AGENDA
AIR QUALITY ADVISORY COMMITTEE*
TUESDAY March 29, 2016
10:00 a.m. - 12:00 noon
East-West Gateway Board Room

I. **Call to Order**
-Carol Lawrence, Chair, East-West Gateway Council of Governments
A. Minutes of January 26, 2016 Meeting

II. **Electric Vehicle Program**
- Andy Knott, Missouri Sierra Club

III. **States Response to EPA's 120 Day Letter Concerning Proposed Non-Attainment Areas for Sulfur Dioxide Standard**
- Stacy Allen, Missouri Department of Natural Resources
- David Bloomberg, Illinois Environmental Protection Agency

IV. **2015 Ozone Season Report**
- East-West Gateway Council of Governments

V. **American Fuel Group Report**
- St. Louis Regional Clean Cities Program

VI. **Update Activities of the States**
- Illinois Environmental Protection Agency
- Missouri Department of Natural Resources

VII. **Other Business – Next Meeting Date May 24, 2016**

VIII. **Adjournment**

*Please note that this meeting will serve as a part of the Inter-Agency Consultation Process as detailed in the Missouri Transportation Conformity SIP.

MINUTES
AIR QUALITY ADVISORY COMMITTEE
Tuesday, January 26, 2016
East-West Gateway Board Room

Members Present:
Michael Coulson, Chair, East-West Gateway Council of Governments
Stacy Allen - Missouri Department of Natural Resources
Mike Henderson - Missouri Department of Transportation
Jeremy Rogus - St. Louis County Health Department
David Bloomberg - Illinois Environmental Protection Agency
Joe Gray - Illinois Department of Transportation, District 8
Jack Fishman - St. Louis University
Susannah Fuchs – American Lung Association
Jeanine Arrighi – City of St. Louis

Others Present:
Darcy Bybee – Missouri Department of Natural Resources
Jason Welsh - St. Louis University
Andrew Warshauer - Citizens for Modern Transit
Curtis Jones - Illinois Department of Transportation
Mike Alesandrini – AECOM
Buzz Asselmeier – Illinois Environmental Protection Agency
Bruce Morrison – Great Rivers Environmental Law Center
Andy Knott – Sierra Club
Kimberly Baumann – Mississippi Lime (telephone)
Chad Eggen – Boonslick Regional Planning Commission (telephone)
David Grimes - Southeast Missouri Regional Planning and Economic Development Commission (telephone)

Staff:
Mary Grace Lewandowski David Wilson John Posey Lubna Shoaib
Carol Lawrence Michael Wohlstadter Rodney Halbert

I. Call to Order
- Michael Coulson, Chair, East-West Gateway Council of Governments

The meeting of the Air Quality Advisory Committee (AQAC) was called to order by Chair Michael Coulson, East-West Gateway Council of Governments (EWG). The minutes of the October 27, 2015AQAC meeting were approved as circulated. Those in attendance introduced themselves. Mr. Coulson, EWG, announced that Mr. Herdler of St. Louis Clean Cities Program was unable to attend the meeting today.

II. 2015 Paris Conference of Parties Agreement to Combat Climate Change
- John Posey, Ph.D., East-West Gateway Council of Governments

The legal structure for the Conference of Parties (COP) was set forth by the United Nations (UN) at the Framework Convention on Climate during the 1992 Earth Summit in Rio de Janeiro. President G.H.W. Bush personally led the U.S. delegation and spoke of the importance of this issue and American leadership. The goal of the treaty was to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system. The treaty established the COP as the governing body for this effort and set forth a schedule for meetings. The COP21 was held in Paris in December 2015.

The most well-known COP was COP3 in Kyoto Japan. Out of this meeting came the Kyoto Protocol which would have imposed mandates and committed countries to a percent reduction in greenhouse gas emissions relative to 1990 levels. President Clinton submitted the Protocol to the Senate and the Senate rejected it 95-0. Much of the rest of the world ratified the treaty. But many did not carry out their commitments. The Kyoto Protocol with its imposed mandates is now viewed as an example of the failure of a "top down" approach. After the 1992 Rio meeting, subsequent COPs set 2° as the "line in the sand" level that should not be crossed (increase in global temperature should be below 2°). An alternative approach was first envisioned at the 2010 Cancun COP and was further developed at the 2011 COP in Durban.

