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February 17, 2005

Mr. David B. Kessler, AICP
U.S. Department of Transportation
Federal Aviation Administration
P.O. Box 92007
Los Angeles, California 90009-2007

Dear Mr. Kessler,

Summary

This constitutes a review of the air quality portions of the January 2005 Final Environmental Impact Statement (FEIS) for the LAX Proposed Master Plan Improvements and the included Final General Conformity Demonstration (FCD). It is important to note that the FEIS carries forward all of the previous air quality analyses performed for the proposed master plan improvements with little or no modifications. As a result, all of the comments provided in the June 4, 2004 comment letter in response to the release of the Final Environmental Impact Report (FEIR) for the same proposed improvements, as well as previous comment letters on earlier draft EIS/EIR releases, continue to apply. Given that specific air quality comments have been submitted on several occasions, this letter is structured to highlight those elements that are most fundamental to illustrating the continuing inadequacy of the FEIS air quality analysis and, as a result, the inability of that analysis to support the determinations required under both the National Environmental Policy Act (NEPA) and Clean Air Act Conformity provisions.

The major reason for this approach is that, while there are deficiencies of varying importance throughout the FEIS air quality analysis, there is but *one* fundamental *assumption* that allows the FEIS to conclude that emissions and air quality under the proposed alternative (Alternative D) are similar to baseline (i.e., No Action/No Plan) emissions and air quality. As such, the integrity of this single assumption is critical to the integrity of the associated air quality analysis. If the underlying assumption is reasonable, the basis for the analysis is sound and analysis components can be considered on the merits of the implemented methodologies and calculations. However, if the underlying assumption is itself fundamentally flawed, then debating the merits of the implemented methodologies and calculations is a distraction from the primacy of the flawed assumption. In effect, combining comments on a single overarching flaw with methodological comments allows one to lose sight of the forest for the trees. Such distraction continues to corrupt the conclusions of the FEIS, and the associated conformity determination.

Methodological Approach

The preferred alternative of the FEIS (Alt. D) continues to be very similar in terms of airport activity to the NA/NP alternative. While the propriety of this similarity is discussed in detail in the body of this letter, the implications of the assumed similarity are significant in regard to air quality impacts since airport-related air quality is primarily a function of the overall level of activity. To the extent that the comments presented in this letter affect the analyses conducted for all of the master plan alternatives, the resultant impact on the NA/NP alternative and Alt. D can be expected to be similar. Where comments affect solely the analysis for Alternative D (or the NA/NP alternative), the relative relationship between the business as usual and build alternative may change. For obvious reasons, these latter comments are most important in judging the efficacy of the build alternative. The former comments, which might affect both the build and no action alternatives similarly, are primarily important in properly assessing the overall onsite and near-site air quality under either of the alternative futures.

The FEIS has been reviewed from a "top down" perspective. Essentially, this means that the presented material has been evaluated in terms of stated methodologies and, to the extent possible from presented materials, assessed in terms of whether those methodologies are reasonable and have been implemented as stated and appropriate. When possible, the consistency of analysis results has been considered against expectations derived from either previous experience or theoretical relationships. In a few instances, confirmatory analyses have been conducted to evaluate assertions presented in the FEIS. These analyses are best characterized as providing modestly detailed comparative calculations intended to evaluate issues where presented FEIS data appears either inconsistent or unexpected. Except when indicated by such data anomalies, efforts to replicate the various air quality analyses have not been performed. It is entirely possible (and likely in a document the size of the FEIS) that minor errors, that are not identified, are present in the various air quality analyses and results. To the extent that such errors would produce "major" shifts in analysis results, they should be inherently identified through various identified issues discussed in the body of the letter. However, minor discrepancies that produce relatively small errors in analysis results, may pass through a review at the associated level-of-detail without detection. As always, a more detailed review is possible, including a complete replication of the underlying modeling and associated analysis work, but such a review would require an allocation of resources well beyond those associated with this work.

It is important to note that the FEIS is not less comprehensive than most previous examples of similar documents. Nevertheless, there remain several areas of deficiency that could impact FEIS conclusions. Despite the underlying analysis, it is somewhat disconcerting that areas of deficiency are actually acknowledged in the FEIS, but subsequently dismissed through unsubstantiated claims of insignificance. Moreover, the responses to comments included as an integral component of both the FEIR and FEIS demonstrate a tendency to downplay any significant critiques brought to the attention of the project authority, so that the public comment process appears to be treated more as more of a challenge to defend than an opportunity to refine. Notwithstanding this situation, the discussion presented in the body of this letter presents continuing concerns with the air quality analysis portion of the FEIS.

<u>The Flawed Assumption</u>: ***Airport Demand Under Alternative D will be Virtually Identical to That Under the No Action/No Plan Alternative***

Although there are other lesser assumptions that impact the air quality analysis of the FEIS, the assumption that airport demand is essentially unchanged between the preferred alternative and the no action alternative (78.9 million annual passengers (MAP) versus 78.7 MAP in 2015, a difference of only 0.2 percent) overwhelmingly defines the air quality relationship between the two alternatives. Because demand is assumed to be similar, emissions from aircraft, aircraft support equipment, and ground access vehicles are also similar. The subsequent implementation of mitigation measures, which by definition cannot influence the no action plan, then serve to differentiate the two alternatives by reducing emissions only for the preferred alternative. The only exception occurs during the interim years between 2005 and 2015, when construction activity under the preferred alternative results in temporary emissions increases. With the exception of the construction emissions, the mitigated preferred alternative, *as defined*, must have lower emissions a priori.

Before examining this issue, it is perhaps important to note that this is not a new comment. The issue has been raised in all previous comment letters as well as by other commenters throughout the EIR/EIS process. This discussion simply isolates and expands the issue due to its overwhelming influence on air quality analysis conclusions and, by extension, FEIS conclusions in general.

If the LAX Master Plan is not adopted as proposed, then it is estimated that LAX will handle approximately 78.7 MAP in 2015 under the NA/NP. According to the FEIS, operations would be "very inefficient and congested, and the quality of passenger/visitor service at LAX would be poor."

By comparison, unconstrained demand in 2015 is estimated to be 97.9 MAP (according to the FEIS). The additional demand is not satisfied under the no action alternative because it is assumed that anticipated airfield and terminal conditions result in an economic equilibrium between air travel supply and air travel demand at 78.7 MAP. In effect, it is simply claimed to be more efficient economically for additional demand (i.e., demand above 78.7 MAP) to be satisfied through other airports, other travel modes, or travel forbearance, *i.e.*, market conditions will act as a travel demand constraint at LAX.

However, the travel demand constraints estimated for alternative D are not defined in the FEIS on the basis of economic forecasting, but rather on the basis of a design "bottleneck" intended to limit travel demand to a level below that which economic conditions would dictate. Table 1 illustrates that alternative D offers essentially the same airfield capacity enhancements as alternative C, as well as similar terminal and ground vehicle capacity – yet is predicted to satisfy only the same demand levels as the no action alternative which offers *none* of these service benefits. Clearly, market forces would dictate that additional travel demand would be expected for alternative D relative to the no action alternative, since both passengers and aircraft can more efficiently access the airport. To overcome these market forces, alternative D intentionally

Table 1. Comparison of LAX Design Parameters

Design Parameter	NA/NP	Alt. C	Alt. D
Number of Runways	4	4	4
Runway 1 Length (ft)	8,925	9,400	10,420
Runway 2 Length (ft)	10,285	12,000	11,700
Runway 3 Length (ft)	12,091	12,091	12,091
Runway 4 Length (ft)	11,096	11,096	11,096
Total Runway Length(ft)	42,387	44,587	45,307
Terminal Capacity (sq ft)	4 million	7 million	6.5 million
Parking Spaces	35,600	41,400	39,000
Number of Gates	163	168	153
NBE Gates	203	223	179

purports to introduce a "bottleneck" into the terminal system that separates the increased airfield capacity from the increased terminal and ground access capacity. By limiting the number of gates available to connect the enhanced airside and groundside facilities, alternative D purports to control travel demand to levels virtually identical to those of the no action alternative.

How realistic of a throughput constraint is this design "bottleneck?" The answer depends entirely on how efficiently airlines can utilize these gates and how much potential for efficiency improvement or load shifting exists. In effect, gate capacity does not serve as a constraint to getting either aircraft or passengers to the airport. While runway configuration and capacity can effectively constrain the arrival and departure of aircraft, and terminal and ground access capacity can effectively constraint passenger arrival and convenience, gate capacity does neither. This is especially important under the preferred alternative since capacity on both sides of the gate is being increased. Terminal and ground access enhancements are encouraging more groundside demand, while runway and airfield improvements are encouraging more airside demand. The ability of gate limitations to serve as a countervailing force is questionable and demands a detailed analysis before it can be accepted as a reasonable and effective demand constraint. We have not been able to find any such analysis in the FEIS.

Given a situation where additional passenger demand exists and can easily be served through the additional capacity provided by improved airside facilities, airlines have only to increase gate efficiency from current levels to increase airport activity beyond that estimated in the FEIS. Since current airlines differ dramatically in their ability to utilize gates efficiently, there is dramatic potential for improvement. It is highly unlikely that airlines will forsake the increased capacity being offered through the alternative D improvements by maintaining gate efficiency at levels typical of current operations. Moreover, the FEIS itself appears to recognize this when it follows the description of the alternative D gate constraints with the qualifying statements:

> *"However, it is important to understand that the levels of passengers that each alternative is designed to accommodate are not finite limits where the airport would somehow be closed or where aircraft would be redirected to some other facility when this number is reached. These levels are an indication of the number of passengers that can be accommodated at a reasonable level of service. The airport can accommodate additional aircraft and passengers beyond these levels; however, the result is a degraded level of service." [FEIS, Page 3-57]*

Since there is capacity "pressure" on both sides of the terminal gate, it is unrealistic to expect gate efficiency to remain constant with the implementation of alternative D. While gate availability may well serve as a capacity constraint at the point where no additional efficiency improvements are possible, that point is well beyond current gate utilization characteristics. Thus, the assumed constancy of annual airport passenger service at about 79 MAP under both the no action alternative, for which gate capacity is not an important constraint, and alternative D, for which gate capacity is the *only* important constraint, cannot be viewed as a realistic assessment of likely airport activity under the two alternatives.

