



The Gateway Cities
Air Quality Action Plan

Air Quality Technical Webinar Summary

September 25, 2012

Meeting Location: Gateway Cities Council of Governments

16401 Paramount Blvd., Paramount, CA 90723

1:00 pm – 4:00 pm

Participants:

T.L. Garret, Pacific Marine Shipping Association *(by phone)*

Steve LeFever, City of South Gate *(in person)*

David McDonald, LA Regional Planning *(in person)*

Ian McMillan, SCAQMD *(by phone)*

Daniel Ojeda, City of Lynwood *(by phone)*

Allyson Terromoto, POLB *(by phone)*

Robert Vazquez, LA County Public Health *(by phone)*

Lisa Wunder, POLA *(in person)*

AQAP Project Team

GCCOG: Jerry Wood, Director of Transportation and Engineering, GCCOG *(in person)*

Adrian Alvarez, Project Manager, Metro *(in person)*

Lori Abrishami, Metro *(by phone)*

Danielle Valentino, Community Relations Manager, Metro *(by phone)*

ICF Team: Ed Carr - ICF presenter *(by phone)*

Scott Broten, ICF International *(in person)*

Andrew Papson, ICF International *(in person)*

Arlene Rosenbaum, ICF International *(by phone)*

Susan DeSantis, Arellano Associates *(in person)*

Maria Yanez-Forgash, Arellano Associates *(in person)*

Elizabeth Hansburg, Arellano Associates *(in person)*

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Opening Comments and Introductions

Susan DeSantis opened the meeting and invited those present and participating by phone to introduce themselves. She then reviewed the meeting's agenda.

Introduction

Ms. DeSantis opened the PowerPoint presentation by reviewing the status of the AQAP and outlining the upcoming calendar of tasks and events through the end of 2012. Ms. DeSantis then invited Ed Carr to take up the presentation.

Review of Modeling Approach

Mr. Carr began with a review of the updated protocol covering the changes in methodology and approach used to model future air quality within the Gateway Cities. He explained that the changes in the methodology were prompted by new emissions data availability, changes in available modeling tools, and updates in meteorological and health science research. The changes included improving the resolution of the meteorological field, expanding the study area to better capture emissions sources impacting the Gateway Cities, and the use of EMFAC 2011 data, which provided an update to the previous data used (EMFAC 2007). Jerry Wood added that air quality modeling for 2035 will be done as part of the Phase II Transportation Plan – which is a separate project. Ms. DeSantis then invited questions. One Technical Roundtable (TRT) member asked if the meteorological data from the air quality monitoring stations had been used in the model's protocol. Mr. Carr indicated it had been used, adding that the increased resolution in the meteorological field was used to better reflect the rapid changes in wind direction and speed along the coast.

Model to Monitor Comparison

Mr. Carr then explained the comparison and performance of the updated air quality modeling. The air quality model output was compared with the 2009 air quality monitored data following the revised modeling protocol procedures. The 2009 monitored data used for comparison came from five monitoring stations within the Gateway Cities Region and included measures for several types of air pollutants, including air toxic compounds, carbon monoxide (CO) and nitrous oxides (NO_x and NO₂), and PM₁₀ and PM_{2.5}. After comparing the measured data to the model's predictions, adjustments were made to the model to improve performance. Overall, the model performed well, which indicates that the model's air quality forecasts for 2035 should be reliable. Ms. DeSantis invited questions; however, none were asked.

Emissions: Criteria Pollutants

Next, Mr. Carr reviewed the sources of criteria pollutants within the Gateway Cities, which include area sources, including charbroiling; point sources from fixed locations, such as refineries; on-road sources

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from cars and trucks on both freeways and arterials; off road sources from construction-type vehicles; aircraft; rail; and watercraft, ranging from large ocean going ships to pleasure craft. The analysis examined how each of these source categories would change between 2009 and 2035 in levels and types of emissions. One TRT member asked Mr. Carr if the data projections for particulate matter included cooking exhaust based on a recent AQMD study citing restaurants as a significant source of particulate matter. Mr. Carr confirmed that charbroiling is a significant source of PM_{2.5} and that charbroiling and restaurants were included in the area sources used in the analysis.

The following are some of the significant changes predicted between 2009 and 2035.

