1 **A PHASED LOGIC MODEL APPROACH TO PUBLIC INVOLVEMENT**
2 **PERFORMANCE MEASUREMENT**

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41 Paper number 18-00053

42 Word count: 5,911 words text + 1 table and 4 figures x 250 words (each) = 7,161 words

44 Revised submission November 15, 2017, for presentation at the 97th Annual Meeting of the
45 Transportation Research Board, and consideration for Transportation Research Record.

ABSTRACT

Performance measurement is a key method for evaluating and improving services in transportation, yet few agencies have systematically evaluated public participation in transportation planning. Review of previous studies reveals that measures of effectiveness and techniques for evaluation vary widely, and often provide cursory reporting of the immediate outputs of involvement efforts, rather than system outcomes related to public participation. Interviews and government documents from three detailed cases in the United States transportation planning suggest that complexity, perceived subjectivity and an extended period of project development creates challenges for performance measurement of public participation. To demonstrate use of the logic model approach for evaluation of public participation, the research team performed three case studies that separate broad phases of projects into context, implementation, and results. This phased approach supports the identification of performance measures that may address immediate outputs of a public participation process, in addition to intermediate and later outcomes related to public participation. Results from the multiple case studies suggest that performance measures are more likely to be sustained and impactful when devised for simplicity, supported by an agency champion, and resources are in place for institutionalization of the process as part of agency operations. The logic model approach clarifies that performance targets should be tailored by an organization to address a particular phase of the project development process.

Keywords: public participation, performance measurement, logic modeling; multiple case study

INTRODUCTION

In recent years, public scrutiny and accountability for public agency performance and spending has steadily increased. Methods of accessing and disseminating information are more available than ever. At the same time, agencies are experiencing ongoing budgetary constraints while demand for public services is increasing. In this context, it has become increasingly important for government agencies to be transparent in how they meet public needs. Currently, performance measurements are commonly required for transportation investment and operations. However, the planning process and products, including public participation, play an important role in aligning transportation priorities with public needs.

Public participation is required for all phases of transportation decision-making, yet little guidance is available on how to monitor the impacts of these efforts. The United States' Fixing America's Surface Transportation, or "FAST Act" requires transportation agencies to monitor a broad range of performance metrics, but specific public involvement measures are not currently required at the federal or state level (1). The phased logic model presented in this research focuses on public involvement in transportation during the planning phase because this is the primary focus for the practice of public engagement. However, researchers and practitioners would benefit from additional research to test the model at other stages of the project life cycle.

Cognizant of the current framing and challenges for public participation in contemporary transportation planning, the objective of this study is to: *develop a method for applying a logic model to guide performance measurement for public involvement through multiple case studies*. TTI researchers reviewed existing research on performance measurement of public participation in transportation, conducted interviews with staff from a wide range of transportation agencies, and reviewed documents that show how they deployed performance measurement in this context—and their challenges. This research frames findings using logic modeling—a relatively simple mechanism to clarify and illustrate both concepts and programs. Through analysis of extensive case study materials, this study demonstrates how logic modeling, deployed in a program evaluation mode, can facilitate stronger insights for both practitioners and researchers, resulting in improvements to the practice and study of public participation in transportation planning.

The next section of this paper summarizes the literature on performance measurement for public involvement, and the application of logic modeling for program evaluation. Case study data and qualitative methods are presented next. Three cases of public involvement in transportation planning deploy logic models as examples to show how the process can clarify meaningful performance measures. This paper concludes with a summary of the findings from the cases, and lessons for both designing and evaluating public involvement for transportation planning with performance measurement.

LITERATURE REVIEW

Performance Measurement for Public Involvement

To evaluate performance measurement, two separate categories of public participation measures, as seen in the paper, need to be defined. *Outputs* are the measurable actions of the public involvement process, such as the number of events held, or comments received. Outputs tend to be directly measurable and can include both the "quantity and quality of a service" (2). *Outcomes* seek to measure impacts to the process or policy as a result of public involvement. These may include changes to a draft plan, or differences in how participants work with the agency. Outcomes tend to be more qualitative and may require analysis over some time to measure change. Though few agencies consistently measure both outputs and outcomes of public participation, doing so makes it possible to gain insight into the ability of public involvement activities to meet agency goals.

