

Policy Brief Seminar Written Q&A

Research Seminar: CARB Policy Briefs - The effects of transportation and land use strategies on vehicle use and emissions

Seminar date: May 1, 2025

This document shows the questions asked in the Q&A function in the Zoom seminar. At left is the question number; the questions repeat as "a" and "b" when more than one answer was given for the same question. The question text is in the "Question" column, with the answer from the panelists in the "Answer" column. When a panelist planned to answer the question live in the seminar, they marked the question "live answered."

#	Question	Answer
1a	Is -9% reduction for total VMT or commuting VMT? Why not reporting a range and only reporting from one study. There are so many studies out there.	Hi - Thanks for this question. Can you add this again with which strategy you mean? We may get to these questions only after the presentations so we will need to know which strategy it addresses. Thanks!
1b	Is -9% reduction for total VMT or commuting VMT? Why not reporting a range and only reporting from one study. There are so many studies out there.	If this question is about telecommuting, the result is actually for the telecommuter's person miles traveled on telecommuting days. If you assume that all travel is by car, then it would translate to a 9% reduction in VMT. However, it appears that remote work has had a bigger impact on transit than on driving, as seen very starkly in the Bay Area. Workers who commute by transit may be more likely to choose remote work (if they have the option), and/or workers who previously commuted by transit every day may be choosing to commute by car on the few days they do commute. We need new studies to sort this out.
2a	For mobility hubs, have there been studies on transit stations that are effectively mobility hubs?	live answered
2b	For mobility hubs, have there been studies on transit stations that are effectively mobility hubs?	Not that we found. Most studies focus on frequency of transit service or distance to transit stations/stops (two of our other strategies). Determining the effect of a transit center or a mobility hub on VMT (or more likely transit ridership) is a bit tricky.

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3a	For telecommuting, is 9% reduction for total VMT or commuting VMT? Why not reporting a range and only reporting from one study. There are so many studies out there.	Thanks for asking this again. It looks like Susan understood that your original question was about telecommuting and answered that one.
3b	For telecommuting, is 9% reduction for total VMT or commuting VMT? Why not reporting a range and only reporting from one study. There are so many studies out there.	Most of the studies are cross-sectional, meaning that they compare VMT for telecommuters and non-telecommuters. The 9% figure comes from a longitudinal study that looks at changes in VMT for people who adopt telecommuting. This is stronger evidence for a variety of reasons. In addition, most of the cross-sectional studies are from before COVID, when percentages of telecommuting were far lower than they are today.
4	You mentioned that 10% increase in cost of driving results in 1% to 1.5% reduction in VMT. Which costs are included in this "cost of driving"?	The cost of driving is generally the cost of fuel adjusted for the cars' gas efficiency. So, a hybrid would have a much lower cost of driving than a SUV. The studies we used did not include maintenance costs.
5	Did you include paratransit services in "microtransit"? Also, did you distinguish between more "shuttle" types vs. more "rideshare" (small car) types? Microtransit seems to be a bit of a buzzword that means different things to different people. Some services provide paratransit and non-paratransit whereas some are strictly paratransit.	live answered
6a	For the Roadway Capacity category, what would you expect to find in an area that is sparsely populated and/or experiencing population decline?	Great question. The studies that have estimated elasticities in rural - or at least non-urbanized - areas have generally found similar long-term elasticities. Noland (2001) found that the long-term elasticities in rural areas were about 90% as large as the elasticities in urban areas, regardless of roadway type. Duranton and Turner (2011) estimated that the long-run elasticities for interstate highways in non-urbanized areas of metropolitan statistical areas were about 80% as large as the elasticities in the urbanized portions of those MSAs.

#	Question	Answer
6b	For the Roadway Capacity category, what would you expect to find in an area that is sparsely populated and/or experiencing population decline?	I should also note that even if the elasticities in rural and urban areas were the same, the total VMT increase caused by a capacity expansion in a rural area would be substantially less, due to lower preexisting VMT levels in rural areas.
7	What evidence is there for induced truck VMT and elasticity on freight corridors roadway capacity?	Good question. Most studies do not parse out truck versus passenger VMT. But what evidence there is indicates large elasticities for both truck and passenger VMT.
8	Which of the induced travel impacts identified is new? What nuances have been found in more recent studies beyond previous studies?	<p>On your first question - Capacity expansion leads to a net increase in total VMT, not simply a shift in VMT from one road to another. Evidence shows that the additional traffic on the new or widened highway is not simply traffic that shifted from slower and more congested roads but is actually an overall increase in VMT. For example, one study found “no conclusive evidence that increases in state highway lane-miles have affected traffic on other roads” (Hansen & Huang, 1997, p. 205), while a more recent study concluded that “increasing lane kilometers for one type of road diverts little traffic from other types of roads” (Duranton & Turner, 2011, p. 2616).</p> <p>On your second question - Almost all of the recent empirical studies over the last 2-3 decades have arrived at similar elasticity estimates, both in the US and abroad (Europe, Japan, China, at least). More research is now being done to determine the effect of different contexts and facility characteristics like congestion, geography, and managed lanes.</p>
9	Please include the recent study on rural induced travel in your data ranges: RCTF Rural Induced Demand Study webpage ¹	That report is not an empirical study. Its conclusions are not comparable to empirical findings. Our research team is working on a formal review of the RCTF report for another CARB project that will provide more details in the coming months.