To provide an indication of the potential impacts of the unrealistic assumption of airport activity, this report contains an emissions inventory estimate for a version of alternative D that is more consistent with the estimates produced for the other airport build alternatives (Revised Alternative D). This estimation treats both airside and groundside airport demand in accordance with the capacity enhancements actually proposed under alternative D. On the airside, alternative D proposes airport enhancements that are functionally equivalent to or in excess of those of alternative C (see for example, the runway parameters presented in Table 1 above, or the more detailed design descriptions of the FEIS). Therefore, if the assumed gate restrictions to not constrain airport activity as presumed in the FEIS, airside improvements can be expected to adequately support the same aircraft activity as estimated for alternative C in the FEIS. Similarly, proposed alternative D includes both terminal area and ground vehicle accommodations equivalent to those of alternative C. While the two alternatives differ in the configuration of their proposed groundside enhancements, they both are designed to accommodate and provide similar levels of service. As a result, it is reasonable to expect that a version of alternative D unconstrained by a presumed gate-based "bottleneck" will function similarly to alternative C in terms of aircraft activity, supporting an estimated 89.6 MAP.

Under an assumption of 89.6 MAP, aircraft, APU, and GSE emissions under this revised version of alternative D will also be similar to the emissions from those same sources as predicted for alternative C. Ground access vehicle emissions cannot be taken directly from alternative C as the ground services configurations of the two alternatives are significantly different. However, it is reasonable to assume that at least off-airport ground access emissions and parking related emissions for alternative D will scale proportionally with annual activity up to a point where congestion affects cause disproportionate impacts. Should congestion affects cause significant impacts between 78.9 MAP and 89.6 MAP, the emissions estimates calculated via an assumption of proportionality will be too low – so implementing an assumption of proportionality is actually conservative and ground access emissions may be higher. Nevertheless, based on the information available in the FEIS, an assumption of proportionality is appropriate if additional uncertainty is to be avoided.

Therefore, under Revised Alternative D, aircraft, APU, and GSE emissions are assumed to be similar to those of alternative C.[1] Off-airport ground access vehicle and parking related emissions are scaled upwards by 13.6 percent, the ratio of 89.6 MAP to 78.9 MAP. Even though there is more activity on the airport, it is assumed that on-airport vehicle and stationary source emissions are identical to those estimated in the FEIS for alternative D. Similarly, alternative D construction emissions are unchanged as the airside work is similar to that proposed under alternative C and the groundside work will not change (i.e., the people mover concept is continued, but under an assumption of higher annual activity). Table 2 presents the resulting emission inventory estimates under the heading "Hybrid C/D."[2]

As indicated in Table 2 and Figures 1 though 6, *mitigated* emissions under the revised alternative emissions D shift from a state of being 4-18 percent *less* than emissions under the NA/NP (depending on the specific emissions species considered) to a state where they are as much as 8 percent *more* than emissions under the NA/NP. Only emissions of VOC continue to be lower than emissions under the NA/NP – emissions of CO, NO_x, SO_x, and PM-10 are all higher than those of the NA/NP. As illustrated in Figures 7 and 8, *mitigated* emissions under revised alternative D are equal to or higher than those of mitigated alternative C for on-airport sources and only 1-12 percent lower than mitigated alternative C for all sources (as compared to 12-22 percent lower as alternative D is analyzed in the FEIS). Thus, the sensitivity of emissions and air quality impacts to aircraft activity levels (and the presumed gate constraints) is obvious. Note also, that while the tables and figures presented below only illustrate emissions relationships in 2015, the same relations would carry through to influence interim year emission estimates and air quality.

While it is more problematic to extrapolate estimates of air quality concentrations as presented concentrations in the FEIR/FEIS to revised alternative D since such impacts depend on both the magnitude and location of emission releases, some observations are possible. First, as presented in the FEIS, alternative C emissions lead to interim year exceedances of the NAAQS for NO_2 and PM-10. Moreover, these exceedances are over 150 percent of the NAAQS. Therefore, since on-airport emissions under Revised Alternative D are higher than those of alternative C and total emissions are only modestly lower, it is almost certain that revised alternative D would also demonstrate exceedances of these same NAAQS. Alternative C also demonstrates interim year CO concentrations that are within about 5 percent of the NAAQS, so it is likely that revised alternative D, with higher on-airport emissions, could also exceed the CO NAAQS during

[1] It should be noted that for this analysis, aircraft VOC emissions for alternative C differ from those presented in the FEIS and associated documents by approximately 9 percent since the FEIR/FEIS failed to convert EDMS HC estimates to VOC. The FEIS did implement this conversion for both the NA/NP and alternative D, but HC estimates for alternatives A, B, and C were not converted before the analytical focus of the FEIR/FEIS shifted to alternative D. To convert the emission estimates for this analysis, the average of the conversion factors used in the FEIS for the NA/NP (9.09 percent) and alternative D (9.03 percent) was utilized.

[2] This alternative is also referred to as the "Revised Alt. D" alternative in the charts and narrative that follow.

Table 2. LAX Emission Estimates for 2015 (tons per year)

Source Type	Species	NA/NP	Unmitigated Alt. C	Mitigated Alt. C	Unmitigated Alt. D	Mitigated Alt. D	Unmitigated Hybrid C/D	Mitigated Hybrid C/D
Aircraft	VOC	1,222	1,364	1,364	1,165	1,165	1,364	1,364
	CO	6,617	7,670	7,670	6,285	6,285	7,670	7,670
	NOx	4,850	5,535	5,535	4,865	4,865	5,535	5,535
	SOx	421	481	481	409	409	481	481
	PM-10	63	72	72	59	59	72	72
APU	VOC	9	10	10	9	9	10	10
	CO	198	212	212	189	189	212	212
	NOx	103	103	103	102	102	103	103
	SOx	18	0	0	18	18	0	0
	PM-10	0	0	0	0	0	0	0
GSE	VOC	40	49	0	30	0	49	0
	CO	1,114	1,567	0	2,053	0	1,567	0
	NOx	331	265	0	334	0	265	0
	SOx	1	1	0	1	0	1	0
	PM-10	12	2	0	4	0	2	0
On-Airport Roadways	VOC	138	116	101	120	118	120	118
	CO	1,242	1,288	1,101	1,140	1,128	1,140	1,128
	NOx	181	159	138	220	217	220	217
	SOx	1	3	2	1	1	1	1
	PM-10	44	49	45	50	51	50	51
Parking Lots	VOC	53	85	78	138	130	156	148
	CO	159	341	306	593	544	673	618
	NOx	44	17	16	73	70	83	79
	SOx	0	0	0	1	1	1	1
	PM-10	9	1	1	28	28	32	32
Stationary Sources	VOC	51	96	96	51	51	51	51
	CO	120	124	124	120	120	120	120
	NOx	220	207	207	220	220	220	220
	SOx	7	6	6	7	7	7	7
	PM-10	39	41	41	39	39	39	39
Total On-Airport	**VOC**	**1,513**	**1,718**	**1,648**	**1,511**	**1,472**	**1,750**	**1,690**
	CO	**9,451**	**11,201**	**9,412**	**10,380**	**8,266**	**11,382**	**9,748**
	NOx	**5,729**	**6,287**	**5,999**	**5,814**	**5,474**	**6,426**	**6,155**
	SOx	**449**	**490**	**489**	**437**	**436**	**490**	**489**
	PM-10	**167**	**165**	**158**	**180**	**177**	**195**	**194**
Off-Airport	VOC	1,606	1,326	1,270	1,152	1,091	1,308	1,239
	CO	15,188	17,401	16,336	14,342	13,166	16,287	14,952
	NOx	2,368	2,824	2,741	2,198	2,102	2,496	2,387
	SOx	27	32	30	26	24	30	27
	PM-10	1,780	2,213	2,060	1,817	1,658	2,063	1,883
Construction	VOC	0	43	40	0	0	0	0
	CO	0	330	320	0	0	0	0
	NOx	0	576	449	0	0	0	0
	SOx	0	2	2	0	0	0	0
	PM-10	0	181	124	0	0	0	0
Grand Total	**VOC**	**3,119**	**3,087**	**2,958**	**2,663**	**2,563**	**3,058**	**2,929**
	CO	**24,639**	**28,932**	**26,068**	**24,722**	**21,432**	**27,669**	**24,699**
	NOx	**8,097**	**9,687**	**9,189**	**8,012**	**7,576**	**8,922**	**8,542**
	SOx	**476**	**524**	**521**	**463**	**460**	**519**	**516**
	PM-10	**1,947**	**2,559**	**2,342**	**1,997**	**1,835**	**2,259**	**2,077**

Note: Aircraft VOC emissions for Alt. C differ from those presented in the FEIR/FEIS by approximately 9 percent as the FEIR/FEIS failed to convert HC to VOC. This conversion was done in the FEIR/FEIS for both the NA/NP and Alt. D.

