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Evaluating Place-Based Transportation Plans

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May 2024

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16. Abstract
We ask how place-based transportation plans are being evaluated, and what insights from the broader policy and plan evaluation research literature might inform evaluation design. We complement a review of the evaluation literature with six expert interviews with 15 people. We find that California agencies and their community partners have high expectations for evaluations of place-based transportation plans. So far, however, those evaluations have been less successful in providing detailed information on outcomes and the causal impact of interventions. This does not reflect the shortcomings of the evaluation teams, but rather the inherent challenges in holistically assessing a diverse set of projects on different implementation timelines in a project area with porous boundaries. There is also a fundamental difficulty with the evaluation scale. California's place-based transportation plans have often been evaluated individually. But in general, evaluations, particularly quantitative causal inference methods, are most effective with a larger number of projects or sites. We suggest a two-pronged approach to addressing the tensions that we identify between place-specific knowledge and generalizable conclusions. The first prong, at the site level, would emphasize process evaluations and assessment of outputs and outcomes. The second prong would focus on impacts across multiple sites and the extent to which place-based transportation programs have a causal role.

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About the UC Institute of Transportation Studies

The University of California Institute of Transportation Studies (UC ITS) is a network of faculty, research and administrative staff, and students dedicated to advancing the state of the art in transportation engineering, planning, and policy for the people of California. Established by the Legislature in 1947, ITS has branches at UC Berkeley, UC Davis, UC Irvine, and UCLA.

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Disclaimer

Evaluating Place-Based Transportation Plans

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Executive Summary

Place-based transportation plans take a holistic approach to equity and environmental challenges in a specific community. They use a suite of transportation investments—transit-oriented housing, transit, bicycle, and pedestrian infrastructure, and car sharing programs, for example—to mitigate air pollution, greenhouse gas emissions, and inequities in access to transportation. In contrast, more traditional transportation plans are often mode-based or follow administrative rather than community boundaries.

In this report, we ask how place-based transportation plans are being evaluated, and what insights from the broader policy and plan evaluation research literature might inform evaluation design. We complement a review of the evaluation literature with six interviews conducted with 15 different people working across different agencies and organizations that implement transportation-focused climate work in California.

We find that government agencies and their community partners have high expectations for evaluations of place-based transportation plans. They hope that the evaluations can demonstrate the impacts on environmental and social justice outcomes, as well as inform the local implementation and internal management of specific grants.

Evaluations to date have focused on process evaluation and baseline data gathering. These process evaluations are extremely valuable as an internal, reflective process and also to inform program design. So far, however, evaluations of place-based transportation plans have been less successful in providing detailed information on outcomes and the causal impact of interventions (individually and in concert). This does not reflect the shortcomings of the evaluation teams, but rather the inherent challenges in holistically assessing a diverse set of projects on different implementation timelines in a project area with porous boundaries.

There is also a more fundamental difficulty with the evaluation scale. California's place-based transportation plans have often been evaluated individually—for example, at each site under the Transformative Climate Communities (TCC) program. But in general, evaluations, particularly quantitative causal inference methods, are most effective with a larger number of projects or sites.

California agencies and other funders of place-based transportation programs might therefore consider reorienting site-level evaluations to emphasize process evaluations. These process evaluations can also illuminate the working relationships and power structures that will both help local staff and community members refine and improve their processes and contribute to broader understanding of the processes by which place-based transportation plans take effect—the "theory of change." At the site level, evaluations can also usefully continue to collect data on outputs, such as bike lane miles, and the number of new electric vehicles or charging stations, and outcomes such as local air quality readings. However, at the site level, these outcome measures should not be seen as an "evaluation" of the success of a particular place-based transportation plan.

Therefore, in the longer term, state agencies and other funders might commission research studies that evaluate outcomes across multiple sites. In contrast to separate evaluations at each site, a combined evaluation would be more likely to causally distinguish the impacts of a program from background variation, and also be able to collect data from control sites in a consistent manner.

Detaching causal impact evaluations from individual sites in favor of a cross-site approach could constrain the applicability of community-engaged and participatory action research within the evaluation. Such research, by definition, follows the lead of communities, both in the selection of the research question and methods, and would not predictably generate data or findings that are comparable across sites. Many of the advantages of community-engaged and participatory action research, however, can be retained through a two-pronged evaluation strategy: site-level evaluations that focus on process, outputs, and outcomes (but without causal attribution), and a longer-term evaluation program that assesses causal impacts across multiple sites.

This report highlights some of the opportunities, challenges, and tradeoffs in evaluating place-based transportation plans, and critically discusses what evaluation can and cannot do. It does not inventory evaluation requirements from the California Air Resources Board and other funders or reports from project sites, but rather focuses on lessons from the broader evaluation literature, complemented by interviews. Consequently, the conclusions are high-level and intended to spur further discussion, rather than recommending specific changes to data collection or reporting requirements.

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Introduction

California has increasingly turned to place-based transportation plans to address the twin priorities of climate change and environmental justice. In contrast to more traditional transportation plans, which are often modal specific (for example, for buses or active transportation) or align with administrative boundaries (for example, a city or a transit agency), place-based transportation plans take a more holistic approach to addressing equity and environmental challenges in a specific community.

