estimate that the proposed ATMP routing will add roughly 3,900 feet (0.74 mile) to the travel distance for drivers.

From the CTA to El Segundo via Southbound Sepulveda Boulevard

Traffic exiting LAX and heading south to El Segundo gets to Sepulveda Boulevard much more directly under the LAMP Phase 1 scheme, which employs the existing pair of relatively short ramps leading directly from the outbound (eastbound) CTA road system to southbound Sepulveda Boulevard. (There are two ramps because one originates on the upper level CTA roadway and the other on the lower level CTA roadway.) While upper level CTA traffic connects directly to a ramp leading to southbound Sepulveda Boulevard, traffic from the lower level roadway passes through an existing traffic-signal-controlled intersection to access a ramp leading to that roadway. Figure A-1 in Attachment A illustrates this travel path using blue arrows.

In contrast, with implementation of the ATMP Project, drivers from both CTA levels headed to southbound Sepulveda Boulevard would follow a highly convoluted exit route, which involves traveling east almost past the proposed Terminal 9, then north to roughly the alignment of existing 98th Street, then west, before eventually heading south and merging onto Sepulveda Boulevard. This travel path is shown using yellow arrows on Figure A-2 in Attachment A. Using Google Earth, we conservatively estimate the total additional travel distance resulting from following that loop at about 5,000 feet (almost 0.95 mile).

In addition, ATMP Project traffic exiting the CTA upper level and headed southbound on Sepulveda Boulevard must go around a loop ramp within the CTA to access the outbound traffic stream. Use of that loop ramp, which is approximately 1,700 feet (0.32 mile) long, would not be necessary under the LAMP Phase 1 scheme.

Consequently, travel time and distance will be substantially greater under the ATMP scheme, which would also equate to an increase in vehicle-miles-traveled (VMT).

From Southbound Sepulveda Boulevard to the CTA

Traffic approaching the CTA from southbound Sepulveda Boulevard would be forced to follow a much more circuitous route under the ATMP Project road system. The LAMP Phase 1 project would provide a direct connection from southbound Sepulveda Boulevard to both levels of the CTA road system via a pair of new ramps, as shown on Figure B-1 in Attachment B (red arrows).

Under the ATMP Project, vehicles exiting southbound Sepulveda Boulevard toward the CTA would first travel east on a circuitous new ramp system beginning at approximately 98th Street, then south at the alignment of the new “A” Street before heading west to approach the CTA along the general alignment of Century Boulevard. This proposed route is illustrated on Figure B-2 in Attachment B (red arrows). Again using Google Earth, we estimate the length of this out-of-direction travel at about 3,200 feet (0.646 mile).

From the CTA to Northbound Sepulveda Boulevard

Drivers exiting the CTA and traveling to the north on Sepulveda Boulevard will also travel substantially farther under the proposed ATMP Project road system. Figure B-1 in Attachment B (blue arrows) shows that, under the LAMP Phase 1 road scheme, such drivers will follow the existing travel path, which involves traversing a loop ramp just outside the CTA and gaining immediate access to northbound Sepulveda Boulevard.

Implementation of the ATMP Project road system will require those same drivers to travel east to approximately the alignment of the new “A” Street, where they will turn to the north before curving back to the west at approximately existing 96th Street, eventually reaching a traffic-signal-controlled intersection at Sepulveda Boulevard. This new routing is illustrated using yellow arrows on Figure B-2 in Attachment B.

Both schemes would require upper level CTA drivers to traverse the internal, 1,700-foot loop ramp within the CTA.

The additional travel distance on the proposed ATMP Project road system is estimated at 1,220 feet (0.23 mile), compared to the LAMP Phase 1 system, based on scaling distances from Google Earth.

CTA Traffic Design Day Demand

DEIR Appendix G presents information describing the characteristics of vehicular traffic at LAX. Of particular interest are Table G.4-7 (“Summary of 2028 Proposed Project Terminal 1 to Terminal 8 Hourly Volumes – Lower Level”) and Table G.4-8 (“Summary of 2028 Proposed Project Terminal 1 to Terminal 8 Hourly Volumes – Upper Level”) from that appendix (pp. G.4-8 – G.4-9). Those tables present hourly traffic volumes for the CTA upon completion of the ATMP Project on a Friday in August, which was designated as the “design day” for this analysis. The traffic volumes represent activity within the CTA at Terminals 1 – 8 only, excluding Terminal 9. The traffic volumes also reflect completion of the Intermodal Facility (ITF) East, the ITF West, and the Consolidated Rental Car (CONRAC) facility, although traffic associated with those projects generally does not enter or exit the CTA. For ease of reference, those tables are presented here as Attachment C.

Also presented in Attachment C are five spreadsheets derived from the information in those two tables.

Table C-1 illustrates the tabulation of 2028 design day traffic volumes using northbound El Segundo Boulevard to access the CTA. As shown there, a total of 22,418 design day vehicles would approach the CTA using that routing upon completion of the ATMP Project.

Table C-2 summarizes the volume of 2028 design day traffic departing the CTA and heading southbound on Sepulveda Boulevard toward El Segundo. According to Table C-2, a total of 32,490 vehicles per day would exit the CTA and head south on Sepulveda Boulevard (17,902 from the CTA lower level and 14,588 from the CTA upper level).

Table C-3 shows how many upper level exiting vehicles would be required to traverse the internal loop within the CTA to reach either direction of Sepulveda Boulevard. Based on the LAX projections, a total of 25,832 vehicles per day would do so on the 2028 design day upon completion of the ATMP Project. Southbound traffic would represent 14,588 of those vehicles, while 11,244 would be traveling northbound.

Table C-4 summarizes similar calculations for traffic entering the CTA from southbound Sepulveda Boulevard. That table shows that 38,709 vehicles/day are expected to do so.

Finally, Table C-5 summarizes the daily volume of traffic projected to travel from the CTA to northbound Sepulveda Boulevard. A total of 19,333 daily vehicles are expected to follow this routing, with 8,089 from the CTA lower level and 11,244 from the CTA upper level.

As noted above, these traffic volumes do not include activity generated at Terminal 9; those values are presented separately in DEIR Appendix G. Consequently, the traffic volume numbers presented here are conservative values, as are the estimates of vehicle-miles-traveled presented below.

Vehicle-Miles-Traveled Estimates

As noted above, on the 2028 design day, 22,418 vehicles are expected to enter the CTA from northbound Sepulveda Boulevard. Under the proposed ATMP Project road system, those vehicles will be required to travel an additional 3,900 feet (0.74 mile) compared to the baseline LAMP Phase 1 scheme. This will result in additional VMT of 16,560 miles each day.

A total of 32,490 vehicles per day are expected to travel south on Sepulveda Boulevard from the CTA. Requiring all of these vehicles to traverse the circuitous, 5,000-foot-long (0.95 mile) path described above to get from the CTA to southbound Sepulveda Boulevard will add approximately 30,770 VMT daily, compared to the LAMP road system. This estimate ignores traffic exiting Terminal 9, which will follow essentially the same route; thus, the number is a conservative indication of additional VMT.

Retaining the internal CTA loop ramp that will serve upper level CTA vehicles traveling southbound on Sepulveda Boulevard will add about 4,700 VMT daily, based on 14,588 upper level vehicles traveling 1,700 feet (0.32 mile) around the loop.

Also, 38,709 vehicles per day are projected to approach the CTA from the north via southbound Sepulveda Boulevard. The additional 3,200 feet (0.61 mile) of travel proposed in conjunction with the ATMP Project will result in a daily increase of 23,460 VMT.

The additional VMT associated with drivers traveling the additional 1,220 feet (0.23 mile) from the CTA to northbound Sepulveda Boulevard will add 4,470 VMT, based on a projected 2028 daily traffic volume of 19,333.

Thus, the CTA-area roadway system modifications directly associated with the proposed ATMP Project will add approximately 79,960 VMT daily, in comparison to the approved LAMP Phase 1 road system, which serves as the baseline for this analysis. We believe this value is conservative, as it does not include traffic associated with Terminal 9, some of which will follow travel paths similar to those described above.

In contrast, the DEIR claims that the ATMP Project will result in additional passenger VMT of 32,786 miles/day, which is roughly 40 percent of our estimate based on detailed evaluation of the CTA road system proposed as part of the ATMP Project.

Table 1 summarizes this VMT estimate.

Table 1
Estimated Additional Vehicle-Miles-Traveled
Due To ATMP Project Road System at Central Terminal Area (Terminals 1 – 8)

Travel Path	2028 Design Day Traffic Volume[1]	Approximate Additional Travel Distance[2]	Additional Vehicle-Miles-Traveled
From El Segundo to the CTA via Northbound Sepulveda Boulevard	22,418 Vehicles	3,900 feet (0.74 mile)	16,560 Vehicle-Miles
From the CTA to El Segundo via Southbound Sepulveda Boulevard	32,490 Vehicles	5,000 feet (0.95 mile)	30,770 Vehicle-Miles
CTA Upper Level Loop to Southbound Sepulveda Blvd.	14,588 Vehicles	1,700 feet (0.32 mile)	4,700 Vehicle-Miles
From Southbound Sepulveda Boulevard to the CTA	38,709 Vehicles	3,200 feet (0.61 mile)	23,460 Vehicle-Miles
From the CTA to Northbound Sepulveda Boulevard	19,333 Vehicles	1,220 feet (0.23 mile)	4,470 Vehicle-Miles
		TOTAL	79,960 Vehicle-Miles

Notes:
1 Reference: DEIR Appendix G, Table G.4-7 ("Summary of 2028 Proposed Project Terminal 1 to Terminal 8 Hourly Volumes – Lower Level") and Table G.4-8 ("Summary of 2028 Proposed Project Terminal 1 to Terminal 8 Hourly Volumes – Upper Level")
2 Estimated by scaling distances from Google earth

Consideration of the three forms of VMT that were analyzed in the DEIR raises substantial questions as to whether the additional VMT cited here has been accounted for. We can readily conclude that it is not included within the Employment VMT category, as that analysis focused on employee commute trips, which rarely (if ever) involve travel within the CTA. Attachment D presents DEIR Figure 4.8-3 – Driveway Count Locations (DEIR, p. 4.8-13), which ". . . shows the location of public and private passenger parking lots, rental car facilities, employee parking lots, and cargo facilities . . .," none of which are within the CTA. Further, "[t]he average Daily VMT per Employee rate was estimated for parking lots where it was possible to isolate employee counts." (DEIR, p. 4.8-11) Again, this focus on employee parking lots (which are outside the CTA) suggests that the additional VMT described above is excluded from the DEIR's Employment VMT value.

Similarly, we can conclude that it would not be part of the Induced VMT that was derived in the DEIR analysis, as that form of VMT ". . . is unrelated to airport trips, but is rather related to the improved roadway operations on nearby surface streets . . .," as defined above. (DEIR, p. 4.8-14)

Consequently, it must be included (if at all) within the Passenger VMT. The DEIR describes that parameter as follows (DEIR, p. 4.8-14):

> *The total airport passenger VMT is the sum of all passenger VMT traveling directly to the CTA (as well as to the ITF East and ITF West in the 2028 future year scenarios) and to the major LAX parking facilities.*

DEIR Tables 4.8-10 (p. 4.8-41) and 4.8-13 (p. 4.8-51) summarize the results of the VMT analyses. Table 2 below reproduces the Total Passenger VMT data.

Table 2
Total Passenger VMT Summary

Existing Conditions (2019)	Projected Future Conditions Baseline (2028)	Future Conditions Baseline + Proposed Project (2028)	Proposed Project Incremental Increase
6,581,811	8,676,209	8,708,995	32,786

As shown, the DEIR projects a Project-related increase in Passenger VMT of 32,786. However, as we demonstrated above, the CTA roadway system modifications proposed as part of the ATMP Project will result in a VMT increase of almost 80,000 VMT daily, a difference of over 47,000 VMT daily. Further, as we pointed out above, we believe our estimate is conservative as it includes activity within the CTA only (i.e., Terminals 1 – 8). No Terminal 9 activity is included. Similarly, whereas the DEIR's estimate of passenger VMT (as defined above) includes the ITF East, ITF West, and major LAX parking facilities (presumably including off-site parking facilities), our estimate excludes any locations beyond the boundaries of the CTA, It is, therefore, apparent, that the DEIR substantially understates the VMT-related impacts of the ATMP Project, due to its failure to accurately reflect the vehicular access system proposed to serve the CTA.

The VMT analysis must be revised to correct this substantial deficiency, and it must then be recirculated for further public review.

<u>Vehicle-Miles-Traveled Mitigation</u>

The VMT-related mitigation measures include a variety of strategies encompassed within a "VMT Reduction Program," as described in the mitigation measure designated MM-T (ATMP)-1. (DEIR, p. 4.8-52) One of the key VMT reduction strategies delineated in the mitigation measure is the establishment of an "on-demand micro-transit shuttle." According to the DEIR (p. 4.8-53):

> *. . . LAWA is currently engaged in the development of an employee shuttle in partnership with the City of Inglewood and a separate pilot program in partnership with Metro. The expansion of these pilot programs into full programs, and expansion of the service area*

> *beyond the City of Inglewood and the Metro service area, would result in additional reduction of single-occupancy commute trips to LAX from the nearby neighborhoods.*

Given that El Segundo borders LAX to the south and is, therefore, closer to the airport than Inglewood, this mitigation measure should be amended to specifically include micro-transit shuttle service serving El Segundo. City of El Segundo representatives should be directly involved in discussions concerning how and where this service would operate within the city.

Further reductions in VMT could potentially be achieved through improved bicycle connections between El Segundo and LAX, as well. Therefore, Mitigation Measure MM-T (ATMP)-1 should be expanded to call for implementation of improvements necessary to facilitate such bicycling activity, particularly for LAX employees residing in and near El Segundo.

3. **Terminal 9 Access** – Vehicles traveling to Terminal 9 and its parking structure from northbound Sepulveda Boulevard will pass through a traffic-signal-controlled intersection on Century Boulevard at the proposed new "A" Street. Traffic from northbound Sepulveda Boulevard to eastbound Century Boulevard will pass though this same intersection, as will eastbound traffic departing the CTA. The DEIR provides no information regarding traffic operations at this location. Of particular concern is the possibility that congestion at that location will cause vehicular queues on the eastbound intersection approach to back up onto northbound Sepulveda Boulevard and even into the Sepulveda Tunnel. This raises the following questions:

    - Upon completion and occupancy of Terminal 9 and its parking structure, how long will eastbound vehicular queues extend from the traffic signal-controlled intersection referenced above?
    - Will the queues extend onto northbound Sepulveda Boulevard/Pacific Coast Highway, including into the Sepulveda Tunnel?
    - What are the safety impacts on Sepulveda Boulevard/Pacific Coast Highway, particularly with regard to increased collisions on the road due to development of Terminal 9 and its associated traffic?

    Moreover, LAWA indicated that temporary access to Terminal 9 will be provided via direct ramps from northbound Sepulveda Boulevard while the ATMP improvements are being constructed. Two ramps are proposed, one to the arrivals level and one to the departure level.

    - How long will vehicular queues on the temporary inbound ramps (from northbound Sepulveda Boulevard/Pacific Coast Highway to Terminal 9) be?
    - Will these queues exceed the lengths of the temporary ramps, thereby extending onto northbound Sepulveda Boulevard and creating a safety issue, particularly with regard to increased rear-end collisions?

    We are concerned that implementation of these direct ramps from northbound Sepulveda Boulevard to Terminal 9, even on a temporary basis, will exacerbate congested conditions in and near the Sepulveda Tunnel. Beyond further congestion, we envision impacts with regard to safety, including a reasonable likelihood of additional vehicular collisions in this area. Because of this, we believe that other alternatives for construction-period vehicular access to/from Terminal 9 must be considered, specifically with respect to traffic approaching/departing via Sepulveda Boulevard/Pacific Coast Highway in or through El Segundo. Such alternatives should avoid direct access from northbound

Sepulveda Boulevard to Terminal 9. Ideally, under all circumstances (i.e., construction period and beyond), Terminal 9 access would be provided via the same set of ramps and roadways that will ultimately serve the CTA upon completion of the ATMP Project.

4. **Construction Impacts** – DEIRs typically address the transportation-related impacts that will occur during the proposed Project's construction period. Those analyses generally provide an estimate of the amount of construction-related traffic that will occur, in terms of construction worker commute trips as well as various forms of truck trips (goods/material deliveries, haul trips, etc.).

This DEIR contains no such analysis. Review of the DEIR Table of Contents shows that construction impacts were addressed for most other topic areas, with the only other exceptions being cultural resources and land use and planning. Consequently, the construction-period traffic and parking impacts on El Segundo and surrounding areas were ignored. For comparison, the LAX LAMP project DEIR contained a highly-detailed construction traffic analysis, which encompassed 52 pages.

We note that the LAMP EIR found that that project's construction traffic impacts were significant and unavoidable. (LAMP DEIR, p. 1-20) Had the ATMP Project DEIR conducted the necessary analysis, it would have undoubtedly determined that the ATMP Project's construction-related transportaion impacts would also be significant, thus triggering the requirement for feasible mitigation.

Limited information regarding construction phasing, staging, contractor parking, haul routes, and access during construction is presented in DEIR Section 2.6 (beginning at page 2-77). Temporary access to the CTA and Terminal 9 is addressed at pp. 2-82 – 2-83, including the extensive traffic reroutings that will be necessary. None of this addresses the impacts of the construction activity on traffic operations and safety in the vicinity of LAX, however.