Most evaluation methods are centered on criteria that are straightforward to tabulate and evaluate. The direct outputs of public participation processes often center on quantifiable characteristics of involvement, including the number of engagement opportunities, counts of attendees, and documented comments received from participants (3, 4). Increasingly, online public engagement platforms build evaluation components into their design, fostering real-time assessment and improvement (5–7). Comparison of demographics and geography of process participants with the larger community can reveal

1 meaningful differences and highlight injustices (3, 8). Earlier research by TTI identified four principles for
2 successful public engagement: accessible events, engaging interactions, multi-platform strategies, and an
3 outcome-oriented process, and tied measurable actions to these principles (9). Multi-platform strategies
4 offer opportunities for the public to engage in a number of different formats, providing convenience to the
5 public.

6 To measure the effectiveness of public engagement, research suggests five key criteria are needed:
7 process quality, inclusion, clarity, and utility of decision support, and efficiency (24). These criteria can be
8 assessed across the various techniques in a participation process, considering what can go right and wrong
9 during implementation (10). Two key areas of evaluation which have been under-emphasized in recent
10 transportation engagement research, with rare exceptions (11, 12), include “accountability by tracking shifts
11 in public preferences,” and “enhancing two-way communication by requiring a dialogic approach to
12 problem understanding and solution development” (13). These issues align with outcomes that require
13 evaluation over a longer term than a typical project cycle affords, preventing a crucial gauge of participant
14 empowerment (14, 15).

15 The academic and industry-specific literature agree that both immediate outputs of planning
16 processes, and longer-term outcomes, need to be assessed to understand the impact of public participation
17 on transportation. The most comprehensive guide in this regard, to date, is “Performance Measures to
18 Evaluate the Effectiveness of Public Involvement Activities in Florida” (16). This approach addresses the
19 components of involvement that are readily quantified and assessed over time and those for which agencies
20 have the most direct control..

21 Contrasting with frameworks for analyzing public participation outputs and outcomes, some focus
22 on process, such as a three-phase approach of stimulating public interest, targeting community groups, and
23 customizing outreach messaging (17). Other recent evaluations have emphasized the role of communication
24 technologies, particularly social media, to accomplish parallel goals of public information and plan input
25 by the public (12, 18–20). In all cases, agency staff work through mandates and strategic decisions in the
26 planning process that affect likely outcomes from public processes (21). Findings from these contributions
27 differ. The present study aims to provide a broader approach to aligning project phases to logical measures. .
28

29 **Challenges for Performance Measurement**

30 Gaps between current practice and truly effective implementation of public participation
31 performance measurement exist. The causes of the gaps are varied and may run the gamut from lack of
32 support at agency leadership, manifest by low prioritization and inadequate resource allocation, to training
33 and support for staff charged with implementing successful public involvement. The challenges to closing
34 these gaps include agency leadership support at the highest levels, a commitment to evaluation, consistency
35 in evaluation methods and the resources to do the job.

36 Time and staffing issues are important restrictions to consistent performance measurement of
37 public participation (22–24). When designing public processes, staff work to balance the perceived
38 preferences of the public, and how practical a given comment may be (25). Performance measurement adds
39 additional demands on staff that do not directly support the immediate demands of the project. Though
40 many may see the value of systematic performance evaluation, lack of focused support through staff time,
41 training, funding, or a mandate is a persistent challenge.

42 Inconsistency in how the performance measures are applied poses another challenge. Though
43 some resources in this review emphasize the need for flexibility of measures that address a project’s unique
44 goals (26), there is also value in adding consistency through standard key measures (16). Changing
45 performance measures for each project prevents evaluation of trends over time, or identification of variables
46 that may lead to an increase or decrease in a given measure. Consistent measures are also related to time
47 and staffing—it takes resources to standardize the practice, but doing so supports continuous improvement
48 (27).
49

50 **Logic Modeling for Program Evaluation**

51 Evaluating public engagement efforts can be a complex process. Diagramming processes as a visual logic
52 model arranges concepts and actions with practical consequences to aid understanding. For instance, a logic

model was employed in the Atlanta BeltLine project to help illustrate “the Beltlines’ potential direct and indirect effects in five dimensions such as access and physical activity—each having a bearing on potential health outcomes” (28). Logic modeling clarifies both the thinking of transportation staff, and provides a visualization to convey ideas and intents to others (29).