The model predicted a decrease of greater than 50% in CO emissions from on-road sources, which is attributable to a reduction in emissions from gasoline vehicles. Overall, there is a projected decrease of 20% in CO emissions from all sources between 2009 and 2035. NO_x will see a net decrease of over 50%. The single greatest source of SO_x is ships and watercraft; levels of SO_x emissions will decrease by 90% due to the widespread use of low sulfur fuels in the ports. TOG (total organic gasses) emissions, which include many of the air toxics, will see a net decrease of 20% between 2009 and 2035; however, TOG emissions from area sources, which are the largest source of TOG emissions, are projected to increase during the same time period. Similar to TOG, the area sources are the largest contributors of PM₁₀ and PM_{2.5} emissions, followed by road dust and off-road dust. Emissions from both on- and off-road dust sources will decrease; however, emissions from area sources will increase. Mr. Carr summarized by saying that despite these changes, the net result shows virtually no change in the total emissions levels for PM₁₀, and only an 11% decrease for PM_{2.5}. Mr. Carr pointed out that the decrease is for primary 2.5 emissions, which are emitted directly from the source; it does include particulate matter that forms in the atmosphere as the result of other emissions such as NO_x and SO_x, which are precursors to this secondary PM formation. Mr. Carr then showed a more detailed comparison of the projected changes in PM₁₀ and PM_{2.5} emissions broken out by source category.

Ms. DeSantis then moderated questions. One Technical Working Group (TWG) member asked why there is a larger reduction in PM₁₀ than PM_{2.5} in the on-road category; he thought that PM_{2.5} should be a subset of PM₁₀ for the on-road category. Mr. Carr and his ICF colleagues discussed the question briefly and agreed to investigate further and report back¹. A TRT member asked Mr. Carr what he attributed the large reductions in PM₁₀ and PM_{2.5} to in the off-road category. Mr. Carr responded by saying that the large reduction is the result of the implementation of higher Tier IV emissions standards for diesel powered vehicles as well as a shift to gasoline and electric powered off road construction equipment.

¹ ICF reviewed the larger reduction in PM₁₀ than for PM_{2.5} and attributed this to the changes in brake wear emissions used in EMFAC2011. The 2009 vehicle fleet has more than half the vehicles older than 1998 with most of these older vehicles using asbestos containing brakes which give off much less particulate matter per application but a larger fraction of PM_{2.5}. By 2035 asbestos free brakes are the only brake type being used and these with a smaller fraction in the PM_{2.5} mode. This results in the net effect of larger reduction seen in the PM_{2.5} category relative to the PM₁₀ category.

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After taking questions, Mr. Carr then moved on to explain several figures that mapped the locations of PM_{2.5} emissions sources. He concluded by identifying the key findings of the emissions analysis: 1) the on- and off-roadways source categories are no longer the dominant source of all types of pollutants; 2) the only source category to show reductions in all types of pollutants is on-road sources, which can be attributed to improvements in gasoline and diesel technology; and 3) the area source category is projected to see an increase in all types of emissions and by 2035 will be the largest source of TOG and PM pollutants in the Gateway Cities. PM_{2.5} and NO_x are the two recommended pollutants to focus on for emissions reductions. PM_{2.5} will be the most difficult of all the pollutants to bring into compliance with national and California air quality standards; therefore, reduction efforts should be focused on reducing PM_{2.5} pollutants from area sources. NO_x reductions are important because NO_x is a precursor to the formation of ozone and secondary PM pollutants. Reduction efforts should continue to be focused on on- and off-road sources as well as ships and watercraft. In response to this point, a TRT member asked why the maps showing the location of pollution sources did not reflect a greater decrease in emissions in the area surrounding the Ports of Los Angeles and Long Beach given the new regulation which requires ocean going vessels (OGVs) to “plug in” to harbor electric sources while in port. Mr. Carr responded that there will be a reduction in emissions on the land side; however, emissions over the water will increase slightly by 2035 because of the increase in the number of ships, which run their engines while in waterways. A TWG member asserted that by 2014, the District has projected that the PM_{2.5} levels will be compliant with the current standards. Mr. Carr responded by saying that the federal PM_{2.5} ambient air quality standard is expected to be reduced soon,² in which case the projected 2035 concentrations would be above this level at various locations with the Gateway Cities. Also the California air quality standard is set at this lower level of compliance.