DEIR Section 2.6.2 includes the following statements (p. 2-78):

- *To the extent possible . . . employee contractor parking for the proposed Project would be located adjacent to or within the construction sites for the proposed facilities.*
- *Construction employees could be shuttled between construction sites and construction employee staging/parking areas, if/as warranted.*

However, no additional detail is provided. Furthermore, there is no indication how (or if) these measures would be enforced so as to ensure that construction workers park on-site. The use of the word "could" (in "could be shuttled") as opposed to the more definitive "would" or "shall" is concerning. Similarly, the implicit limitation of "if/as warranted" raises concerns. Who will determine if/when this is warranted and what criteria will be applied to make that determination?

The DEIR states that construction activities would be coordinated through a Coordination and Logistics Management (CALM) team to be established by Los Angeles World Airports (LAWA). The functions of the CALM team are spelled out in LAWA's *Design and Construction Handbook (DCH)*[1], although the membership of that critical in-house organization is not specified. According to the DCH (Division 1 – Page 4 of 68):

[1] https://www.lawa.org/en/lawa-businesses/lawa-documents-and-guidelines/lawa-design-and-construction-handbook

> *The CALM Team's mission statement is to minimize construction-related impacts to passenger service and tenants.*

This suggests that the CALM team ignores any construction-related impacts that extend beyond the borders of LAX. We believe that, given the magnitude of the proposed ATMP Project, this is a significant shortcoming.

It is essential that a mitigation measure be added to require that the CALM team be expanded to include the City of El Segundo as a key member, to ensure that the City is able to provide necessary input regarding construction-related working hours and days, traffic control plans, construction staging, and contractor parking issues. The CALM team must also include a qualified traffic engineer (licensed by the State of California as a Civil or Traffic Engineer) acceptable to the City of El Segundo, who would be responsible for monitoring construction-related traffic congestion and would have the authority to order timing plan changes for traffic signals within El Segundo and surrounding areas, when necessary.

In addition, the standard construction period procedures employed by LAWA must be expanded through an additional mitigation measure addressing the dissemination of public information to residents and businesses within El Segundo and other nearby jurisdictions. Establishment and maintenance of a Project-specific website with current construction status information is one measure that should be employed. Also, e-mail and postal updates should be provided on a regular basis to those same areas, including notification of lane closures, detours, hauling activities, etc.

Finally, LAWA must undertake a process, in coordination with the City of El Segundo, to mitigate haul route pavement damage incurred as a result of the ATMP Project. This process should involve development of a baseline Pavement Condition Index (PCI) for key roadways identified by El Segundo prior to initiation of construction work. (The PCI is a numerical index between 0 and 100, which indicates the condition of a pavement section.) Following completion of the ATMP Project, the PCI evaluation process should be repeated, and LAWA would then be responsible for undertaking any necessary pavement repairs, repaving, or roadway reconstruction, to the satisfaction of the City of El Segundo. During the course of the ATMP Project construction period, LAWA must also respond promptly to City requests for evaluation of specific areas of concern regarding pavement conditions.

5. **Construction Haul Routes** – DEIR Section 2.6.3 (p. 2-82) describes the process for establishment of construction haul routes, which consists of two elements: (1) LAWA would submit a Haul Route Form and Haul Route Map to the Los Angeles Department of Building and Safety, and (2) a Site Logistics Plan would be submitted to the LAX CALM Team.

   The City of El Segundo should be included as an active participant in the establishment of haul routes and in the review and approval of the Site Logistics Plan, as described in Section 1.2 of the LAWA *2020 Design and Construction Handbook* (Division 1 – Page 4 of 68).

6. **Project Trip Generation** – The volume of traffic associated with the proposed ATMP Project is summarized in DEIR Table 4.8-7 (p. 4.8-39). A total of 8,190 daily trips are projected. According to the DEIR, only trips associated with the 4,700 estimated new employees in Concourse 0 and Terminal 9 will generate trips. No additional passenger-related trips are assumed. In effect, the assumption is that the proposed ATMP Project is intended to accommodate passenger demand that will occur regardless of whether the ATMP Project is completed; passenger traffic will simply be redistributed within the airport and no off-site traffic impacts will be associated with those passengers. No support is provided for these assumptions, however.

We find it somewhat ironic that the DEIR touts the ability of the ATMP Project to "improve overall access to and from the CTA" (DEIR, p. 2-39), "reduc[e] traffic congestion on Sepulveda Boulevard" (DEIR, p. 2-39), and "help keep airport-related traffic congestion and back-up off public streets" (DEIR, p. 2-10), but fails to recognize that such improvements (were they to actually materialize) would have the effect of improving the attractiveness of LAX for both airlines and passengers. Further, we believe it is reasonable to expect that the proposed airfield improvements will similarly have the effect of making LAX more attractive to airlines, with the resulting air service enhancements drawing more passengers to LAX. These factors will clearly result in additional vehicular traffic, which has not been addressed in the DEIR.

Although the DEIR trip generation estimate accounts for the various travel modes to be used by employees (vanpool, carpool, walk/bike/transit, and drive alone), all employees are assumed to make only 2.0 trips per day – one from home to work and the return trip home. None of the employees are assumed to make a trip during the course of a work day (e.g., to attend an off-site meeting, eat lunch, or perform a work-related errand). Again, no support is provided for this assumption.

The ATMP Project trip generation estimate also ignores any non-employee trips that will certainly be associated with the new concourse and terminal facilities. Such trips might be additional deliveries, service trips, etc.

No estimate of peak-hour trips is presented, although DEIR Appendix G presents estimates for the following time periods (which were used in the travel demand forecasting model employed in the analysis):

- AM peak period (6:00 – 9:00 AM),
- Midday period (9:00 AM – 3:00 PM),
- PM peak period (3:00 – 7:00 PM), and
- Night-time period (7:00 PM – 6:00 AM).

Historically, peak-hour traffic volumes represented the most basic element in a traffic impact analysis. For an analysis based on vehicle-miles-traveled (VMT), such as this one, peak-hour volumes are unnecessary. However, this information still provides a valuable perspective with regard to local traffic impacts, and is needed to determine the specific project-related impacts on the El Segundo road system, during the construction period and beyond. This is discussed in greater detail later in this letter.

In order to ensure full understanding of the ATMP Project and its impacts on the nearby road system, the DEIR must reveal the projected vehicular traffic demand to be generated by the overall ATMP Project, as well as by Terminal 9 and Concourse 0 individually. Those trip generation estimates should represent the following time periods:

- Daily,
- AM peak hour (inbound, outbound, and total, during the busiest one-hour period between 7:00 and 10:00 AM),
- Midday peak hour (inbound, outbound, and total, during the busiest one-hour period between 10:00 AM and 2:00 PM), and
- PM peak hour (inbound, outbound, and total, during the busiest one-hour period between 3:00 and 6:00 PM).

7. **Traffic Operations** – We understand that under SB 743 the currently-accepted mode of transportation analysis for CEQA documents considers vehicle-miles-traveled (VMT), in place of the traditional approach that addresses intersection and roadway level of service (LOS)[2]. This does not preclude consideration of LOS analyses, where appropriate, however. Of particular concern are traffic operations at certain key off-site intersections and freeway segments where it is reasonable to expect that the proposed ATMP Project would adversely impact quality of life for El Segundo residents and others.

   <u>Intersection Impacts</u>

   For perspective, we note that the LAX LAMP traffic analysis presented detailed level of service analyses for the following 15 intersections, which are under the sole or joint jurisdiction of the neighboring City of El Segundo:

   - Vista del Mar/Grand Avenue,
   - Main Street/Imperial Highway,
   - Sepulveda Boulevard/Imperial Highway,
   - Sepulveda Boulevard/Mariposa Avenue,
   - Sepulveda Boulevard/Grand Avenue,
   - Sepulveda Boulevard/El Segundo Boulevard,
   - Sepulveda Boulevard/Rosecrans Avenue,
   - Nash Street/I-105 Westbound Ramps/Imperial Highway,
   - Nash Street/El Segundo Boulevard,
   - Douglas Street/Imperial Highway,
   - Douglas Street/El Segundo Boulevard,
   - Aviation Boulevard/Imperial Highway,
   - Aviation Boulevard/West 120th Street,
   - Aviation Boulevard/El Segundo Boulevard, and
   - Aviation Boulevard/Rosecrans Avenue.

   Tables 1 – 3 in Attachment E summarize the level of service results for those locations under AM, midday, and PM peak hour conditions for each of the analysis scenarios addressed in the LAMP traffic study. Intersections that were found to operate at LOS E or F (i.e., at or beyond capacity) are highlighted in yellow. Under City of El Segundo policy, intersections are required to operate at LOS D or better, so the highlighted intersections represent unacceptable operations and violations of city policy.

   Five of the fifteen intersections were found to operate at LOS E or F in one or more analysis scenarios in the AM peak hour in the LAMP analysis. In the PM peak hour, nine of the locations were found to do so. This suggests a reasonable likelihood that a development of the magnitude of the proposed

[2] Intersection and roadway operations have traditionally been described in terms of level of service (LOS), which is reported on a scale from LOS A (representing free-flow conditions) to LOS F (which represents substantial congestion and delay). Capacity is defined to occur at LOS E.

ATMP Project would have a significant adverse impact on intersection operations in El Segundo. However, the DEIR has ignored this possibility.

We note that it is the policy of the City of El Segundo to require level of service analyses for the purpose of assessing traffic impact fees. It would be appropriate, therefore, for the DEIR to incorporate such analyses to ensure that ATMP Project impacts are fully mitigated within the city. Those analyses should address the specific operational impacts of the ATMP Project, in terms of congestion, vehicular delay, level of service, and queuing at the 15 intersections referenced above.

Freeway System Impacts

The DEIR has also ignored the impacts of the proposed ATMP Project on the freeway system, as the "freeway safety analysis" included in the DEIR did nothing to address operational or safety conditions on the freeway mainline. Referring again to the LAX LAMP EIR, which included an analysis of the now-defunct Congestion Management Program road network, we see that 46 freeway segments in the vicinity of the ATMP Project were examined (i.e., each direction of 23 individual segments). Of those, 26 were found to operate at LOS E or F in the AM peak hour under 2035 Future with Project conditions. In the PM peak hour, 23 such segments were identified. Again, this suggests a need to evaluate the potential impacts of the ATMP Project on the freeway system serving LAX and surrounding jurisdictions.

The analysis of freeway operations should also address whether implementation of the ATMP Project will encourage drivers to use Sepulveda Boulevard/Pacific Coast Highway as an alternative to I-405. That is, will the ATMP Project cause sufficient congestion on the freeway to divert drivers to the nearby arterial roads? Such an analysis must, of course, consider the effects of the widespread use of cell phone apps (such as Waze, Google Maps, and others) and in-car navigation systems, which often encourage drivers to divert to alternative routes.

Midday Analysis

The analysis of the ATMP Project's traffic impacts should not be limited to the typical AM and PM peak hour periods. The LAX LAMP DEIR (Figure 4.12.1-4) illustrates the pattern of arriving and departing passenger volumes over the course of an entire day. Those patterns are closely linked to the traffic patterns of LAX as a whole. LAMP DEIR Figure 4.12.1-4 (presented here as Attachment F) shows a distinct peak in existing passenger arrival and departure activity at about 11:00 AM. A similar pattern is illustrated in LAMP DEIR Figures 4.12.1-8 and 4.12-9, which show projected hourly passenger activity in 2024 and 2035, respectively. In fact, the midday peak is clearly higher than the total passenger activity shown in the AM (7:00 - 9:00 AM) and PM (4:00 - 6:00 PM) peak periods.

In short, the need for a midday traffic analysis is not inconsequential, given the LAX activity patterns. In fact, the 2014 *Traffic Generation Report* for LAX, which is referenced in the LAMP DEIR, specifically refers to ". . . the airport peak hour of 11 am to noon." (Reference: Los Angeles World Airports, *Traffic Generation Report - Los Angeles International Airport / August 2014*, December 2014, p. 1). The most recent version of that report (for August 2019, published in November 2019) also refers to ". . . the 11 am to noon airport peak hour." (p. 1) This is further illustrated in LAMP DEIR Table 4.12.2-4 (also in Attachment F), which summarizes the existing trip generation at LAX, as follows:

- AM Peak hour: 12,338 vehicle-trips,
- Midday peak hour: 16,097 vehicle-trips, and

- PM peak hour: 12,840 vehicle-trips.

As shown, the volume of traffic generated at LAX in the midday peak hour is 25 – 30 percent higher than either the AM or PM peak hours.

8. **Freeway Safety Analysis** – The inappropriately named freeway safety analysis (beginning at DEIR p. 4.8-59) is limited to consideration of whether vehicular queues on freeway off-ramps serving the ATMP Project will extend all the way back onto the freeway mainline, thereby creating the potential for rear-end collisions. Seven off-ramps were evaluated, but only one (I-405 Northbound/Century Boulevard) was found to have 25 or more Project-generated trips in the AM or PM peak hour. (This suggests that, contrary to information presented elsewhere, peak-hour trip generation estimates were developed for the ATMP Project.) We have the following specific comments regarding this analysis.

<u>Traffic Volumes are Suspect</u>

The off-ramp traffic volumes used in the analysis are suspect. As an initial matter, it is difficult to believe that only one of the freeway off-ramps serving LAX will have 25 or more Project-related peak-hour trips. Because the ATMP Project's peak-hour trip generation estimates were not revealed in the document, it is impossible to verify this conclusion.

As shown in Table 3 below, the right-turn off-ramp volumes (i.e., NBR) in the 2028 Baseline scenario are 90 - 95 percent lower than the Existing right-turn volumes. Specifically, in the AM peak hour, the northbound right-turn volume is shown to decline from 308 existing vehicles to 14 vehicles in the 2028 Baseline scenario, a reduction of 294 vehicles. In the PM peak hour, that right-turn movement is reduced from 394 vehicles (existing) to 38 vehicles (2028 Baseline), a difference of 356 vehicles. The 2028 Baseline + Project right-turn volumes are even lower than the 2028 Baseline volumes, improbably suggesting that implementation of the ATMP Project will cause a reduction in traffic on that movement.

Table 3
Traffic Volume Comparison
I-405 Northbound Off-Ramp/Century Boulevard

	Existing		2028 Baseline		Base - Existing		Base + Project		Project Only	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
NBL	1,177	518	1,284	1,148	107	630	1,310	1,163	26	15
NBR	308	394	14	38	-294	-356	11	28	-3	-10
EBL	18	20	18	20	0	0	18	20	0	0
EBT	510	1,750	1,152	2,056	642	306	1,159	2,154	7	98
EBR	189	557	189	557	0	0	189	557	0	0
WBT	1,652	790	1,968	1,479	316	689	1,998	1,505	30	26
WBR	7	10	7	10	0	0	7	10	0	0

NBL = Northbound Left Turn NBR = Northbound Right Turn
EBL = Eastbound Left Turn EBT = Eastbound Thru EBR = Eastbound Right Turn
WBT = Westbound Thru WBR = Westbound Right Turn

The only possible explanation for the reduction from Existing to 2028 Baseline conditions is that a significant roadway system modification is assumed that would divert traffic away from the northbound off-ramp; no such modification is described in the DEIR, however. Beyond this, it is difficult to imagine why addition of the ATMP Project traffic would result in a further reduction in the off-ramp volumes.

It is also difficult to understand why the northbound I-405 on-ramp volumes (i.e., EBR in the table) are unchanged in either the 2028 Baseline or Baseline + Project scenarios. Substantial growth is projected on the eastbound and westbound thru movements at the intersection. There is simply no rational explanation for these anomalies.

Validity of the Left-Turn Traffic Estimates

Review of the queue length calculation sheets in DEIR Appendix G (which are discussed in greater detail below) reveal that the Project is estimated to generate 26 left turns from the I-405 Northbound/Century Boulevard off-ramp in the AM peak hour and 15 such trips in the PM peak hour, as well as to cause questionable reductions in the number of off-ramp right turns.

To gain additional perspective with respect to the validity of the estimated left-turn volumes, we compared them to traffic generation information developed annually by LAWA. Each year, as a condition imposed by the City of Los Angeles, LAWA produces a report documenting the volume of traffic at LAX. The most recent version of that report provides data describing the volume of traffic entering and exiting the CTA in the AM peak hour, the midday peak hour, and the PM peak hour. In the peak month (i.e., August) of 2019, an average of 5,202 vehicles entered the CTA in the AM peak hour, 5,614 entered in the midday peak hour, and 4,909 did so in the PM peak hour. (Reference: Los Angeles World Airports, *Traffic Generation Report - Los Angeles International Airport / August 2019*, November 2019, p. 1.)

The Project-related left-turn volumes described above represent 0.5 percent of the existing inbound AM trips at the CTA and 0.3 percent of the corresponding PM peak hour trips. In contrast, the existing AM peak hour left-turn volume at the off-ramp (1,177 vehicles) represents 22.6 percent of the entering CTA traffic and the 518 existing PM peak hour left turns equate to 10.6 percent of the entering CTA traffic. While we recognize that not all of the off-ramp left turns are bound for the CTA, we believe this provides a reasonable indication that the estimated ATMP Project volumes are not valid, as they appear to understate the volume of ATMP Project-generated traffic at the off-ramp.

Reasonableness of the Queue Length Estimates

All of the queue length values (including for existing conditions) were derived from traffic analysis software. There is no indication that the existing queues reported in the DEIR were validated in the field to ensure that the software-generated queue lengths accurately reflect the actual queues. Thus, we have no meaningful assurance that any of the queue length estimates presented in the DEIR reflect reality.

