MINUTES OF THE
MARICOPA ASSOCIATION OF GOVERNMENTS
AIR QUALITY TECHNICAL ADVISORY COMMITTEE MEETING

Thursday, May 21, 2015
MAG Office
Phoenix, Arizona

MEMBERS ATTENDING

* William Mattingly, Peoria, Chairman
Tim Conner, Scottsdale, Vice Chair
Drew Bryck, Avondale
Robert van den Akker for John Minear, Buckeye
Jon Sherrill for Jim Weiss, Chandler
Jamie McCullough, El Mirage
Jessica Koberna, Gilbert
Megan Sheldon, Glendale
* Cato Esquivel, Goodyear
# Kazi Haque, Maricopa
# Scott Bouchie, Mesa
Joe Gibbs for Joe Giudice, Phoenix
Antonio DeLaCruz, Surprise
Oddvar Tveit, Tempe
* Youngtown
Ramona Simpson, Queen Creek
* Walter Bouchard, American Lung Association of Arizona
Kyle Heckel for Kristin Watt, Salt River Project
Rebecca Hudson, Southwest Gas Corporation
Michael Denby for Nancy Nesky, Arizona Public Service Company
Gina Grey, Western States Petroleum Association
Robert Forrest, Valley Metro/RPTA
* Dave Berry, Arizona Motor Transport Association
Jeanette Fish, Maricopa County Farm Bureau
* Steve Trussell, Arizona Rock Products Association
Ashley Ferguson for Claudia Whitehead, Greater Phoenix Chamber of Commerce
Amanda McGennis, Associated General Contractors
* Spencer Kamps, Homebuilders Association of Central Arizona
* Mannie Carpenter, Valley Forward
Kai Umeda, University of Arizona Cooperative Extension
Beverly Chenausky, Arizona Department of Transportation
* Arizona Department of Environmental Quality
* Environmental Protection Agency
Corky Martinkovic, Maricopa County Air Quality Department
Scott DiBiase, Pinal County
Michelle Wilson, Arizona Department of Weights and Measures
* Ed Stillings, Federal Highway Administration
* Judi Nelson, Arizona State University
Stan Belone, Salt River Pima-Maricopa Indian Community

*Members neither present nor represented by proxy.
#Participated via telephone conference call.
+Participated via video conference call.

OTHERS PRESENT

Lindy Bauer, Maricopa Association of Governments
Julie Hoffman, Maricopa Association of Governments
Matt Poppen, Maricopa Association of Governments
Kara Johnson, Maricopa Association of Governments
Dean Giles, Maricopa Association of Governments
Taejoo Shin, Maricopa Association of Governments
Ieesuck Jung, Maricopa Association of Governments
Randy Sedlacek, Maricopa Association of Governments
Feng Liu, Maricopa Association of Governments
Adam Xia, Maricopa Association of Governments
Joonwon Joo, Arizona Department of Transportation
Bob Huhn, Maricopa County Air Quality Department

1. Call to Order

A meeting of the Maricopa Association of Governments (MAG) Air Quality Technical Advisory Committee (AQTAC) was conducted on May 21, 2015. Tim Conner, City of Scottsdale, Vice Chair, called the meeting to order at approximately 1:30 p.m. Scott Bouchie, City of Mesa; Antonio DeLaCruz, City of Surprise; Jamie McCullough, City of El Mirage; Jon Sherrill, City of Chandler; Gina Grey, Western States Petroleum Association; Kazi Haque, City of Maricopa; and Amanda McGennis, Associated General Contractors attended the meeting via telephone conference call. Ms. McGennis requested that the March 26, 2015 minutes be changed to show her attendance at the meeting through telephone conference call.

Acting Chair Conner indicated that copies of the handouts for the meeting are available. He noted for members attending through audio conference, the presentations for the meeting will be posted on the MAG website under Resources for the Committee agenda, whenever possible. If it is not possible to post them before the meeting, they will be posted after the meeting.