Examples in California include:

- Transformative Climate Communities (TCC)
- Community Air Protection Program (CAPP)
- Sustainable Transportation Equity Project (STEP)

Common to all these programs is a desire to use transportation investments to mitigate air pollution, greenhouse gas emissions, and inequities in access to transportation. These programs are also guided by community leadership. In the case of TCC, applicants are required to create "Collaborative Stakeholder Structures" that bring together residents, local non-profit organizations, and public agencies to jointly play a grant governance role and ensure that investment dollars are in sync with the community's vision for transformation.[1]

The idea of centering investments in a particular place is not unique to transportation. In recent years, place-based initiatives such as HOPE VI[2] have been implemented, albeit with mixed success, to address issues such as concentrated poverty which require multiple interventions in the physical and social realms. More recent federal initiatives have included Choice Neighborhoods and Promise Neighborhoods (Turner 2017). Federal and state governments are not the only proponents, foundations have sometimes turned to place-based approaches too. One common theme of such "comprehensive community initiatives" is the potential of individual interventions to work synergistically and achieve benefits that are more than the sums of their parts.

The evaluation of place-based transportation plans can serve multiple purposes. It helps legislators and other funders decide on future funding levels, ensures accountability, and extends the research base on the impacts of particular interventions such as multi-family housing located near transit, bicycle and pedestrian infrastructure, and car sharing programs, among other transportation-related interventions. Locally, evaluation can also build the capacity of local organizations and community members to participate more substantively in research and knowledge generation processes and continue collecting and analyzing data well after a third-party evaluator's formal work has concluded. Depending on the conclusions of the evaluation, local organizations and community members can leverage evaluation deliverables to secure additional funding,

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[1] See, for example, https://sgc.ca.gov/programs/tcc/docs/20230308-TCC_R5_Guidelines.pdf

[2] HOPE VI is a US federal program that aimed to revitalize public housing projects, in part through rebuilding them as mixed-income, walkable communities. See, for example, Popkin et al. (2004).

partnerships, and political capital to continue their work on transportation access, climate action, and environmental justice.

Place-based transportation plans, however, are inherently challenging to evaluate compared to more discrete plans and projects. They incorporate a diverse set of projects on different implementation timelines in a project area with porous boundaries, making it difficult to isolate the effects of multiple programs acting on the same variables in the same project area. Carefully selected control sites can support this effort, but no two communities are exactly alike, limiting the ability of evaluators to establish a perfect counterfactual as a basis for comparisons.

In this report, we ask how place-based transportation plans are being evaluated, and what insights from the broader policy and plan evaluation research literature might inform evaluation design. We complement a review of the evaluation literature with six interviews conducted with 15 different people working across different agencies and organizations that implement climate work in California. We focus on evaluating the implementation of the plans, rather than evaluating the quality of the planning process or the text of the plan itself.

This report raises some of the opportunities, challenges, and tradeoffs in evaluating place-based transportation plans, and critically discusses what evaluation can and cannot do. It does not inventory evaluation requirements from the California Air Resources Board and other funders or reports from project sites, but rather focuses on lessons from the broader evaluation literature, complemented by interviews. Consequently, the conclusions are high-level and intended to spur further discussion, rather than recommending specific changes to data collection or reporting requirements.

The Evaluation Literature

A large body of academic work and professional practice has developed and honed evaluation methods over the past decades. Entire textbooks introduce the concepts and methods of program evaluation (e.g. Newcomer, Hatry, and Wholey 2015), and apply them to specific fields such as education and health. In this section, we adopt a narrower focus: we review the literature on the program evaluation of place-based transportation plans. The section below summarizes our process.

In general, there is little to no research that provides a template or guidance for comprehensively evaluating the programs that we consider here. However, the literature is much richer when considering specific aspects of program evaluation, such as the impacts of Safe Routes to Schools programs and other well-defined, clearly delineated, specific interventions.

Literature Review Process

The initial criteria for selecting literature for this review were: (1) papers from 1990 to present for academic literature and 2000 to present for gray literature; (2) limited geographically to plans/projects in the U.S. or Canada, that were (i) multi-benefit, addressing transportation gaps or needs and at least one other co-benefit (e.g. GHG reductions, air pollution), (ii) place-based (geographic boundary is smaller than the city or unincorporated area in which it sits), and (iii) community-led (meaning the project was conceived through a community engaged planning process, a community benefit organization serves as a lead grantee for the project, or a CBO or resident representative sits on an oversight body that has decision making power over the project); and (3) evaluated the outcome of the plans or projects.

Google Scholar and Web of Science were the primary search engines. Articles were identified based on reviewing titles and abstracts of the search results. Subsequently, forward and backward searches were performed on a "shortlist" of relevant papers that had been identified (potentially relevant articles that had cited an article of interest on the shortlist or that were cited in the references of an article on the shortlist).

However, after an initial search using various permutations of keyword combinations for "transportation," "place-based," and "evaluation," it became clear that there were very few true outcome evaluations featured in the literature for transportation projects overall let alone more complex, place-based transportation projects. Moreover, while many evaluations identified the specific communities and the geographic scale served by the plan or project, there was no consensus about how a "community" is spatially demarcated or what the "neighborhood effects" of multi-benefit community-led interventions in those communities include and therefore how to measure them.

Since almost no literature met these initial criteria, the criteria were subsequently relaxed to allow for consideration of literature focused more broadly on closely related place-based, community-led programs (e.g., urban greening and neighborhood revitalization) as well as place-based transportation plans/projects specifically. Additionally, some papers were identified by individuals who have worked on place-based, community-led transportation projects in California (e.g., evaluators, program/project managers) and were interviewed for this project. A total of 126 papers were located and documented, with 41 academic papers and 12 gray literature papers included after being evaluated for relevance. A subsequent classification scheme was developed to organize and analyze the resulting body of literature that was included in this review: evaluation frameworks, plan evaluations, environmental justice assessments, process evaluations, and outcome evaluations.