Century Boulevard Operational Deficiencies

While not discussed in the DEIR, the queue length analysis worksheets reveal substantial operational deficiencies on Century Boulevard. In particular, the queue on the westbound Century Boulevard thru movement at the I-405 Northbound Off-ramp/Century Boulevard intersection is projected to be 662 feet (27 vehicles) long in the AM peak hour under 2028 Baseline Plus Project conditions. In the PM peak hour, that queue would be 309 feet (13 vehicles) long. However, only approximately 200 feet exist between the subject intersection and the next intersection to the east (Century Boulevard/Felton Avenue). Thus, in both peak-hour periods, the Felton Avenue intersection would be blocked by westbound vehicles on Century Boulevard, as would several driveways serving private properties.

More importantly, perhaps, given the freeway-related intent of the analysis, the eastbound thru queue in the PM peak hour at this intersection would be 652 feet (27 vehicles) long, which would be sufficient to block access to the I-405 northbound on-ramp. (Perhaps this is the reason for the illogical lack of growth in the I-405 on-ramp traffic, as described above.)

<u>Flawed Interpretation of Analysis Results</u>

We also note that the more-than-600-foot queue length estimates are shown on the analysis worksheet with a "#" symbol, which refers to a footnote stating, "95th percentile volume exceeds capacity, queue may be longer." Thus, the situation might well be worse than described here, with even greater traffic obstructions prevailing.

<u>Obsolete Analysis Software</u>

And, finally, we note that the queue length analysis was conducted using procedures documented in the year 2000 edition of the *Highway Capacity Manual* (HCM). The HCM, which is published by the Transportation Research Board (TRB) of the National Academies of Science, Engineering, and Medicine, is the primary resource with respect to matters associated with road capacity and intersection operations. Two editions of that document have been published since the 2000 version, one in 2010 and one in 2016. It is unclear why the analysts chose to use this outmoded version of the document to complete this analysis.

<u>Summary</u>

The "freeway safety analysis" presented in the DEIR is highly flawed, to the point where the results are simply not credible. The analysis must be corrected, and the modified analysis must be incorporated into a revised DEIR and circulated for further public review.

9. **Cumulative Impacts** – The DEIR purports to provide an analysis of cumulative conditions, but this is questionable. The traffic analysis addresses the following analysis scenarios:

   - Existing (2019),
   - Future Baseline (2028), and
   - Future Baseline (2028) With Project.

   No Existing + Project scenario was considered, as the DEIR says that would be "misleading," since the project will not be operational until 2028. Similarly, no analysis is presented for any scenario addressing a time frame beyond the anticipated 2028 Project implementation.

   In justifying this approach, the DEIR states that the analysis, as presented, reflects completion of the ground transportation system improvements associated with the LAX Landside Access Modernization Program (LAMP) Phase 1 as well as the Airport Metro Connector 96th Street Transit Station (p. 4.8-61):

   > *As such, the baseline used for the transportation analysis already accounts for other transportation improvement projects, and the identification of impacts associated with the*

> *currently proposed Project provides the basis to measure and evaluate cumulative impacts and assess whether the proposed Project has a cumulatively considerable contribution to the combined impacts.*

However, no support is presented that would provide reasonable assurance that the LAMP Phase 1 improvements will actually be complete by 2028. Unless such support can be provided, it is inappropriate to rely on a future baseline for the transportation analysis.

Moreover, the land use assumptions incorporated into the 2028 traffic estimates are unclear. The DEIR specifically refers to 123 cumulative projects (p. 4.8-35; Appendix G-7), but there is no discussion of those projects in the Cumulative Impacts section (beginning at DEIR p. 4.8-61). The volume of traffic associated with the 123 cumulative projects is presented at DEIR Appendix G.7. According to that table, those projects would generate almost 233,000 daily trips, almost 20,000 AM peak hour trips, and over 25,000 PM peak hour trips. Because the DEIR does not adequately describe the cumulative land use projects (i.e., how many of these cumulative land use projects will be implemented by 2028), it is not possible to verify the accuracy of the cumulative traffic estimates.

Furthermore, as noted above, no discussion is presented with regard to conditions beyond the 2028 implementation year. As described at DEIR p. 2-17, passenger demand at LAX is projected to increase to 110.8 million annual passengers (MAP) in fiscal year (FY) 2028 compared to 86.1 MAP in FY 2018, almost a 30 percent increase. Passenger activity in the year 2045 is projected to be 127.0 MAP, which represents roughly a 50 percent increase over existing conditions and a 15 percent increase over the 2028 Baseline. We would also note that these projections ignore the likely increases in activity at LAX that are directly attributable to the ATMP Project, as discussed earlier. The DEIR has completely failed to address the cumulative effects of these major increases in activity at LAX.

10. **Emergency Access** – The ATMP Project's potential emergency access impacts were not addressed in the DEIR, as the Initial Study found that the ATMP Project would have a "Less Than Significant" impact. (DEIR, p. 4.8-2) The analysis of this issue, however, was restricted to the area in the immediate vicinity of the ATMP Project. It ignored anything beyond the boundaries of LAX.

    Moreover, it focused almost exclusively on the construction period. As such, it failed to address the question of whether the traffic generated by the ATMP Project would result in congestion that would substantially impede the ability of emergency vehicles to respond to calls at or near LAX or to reach hospitals, either during the construction period or throughout the life of the ATMP Project.

11. **Parking Analysis** – Although the ATMP Project proposes construction of a parking structure at Terminal 9, no analysis is provided to determine whether the unknown number of additional parking spaces will be adequate to serve the newly-generated demand. As noted earlier, the number of parking spaces to be provided in the Terminal 9 structure is not stated in the DEIR.

    The ATMP Project would also involve the acquisition of a number of properties, including existing parking facilities. No indication is provided, however, as to how many parking spaces exist on the properties to be acquired and how many, if any, will continue to be available to serve the parking demand generated by the ATMP Project. The DEIR should identify the net increase or decrease in the available parking supply following completion of the ATMP Project. Further, it must address how this compares to the parking demand generated by the ATMP Project and LAX as a whole.

12. **Analysis of Project Alternatives** – DEIR Chapter 5 presents the analysis of the ATMP Project alternatives. Four alternatives are addressed:

- Alternative 1: No Project,
- Alternative 2: Concourse 0 Only,
- Alternative 3: Terminal 9 Only, and
- Alternative 4: Approved LAMP Roadway Improvements plus Terminal 9 Access Alterative.

The VMT impacts associated with each alternative are addressed, although not in a consistent fashion. Specifically, for Alternatives 1, 3, and 4, the VMT impacts were evaluated based on running modified versions of the LAX Travel Demand Model, from which detailed VMT estimates were derived. In each case, this approach is identified as being "consistent with the methodology described in Section 4.8.2 for the proposed Project VMT analysis." (DEIR, pp. 5-47, 5-77, and 5-92)

Inexplicably, however:

> *An additional model run for Alternative 2 was not undertaken due to the similarity of this alternative (with the exception of Terminal 9, and the Terminal 9 APM station and parking facility) to the proposed Project."* (DEIR, p. 5-63)

It is simply not credible to claim that the VMT impacts of Alternative 2 would be similar to those associated with the proposed ATMP Project. The "exceptions" described above are not inconsequential; in fact, they are major components of the ATMP Project. Terminal 9 would provide 12 – 18 new passenger gates within a 1,178,000-square-foot structure (DEIR, pp. 2-27 – 2-28). Approximately 3,225 employees (almost 70 percent of the ATMP Project total) would be required to operate Terminal 9, including 1,290 employees "for a typical 8- to 9-hour shift." (DEIR, p. 4.8-11) In addition, the "exceptions" include the 700,000-square-foot Terminal 9 parking facility (DEIR, p. 2-28) and its unspecified number of new parking spaces, as well as the extensive system of roadways intended to serve Terminal 9 and its parking structure.

Given the massive reduction in project size associated with this alternative, it is completely inappropriate to fail to perform a quantitative analysis of its VMT impacts and, instead, to rely on a subjective, speculative determination as to those impacts. In short, no factual basis or support is provided with respect to the VMT impacts associated with Alternative 2.

13. **Various Unsupported Statements** – The DEIR presents as fact a number of statements that are unsupported by the transportation analysis. Examples include:

    - *The types of improvements anticipated as part of the roadway system concept for the proposed Project would . . . provide the following additional benefits for traffic related to the CTA: . . . improvement of through-traffic flow for surrounding communities (i.e., vehicles on Sepulveda Boulevard that are not accessing the airport) by reducing traffic congestion on Sepulveda Boulevard.* (DEIR, p. 2-39)
    - *The proposed roadway system would improve overall access to and from the CTA* . . . (DEIR, p. 2-39)
    - *The proposed access improvements would help keep airport-related traffic congestion and back-up off public streets.* (DEIR, p. 2-10)

    These statements can only be supported through the completion of quantitative level of service analyses, as described above. The DEIR must be revised to incorporate such analyses and the revised document must then be recirculated for further public review.

CONCLUSION

Our review of the Draft Environmental Impact Report completed in connection with the proposed Airfield and Terminal Modernization Project at Los Angeles International Airport (LAX) in Los Angeles, California revealed a number of issues regarding the adequacy of the transportation analysis. The deficiencies we have identified raise significant questions as to the validity of the conclusions presented in the DEIR with respect to ATMP Project-related impacts.

Of particular concern is the apparent failure of the environmental analysis to accurately assess the impacts of the ATMP Project with respect to vehicle-miles-traveled. Our analysis indicated that, when the detailed layout of the Central Terminal Area road system is carefully evaluated, the Project-related passenger VMT will be substantially greater than is indicated in the DEIR.

We also believe that the DEIR is deficient due to its failure to include any analysis of Project-related construction impacts. In that regard, we have proposed several measures intended to give the neighboring City of El Segundo a voice in establishing construction haul routes and generally guiding and monitoring construction activities.

We further believe that it is incumbent upon LAWA to perform roadway operations analyses at a sufficient level of detail as to reveal impacts of the Project on traffic operations in nearby jurisdictions, particularly in El Segundo. And the freeway safety analysis presented in the DEIR must be revised to correct the obvious problems with the traffic volumes employed in the calculations.

These issues must be addressed prior to approval of the proposed project and its environmental documentation.

We hope this information is useful. If you have questions concerning any of the items presented here or would like to discuss them further, please feel free to contact me at (906) 847-8276.