This study breaks public participation processes into *context*, *implementation*, and *results*, enabling a clearer description of the key factors in how the processes work, and helps delineate separate issues as measurable components, as shown in Figure 1. In this paper, *context* includes all of the factors that affect how a transportation organization carries out public participation, including both internal and external influences and resources (30). Agency staff, consultants, operating budget, changing politics, and other factors relate to either the influences or resources afforded by a transportation agency for public participation and as such provide context. *Implementation* includes the participation activities (such as public meetings and social media), and the direct outputs, such as attendance, comments, or online ‘likes,’ and similar. *Results* include anything affected by the implementation of public participation. Short-term outcomes can include agency responses to comments or questions, such as alteration of a roadway plan or addition of a project meeting or review. Intermediate outcomes could include funding decisions and construction of the altered roadway. Impacts could be the downstream results of the project such as measures of collision rates on a roadway, or capacity in terms of people per hour, for example. Typical evaluations of public participation include measuring outputs from activities while ignoring both the context and longer-term outcomes of the effort.

FIGURE 1 Program evaluation logic model (30, 31)

Evaluation of public participation using logic modeling requires some forethought and planning to implement, but Knowlton and Phillips provide clear steps to develop a logic model for a program, such as public participation in transportation planning (31). First, analysts should consider how transportation decision-makers would use the logic model to improve processes. Working from right to left in the diagram in Figure 1, an analyst identifies measurable outcomes linked to activities and associated outcomes. Observable outputs logically associate with specific actions—clarifying these forms the basis of evaluating quality and quantity of implementation. Contextual issues including available resources and human influences may have either a direct or an indirect role in the process. Logic modeling separates and clarifies the interaction between processes and products, and provides a guiding framework for evaluating public involvement used in this study.

DATA AND METHODS

This study employs a multiple case study approach, which balances context-specific detail of actual transportation projects, with the generalizability of different types of agencies and communities (32–34). Transportation agency documents and interviews form the core material for this study. This approach supports triangulation of findings, by cross-verifying published reports with anonymous interviewee responses, and then corroboration between researchers’ preliminary assessments.

Researchers identified six transportation planning case studies for this topic using three criteria.

First, the cases had to have documented efforts to evaluate public participation, ensuring at least a minimal amount of information about the case's context and results were available online. Second, researchers sought a balance of regional and state transportation agencies, recognizing that the resources and context of a state department of transportation and a metropolitan planning organization vary widely. Third, researchers chose cases with broad geographic representation to improve generalizability across cultural and political environments (35). This paper documents three final case studies that best reflected these criteria.

After gathering preliminary resources, such as public participation plans and evaluation reports, researchers identified interviewees through either the documents' contact information or contacting agency staff to determine a current public involvement staff contact. Researchers conducted interviews by telephone with agency staff, taking approximately one hour each. One researcher followed a semi-structured interview script with prompts relating to public involvement, performance measurement, and agency practices, while a second researcher took notes during the conversation. Researchers emailed respondents to obtain and clarify additional documentation on the cases. After the initial draft of findings, researchers asked an interviewee from each agency to assess the interim work—a qualitative research process of *member checking* to improve validity (36).

TABLE 1 Summary of Case Data Sources Used in this Study

Cases	State	Project Phase	Interviewees	Agency Reports	Additional Materials*
State Route 600 Widening	Florida	Preliminary Design	2	3	3
Statewide Long Range Transportation Plan	Tennessee	Planning	3	5	4
Plan Bay Area	California	Planning	2	4	2
<i>Total</i>			<i>7</i>	<i>12</i>	<i>9</i>

* Additional materials included unpublished reports, emails, and websites referred by interviewees.

Note: Researchers conducted three other case studies with interviews and document, but these are omitted from this paper for brevity.