Evaluation Frameworks

A number of papers attempt to identify systematic frameworks, including potential indicators and measures, to guide both process and outcome evaluations of transportation plans and projects. These papers often discussed the shortcomings of how evaluations are currently performed and provided recommendations for how to improve them (Amekudzi 2011; Appleyard, Riggs, and Stanton 2023; Bailey, Grossardt, and Ripy 2015; Beaulieu, Silva, and Plante 2016; Chakraborty 2006; Cytron 2010; Falcocchio 2004; Hartell 2007; Kaufman, Glassman, and Keller 2022). They also include discussion of evaluations more broadly for public participation processes (Rowe and Frewer 2004) or place-based programs in policy areas beyond transportation (Smith et al. 2010). Some of this literature coincides with the literature documenting efforts to assess environmental justice (EJ) impacts of transportation plans and projects (Bailey, Grossardt, and Ripy 2012; Hartell 2007).

While a few studies examined the feasibility of using proposed indicators or measures to evaluate outcomes, such as how and whether investment inputs can be used to determine project impact (Chapple and Elias 2018) or the feasibility of accessibility evaluations (El-Geneidy et al. 2011), overall, the studies in this segment of the literature rarely went on to use the frameworks that they identified to evaluate plans or projects. However, it is still important to acknowledge that researchers have made some efforts over the last two decades to begin articulating how true impact evaluations can be undertaken and proposing new directions for research agendas to facilitate this work, given the aforementioned lack of literature documenting comprehensive evaluations of both relatively novel place-based transportation plans and projects and long standing "conventional" transportation projects more generally.

Plan Evaluations

Urban planning scholars often take plans themselves as their objects of study. One common approach is to evaluate the quality of the plan, or its coverage of key topics. Most of these studies are of city- or region-wide plans, such as comprehensive plans or climate action plans. However, the methods could be applied to other types of plans and programs, such as the place-based transportation plans discussed in this report.

Some studies informally assess the extent to which equity is reflected in a plan's objectives and performance measures (e.g. Manaugh, Badami, and El-Geneidy 2015; Arsenio, Martens, and Di Ciommo 2016). More systematic studies use a formal qualitative coding protocol to evaluate the plan against specific criteria, such as the extent to which policies contained in a climate action plan promote equity objectives, include practices such as monitoring and evaluation, or address particular sectors (e.g., Angelo et al. 2022; Tang et al. 2010). Similar coding protocols have also been used for comprehensive plans (Berke and Conroy 2000) and regional transportation plans (Mullin, Feiock, and Niemeier 2020) as well as climate action plans. Another approach models how a plan, if implemented, is likely to affect outcomes such as vehicle travel or pollution exposure in both the population as a whole and in communities of color (e.g., Tayarani et al. 2016; Poorfakhraei, Tayarani, and Rowangould 2017).

The main limitation of these plan evaluation studies is that the plan itself is typically seen as the end product. But good plans do not automatically translate into desired outcomes. Their causal impacts may be limited if they sit on the shelf or simply catalog actions that would have been taken anyway (Millard-Ball 2013; 2021). While a few studies take the process one step further, for example through linking the quality of regional transportation plans to funding decisions (e.g., Mullin, Feiock, and Niemeier 2020), most research focuses on the text of the plan itself. Even where a study models the outcomes of a plan, this is typically an ex ante analysis that assumes full implementation, rather than an ex post analysis that examines actual pollution levels and other outcomes.

Process

To take one step beyond the ex ante analyses that model plan impacts, some studies evaluate the planning process. An effective and inclusive process may be a precursor to improvements in pollution, accessibility, and other outcomes, but can also be important in its own right through promoting procedural justice.

At a high level, some studies in this vein propose process evaluation criteria for environmental justice and transportation planning (Bailey, Grossardt, and Ripy 2012), or for evaluating public participation processes (Rowe and Frewer 2000). Empirical researchers often survey or interview participants in planning efforts, conduct focus groups, analyze progress reports from grant recipients, or observe meetings and workshops to understand process-oriented questions such as coalition building and the strengthening of organizational relationships (e.g., Barajas et al. 2019; Hooker, Cirill, and Wicks 2007; Pelletier et al. 2018; Buttazzoni, Coen, and Gilliland 2018). Other studies use similar methods to provide a more focused evaluation of a particular type of process, for example the effectiveness of participatory budgeting (Karner et al. 2019).

Public participation itself is the subject of a broader research field that partially overlaps with the justice and equity-focused literature. Some studies focus specifically on public participation in planning efforts, such as tracking events or analyzing the rates of engagement across different neighborhoods or different types of community partners (Prevost 2006; Sandt, Marshall, and Ennett 2015).