Emissions: Air Toxics

Mr. Carr moved on to explain a similar analysis of air toxic pollutants, including benzene, butadiene, formaldehyde, arsenic, diesel particulate matter (DPM), and hexavalent chromium, using the same source categories used in the criteria pollutant analysis. The key finding of the air toxics analysis was that DPM, which comes from diesel powered vehicles, will see a net decrease of 70% between 2009 and 2035 despite the projected 12% growth in vehicle miles traveled (VMT) in the Gateway Cities. This decrease can mostly be attributed to a reduction in DPM exhaust from control technology and some equipment switching from diesel to gasoline and electrification. Benzene will also see a decrease due to reductions in on and off-road VOC emissions sources. Together these two emissions source categories are responsible for the majority of the emissions decreases in air toxics. Mr. Carr’s spatial analysis showed patterns similar to those for criteria pollutants; most regions of the Gateway Cities will see reductions in air toxics between 2009 and 2035. However, the Port area will see an increase in air toxics, particularly DPM, over the waterways because of the increase in water traffic. At the conclusion of the

² EPA announced on June 14, 2012, their intent to lower the PM_{2.5} annual average standard in the range from 12–13 ug/m³. They would issue final standards by December 14, 2012.

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air toxics presentation, Ms. DeSantis invited questions. Since there were no questions, Mr. Carr moved on to the air quality portion of the presentation.

Air Quality

Mr. Carr focused the air quality portion of his presentation on the criteria pollutant $PM_{2.5}$ and the air toxic DPM. He examined the changes in total annual average $PM_{2.5}$ concentrations for the Gateway Cities region from 2009 to 2035, followed by a spatial analysis of the five major source categories of $PM_{2.5}$ pollutants: freeways, arterial and local roads, area sources, watercraft, and secondary PM, which forms in the atmosphere. Between 2009 and 2035, there will be a net decrease in $PM_{2.5}$ emissions within the Gateway Cities. Secondary PM formation shrinks from 51% in 2009 to 46% in 2035, but still remains the largest source of all $PM_{2.5}$ emissions. Area source contributions grow from 18% in 2009 to 24% in 2035. Other source categories experience minimal shifts between 2009 and 2035; combined on-roadway activity remains steady at approximately 24%. Mr. Carr then explained several maps of the Gateway Cities region that showed the spatial analysis of $PM_{2.5}$ sources categories. The figures reflected the net decrease in $PM_{2.5}$ emissions distributed over the entire Gateway Cities region. The on-roadway sources still remain highest near warehouses and freeways, and watercraft, particularly boats used for pleasure, become significant contributors to the $PM_{2.5}$ concentrations in the area surrounding the Ports of Los Angeles and Long Beach. Mr. Carr emphasized that even with the reductions in $PM_{2.5}$ concentrations forecasted for 2035, if air quality standards are tightened as expected, 24% of the Gateway Cities will be out of compliance with the new standards in 2035. He suggested that efforts to reduce $PM_{2.5}$ concentrations should target the precursors to $PM_{2.5}$ including NO_x and SO_x .

Next Mr. Carr reviewed a similar analysis for DPM, which will see a 79% reduction in concentration levels between 2009 and 2035. The distribution across the source categories for DPM remains steady between 2009 and 2035, with on-road and freeways remaining the largest contributor and accounting for 40% of DPM emissions in both years. Off-road sources remain the second largest contributor of DPM and fall from 29% in 2009 to 15% in 2035. Non-freeway sources, which are primary and secondary roadways as well as local roads, remain the third greatest contributor and decrease from 18% to 14% over the same time period. Rail and rail yards become more significant contributors of DPM in 2035, rising from a combined total of 7% in 2009 to 16% in 2035. The highest concentrations of DPM will continue to be clustered around freeways, roads, and rail operations, as was easily seen on the maps presented by Mr. Carr showing the spatial distribution of DPM concentrations. Mr. Carr also pointed out that the area surrounding the Ports will still have high concentration levels of DPM in 2035 primarily as the result of pleasure watercraft. In conclusion, Mr. Carr explained that given this spatial variation in DPM concentrations across the Gateway Cities, one reduction strategy will not work equally well in all areas of the region.