Figure 1. On-Airport Emissions in 2015 (tons per year)

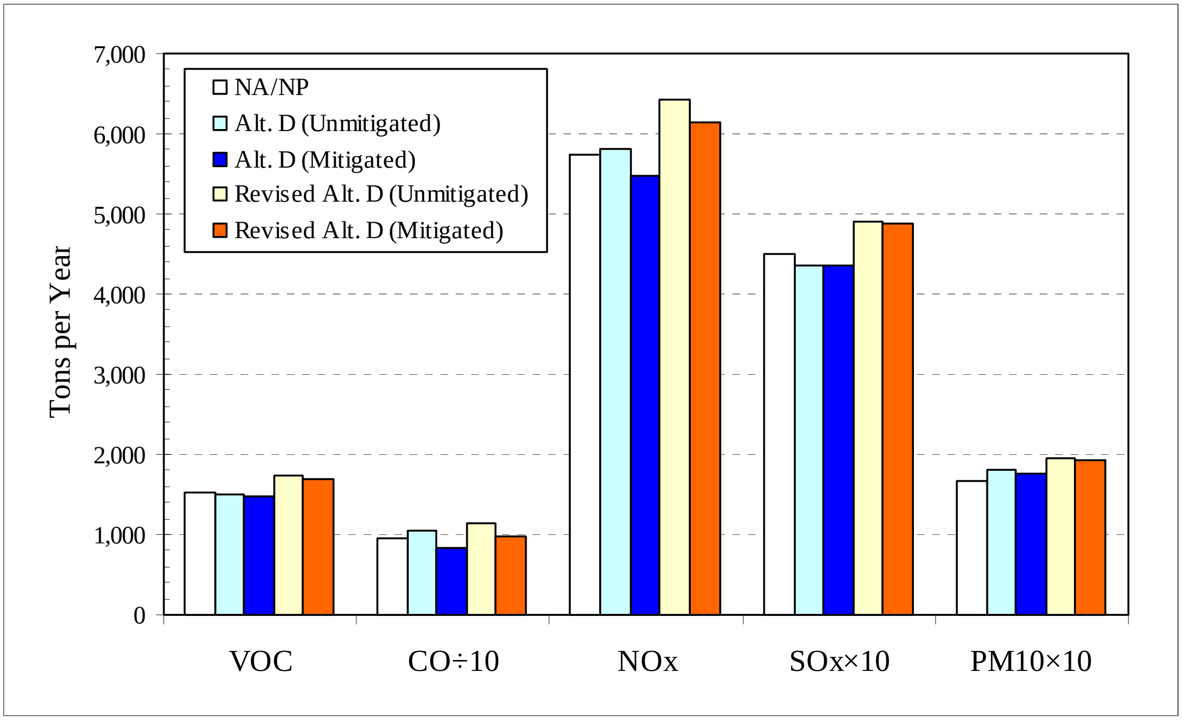


Figure 2. Total Emissions in 2015 (tons per year)