The focus of the 2015 Paris COP was a "bottom up" approach where individual countries set their own goals/targets and the method for how they will reach targets/goals. At the Paris COP, the adoption of a 1.5^o goal was urged. Participants reaffirmed the 2° goal. The Paris COP envisions a scenario where emissions would peak by mid-century and decline thereafter. Every country will determine its own Intended Nationally Determined Contribution (NDC) in order to achieve greenhouse gas emission reduction. There are no binding commitments to achieve targets. Countries will make a commitment to measure progress, to report and to transparency. Each country will commit to reviewing their NDC every five years and prepare a new one so commitments can be increased over time. For example, the U.S. NDC calls for a 26-28 percent reduction below 2005 levels which would be achieved by a combination of fuel efficiency, Clean Power Plan and increase in CAFÉ standard. Important to note that the U.S. did not propose to use carbon trading market as many countries did.

Mr. Coulson, EWG, said that historically the global carbon dioxide (CO_2) measuring station was located in Hawaii and asked if temperature is measured there. Mr. Posey, EWG, said that there are temperature monitors around the world. Mr. Fishman, Saint Louis University (SLU), said there are temperature networks operated by NOAA in Nashville, NASA in New York City and one in the United Kingdoms with thousands of land and ship monitors as well as satellites.

There are two main criticisms of the Paris COP. First, there is concern about the effectiveness of the NDC approach. Prior to the Paris COP all of the participating countries submitted their NDC to the UN conference staff for tabulation. The pre-conference report stated: "Find the implementation of the communicated climatic NDCs is estimated to result in aggregate global emission levels of 55.2 gigatons of CO_2 equivalent in 2025 and 56.7 gigatons of CO_2 equivalent in 2030." According to modeling by the Intergovernmental Panel on Climate Change (IPCC), in order to stay below the 2° threshold, global emissions have to remain below 2,900 gigatons of

carbon dioxide (CO_2) equivalent. Since the beginning of the industrial revolution, 1,900 gigatons of CO_2 equivalent have been emitted leaving 1,000 gigatons available. According to the IPCC, in 2010 global emissions were 49 gigatons a year. If emissions could be stabilized at the 2010 level, it would be 20 years before the 1,000 gigaton budget was exhausted. The proposed NDCs do not keep us below the 1,000 gigatons limit. Proponents of the Paris treaty freely acknowledge this issue and emphasize that the treaty's framework is the start of the process. The transparency in reporting can strengthen confidence that all are doing their fair share. Another criticism is about how legally binding this treaty is. The commitments to goal setting, reporting and transparency are legally binding. However, the commitment for a participating country to actually take any steps to reduce CO_2 emissions is not legally binding.

The Paris treaty will be signed on Earth Day (April 22) at the U.N in New York. It will take effect when 55 countries, accounting for 55 percent of global emissions, ratify it. The treaty would go into effect in 2020. A lot of less developed countries have conditioned their goals on the receipt of financial assistance from developed countries.

Mr. Coulson, EWG, asked if the treaty had any enforcement mechanism to ensure no back-sliding. Mr. Posey, EWG, said that he was not aware of anything like that.

III St. Louis Mobile Source Greenhouse Gas Emissions Study
- John Posey, Ph.D., East-West Gateway Council of Governments
- Michael Wohlstadter, East-West Gateway Council of Governments

Over the last year, EWG and their project partner, SLU, have been working on a toolkit (conceptual data model) to estimate transportation-related greenhouse gas (carbon dioxide or CO_2) emissions at regional and sub-regional geographic areas as defined by the user.

One reason for the interest in developing such a toolkit is that the protection of air quality resources is one of the guiding principles of Connected 2045: The Long Range Transportation Plan for the St. Louis Region. The OneSTL: The Regional Plan for Sustainable Development has as one of its goals reductions in greenhouse gas emissions. In addition, EWG has been contacted by a few municipalities who are interested in doing their own greenhouse gas emissions inventory. The toolkit might be useful in providing technical assistance.

