APCD Preliminary Comments on IEA Warehouse ISR Analysis Slide Deck and Excel Spreadsheet
11/30/2023

APCD appreciates the opportunity to provide feedback. Overall, we have the following main takeaways:

1. There remain large data gaps in making a strong correlation between the stated findings, which is that warehouses have little/no correlation to high levels of DPM in various communities.
    - No surface street truck activity data is a primary concern. However, it's possible that SANDAG truck volume data could fill in this gap.

    IEA Response: Agreed that a lack of surface street truck activity data is a challenge in this analysis. Hopefully the District can share the data that they found from SANDAG – and ideally it would be actual counts vs modeled street traffic.

2. The comparison to "normal" traffic data and "truck" traffic data may not be appropriate.
    - Percent of traffic data does not necessarily equate or compare to emissions from such vehicles. For examples, trucks make up a very small percent of traffic activity but emit higher emissions than typical passenger vehicles. An assessment that reviews *emissions* between the two could better address that dynamic.

    IEA Response: Agreed, the graphs have been revised to show count of trucks on the roads rather than percentage.

    - Most general vehicle traffic is not powered by diesel; consequently, making any assumptions between "normal" vehicle traffic and DPM seems off-base. A more appropriate and focused comparison might be to look at the level of truck activity in the same areas but attempt to determine the impact of DPM emissions from other emission sources (i.e. off-road, marine, cargo handling, etc.). Doing so could present a better comparison as to the level of impact trucks are having in these same neighborhoods, to perhaps make the findings stronger.

    IEA Response: Agreed, we spoke with CARB staff who worked on EMFAC and while they walked us through the EMFAC methodology and source of the data, we could not replicate a result that made sense. CalEnviroScreen, for all of SD County, had approximately 132 tons of DPM allocated throughout the census tracts. At CARB's recommendation, use of Diesel PM2.5 without any other calculations yielded results in EMFAC that were much higher. That said, it was useful in that we now know the universe of vehicle classes used in the on-road diesel portion of emissions and the breakdown of emission sources by class. While we may not be able to single out the portion of on-road DPM on CalEnviroScreen, we may be able to infer the proportionality of on-road mobile source emissions associated with the classes most likely to be used by warehouses and distribution centers within SD County.

3. We would encourage taking this feedback to improve the study and allowing APCD to review once again before having this be presented to the WWG group and/or AB617 Steering committees.

<u>Technical Comments on PowerPoint:</u>

1. Slide 2 - The problem statement in the PPT presentation Slide 2 indicates this review is focused on the degree that warehouses are responsible for DPM in specific census tracts.
    - It would be useful to expand that statement to also look at NOx levels in specific census tracts as well, since NOx is a precursor to ozone, and it's possible any proposed warehouse rule would also be investigating NOx reductions to assist in attainment of federal ozone standards.

    IEA Response: Agreed. Although the scope of the CalEnviroScreen data set used in this study does not include NOx, EMFAC and CEPAM model outputs for annual NOx emissions as well and can support NOx forecasting.

    - The same concern exists regarding the follow-up question on Slide 2, which is whether additional regulation on warehouse facilities provide material improvement to DPM emissions in those census tracts. However, answering this question could be difficult to conclusively answer, given that any reduction in NOx levels might not be seen in the immediate area of the census tract; ozone is mainly created in the inland foothill areas of the County.

    IEA Response: Agreed, it will be difficult to ascertain any given census tract's contribution to the total measured zone concentrations at monitoring stations in the County.

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2. Slide 3 – The slide finds (with some exceptions) that high DPM percentiles "correlate" with vehicle traffic percentiles (i.e. high vehicle traffic = high DPM percentiles).
    - What specific data source is this referring to in making this claim?

    IEA Response: The CalEnviroScreen 4.0 supporting data spreadsheet. Specifically, Census Tract DPM and Traffic Percentiles for each area.

    - The slide notes that Barrio Logan is one of the areas that does not have high DPM percentiles correlating with high vehicle traffic percentiles. Can this study determine what the cause of the high DPM percentiles is?

