Reducing GHG Emissions While Protecting Public Health

Extended Abstract #51

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INTRODUCTION

The most efficient way to reduce greenhouse gas (GHG) emissions from land use development is to build infill and mixed-use projects that place people within close proximity of various commercial, recreational, and educational destinations. It is well documented that less reliance on private automobiles, more use of transit, walking, cycling, and more land-conserving compact development, instead of sprawl land use, will reduce GHG production by reducing vehicle miles traveled per household.[1] However, in some situations, these efficient land-use strategies may place sensitive receptors within close proximity of sources of toxic air contaminants (TACs) such as freeways, gas stations, dry cleaners, railroads, power plants, and industrial uses, and can have serious health consequences, including increased rates of asthma, heart attacks, and premature death.[2]

In sum, proximity of people to destinations helps meet GHG reduction goals, but also may expose people to toxic air contaminants. The simplest way to protect people from TACs is to create buffer zones between sensitive receptors and sources of TACs. Thus, these competing mitigations create a conflict for planners seeking to meet both policy goals.

In order to protect public health and meet GHG reduction goals, planners need the analytical tools and methodologies to accurately assess the potential adverse impacts and a suite of mitigation strategies that can be applied to lessen any impacts. This paper presents some of the tools that BAAQMD has developed to help planners analyze TACs. These tools represent large improvements compared to what has existed prior to the District's new California Environmental Quality Act (CEQA) Air Quality Guidelines. More work is needed to create accessible analytical tools and to identify feasible mitigation measures that can be implemented by projects to protect sensitive receptors from TACs. For example, analytical tools that help planners quickly determine if an impact exists or the size of a buffer zone (or other mitigation measure) would increase the chances that potential adverse impacts would be identified during the CEQA process and mitigated to protect public health while still reducing GHG emissions.

UPDATED CEQA GUIDELINES AND ANALYSIS TOOLS

As a public health agency, BAAQMD is working to improve local and regional air quality and reduce exposure to harmful air pollutants. Toxic air contaminants represent a defined set of air pollutants, such as benzene and fine particulate matter that pose a present or potential hazard to human health. TACs are emitted from a wide range of sources including industrial processes, cars, and trucks. Diesel particulate matter from mobile sources, such as heavy-duty diesel trucks, construction equipment, locomotives, and ships accounts for most of the cancer risk associated

from TACs in the Bay Area. Diesel particulate matter is a known carcinogen and has been linked to cardiovascular and lung diseases.[3] Reducing emissions of and population exposure to toxic air contaminants and diesel particulate matter (collectively, "TACs") as well as particulate matter less than 2.5 micrometers in aerodynamic diameter ($PM_{2.5}$), and meeting state GHG reduction goals, are key priorities for BAAQMD.

To that end, BAAQMD updated its California Environmental Quality Act (CEQA) Guidelines in June of 2010 (the "2010 CEQA Guidelines") and adopted new thresholds of significance for criteria pollutants, GHGs and toxic air contaminants, and developed new analytical tools and methodologies to be used during environmental review of plans and projects subject to CEQA.[4]

BAAQMD's adopted GHG thresholds of significance allow lead agencies to tier off a qualified GHG Reduction Strategy, or to quantify metric tons of carbon dioxide equivalent (CO_2e) from project operations and determine significance by comparing CO_2e totals to one of two numeric thresholds. To assist with this analysis, BAAQMD developed the BAAQMD GHG Model (BGM) and produced instructional training videos on how to use the BGM, all available to download from our webpage. In addition, BAAQMD contributed financially and substantively to the development of the *CAPCOA GHG Mitigation Quantification Report*, which contains numerous strategies for analyzing and mitigating GHG emissions in projects and plans.

As an example of how these thresholds and tools can be effective, consider a comparison between a CEQA document produced before the 2010 CEQA Guidelines were released and a CEQA document produced after the 2010 CEQA Guidelines were released, both analyzing a mixed-use residential project. The pre-2010 document quantifies the metric tons of CO_2e produced from project operations, but a significance determination is not made because the project's incremental contribution to cumulative GHG emissions is considered too speculative. In contrast, in a post-2010 document, the same lead agency did not have to quantify CO_2e from the project because of their adopted qualified GHG Reduction Strategy, and determined that the project was consistent with the GHG Reduction Strategy and therefore project impacts would be considered less than significant. The 2010 CEQA Guidelines helped to clarify thresholds of significance, created several options for lead agencies to determine significance, and in this case streamlined the project's CEQA process.