Sincerely,

GRIFFIN COVE TRANSPORTATION CONSULTING, PLLC

Neal K. Liddicoat

Neal K. Liddicoat, P.E.
Principal

Attachments

ATTACHMENT A

Figure A-1
To/From Sepulveda Blvd. South
LAMP Phase 1 Road System

&

Figure A-2
To/From Sepulveda Blvd. South
ATMP Road System

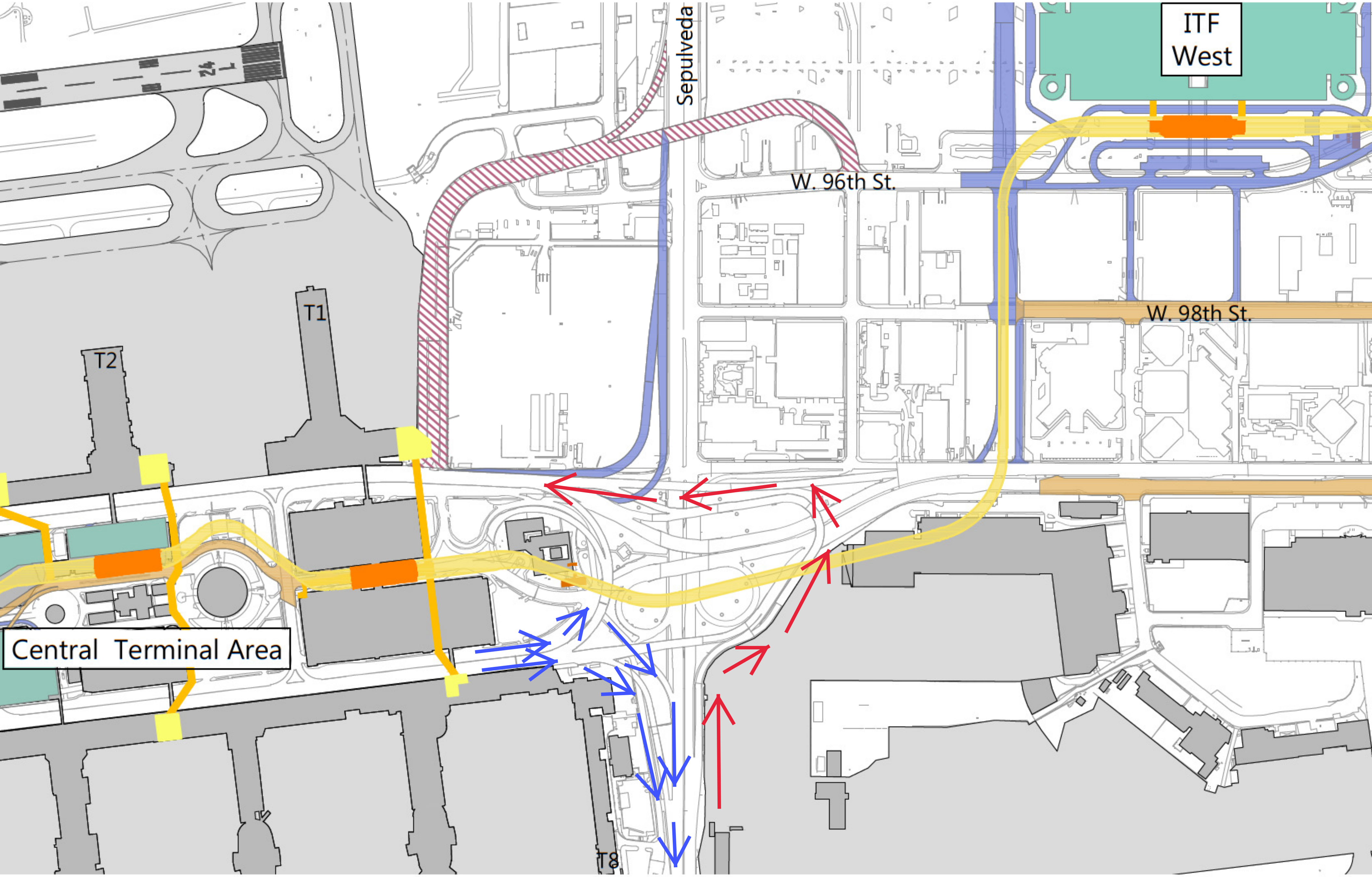


Figure A-1
To/From Sepulveda Blvd. South
LAMP Phase 1 Road System

Figure A-1
To/From Sepulveda Blvd. South
ATMP Road System

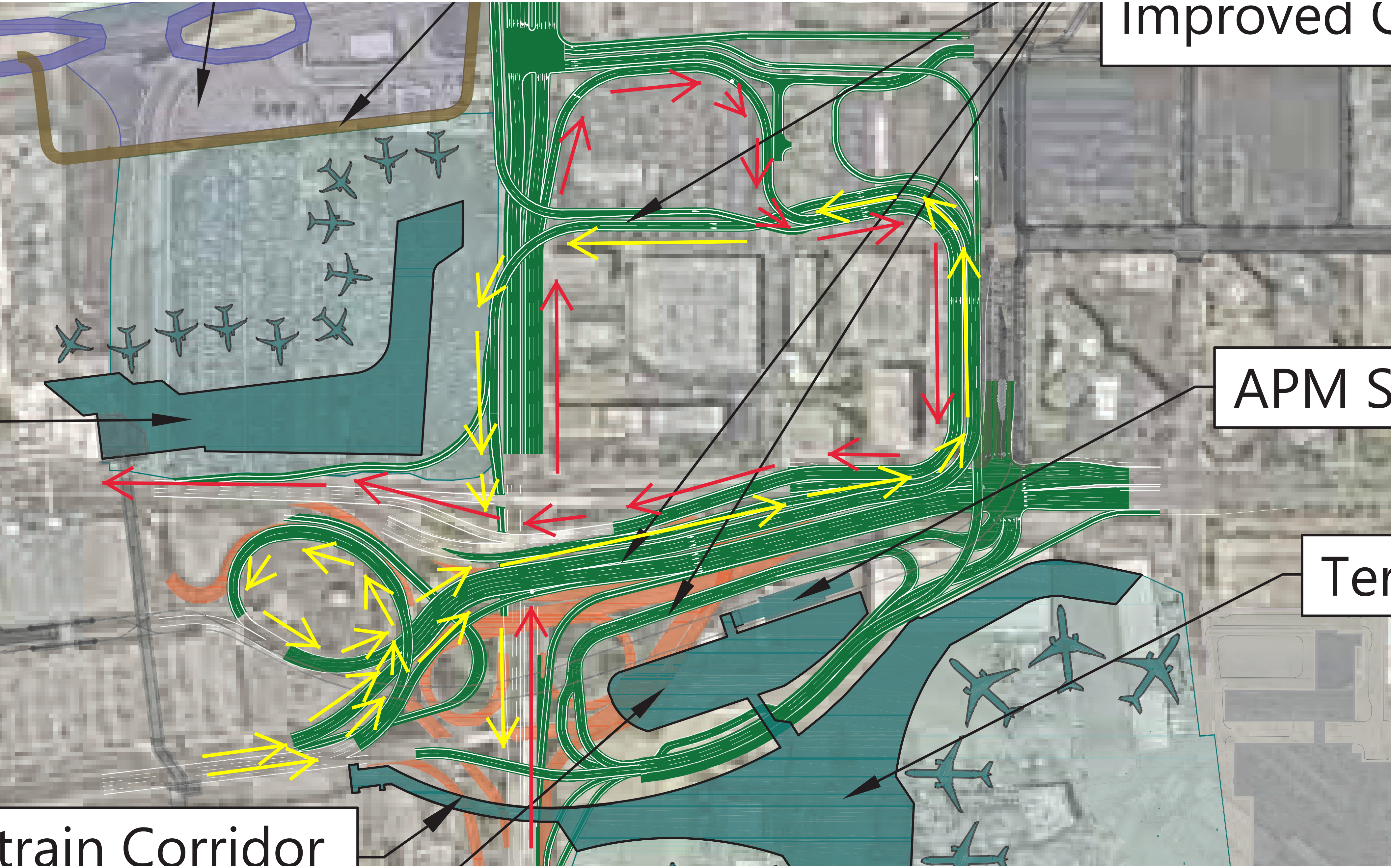


Figure A-2
To/From Sepulveda Blvd. South
ATMP Road System

ATTACHMENT B

Figure B-1
To/From Sepulveda Blvd. North
LAMP Phase 1 Road System

&

Figure B-2
To/From Sepulveda Blvd. North
ATMP Road System

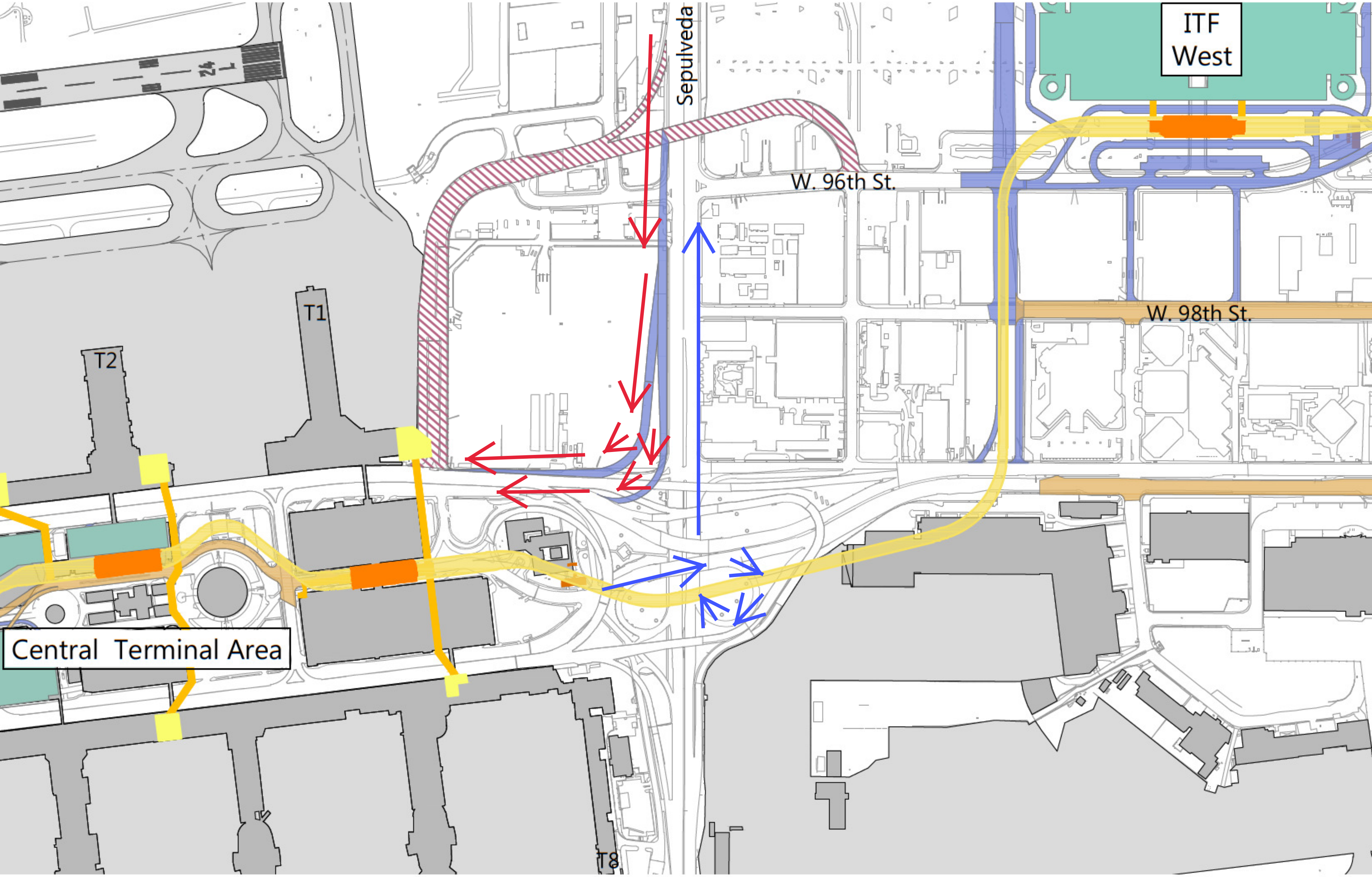
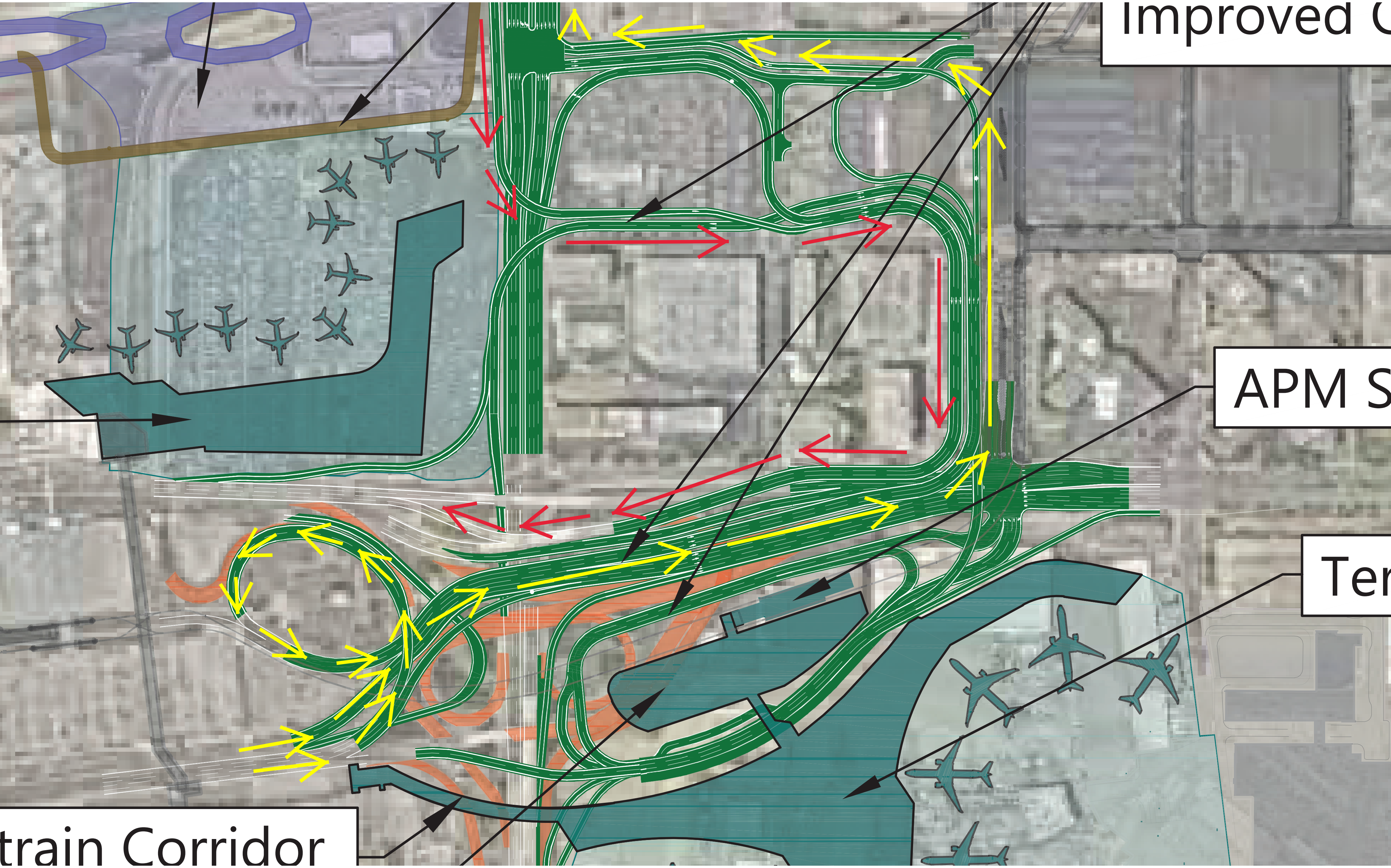


Figure B-1
To/From Sepulveda Blvd. North
LAMP Phase 1 Road System

Figure B-2
To/From Sepulveda Blvd. North
ATMP Road System



ATTACHMENT C

DEIR Table G.4-7 ("Summary of 2028 Proposed Project Terminal 1 to Terminal 8 Hourly Volumes – Lower Level")
&
DEIR Table G.4-8 ("Summary of 2028 Proposed Project Terminal 1 to Terminal 8 Hourly Volumes – Upper Level")

(Source: Los Angeles World Airports, *Airfield and Terminal Modernization Project – Los Angeles International Airport (LAX) – Draft Environmental Impact Report (Draft EIR)*, October 2020.)

&

Tables C-1 – C-5
2028 Design Day Traffic Calculation Spreadsheets

(Source: Griffin Cove Transportation Consulting, PLLC)

Table G.4-7
Summary of 2028 Proposed Project Terminal 1 to Terminal 8 Hourly Volumes – Lower Level

	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM
Vehicle Volumes																								
Private Vehicle - Pick-Up/Drop-Off	727	110	50	0	0	417	641	1,524	1,267	1,783	1,971	2,006	1,965	1,590	1,610	1,899	2,020	1,426	1,504	1,523	1,747	1,489	1,714	1,336
Private Vehicle - CTA Parking	135	19	7	0	0	169	219	394	355	416	490	520	493	414	458	542	671	425	394	377	420	342	419	0
Charter Van	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taxi	35	5	1	0	0	6	10	25	21	68	76	77	75	61	62	73	77	69	73	73	85	72	83	64
Transportation Networking Company	140	21	3	0	0	23	36	85	71	313	346	353	346	279	283	334	355	275	290	294	337	287	330	258
Limo/Town Car	18	3	0	0	0	3	4	9	7	46	51	53	51	42	42	50	53	35	37	36	42	35	41	32
Shared Ride Van	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rental Shuttle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Shuttle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking Shuttle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FlyAway	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Charter Bus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crew	14	2	0	0	0	0	0	1	1	23	25	26	26	21	21	24	27	29	30	31	35	30	34	27
LAWA Shuttles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTA Lower Level Ins	**1,069**	**160**	**61**	**0**	**0**	**618**	**910**	**2,038**	**1,722**	**2,649**	**2,959**	**3,035**	**2,956**	**2,407**	**2,476**	**2,922**	**3,203**	**2,259**	**2,328**	**2,334**	**2,666**	**2,255**	**2,621**	**1,717**
Commercial From Upper Level	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sepulveda Boulevard SB	378	57	22	0	0	178	310	855	692	1,056	1,200	1,180	1,206	1,021	1,069	1,274	1,386	992	1,046	972	1,051	925	1,017	567
Century Boulevard	429	58	23	0	0	206	294	640	582	969	1,080	1,180	1,003	805	735	798	917	578	585	726	1,039	955	1,212	648
Sepulveda Boulevard NB	263	45	17	0	0	234	306	542	448	624	679	675	746	580	672	850	900	689	697	637	576	376	391	502
CTA Lower Level Outs	**1,634**	**237**	**86**	**0**	**0**	**545**	**796**	**2,152**	**1,646**	**2,637**	**2,931**	**3,178**	**3,214**	**2,600**	**2,643**	**3,361**	**3,434**	**2,499**	**2,552**	**2,489**	**2,857**	**2,454**	**2,915**	**2,409**
Sepulveda Boulevard NB	82	16	7	0	0	101	171	341	257	313	343	353	397	295	319	452	443	267	244	271	298	268	283	149
Century Boulevard	783	122	44	0	0	326	459	1,156	884	1,362	1,526	1,596	1,558	1,374	1,376	1,731	1,774	1,293	1,293	1,396	1,630	1,315	1,523	1,176
Sepulveda Boulevard SB	769	99	35	0	0	118	166	655	505	962	1,062	1,229	1,259	931	948	1,178	1,217	939	1,014	822	929	872	1,109	1,084
Other CTA Vehicle Assignments [1]																								
Parking Net[2]	565	77	25	0	0	(73)	(114)	114	(76)	(12)	(28)	143	258	193	167	439	231	240	224	155	191	199	294	692

Note:

[1] Vehicle volumes included in Vehicle Volume counts above.

[2] (Negative) value indicated more vehicles leaving parking than entering during hour.

NB = northbound SB = southbound

Source: Ricondo & Associates, Inc., May 2020.

Table G.4-8
Summary of 2028 Proposed Project Terminal 1 to Terminal 8 Hourly Volumes – Upper Level

	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM
Vehicle Volumes																								
Private Vehicle - Pick-Up/Drop-Off	15	20	116	397	905	1,189	1,447	1,614	1,604	711	715	671	655	638	613	605	553	823	736	828	920	867	517	206
Private Vehicle - CTA Parking	1	1	4	39	85	120	133	179	176	87	112	101	98	101	94	80	76	109	88	127	159	168	105	0
Charter Van	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taxi	0	0	2	7	17	21	26	29	28	12	11	11	10	10	10	10	9	5	5	5	7	6	4	1
Transportation Networking Company	10	13	120	411	938	1,232	1,500	1,672	1,662	1,120	1,126	1,057	1,032	1,006	966	952	871	515	461	518	576	541	324	128
Limo/Town Car	1	1	2	6	15	19	24	26	25	69	69	66	63	62	60	59	54	52	46	52	58	54	33	13
Shared Ride Van	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rental Shuttle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Shuttle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking Shuttle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FlyAway	0	0	0	2	3	5	5	5	5	3	4	4	4	4	4	4	3	4	3	3	3	3	2	1
Charter Bus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crew	1	0	0	0	1	1	1	1	1	10	10	10	9	9	9	9	8	16	13	16	17	16	9	4
LAWA Shuttles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTA Upper Level Ins	**28**	**35**	**244**	**862**	**1,964**	**2,587**	**3,136**	**3,526**	**3,501**	**2,012**	**2,047**	**1,920**	**1,871**	**1,830**	**1,756**	**1,719**	**1,574**	**1,524**	**1,352**	**1,549**	**1,740**	**1,655**	**994**	**353**
Sepulveda Boulevard SB	20	24	132	268	720	1,072	1,426	1,863	2,242	1,276	1,084	1,018	1,014	943	910	818	783	820	676	758	835	820	520	213
Century Boulevard	4	6	56	170	322	386	553	847	684	411	548	519	482	458	377	339	237	215	218	419	511	482	252	59
Sepulveda Boulevard NB	4	5	56	424	922	1,129	1,157	816	575	325	416	383	375	429	468	562	554	489	458	372	394	353	222	81
CTA Upper Level Outs	**27**	**34**	**240**	**823**	**1,879**	**2,467**	**3,003**	**3,347**	**3,325**	**1,925**	**1,935**	**1,819**	**1,773**	**1,729**	**1,662**	**1,639**	**1,498**	**1,415**	**1,264**	**1,422**	**1,581**	**1,487**	**889**	**353**
Sepulveda Boulevard NB	6	7	62	274	616	724	1,015	1,033	1,059	568	548	544	546	519	481	490	432	405	372	406	436	406	220	75
Century Boulevard	6	10	55	226	485	735	896	1,071	980	532	523	484	493	558	486	478	475	445	406	629	714	630	303	83
Sepulveda Boulevard SB	15	17	122	323	778	1,009	1,092	1,243	1,286	825	863	791	734	652	696	671	590	565	486	387	431	451	366	195
Other CTA Vehicle Assignments [1]																								
Parking Entries	1	1	4	39	85	120	133	179	176	87	112	101	98	101	94	80	76	109	88	127	159	168	105	0

Note:

[1] Vehicle volumes included in Vehicle Volume counts above.

NB = northbound SB = southbound

Source: Ricondo & Associates, Inc., May 2020.