Lindy Bauer, Maricopa Association of Governments, stated that a memorandum was sent to the Committee on the AQTAC chair and vice chair appointments that are due to expire on June 30, 2015. In accordance with the MAG Committee Operating Policies and Procedures, the Committee chair and vice chair are eligible to serve an additional two-year term since they succeeded to an unexpired term of twelve months or less. Ms. Bauer stated that the current chair has indicated a preference to not serve an additional two-year term, if at all possible. Therefore, the vice chair will ascend to the chair position and a new vice chair will be approved by the MAG Executive Committee. MAG is requesting that member agencies interested in the vacant vice chair position submit a letter of interest by May 27, 2015 to the MAG Chair, Mayor Michael LeVault.

2. Call to the Audience

Acting Chair Conner stated that the Call to the Audience provides an opportunity for members of the public to address the Committee on items not scheduled on the agenda that fall under the jurisdiction of MAG, or on items on the agenda for discussion but not for action. Comment cards for those wishing to speak are available on the tables adjacent to the doorways inside the meeting room. Members of the public will be requested not to exceed a three minute time period for their comments. A total of 15 minutes will be provided for the Call to the Audience agenda item, unless the Committee requests an exception to this limit. Please note that those wishing to comment on action agenda items will be given an opportunity at the time the item is heard. Acting Chair Conner noted that no public comment cards had been received.

3. Approval of the March 26, 2015 Meeting Minutes

The Committee reviewed the minutes from the March 26, 2015 meeting. Acting Chair Conner noted the modification to the March 26, 2015 minutes to reflect that Ms. McGennis attended the meeting by telephone conference call. Ms. McGennis, moved and Ramona Simpson, Town of Queen Creek, seconded and the motion to approve the March 26, 2015 meeting minutes, with the correction, carried unanimously.

Ms. Bauer apologized to Ms. McGennis. She indicated that MAG will be careful moving forward.

4. EPA Approval of the MAG 2014 State Implementation Plan Revision for the Removal of Stage II Vapor Recovery

Ms. Bauer stated that on March 30, 2015, the Environmental Protection Agency (EPA) issued a notice to approve the MAG 2014 State Implementation Plan Revision for the Removal of Stage II Vapor Recovery Controls in the Maricopa Eight-Hour Ozone Nonattainment Area. She stated that EPA made a determination that onboard refueling vapor recovery systems are in widespread use throughout the motor vehicle fleet, effective May 16, 2012. She noted that EPA indicated that they did not wish to impose an economic burden on communities, business and industry. Ms. Bauer stated that MAG worked closely with the Arizona Department of Weights and Measures, Arizona Department of Environmental Quality (ADEQ), and the Maricopa County Air Quality Department. EPA will be publishing the notice in the Federal Register in the near future.

5. Maricopa County Ozone Campaign

Bob Huhn, Maricopa County Air Quality Department, provided an overview of the Maricopa County Ozone Campaign. He stated that the region faces some challenges regarding ozone. The region does not attain the current 2008 eight hour ozone standard of 0.075 parts per million (ppm) and EPA has proposed tightening the ozone standard. Mr. Huhn displayed a graph of the 2014 ozone design values and proposed health standards. He indicated that three Maricopa County monitors are violating the current ozone standard and a majority are exceeding the proposed EPA ozone standard, (within the range of 0.065 to of 0.070 ppm). Therefore, the Maricopa County Air Quality Department is developing a campaign to address ozone.

Mr. Huhn discussed the ozone campaign. The target audience is drivers, especially single occupancy drivers; residents; and businesses in Maricopa County. Mr. Huhn displayed the icons for "Commit to One Day". He stated that the campaign will utilize the "Commit to One Day" slogan and also use characters to represent opportunities to help reduce ozone each day of the week. The campaign slogan is, "Commit to One Day and Help Keep the Ozone Away". The Clean Air Make More website will feature a webpage for the ozone campaign. The focus of the campaign will be to educate residents on ozone and why is important to reduce ozone.

Mr. Huhn displayed the ozone campaign characters. He noted that the characters are not final and are subject to change. Mr. Huhn noted that the first character walking his dog will be changed so that he is walking to work. The second character would be used to encourage alternative modes, and may be changed to include more characters waiting for the bus. Characters were also displayed for refueling after dark, carpool, and bicycling. In addition, Mr. Huhn indicated that the character sweeping may be changed. The idea behind the character is to sweep outside instead of using leaf blowers, however it may be confused with dust instead of ozone. Mr. Huhn also discussed a character for no drive-thru Thursday.