A major element was the examination of the inputs and sources of data used in the MOVES model to see if they could be refined. This step was performed by Lubna Shoaib of EWG and SLU graduate student Jason Welsh. Next, post-processing tools would be developed to make it easier to deal with MOVES output. After that visualization tools would be prepared to present results of post-processing. As the project progressed, staff decided that one tool could be developed which would accomplish the second and third steps. Michael Wohlstadter of EWG developed the toolkit. The last step is to share results and lessons learned.

The toolkit uses output from the emissions rates mode of the MOtor Vehicle Emission Simulator (MOVES) model. This model produces on-road emission estimates of transportation-related criteria pollutants and precursors which are used in EWG's transportation air quality conformity determination process. MOVES can also be used to estimate emissions of greenhouse gases. The emissions rates mode output is a set of emission rates stratified by time of day, day of the

week, month, vehicle type, road type and speed. These emission rates then can be applied to local vehicle miles travelled (VMT) information.

The data processing platform chosen was the open source (freely available) Python Language. For the geoprocessing element of the toolkit, staff initially used ERSI suite of ARC-GIS (proprietary). So that there would be an open source alternative the SpatiaLite program was selected. Estimates of VMT for main roads and local roads used in the toolkit come from EWG's travel demand model. In the travel demand model main roads are roughly equivalent to real world road and local roads are represented by centroid connectors. In order to analyze centroid connectors, transportation analysis zones (TAZs) are used. The final spatial data utilized in the toolkit is the selected analysis area which could be grid cells, county or municipal boundaries, zip codes or even neighborhoods. Toolkit takes the selected geography and associated transportation network to identify the VMT within a specific area. VMT is applied to the MOVES-generated greenhouse gas emission rates. For geoprocessing, the toolkit uses existing third party geoprocessing libraries (either the proprietary ESRI suite packaged with ARC-GIS or the open source PyspatiaLite/SpatiaLite). First, VMT and spatial data is loaded into the toolkit and then the stratified emission rates generated by MOVES. Then, the geoprocessing script is run. The script itself is a suite of scripts (computer processing commands) directing the operation of the toolkit. During the course of the study found that PyspatiaLite runs faster than ESRI ARC-GIS. With the SpatiaLite extensions to SQLite, spatially aware commands can be issued in the SQL statement and are performed in the database itself. Processing is faster because it is happening at the database level. There are other open source options available. Emissions estimates for CO_2 can be presented in grams, pounds or by metric tons.

The toolkit 2015 was used to calculate annual on-road CO_2 emissions by grid cell for the region. Emissions are higher in the urban core and along the interstates which conforms well to what was expected. When emissions are projected out to 2045, find that emissions are generally lower due to the rising CAFÉ standard. When the change between 2015 emissions by grid cell to 2045 estimates is calculated, a slight increase is observed in the peripheral areas. It is expected that in the coming decades population and employment growth in urban core is likely to remain stable or even slightly decrease while more robust growth is going to take place at the periphery. Maps showing CO2 emissions estimates by corridor, zip code and TAZ were also presented.

One lesson learned from this effort was that the travel demand model contains imperfect line network. If the border of a TAZ is not perfect, emissions estimates could be placed in the wrong selected geography. Allocating emissions on major arterials to one side of the road or the other can be challenging. Because of this the preferred method is to use grid cells. With TAZs travel volume on local roads is represented by centroid connectors. A different set of rules is needed when dividing up a TAZ into grid cells and allocating volume on those centroid connectors. Another lesson learned was that the MOVES model contains more vehicle types. In the travel demand model, VMT distribution is done at a higher level of aggregation. Population was used as an analog in order to factor VMT down to vehicle source type levels used in MOVES.

Mr. Knott, Sierra Club, asked if CO_2 reductions for 2025 had been estimated. Mr. Posey, EWG, said they could get this information for him. Ms. Shoaib, EWG, pointed out that there is uncertainty that far out for model VMT and population inputs. Mr. Wohlstadter, EWG,

observed that the focus of this project was on-road vehicle emissions which make up 20 percent of total emissions. Ms. Allen, MoDNR, said that state does not calculate greenhouse gas emission estimates. She added that MOVES includes version of CAFÉ standards out to a certain end point. After 2025, reductions level out because model is only taking into account the turnover of the oldest vehicles.

