

Scope of Work for Regional Air Quality Study

This scope of work (SoW) identifies tasks for Regional Air Quality Study funded by City of Austin and carried out by the Capital Area Council of Governments (CAPCOG). Following execution of this agreement, CAPCOG's SPOC will provide a detailed work plan for carrying out the study. Upon finalization of the study work plan, CAPCOG will submit an invoice to the City of Austin for the amount detailed in Section II of this ILA. The final deliverable for this scope of work would be a report that would be submitted to the City of Austin and presented to the Clean Air Coalition and any of the City's boards or commissions which the City wished to receive this information.

Task 1: Extended Analysis of On-Road Activity and Air Pollution Data Potentially Affected by COVID-19 Behavior Change

In April 2020, CAPCOG released a brief analysis of the potential air quality impacts associated with COVID-19-related behavior change and changes in on-road vehicle use. Under this task, CAPCOG will expand this analysis to cover a broader period of time, compare data week by week, include other analysis of emissions-generating activity and background air pollution levels during this period, or other analyses to try to expand our understanding of differences in ambient air pollution concentrations measured since March 2020 to comparable periods in 2017 – 2019. This option may shed additional light on why, for example, carbon monoxide and particulate matter concentrations were higher in March and April 2020 compared to the same periods from 2017 – 2019 despite lower traffic counts, and the extent to which the lower concentrations of NO₂ and O₃ for these same periods can be explained by the reduction in local traffic versus other potential explanations.

Task 2: Estimate the Impact of Increased Telecommuting Related to COVID-19 on On-Road Emissions

The widespread use of extended telecommuting as a result of COVID-19 has coincided with significant changes in on-road vehicle activity, thereby affecting on-road vehicle emissions in a number of ways:

1. A reduction in “start” exhaust emissions and “hot soak” evaporative emissions due to fewer trips between home and work;
2. A reduction in “running” exhaust emissions, “tire wear” emissions, “brake wear” emissions, and evaporative emissions occurring during vehicle operation due to reduced vehicle miles traveled associated with the reduction in trips between home and work;
3. A reduction in refueling evaporative emissions due to reduced fuel consumption;
4. Changes in average rates of “running” exhaust emissions, “tire wear” emissions, “brake wear” emissions, and evaporative emissions occurring during vehicle operation for the remaining vehicles on the road due to improved traffic flow that would occur with fewer passenger cars on the road.

Depending on a road's free flow speed, existing levels of congestion, average vehicle characteristics along that road, and pollutant type, improving traffic flow may either reduce or increase emissions.

Under this task, CAPCOG will estimate the impact of telecommuting related to COVID-19 on on-road emissions within the region.

Task 3: Model the Ambient Air Quality Impact of Reductions in On-Road Emissions Related to COVID-19

With the large reductions in on-road vehicle activity coinciding with the COVID-19 crisis, many people were interested in knowing what type of air quality impact the reduction in traffic may have had. Since there are many different variables that can affect the recorded concentration of the various types of air pollution monitored in the region apart from changes to on-road vehicle activity, this type of question is most appropriately answered by conducting photochemical modeling of the impact of a reduction in on-road vehicle emissions in ambient air pollution concentrations, since such an approach would hold all other variables (i.e., meteorology, emissions from other sources, land use) constant, thereby isolating the effect of the change in on-road emissions from other potential explanations for changes in air pollution concentrations.

Based on prior experience conducting these types of analyses through contracts with the Alamo Area Council of Governments (AACOG), CAPCOG expects to need approximately \$2,500 - \$3,000 per modeling “run” for these types of analyses, if CAPCOG contracted with AACOG to carry this work out. AACOG would need to perform at least two model runs – a baseline and a “control” scenario – for this study. Depending on funding availability for this Task, additional model runs might include:

- Model different types of ground-level pollution concentrations;
- Differentiate the impact of reductions in emissions from light-duty vehicles versus heavy-duty vehicles;
- Differentiate the impact of start emissions, which are associated with the # of trips, from “running” emissions, which are associated with vehicle miles traveled;
- Differentiate the impact of emission reductions along specific corridors from broad, across-the-board reductions; and
- Differentiate the impact of emissions reductions during different times of the day.