Mr. Huhn indicated that the characters and icons will be used on the webpage and mobile application. The characters on the mobile application will be animated. The icons on the webpage can also be added to a calendar. In addition, the campaign will be promoted on the

radio and the County is looking to focus on sponsoring traffic reports to hit the target audience of drivers during peak times. Mr. Huhn stated that a short tag line would be aired before the traffic report and a 15 second ozone campaign spot after the traffic report.

Mr. Huhn discussed the mobile application. He stated that the Maricopa County mobile application has been successful and that the County is pleased with the download rate. Recently, the average downloads per week for the application is approximately 50. Mr. Huhn added that hopefully the downloads increase during the ozone campaign.

Mr. Huhn stated that the Maricopa County is also looking to utilize billboards. The billboard may include a character and will mention ozone.

Mr. Huhn indicated that Maricopa County is discussing promotion of the campaign with Valley Metro. Maricopa County is looking to promote the campaign at bus stops. In addition, Maricopa County will be applying for space on the light rail. He stated that Valley Metro has three light rail trains that are made available to non-profit and government organizations if certain requirements are met. Mr. Huhn stated that the County cannot purchase advertising space on the light rail since it can only be sold to for-profit entities. However Maricopa County would purchase the light rail wraps if awarded the space.

Ms. McGennis stated that the Association of General Contractors (AGC) would like to sponsor a billboard and discussed potentially a 6 by 8 foot building banner to be placed in front of the AGC offices for the campaign. She also indicated that if the County can provide a template that signage could be placed at active construction projects along fence lines. Ms. McGennis noted that AGC is committed in helping to promote the ozone campaign in the region. Mr. Huhn responded that their help is appreciated and thanked Ms. McGennis.

Mr. Huhn added that Maricopa County is working with the cities and towns and many have already agreed to help with the campaign. The Arizona Diamondbacks have also agreed to space in Chase Field for the campaign.

Ms. Simpson inquired if the website for the campaign is live. She stated that the Town of Queen Creek has a dust awareness campaign the first week of June in which they could include the ozone campaign information. Mr. Huhn replied that the website is not yet active, however once the website and artwork is finalized, the County will send it out to the cities and towns. Ms. Simpson asked if there was an estimated timeframe. Mr. Huhn responded that Maricopa County is aiming to finalize the entire campaign by June 30th and the artwork is anticipated to be available mid-June. Ms. Simpson noted that once there is finalized artwork for the campaign, Queen Creek would promote it through their website and social media. Mr. Huhn commented that this campaign will be similar to the No Burn Campaign in that kits will be sent out containing artwork and language for the ozone campaign. Ms. Simpson stated that Queen Creek is happy to help in the campaign and noted that Queen Creek has a high commuter population. Mr. Huhn indicated that he appreciates all the support for the campaign.

Beverly Chenausky, Arizona Department of Transportation, suggested using "rake it up" instead of "sweep it up" for the Saturday campaign character so that more residents would think of lawn and garden equipment instead of sweeping their home. Mr. Huhn replied that this is an option in which the County has also contemplated making Saturday about low volatile organic

compound (VOC) paints instead of the lawn and garden equipment. He indicated that the challenge is educating residents on the impact leaf blowers, lawn mowers, and other lawn and garden equipment have on ozone. Mr. Huhn commented that the ozone campaign is a tougher message to convey as opposed to the No Burn Campaign because ozone is not visible.

Mr. Conner asked about the length of the campaign. Mr. Huhn responded that the campaign is aiming to target as much of the summer and ozone season months as possible, but mainly July and August. He indicated that the billboards and radio spots would run the month of July going to mid to late August.

6. Development of the 2014 Periodic Emissions Inventory

Taejoo Shin, Maricopa Association of Governments, provided an overview on the development of the 2014 Periodic Emissions Inventory. He stated that MAG is working with the Maricopa County Air Quality Department on the 2014 calendar year periodic emissions inventories for ozone precursors and PM-10 that are being developed for Maricopa County and the nonattainment areas. Mr. Shin indicated that the inventories for ozone precursors include annual and ozone season-day emissions of VOC, nitrogen oxide (NOx), and carbon monoxide (CO). The PM-10 inventory includes annual and daily emissions of PM-10, PM-2.5, NOx, sulphur oxides (SOx), and ammonia (NH_3). He stated that the County-level emissions for 2014 are required to be submitted to EPA's National Emissions Inventory. The nonattainment area emissions inventories are included and required in air quality plans for attaining and maintaining EPA air quality standards.