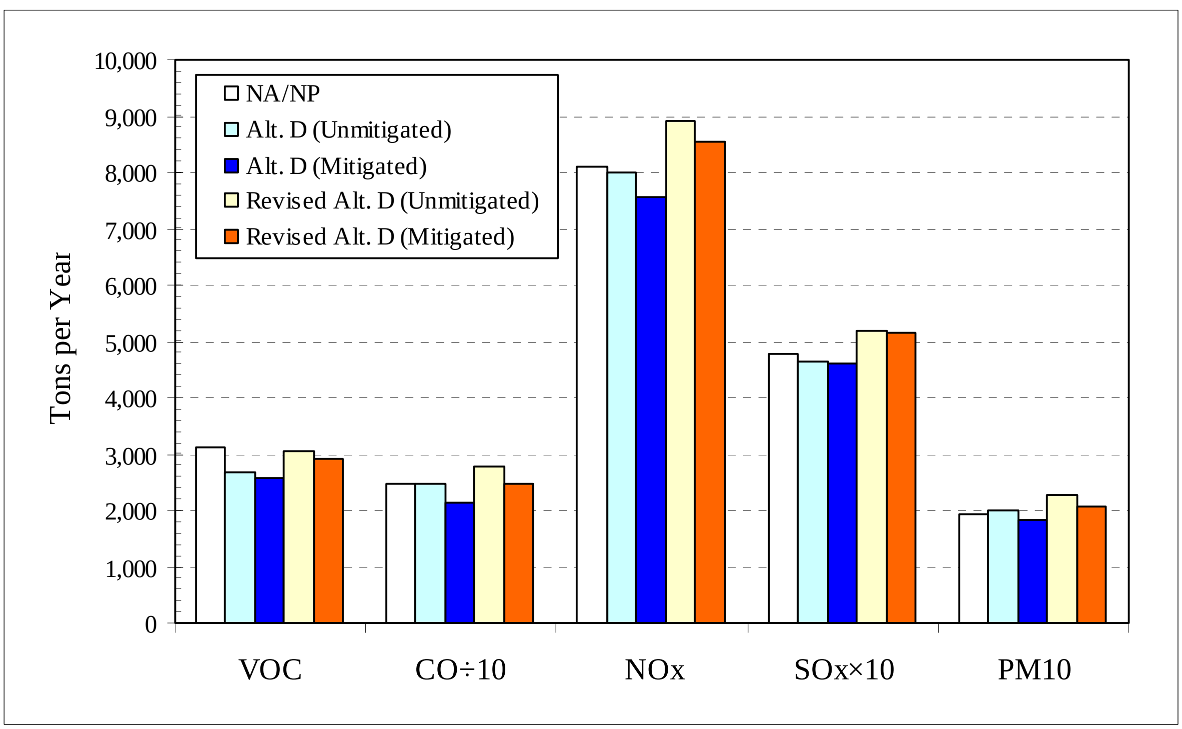


Figure 3. On-Airport Emissions in 2015 Relative to the NA/NP

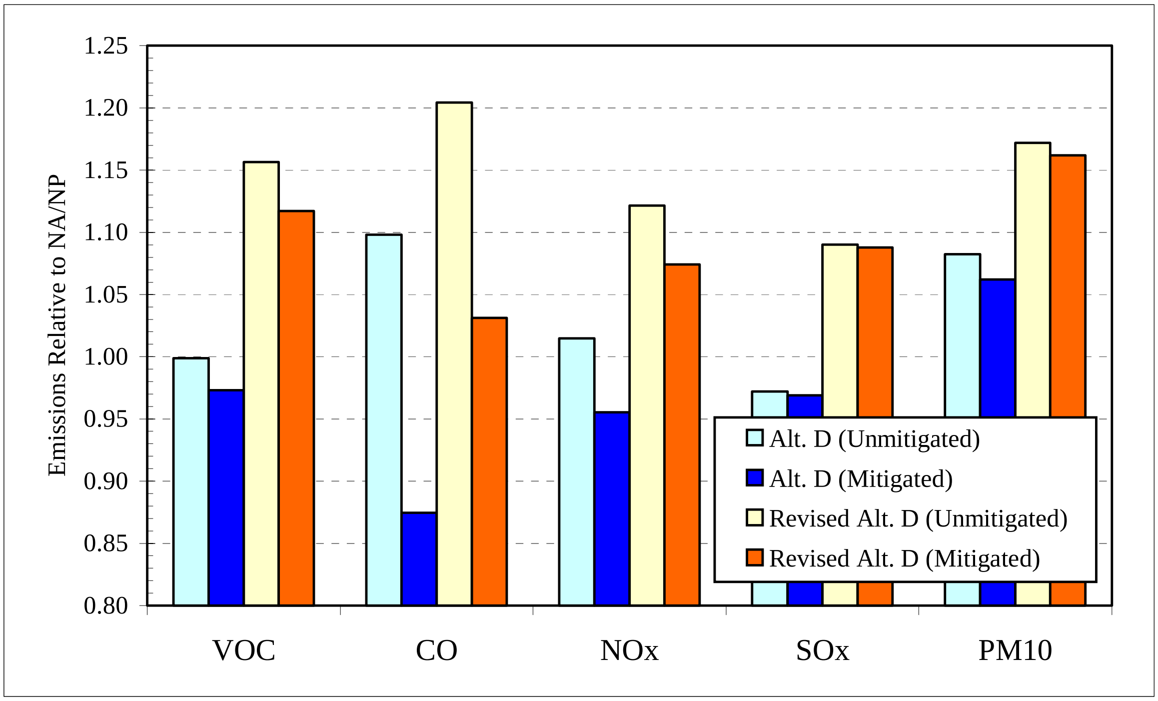


Figure 4. Total Emissions in 2015 Relative to the NA/NP

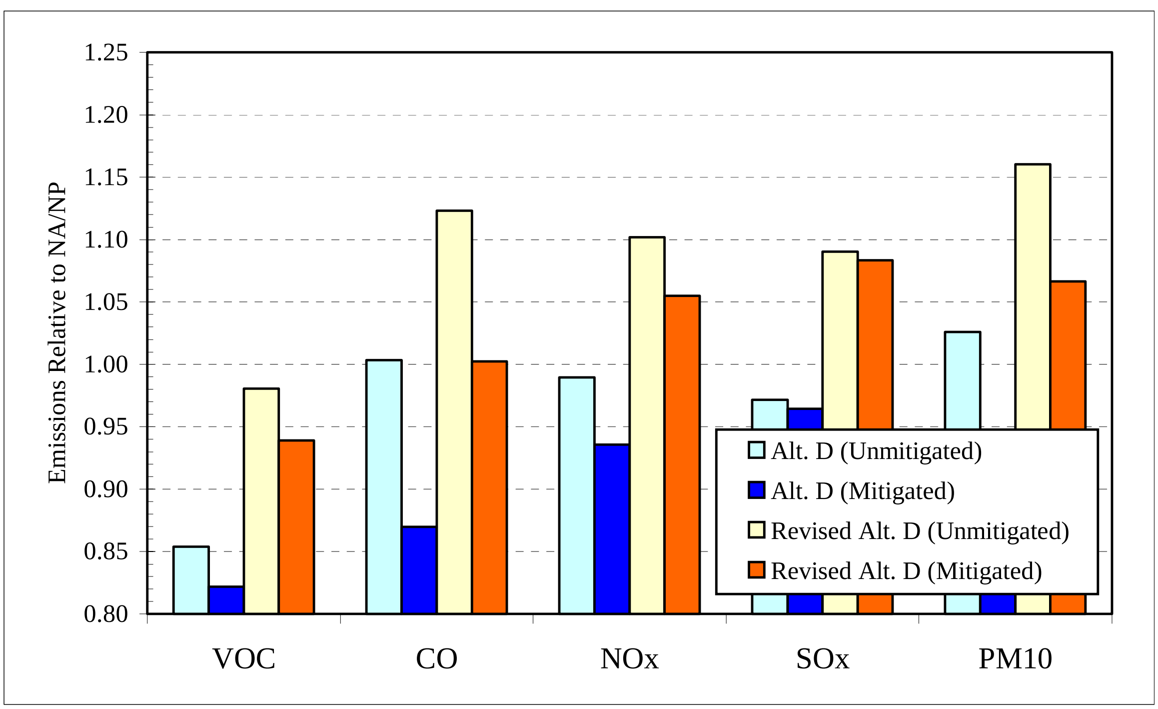


Figure 5. On-Airport Mitigated Emissions in 2015 Relative to the NA/NP

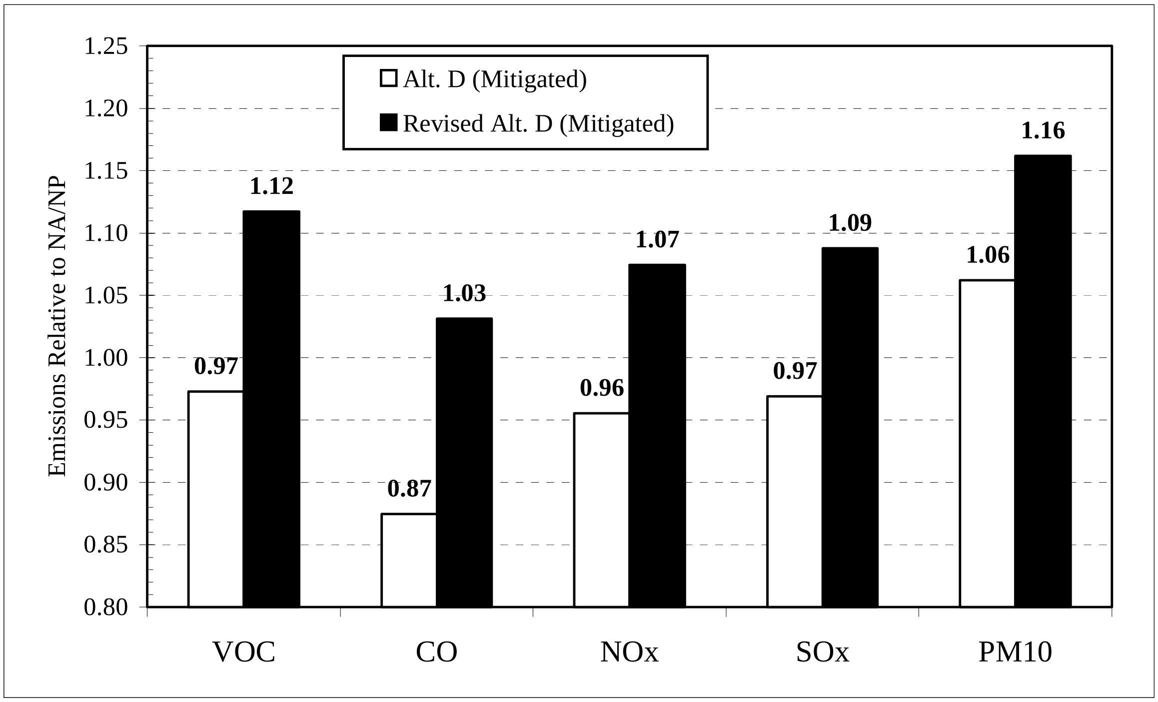


Figure 6. Total Mitigated Emissions in 2015 Relative to the NA/NP

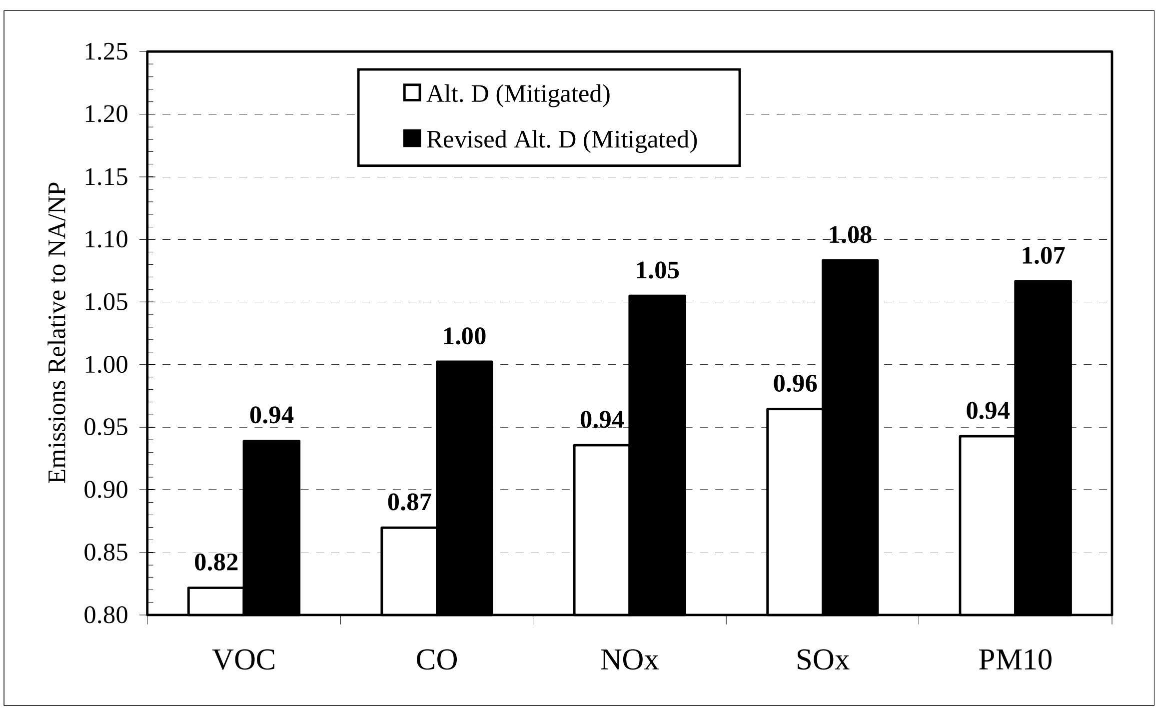


Figure 7. On-Airport Mitigated Emissions in 2015 Relative to Alt. C

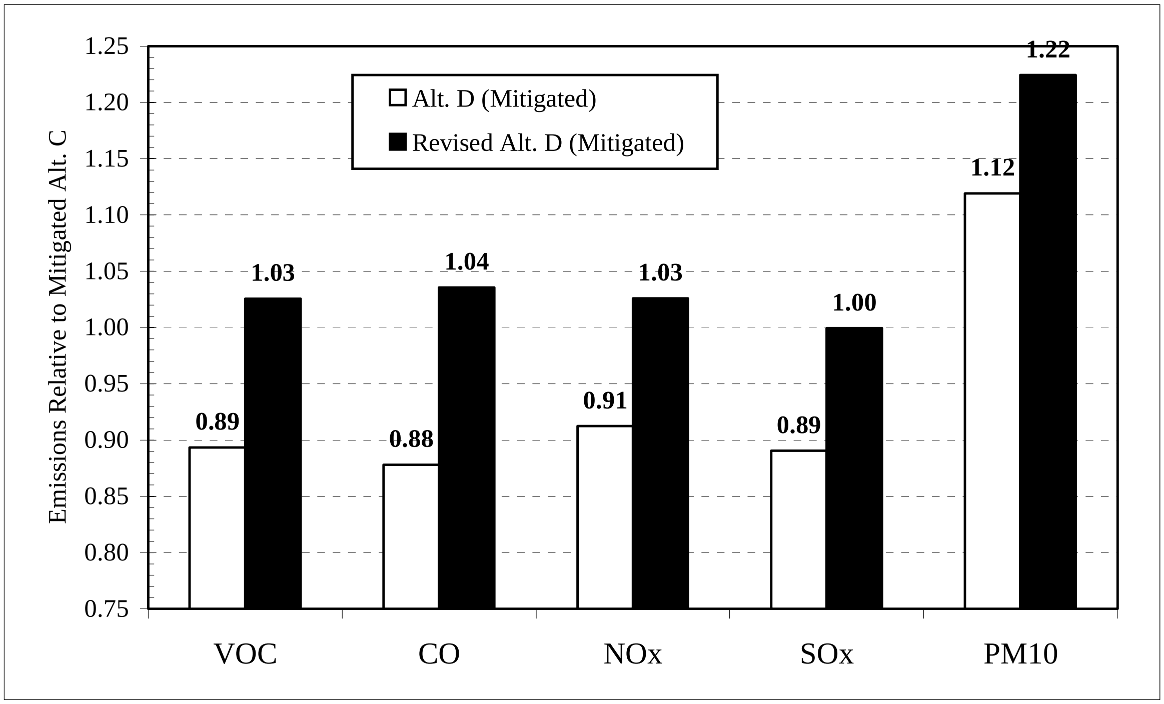
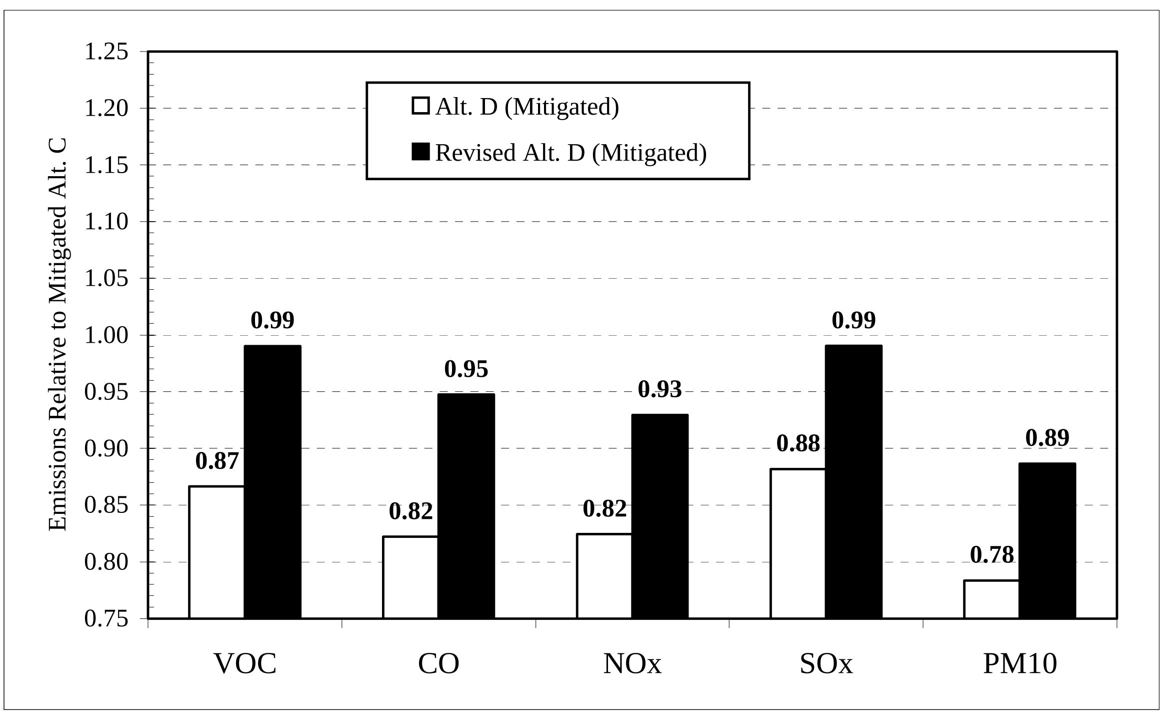


Figure 8. Total Mitigated Emissions in 2015 Relative to Alt. C



interim years. Upon buildout in 2015, the FEIS shows that alternative C meets the NAAQS for all emission species, but is within about 5 percent of the NAAQS for NO_2. Thus, revised alternative D, with higher on-airport emissions than alternative C could result in exceedances of the NO_2 NAAQS.[3] Finally, alternative C, alternative D, and revised alternative D all continue to violate the CAAQS for PM-10, but these violations are considerably more substantial for alternative C and revised alternative D.