The Phased Logic Model Approach

A *phased* logic model approach is proposed to facilitate evaluation of public participation activities over the project development lifecycle. The *context, implementation, and results* of a public participation process are theorized to align with transportation planning factors, critical inputs, and feedback, as described in the Federal Highway Administration's description of the transportation planning process (37). These are the broad "phases" of this approach to logic modeling—the context, implementation, and results occur sequentially, supporting three distinct opportunities to understand public participation.

First, the context of a given public involvement process can include the internal structures and resources of a transportation agency, the societal and local community issues and concerns, and the resources available for implementing public participation. Second, an implementation phase includes the actions taken by the transportation agency, including the immediate outputs of their work, such as the number of people attending public meetings. Third, the phased logic model addresses outcomes of the public participation process. Short-term outcomes might include the comments dealt with in subsequent plans, and the networking that occurs between constituent groups, the transportation agency, and individuals brought into the process. Longer-term outcomes could include changes in project implementation, such as routing or design changes, which may culminate in community impacts, which would require post-implementation assessment. When viewed along the project development lifecycle, performance measures can be tailored to precisely inform the applicable phase of the project—whether it is immediate feedback on public involvement or more long-term impacts that could require additional resources.

PERFORMANCE MEASUREMENT CASES

State Route 600 (John Young Parkway) Widening

The Florida Department of Transportation (FDOT) identified a need to add an additional lane in each direction to a section of SR 600 (John Young Parkway), south of downtown Kissimmee, Florida. The project goals were to “improve the traffic capacity and enhance highway safety and mobility” (38). The project was proposed to convert existing median space for added capacity, with a proposed typical section including six, 11-foot (3.3 m) wide lanes, a 22-foot (6.7 m) median, 7-foot (2.1 m) bike lanes and 5-foot (1.5 m) sidewalks in each direction (39). The majority of the public involvement for this project took place in 2015 and 2016. An open house and public hearing were held in October 2016 in downtown Kissimmee.

FDOT had recently developed a Public Involvement Performance Measurement (PIPM) system in partnership with University of South Florida’s Center for Urban Transportation Research (CUTR), which developed “a systematic methodology to evaluate the effectiveness of public involvement processes and practices based on defined performance measures” (16). FDOT and the project consultants used the new PIPM system, along with other FDOT guidance on public involvement, to guide development and evaluation of the public participation process in the John Young Parkway project.

After the public meeting, the John Young Parkway team sent follow-up surveys to local residents and businesses in the area, finding that some people did not feel they were adequately notified, or the meeting was inconveniently timed, preventing some from participating directly. Mailed responses to the follow-up survey revealed challenges not revealed by in-person comments, suggesting a role for including evaluations that do not require face-to-face interaction. However, results from analysis of documents and an interview with staff indicate that the practice is not yet institutionalized at FDOT, even though the agency has developed a robust system for measuring public involvement. Figure 2 is a logic model summarizing performance measurement for public participation in the John Young Parkway widening project, showing the progress of the project context, how performance measures were implemented, and the immediate outcomes. Intermediate outcomes have not yet been assessed, and similarly, the long-term impacts would require follow-up during and after completion of the project. In summary, the John Young Parkway case materials demonstrate an initial phase of outcome assessment of public participation with recommendations to improve participation, but additional work is needed to gain further knowledge from this project.

FIGURE 2 SR 600 Widening Public Involvement Performance Measurement Logic Model

Statewide Long Range Transportation Plan

From 2013 to 2015, the Tennessee Department of Transportation (TDOT) led an update of the state’s 25-year Long Range Transportation Plan. In 2012, the state had adopted a Public Involvement Plan with detailed guidelines for public outreach and the collection of simple quantitative measures of public participation in federally-funded transportation planning processes (40). This plan provided TDOT with a framework for its public involvement strategy during the Long Range Transportation Plan update.