Mr. Shin continued reporting on the 2014 Periodic Emissions Inventory. He mentioned that MAG develops emissions for: onroad mobile sources; nonroad mobile sources; biogenic sources; and three area sources, which include windblown dust, dust from offroad recreational vehicles, and dust from unpaved parking lots. Maricopa County Air Quality Department develops emissions for: point sources; most area sources; and one nonroad mobile source, locomotives. The Maricopa County Air Quality Department is responsible for the publication of the final periodic emissions inventory.

Mr. Shin discussed the onroad mobile source emissions. He stated that MAG utilizes EPA's Motor Vehicle Emission Simulator 2014 (MOVES2014) that calculates onroad and off-network vehicle emissions. He noted that off-network vehicle emissions include engine starting, parking, and idling emissions. The inputs for MOVES2014 include: hourly meteorology data such as temperature and humidity; vehicle registration, provided by the Arizona Department of Transportation, which includes vehicle population by vehicle type and model year; fuel inspection data, provided by the Arizona Department of Weights and Measures, include Reid Vapor Pressure, fuel sulfur percentage, and oxygen percentage; inspection and maintenance programs from ADEQ, which is one of the most important inputs, screen malfunctioning vehicles, and have them repaired. Both VMT and vehicle fleet speed data are derived from the MAG TransCAD model outputs.

Mr. Shin stated that the TransCAD modeling outputs are important in the development of onroad mobile source emission inventories. The TransCAD outputs provide approximately 120,000 link data for four time periods: AM peak (6 a.m. to 9 a.m.), midday (9 a.m. to 2 p.m.), PM peak (2

p.m. to 6 p.m.), and night time (6 p.m. to 6 a.m.). Mr. Shin indicated that the TransCAD modeling outputs include link specific travel time and traffic volume by area type, road type, and vehicle type. He noted that TransCAD outputs provide so many link data that they are difficult to process manually, therefore MAG staff developed the MOVESLINK2014 model.

Mr. Shin reported on the MOVESLINK 2014 that is designed to utilize link specific data to calculate onroad mobile source emissions for the periodic emissions inventory, regional transportation conformity analysis, and photochemical air quality modeling analysis. The model was coded with Python programing language and Geographic Information System technology. MOVESLINK 2014 employs a bottom-up method: link-specific vehicle fleet emissions are calculated using link-specific VMT and speed data by road type, vehicle type and area type, that are subsequently summed to estimate county or sub-county level emissions. The top-down methodology calculates total county emissions using county-level VMT and speed data. The County emissions are disaggregated into sub-county level emissions using a spatial surrogate (population density and distribution). Mr. Shin noted that the top-down method is less accurate than the bottom-up methodology since the spatial surrogate cannot perfectly account for vehicle emissions distribution and the link specific traffic congestion emissions cannot be addressed by the top-down methodology. Therefore, MAG utilizes the more accurate bottom-up approach for MOVESLINK 2014. In addition, MOVESLINK 2014 estimates hourly, gridded, and chemically speciated emissions for photochemical air quality modeling analyses.

Mr. Shin provided an overview of the nonroad mobile source emissions which are calculated by the EPA NONROAD2008a model. The NONROAD2008a model calculates emissions for the following sources: agricultural equipment; construction, commercial, and mining equipment; industrial equipment; lawn and garden equipment; pleasure craft and recreational equipment; and railway maintenance equipment. The nonroad emissions calculations are dependent upon equipment types, fuel types, usage, deterioration rates, population, age, and power load factor. The NONROAD2008a inputs include temperature, Reid Vapor Pressure, sulfur and oxygen content percentage.