Outcomes

A robust literature details methods to evaluate the outcomes of specific projects. The methods generally fall under the rubric of causal inference, that is, can a "treatment" or "intervention" be causally linked to changes that would not have otherwise happened. The gold standard for causal inference is a randomized experiment in which the units to receive the treatment are randomly chosen. However, such experiments are typically infeasible (practically or ethically), and so researchers turn to quasi-experimental methods. Among the most common are (see Cunningham 2021, for a full discussion):

- **Matching**, which compares outcomes between the treatment group and a control group which is statistically constructed to be observationally similar to the treatment group. Propensity score matching is one common matching analysis technique.
- **Difference in differences**, in which the before-after differences in the treatment group are compared to those in a control group.
- **Regression discontinuity**, which takes advantage of an arbitrary cutoff (e.g., a threshold score) that determines which units are treated.
- **Instrumental variables**, which overcome confounding effects by using a third variable that only affects the outcome through its correlation with the treatment.

Numerous examples use difference-in-differences to study the outcomes of transportation and related projects. For example, Immergluck and Balan (2018) study the impacts of the Atlanta Beltline—a network of trails and parks with a planned streetcar—on housing affordability, comparing trends for neighborhoods close to the Beltline with those elsewhere in the city.

Safe Routes to Schools programs have been a particular focus of evaluation efforts using difference-in-differences. For example, Ragland et al. (2014) and Hoelscher et al. (2022) compare trends in safety, mode share, and other outcomes between Safe Routes to School projects and a set of control sites. Another focus has been the impacts of urban greening initiatives on outcomes such as property values and public health (e.g., Heckert and Mennis 2012; Branas et al. 2011; Wachter and Wong 2008; Heckert 2015).

Matching is less common in the planning literature but has been used to evaluate the impacts of climate action plans on outcomes such as reducing car travel (Millard-Ball 2012), and to evaluate how California's climate investments such as parks, public transit improvements, and bicycle lanes have affected displacement (Chapple et al. 2022).

Other studies use a simpler before-after or longitudinal approach that does not include a control group (e.g., Karner et al. 2009; Boarnet et al. 2005; Chapple and Elias 2018). An alternative approach is to compare "after" data with modeling of what public health and equity outcomes would have been without the treatment, such as the rerouting of the Cypress Freeway in Oakland (Patterson and Harley 2019). Finally, other studies undertake a more qualitative assessment of comparative case studies (e.g., Smith et al. 2022), or analyze only "after" data but in the context of a community-based participatory research design (Wier et al. 2009).

These types of evaluations are well suited to uncovering the impacts of a single intervention on a small number of outcomes, for example, the impact of Safe Routes to School programs on walk and bike mode share. However, the methods are hard to adapt to broader, multi-intervention programs, particularly where the different interventions are implemented at different times or have different geographic scopes. For example, the most common approach, difference-in-differences, relies on before-after comparisons with an untreated control group, but such comparisons are fraught if "before" and "after" are not clearly defined because multiple interventions are implemented gradually. The same challenge applies to regression discontinuity designs and most other natural experiments. Moreover, the choice of a control group may depend on the nature of the intervention—a "bicycle lane" control group might be different from a "transit-oriented housing" control group—and so multiple interventions may complicate the process of identifying suitable controls.

Thus, there are few examples of studies that evaluate the outcomes of the types of place-based transportation plans we consider in this report. The closest and most comprehensive example is Chapple et al.'s (2022) study of displacement resulting from California's climate investments. In addition to a matching-based quantitative analysis, the authors use qualitative interviews to explore perceptions of success. However, while the study considers a range of investment types (transit, active transportation, and urban greening), the different spatial extents and implementation times mean that the researchers study the isolated impacts of each intervention separately, rather than the holistic impact of a place-based program of multiple interventions.

Environmental Justice

The environmental justice literature has burgeoned over the past decades as questions of equity and systemic racism have risen up policy and research agendas, building on the early work of scholars such as Robert Bullard (Bullard and Johnson 1997). One strand of this literature focuses on the equity impacts of transportation plans and programs. These studies tend to focus on the regional scale, and are often driven by federal requirements under Title VI of the Civil Rights Act to include environmental justice analysis in Regional Transportation Plans.

As a result, a large number of studies introduce or refine the methods for environmental justice analysis at the state, regional, or county scale, for example through developing equity indices or accessibility-based models (e.g., Amekudzi and Dixon 2002; Chakraborty 2006; Klein 2007; Amekudzi et al. 2012; Duthie and Waller 2008; Chakraborty 2006; Heyer, Palm and Niemeier 2020; Hartell 2007). Related studies also focus on analytic techniques, such as modeling the equity benefits of increased transit accessibility (Allen and Farber 2020), identifying inequities in pollution burdens (Forkenbrock and Schweitzer 1999), or developing participatory mapping methods (Zhang et al. 2009). These methodological advances, however, have largely been focused on ex ante analyses that attempt to predict the impacts of a plan or a set of investments, often with a focus on compliance with federal regulations. Other literature, meanwhile, documents inequities in accessibility and pollution burdens (e.g., Houston et al. 2004), but does not tie observed changes in equity to a particular plan or infrastructure investment. As Amekudzi et al. (2011) conclude in the Georgia state transportation planning context, most programs are implementing environmental justice practices, but few have evaluated whether they result in intended environmental justice outcomes.

Stakeholder Perspectives

In total, six interviews were conducted with 15 different people working across five different agencies and organizations that implement climate work in varying capacities in California (two state level agencies, one city government employee, and two nonprofit organizations).