BAAQMD's adopted risk and hazard thresholds of significance also allow land-use project proponents to tier off a Qualified Community Risk Reduction Plan or to quantify increased cancer risk, non-cancer risk, and $PM_{2.5}$ emissions and determine the significance of project impacts by comparing these metrics to BAAQMD adopted risk and hazard thresholds.[5] As part of an effort to provide tools and help streamline the process, BAAQMD has also developed screening tools and strategies to analyze and mitigate TAC emissions, which are presented below:

- Google Earth map tools to help identify the location and screening-level risks for stationary sources and Bay Area freeways.
- Screening Level Tables to determine risk from Bay Area roadways.
- The BAAQMD document *Recommended Methods for Screening and Modeling Local Risks and Hazards* describes in detail how to screen and model risk and hazards from stationary,

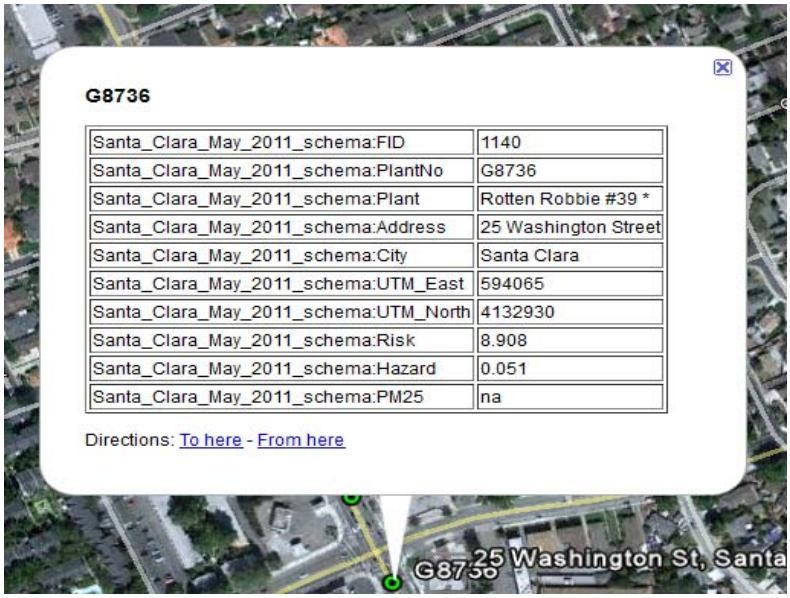
highway, and roadway sources and discusses the assumptions and methodologies used in developing the stationary source, highway, and roadway screening tools.

BAAQMD continues to develop tools for risk screening and streamline the review process. Currently under development is a model to screen risks from construction activities. BAAQMD is surveying local construction firms to develop a database of equipment type and usage rates. This will ensure that the construction model is robust and reflects regional practices. Also under development is a railroad line screening tool that will function like our Google Earth freeway tool. Users will be able to download a file and click on railroad links that will have screening values that reflect local meteorology, rail line use frequency, and emissions from the engines in use on the line. Finally, BAAQMD is drafting a document to help streamline the application of mitigation measures. For example, users will be able to quickly identify appropriate mitigation measures and the decrease in emissions or exposure associated with its application.

Note that the available tools and those under development are designed to assist planners with screening-level activities and choosing mitigation measures. The screening-level tools are designed to help planners determine if more extensive modeling is needed. In some cases, screening will show more sophisticated site-specific modeling is needed. However, there remains a vast difference between a simple screening and the amount of expertise, time and funds needed to complete more complicated, intensive modeling activities. Thus, tools that can help to conduct more sophisticated analysis, while still being accessible to general planners, are still needed.

Figure 1 below is a screen shot from the BAAQMD's Google Earth tool. After downloading the files, planners can identify the stationary sources and freeways in the vicinity of a project, click on the site, and quickly learn the screening level risk assigned to the source.