    IEA Response: From the CalEnviroScreen data alone, we cannot. The OEHHA Methodology describes using the following:

    - 2016 EMFAC model output data based on a 1x1 km weighted apportionment for each Census Tract in San Diego for on-road data sources;
    - CEIDARS Reported emissions from 2012 for Stationary Sources; and
    - CEPAM Model data for non-road sources such as rail and ship movement.

    The OEHHA Report authors do not present a breakdown of the above three sources' contributions to the total score we see in CalEnviroScreen. However, CEPAM model results have a breakdown of emissions for on-road, non-road/area, and stationary sources that while may not be a 1:1 source of OEHHA's total DPM scores, may provide some inference.

    - The slide notes total vehicle traffic decreased from Caltrans AADT 2016 to 2021 data. While the "normal" traffic/truck traffic percents make sense, picking 2021 as the outward year could skew the data in relation to COVID-19 restrictions that were still in place to some extent. Utilizing 2022 data if it's available would probably nullify any further pandemic impacts in traffic and represent a more representative "normal" year.

    IEA Response: Agreed- however CALTRANS unfortunately only currently has AADT data available for its most recent count. As 2022 and onward data is published, it would be prudent to include these datasets in the analysis.

    - #4 on the slide indicates truck traffic has a weak/no correlation with warehouse space in San Diego County, however in Otay Mesa it's noted that around 20% of the activity in that areas are from trucks. Can that finding be still relevant for Otay Mesa?

    IEA Response: As noted in the comment above regarding total truck traffic rather than a percentage, we can see that other areas throughout San Diego County have substantially more trucks driving through the arterial systems than on the 905 where the majority of the warehouses in SD County are located. In the context of the entire dataset, it would be difficult to conclude that overall truck activity from warehouses is distinct from overall truck activity throughout the county.

3. Slide 4 – The slides notes that national EPA data was used for average vehicle emissions rates from Bureau of Transportation Statistics.
    - APCD would recommend instead using truck data from California's specific EMFAC database to get the most accurate estimates for fleet makeup in San Diego County.

    IEA Response: Agreed- for a direct analysis of the EMFAC data cited by OEHHA for CalEnviroScreen 4.0, we examined 2016 data, as well as 2017, 2022, 2023, and 2030 for forecasting. We have not been able to determine exactly how CARB calculated the total on-road proportion of DPM seen in the report's supporting data sheet. However, we do see the make up of vehicle classes and their respective proportions of PM2.5 emissions from the tailpipe, which we are assuming is DPM.

4. Slide 6 – The slide identifies warehouse spaces in San Diego County via Google Earth.
    - This is an interesting concept that was similarly used by SCAQMD in the preparation of their rule. Any processes in how this was done should be clearly documented (as well as the time it took to do this analysis), as this could assist staff in doing a similar analysis if one is pursued.

IEA Response: Agreed, if the District has interest, we can prepare a brief work instruction with a rough estimate of time needed for warehouse identification efforts.

5. Slide 7 –The slide presents truck volume data from Caltrans
    - The Caltrans data is useful. However, it only presents data on highways/freeways, and not necessarily on surface streets where many warehouses congregate in business parks/industrial areas.

    IEA Response: Agreed- it is unfortunate that the data set is limited to arterial roads in the County. However, it should be noted that these are direct counts rather than modeled information, which gives a better degree of refinement for the purposes of this analysis. It would be ideal to locate a dataset from SANDAG or other Agency that can provide street-level data.

    - The traffic percentages don't appear to account for the relative relation of emission impact that trucks have. For instance, in the example given on the slide for Miramar, 3.73% of the traffic was attributable to trucks, but what was the percent of that truck traffic's emissions compared to the total AADT? While truck volume % relative to general traffic is low, the mobile contribution to DPM emissions is arguably coming from diesel trucks.

    IEA Response: Agreed and moving forward, examining total truck trips will be a better representation of the data.

    - Another data gap is that the Caltrans data only accounts for major freeways/junctions, and no local data, exits, major arteries/crossings is included. Getting access to the localized data on surface streets may be needed, either through SANDAG or other local entities.

    IEA Response: Agreed, any additional data, especially direct counts, even if for a handful of specific stations would be helpful.