TABLE C-1
FROM EL SEGUNDO TO THE CTA VIA NORTHBOUND SEPULVEDA BLVD.
2028 DESIGN DAY

TIME	LOWER LEVEL	UPPER LEVEL	TOTAL
12:00 AM	263	4	267
1:00 AM	45	5	50
2:00 AM	17	56	73
3:00 AM	0	424	424
4:00 AM	0	922	922
5:00 AM	234	1,129	1,363
6:00 AM	306	1,157	1,463
7:00 AM	542	816	1,358
8:00 AM	448	575	1,023
9:00 AM	624	325	949
10:00 AM	679	416	1,095
11:00 AM	675	383	1,058
12:00 PM	746	375	1,121
1:00 PM	580	429	1,009
2:00 PM	672	468	1,140
3:00 PM	850	562	1,412
4:00 PM	900	554	1,454
5:00 PM	689	489	1,178
6:00 PM	697	458	1,155
7:00 PM	637	372	1,009
8:00 PM	576	394	970
9:00 PM	376	353	729
10:00 PM	391	222	613
11:00 PM	502	81	583
TOTAL	**11,449**	**10,969**	**22,418**

TABLE C-2
FROM THE CTA TO EL SEGUNDO VIA SOUTHBOUND SEPULVEDA BLVD.
2028 DESIGN DAY

TIME	LOWER LEVEL	UPPER LEVEL	TOTAL
12:00 AM	769	15	784
1:00 AM	99	17	116
2:00 AM	35	122	157
3:00 AM	0	323	323
4:00 AM	0	778	778
5:00 AM	118	1,009	1,127
6:00 AM	166	1,092	1,258
7:00 AM	655	1,243	1,898
8:00 AM	505	1,286	1,791
9:00 AM	962	825	1,787
10:00 AM	1,062	863	1,925
11:00 AM	1,229	791	2,020
12:00 PM	1,259	734	1,993
1:00 PM	931	652	1,583
2:00 PM	948	696	1,644
3:00 PM	1,178	671	1,849
4:00 PM	1,217	590	1,807
5:00 PM	939	565	1,504
6:00 PM	1,014	486	1,500
7:00 PM	822	387	1,209
8:00 PM	929	431	1,360
9:00 PM	872	451	1,323
10:00 PM	1,109	366	1,475
11:00 PM	1,084	195	1,279
TOTAL	**17,902**	**14,588**	**32,490**

TABLE C-3
FROM CTA UPPER LEVEL LOOP TO NORTHBOUND & SOUTHBOUND SEPULVEDA BLVD.
2028 DESIGN DAY

TIME	SB SEPULVEDA	NB SEPULVEDA	TOTAL
12:00 AM	15	6	21
1:00 AM	17	7	24
2:00 AM	122	62	184
3:00 AM	323	274	597
4:00 AM	778	616	1,394
5:00 AM	1,009	724	1,733
6:00 AM	1,092	1,015	2,107
7:00 AM	1,243	1,033	2,276
8:00 AM	1,286	1,059	2,345
9:00 AM	825	568	1,393
10:00 AM	863	548	1,411
11:00 AM	791	544	1,335
12:00 PM	734	546	1,280
1:00 PM	652	519	1,171
2:00 PM	696	481	1,177
3:00 PM	671	490	1,161
4:00 PM	590	432	1,022
5:00 PM	565	405	970
6:00 PM	486	372	858
7:00 PM	387	406	793
8:00 PM	431	436	867
9:00 PM	451	406	857
10:00 PM	366	220	586
11:00 PM	195	75	270
TOTAL	**14,588**	**11,244**	**25,832**

TABLE C-4
FROM SOUTHBOUND SEPULVEDA BLVD. TO CTA
2028 DESIGN DAY

TIME	LOWER LEVEL	UPPER LEVEL	**TOTAL**
12:00 AM	378	20	398
1:00 AM	57	24	81
2:00 AM	22	132	154
3:00 AM	0	268	268
4:00 AM	0	720	720
5:00 AM	178	1,072	1,250
6:00 AM	310	1,426	1,736
7:00 AM	855	1,863	2,718
8:00 AM	692	2,242	2,934
9:00 AM	1,056	1,276	2,332
10:00 AM	1,200	1,084	2,284
11:00 AM	1,180	1,018	2,198
12:00 PM	1,206	1,014	2,220
1:00 PM	1,021	943	1,964
2:00 PM	1,069	910	1,979
3:00 PM	1,274	818	2,092
4:00 PM	1,386	783	2,169
5:00 PM	992	820	1,812
6:00 PM	1,046	676	1,722
7:00 PM	972	758	1,730
8:00 PM	1,051	835	1,886
9:00 PM	925	820	1,745
10:00 PM	1,017	520	1,537
11:00 PM	567	213	780
TOTAL	**18,454**	**20,255**	**38,709**

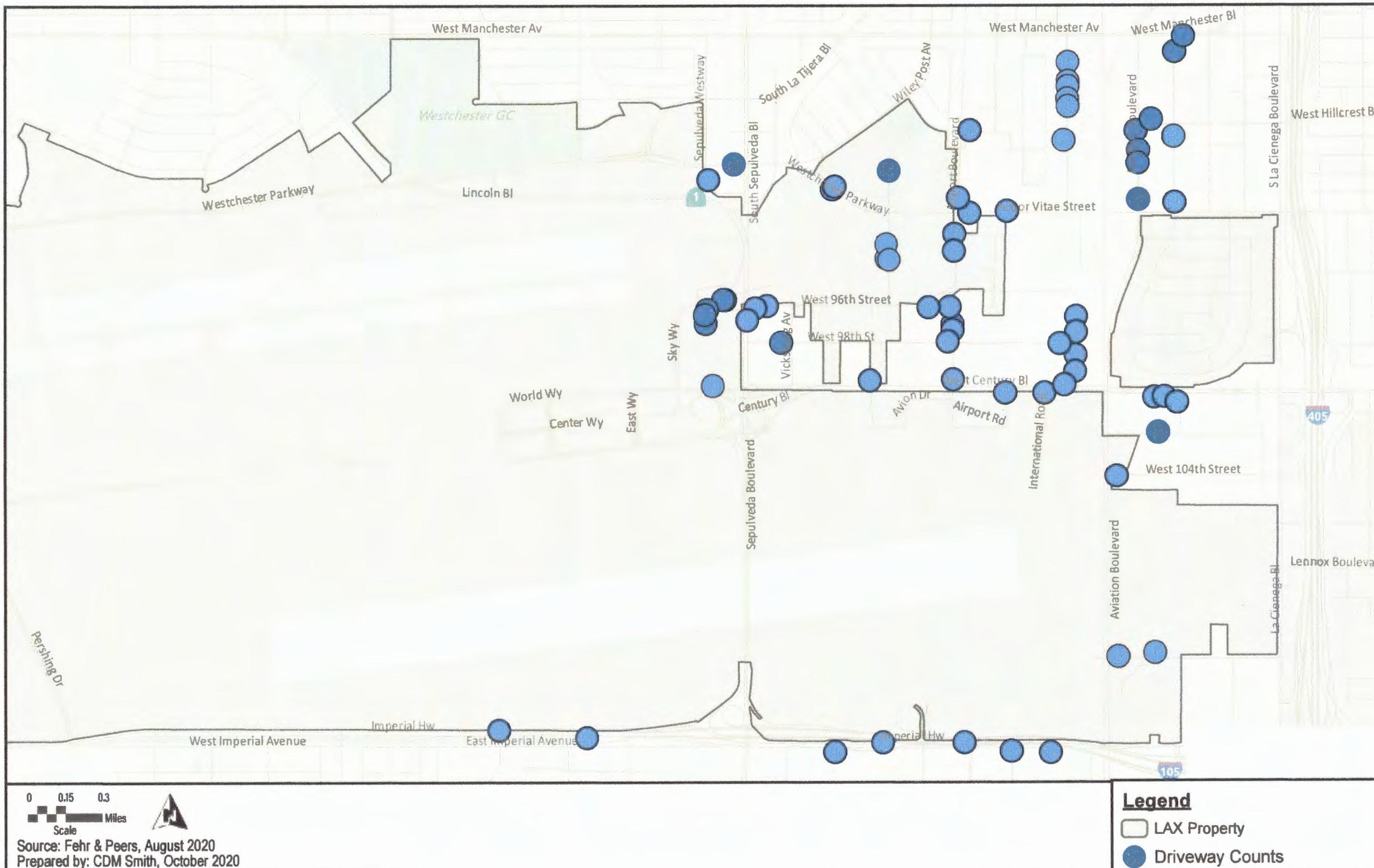
TABLE C-5
FROM THE CTA TO NORTHBOUND SEPULVEDA BLVD.
2028 DESIGN DAY

TIME	LOWER LEVEL	UPPER LEVEL	TOTAL
12:00 AM	82	6	88
1:00 AM	16	7	23
2:00 AM	7	62	69
3:00 AM	0	274	274
4:00 AM	0	616	616
5:00 AM	101	724	825
6:00 AM	171	1,015	1,186
7:00 AM	341	1,033	1,374
8:00 AM	257	1,059	1,316
9:00 AM	313	568	881
10:00 AM	343	548	891
11:00 AM	353	544	897
12:00 PM	397	546	943
1:00 PM	295	519	814
2:00 PM	319	481	800
3:00 PM	452	490	942
4:00 PM	443	432	875
5:00 PM	267	405	672
6:00 PM	244	372	616
7:00 PM	271	406	677
8:00 PM	298	436	734
9:00 PM	2,687	406	3,093
10:00 PM	283	220	503
11:00 PM	149	75	224
TOTAL	**8,089**	**11,244**	**19,333**

ATTACHMENT D

DEIR Figure 4.8-3
Driveway Count Locations

(Source: Los Angeles World Airports, *Airfield and Terminal Modernization Project – Los Angeles International Airport (LAX) – Draft Environmental Impact Report (Draft EIR)*, October 2020.)



Source: Fehr & Peers, August 2020
Prepared by: CDM Smith, October 2020

LAX Airfield and Terminal Modernization Project

Driveway Count Locations

Figure
4.8-3

ATTACHMENT E

Intersection Level of Service Summary Tables – City of El Segundo
AM Peak Hour
Midday Peak Hour
PM Peak Hour

(Reference: Raju Associates, Inc., *Draft Transportation Study for the Landside Access Modernization Program DEIR*, September, 2016)

Table 1
Intersection Level of Service Summary
AM Peak Hour

Intersection	Baseline (2015)		Baseline (2015) With Project		2024 Future Without Project		2024 Future With Project		2035 Future Without Project		2035 Future With Project		2035 Future With Project and Potential Future Development	
	V/C[1]	LOS[2]	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
4. Vista del Mar/Grand Ave.	0.638	B	0.631	B	0.689	B	0.682	B	0.713	C	0.706	C	0.706	C
11. Main St./Imperial Hwy.	0.693	B	0.689	B	0.685	B	0.686	B	0.694	B	0.701	C	0.702	C
67. Sepulveda Blvd./Imperial Hwy.	0.774	C	0.719	C	0.769	C	0.712	C	0.792	C	0.733	C	0.735	C
68. Sepulveda Blvd./Mariposa Ave.	0.748	C	0.746	C	0.886	D	0.882	D	0.888	D	0.888	D	0.889	D
69. Sepulveda Blvd./Grand Ave.	0.820	D	0.822	D	1.146	F	1.144	F	1.146	F	1.149	F	1.150	F
70. Sepulveda Blvd./El Segundo Blvd.	0.815	D	0.817	D	0.840	D	0.844	D	0.848	D	0.850	D	0.851	D
71. Sepulveda Blvd./Rosecrans Ave.	0.937	E	0.937	E	1.046	F	1.044	F	1.056	F	1.053	F	1.054	F
85. Nash St./I-105 WB Ramps/Imperial Hwy.	0.414	A	0.403	A	0.521	A	0.520	A	0.547	A	0.549	A	0.551	A
86. Nash St./El Segundo Blvd.	0.551	A	0.545	A	0.635	B	0.631	B	0.646	B	0.642	B	0.642	B
87. Douglas St./ Imperial Hwy.	0.346	A	0.349	A	0.369	A	0.403	A	0.398	A	0.438	A	0.439	A
88. Douglas St./El Segundo Blvd.	0.736	C	0.731	C	0.830	D	0.826	D	0.848	D	0.855	D	0.858	D
97. Aviation Blvd./Imperial Hwy.	0.576	A	0.538	A	0.724	C	0.602	B	0.878	D	0.652	B	0.664	B
98. Aviation Blvd./West 120th St.	0.856	D	0.834	D	0.821	D	0.814	D	0.905	E	0.869	D	0.874	D
99. Aviation Blvd./El Segundo Blvd.	0.863	D	0.854	D	0.971	E	0.969	E	0.991	E	0.987	E	0.992	E
100. Aviation Blvd./Rosecrans Ave.	0.946	E	0.943	E	1.001	F	0.998	E	1.013	F	1.010	F	1.012	F

Notes:
[1] Volume/capacity.
[2] Level of service.

Table 2 Intersection Level of Service Summary Midday Peak Hour														
Intersection	Baseline (2015)		Baseline (2015) With Project		2024 Future Without Project		2024 Future With Project		2035 Future Without Project		2035 Future With Project		2035 Future With Project and Potential Future Development	
	V/C[1]	LOS[2]	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
67. Sepulveda Blvd./Imperial Hwy.	0.684	B	0.654	B	0.632	B	0.632	B	0.647	B	0.658	B	0.659	B
97. Aviation Blvd./Imperial Hwy.	0.517	A	0.429	A	0.667	B	0.622	B	0.694	B	0.640	B	0.645	B

Notes:
1 Volume/capacity.
2 Level of service.

Table 3
Intersection Level of Service Summary
PM Peak Hour

Intersection	Baseline (2015)		Baseline (2015) With Project		2024 Future Without Project		2024 Future With Project		2035 Future Without Project		2035 Future With Project		2035 Future With Project and Potential Future Development	
	V/C[1]	LOS[2]	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
4. Vista del Mar/Grand Ave.	0.478	A	0.470	A	0.548	A	0.540	A	0.583	A	0.575	A	0.575	A
11. Main St./Imperial Hwy.	0.608	B	0.610	B	0.619	B	0.624	B	0.633	B	0.632	B	0.632	B
67. Sepulveda Blvd./Imperial Hwy.	1.089	F	1.056	F	0.910	E	0.849	D	0.940	E	0.893	D	0.895	D
68. Sepulveda Blvd./Mariposa Ave.	0.782	C	0.786	C	0.835	D	0.835	D	0.823	D	0.827	D	0.829	D
69. Sepulveda Blvd./Grand Ave.	0.875	D	0.879	D	0.983	E	0.989	E	0.984	E	0.987	E	0.989	E
70. Sepulveda Blvd./El Segundo Blvd.	0.967	E	0.967	E	1.036	F	1.033	F	1.050	F	1.049	F	1.051	F
71. Sepulveda Blvd/Rosecrans Ave.	1.001	F	1.003	F	1.055	F	1.052	F	1.068	F	1.067	F	1.068	F
85. Nash St./I-105 WB Ramps/Imperial Hwy.	0.350	A	0.258	A	0.446	A	0.410	A	0.480	A	0.496	A	0.498	A
86. Nash St./El Segundo Blvd.	0.579	A	0.560	A	0.694	B	0.679	B	0.721	C	0.708	C	0.708	C
87. Douglas St./ Imperial Hwy.	0.579	A	0.578	A	0.706	C	0.699	B	0.739	C	0.715	C	0.717	C
88. Douglas St./El Segundo Blvd.	0.854	D	0.840	D	0.967	E	0.963	E	0.989	E	0.986	E	0.986	E
97. Aviation Blvd./Imperial Hwy.	0.736	C	0.759	C	0.865	D	0.867	D	0.923	E	0.923	E	0.931	E
98. Aviation Blvd./West 120th St.	0.728	C	0.709	C	0.920	E	0.918	E	0.968	E	0.941	E	0.945	E
99. Aviation Blvd./El Segundo Blvd.	0.955	E	0.949	E	1.063	F	1.060	F	1.076	F	1.078	F	1.084	F
100. Aviation Blvd./Rosecrans Ave.	0.920	E	0.916	E	0.995	E	0.992	E	1.013	F	1.013	F	1.016	F

Notes:
1 Volume/capacity.
2 Level of service.

ATTACHMENT F

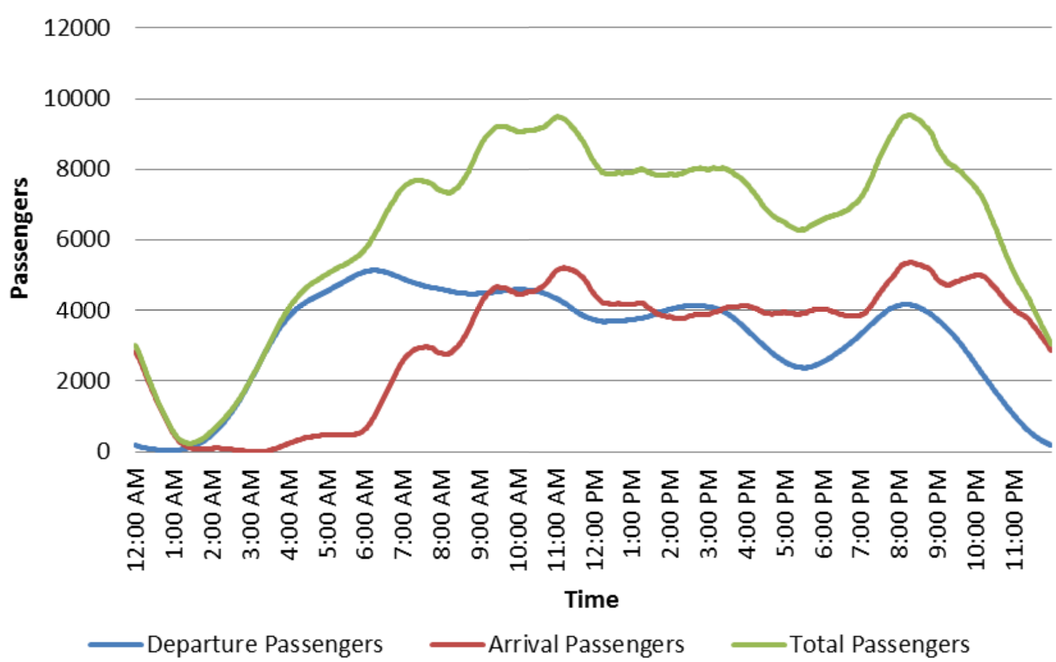
LAMP DEIR Figures 4.12.1-4, 4.12.1-8 and 4.12-9
LAX Passenger Arrival and Departure Hourly Patterns
Existing, 2024 and 2035

(Source: Los Angeles World Airports, ***Draft Environmental Impact Report for Los Angeles International Airport (LAX) Landside Access Modernization Program*****, September 2016.)**

1325900.1

The international arriving passenger data used for this analysis for both the existing and future conditions was generated based on: (a) the existing geometric configuration and operational conditions; and (b) future configurations, aircraft fleet mixes, and operational conditions. Departing and arriving passenger volumes at the curbside were calculated for domestic and international passengers for a 24-hour period in 1-minute increments. Each sixty successive 1-minute passenger counts were added to generate a rolling hourly passenger count total. From these data, the departures and arrivals peak hour passenger volumes by time of day were determined. **Figure 4.12.1-4** depicts the rolling hourly departing and arriving passenger flows in 2014 for the CTA curbside. **Table 4.12.1-3** summarizes the 2014 Airport passenger arrivals and departures peak hours.