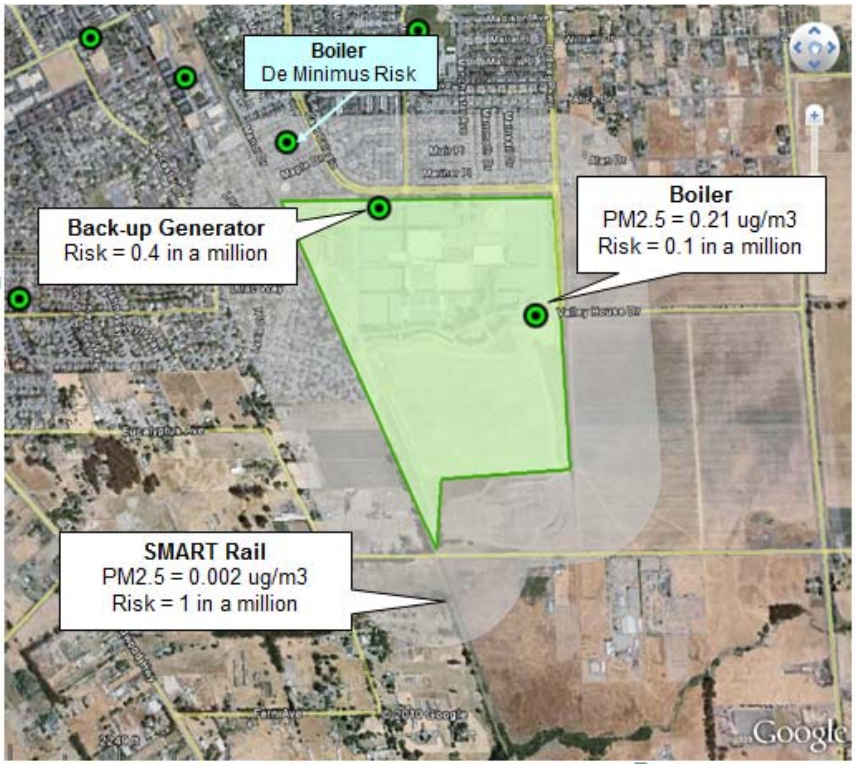
Figure 1: Google Earth Tool with Plant G8736 Information Table Selected



Cancer risk: 8.9 in a million; non-cancer risk: 0.05 in a million; no PM2.5 emissions.

The screening level tools can be used to assemble information about risks and hazards at the project or plan level. Figure 2 below presents an area plan in green. Stationary sources are indicated with a black and green circle. Several of these sources are further described in the call-out tag by type with risk or $PM_{2.5}$ emissions screening information. The SMART Rail line is also identified as a source of risk and $PM_{2.5}$ emissions. This information can be combined to determine the cumulative risk from all sources within a 1,000-foot radius.

Figure 2: Example of an Area Plan



To illustrate how the 2010 CEQA Guidelines and tools can be effective, compare the previously mentioned pre-2010 project to the post-2010 project again. The pre-2010 project did not include an analysis of TACs, and TACs were not considered in the significance determination. BAAQMD CEQA Guidelines have included thresholds of significance for TACs since the 1990's, so it is not clear: if the lack of risk and hazard analysis was an oversight; if it was because the lead agency lacked tools to measure TACs; or if this analysis was not conducted for some other reason. However, this may represent a missed opportunity to reduce human exposure to TACs.

In the analysis of the post-2010 project, the Draft EIR does analyze TACs, and concludes that there are significant and unavoidable impacts from risks and hazards during both the construction and operations phases. As a result, the Draft EIR includes binding mitigation measures to reduce human exposure to TACs during the construction and operations phases. During the construction phase, mitigation measures include prohibiting use of diesel generators when it is possible to plug into the electric grid; use of Tier 3 equipment where available and when it is the Best Available Control Technology (BACT); utilizing only on-road haul trucks

model year 2007 or later equipped with diesel particulate filters or newer engines; and requiring all contractors to use equipment that meets the most recent certification standard for off-road heavy duty diesel engines from the California Air Resources Board. The mitigation measure to protect sensitive receptors from operational-related TACs is a building filtration system with air intake located on the roof of the building. These two measures are capable of removing 80% of outdoor $PM_{2.5}$ concentrations from the indoor air supply.

It is still too soon to determine if the 2010 CEQA Guidelines are having any measurable effect on land development in the Bay Area in regard to reducing GHG emissions and limiting exposure to TACs. However, development of the risk and hazard screening tools is a first step towards better measurement and documentation of exposure to TACs and possibly will result in more TAC analyses in CEQA documents, at least at the screening level. Yet the conflict between the need to reduce GHG emissions and placing sensitive populations in close proximity to sources of TACs still remains and is not resolved by screening-level tools. The screening-level tools can only help planners become more aware of TAC issues. The GHG reduction and TAC exposure dilemma presents an ongoing challenge for planners and policy makers. There is a continued need for the development of additional analytical tools for assessing potential TACs impacts and identifying feasible mitigation measures that lead agencies can adopt to reduce the risk to human health from land use decisions.

SUMMARY

In sum, reducing GHG emissions from land-use development often places sensitive receptors close to TACs. Lead agencies are often frustrated when trying to balance the conflicting goals of reducing GHG emissions and protecting public health. Based on this analysis, BAAQMD has identified the need for better tools to analyze TACs and the need for development of additional mitigation measures to reduce the risk to human health from TACs.

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