Mr. Fishman, SLU, said this was an excellent study. He then asked if there was a carbon dioxide National Ambient Air Quality Standard (NAAQS) and how did this project fit into the context of air pollution in the region. Mr. Coulson, EWG, said that carbon dioxide has never been presented as a criteria air pollutant. Ms. Allen, MoDNR, said that EPA built the greenhouse gas estimation module in MOVES for information purposes as there is interest. Communities may want to conduct on-road greenhouse gas inventories.

Mr. Warshauer, Citizens for Modern Transit (CMT), asked if the toolkit could be used to model the impact of transit lines. Ms. Shoaib, EWG, replied that it could but transit ridership is only two percent, so a small transit line may not show up.

Mr. Coulson, EWG, asked about next steps. Mr. Posey, EWG, said that people could e-mail for a copy and as improvements are made, send out updates. The report will be posted on EWG web site. EWG would like to share the code developed and next year hope to find some projects to apply this toolkit. EWG would like to investigate if such a tool could be used in corridor studies.

IV Proposed Federal Cross State Air Pollution Rule Update for 2008 Ozone Standard - Stacy Allen, Missouri Department of Natural Resources

Earlier transport rules addressing the interstate transport of air pollutants had been challenged in court. In 2011 EPA developed the Cross State Air Pollution Rule (CSAPR) for the 1997 ozone standard. This transport rule addressed annual sulfur dioxide (SO_2), annual oxides of nitrogen (NO_x) and ozone season NO_x emissions. The aim is to reduce the impact of interstate transport of air pollutants on downwind area's ability to meet ozone and fine particle (PM2.5) standards. The focus is on fossil fuel-fired electric generating units (EGUs) that produce electricity.

Missouri as a whole impacts the air quality of some downwind states. For the last several years, Missouri has been implementing 2011 CSAPR. For the states covered by CSAPR, EPA created a statewide budget (maximum emissions limit) and identified an annual emissions limit (allowance allocation) for each affected EGUs. Facility has to have enough allowances to cover emissions annually or summer season. Each facility can decide how to comply with the requirements. 2015 was the first year that facilities had to comply with the 2011 CSAPR requirements.

EPA modeled downwind impact areas based on the 2008 ozone standard and found that, depending on the day, emissions from Missouri impact other states like Texas, Michigan and Illinois. EPA gave the states an opportunity to comment on this analysis. Missouri provided comments and EPA revised their modeling. In December 2015 EPA proposed an updated CSAPR rule based on this revised modeling. Comment period ends on February 1. It is to be

finalized in October 2016. If rule is finalized as proposed, emission reductions would start in May 2017.

The proposed CSAPR primarily affects eastern states plus Kansas, Oklahoma and Texas. Due to the revised modeling, some states in the southeast, like Georgia, were excluded. In the proposed rule, EPA set statewide budget for each affected states and used an allocation method to give each facility with EGU(s) a certain amount of allowances. The proposed budget for Missouri calls for a 30 percent reduction in ozone season NO_x. No other pollutants were addressed. MoDNR is evaluating whether the total statewide budget reductions are reasonable for the state. EPA is proposing to spread out allowances to all affected units. Missouri has over 100 affected EGUs and some are grouped together. The majority of affected EGUs in the St. Louis area are owned by Ameren. In early January MoDNR held a telephone stakeholders meeting with all the affected facilities/utilities but one to get their perspective on this proposal. MoDNR wanted to learn if the approach was doable and were there any technical issues or problems. National utility groups are reviewing this proposal and doing their own modeling. Some of the affected facilities shared their comment letters and associated data with MoDNR.

One problem identified by Missouri facilities is that EPA's model shows that, in future years, some of their EGUs are going to shut down. Facilities have indicated that such a shutdown is not in their long-term plan. Also, some facilities have expressed some disappointment about how the allowances were given out. Facilities are saying that their units are well controlled and that they do not intend to reduce operations by 20 percent and there is no way to add on controls after the finalization of the rule in October 2016. If a facility indicates that it cannot control emissions or reduce operations enough to meet its allowance as of May 2017, it can go out to the EPA-operated power sector emissions trading program and buy allowances from other utilities.