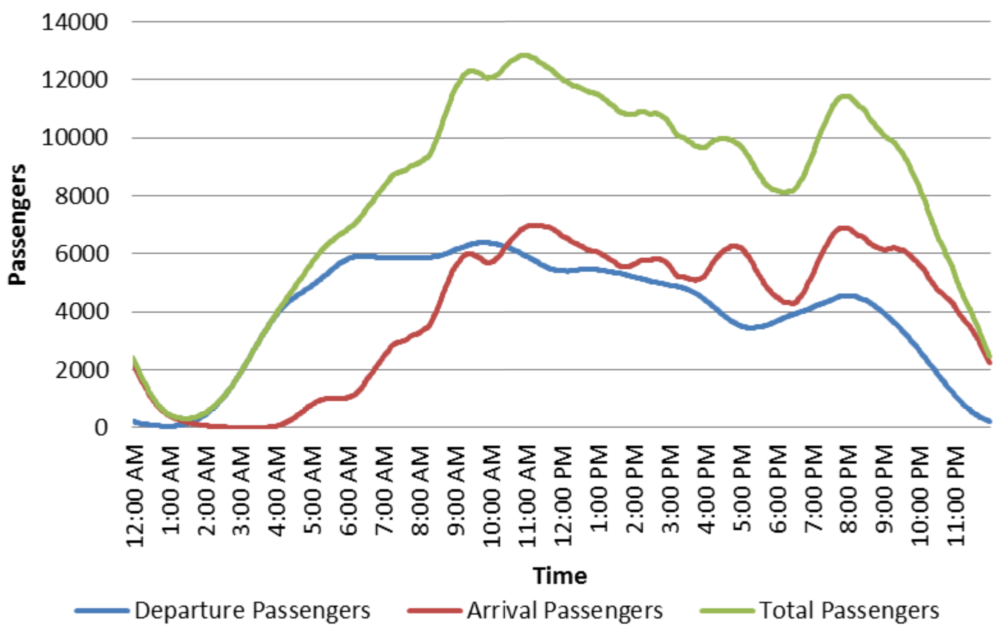
Figure 4.12.1-4: Existing (2014) Rolling Hour Departure and Arrival Passengers Volumes



SOURCE: Ricondo & Associates, Inc. May 2016.
PREPARED BY: Ricondo & Associates, Inc. May 2016.

Figure 4.12.1-8 depicts the rolling hourly terminating and originating passenger flows at the CTA curbsides for the future 2024 conditions. The passenger flows show that in 2024, there would be two pronounced peaks in passenger activity on the arrivals level curbsides with the peak hour occurring from 11:15 a.m. to 12:15 p.m. resulting in a total of 6,976 passengers on the curbside. Similarly, departing passenger flows show that in 2024, the peak hour would occur between 9:51 a.m. to 10:51 a.m. with a total of 6,377 passengers on the curbside.

Figure 4.12.1-8: Future (2024) Rolling Hour Departure and Arrival Passengers Volumes



SOURCE: Ricondo & Associates, Inc. May 2016.
PREPARED BY: Ricondo & Associates, Inc. May 2016.

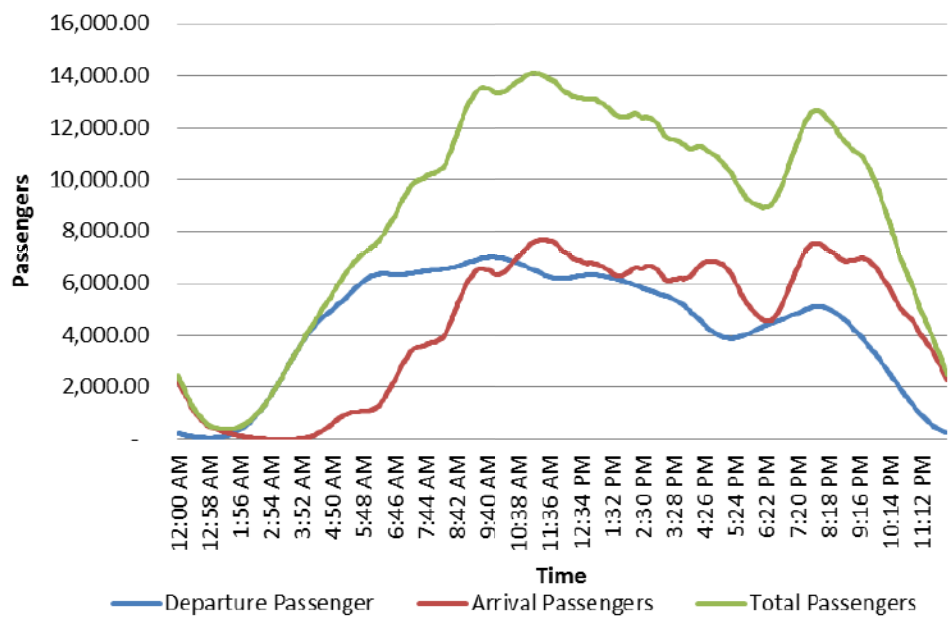
4.12.1.8.2 Determination of Future (2024) Traffic Volumes

The calibrated trip generation and trip distribution models for the 2014 departures and arrivals peak hours were used as a basis for estimating the peak hour CTA vehicle volumes for each of the future (2024) conditions. As part of this process, adjustments were made to the 2014 passenger mode splits to reflect the two ITFs and CONRAC, and how changes to the regional transportation network would affect passenger mode choice and resultant vehicle activity at the Airport (see Section 4.12.1.9.1 for methods used to adjust 2024 mode splits). **Table 4.12.1-8** and **Table 4.12.1-9** present the passenger mode splits used to estimate the CTA traffic volumes in 2024 on the departures level and arrivals level, respectively. The passenger mode splits represent the proportion of total airline passengers using each vehicle mode during the peak hours analyzed. The tables also present the modes picking-up or dropping-off passengers at either of the ITFs or CONRAC. These passengers would use the APM to access the CTA.

flight schedule representative of passenger activity level of 95 MAP was used.[14] The passenger schedule for 2035 Without Project and With Project conditions was the same, as the proposed Project would not affect the number or type of aircraft operations or passenger activity levels at LAX.

Figure 4.12.1-9 depicts the rolling hourly terminating and originating passenger flows at the CTA curbsides for 2035 conditions. The passenger flows show that 2035 conditions would produce two pronounced peaks in passenger activity on the arrivals level curbsides with the peak hour occurring from 11:30 a.m. to 12:30 p.m. resulting in a total of 7,659 passengers on the curbside. Similarly, departing passenger flows show the 2035 conditions would result in the peak hour occurring between 9:51 a.m. to 10:51 a.m. with a total of 7,006 passengers on the curbside.

Figure 4.12.1-9: Future (2035) Rolling Hour Departure and Arrival Passengers Volumes



SOURCE: Ricondo & Associates, Inc. May 2016.
PREPARED BY: Ricondo & Associates, Inc. May 2016.

14 Ricondo & Associates, Inc., *LAX 2024 and 2035 Passenger Flight Schedules*, August 2016.

Table 4.12.2-4: Summary of Existing (2015) Trip Generation

	2015 BASELINE		
	IN	OUT	TOTAL
AM PEAK HOUR			
Central Terminal Area (CTA)	4,039	3,776	7,815
Airport Parking	148	19	167
Off-Airport Parking	233	55	288
Rental Car Facilities	766	513	1,279
Employee Parking	759	280	1,039
Cargo Facilities	978	772	1,750
TOTAL	**6,923**	**5,415**	**12,338**
MD PEAK HOUR			
Central Terminal Area (CTA)	5,219	5,377	10,596
Airport Parking	114	51	165
Off-Airport Parking	191	97	288
Rental Car Facilities	1,232	863	2,095
Employee Parking	639	549	1,188
Cargo Facilities	949	816	1,765
TOTAL	**8,344**	**7,753**	**16,097**
PM PEAK HOUR			
Central Terminal Area (CTA)	3,956	4,428	8,384
Airport Parking	102	38	140
Off-Airport Parking	116	106	222
Rental Car Facilities	541	573	1,114
Employee Parking	338	586	924
Cargo Facilities	940	1,116	2,056
TOTAL	**5,993**	**6,847**	**12,840**

SOURCE: Ricondo and Associates, Inc., July 2016.
PREPARED BY: Ricondo and Associates, Inc., July 2016.

ATTACHMENT D

January 21, 2021 Ref 1326

Laurel Impett, AICP
Shute, Mihaly & Weinberger LLP
396 Hayes Street
San Francisco, CA 94102-4421

Re: Review of LAX ATMP EIR

Dear Ms. Impett:

Per your request, Tamura Environmental, Inc. has reviewed the air quality and greenhouse gas sections of the Draft EIR (DEIR) for the Los Angeles International Airport (LAX) Airfield & Terminal Modernization Project (ATMP).[1] Our review revealed a number of issues with the DEIR, with one of the most significant being that it does not evaluate the year when the project actually impacts LAX's capacity. By only evaluating the year that construction is complete, it underestimates operational emissions of criteria air pollutants, toxic air contaminants and greenhouse gases (GHG) associated with the project. These issues, which are presented below, must be addressed prior to the certification of the environmental document and approval of the ATMP.

Project Context/Existing Conditions

Operational emissions from the airport (identified in Appendix C.2 of the ATMP DEIR) are summarized in Tables 1 and 2 on the following page; the majority of the VOC, NO_x, and SO_x emissions are from the aircraft. To provide some context for the airport's NO_x emissions relative to recent emissions inventory calculations by the South Coast Air Quality Management District (SCAQMD): [2]

- The daily NO_x emissions from LAX are approximately 4% of the daily emissions for the entire South Coast Air Basin (SCAB) in 2018, and are projected to be approximately 7% of the Basin's total in 2028.
- The 2018 annual NO_x emissions from LAX are over half of the emissions of all "point sources" (permitted industrial sources) in the entire SCAB, and are more than double the combined NO_x emissions of all the petroleum refineries in the Wilmington/Carson/West Long Beach area.

[1] Los Angeles World Airports (LAWA), Draft Environmental Impact Report (Draft EIR) - Airfield & Terminal Modernization Project, Los Angeles International Airport, State Clearinghouse No. 2019049020, October 2020.
[2] SCAQMD, "Emissions Inventory in the Base and Future Milestone Years – Point and On-Road Mobile sources", presentation at Technical Advisory Group Meeting, May 29, 2019, available from https://www.aqmd.gov/docs/default-source/ab-617-ab-134/technical-advisory-group/presentation-may29-2019.pdf?sfvrsn=9.

19 4th Street, Ste 200, Petaluma, CA 94952 ~ Tel: 707.773.3737 ~ Fax: 888.874.2788

- The magnitude of the increase in LAX operational NO_x emissions between 2018 and 2028 (1.25 tons per day) is roughly 40-50% of the magnitude of the total SCAB-wide NO_x reductions identified in SCAQMD's 2016 Clean Air Plan for "Traditional Regulatory Measures" in 2022 and 2023 (2.6 and 3.2 tons-per-day, respectively).[3]

These are comparisons to region-wide air emissions; clearly, the airport has a greater relative contribution locally. The DEIR acknowledges that "[t]he existing air quality setting in the immediate vicinity of the Project site is dominated by air pollutants from aircraft activities, including landings and take-offs, taxiing, and other aircraft movements; vehicles on airport roads and surrounding roads and highways; and industrial uses." (p. 3-2)

Table 1. Annual Emissions from LAX.

	CO (tons/yr)	VOC (tons/yr)	NO_x (tons/yr)	SO_x (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)	GHG (metric tonnes CO_2e/yr)
2018	9,823	945	5,448	411	503	193	2,151,823
2028 (No Project)	9,077	854	5,892	499	611	223	2,335,427
2028 (With Project)	9,133	871	5,891	498	620	225	2,356,700
10-Year Change[a]	-690	-74	+443	+87	+117	+32	+204,877

[a]Values shown are the difference between the 2028 (With Project) case and 2018; the difference between 2028 (No Project) and 2018 is not qualitatively different.

Table 2. Daily Emissions of Criteria Pollutants from LAX.

	CO (lbs/day)	VOC (lbs/day)	NO_x (lbs/day)	SO_x (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
2018 Operations	55,339	5,323	30,690	2,314	2,834	1,090
Construction – Max. Year	4,394	385	805	173	33	20
2028 Operations (No Project)	51,140	4,813	33,193	2,812	3,440	1,256
2028 Operations (With Project)	51,456	4,906	33,199	2,808	3,492	1,268
10-Year Change in Operations[a]	-3,883	-417	+2,509	+495	+658	+178

[a] Values shown are the difference between the 2028 (With Project) case and 2018; the difference between 2028 (No Project) and 2018 is not qualitatively different.

LAX handled 88 million annual passengers (MAP) in 2019, making it the third-busiest airport in the world.[4] It is also projected to grow: i.e., the recently released South Coast Association of Governments (SCAG) Regional Transportation Plan/Sustainable Communities Strategy, "Connect SoCal", projects 127 MAP at LAX in 2045.[5] While the Program EIR for Connect

[3] SCAQMD, Final 2016 Air Quality Management Plan, March 2017, available from http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp, p. ES-10.
[4] The Port Authority of NY and NJ, "Top 60 Worldwide Airport Comparison: World Passengers Traffic, Ranked by Passenger", Section 2.1.2 in 2019 Airport Traffic Report, May 2020.
[5] "SCAG Region Airport Passenger Forecast for 2020–2045", Table 3.3 in SCAG, "The 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments" (Connect SoCal), adopted on September 3, 2020.

SoCal concludes that total emissions for the South Coast Air Basin (SCAB) "are expected to generally decline through at least 2031 except for small increases in $PM_{2.5}$ and SO_x",[6] the ATMP DEIR projects increasing NO_x (an ozone precursor) and other air pollutants from LAX.

For existing conditions, the DEIR provides air pollutant data from a monitor on the north side of LAX, which is obviously very close to the project. However, the DEIR should acknowledge that the prevailing wind direction is more westerly (from the west) than southerly,[7] and that local air quality monitoring data are not available for areas immediately east of the airport.

Project Relationship to LAX Capacity; Time Horizons and Cumulative Impacts

Throughout the DEIR, there are statements identifying that the ATMP does not increase the airport's capacity, which is a key reason why Tables 1 and 2 above show relatively minor differences between the "No Project" and "With Project" scenarios: i.e., the ATMP identifies that the air traffic volumes are the same for both scenarios (differences in aircraft emissions appear to be due to differences in the routing of aircraft on the ground). However, this conclusion is a result of the fact that the DEIR only considers the future year of 2028, immediately after the project construction is completed, and before its impact on LAX capacity is realized.

The DEIR identifies that the overall operational capacity of an airport is influenced by three key components – airfield, terminal, and landside – and that the most limiting factor is currently the four-runway airfield system, which begins to constrain annual capacity in 2029. Accordingly, the DEIR asserts that the project does not impact capacity in 2028, but the ATMP clearly appears to be one of a number of projects that are occurring over time to ensure that LAX is capable of handling unconstrained demand for the airport. This is further reinforced by a statement in Appendix B of the DEIR:

> "Several terminal facilities at LAX have been in the process of being modernized to ensure the ability of aging terminal facilities and passenger processors to accommodate demand for air travel. These projects include the Midfield Satellite Concourse, the LAX Terminals 2 and 3 Modernization Project, and LAX Terminal 1.5 Project. Therefore, existing and planned terminal facilities would provide adequate processing facilities for all existing and planned passenger gates in FY 2028 and FY 2033."[8]

Past CEQA analyses conducted for each of the three projects mentioned as "ensur[ing] the ability…to accommodate demand for air travel" also only looked out to the year that their

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[6] SCAG, Connect SoCal Certified Final Program Environmental Impact Report, State Clearinghouse #20199011061, May 2020, p. 3.3-60.