How Evaluations Are Currently Utilized

Various interviewees commented that because *"collective impact work"* (multisector collaboration to develop and implement a shared agenda that addresses specific public welfare issues) is still somewhat of a novelty in their field, there is a general lack of guidance about how to implement evaluations for such work. They explained that the state provides little to no funding to allow for general program evaluation of the climate programs and initiatives that they oversee, and that while a large amount of data collection is undertaken, true program evaluation is rare. Of the outcomes that are measured in data collection efforts, GHG reductions are the main priority. The few evaluations that have been produced only examine discrete program effects rather than "collective impact" (Chapple et al. 2022). Much of this evaluation work is conducted through third-party contractors, often private firms or universities and their affiliated research centers (e.g., Othering and Belonging Institute at UC Berkeley, Institute for Social Research at Cal State Sacramento, and various centers at UC Davis).

In practice, process evaluations seem to be the most common type of evaluation. Organizations and agencies typically implement them to help improve the design of grant solicitations and administration (program design). These process evaluations take various forms—ranging from contracts with third-party evaluators to conduct a formal evaluation of community engagement processes, organizationally-administered program surveys, more informal internal organizational *"learning evaluations"* or *"sense-making"* sessions that organizations hold to evaluate program administration, and other less structured ways of capturing qualitative data for story-telling purposes. For example, one interviewee explained that the findings from a third-party evaluation of grant solicitation processes for their programs led them to scale back reporting requirements and alter their grant disbursement protocol from a reimbursement system to advanced funds—both of which decreased the administrative and financial burdens for grantees.

There has been more work in recent years to build out process-oriented program evaluations that focus on racial equity, as well as a more conscious effort to integrate racial equity in research agendas through partnerships with local organizations and universities—*"from the ground up,"* in one interviewee's words. Efforts have included developing new frameworks to guide such evaluations. For example, Greenlining Institute has developed an equity framework to evaluate transportation and mobility programs (Creger et al. 2021). The Strategic Growth Council is also currently looking at the frameworks the California Public Health Department developed to evaluate mental health intervention and prevention programs to help them develop their own equity-focused evaluation frameworks.

However, part of this work will likely focus on increasing the level of community engagement in research more broadly, given that this research is often relied upon by state legislators deciding what they will fund. As one interviewee explained, "*bringing community organizations into research as a partner in that research is an incredible route, is an incredible strategy, and actually helping communities access power and informed state strategies.*" According to one interviewee, the Climate Change Research Program is the only program in the state that "*actually requires that principal investigators save a portion of their budget for community organizations to actually participate in [research].*"

Overall, interviewees suggest that while what data is collected and how it is collected has changed, research is still not structured in a way that constitutes true evaluation. For example, one agency has begun collecting "*more holistic types of information*" for the 70-plus climate programs it oversees, but since this data collection ("*operational project details*") is implemented in an unstructured way, taking place at any time during project lifecycle, much of the data is "*often not usable*" for evaluation purposes. Typically, there are no "*controls*" against which to evaluate project outcomes.

What to Deprioritize in Evaluations

Given the scarcity of resources for evaluations more generally, some interviewees noted that they would like to see fewer resources devoted to evaluating the following issues:

- Small-scale projects/interventions, like bike lane installation and urban canopy, given that these projects already collect a "*ton*" of data and due to concerns that evaluations aiming to identify large-scale impacts from these very localized interventions do not "*make sense given the difficulty of isolating impacts from this one piece.*"
- "*Research projects about strategies that we know are not beneficial and aren't going to help us achieve our air quality and climate goals,*" such as lane expansions on highways.
- "*[Well understood] questions like, 'Is climate change caused by humans?'*"

What Evaluations Should Do and Potential Areas of Focus

Generally, interviewees reported sharing common interests that include understanding how to evaluate collective impact work, building on process evaluations to support these more complex types of evaluations; balancing the desire for more rigor in evaluation with the need to protect the interests of the communities that are being studied; and securing more consistent institutional funding for program evaluation to make all the above possible.

However, some agencies and organizations had evaluation interests that were unique to them. Specific topics and questions that they wanted to be more rigorously evaluated ranged from:

- How do accessory dwelling units (ADUs) and housing policies more broadly impact wealth-building opportunities in low-to-moderate income (LMI) communities? To what extent do they discourage solar program participation?
- How has state funding either perpetuated or moved away from inequitable planning processes?
- Meta-evaluations: The *"degree to which evaluations even influence policy or programmatic decisions. Are they just communications documents that highlight program milestones or do they actually change the way decisions are made?"*
- Complete Streets projects: Does developing only blocks within a whole (the complete) street actually modify travel behavior?
- Air quality programs: Since benefits are cumulative, where specifically are the benefits being distributed/concentrated?
- Programs that incorporate workforce development or anti-displacement components, including urban forestry programs (*"What are effective anti-displacement measures?"*)
- Other specific project types: What are the impacts of specific projects such as forest health, Clean Mobility Options, Sustainable Transportation Equity Project, and transit oriented development?

Network Effects of Collective Impact Work

Interviewees expressed particular interest in developing evaluations to examine the more dynamic and complicated outcomes (*"network effects"*) of collective impact work. This work would include: developing evaluation frameworks to look at network effects across programs, defining indicators to measure outcomes for complex projects (*"What does community resilience look like in the context of these place-based projects? How do you measure that?"*) and understanding any unanticipated effects of community investments (e.g., displacement). Such evaluations would help them better answer questions like: *"Are large place-based competitive grants the most effective method to create lasting change? What is the best method for the state government to make investments in the most disadvantaged cities?"* and *"Is putting a bunch of money in a bunch of projects in one community a better approach than spreading out the money in a lot of different places?"* They would also allow agencies to test hypotheses about whether community investments facilitate "pipelining"—helping communities establish processes and capacities to pursue other state funding on an ongoing basis for projects of a more significant scope over time.