One concern Missouri had with the 2011 CSAPR was that several of the smaller municipal units, located in rural areas, did not get any allowances at all. These units typically run a little in the summer during peak demand times. MoDNR had to use the state rule-making process to give one unit an allowance. With the 2015 proposal, one unit received an allowance and one did not. This concern is going to be mentioned in MoDNR's comment letter as MoDNR would like EPA to address that issue since it affects the utility's ability to comply with rule. If rule goes into place as is, Missouri will have to change one state rule. As the proposed federal rule is written, 2017 allowances cannot be changed but in 2018 can shift allowances.

Mr. Coulson, EWG, asked if it is anticipated that EPA will move forward with this time frame. Ms. Allen, MoDNR, replied that EPA probably would. The goal of the proposed rule is to provide emissions reduction in time to affect the marginal and moderate 2008 ozone non-attainment areas as they have some requirements starting in 2017. EPA is trying to get reductions in a timely and economical fashion and focused on EGUs because there are some easily identifiable and fast add-on controls to achieve reductions by 2017.
Mr. Bloomberg, Illinois EPA, said that their comments on this proposed rule are under reviewed internally. Illinois and many states are having a problem with the way EPA did the base modeling. EPA used the Integrated Planning Model (IPM), developed by a consultant. IPM is a "black box" model, so do not know how it works. For the base modeling, EPA chose to include assumptions about the impact of the Clean Power Plan which are not going to occur until

about 2022. EPA is making 2017 allowances based on the Clean Power Plan. The model shows five to seven power plants to shut down in Illinois because for these facilities it will be too expensive to meet the requirements of the Clean Power Plan. Illinois EPA has learned that these facilities have power contracts and will be in operation at least out to 2020. Maybe closings will happen in 2022 or not but it is not going to happen in 2017. In their calculation, EPA used a $1,300 per ton cost emission reduction estimate. The problem is that EPA has already factored in all these shutdowns. If there are no facility shutdowns, it will cost a facility a lot more to reduce emissions. Many of the Midwest states see a similar problem and want EPA to re-run IPM. EPA is under a tight timeline and wants to get this rule done. States in the northeast want the rule finalized. It is the view of the Midwest states that it is more important to be right than fast.

Another problem observed was that to calculate allowances EPA just used operations in 2014 as a baseline. Normally a three to five year baseline of operations is used so that downtime at an EGU can be averaged out. This is a problem because for part of 2014 one Illinois facility was out of operation due to the installation of pollution controls. Because of that they are getting penalized for not producing electricity. Illinois does not have its own rule to re-allocate allowances and relies on the federal rule.

Mr. Coulson, EWG, asked if the model assumed that the Wood River power plant was going to shut down as Dynegy has announced it will shut down this year. Mr. Bloomberg, Illinois EPA, replied that Wood River and a facility in Will County hurt Illinois' argument because they did not inform us that they were going to shut down. Illinois EPA specifically called all the companies involved and found they have bid power contracts out to 2019. If a company has a power contract, they cannot shut down. In Mr. Bloomberg's opinion, for EPA to think that these facilities are going to be shut down by 2017, goes against reality.

Mr. Knott, Sierra Club, said that at a public meeting in Alton about closing of the Wood River power plant, the CEO of Dynegy said the decision was based on market economics. Mr. Bloomberg, Illinois EPA, said that as part of the SO_2 Consent Decree designation round, Illinois EPA had recommended attainment for this power plant. Dynegy's problem is that Illinois is a de-regulated state for power while Missouri is not. Missouri utilities have a set cost/price per megawatt and any electricity they can sell elsewhere such as Illinois is extra profit. Illinois utilities cannot compete with guaranteed income and extra profit. It makes sense to take into consideration power plant shutdowns as result of Clean Power Plan as it will have an effect. Power plants will close but do not know how many, which utilities or when.