[7] This is reflected in wind rose information as well as figures in the paper by Hudda et al., "Emissions from an International Airport Increase Particle Number Concentrations 4-fold at 10 km Downwind", *Environ. Sci. Technol.* 2014, **48**, 12, 6628-6635, https://doi.org/10.1021/es5001566

[8] ATMP DEIR, p. 6-5; Ricondo & Associates, "Los Angeles International Airport: LAX Airfield and Terminal Modernization Project – Draft Activity Forecasts Report", August 2020 (in "Activity Forecasts and Operational Analyses", Appendix B to the ATMP DEIR), p. 4-6.

construction was complete, and also made statements about how they did not impact capacity.[9,10,11] The ATMP DEIR does compare the overall increases in airport emissions between 2018 and 2028 to CEQA significance thresholds (and finds that the increases are significant), but this is looking at growth over the time period needed to construct the project, not growth associated with the actual project.

There are at least two key issues with the ATMP DEIR continuing this paradigm of only considering impacts at the time of project completion:

1. The analyses do not consider "direct physical changes in the environment which may be caused by the project and reasonably foreseeable indirect physical changes in the environment which may be caused by the project" as required by CEQA Guidelines [§15064(d)]. The airport clearly needs to plan in advance and enact a number of projects in order to expand in the future, and the reasonably foreseeable impacts of individual projects are not realized at the time that their construction is completed. At a minimum, the DEIR should include an analysis of the impacts of the capacity-increasing aspects of projects, even if they are being completed in advance of the point in time where the terminal's overall capacity is limited by them (as it seems that they would always be). For nonattainment pollutants their precursors, such an analysis is also required by Federal General Conformity regulations: i.e., the analysis of a project's conformity with the California's EPA-approved State Implementation Plan (SIP) for attaining the National Ambient Air Quality Standards (NAAQS) is required to be based on the total of direct and indirect emissions[12] from the action and must address the year during which the total of direct and indirect emissions from the action is expected to be greatest on an annual basis [40 CFR 93.159(d)]. 2028 is not "the year during which the total of direct and indirect emissions from the action is expected to be the greatest on an annual basis", and the DEIR underestimates the latter by only estimating emissions during 2028. The EIR needs to evaluate the year during which the total of direct and indirect emissions from the action is expected to be the greatest on an annual basis (even if that capacity is a result of concerted projects on the airfield, terminal, and landside components of the airport) – which in turn is a function of the extent of the future terminal capacity that the ATMP provides.

[9] "the MSC North Project would not alter the airspace traffic, runway operational characteristics, or the practical capacity of the Airport. As such, changes in emissions from aircraft operations over the 2012 existing conditions are due to increased travel demand and changes in aircraft fleet mixes that are projected to occur by 2019 irrespective of the proposed MSC North Project." (LAWA, DEIR for LAX Midfield Satellite Concourse, Section 4.1, p. 4-40.)

[10] "the proposed project would not alter the airspace traffic, runway operational characteristics, or the practical capacity of the airport; therefore, the proposed project would not increase the number of daily flights arriving and departing from LAX or the growth in aviation activity at LAX that is projected to occur in the future." (LAWA, DEIR for LAX Terminals 2 & 3 Modernization Project, Section 6, p. 6-3.)

[11] "The proposed project, including the removal of Gate 10, would not increase airport capacity or affect the routing of aircraft in the air to and from LAX. No change in air traffic patterns would occur and no change in safety risks would result. Therefore, no impact would occur and no mitigation is required." (LAWA, Final Initial Study/Mitigated Negative Declaration for LAX Terminal 1.5 Project, p. B-70.)

[12] *Indirect emissions* means "those emissions… (1) That are caused or initiated by the Federal action and originate in the same nonattainment or maintenance area but occur at a different time or place as the action; (2) That are reasonably foreseeable; (3) That the agency can practically control; and (4) For which the agency has continuing program responsibility." [§93.152]

2. CEQA requires that EIRs discuss cumulative impacts—"the cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects" [§15355]—and that this discussion "reflect the severity of the impacts and their likelihood of occurrence" [§15064(d)]. The cumulative impacts section of the ATMP DEIR identifies other projects within the 2018-2028 timeframe, but does not actually evaluate the cumulative impacts when added to other closely related past or reasonably foreseeable future projects. Specifically, a formal projection of LAX capacity growth is identified in the Connect SoCal Regional Transportation Plan), and Appendix B identifies that the four-runway airfield system starts to constrain airport operations in 2029 but the existing terminal and landside capacity is sufficient to handle unconstrained demand through 2033. Both of these indicate that it is reasonably foreseeable that the four-runway airfield system will be modified. However, this also was not analyzed anywhere in the DEIR. The ATMP DEIR needs to include a discussion of those cumulative impacts as prescribed by CEQA, not just an analysis of cumulative impacts between 2018 and 2028.

Project Description/Characterization

The DEIR contains seemingly contradictory statements about the ATMP's impact on capacity. On one hand, it identifies the underlying purpose of the ATMP as being "integral to Los Angeles' plans to host the 2028 Olympic and Paralympic Games, with LAX serving as the main portal" and to "help LAX to prepare early for the continued aviation growth that is projected".[13] However, it then subsequently states that "the ability to accommodate the future aviation demand projected for LAX is not dependent on any of the improvements associated with the proposed Project".[14] The EIR needs to resolve these inconsistencies and quantify the extent to which hosting the Olympic and Paralympic games requires more capacity than what is predicted using the standard growth-projection methods identified in Appendix B.

In addition, while Appendix B identifies the average delay for the build and no-build scenarios, its discussion of terminal and landside capacity does not clearly identify the extent to which the ATMP increases the airport's capacity to handle more passengers and aircraft. The final EIR should identify the extent to which the ATMP affects the airport's capacity to handle more passengers and aircraft.

State Implementation Plan (SIP) Conformity

While the DEIR acknowledges the SIP that is submitted to EPA for purposes of assuring attainment of the National Ambient Air Quality Standards (NAAQS), there is little mention of the fact that sufficiently large projects in NAAQS nonattainment areas such as the SCAB—i.e., projects where emissions are not subject to stationary source permitting requirements—need to

[13] ATMP DEIR, p. 2-18.
[14] Ibid., p. 6-5. The context for this sentence could be interpreted as being only applicable to 2028, but still appears inconsistent with the earlier statement about the Olympic and Paralympic Games.

evaluate and (if necessary) make a determination of "General Conformity" with the SIP in accordance with 40 CFR 93. These determinations are technically the responsibility of the Federal agency issuing the approval (Appendix C of the DEIR identifies that the Federal Aviation Administration will be evaluating General Conformity[15]), but it is typically the responsibility of the project proponents to provide the information needed for the Federal agency to make that evaluation. In addition, the conformity determination is relevant to the DEIR given that (1) air quality modeling may be required and (2) such demonstrations can potentially result in the requirement for additional mitigation (potentially including the purchase of emissions offsets). Moreover, Federal agencies are precluded from approving projects unless General Conformity requirements are addressed and complied with. The EIR needs to provide information pertinent to the evaluation of the project's General Conformity with the SIP.

Health Impacts of Secondary Air Pollutants

The Supreme Court of California rendered a decision indicating that CEQA requires an EIR to contain discussions that estimate the specific human health effects that would occur as a result of a project's significant air pollutant emissions, or explain why such further evaluation is infeasible.[16] This case is referred to as the Friant Ranch decision.

The 2,509 lb/day of operations-related emissions increases of NO_x identified in the DEIR are approximately 46 times greater than the CEQA significance threshold of 55 lb/day established by SCAQMD.[17] The DEIR determines that even with mitigation, this would remain a significant and unavoidable impact.

The DEIR acknowledges the Friant Ranch decision. However, it declines to conduct the necessary analysis suggesting it is unnecessary because EIRs for two other projects conducted the evaluation and found only small impacts:

> "…the changes in emissions of ozone precursors and $PM_{2.5}$ from a single project do not "move the dial" with regard to regional human health impacts. The models available to analyze regional impacts are designed to address large, regional changes in emissions, such as those due to proposed emission control regulations that affect emissions across an entire region. Given the uncertainties in emissions, dispersion modeling, and human health concentration-response functions, the conclusion reached in these two studies was that the results to human health impacts were not statistically different than zero (i.e., no change)".[18]

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[15] CDM Smith, "Los Angeles International Airport Airfield and Terminal Modernization Project, Final CEQA Protocol for Conducting an Air Quality Impact Analysis of Criteria Air Pollutants," June 4, 2020 (in "Air Quality, Human Health Risk Assessment, Greenhouse Gas Emissions, and Energy", Appendix C to Los Angeles World Airports (LAWA), Draft Environmental Impact Report (Draft EIR) - Airfield & Terminal Modernization Project, Los Angeles International Airport, State Clearinghouse No. 2019049020, October 2020), p. 1-1.
[16] *Sierra Club et al. v. County of Fresno* (2018) 6 Cal.5th 502, p. 21.
[17] ATMP DEIR p. 4.1.1-44.
[18] ATMP DEIR, p. 4.1.1-42.

The two projects referred to were the airport Master Plan for San Jose's Mineta Airport (SJC) and the Inglewood Basketball and Entertainment Center (which did not have comparable NO_x emissions to the proposed LAX expansion). The Mineta Airport EIR identified current (2018) NO_x emissions of 3,853 lb/day (far below LAX's 30,690 lb/yr), projected that these emissions would increase by 5,325 lb/day by 2037 (19 years out),[19] and calculated that the maximum associated increase in ozone (averaged over a 4 km × 4 km area) was approximately 2 parts per billion (ppb) (8-hour average);[20] the 8-hour NAAQS and CAAQS for ozone are 70 ppb.

We reviewed the Mineta EIR and found no text identifying that the corresponding human health impacts were "not statistically different than zero (i.e., no change)", only that there were several conservative assumptions and that actual impacts could be as low as zero. The ATMP DEIR authors should include a citation to the Mineta EIR where it states that the impacts to human health were "not statistically different" than zero.

The ATMP DEIR compares the 10-year emissions increase calculated for this Project to the 19-year increase calculated for Mineta Airport, and concludes that:

> "[i]f the proposed Project emissions were applied to the SJC site, the resulting health impacts from ozone would likely be the same as, or less than, those modeled for the SJC Master Plan Amendment Draft EIR…the resulting change in health end-point incidences would be <0.05 percent for both ozone and $PM_{2.5}$ emissions."[21]

There are several flaws with the DEIR's discussion of this topic, including the following:

- As discussed previously, the DEIR does not accurately reflect the full extent of the increase in emissions that would result from the ATMP because it only identifies the increase in LAX emissions between 2018 and 2028.
- It does not identify how the "<0.05 percent" conclusion was arrived at. More importantly, it neglects the well-known fact that ozone impacts are not a function of project emissions alone, they are a complex function of NO_x and VOC emissions in the surrounding environment, meteorology (including sunlight/temperature), and topography, all of which are different for Los Angeles than San Jose. Therefore, making a quantitative statement regarding this project's ozone impacts based on applying its emissions to photochemical modeling conducted in San Jose is not valid.
- By providing only a percent change in "health end-point incidences", it does not fully address the statements in the Friant Ranch judgment that CEQA requires an EIR to make

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[19] David J. Powers & Associates, Integrated Final Environmental Impact Report, Amendment to Norman Y. Mineta San Jose International Airport Master Plan, City of San Jose PP 18-103, SCH #2018102020, April 2020, available from https://www.sanjoseca.gov/your-government/department-directory/planning-building-code-enforcement/planning-division/environmental-planning/environmental-review/active-eirs/sjc-airport-master-plan-update, p. 72 and p. 87.
[20] Ramboll US Corporation, Mineta San Jose Airport Supplemental Air Quality Impacts Analysis, San Jose, California, October 2019 (available from https://www.sanjoseca.gov/Home/ShowDocument?id=61650), Appendix B, p. 9.
[21] ATMP DEIR, p. 4.1.1-48.

> "a reasonable effort to discuss relevant specifics regarding the connection between two segments of information already contained in the EIR, the general health effects associated with a particular pollutant and the estimated amount of that pollutant the project will likely produce. This discussion will allow the public to make an informed decision, as CEQA requires."[22]

Specifically, the general public does not have an understanding of "health end-point indices", either on a technical basis or in an applied sense. Given the magnitude of the NO_x emissions associated with LAX cumulatively, as well as the climate and topography of the SCAB as a whole, it is hard to imagine a site more deserving of photochemical grid modeling than this one. The DEIR should have conducted photochemical grid modeling. In addition, while the traditional "grid size" (averaging area) is 4 km × 4 km, it is recognized that efforts have been made to develop the photochemical grid model for neighborhood-scale analyses. The EIR should be revised to evaluate and explain the extent to which it is possible to meaningfully evaluate impacts more closely than the traditional 4 km × 4 km grid square. Given that the increase in annual NO_x emissions over just a 10-year period is approximately 46 times higher than the SCAQMD's significance threshold, LAWA should "relate the expected adverse air quality impacts [pollutant concentrations] to the project's likely health consequences, per the Friant Ranch decision.

Toxics Health Risk Analysis

Health risks associated with operational emissions of Toxic Air Contaminants (TACs) from the 2028 build scenario are presented as "incremental" values, relative to either 2018 or the 2028 no-build scenario. DEIR Table 4.1.2-2 shows the incremental cancer risk from the Project's construction and operation declining between 2018 and 2028. This is in part because TAC emissions are a fraction of the emissions of volatile organic compounds (VOC)—which are identified as decreasing from 2018 to 2028—and emissions of particulate matter (PM)—which are identified as increasing only slightly (and not in excess of significance thresholds). However, the DEIR's health risk analysis has the same deficiency that was identified for the analysis of criteria air pollutants: i.e., not evaluating the actual impact of the proposed project on operations beyond 2028 (i.e., when the project actually makes a difference in the airport's emissions). As discussed above, the EIR should be revised to identify the reasonably foreseeable changes in emissions which may be caused by the Project.

Greenhouse Gases/Climate Change

As with the DEIR's analysis of criteria air pollutant emissions, the DEIR also underestimates the Project's increase in greenhouse gas (GHG) emissions because it does not evaluate the impact of the Project beyond 2028. The EIR should be revised to identify the reasonably foreseeable changes in the environment which may be caused by the project. In addition, Section 4.4.2.2 should clearly identify the boundary of the aircraft GHG emissions inventory. While there is a

[22] *Sierra Club et al. v. County of Fresno*, p. 23.

logical basis for using the "mixing height" cutoff with regard to criteria pollutant emissions, there is not an analogous logical basis for using it for GHG emissions.

Criteria Air Pollutant and GHG Mitigation

CEQA requires that EIRs identify the following with regard to mitigation:

> "where several measures are available to mitigate an impact, each should be discussed and the basis for selecting a particular measure should be identified. Formulation of mitigation measures shall not be deferred until some future time. The specific details of a mitigation measure, however, may be developed after project approval when it is impractical or infeasible to include those details during the project's environmental review provided that the agency (1) commits itself to the mitigation, (2) adopts specific performance standards the mitigation will achieve, and (3) identifies the type(s) of potential action(s) that can feasibly achieve that performance standard and that will [be] considered, analyzed, and potentially incorporated in the mitigation measure." [§15126.4(a)(1)(B)]

The DEIR identifies on p. 4.1.1-43 that several types of mitigation measures (listed in Appendix C.9) were considered, but determines that most were "not applicable or feasible" with regard to the ATMP. It does not identify a clear basis for selecting the measures identified in the body of the DEIR. Several of the measures included in the DEIR (intended to address the ATMP's significant air quality and GHG impacts) include neither specific details nor the commitment or performance standards required by CEQA identified above. The DEIR should be revised to ensure that the mitigation measures comply with CEQA's requirements.

The DEIR identifies the following significant impacts and proposed mitigation measures:[23]

1. Emissions of CO, VOC, NO_x and SO_x associated with ATMP construction would constitute a significant impact; the two proposed mitigation measures (MM) are:
    a. MM-AQ/GHG (ATMP)-1: Rock Crushing Operations (on-site crushing/waste reuse)
    b. MM-AQ/GHG (ATMP)-2: Use of Renewable Diesel Fuel (in construction equipment and on-site water trucks)
    c. MM- C (ATMP)-1. Construction Mitigation Oversight.

2. Increases in airport operational emissions of NO_x, SO_x, PM_{10}, and $PM_{2.5}$ between 2018 and 2028 would constitute a significant impact. Proposed MM:
    a. MM-AQ/GHG (ATMP)-3: Parking Cool Roof
    b. MM-AQ/GHG (ATMP)-4: Electric Vehicle (EV) Charging Infrastructure
    c. MM-AQ/GHG (ATMP)-5: EV Purchasing
    d. MM-AQ/GMG (ATMP)-6: Solar Energy Technology
    e. MM-T (ATMP)-1: Vehicle Miles Traveled (VMT) Reduction Program

[23] ATMP DEIR, Sections 4.1.1.5 and 4.4.5.

3. Increases in GHG from construction and operations would constitute a significant impact. Proposed MM:
    a. All of the measures identified for #1 and #2 above
    b. MM-GHG (ATMP)-1. Demolition Waste (recycling)
    c. MM-GHG (ATMP)-2. Organic Waste Collection and Diversion
    d. MM-GHG (ATMP)-3. Green Procurement (adoption of a policy)
    e. MM-GHG (ATMP)-4. Enhanced Recycling (enhancing existing program)
    f. MM-GHG (ATMP)-5. Landscaping Water (non-potable water for landscaping)

Several of the measures are vaguely worded and/or contingent on the extent to which they are "feasible", available at a "comparable price", etc. Therefore, the measures do not provide concrete commitment that they will be implemented. Nor do they provide adequate information with regard to the criteria for how feasibility will be assessed, what is considered to be a "comparable" price, etc. For example:

- MM-AQ/GHG (ATMP)-1: Rock Crushing Operations requires contractors to conduct rock-crushing on-site and reuse waste "to the maximum extent feasible (determined based on facility capacity and capability, project schedule, costs and regulatory conditions)". However, there is no commitment; i.e., there is nothing in the text to prevent a contractor from simply saying that rock-crushing and the reuse of waste is not feasible.