Mr. Shin indicated that MAG is utilizing the Federal Aviation Administration's Emissions Dispersion Modeling System (EDMS) 5.1 to develop airport emissions. The EDMS model calculates aircraft, auxiliary power unit, and ground support equipment emissions for 15 airports in Maricopa County. Emissions are calculated for four aircraft categories: air carrier, air taxi, general aviation, and military. Mr. Shin noted that air carrier and air taxis are a commercial category where flights are regularly scheduled. The categories are distinguished by the number of seats; air carriers have at least 60 seats and air taxis have less than 60 seats. General aviation is private aircrafts for personal use. The inputs for airport emissions include: the number of aircraft operations or the number of landing and takeoff cycles - landing and takeoff are considered two separate operations; fleet mix data; and aircraft monthly, daily, hourly operation profiles. Mixing height data are developed using AERMOD model that utilizes Sky Harbor Airport surface and Tucson upper air meteorology data.

Mr. Shin discussed biogenic source emissions. The natural source emissions include lightening NOx and volcanic eruptions. He stated that natural source emissions for the area are mainly vegetation emissions. The Model of Emissions of Gases and Aerosols from Nature (MEGAN) 2.1 calculates the vegetation VOC and soil microbial NOx emissions. Model inputs include:

modeling domain information; hourly meteorological data (including temperature, solar radiation, humidity, wind speed) from Weather Research and Forecasting meteorological model outputs and/or monitor data; vegetation emissions factors; leaf area index or foliar density; and plant functional type. Mr. Shin noted that the last three inputs are provided by the model itself; however, the input files can be updated with local data.

Michael Denby, Arizona Public Service, inquired how biogenic emissions are determined by area. Mr. Shin replied that the modeling domain is defined in the MEGAN model; it will calculate the total modeling domain emissions. Mr. Denby asked if the model knows about the amount of vegetation. Mr. Shin responded that the model inputs include land use data which includes a percentage of trees and grasses for that area. He noted that the model determines the biogenic emissions based on the trees, foliage, or agriculture in that area. Mr. Shin stated that land use data is broken into categories in which each category has specific emission factors that are included in the modeling domain.

Joe Gibbs, City of Phoenix, inquired if the model accounts for southwest vegetation. Mr. Shin replied that there are two biogenic emission models, MEGAN and the EPA Biogenic Emission Inventory Model. He explained that the EPA model was based on east coast vegetation factors; however, the MEGAN model contains southwest vegetation factors. Mr. Shin reported that in 2005 MAG worked with Environ, an environmental consultant, who enlisted the help of a well-known professor of the Biogenics Emissions Inventory Model, to measure desert tree and vegetation emission factors, which were then applied to the MEGAN model. He stated that the MEGAN model is the most accurate biogenic model for the southwest since desert vegetation factors are included in the model. Ms. Bauer added that the MEGAN model was developed for this area with very specific data applicable to the region. She indicated that the professor created an inventory for the region that is updated with current land use data. Ms. Bauer stated that different vegetation in the area have varying levels of isoprenes emitted that can contribute to ozone. She noted that some vegetation and trees were better than others with regard to ozone formation. She mentioned that it was a very interesting study that was developed specifically for this region.

Mr. Gibbs asked if an accommodation is given by EPA for biogenic emissions. Ms. Bauer responded that for a Moderate Area plan, the 15 percent reduction for reasonable further progress is calculated for man-made emissions only. She added that when modeling ozone concentrations for an attainment demonstration, the biogenic emissions are factored back into the photochemical grid model. She mentioned that MAG utilizes the CMAQ and CAMx model. Mr. Shin added that biogenic emissions are used for background emissions. Ms. Bauer commented that biogenics emissions are included for background concentrations that are used in attainment and maintenance demonstrations. Mr. Shin stated that biogenic emissions are a large portion of VOC emissions, therefore biogenic emissions must be included to accurately replicate ozone concentrations and to better model performance.

Drew Bryck, City of Avondale, inquired about biogenic emissions from salt cedars. He added that salt cedars are a challenge in the Tres Rios project. Mr. Shin explained that the professor used a gas chromatography to measure emissions from varying trees and agriculture in the region. Mr. Bryck commented that potentially biogenic emissions could be a defense for the removal of the salt cedars. Ms Bauer responded that she would check to see if the salt cedar was

on the list in the study: however, MAG has not recommended the removal of vegetation. She added that plants and vegetation are good for PM-10 as they help stabilize the soil.