Clearly, the reliability of the assumed design constraints is *the* key factor in determining the significance of the FEIS-estimated air quality impacts. For alternatives A, B, and C, runway capacity is the design constraint. The NA/NP is constrained by landside access limitations. Thus, all four of these alternatives are constrained either by the ability of aircraft or passengers to access the airport. Conversely, alternative D is constrained by neither of these market forces. Instead, alternative D actually increases the ability of both airlines and passengers to access the airport, but places a structural design constraint between supply and demand. Such a constraint can only function as designed if it represents a true barrier that cannot be compromised through operational changes. There is no such assurance in the FEIS. Moreover, natural market forces provide the pressure required to “breach” the constraint. Air carriers will recognize the unsatisfied passenger demand available under alternative D and attempt to improve operational efficiency to tap the market. If efficiency improvements can be made for the given number of aircraft gates and gate configurations, pent-up demand is available to reward that improvement. In effect, there is a design incentive to improve efficiency (and increase emissions) under alternative D that does not exist under the NA/NP.

While neither LAWA nor the FAA has the authority to physically limit the number of aircraft or passengers that access LAX, they do have the authority *and the requirement* to develop mitigation measures to offset emissions and air quality impacts. Therefore, given the FEIS reliance on an untested and singular “bottleneck” to restrict emissions and air quality impacts to levels required under state and federal rules, it is only reasonable to support that reliance with assurances that those thresholds will not be breached. Anything less is tantamount to rewarding the underestimation of airport activity, an underestimation that is more critical to the potential approval of alternative D than any mitigation measure currently proposed. One method to accomplish this safeguard would be through the imposition of contingency mitigation measures that would take effect automatically and immediately at any point when actual activity levels exceed the assumptions used to justify implementation of the alternative. While this approach would still not satisfy the obligation to utilize reasonable planning assumptions, it would at least place the airport authority and neighboring communities in equivalent risk positions, whereas alternative D as currently designed places all associated risk on the communities alone. Without question, the reliability of future airport activity estimates is *the* key to assessing the propriety of the FEIS and the FEIS does nothing to support the efficacy of the assumed gate constraints for alternative D.

[3] Note that all of these assessments do not consider the potential emissions and air quality impacts of the other estimation issues raised in this letter. To the extent that those issues increase emissions and air quality concentrations, they will carry over to further exacerbate the potential implications discussed in this section that result solely from the underestimation of airport activity.

Finally, it is important to note that the California Air Resources Board has also questioned the derivation of the airport activity constraints for alternative D (see issue #3 in a March 3, 2003 letter to the FAA that is included as Attachment A-1D to the FCD) and specifically requested that FAA provide an explanation of what steps would be taken to ensure that the assumed levels of activity were not exceeded. The record does not reveal what, if any, actions the FAA took in response to this inquiry.

Additional Issues in FEIS

While the overall sensitivity of FEIS and FCD conclusions to airport activity estimates renders the accuracy of those estimates of primary importance in assessing FEIS and FCD conclusions, there continue to be a number of other issues that influence the emissions and air quality impacts of either or both of the NA/NP alternative and alternative D. A discussion of each of these issues follows.

8-Hour Ozone and PM-2.5 NAAQS: Portions of the Los Angeles area that include LAX were classified as federal nonattainment areas for the 8-hour ozone NAAQS on April 30, 2004 (69FR23857, effective June 15, 2004) and PM-2.5 NAAQS on January 5, 2005 (70FR00943, effective April 5, 2005). While there are currently no official State Implementation Plans for either 8-hour ozone or PM-2.5 in the Los Angeles area (the state has three years from designation to develop an attainment SIP), the U.S. Environmental Protection Agency (EPA) has already amended federal transportation conformity requirements to include provisions for both 8-hour ozone and PM-2.5 (published July 1, 2004, 69FR40004, effective August 2, 2004). Under the revised transportation conformity requirements, EPA provides a one year grace period (as required under the federal Clean Air Act for newly designated nonattainment areas) for affected areas to incorporate 8-hour ozone and PM-2.5 into their conformity demonstrations. No similar revisions have yet been implemented for federal general conformity requirements, which are the specific requirements that govern the LAX conformity determination, but such revisions are undoubtedly forthcoming.

Therefore, while it is clear that no specific regulatory requirements yet exist for the inclusion of 8-hour ozone and PM-2.5 in the LAX Master Plan amendment process, such requirements will be in place for future plan amendments and it would be appropriate, albeit not mandatory, for the project authority and the FAA to consider the impacts of the proposed improvements on these pollutants. In fact, in a letter dated March 3, 2003, the California Air Resources Board recommended just such consideration (see issue #16 in a March 3, 2003 letter to the FAA that is included as Attachment A-1D to the FCD). The FEIS is very clear in stating that the demonstration of compliance with PM-10 standards is being viewed as a surrogate for demonstrating compliance with PM-2.5 standards (FEIS page 4-656) and indicates that the South Coast Air Quality Management District (SCAQMD) has confirmed their agreement with this approach. However, one cannot conclude that PM-10 impacts are equivalent or proportional to PM-2.5 impacts. This is due to the fact that virtually 100 percent of combustion related particulate is PM-2.5. Therefore, while the numerical stringency of PM-2.5 standards is increased relative to PM-10, associated emissions do not decrease proportionally.

Ambient PM-2.5 concentrations due to combustion sources (i.e., aircraft, vehicles, etc.) will be similar in magnitude to combustion related PM-10. In 2015, the FEIS is showing, for alternative D, a 24-hour PM-10 concentration of 65 $\mu g/m^3$ (micrograms per meter cubed) against a PM-10 NAAQS of 150 $\mu g/m^3$, and an annual average PM-10 concentration of 35 $\mu g/m^3$ against a PM-10 NAAQS of 50 $\mu g/m^3$. For PM-2.5, the corresponding NAAQS are 65 $\mu g/m^3$ (24-hour) and 15 $\mu g/m^3$ (annual), so it is very possible that the airport would have difficulty demonstrating compliance with the PM-2.5 standard. While there is insufficient data in the FEIS to make a similar assessment for 8-hour ozone, it likely that the focus on VOC and NO_x emissions as surrogates for assessing ozone impacts would result in little, if any, change in ozone-related analysis.

Issues Common to FEIS and Prior Environmental Documents

Significant Uncertainty Remains in Estimated Future Background Concentrations*:* As was the case with previous EIR/EIS documents, the FEIS continues to rely on large assumed reductions in ambient background concentrations between 2000 and 2015 to minimize predicted air quality concentration impacts relative to the federal and state AAQS. In effect, emissions in the airport environs are being allowed to increase within the constraints of applicable AAQS through emissions decreases *expected* to occur offsite as reflected in reduced ambient baseline concentrations. While there is nothing inherently wrong with such reliance *providing offsite emission reductions can be reasonably expected to affect background concentrations in the manner presumed*, it is not possible to adequately determine this likelihood from either the discussion or data included in the FEIS, or its predecessor documents.

The importance of this cannot be overstated. Regardless of the accuracy (and precision) of onsite emission estimates and associated air quality modeling, the overall air quality impact of those estimates depends equally on the accuracy of the future background concentrations. If background concentrations are underestimated, air quality impacts will be equally underestimated. In effect, the reliability of the air quality analysis conducted for the FEIS depends *equally* on the accuracy of the *very detailed* onsite emissions and air quality analysis and the *very "generic"* background emissions and air quality analysis. Support demonstrating the reliability of the latter continues to be lacking.

The emissions rollback method employed in both the FEIR and FEIS is a generally recognized method for estimating future background concentrations. However, the applicability of the general method to conditions at LAX must be adequately investigated and validated to provide sufficient assurance of reliability. This investigation and assurance are deficient in the FEIR/FEIS. Without undertaking the appropriate demonstration analysis for the project authority, it is only possible to delineate the type of questions that it would be appropriate to investigate and resolve. Without technically sound answers to these and other questions that might arise during the course of the analysis, it is impossible to place a high degree of certainty in the future background concentration estimates and, by extension, estimated future ambient concentrations.

For example, can concentrations around LAX be expected to decline proportionally with total emission reductions in the South Coast Air Basin? This is precisely the assumption made in the FEIR/FEIS. While this is a generally utilized assumption for estimating future concentrations, there are features associated with LAX that render the unadjusted application of this method questionable. Foremost is the fact that LAX lies within a coastal environment that limits emission reductions to the west. Since a significant portion of air movement occurs in both easterly and westerly directions, it might well be expected that regional emission reductions will have a larger impact during easterly wind conditions (since the bulk of regional emission reductions will occur to the east of LAX). How westerly wind background concentrations are affected is unclear.