- MM-AQ/GHG (ATMP)-2 calls for use of renewable diesel fuel for equipment and trucks "as feasible based on commercial renewable fuel availability…at a "comparable price" and without incurring "a substantial transportation cost." Again, this could lead to no renewable diesel use at all; i.e., phrases such as "comparable price" and "substantial transportation cost" are subjective.

- MM-AQ/GHG (ATMP)-6 "requires LAWA to implement solar energy…where feasible based on [several factors]". Here too, there is nothing in this measure that requires LAWA to make any type of feasibility assessment and so there is no assurance that solar energy would be implemented as the measure would suggest.

For each of these measures, the DEIR is not (1) identifying a commitment to implement and (2) adopting specific performance standards the mitigation will achieve, as required by CEQA.

As mentioned previously, CEQA requires that "where several measures are available to mitigate an impact, each should be discussed and the basis for selecting a particular measure should be identified." Appendix C.9 lists 93 measures and states that "many of those potential measures are already being implemented at LAX under existing LAWA programs…. of the remaining measures, some were considered feasible to add as mitigation measures for the proposed Project, while others were determined to not be applicable or infeasible to include as mitigation measures for the Project" (p. C.9-1). However, the "remaining measures" text indicates that if a certain type of measure is already being implemented, there was not an evaluation of the extent to which more stringent commitments could be made.

For GHG, the CEQA Guidelines require that mitigation measures may include "Off-site measures, including offsets that are not otherwise required" [§15126.4(c)(3)]. Table C.9-1 identifies that while the creation of "a carbon offset purchasing strategy" was considered (measure #32), "FAA takes the position that any use of funds by LAWA absent a specific regulatory requirement is prohibited by revenue diversion policies", citing a 1999 FAA policy. Given that CEQA does not include "specific" regulatory requirements for mitigation, it is unclear why LAWA is interpreting offsets as being different from any of the other mitigation measures. This should be explained in more detail.

Also, Table C.9 does not quantify the emission reduction potential associated with the listed measures. While there is some utility to identifying potential mitigation measures, LAWA should identify those measures that would be most effective in reducing emissions.

As identified in Appendix C.2 of the DEIR, aircraft are the most significant source of operational NO_x, CO, VOC, and SO_x emissions from LAX, and account for roughly half of the GHG emissions (with most of the remaining half being from autos, while other sources comprise less than 10% of the total).[24] Table C.9-1 mentions "sustainable (renewable) aviation jet fuel" (Measure #7) and "alternative fuels"/ "sustainable fuels" (Measure #23) for jets, yet there is no quantitative detail regarding the extent of the existing programs or project features at LAX. Nor is there any indication that LAWA considered ways to strengthen such measures to result in enhanced reduction of criteria air pollutant and GHG emissions (e.g., by increasing hydrant fueling infrastructure at existing gates). It is also not identified whether the fuels being referred to by these mitigation options included renewable-only fuels, California Low Carbon Fuel Standard-certified alternative jet fuels, or jet fuel formulations which are neither renewable nor LCFS-certified, but which emit fewer criteria air pollutants. Given the substantial amount of aircraft emissions generated at LAX, the evaluation of the feasibility of these measures needs to be described in more detail than is shown in Table C.9-1.

In addition to the relatively high-level "big picture" comments that we have identified earlier in this letter, we have several detailed comments that are identified in Attachment A to this letter.

Please contact me at (707) 773-3737 or todd@tamuraenv.com if you have any comments or questions regarding this letter.

Sincerely,

TAMURA ENVIRONMENTAL, INC.

Todd Tamura, QEP
Principal

[24] It is important to note that contributions of mobile sources like aircraft and autos is a strong function of assumed trip lengths and the extent to which emissions during those trips are attributed to LAX.

Attachment A. Detailed Comments.

Below are detailed comments on the DEIR, that are in addition to the broader comments mentioned in the preceding letter.

Details of Emissions Calculations

The DEIR's Air Quality, Human Health Risk Assessment, Greenhouse Gas Emissions Appendix is over 1,200 pages long, but it does not identify key details of the analyses that were done. These omissions include, but are not necessarily limited to, the following:

1. Significance thresholds are on the basis of maximum pounds per day, and the DEIR identifies that even though the ATMP does not increase the airport's capacity in 2028, it is "integral to Los Angeles' plans to host the 2028 Olympic and Paralympic Games, with LAX serving as the main portal" (p. 2-18). Please provide details of how the demand associated with these plans were factored into the calculation of maximum daily emissions.
2. Aircraft emissions are identified as being calculated using the FAA's Aviation Environmental Design Tool (AEDT) emissions model, but the only model inputs identified in Appendix C.2 appear to be those associated with SIMMOD activity, aircraft, and airframe/engine pairings. Other inputs are relevant to emissions, such as the assumed fuel sulfur content. Furthermore, emissions inventories for mobile sources are completely a function of how much of their travel is incorporated (i.e., what the boundaries of the inventory are). For purposes of calculating the Project's criteria air pollutant emissions, the DEIR appears to have assumed that aircraft travel up to a mixing height of 1,806 feet[25] (which has some justification, for tropospheric pollutants) but the DEIR does not identify the boundary assumed in its calculation of GHG emissions. Was the same boundary used? If not, what boundaries were set for evaluating GHG emissions?
3. On-road vehicles are significant portions of the Project's operational emissions inventories and the quantification of their emissions can be a strong function of how exactly they were calculated. With regard to the trip lengths, was the CalEEMod® default of 20 miles (one-way) used, and if not, what was assumed? Page 4.1.1-7 of the DEIR identifies that EMFAC2017 was used (and off-model adjustment factors were applied), and Appendix C identifies speed-specific emission factors (and speed assignments to roadways), but the details of precisely which inputs to EMFAC2017 were used and how adjustment factors were applied are not explained in Appendix C. Please provide that explanation.
4. For off-road vehicles, p. 4.1.1-7 of the DEIR identifies that calculations were "based on" ARB's OFFROAD2017/ORION model, but the inputs identified on p. 18 of Appendix C are not in the format of inputs used in that model, and the outputs on pp. 21-27 are not OFFROAD2017/ORION outputs. The format of the data in Appendix C indicate that the

[25] ATMP DEIR, p. 4.1.1-10.

calculations were done manually with a spreadsheet, but spreadsheet validation/sample calculations are not shown, only the results. The DEIR should have also provided the basis for the assumptions on pdf page 18 of Appendix C: i.e., 3% Tier 3, 30% Tier 4 Interim, 65% Tier 4 Final, with half of the Tier 3 engines identified as being equipped with 85% effective Diesel Particulate Matter (DPM) filters. Is LAWA committed to meeting this percentage?

5. Sulfur in fuel can be converted to either SO_2 (IV oxidation state) or sulfate (SO_4^{2-}, VI oxidation state) when combusted, and sulfate compounds (sulfates) can be an important contributor to total PM mass emissions from aircraft turbines.[26] Yu *et al*. (2019)[27] found that sulfates (measured at a distance of 30 meters from the aircraft turbine) could account for the majority of the PM mass emissions at high thrust.[28] However, the DEIR states (p. 4.1.1-2) that

> "Sulfate compounds (e.g., ammonium sulfate) are generally not emitted directly into the air but are formed through various chemical reactions in the atmosphere; thus, sulfate is considered a secondary pollutant. All sulfur emitted by airport-related sources included in this analysis was assumed to be released and to remain in the atmosphere as SO_2. No sulfate inventories or concentrations were estimated for the criteria air pollutant analysis because the relative abundance of sulfates from fuel combustion is much lower than that of SO_2, and because very little sulfur is emitted from Project sources. However, the trace amounts of sulfates identified in jet fuel are assessed in Section 4.1.2, *Human Health Risk*."

While *some* sulfate is certainly formed through chemical reactions in the atmosphere (and is therefore "secondary"), it is not categorically the case that *all* sulfate is a secondary pollutant. Therefore, the first sentence in the quotation above should be removed, and sulfate should not be categorically excluded from the PM inventory. The precise definition of "secondary" sulfate is an active topic of discussion; however, inventories of primary pollutants for ground-level combustion sources typically assume that at a minimum a small percentage of the fuel sulfur (2% or so) is converted to primary sulfate rather than being entirely converted to SO_2. The DEIR does not provide evidence to support its assumption that sulfate compounds from aircraft would not contribute to PM 10 emissions or describe specifically how the PM emissions inventory was adjusted to remove sulfates. It should do so.

[26] Petzold et al., "Evaluation of Methods for Measuring Particulate Matter Emissions from Gas Turbines", *Environ. Sci. Technol.* 2011, **45**, 3562–3568, dx.doi.org/10.1021/es103969v. This work was conducted with a jet fuel sulfur content of 300 ppmw = 0.030% (w/w).

[27] Zhenhong Yu, Michael T. Timko, Scott C. Herndon, Richard, C. Miake-Lye, Andreas J. Beyersdorf, Luke D. Ziemba, Edward L. Winstead, Bruce E. Anderson, "Mode-specific, semi-volatile chemical composition of particulate matter emissions from a commercial gas turbine aircraft engine," *Atmospheric Environment*, Volume 218, 2019, 116974, ISSN 1352-2310, https://doi.org/10.1016/j.atmosenv.2019.116974.

[28] This was for JP-8 fuel (satisfying Jet A fuel specifications) with a sulfur content of 1148 ppmw (0.11% w/w).

6. Overall, the DEIR should clearly identify key details associated with the emissions calculations. It may be preferable to show a single sample calculation for the various calculation steps.

TODD M. TAMURA, QEP

SUMMARY OF EXPERTISE

Professional air pollution/GHG consultant for 27 years and a Planning Commissioner for Sonoma County. Diversified experience base that includes the preparation of CEQA/ NEPA analyses/documentation, General and Transportation Conformity analyses, and permitting and compliance assurance for industrial facilities.

EDUCATION

Massachusetts Institute of Technology, MS Technology and Policy, 1993
UCLA, MS Chemistry, 1990
Harvey Mudd College, BS Chemistry, 1988 (Distinction & Departmental Honors)

EMPLOYMENT HISTORY

2005 – present: Founder and President, Tamura Environmental, Inc. (Petaluma, CA)
2016 – present: Planning Commissioner, Sonoma County (CA)
2005 – 2015: Supervising Seller-Doer (part-time), Tetra Tech, Inc. (Boston, MA)
2002 – 2005: Project Manager/Senior Scientist, Sonoma Technology, Inc. (Petaluma, CA)
1993 – 2002: Partner and Senior Project Mgr. (final position), Tech Environmental, Inc. (Waltham, MA)

OTHER PROFESSIONAL ACTIVITIES

Air & Waste Management Association: Vice Chair, Editorial Advisory Committee, *EM* magazine, 2004-2007; Golden West (Northern California) Section Executive Board, 2005-2006; New England Section Executive Board, 1996-2002; member, 1993-present
Peer reviewer for *Atmospheric Environment*, *Journal of the Air & Waste Management Association*, the Transportation Research Board of the National Academies (Air Quality Committee), and US EPA (innovative research grant proposals for monitoring technologies)
Transportation Research Board of the National Academies, Transportation and Air Quality Committee (ADC20) Peer Reviewer/Affiliate Member, 2003-2016
CARB-accredited GHG inventory Lead Verifier (and Refineries Specialist), 2009-2018
IPEP-certified Qualified Environmental Professional (QEP), 1999-present
API Committee on Evaporative Loss Estimation (CELE) member, 2018-present
ASTM Committee member (D02 on Petroleum Products, Liquid Fuels, and Lubricants and D03 on Gaseous Fuels)
Forensic Expert Witness Association, Associate Member, 2011-2014

19 4th Street, Ste 200, Petaluma, CA 94952 ~ Tel: 707.773.3737 ~ Fax: 888.874.2788

EXAMPLES OF PROJECT EXPERIENCE

Mobile Sources. Completed several projects involving on-road mobile source emissions and dispersion modeling at individual roadways; multiple policy-relevant projects completed for the Federal Highway Administration (FHWA), including a review of mobile source air toxics issues. Principal air consultant for multiple proposed marine liquefied natural gas (LNG) projects (including Northeast Gateway) and marine construction projects for offshore wind turbines (including Block Island Wind Farm and the Virginia Offshore Wind Technology Assessment Project that served as a precursor to the Coastal Virginia Offshore Wind project). Work included both EIR/EIS work and permit application documents. Recently completed an emissions screening analysis as part of a CEQA initial study for a proposed Bay Area commercial port project; developed a technical framework for evaluating PM deposition near airports; extensive work with permit applications for aeroderivative turbines for electric power production.

Regulatory Agencies/Metropolitan Planning Organizations. Prepared a two-day air toxics emissions inventory training course for US EPA Region 9 and presented to state and local agency personnel within the Region's jurisdiction. Reviewed the EIS for the Jordan Cove marine LNG terminal as a contractor to the Federal Energy Regulatory Commission (FERC). Evaluated control technology options (availability, cost, and impacts) for the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD), Rhode Island Department of Environmental Management, Mid-Ohio Regional Planning Commission (MORPC), and Mid-America Regional Council (MARC, Kansas City); developed emissions inventory methods documents for SJVUAPCD (including one for composting). Led a fast-track project to prepare a SIP Conformity Plan for Minneapolis-St. Paul for the Minnesota Pollution Control Agency.

Communities. Worked on behalf of a citizen's group (Save The Air in Nevada County) and their counsel (Shute, Mihaly & Weinberger) to evaluate an EIR for a proposed gold mining operation in a California location with a small air district. Recommended permit conditions for monitoring operations of a modified wastewater treatment plant and presented analysis results to a citizens group on behalf of the Town of North Andover (MA) Board of Health and its counsel (Ken Kimmell); assisted the Town with reviewing air pollution controls, monitoring data, and test data for a municipal solid waste incinerator located there. Prepared CEQA IS/MND studies of air quality/GHG for small water/wastewater infrastructure/maintenance projects for a variety of municipalities. Currently serving as a volunteer member of the Richmond – San Pablo AB617 Technical Advisory Group.

State-Of-The Science Evaluations. Lead author of the reports "Transportation and Particulate Matter: Assessment of Recent Literature and Ongoing Research"—which was the basis of FHWA's Strategic Plan for Particulate Matter Research—and the CEC PIER report "Air Quality Research Roadmap for Alternative Fuels", each of which involved communication with numerous experts with different backgrounds. Author of the report "Gap Analysis for Particulate Matter Emission Factors for Gas-Fired Combustion Sources and Large Compression-Ignition Engines", which reviews details regarding the science and QA of PM emissions measurement as well as the development of emission factors.

Electric power generation. Prepared numerous feasibility studies, permit applications, compliance notebooks, due diligence evaluations (for mergers & acquisitions), and GHG verifications for electric utility and independent power producer (IPP) clients; completed a competitive evaluation of utilities with regard to Phase II Acid Rain Program requirements. Prepared the air/GHG portion of the EIS for the proposed 720-mile, 600 kV Plains & Eastern Clean Line Transmission Project high voltage direct current (HVDC) transmission line designed to have the capacity to transmit 3,500 MW of wind power.

Western States Petroleum Association (WSPA) Bay Area Committee / Bay Area Refineries. Principal air consultant to the committee since 2014. Participated in nearly all technical meetings between the District, WSPA, and the five Bay Area refineries—including but not limited to those involving technical details regarding the ongoing joint research regarding leak emissions from components in heavy liquid service, emissions inventories, and rule implementation—and led several of these. Served as a technical resource and communications resource, explaining the refineries' issues to the District and the District's perspective to the refineries. Assisted air staff at multiple individual refineries with various technical details, including those regarding emissions inventories (including explanatory documentation) and source test planning and review.

Monitoring and Testing. Planned, specified, coordinated, and/or supervised source testing at dozens of facilities; reviewed/critiqued over 100 stack test reports and associated analytical laboratory work. Extensive communications with stack testing experts and analytical laboratories regarding the details of sampling and analytical work. Multiple evaluations of continuous monitoring technologies. Served on five US EPA peer review panels for environmental monitoring technologies (innovative research grant proposals).

Retail gasoline dispensing facilities. Principal air consultant to two industry trade organizations with regard to these facilities since 2002, and currently working for a third. Completed two research studies, served as principal reviewer of research by CARB and other parties, attended many meetings between WSPA and CARB's Monitoring and Laboratory Division, and presented technical issues regarding Enhanced Vapor Recovery (EVR) in a meeting with the CARB Executive Officer (Catherine Witherspoon) and WSPA President.

Air Emissions from Waste Reuse/Conversion. Surveyed air emissions for municipal wastewater sludge-to-fertilizer facilities across the United States and conducted an extensive 5-year evaluation of air pollution control equipment (through source testing) for one such facility owned by the Massachusetts Water Resources Authority. Critically evaluated multiple solid waste conversion technologies with regard to energy balances and associated air emissions. Conducted due diligence work for the acquisition of municipal wastewater sludge incinerators.