¹ <https://www.nctc.ca.gov/Reports/RCTF-Rural-Induced-Demand-Study/index.html>

#	Question	Answer
10	For induced demand, this elasticity refers to the VMT on the specific route that has been expanded, correct? What is the elasticity at the regional VMT level?	Most studies estimate the effect on VMT on all facilities of the same type (e.g., interstates, or interstates and other highways, or interstates, other highways and major arterials, all three of which are commonly used) in the same region (usually counties, metro areas, or states). So, the estimated elasticities refer to a network-wide change in VMT. The available evidence also indicates that the increased VMT on the studied roadways is not just diverted from other roadways (collectors, local roads, etc.). It is primarily new VMT. That means there is a net increase in VMT across the network.
11	On parking cash-out: is the 12% reduction in VMT/capita for a specific population? say, employees with the parking cash-out program available, or employees participating the program? etc.	Good question, Zhen. That is for the population of employees in the study - so, all employees for the 8 businesses included in the study, even those employees who did not participate in the cash-out program.
12a	Were any of the studies on bus vs. rail in LA? Seems to be a rare area where the rail = higher quality/higher income ridership vs. bus pattern is flipped...	No study compared bus v. rail in LA specifically, but some of the studies included LA (amongst other areas).
12b	Were any of the studies on bus vs. rail in LA? Seems to be a rare area where the rail = higher quality/higher income ridership vs. bus pattern is flipped...	But yes, you're absolutely right that the effects very likely depend on context (transit quality, etc.).
13	I didn't understand whether the effect of distance to bus transit is bigger or smaller than rail. It looked like a bullet said the elasticity for bus transit was larger than rail, but the speaker made it sound like proximity to rail was more effective.	That's exactly right - the elasticity appears higher for proximity to bus transit. However, the maximum distance from residences at which transit has an effect on VMT is likely greater for rail transit than bus transit - on the order of 4 miles for rail transit and 1 mile for bus transit. As a result, the maximum potential effect of rail transit proximity is likely substantially greater than that of bus stop proximity - on the order of a maximum VMT reduction of 13% for rail transit proximity versus 6% for bus transit proximity.

#	Question	Answer
14	My understanding of the induced-demand elasticity reported in literature is a positive association between added road capacity and traffic using panel regressions. To what extent can we interpret that as a causal effect, given the risk of omitted confounders or reverse causality?	Great question. The statistical methods used to estimate induced travel have improved immensely over the last couple decades. Most recent empirical studies account for both the simultaneity bias (reverse causality) and a whole host of other factors that affect VMT (population, economy, geography, etc.). See my policy brief and our comprehensive 2022 report. Updating the Induced Travel Calculator report ² Roadway Capacity and Induced Travel report ³
15	In terms of equity, when looking at things like raising the cost of parking, have there been studies looking at the extra burden that puts on single parents? Many elementary schools are not located off of public transit routes. Some require walking at least a half hour. These parents would not have time to drop off their kids and then drive into work. So, say, a single person with no children may be more likely to utilize public transit, while a single parent would not be able to, yet incur extra costs, further fueling an equity divide.	That's a great question. I didn't find any studies that explored the effects on single parents.
16	*correction: they would not have time to drop off their kids, and then take public transit into work.	live answered
17	Do all of the policy briefs look at costs and cost-effectiveness?	live answered
18	Thanks for the great presentations so far. Will you be sharing a recording and/or the slides?	Yes! We will have both on the policy briefs webpage in coming weeks. If you want me to let you know when they're on the website, send me an email at john.beutler@arb.ca.gov and I'll email you when they're there.

² <https://escholarship.org/content/qt1hh9b9mf/qt1hh9b9mf.pdf>

³ <https://escholarship.org/content/qt2444c0bw/qt2444c0bw.pdf>

#	Question	Answer
19	For all the policies shown today, that require VMT quantification, what model is used? Are those numbers based on research/studies or the travel model results?	live answered
20	Can you add the numeric effect sizes to the color-coded table? If so, it would be very helpful.	live answered
21	Regarding the Induced Demand Policy, have you considered the RCTF Rural Induced Demand Study led by NCTC? Has there been any change on the elasticities in the NCST calculator for the rural highways?	live answered
22	I'm curious about rebound effects, i.e., backfilling (discussed in the recent study by Millard-Ball et al. Road Expansion is a Fundamental Cause of Growth in Vehicle Travel (<i>Road Expansion is a Fundamental Cause of Growth in Vehicle Travel</i>). ⁴ Could you talk a bit about the implications on the efficacy of these strategies?	live answered
23	Will we participants receive a link to resources? I didn't see links in the meeting invite, and missed the first part of today's presentation. Thanks.	live answered
24	Regarding the table, you might consider adding elasticity to VMT (unitless), to the extent that information is available	live answered
25	How would someone translate the findings in the policy briefs when assessing the outputs of a regional travel demand model?	live answered

⁴ <https://escholarship.org/uc/item/1xz8g17k>

#	Question	Answer
26	Is there any research on the effect of reducing travel lanes or removing highways on VMT? (Traffic evaporation)	live answered
27	Thank you research team! All of your work is much appreciated.	
28	To what extent do you think the policy briefs are applicable to other states beyond California?	live answered
29	Is the takeaway from the Managed Lanes finding that they don't reduce VMT as generally implemented?	live answered