The FEIR implies that the maximum background concentrations occur during periods of easterly winds and this is supported by data presented in Table 2 of Attachment Y of the Air Quality Technical Report (Technical Report 4). This lends support to the premise that the regional emissions rollback methodology might be appropriate. However, Table 2 also shows that the short term (i.e., one hour) maximum background concentrations for NO_2 and SO_2 are similar during periods of westerly wind. The maximum NO_2 concentration is 0.14 ppm during westerly winds, versus 0.15 ppm during easterly winds. Similarly, the maximum SO_2 concentration is 0.018 ppm during westerly winds, versus 0.021 ppm during easterly winds. In short, the westerly wind background for these two pollutants is 85-95 percent of the easterly wind background. Unless background conditions reflect a well mixed composite of regional emissions, and this is increasingly unlikely as one moves away from the centroid of regional emissions, it seems unlikely that background concentrations will respond proportionally to regional emission reductions during periods of both easterly and westerly winds. This uncertainty reaches a peak at regional border sites such as LAX.

An analogous situation exists for PM-10, where the maximum background concentration was measured during a 24 hour period in which winds were predominately from the west (15 of 24 hours according to Attachment Y of the Air Quality Technical Report (Technical Report 4) of the FEIR/FEIS). It is not clear that such a concentration be expected, as was assumed in the FEIR/FEIS, to decline proportionally with PM-10 concentrations in central Los Angeles. Perhaps under well mixed conditions, but an appropriate demonstration needs to be made for a coastal area such as LAX.

Data required for the appropriate demonstrations should exist. The SCAQMD monitor used to estimate longer term background concentrations (the monitor designated as station 094, Southwest Coastal LA County by SCAQMD) should be capable of serving as a long term indicator of the proportionality of response between measured concentrations and regional emission reductions *during periods of varying wind direction*. If this response is truly regional in nature and independent of wind direction (even in the coastal environment associated with LAX), then changes in wind direction-specific concentrations over time will reflect the same degree of proportionality with emission reductions. If not, an appropriate adjustment to the assumed background concentration estimation methodology is required.[4]

Of additional concern is the differential treatment afforded PM-10 in both the FEIR and FEIS. Whereas all other pollutant backgrounds are set in accordance with the ratio of emissions inventory estimates for 2015 to base year emissions inventory estimates, the PM-10 background is set according to the ratio of modeled 2015 to base year PM-10 concentrations in central Los Angeles. The only explanation for this differential treatment in the FEIR/FEIS is the single assertion that "this method allows for the inclusion of secondary PM-10 formation." Without further support, it is difficult to assess the propriety of this approach. It is clear, however, that SCAQMD PM-10 emissions inventories reflect an approximate 11 percent *increase* between 1997 and 2015, while FEIR/FEIS background concentrations indicate an approximate 48 percent *decrease* during this same period (24-hour background concentrations of 82 $\mu g/m^3$ in 1996 versus 43 $\mu g/m^3$ in 2015). Secondary PM cannot account for this level of difference. As potential support, the expected changes in secondary PM precursor emissions, currently lacking in the FEIR/FEIS, should be provided along with additional supporting material as an integral component of the FEIS. Moreover, given the fact that continuing exceedances of the 24-hour PM-10 AAQS represent the major AAQS issue associated with the estimated FEIR/FEIS ambient concentrations in 2015, it is most appropriate to ensure proper characterization of the background PM-10 concentration since any underestimate will further exacerbate AAQS compliance.

The overall sensitivity of the air quality analyses to the background concentration reduction is perhaps best recognized by examining forecasted 2015 pollutant concentrations. Despite an assumed 50 percent reduction in the background concentration of NO_2 between 1996 and 2015, onsite NO_2 concentrations are forecasted to increase. Similarly, while the background 24-hour concentration of PM-10 is assumed to decrease by almost 50 percent between 1996 and 2015, overall onsite PM-10 declines by only about 20 percent. Clearly, these reduced background concentrations are allowing significant emissions growth to occur from onsite sources and, as a result, the integrity of the demonstrated AAQS compliance status hinges on the proper demonstration of background concentration propriety, a demonstration that has not been performed to date.

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[4] At the risk of introducing a concern that might detract from the wider issue being discussed, it is also worth noting that the SO_2 one-hour data published by SCAQMD for station 094 differs by an order of magnitude from that published in the FEIR/FEIS. For 2000, the FEIR/FEIS indicates a one-hour background SO_2 concentration of 0.017 ppm, while data published by SCAQMD indicates 0.17 ppm. The 0.017 ppm concentration must be inaccurate since it is actually lower than the FEIR/FEIS 24-hour concentration of 0.020 ppm, which is a physical impossibility. In fact, the lowest annual one-hour maximum SO_2 concentration published by SCAQMD for station 094 between 1994 and 2002 is 0.03 ppm. Data in Attachment Y of the Air Quality Technical Report (Technical Report 4) of the FEIR/FEIS supports the reported maximum one-hour onsite monitoring station concentration of 0.021 ppm, but it is not clear why this is so much lower than similar data measured at station 094 (although the measured annual maximum for station 094 during the period the onsite monitoring station was in operation was 0.03 ppm, the lowest measured annual maximum during the 1994-2001 period).

In summary, substantial reductions in estimated ambient baseline concentrations continue to reflect a major mechanism by which the FEIS demonstrates compliance with AAQS. As a result, it is imperative that a sufficient level of effort be devoted to the justification of the estimated values. The environmental documents devote literally hundreds, if not thousands, of pages of support to the onsite emissions inventory and dispersion modeling assumptions, but comparatively little in analytical support for the assumed background concentration reductions. The FEIR/FEIS does include a robust set of monitoring data for the onsite air quality monitor that was operated in 1997 through early 1998, but additional analysis supporting the propriety of the emissions rollback procedure and the central Los Angeles PM-10 modeling estimates to the situation at LAX is entirely lacking. Without such support, it is simply not possible to rely on the presented future ambient concentrations.

<u>Reverse Thrust Emissions from Aircraft are Not Considered</u>: The air quality analysis continues to be deficient because it does not address reverse thrust emissions from aircraft. At various times, LAWA has declared that: (1) emission factors and regulatory guidance for considering reverse thrust operations are not available, (2) emissions from reverse thrust are insignificant, (3) because runway length at LAX is sufficient, reverse thrust operations should be minimal, and (4) the methodology used to estimate the times-in-mode for approach, taxi, takeoff, and climbout modes is sufficiently conservative to inherently account for any reverse thrust emissions. To this list, the FEIS adds the argument that because aircraft are assumed to carry their maximum allowable weight on takeoff, reverse thrust emissions are inherently considered.

Each of the arguments offered in support of the omission of reverse thrust emissions is inadequate, and in many cases is pure speculation. The FEIS offers no compelling evidence that reverse thrust emissions are inherently considered. Times-in-mode have been specifically tailored to reflect expected operational conditions at LAX, exclusive of reverse thrust operations. The argument that runway length is sufficient to minimize reverse thrust operations is equally spurious. Aircraft routinely (at LAX and elsewhere) utilize reverse thrust to minimize stopping distance and access the first safe runway turnoff. This both minimizes aircraft time on an active runway and reduces brake maintenance costs. Some airports and airlines restrict reverse thrust operations on longer runways, but there is no evidence that this is the case at LAX. Independent studies in the late 1990s showed reverse thrust operations to be common at LAX.[5]

Although the FEIS is correct in stating that there is no official guidance or emission factors for addressing reverse thrust emissions, common practice has existing since at least the mid 1990s. Takeoff or climbout emission factors are generally recognized to be consistent with those of reverse thrust operations as all three are high thrust modes. In fact, the most common practice is simply to add reverse thrust time to takeoff time and allow the EDMS to estimate combined takeoff and reverse thrust emissions simultaneously. This is not a novel approach and can easily be incorporated into the FEIS analysis. In short, the argument that guidance methods do not exist is irrelevant. What is important is that air quality estimates be as accurate as data allows, and there is sufficient data to estimate emissions from reverse thrust operations.

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[5] See, for example, <u>Analysis of Techniques to Reduce Air Emissions at Airports</u>, Energy and Environmental Analysis, September 1997.

Although the time-in-mode for reverse thrust is small, generally on the order of 15-20 seconds, such high thrust operational modes produce very high NO_x per unit time relative to other operating modes. Based on the data presented in the FEIR/FEIS, a reverse thrust mode time of 15 seconds would increase the overall aircraft NO_x inventory by about 10 percent.

Ground Support Equipment (GSE) Populations*:* The population and activity of aircraft ground support equipment (GSE) at LAX can be estimated with a high degree of certainty by simply surveying current airport operators. Despite this, the FEIS continues to rely on the FAA's EDMS model to estimate these parameters. This would be acceptable if there was some demonstration that the estimates produced by EDMS were consistent with actual population and activity statistics, but no such demonstration is provided. In their response to previous comments, LAWA states that either approach is acceptable under FAA guidelines and also claims, without providing supporting evidence, that the approach employed is "believed" to produce a conservative estimate. It is exactly such support that the verification from suggested comparison to ground counts is intended to provide.

The "acceptability" of the suggested ground count method versus that employed in the FEIS is not the critical issue. The accurate depiction of LAX GSE operations (and emissions) is the issue of importance and that can easily be demonstrated by providing a comparison of actual GSE populations and activity to those assumed in the EDMS modeling. The fact that the FAA has added the option of quantifying GSE emissions through such an airport "census" approach is clear evidence that the agency also supports the maximum possible use of local data. Only through a ground truth validation of the EDMS assumptions can the air quality impacts of LAX GSE be accepted with confidence.

Use of Electric GSE to Fully Mitigate GSE Emission by 2015: The primary emissions mitigation measure employed under alternative D is the conversion of 100 percent of airport GSE to electric (or very low emission) power by 2015. While this is a laudable goal and should be pursued with vigor, the likelihood that it will be accomplished in the suggested timeframe is minimal at best. In 2002, the California Air Resources Board entered into a Memorandum of Understanding (MOU) with various participating airlines to reduce emissions of GSE in the South Coast Air Basin. Under this MOU, airlines have agreed to meet specified fleet average emissions levels by 2010 as well as introduce zero emission GSE into the existing GSE fleet to attain an aggregate fleet penetration rate of 30 percent by that same year. Those goals also demonstrate that a level of zero (or near zero) GSE emissions are unlikely to be attained by 2015. In seven years between 2003 and 2010, the MOU will result in the conversion of approximately 30 percent of the GSE fleet to zero emission status. The alternative D mitigation measure will require the conversion of the remaining 70 percent of equipment to zero emission status in five years. The likelihood of success on that time schedule is obviously very small. It is therefore important that the FEIS indicate specific alternative (and quantifiable) mitigation measures that will be implemented in the event that the GSE conversion measure does not proceed as planned.