TDOT’s Public Involvement Summary for the Long Range Transportation Plan provides a detailed account of the different methods used to reach the public throughout the process (41). The first phase of outreach focused on informing the public about the importance of the 25-year plan, and the second phase emphasized collecting input about the draft plan. During Phase 1, TDOT cultivated interest around

the plan update by reaching out to a diverse network of public and private sector participants. A central website directed people to information and access to the process with links to request informational meetings called “book-a-planner” and online surveying (42). Regional summits served as a means of gathering stakeholders together for discussion and collecting input. In the second phase, the team added focus groups, a digital mapping platform for registering geo-located suggestions, an additional online survey, and a postal mailing targeted input from underserved populations.

Quantitative outputs from TDOT’s robust public involvement strategy are noteworthy, with over 4,000 online surveys completed, over 5,000 event participants and over 6,000 visits to the website. However, there is minimal connection shown between output and outcomes during and after the process. There are brief mentions of incorporating input from Phase 1 into Phase 2 proceedings, but how the agency used input and molded Phase 2 is not detailed.

An interview with staff revealed that the public involvement priorities of the agency have shifted over time (43). Though the Statewide Long Range Transportation Plan was completed, resources for evaluating outcomes also concluded. Public involvement staff work on different projects, and further assessment of intermediate outcomes or impacts would require additional resources. Illustrated as a logic model in Figure 2, this project’s outreach and assessment achieved a great deal through implementation, but outcomes are not yet assessed.

FIGURE 3 Tennessee Long Range Transportation Plan Public Engagement Logic Model

Plan Bay Area Public Outreach and Participation Program

Plan Bay Area is the San Francisco region’s long-range integrated transportation and land-use plan, developed by the Metropolitan Planning Commission (MTC). The agency’s *Public Participation Plan*, developed in 2010, guided engagement for the plan, and included six key areas of evaluation: diversity, reach, accessibility, impact, education and participant satisfaction. The public participation plan includes both quantitative and qualitative metrics to measure performance of public participation. For example, the area of *diversity* targets a “representative cross section,” while one of the *reach* targets is “6,000 individuals participate via survey and meeting attendance”. Likewise, the areas may be evaluated in terms of outputs (diversity, reach accessibility) and outcomes (impact, education and participant satisfaction). After the *Plan Bay Area* public process was completed, MTC took the extra step to engage a consultant to evaluate the agency’s outreach program, providing an external review and detailed report that includes performance measures (44). The report described how the agency met its targets for the accessibility and impact measures, assessed quantitatively. Though education and participant satisfaction measures were quantifiable through the survey, the report only evaluated these metrics subjectively. Inconsistent use of the performance measures undermined the effort of creating both the evaluation method and the effort to independently evaluate the process and publish results.

Interviews with staff revealed challenges with measuring change over time, and with implementing quantitative performance measures. When asked whether the agency compares findings year over year, staff described that they “generally don’t, rather we just evaluate the public involvement for each plan.” (personal communication, April 5, 2017). Staff also noted that changing contexts makes it hard to compare involvement activities over time, citing dramatically different levels of public interest between the previous plan and the current one. The challenge of tracking quantitative outputs such as meeting attendance or number of comments is that the level of interest in a given outreach effort may vary for reasons entirely separate from staff’s work. Staff reported “there is a lot less interest for the plan we are currently working

on because it is an update. It does not generate the level of interest the original March 2017 plan did. In addition, we were targeted by conservative groups opposed to regional planning during our first plan, so there was a ton of interest, both from the progressive side and from the more conservative side, like those from Tea Party” (personal communication, April 5, 2017). Tracking quantitative outputs from public participation efforts may support the description of the process, but evaluation of the outcomes—both the short-term impacts to the plan and longer-term changes to the transportation system resulting from the public process—is missing from these cases to date.

FIGURE 4 Plan Bay Area Public Outreach and Engagement Logic Model

Validity and Reliability

The strength of the multiple case method in this study is that the data used in the study—agency reports, interviews, and follow-up materials obtained by researchers—are grounded in the context of the organizations involving the public in transportation planning. Singleton and Straights describe *convergent validity* as the “correspondence of results when a concept is measured in different ways” (45). By beginning with project materials, proceeding to internal assessments by agency staff, and then reflecting on the results within the research team, findings in this study are consistent between triangulated sources. Returning to our informants via *member checking*—asking an interviewee from each agency to review our initial findings—resulted in additional detail, but not changes in key findings. In addition, United States regulations support some consistency in how agencies implement transportation planning, despite changes in organizational and cultural contexts. The reliability of findings in these cases suggest some of the lessons are likely transferable to similar contexts.