Kai Umeda, University of Arizona Cooperative Extension, asked about the biogenic emissions contribution. Mr. Shin indicated that biogenic emissions contributed approximately 60 percent of VOC in the 2011 Periodic Emissions Inventory. He added that according to a recent EPA study, more than 70 percent of VOC's are biogenic source emissions. Mr. Shin stated that biogenic source emissions are spread out and mainly impact the background concentrations. Anthropogenic source emissions are highly concentrated in the urban areas.

Matt Poppen, Maricopa Association of Governments, provided an overview of the development of emissions for three area sources, which include: windblown dust, dust from offroad recreation vehicles, and dust from unpaved parking lots. He stated that with regard to windblown dust, MAG first identifies land uses capable of producing windblown dust. Mr. Poppen presented a map that displayed land uses that contribute to windblown dust. The next step is to determine the percentage of stable and disturbed land uses through Maricopa County inspection data. Mr. Poppen stated that wind speed data is collected for the entire year from area monitoring stations and applied to the land uses that are nearest the monitors. He indicated that rural monitors cover more land than urban monitoring sites. Mr. Poppen explained that wind speed is multiplied by land use acreage and wind tunnel emission factors to determine PM-10 emissions from each land use. To standardize 2014 windblown dust PM-10 emissions, they are compared to the percentage of 2014 PM-10 concentrations associated with wind speeds of 12 mph or greater. Mr. Poppen displayed a table that shows the percent of PM-10 concentrations associated with high winds using 2014 data. He noted that on average five percent of concentrations at a monitor are association with high winds. Mr. Poppen noted that on an annual basis windblown dust emissions account for approximately five percent of the inventory. He added that this percentage is smaller than the 2011 emissions inventory of 12 percent due to more windblown dust activity in 2011 as compared to 2014.

Mr. Poppen discussed the dust from the offroad recreation vehicles category. He indicated that the EPA NONROAD2008a model provides estimates of the number of offroad vehicles and the annual mileage for offroad vehicles in Maricopa County. The total VMT are multiplied by EPA emission factors for travel on unpaved roads to produce annual and daily PM-10 and PM-2.5 emissions for fugitive dust from offroad recreational vehicles. Maricopa County emissions are allocated to the PM-10 nonattainment area using the ratio of land uses in the PM-10 nonattainment area to Maricopa County. Mr. Poppen reported that approximately 18 percent of the offroad vehicle dust emissions are assumed to occur in the nonattainment area as opposed to Maricopa County where there is more opportunity to ride offroad vehicles.

Mr. Poppen reported on dust from unpaved parking lots. He stated that GIS land use data and prior fugitive dust emissions studies are used to identify and estimate the total acreage of unpaved parking lots in Maricopa County and the PM-10 nonattainment area. Once the land uses are identified, estimates of the VMT on unpaved parking lots are developed assuming an average of 10 vehicles on each lot per day, driving an average distance of 0.031 miles per day. The total vehicle miles traveled is then multiplied by the EPA emission factors for travel on unpaved roads to produce annual and daily PM-10 and PM-2.5 emissions for fugitive dust from unpaved parking lots. Mr. Poppen added that the emissions are strictly dust, they do not include exhaust from vehicles.

Mr. Gibbs inquired about mileage for off-road recreational vehicles in Maricopa County. Mr. Poppen responded that the NONROAD2008a model breaks the mileage down by county for the entire country.

Mr. Poppen indicated that by January 15, 2016, Maricopa County is required to submit county-level emissions to EPA's National Emissions Inventory. In August 2016, the Maricopa County Air Quality Department would publish the final periodic emissions inventories, which would include emissions for the ozone and PM-10 nonattainment areas.

Mr. Poppen stated that the last periodic emission inventories were completed for 2011. He provided pie charts on the annual emissions of VOC, NOx, CO, PM-10, and PM-2.5 for 2011.

7. Call for Future Agenda Items

Acting Chair Conner indicated that the next meeting of the Committee has been scheduled for Thursday, June 25, 2015 at 1:30 p.m. He requested suggestions for future agenda items. With no further comments, the meeting was adjourned at approximately 2:30 p.m.