It is also important to note that the GSE electrification program could be carried out to the benefit of LAX patrons and neighbors regardless of the fate of alternative D, or any other build alternative. If, as stated in the FEIR/FEIS, "LAWA continues its commitment to air quality improvement programs for activities over which it has direct control," then this program should be implemented and carried through to completion under any of the LAX alternatives, including the no action alternative. There is simply no activity upon which the electrification of GSE is dependent that is tied to any of the build actions. This measure cannot, therefore, be said to be a specific mitigation measure for Alternative D.

Incorrect Aircraft PM Emission Factors are Used in Air Quality Analyses*:* The FEIS continues to rely on the incorrect application of its cited methodology for estimating aircraft PM-10. The emission factors employed in the FEIS consider only the non-volatile carbon portion of emitted particulate. The reference documents for the cited PM estimation method are presented in Attachment H of the Air Quality Technical Report, Technical Report 4 of the FEIR/FEIS. The first document included in that Attachment is a June 1999 report entitled "Aircraft Engine Particulate Matter Data." On page 3-1 of that report, it is clearly stated that "The particulate emission indices plotted are directly emitted soot (non-volatile) mass, and do not consider secondary particulate formation." Yet, it is these emission indices that were used to estimate aircraft PM. It is important to note that it is not only secondary particulate that is omitted from the emission indices (as implied by the quoted report statement), but directly emitted volatile and non-carbonaceous PM mass as well. Attachment A of the June 1999 report is a March 1999 report entitled "Estimate of Particle Emission Indices as a Function of Particle Size for the LTO Cycle for Commercial Jet Engines." This is the University of Missouri report cited as a main PM reference by the FEIR/FEIS. As stated on page A-5 of the report, "Table 4 provides "first of a kind" estimates of number and mass-based EI's [emission indices] for the LTO cycle of four popular engines currently in use in the commercial fleets. The EI's are provided for both non-volatile (soot) particulates and for the total particulates for both high and low fuel sulfur contents." Cited Table 4 thus provides the means to convert non-volatile PM to total PM. It is this conversion that is lacking in the FEIS.

The data presented in Table 4 show the total PM to non-volatile PM ratio to be about 2.6 for low sulfur (about 70 ppmW) jet fuel and 14.7 for high sulfur (about 675 ppmW) jet fuel. EPA data demonstrates that U.S. jet fuel averages about 600 ppmW sulfur. As a result, the appropriate adjustment factor for the FEIS PM estimates would be about 13.2, unless specific data for operations at LAX indicate a different average fuel sulfur content. In the absence of such data, I estimate that aircraft PM emissions are underestimated by approximately a factor of 13.

Additional uncertainty arises through the assumed density of carbonaceous soot particles. This uncertainty is also discussed on page A-5 of the University of Missouri report. For the FEIS emission factors, a value of 1 gram per cubic centimeter (g/cc) was assumed, which is within the range of generally accepted values of 1-2 g/cc. However, given this range, actual PM emission rates could be twice as high as estimated in the FEIR/FEIS, and this uncertainty is in addition to the factor of 13 underestimation noted above - so that PM emissions could be underestimated by as much as a factor of 26.

Attachment 9 to the FEIS Air Quality Appendix F-B shows aircraft emissions to constitute about 2 of the estimated 65 $\mu g/m^3$ 24-hour average PM-10 concentration for mitigated alternative D, along with similar estimates for the no action alternative. If aircraft PM is, in fact, underestimated by a factor of 13-26, then both aircraft-related and total ambient PM concentrations will go up accordingly. If we assume proportionality between emissions and ambient concentrations, overall PM-10 concentrations might be expected to increase by 24-50 $\mu g/m^3$, bringing total estimated PM-10 to 89-115 $\mu g/m^3$. This would clearly exacerbate the already demonstrated noncompliance with the PM-10 CAAQS and increase the potential for violations of the PM-10 NAAQS. Given that even these levels assume the virtual elimination of GSE PM through the electrification mitigation measure, it is clear that any backsliding from full implementation of the GSE electrification program may have significant implications for AAQS compliance.

Gate-Based Power and Air Continues to be Assumed for All Aircraft*:* The assumption that 100 percent of air carrier gate power and conditioned air needs will be satisfied by gate-based electrically powered systems (as opposed to fossil fuel powered auxiliary power units (APU) or GSE) is optimistic and, therefore, results in an underestimation of APU and/or GSE emissions. Experience at airports with fixed gate-based power and air systems, including LAX, has demonstrated that even when gate-based equipment is available, not all airlines or aircraft will utilize it consistently. The most realistic emissions estimate for APU would be based on the current usage rate of existing gate-based power and air systems at LAX. The rate is either already known or can easily be determined through a modest random survey of gate activity. An assumption of 100 percent usage certainly provides an indication of the ideal level of APU emissions, but the AAQS compliance demonstration should be based on the most likely, not the ideal, emissions level.

APU Emission Factors for PM are Not Considered: The FEIS continues to assume that PM emission factors for all APU are zero. The impact of this omission continues to be buffered by that fact that APU usage at LAX is assumed to be limited due to an assumption of 100 percent usage of gate-based power and conditioned air, but even under these ideal assumption, APU are assumed to operate for 15 minutes per LTO cycle. In response to previous comments on this issue, LAWA has stated that the operational information required to estimate APU PM emission rates is not available and concludes that “any calculation of PM10 from APUs would be a gross speculation at best, and not representative of acceptable scientific or engineering methods or ethics.”

While there is insufficient information to estimate APU PM emission rates using the approach employed in the FEIR/FEIS for aircraft PM, that does not mean that all methods are similarly restricted. Comments on both the DEIR and SEIR set forth a method that relies on regression analysis to relate aircraft PM to the inverse of NO_x emissions was described. This approach results in relationship coefficients significant at the 99 percent confidence level and since APU are essentially small jet engines, can be applied without sacrificing either engineering methods or ethics, to both main aircraft engines and APU. This method and the developed coefficients have already been described in detail in previous comments on the DEIR/SEIR. Suffice it to say that the assumption of zero APU PM is both clearly an assumption and clearly incorrect. Engineering ethics dictate the development of the best possible estimate given available data and simply deferring to a “best case” emission estimate of zero is clearly not the most appropriate engineering method or ethical approach to estimating the AAQS impacts of airport operations. For what it is worth, the regression approach cited above estimates APU PM emission rates that average about 5 grams per kilogram of fuel consumed.

Default Aircraft Engine Assignments Continue to be Utilized in Lieu of More Appropriate LAX-Specific Engine Assignments*:* Aircraft emissions in the FEIS continue to be based entirely on the default engine assignments of the FAA EDMS model, as opposed to engine assignments tailored to operations at LAX. While this approach does not affect the relative emissions relationships between alternatives, it can have a significant impact on the absolute level of aircraft emissions and, therefore, on associated AAQS compliance demonstrations. In response to previous comments on this issue, LAWA claims that the use of the EDMS default engine assignments represents the most statistically probable aircraft/engine combinations in use at LAX. LAWA also cited the difficulty of engine identification for a particular aircraft and the lack of evidence that the LAX air carrier mix is inconsistent with EDMS default assumptions. All three assertions are incorrect.

The EDMS default engine reflects the "most popular" engine for an airframe based on *total* airframe sales. This includes all air carriers operating that airframe, regardless of the location of those operations. If*, and only if*, the distribution of air carrier-specific operations at LAX is similar to that for the national aircraft fleet as a whole, will the probability of encountering a particular aircraft/engine combination be similar to the EDMS default assignments. Such a comparison can be made to justify the use of the EDMS defaults, but there is no evidence presented in the FEIS that such an exercise has been undertaken. In the absence of the comparative analysis, it is statistically most likely that LAX (or any other airport) will exhibit variation about the mean EDMS distribution. It is the magnitude of this variation that will affect airport emission estimates.

The FEIR/FEIS claims that aircraft/engine tracking is difficult, and that is true. However, there are several aircraft census databases that track airframe ownership by air carrier and identify the associated characteristics of those airframes, including equipped engines. The use of such a database allows the uncertainty of the EDMS "most popular" *overall* engine to be refined to the level of individual air carriers. Since operations at the air carrier level of detail are known at individual airports, including LAX, this allows for a substantially increased level of certainty in determining the probability of encountering a particular aircraft/engine combination at a given airport. In short, the EDMS distribution reflects the probability across all airports, while an air carrier-specific distribution allows for distributions to be tailored to a specific airport in accordance with the relative frequency of carrier-specific operations at that airport. Only in the limited case where local airport operations are statistically similar to aggregate operations across all airports will the two distributions coincide.

An example can perhaps best illustrate the sensitivity of emissions estimates to the proper allocation of aircraft engines. While the following presented statistics are a few years old (perhaps three) and were originally generated for another project, their illustrative value is unaffected. According to the FEIR/FEIS, the Boeing 757-200 will account for nearly 18 percent (65,532 of 371,577) of LAX operations under alternative D in 2015 (from Attachment E of the

S-4 Supplemental Air Quality Technical Report of the SEIR). The B757-200 is available with either Pratt & Whitney or Rolls-Royce engines. Table 3 illustrates the relative population of in-use B757-200 engines for U.S. air carriers. As indicated, the EDMS default engine, the Pratt & Whitney PW2037 is, in fact, the most prevalent engine, accounting for about 46 percent of B757-200 engines.

Table 3. B757-200 Emissions Sensitivity to Engine Selection

Aircraft Engine	Engine Fraction	Pounds per LTO (1)			Change from EDMS Default		
		CO	HC	NO_x	CO	HC	NO_x
PW2037 (EDMS Default)	46.0%	24.68	2.08	35.80	default	default	default
PW2040	10.9%	23.01	1.88	44.04	-6.8%	-9.6%	+23.0%
RB211-535C	0.2%	26.59	2.44	40.90	+7.7%	+17.3%	+14.2%
RB211-535E4	15.4%	17.81	0.49	51.65	-27.8%	-76.4%	+44.3%
RB211-535E4B	27.6%	25.63	0.24	39.36	+3.8%	-88.5%	+9.9%
Weighted Average	100.1%	23.71	1.31	40.13	-3.9%	-37.2%	+12.1%

(1) For this comparison, the standard EPA times-in-mode are used to define the LTO cycle.

