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IN CALIFORNIA

Growing Healthy in Southern California: Methodology

The American Lung Association in California analyzed the potential health and societal benefits for the SCAG region from pursuing smart growth strategies that reduce vehicle miles travelled (VMT) between now and 2035. In conducting this analysis, the American Lung Association in California used the latest federal (US EPA) data on the health costs and health outcomes calculated per ton of emissions of smog forming pollutants and particle pollution and the latest US EPA data on the energy security and environmental costs of emissions that contribute to climate change. The American Lung Association in California contracted with transportation technology experts at TIAX, LLC. to conduct this analysis.

This study evaluates the criteria pollutant and greenhouse gas emissions and fuel consumption associated with a fleet of approximately 15 million passenger vehicles on Southern California roads in the years 2010 through 2035 assuming both a gradual phase-in of cleaner cars as detailed below, and a gradual phase-in of smart growth strategies that reduce the growth in the region's vehicle trips by 20 percent by 2035. The study covers the passenger vehicle fleet in the air districts covering the counties of Imperial, Orange, Los Angeles, Riverside, San Bernardino and Ventura (the counties that constitute the Southern California Association of Governments). This analysis relied on the following process to determine the benefits of a cleaner fleet that drives 20 percent fewer miles due to smart growth as envisioned by Senate Bill 375:

1. A petroleum consumption and vehicle emissions baseline was calculated by TIAX LLC using the California Air Resources Board's (CARB) EMFAC2007[1] model to determine region-specific vehicle miles traveled, emissions rates for various pollutants and fuel consumption for a 2035 fleet by using the characteristics of the 2010 on-road vehicle fleet as compared to the characteristics of a 2035 fleet of vehicles complying with a suite of next generation California vehicle standards for the year 2025 (CARB will adopt new standards in early 2012)[2].

2. Reductions in vehicle miles traveled were phased in at an annual rate of 0.8 percent from a baseline of Southern California vehicle travel of approximately 177 billion miles in 2010, building to an overall 20 percent reduction in vehicle miles traveled by 2035, a level comparable to the results of the "Growing Smart" scenario in the Vision California research released in 2010[3].

3. From the Southern California vehicle baseline, this study also phases in turnover of the vehicle fleet to a mix of vehicles required to achieve a 6 percent annual reduction[4] in greenhouse gas emissions from 2017 – 2025 and a 20 percent mix of zero-emission vehicle technologies (ZEV and TZEV) in the new car fleet by 2025[5]. This mix of cleaner cars is assumed to begin rolling into the overall fleet at seven percent per year from 2018-2030, a 91 percent fleet turnover to cleaner vehicles by 2035[6].

4. US EPA and other federal agency cost and damage values associated with each ton of criteria[7] or greenhouse pollution[8] and each gallon of petroleum[9] were applied to pollution

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[1] California Air Resources Board, EMFAC2007 model used to determine criteria emissions factors. Well-to-tank (WTT) criteria emissions estimated from Argonne National Laboratory's GREET model 1.8d.1.
[2] TIAX, LLC. Full Technical Slides SCAG Region, available online at lungusa.org/california.
[3] Vision California: Charting Our Future. 2010. www.visioncalifornia.org.
[4] US EPA, NHTSA, and CARB, "Interim Joint Technical Assessment Report: Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2017-2025," September 2010.
[5] American Lung Association in California. Road to Clean Air. May 2011. Available online at: www.lungusa.org/california-cleancars
[6] TIAX, LLC. Calculations, M. Jackson, 2011.
[7] US EPA, "The Benefits and Costs of the Clean Air Act from 1990 to 2020," Final Report, March 2011.

emissions calculated for vehicle fleets of 2010 and 2035 and to the cumulative estimate of pollution emissions/petroleum consumption avoided between 2010 and 2035. These calculations determine damages avoided in terms of health care, climate change and petroleum dependency on an annual (2035) and a cumulative (2011-2035) basis.

5. Health, energy security and environmental costs include the following:
    a. Health: Vehicle pollution-related premature deaths, asthma attacks, heart attacks, hospitalizations and ER visits related to respiratory and cardiovascular issues, lost school and work days and additional respiratory health symptoms as well as monetized health care costs.
    b. Energy security: Costs reflect the macroeconomic cost adjustments for importing oil (above purchase price) into the United States. These costs account for sudden disruptions in the supply of imported oil into the United States as well as the purchase power (monopsony) effect of the United States. (The costs of maintaining military presence to secure stable oil supplies from volatile regions of the world are not included in the scope of this study.)
    c. Environmental/Climate: The "social cost of carbon" includes changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change.

This process allows quantification of the health and other societal benefits that could be achieved in a Southern California scenario for reducing traffic emissions and petroleum consumption and dependency as new state vehicle standards and regional smart growth efforts are implemented concurrently over the next two decades.

Contact: Bonnie Holmes-Gen or Will Barrett at (916) 554-5864.

[8] US Government Interagency Working Group (inc. US EPA, Depts of Energy, Transportation). "Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis, Under Executive Order 12866,". February 2010.
[9] US Federal Register, Volume 75, No. 58, March 26, 2010, pp. 14760-14818.