Each of these cases incorporated and publicized evaluation of immediate outcomes of the planning process, but none conducted a review of outcomes related to impacts to the transportation system or communities. This finding is consistent with previous evaluations of public planning processes (4, 26, 27, 46, 47), yet the logic model suggests future evaluations could improve upon these findings by focusing on the results of planning processes, rather than the direct outputs of process implementation. Furthermore, additional methods capable of reviewing a larger number of public participation cases, such as surveying or data mining, are needed to further evaluate the reliability of findings in this article (18, 48).

CONCLUSIONS

Following a review of the case materials and interviews with three transportation agencies, several lessons may apply to the future development of public involvement efforts. Overall, the evidence suggests that systematic evaluation of public participation efforts is a challenge, given other agency priorities. However, three suggestions for continuing the practice include simplification, championing, and institutionalization.

Simple measures are more likely to be repeated. The SR600 case in Florida demonstrates clear implementation of public involvement performance measures, as defined in the *PIPM* system, but institutionalization and replicability remain challenges. Despite a solid foundation in research and a flexible implementation process, individual districts were unlikely to prioritize this effort, due to staffing and resource limitations, without a mandate from leadership. High-level support of simple performance measures, through either internal culture or external mandate, is more likely to result in consistent implementation.

Champions play a role in developing and implementing performance measures. Though not

1 mentioned directly, elected officials, professional associations, agency leaders, and staff can serve as
2 champions for performance measurement. A single staff member led much of Florida's public participation
3 performance measurement over the course of several years, and yet the agency has not fully integrated the
4 work across divisions. One person can provide the motivation to begin effective evaluation programs but
5 there must be buy-in from leadership to perpetuate the program. MTC's performance measures were the
6 result of a top-down vision to create the system, and bottom-up technical skills to report them. One-time
7 evaluations of major projects, such as the Evaluation of the Plan Bay Area Public Outreach and Participation
8 Program (44), can inspire individuals to find the most appropriate performance measures for transportation
9 agencies, which may be repeated with continued community interest and agency leadership. Qualitative
10 case research showed both *who* led each effort, and *how* champions struggled to maintain performance
11 measurement of public engagement over time.

12 Institutionalization—whether by regulation or habit—is often the difference between short-term
13 efforts, and long-term understanding gleaned from precise performance measurement. Perhaps the strongest
14 example from the case studies of institutional support of public involvement activities is California's law
15 requiring public participation, SB 375. That law required MTC's Public Participation Plan, which guides
16 their performance measurement process. Consistent with previous research on public engagement in
17 planning (21), statutory mandates of public participation ensure regular compliance, at the very least.
18 However, mandates tend to not require specific data points, but provide local flexibility to develop
19 appropriate measures. Rather than a one-time effort, institutionalizing performance measurement leverages
20 previous efforts to understand trends over time.

21 Transportation agencies can understand and manage public participation efforts in public
22 perception, project delivery, and agency costs through systematic performance measurement. Since
23 transportation project development can be protracted over many years, a phased logic model approach can
24 help isolate the context, implementation, and results of a public process. Project phases can align with
25 evaluation phases, ensuring transportation agencies can respond meaningfully to pressures concerning the
26 efficacy of their public participation efforts. However, agencies have to plan for the workload to be part of
27 everyday expectations. Providing clear leadership, simple measures, and institutional resources are likely
28 to support long-term use and benefits of performance measures for public involvement. Future research
29 should explore additional phases of project development beyond the present emphasis on planning, and
30 include longitudinal analysis of outcomes in cases.

31 **ACKNOWLEDGEMENTS**

32 The authors greatly appreciate the contributions of the agency staff interviewed in this study, in addition to
33 the Transportation Research Board anonymous reviewers. This research was supported in part by the Texas
34 A&M Transportation Institute Policy Research Center. The first author takes responsibility for any errors
35 or omissions.
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