At this point, we can make the first observation about using EDMS defaults, namely that even ignoring airport-to-airport differences, the EDMS default does not imply that the majority of aircraft possess a given engine. As illustrated, on average, more B757-200's will utilize an engine other than the PW2037. Statistically, 46 out of 100 will use the PW2037, while the remaining 54 will not. So, the probability of a B757-200 utilizing a PW2037 for operations at LAX is actually less than 50/50 on the basis of national statistics.

A statistically reliable method of addressing this situation (on a national population basis) is to use a weighted average engine. This can be accomplished either by introducing a new "composite" engine into EDMS or disaggregating the total number of B757-200 operations into multiple (properly weighted) components, each associated with a different engine. Either approach accomplishes the same goal of better tailoring aircraft emission estimates to expectations. As indicated by the differences in the emission rates included in the table above for the various engine options as well as a weighted national average engine, the effects of tailoring aircraft engine assignments can be significant, with variations for individual pollutants ranging from about -90 percent to +45 percent for this aircraft. Variations for other aircraft can be greater or lesser depending on available engine characteristics. This is why proper engine assignment, rather than simple reliance on EDMS defaults, is critical.

Despite the magnitude of the potential emissions differences, it is critical that it be understood that the data reflected in Table 3 above does *not* yet reflect any airport-specific population data, but instead is based on national average data. Table 4 shows how the B757-200 engine populations break out by major U.S. air carrier. It is this data that is critical in tailoring an airport assessment to local conditions.

While the FEIR/FEIS is correct in that local tracking of aircraft engines is limited at best, "census-type" databases tracking aircraft sales do exist and can be accessed to develop carrier-specific tables such as that shown in Table 4 for the B757-200. While this does not allow the specific engine associated with each operation at an airport to be determined, it does allow

Table 4. B757-200 Engine Distribution by Major U.S. Carriers

Air Carrier	B757-200 Engines			
	PW2037	PW2040	RB211-535E4	RB211-535E4B
America West			13	
American Airlines				102
Continental				38
Delta Air Lines	100	6		
Northwest	48			
United Airlines	49	49		
US Airways			34	
Aggregate U.S. Majors	197	55	47	140

for the development of more reliable statistics at the airport level-of-detail than does the use of EDMS default engine assignments. Using these data, air carrier-specific engine assignments can be identified and individual airport "default" engine assignments can be developed by weighting the air carrier specific engine data by the fraction of aircraft operations accounted for by that carrier. Clearly, when America West, American, Continental, and US Airways B757-200's utilize LAX, they do not do so with a PW2037 engine. The bottom line is that it is not only possible to develop a tailored airport-specific emissions analysis using readily available data, but such tailoring should be an integral component of any airport emissions analysis.

Note also that the above statistics as well as the EDMS defaults represent data for domestic air carriers only. To the extent that LAX is encouraging international flights, the exercise summarized above will need to consider both domestic and international air carriers. Although the B757-200 is not a long range aircraft, it can illustrate the necessity of considering foreign aircraft configurations when one recognizes that on a worldwide basis, the Rolls-Royce RB211 engines, not the Pratt & Whitney engines, are the dominant engine for the B757-200.

It is Still Not Clear that Heavy Trucks are Properly Considered in On-Airport Fleet Mixes: From data presented in the FEIR/FEIS, it appears that on-airport vehicle emission estimates continue to exclude heavy duty truck traffic. Such an assumption is not consistent with the fact that Federal Express and other cargo carriers operate substantial fleets of heavy duty vehicles. In response to previous comments on this issue, LAWA has claimed that diesel truck emissions are included in both the on-airport and off-airport traffic emission estimates. However, LAWA has provided no additional evidence for this assertion in the FEIR/FEIS and continues to cite data tables presented in the SEIR as evidence of the emissions inclusion. After another review of Attachment J of the S-4 Supplemental Air Quality Technical Report from the SEIR, there is still no evidence of heavy truck inclusion in the on-airport traffic estimates. Table J3, which indicates the year 2000 fleet composition, does include passenger cars, light duty trucks, medium duty trucks, heavy duty trucks, and buses. However, both Tables J4 (fleet mix in 2013) and J5 (fleet mix in 2015) indicate zero VMT fractions for light-heavy, medium-heavy, and heavy-heavy trucks on all on-airport road links, *even those for which heavy duty truck traffic is assumed in 2000*. VMT on all of the cargo facility links is indicated as being comprised of 60.4 percent *gasoline* light duty trucks, 39.4 percent *gasoline* medium duty trucks, and 0.2 percent diesel *light* duty trucks. Since these data are not indicated to have changed in the FEIS, it appears that on-airport heavy truck emissions are not considered.

The Determination of Conformity

The FDC concludes that NO_x, NO_2, and PM-10 emissions exceed conformity thresholds and does provide an associated conformity analysis for each. However, as a threshold issue, this analysis must be viewed in the context that associated emission rates are underestimated due to the issues presented in this letter and, as a result, conformity conclusions could (and would) be affected for alternative D were the FEIS revised to properly address the various emissions issues discussed.

Federal conformity requirements allow for the use of various approaches to demonstrate conformity. Generally, these approaches can be summarized as follows:

1. Demonstrate that the emissions increases are specifically identified and accounted for in the associated SIP,
2. For ozone and NO_2, demonstrate that emissions are fully offset by other measures in the nonattainment area,
3. For pollutants other than ozone and NO_2, demonstrate through air quality modeling that the emissions do not increase the frequency or the severity of NAAQS exceedances,
4. Demonstrate that the state has certified that the emissions increases are accounted for in the applicable SIP emissions budgets, or
5. Demonstrate that the state has certified that it will revise the applicable SIP emission budgets to include the emissions increases.

The FCD relies on criterion 4 to demonstrate conformity for NO_x and NO_2 and criterion 3 to demonstrate conformity for PM-10. The FCD *purports* to demonstrate that emissions of NO_x and NO_2 do not exceed the emissions budgets specified in the approved SIP (criterion 1), but it does not actually do this and could not adequately demonstrate conformity without an associated certification from the state that the emissions budgets are not exceeded. Despite significant effort in the FCD to illustrate that project emissions are within the applicable emissions budget, this effort is unconvincing because there is no way to determine what component of the applicable SIP budget is associated with emissions at LAX.

The closest the FCD gets to an actual emissions budget comparison is for aircraft and APU emissions, where FEIS emissions estimates for alternative D are compared to LAX-based aircraft emission estimates from the approved SIP (the 1997/99 AQMP). However, this comparison is flawed for several reasons. Foremost is the fact that the SIP budget as developed includes emissions from reverse thrust operations, which continue to be excluded from the FEIS and FCD despite repeated comments. As indicated further in this and previous comments, such inclusion can be expected to increase NO_x and NO_2 emissions by at least 10 percent. An increase of this magnitude would be sufficient to alter the relationship between alternative D emissions and the approved SIP budget for LAX aircraft operations. The FCD also provides associated aircraft emission budgets from the 2003 AQMP that purport to be for LAX, but these emissions are so inconsistent with those of both the 1997/99 AQMP and the FCD that there is simply no way they can be for LAX operations alone.

A secondary aspect that renders the aircraft emissions comparison obsolete is that the 1998 Regional Transportation Plan upon which the LAX emissions budget is based, clearly states that operations at LAX (and El Toro, which was assumed to be operational) "cannot be estimated … due to lack of air traffic simulation modeling ability."[6] Therefore, LAX was assumed to be unconstrained from a growth perspective and it was further assumed that operations would have to be redistributed among the other airports in the region once definitive modeling analysis was available. Thus, the emissions estimated for LAX are essentially regional placeholders and cannot be used to support an airport-specific emissions budget since budgets for other airports will be correspondingly underestimated. In effect, this emissions estimation approach left the 1997/99 AQMP without an airport-specific emissions budget.

Similar difficulties exist with regard to determining a specific emissions budget for GSE, stationary sources, motor vehicles, and construction activities. The approved SIP emission budgets are simply not sufficiently detailed to allow LAX-specific budgets to be determined. While the FCD attempts to show that the level of emissions from LAX is but a fraction of the areawide emission budgets for each source category, these comparisons are ultimately irrelevant as there is simply no way to know how the LAX emissions (regardless of their magnitude) compare with the level of emissions assumed in the SIP for activity at LAX.

Ultimately, this entire demonstration is effectively relegated to academic status through a letter dated August 12, 2004 from the SCAQMD that states that the emission estimates developed for alternative D are below the applicable SIP budgets. Since such a certification is an allowable conformity determination option (see criterion 4 above), the issue of comparing emissions to specifically identified emission budgets (criterion 1) is avoided. It should be emphasized that the FCD is not supported by any emissions comparison, and it is solely the state certification that provides the necessary basis for conformity.

For PM-10, the FCD relies on conformity criterion 3 as there are no PM-10 emission budgets for aircraft operations in the applicable SIP. Though the associated modeling analysis found peak concentrations to be below both the 24-hour and annual NAAQS, it is important to note that concentrations as high as 90 percent of the NAAQS were estimated. Since the emissions leading to this concentration are underestimated due to the emissions inventory impacts of the alternative

[6] See FCD Attachment C-1.

D activity underestimate discussed above and various additional inventory shortcomings discussed below, it is entirely possible that exceedances of the annual PM-10 NAAQS could well be observed were these various shortcomings corrected.[7]

Respectfully,

Daniel J. Meszler, P.E.

[7] The FCD concludes that the net emissions increases of both VOC and CO are below the significance thresholds for conformity determination. This conclusion is based on the emission estimates presented in the FEIS and could, and likely would, change were the issues presented in this letter properly addressed. Since no specific conformity demonstration was performed for either pollutant due to the conclusion that neither exceeded the conformity emissions threshold, no further comment is possible.