Interviewees believe that mixed-methods evaluations—*"qualitative and quantitative data, including surveys and ground truthing with individuals in whatever area the program is impacting or conducted in"*—will be required to capture the outcomes of complex community-based interventions. As one interviewee explained: *"A lot of the evaluation efforts … are quantitative in nature. But when we're trying to understand complex community processes … [h]ow do you measure and evaluate equity? How do you measure collaborative governance? How do you measure collective impact? I think those things will take a mix of qualitative and quantitative measures, and in general I think that's what I want to see in the field of evaluation move much more towards is rigorous but also qualitative evaluation of some of these hard to measure kinds of concepts."*

Process Evaluations

Interviewees also expressed interest in continuing investment in process evaluations for reasons ranging from making the solicitation process easier for grantees, assessing "*administrative equity*"—how agency-established rules impact grantmaking and management direction (e.g., risk avoidance versus more bold investments)—and analyzing how grant distribution types (e.g., block grants involving local or regional partners) impact capacity-building for grantee communities.

Moreover, interviewees wanted evaluations to examine how processes, specifically community-engaged processes, including "*capacity building and technical assistance, and removing barriers for community collective impact, partnership and trust building,*" impact program outcomes. As one interviewee explained, "*How have capacity building components of climate investments programs impacted their outcomes?*" Another interviewee expressed similar sentiments: "*How do we measure whether the inputs, the interventions, the processes that we are trying to stand up actually are leading to community change? I think it's using a matrix of different kinds of evaluative measures.*" Similarly, another interviewee expressed interest in evaluating how changes to project scope (proposed versus implemented projects) might impact outcomes. Interviewees believe these evaluations also serve the purpose of providing guidance on how to integrate community-oriented processes in the work.

Rigorous Evaluations vs Community Interests

Interviewees noted two key challenges that are inherent in their desire to improve and increase evaluations in their work: (1) balancing the need for context-specific indicators with more universal indicators that allow for standardization across projects, and (2) collecting more fine-grained data in already overstudied communities.

Interviewees wanted to implement evaluations that would allow them to collect more context-specific information, while also developing more standardized indicators to measure outcomes across different programs. One interviewee explained: "*We'd love to be able to come up with a suite of … four or five like key components that we think everyone should track, so we can evaluate more globally how the program is doing,*" while also acknowledging, "*how do you evaluate a program that is meant to be individualized, different for different locations?*" Meanwhile, other interviewees wanted to ensure evaluation measures are grounded in communities' experiences of interventions and that evaluations do not over prioritize the generalizability of interventions and contribute to reductive, inflexible, and universal prescriptions for very different communities —to "*standardize … while allowing for flexibility.*" As one interviewee explained: "*I think our goal is to support and create and make sure that as many of those programs are flourishing as opposed to just one approach, because one approach is not going to solve any one community's needs … to the extent that we could avoid really broad prescriptive outcomes like just CO_2 reduction.*"

Interviewees also wanted evaluations to capture more fine-grained data (e.g., disaggregated demographics and neighborhood conditions in smaller communities, like Tribal communities) while being wary of the increased time and labor burden this might impose upon grantees and communities. One interviewee shared that state programs are already facilitating a lot of data collection that does not qualify as evaluation, and they are wary

that more rigorous data collection will add to the grantee burden. Another interviewee cautioned researchers against inundating already overstudied disadvantaged communities with more studies.

Institutional Support for Program Evaluation

Various interviewees emphasized that more funding is necessary to support any of the above proposed evaluation work. For example, one interviewee explained that they often do not have an accurate understanding of the outcomes of older, legacy programs and "*historical investments*" (made 10 to 15 years prior), since ongoing and retrospective evaluations are not common practice: "*our attention has been focused constantly on the next round of funding program.*" More investments in longitudinal evaluations of programs would be necessary to understand the impact of programs over time.

Generally, interviewees wanted more resources to develop and implement true outcome evaluations with "*accurate counterfactuals.*" This includes standard evaluations of discrete outcomes (e.g., "*What are the VMT impacts of shared mobility projects, particularly things like car share?*") so that they not only have more clarity about what programs and policies are working but also what is failing—"*where and how it fails*"—and therefore how to more responsibly allocate funding and other resources. As one interviewee explained, more investment in evaluation work would "*support our accountability and transparency regime.*" For example, some interviewees mentioned wanting a true evaluation of the clean vehicle rebate program given that "*it consistently fails in equity but is where the lion's share of funding goes to and has been replicated nationwide.*"

Various interviewees expressed that research is critical to the future of climate mitigation and collective impact work because "*so much of what the state funds or develops from a policy standpoint, can be traced back to research that was done at the UC or CSU system.*" Various interviewees believe that without more funding for evaluations more broadly, there will be few resources available to support evaluation of community-based programs with intended "*network effects.*" As one interviewee explained: "*Without actual dollars from the legislature that are earmarked for the purpose of conducting evaluation or commissioning reports by third party evaluators on projects, there basically isn't resources to do this in a comprehensive or across the board kind of way. ... I think that there's a large unmet need within state government for additional funds to support project and program evaluation that's really dedicated to that purpose.*"

Without the funding to evaluate and potentially communicate the hard-to-measure outcomes of collective impact programs, these types of programs may have a limited shelf-life, particularly when they must compete with legacy programs with more traditionally-defined outcomes that are easier to quantify for limited resources: "*At the end of the day, it's easier to go to the legislature and pursue funding for a program with very tangible outcomes than it is something that's a little bit squishier in nature.*" The legislature may not be willing to support more collective impact programs moving forward due to a lack of evaluations justifying expenditures for such programs: "*State government bureaucracy generally is hesitant to do anything unless there's an evaluation to prove that that action would have a benefit to them.*"

Conclusions

Key Findings

Government agencies at the state and local level and their community partners have high expectations for evaluations of place-based transportation plans. They hope that the evaluations can demonstrate the impacts of programs such as TCC, CAPP, and STEP on environmental and social justice outcomes, as well as inform the local implementation and internal management of specific grants.