Ms. DeSantis then invited questions. A TRT member asked which compounds were monitored as a representative of DPM. Mr. Carr responded that the modeled DPM was not compared with monitored data. A TRT member from the Port of Los Angeles added that the Port is in the process of developing programs to help owners replace the older motors on their pleasure craft with cleaner burning ones in

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an effort to reduce emissions in the port area. Mr. Carr acknowledged this as a step forward and noted that it should be added to the New Measures section of the AQAP. A second TRT member asked if climate change had been considered as a factor in the modeling of future air quality. Mr. Carr replied that it was not used in the model and that meteorological and climate conditions were held constant using 2009 conditions in the model. A TWG member questioned Mr. Carr's conclusion that PM_{2.5} levels would be difficult to bring into compliance with recommended standards in 2035. He pointed out that AQMD had not reached this conclusion. Mr. Carr replied that AQMD's conclusion was based on the current national ambient air quality standards; however, as noted earlier, in June 2012 EPA announced their intention to reduce the standard from 15 to between 13–12 micrograms per cubic meter by December 2012, in which case PM_{2.5} levels will be out of compliance. Further, the California ambient air quality standard is 12 micrograms per cubic meter. The TWG member also sought to confirm that new regulations for newly manufactured and/or updated ships, which will be fully implemented by 2016, were considered in the modeling. He stated that although shipping fleet turnover is slow, there will be sufficient turnover from 2016 to 2035 to make a significant reduction in emissions from shipping under the new regulations. Mr. Carr said that he believed the new regulations were considered as part of the model, but would double check and confirm the response.³ The TWG member said he believed that emissions from shipping would drop by 25% even with the projected increase in shipping, but that those reductions were not reflected in the data presented. The previous TRT member added that another reason for this discrepancy could be because the model presented 2007 AQMP data, but the newly available 2012 data shows a reduction in emissions levels. After moderating the questions, Ms. DeSantis turned the presentation over to Andrew Papson to explain the next steps in the AQAP process.

Next Steps

Mr. Papson explained the next steps in the AQAP process. He explained that the modeling results presented here would be used in a health risk assessment (HRA), which would be presented in a webinar on November 6. The air quality and HRA results will be combined into a report that will be released in late November. He also referenced the development of a set of initial new measures based on these air quality modeling results, which will be presented at a workshop on October 10 at the GCCOG and will provide an opportunity for participants to give feedback as well as identify other measures to be included in the AQAP. The new measures will be assessed as their likely benefits, and these findings will be presented in a webinar in November. All of these elements form the draft Air

³ We confirmed that the air quality modeling did include the relatively new IMO/EPA engine standards. Specifically, in December 2009 EPA tightened and brought into agreement with the **Category 3 Marine Engine Standard** IMO standards for engines larger than 30 liters per cylinder. Most ocean going vessel engines are Category 3. The new standards introduce stricter controls for NO_x, CO, and hydrocarbons, as well as reporting requirements for PM emissions and related fuel standards for low-sulfur marine diesel oil. This regulation only applies to new or remanufactured engines but applies in the US and on international vessels. The Tier 2 emission standards are applicable starting 2011 while Tier 3 standard are applicable starting 2016.

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Quality Action Plan (AQAP), due to be released in the first quarter of 2013. After Mr. Papson finished explaining the remaining AQAP timeline, Ms. DeSantis invited questions. A TRT member asked if the HRA would include the ultrafine particles. Mr. Carr said that it did not, but referred to the “state of the science” presentation on ultrafine particles that was conducted in the fall of 2012 as part of the AQAP. Ms. DeSantis offered to provide the report to the TRT member.

Ms. DeSantis noted that the GCCOG Environmental Committee would be scheduled to meet in November/December timeframe to review the air quality and HRA results and the new measures toolkit. The draft Air Quality Action Plan will be reviewed next year. The events will be publicized once the dates have been finalized. She also gave more detail regarding the October 10 New Measures Workshop, saying that there would be a brief summary of the air quality modeling results, a presentation on possible new measures, and roundtable discussions at the workshop.

Adjournment

After inviting final questions, Ms. DeSantis thanked the participants and the presenter, Mr. Carr, and adjourned the meeting.