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Governor's Office of Planning and Research
1400 Tenth Street
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February 11, 2014

Suggestion in Response to Governor's Office of Planning and Research Preliminary Evaluation of Alternative Methods of Transportation Analysis

Mr. Calfee,

In my opinion, fuel use proposed alternative transportation metric of fuel use fails to meet OPR's goals and objectives of simplicity, fiscal and economic effect, consistency with other state policies, and equity. I support OPR's consideration of these and other proposed goals and objectives. I also suggest that OPR include a provision to accurately assess the transportation impacts of location-efficient retail within the updated transportation analysis implementation guidance or CEQA guidelines. I am available by phone or email to expand or clarify on any of these points.

Fuel Use

My findings on fuel use as a transportation metric are based on prior research¹ I conducted when assessing challenges and opportunities to improve the accuracy and precision of greenhouse gas measurement and forecasting to support SB 375 implementation. These findings also apply to direct estimates of greenhouse gas emissions from automobiles, as an emissions model's ability to estimate greenhouse gas emissions depends almost exclusively on its ability to accurately estimate fuel use.

EMFAC generates estimates of air emissions based on VMT and average speed by vehicle class and emissions control technology. Such a model architecture is useful for estimating the emissions of criteria pollutants, which are mitigated by onboard controls such as catalytic converters and advanced air injection systems. However, this architecture is not well-designed to estimate fuel use, the primary intermediate indicator of greenhouse gas emissions.

Research has shown that a modal emissions model architecture, such as that included the U.S. EPA's MOVES, performs better than the EMFAC architecture for estimating fuel use and greenhouse gas emissions from vehicles,² especially under congested conditions³

¹ Matute, Juan (2010). "Measuring Progress toward Transportation GHG Goals."

<http://innovation.luskin.ucla.edu/content/measuring-progress-toward-transportation-ghg-goals>

² Song, Bai, Douglas Eisinger, and Deb Niemeier. "MOVES vs. EMFAC: A Comparative Assessment

³Based on a Los Angeles County Case Study." TRB 88th Annual Meeting Compendium of

Implementing more accurate vehicle greenhouse gas estimation methods in California would require both a top-down and bottom-up approach. In the top-down approach, the California Air Resources Board would need to replace the architecture of the existing EMFAC model with a modal emissions model approach. The bottom-up approach would require advancements in link and intersection-level traffic studies to assess for vehicle acceleration and deceleration cycles (as proxies for vehicle specific power) instead of delay and counts, which are easier to observe.

Moving to a more accurate and precise measure of localized congestion effects than is currently possible with vehicle delay studies and traffic counts requires a substantial change to traffic study methodology and equipment. Observing localized congestion effects at a detail sufficient to capture variations in vehicle specific power and vehicle hours operating would likely require installation of video recording equipment and development and commercialization of software capable of creating summary statistics from observed vehicle flow. This added complexity may be beyond the capabilities and resources of many local governments and other lead agencies under CEQA.

Both fuel use and greenhouse gas emissions from vehicles are cumulative impacts and best assessed and regulated at the commutershed or state level. SB 375's regional, tiered assessment of greenhouse gas emissions from light duty vehicles shows greater promise in effectively managing this impact than does any lower-tier assessment of fuel use or greenhouse gas emissions for plans and projects consistent with an approved Sustainable Communities Strategy. Low thresholds of significance for fuel use or greenhouse gas emissions could be used to preclude greenhouse gas hotspots, even when such hotspots are consistent with best practices to reduce greenhouse gas emissions.⁴

Furthermore, the evolution of maturity of a fuel use transportation metric can lead to unintended equity impacts that would disproportionately affect low-income communities. If, in pursuit of greater accuracy and precision, local fuel use estimates are made sensitive to community-specific or project specific-vehicle mix, then public and private projects in these communities could be at a disadvantage relative to equivalent projects in more affluent communities.

State and national fuel efficiency policies are leading to significant annual increases in

²Papers DVD. Transportation Research Board, 2009.

³Barth, Matthew, and Kanok Boriboonsomsin. "Real- World Carbon Dioxide Impacts of Traffic Congestion." *Transportation Research Record: Journal of the Transportation Research Board* (Transportation Research Board of the National Academies) 2058 (2008): 163-171.³

⁴Matute, Juan (2013). "Greenhouse Gas Management: Local Efforts to Curb a Global Phenomenon." *Access*. http://www.uctc.net/access/42/access42_localghg.shtml

the fuel efficiency of new vehicles sold. With this trend, the gap in fuel efficiency between vehicles of a given age (e.g. 10 or 15 years) versus the current model grows. As low-income Californians typically maintain older vehicles than more affluent Californians⁵, any sensitivity to project-level or community-level vehicle mix will penalize projects that serve low-income populations. Low-income populations in California travel substantially fewer miles in privately-owned automobiles than do more affluent Californians.⁶ Thus, fuel use as an impact analysis method would disproportionately affect low-income populations versus their relative contribution to statewide fuel consumption and vehicle miles traveled.

Case-by-case adjustments for Location-Efficient Retail

Retail development can lead to overall reductions in vehicle miles traveled, even when it leads to increases in vehicle miles traveled attracted to a parcel. The case study⁷ of the Davis, CA Target Store leading to an overall reduction in vehicle miles traveled provides a valuable lesson for the role of infill and location-efficient retail as part of a broad transportation sustainability strategy. While the case for absolute reductions in vehicle miles traveled resulting from infill housing has been well-established, the research community is still exploring the vehicle travel reduction effects of infill retail.

OPR's guidance for transportation analysis should accommodate site-specific studies that demonstrate reduced transportation impacts versus a project-level assessment that is not sensitive to how the proposed project affects an individual's retail choice set. It is unlikely that an individual will drive further to a similar or identical retail opportunity. In the case of the Davis Target, trips to this location supplanted trips to identical retail opportunities 10+ miles away in Woodland and West Sacramento.

Such studies would include an assessment of identical retail opportunities (same chain or product/price mix). Such studies should also control for external differences that may lead individuals to travel greater distances for what appear to be identical retail opportunities: such as where parking is "easier" or cheaper at the further store, or where the further store location provides additional external amenities, for example a walking

⁵ Matute, Juan and Stephanie Pincetl (2013). *Unraveling Ties to Petroleum: How Policy Drives California's Demand for Oil*. Next 10. Pg 24-25
<http://www.next10.org/sites/next10.huang.radicaldesigns.org/files/Unraveling%20Ties%20to%20Petroleum%20-%20combined.pdf#page=24>

⁶ *ibid*, page 58

⁷ Lovejoy, K., Sciara, G. C., Salon, D., Handy, S. L., & Mokhtarian, P. (2013). Measuring the impacts of local land-use policies on vehicle miles of travel: The case of the first big-box store in Davis, California. *Journal of Transport and Land Use*, 6(1), 25-39.
<https://www.jtlu.org/index.php/jtlu/article/viewArticle/336>



and entertainment district. Such studies would also control for induced trips - where people make more trips to a nearby store than a further store.

Sincerely,

A handwritten signature in blue ink, reading "Juan Matute". The signature is written in a cursive style with a large initial "J" and a distinct "M".

Juan Matute
Associate Director, UCLA Institute of Transportation Studies