According to interviewees, evaluations of California's place-based transportation plans have so far focused on process evaluation and baseline data gathering. These process evaluations are extremely valuable as an internal, reflective process and also to inform program design. For example, as some of the interviewees shared, some organizations and agencies supporting place-based climate work have used the results of process evaluations to support on-going internal program modification and to provide guidance for changing grant administration and management protocols to reduce grantee burden.

So far, however, evaluations of place-based transportation plans have been less successful in providing detailed information on outcomes and the causal impact of the interventions (individually and in concert). This does not reflect the shortcomings of the evaluation teams, but rather the following inherent challenges in assessing the impacts of place-based transportation plans:

- The time lag between an intervention (e.g., sidewalk construction or a car share program) and changes in outcomes such as employment, wage rates, travel costs, air quality, and greenhouse gas emissions.

- The existence of multiple interventions. Evaluating the impacts of individual interventions (e.g., bicycle lanes) is complicated by the other projects (e.g., transit-oriented housing) taking place in the community at a similar time. But evaluating the plan holistically, and taking account of synergistic impacts, is complicated by the different timelines and different scope of the individual interventions, which also make it difficult to identify a suitable control group.

- The community-based scale of the interventions. The boundaries for analysis are porous and often vary depending on the interventions. Moreover, residential turnover means that some of the individuals affected by a program may leave the community and thus exit the evaluation.

There is also a more fundamental difficulty with the evaluation scale. California's place-based transportation plans have often been evaluated individually, for example, at each TCC site. But in general, evaluation methods, particularly quantitative ones, are most effective with a larger number of projects. The impacts of a single ridesharing program or a single bicycle lane—or even the synergistic impacts of a single place-based transportation plan—are hard to precisely quantify and distinguish from local variations in air quality, accessibility, and emissions, even when using a control group for comparison. Without a larger sample of implemented projects, any impacts are unlikely to be statistically distinguishable from background variation. As a result, most of the evaluations discussed in the literature review earlier in this report consider a group of

similar projects—safe routes to school programs, public transit priority measures, and so on—rather than a single site. The causal inference methods discussed earlier in this report are, in general, not appropriate to assess the impact of a single intervention at a single location.

Overall, stakeholders understandably are eager to see full-fledged causal impact evaluations, in order to inform program design and communicate the results. However, these ambitions are hard to achieve given funding levels for evaluation, and the splintering of evaluation efforts across different sites.

Recommendations

We suggest a two-pronged approach to addressing these tensions between place-specific knowledge and generalizable conclusions (Table 1). The first prong, at the site level, would emphasize process evaluations and assessment of outputs and outcomes. The second prong would focus on impacts across multiple sites and the extent to which place-based transportation programs have a causal role.

Table 1. A Two-Prong Evaluation Strategy

	Site-Level Evaluations	Cross-Site Evaluations
Primary goals	▪ Create transparency in use of funds ▪ Address community priorities ▪ Minimize the burden on implementing organizations	▪ Determine causal impacts on outcomes ▪ Refine the research base used to estimate program impacts
Evaluation focus	▪ Process – working relationships and power structures ▪ Outputs – what was built, planted, and installed ▪ Outcomes – observable changes in what matters to communities and state policy makers (but without causal attribution)	▪ Causal impacts—the effectiveness of different interventions on the health and wellbeing of humans and ecosystems

Site-Level Evaluations

Process. California agencies and other funders of place-based transportation programs might consider reorienting site-level evaluations to emphasize process evaluations. In many ways, this reflects what has actually happened, particularly in the early years of a program, where our interviewees highlighted how questions of process have come to the fore in evaluation work to date. The process evaluations can also illuminate the working relationships and power structures that will both help local staff and community members refine and improve their processes and contribute to broader understanding of the processes by which place-based transportation plans take effect—the "theory of change."

Outputs. At the site level, evaluations can also usefully continue to collect output measures, such as miles of bike lane and the number of new electric vehicles or charging stations. Then, evaluators can use the established research literature to translate these outputs into quantitative approximations of socioeconomic and environmental outcomes, such as greenhouse gas reductions. This mirrors the process that is often done at the application stage, and the California Air Resources Board has numerous calculators and methodological guidance for these purposes.[3]

The primary goals with tracking output measures would be (i) transparency, and (ii) documenting progress toward the ultimate objectives of concern to communities. Tracking outputs can help communicate what otherwise nebulous projects entail in practice, and bring clarity to what actually gets implemented on the ground.