6. Slide 10 – The graph notes warehouse total surface area as of 2023, which APCD is assuming was tabulated by the Google Earth analysis.
    - It could be misleading to compare total traffic and truck traffic from 2016 and 2021 respectively, when we don't know what the total square footage of warehouses in these communities were at those same timeframes as well, to see if there is any correlation between increased truck traffic and increase warehouse activity since then.

    IEA Response: Agreed that non-congruent years can cause a distortion in the visualization- it is true that warehouses have grown and continue to grow in the Otay Mesa region. Additional AADT years from Caltrans for 2022 and eventually 2023 would be helpful in assessing for a correlation. We should also be aware of other external factors such as infrastructure expansions of the Otay Mesa crossing, which may complicate the analysis.

    - The red DPM % line in this slide (and others) is difficult to understand in the context of all the other bars on the chart. We recommend conveying this information in a different way to help convey the point being made. As we understand, the DPM % line wildly fluctuates based on the parameters included (thus no correlation) but it's difficult to ascertain that from the graphs alone.

    IEA Response: Understood, we have prepared a different visualization to present the data in a way that can hopefully be better understood by a broader audience.

7. Slide 11
    - What are the red and green dotted lines representing?

    IEA Response: They were intended to represent DPM and Traffic Census Tract Scores for other areas where warehouses were present.

    - Viewing the traffic bars for these areas with no warehouses alone, i.e. not in relation to areas that do have warehouses, could be misleading since all the percentages are less than 1% overall. We recommend including these areas into the other graphs on Slides 8-10 to get the full picture.

    IEA Response: We initially included a separate visualization of some areas of SD County without warehouses to reduce clutter for already busy graphs. We can consider adding these areas to other visualizations as feasible.

8. Slide 12 –The slide notes that CES 4.0 data took DPM scoring over the worst-case full week and then applied it over the whole year.

- Was that something that was done in this analysis, or was that already built into the CES 4.0 scoring?

IEA Response: The application of a typical summer (i.e. "worst-case") week for the whole year was part of OEHHA's initial analysis for CalEnviroScreen 4.0.

9. Slide 13 – As mentioned, we recommend utilizing EMFAC data instead of national fleet data, to get more accurate picture of California and San Diego County specific emissions data.
   IEA Response: Agreed, and we have reviewed CEPAM 2019V1.05 model data as well.

Comments on Excel Spreadsheet:

IEA Response: As a general response to the comments regarding the Summary Tab- the statements listed were initial thoughts throughout the development of the analysis to organize the author's thoughts. Please disregard.

1. Summary Tab - The following statement reads: *"(5) Given that the total truck % (in blue) accounts for all traffic, not just warehouses, it is highly unlikely that truck traffic related to warehouse, distribution, storage centers is a driver of DPM in San Diego County".*
   - This is a big statement to make, given that it also doesn't account for the weighted impact truck emissions have in relation to passenger vehicle emissions, which are comparatively cleaner overall. We think additional data support would be needed to make such a claim.
2. Summary Tab - The following statement reads*: "(7) Advanced Clean Fleets, Advanced Clean Trucks, and no-idling rule are projected to reduce DPM emissions by up to 96.8% once fully implemented, according to Chris Shimoda (CA Trucking Association)".*
   - We would recommend double-checking these figures with CARB.
   - Also, determining when full implementation would occur is probably needed since ACF and ACT are both phased in over a number of years/decades.
3. Summary Tab - The following statement reads: *"(8) Additional regulation would not likely pass the economic feasibility standard for Rule development, nor would it be in the Port's best interest to enter an MOU with the Air District, since similar DPM conditions are observable elsewhere in the County (Kearny Mesa, East National City, La Jolla, Hillcrest, Mission Valley, etc.)."*
   - We recommend revising this statement, as the APCD Governing Board would determine if any proposed rulemaking (cost-effective or not) warranted adoption.
   - The statement regarding the possible Port MOU could also be out of place, given this analysis' focus on warehouses.

4. The overall sample size considered is small.
   - While the presentation states that the warehouses are "representative," nevertheless, the warehouses evaluated in the study represent less than 5% of the overall CoStar warehouse inventory. Consequently, it is difficult to form any conclusions based on a small sample of warehouses.