V Update Activities of the States
- Stacy Allen, Missouri Department of Natural Resources
- David Bloomberg, Illinois Environmental Protection Agency

EPA is approving Missouri's Early Progress Plan for the St. Louis area for the 2008 eight-hour ozone standard. The Federal Register notice was published earlier this month. The Early Progress Plan shows there will be continued reductions in emissions by the 2015 attainment date. New motor vehicle emissions budgets were set using MOVES for use in Conformity (found adequate for Conformity in October 2013).

The St. Louis area did attain the 2008 ozone standard in 2015. MoDNR will submit a Clean Data Determination request letter to EPA. Next, MoDNR will work to have EPA redesignate the St. Louis area to attainment of 2008 standard. Missouri will be coordinating with Illinois. Over the next several months, MoDNR will be developing boundary recommendations (attainment, non-attainment) for the 2015 ozone standard. They are due October 2016. MoDNR continues to model the SO_2 consent decree sources in order to come up with limits which can be used in state rules. MoDNR has begun rule-making on SO_2 rules as two sources (Springfield and Empire Electric) were identified as needing additional study under the consent decree round.

Mr. Bloomberg, Illinois Environmental Protection Agency (Illinois EPA), asked if EPA Region 7 told MoDNR to submit a Clean Data request. Ms. Allen, MoDNR, replied that EPA Region 7 asked them to draft a letter. Mr. Bloomberg said that EPA Region 5 told Illinois that Region 5 would do the Clean Data request.

The permit fees rule and asbestos fee rule have been approved by the Missouri Air Conservation Commission (MACC). The rules will take effect starting in 2016.

Mr. Fishman, SLU, asked if the MACC vacancies had been filled. Ms. Bybee, MoDNR, said that in December the Governor appointed Jack Jones, emeritus professor forestry at University of Missouri and Donald Drysdale, an attorney from the St. Louis area.

Illinois is moving forward with their redesignation request for the 2008 ozone standard. EPA Region 5 pointed out to Illinois EPA that although 2015 brought Illinois into attainment (Chicago and Metro East), redesignation is not a done deal. Illinois will submit redesignation request in 2016. The review by EPA probably is not going to be finished until part way through the 2016 ozone season. If there is a bad 2016 ozone season, then there could be problems. This is more of an issue with the Chicago area than the Metro East.

Mr. Coulson, EWG, asked what would happen if Chicago is bumped up to moderate under the 2008 standard and designated as marginal under the 2015 standard. Mr. Bloomberg, Illinois EPA said that, hopefully, the Chicago area will be redesignated to attainment under the 2008 standard before EPA makes designations for the 2015 standard. It is possible to have different designations at the same time.

At the end of 2015, there was clean data in Granite City for lead. The data is being certified and submitted to EPA Region 5. Shortly thereafter, EPA will issue a Clean Data Finding. EPA has not acted upon the lead Attainment Demonstration State Implementation Plans (SIPs) for the Chicago and Granite City non-attainment areas. Illinois is going to withdraw the Granite City SIP and re-submit it as a redesignation request. The company in Granite City which caused the problem has installed controls.

Illinois is waiting to hear from EPA concerning their boundary recommendations for the SO_2 consent decree sources. The only recommendation for non-attainment was for a small area around the Alton Steel facility. Assume EPA will agree with this non-attainment recommendation. Hopefully, Alton Steel is already working on their stack problem. Illinois recommended that the area around the Dynegy Wood River power plant be designated as attainment. This will probably happen as Dynegy has announced that this plant is going to

close. There will be another round of designation recommendations based on the Data Requirements Rule. Some of the sources recommended by Illinois for additional study include: Kincaid Generation in Christian County; Rain CII Carbon in Crawford County; DTE Tuscola in Douglas County; Dynegy Baldwin power plant in Randolph County; Prairie State Generating in Washington County; and US Steel and Gateway Energy in Madison County. DTE Tuscola is in the process of converting to compressed natural gas. All of these sources will be modeled. Two sources in Macon County are working together to have monitors installed instead.

VI. Other Business

The next meeting of the AQAC was scheduled for March 29, 2016. There being no other business, the meeting of the Air Quality Advisory Committee was adjourned.