In tracking outputs, there is often a tradeoff between simplicity (i.e., using measures that are legible to a wide audience, thereby allowing for transparency), and accuracy (i.e., using measures that reliably track back to key outcomes such as air pollution). For example, a count of "miles of new bicycle lane" is helpful for communicating the scale of new active transportation that has been added to a particular community, but not all miles of new bicycle lanes are created equal. High-usage lanes that fill gaps in the network may be more likely to actually lead to a mode shift away from cars to biking, while low-usage isolated lanes may have little or no effect. However, characterizing the degree to which a bike lane is connected or disconnected to other transportation infrastructure requires network analysis, and the degree to which it is high-use or low-usage requires usage counts, both of which are substantially more time consuming to analyze or collect, and can be harder to interpret and to compare across sites.

There is also a tradeoff, in that resources spent tracking outputs mean fewer resources to implement projects. In programs such as TCC, much of the data collection work falls to community partners who normally do not have dedicated staff assigned to evaluation. And in some cases, data collected in a labor-intensive manner may never get analyzed if there is too little of it to say anything meaningful (e.g., surveys with low response rates) or if it is collected in an inconsistent or incomplete way (e.g., employment data that is missing details about where workers live, how much they're paid, or how many hours they work).

Outcomes. Outcome measures—both for the baseline "pre-project" conditions and over the project implementation period and beyond—should also be collected at the site level. While some data (e.g., traffic collisions) are available from administrative sources or statewide surveys, including for previous years, other data (e.g., bicycle and pedestrian counts and perhaps local air quality readings) will need to be collected locally and contemporaneously. These outcome data are important for two reasons. First, trends in outcomes such as air quality and respiratory health are often of great interest to local staff and community members, regardless of whether they are caused by a specific intervention. Second, these data will be an important input for broader multi-site evaluations as discussed below.

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[3] Some of these calculators are available at: https://ww2.arb.ca.gov/resources/documents/cci-quantification-benefits-and-reporting-materials

However, at the site level, these outcome measures should not be seen as an "evaluation" of the success of the programs in a particular place-based transportation plan. Identifying the cause of any trends, or a comparison to a control group, is likely beyond the scope of a single site-level evaluation. The same is true for potential synergies and network effects across sites.

In general, therefore, funders might consider reorienting site-level data collection, for both outputs and outcomes, along the following lines:

- Identify the rationale for any data collection: transparency (communicating what the project does), auditing (ensuring proper use of public funds), approximating outcomes (e.g., providing information to feed into emissions calculators), or informing longer-term multi-site evaluations

- Fully fund the labor costs borne by community partners who support data collection efforts

- Collect a small number of measures on a consistent basis across sites that are of high priority to a broad set of stakeholders (e.g., air quality), while also funding more expansive evaluation work that focuses on local priorities

Cross-Site Evaluations

In the longer term, state agencies and other funders might commission research studies that evaluate casual impacts across multiple sites. In contrast to separate evaluations at each site, a combined evaluation would be more likely to distinguish the impacts of a program from background variation and could also collect data from control sites in a consistent manner using the causal inference techniques discussed earlier in this report.

However, a prerequisite for these more complex evaluations is to ensure that evaluations are built into the budget at a project's inception as a standard practice. Program evaluation has been incorporated from the start into TCC and a few other recent single and multi-intervention pilot programs where the unit of treatment is the individual, such as LA County's BREATHE guaranteed income program or MyPath's combined youth workforce development and financial literacy initiative (Los Angeles County Chief Executive Office. n.d.; Loke, Choi, and Libby 2015), but is not universal with some other funding programs. Similarly, the most notable randomized controlled evaluations to study the place-based effects of individuals living in healthier communities were completed on the U.S. Housing and Urban Development's Moving to Opportunities demonstration program nearly a decade ago (National Bureau of Economic Research. n.d.). Moving to Opportunities was a fair housing/housing mobility program authorized by the 1992 Housing and Community Development Act, which simultaneously provided funding to evaluate its effectiveness. To reiterate a point emphasized by interviewees, true program evaluation is rare in practice because funding is typically not allocated for it when budgets are drawn for programs.

There is a tension and tradeoff here between the general and the specific. Generalizable findings across multiple sites are important, not least as they can inform expectations of the types of impacts—economic, air quality, climate, and so on—that might be expected from similar projects in the future. These findings would

also extend the research base that agencies such as the California Air Resources Board rely on to develop the calculators and methodological guidance noted above. Broad-based evaluations can assess the impacts and cost-effectiveness of specific interventions and provide accountability to funders. For example, designing locally specific evaluations with metrics and data collection protocols based on local knowledge is likely to mean that the results are not directly comparable with other sites. It is possible that some metrics born out of a community engaged process may be comparable across sites, but not predictably so.

At the same time, detaching impact evaluations from individual sites for a cross-site approach risks losing some of the potential for community-engaged and participatory action research. And with that loss comes missed opportunities to boost the research capacity of communities to pose and answer the questions that interest them most (Cornish et al. 2023). Moreover, while concerns such as air pollution and housing affordability tend to be universal, locally driven evaluations can qualitatively capture differences in priorities and context across the diverse settings of different place-based transportation plans.

Many of these advantages of community-engaged and participatory action research, however, can be retained through a two-pronged evaluation strategy: (1) site-level evaluations that focus on process, outputs, and outcomes, and (2) a longer-term evaluation program across multiple sites that seeks to explain what causes these changes. These two prongs can be complementary and reduce the sometimes-unrealistic expectations that evaluations at individual sites will be able to provide causal estimates of the impacts of their programs.

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