   IEA Response: It would be prudent for the Working Group to establish the boundary conditions of the CoStar inventory by determining a definition for "Warehouse". Of the population of approximately 6,737 properties listed, it is highly likely that at least a plurality of these are commercial office spaces, miscellaneous industrial space (shop floors), repurposed venues (such as churches and gyms), and other mixed uses that may not attract trucks.

   Furthermore, the current sample size, at just over 300, yields a 95% confidence level for the population size with a 5.3% margin of error assuming 60% of all CoStar properties are applicable warehouses for this analysis. If we assume that a greater proportion of the properties in CoStar are applicable, for example 70 or even up to 90%, then the margin of error would decrease because each of the data points would carry more representative weight.

5. The data used in the spreadsheet does not conclusively tell the reviewer where trucks are going.
   - While truck volumes at certain large locations could be useful, it is not granular enough to determine for specific warehouses in these neighborhoods.

   IEA Response: Agreed. As stated before, any street level data with AADT would be useful. Without further clarity in the data, it would be extremely difficult to prove that trucks visit warehouses in higher volume and frequency than in other spaces like say, a grocery or "big-box" store.

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6. CalEnviroScreen DPM data use includes impacts from all diesel sources, including off-road and stationary sources.
    - Ideally, the study would know the inventory for a given zip code or larger area to focus on the contribution to DPM emissions from diesel trucks only. Such data may/may not exist to allow for any subtraction of non-truck sources of DPM – further research is needed.

    IEA Response: Agreed. As stated before, any street level data with AADT would be useful. Without further clarity in the data, it would be extremely difficult to prove that trucks visit warehouses in higher volume and frequency than in other spaces like say, a grocery or "big-box" store.

Other comments for consideration:

1. APCD maintains that the most conclusive way to determine the impact of warehouse space and high DPM emissions is to utilize actual truck trip data, should it exist.
   IEA Response: Agreed, the Caltrans datasets are the only true measurements of truck trips on SD County roads. The rest are modeled. Should alternate datasets exist that show street level data, we should give significantly more weight to actual measurements.

2. Alternative approaches that could be incorporated:
    - Using SANDAG truck volume data and extracting truck volumes at certain areas, e.g., high concentrations of warehouses. Truck volume data could then be used to estimate emissions at certain points (streets, intersections), assuming the trucks are going to those warehouses.

    IEA Response: This may work in very limited areas assuming that there are not also other properties such as big box stores, grocers, or even gas stations and convenience stores that may also contribute to truck traffic within that given street or intersection. For example, Encinitas – almost no warehouse presence exists yet there is a significant truck presence.

    Other assumptions would be needed, e.g., distance traveled to and from a location and idling time at the location. Results would not be warehouse specific but could estimate for certain areas of interest. Optionally, this data could be used to calculate truck trip rate per square foot, which could then be used to estimate emissions for each warehouse.

    IEA Response: We would caution against attributing any specific truck visit frequency based on size alone. It may be a good idea to contact large warehouse operators in the County to get an idea on the frequency and size of the trucks that come to their facility and whether they are idling.

3. APCD briefly reviewed the same CalEnviroScreen 4.0 dataset used in the study and cross referenced that with the complete CoStar warehouse inventory used in our ISR Framework and warehouse analysis thus far. The data summarized below shows that warehouses located in DACs are in areas with diesel PM percentiles of 76% or greater. Thought we can't conclusively identify the source of the DPM emissions based on this data alone, it's notable the correlation between high DPM percentile locations and warehouses.
   IEA Response: This is true only if all of the properties counted in the table below are verifiably warehouses. It would be prudent to first identify in the dataset those properties that would likely fit the definition and use case of a warehouse before concluding that high DPM percentile locations are in the same areas.

City/Area	Warehouse Count	Avg Diesel PM Percentile (%)
Countywide	6,737	59.3
Countywide - CES 70 or higher	1,316	84.9
Portside	442	92.2
International Border	302	42.4
International Border - CES 70 or higher	14	76.6
Other DACs		
Chula Vista	159	75.4
Lemon Grove	29	77.2
National City	4	83.2
El Cajon	387	87.8
SD 92101	3	99.3
SD 92102	71	93.1
SD 92105	9	91.5
SD 92113	3	80.0
SD 92114	9	72.7
Average		**84.5**