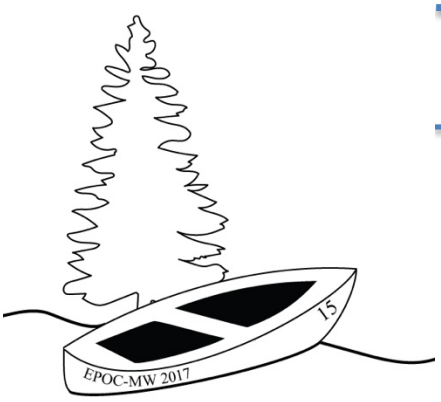

Working Paper Proceedings

15th Engineering Project Organization Conference
with
5th International Megaprojects Workshop
Stanford Sierra Camp, California
June 5-7, 2017

Effective Public Involvement According to Whom?: Investigating measures of participant perspectives of infrastructure projects

Jeannie M. Purchase, Virginia Tech

Denise R. Simmons, Virginia Tech

Proceedings Editors
Ashwin Mahalingam, IIT Madras, Tripp Shealy, Virginia Tech, and Nuno Gil, University of Manchester

Effective Public Involvement According to Whom?: Investigating measures of participant perspectives of infrastructure projects

Jeannie M. Purchase[1] and Denise R. Simmons[2]

ABSTRACT

Interest in public involvement (PI) for public infrastructure projects has increased over the past several years, in part due to the emphasis placed on the societal impacts of infrastructure projects and the need to ensure that all groups, particularly those underserved, have a voice in the process. Accounting for PI may support project governance and promote successful project delivery. Conversely, not accounting for PI may lead to dire consequences such as project delays, increased costs, and, in some cases, abrupt project discontinuation. Metric-based evaluations take into account the complex decision-making of project governance by providing structured means for improving the quality of PI. This research uses a comparative content analysis of metric-based evaluative frameworks of PI for transportation infrastructure. The researchers sought to investigate the extent to which participants' perspectives are considered when evaluating the effectiveness of PI within three frameworks. The frameworks were critically analyzed based on the extent to which each framework encompassed the breadth and depth of participant perspective, dimensions of PI, in addition to considering the instrument reliability and implications of framework results. The analysis revealed the multiplicity and limitations of evaluating PI depending on the type of data collected and the extent to which participant perspectives are considered. By achieving a better understanding of the complexities of evaluating public involvement, we can continue to refine the methodologies of evaluation to improve PI processes that result in successful delivery of infrastructure projects.

KEYWORDS: Public Involvement, Participant Perspective, Infrastructure, Evaluation Framework, Project Governance

INTRODUCTION

Public involvement (PI) is described as "any process that involves the public in problem solving or decision making and uses public input to make decisions" (IAP2, 2017). Interest in PI for public infrastructure projects has increased over the past several years, in part due to the emphasis placed on the societal impacts of infrastructure projects and

[1] Ph.D. Student, Myers-Lawson School of Construction & Civil and Environmental Engineering Department, Virginia Tech, jmp16@vt.edu

[2] Assistant Professor, Myers-Lawson School of Construction & Civil and Environmental Engineering Department, Virginia Tech, densimm@vt.edu

the need to ensure all groups, especially those underserved, have a voice in the process. Public input is frequently gathered through mandated implementation of mechanisms that facilitate PI. Common forms of PI include public meetings, visioning, charrettes, citizen advisory boards, and workshops. Accounting for PI can support project governance and promote successful project delivery. Conversely, not accounting for PI may lead to dire consequences such as project delays, increased costs, and, in some cases, abrupt project discontinuation.

O'Connor et al. (2000) state that a good PI program for transportation infrastructure consists of "dynamic two-way communication, which promotes public feedback and uses that feedback to transform the decision process and outcome". Benefits of good PI include: increased public ownership of policy/project and decision support, projects and policy decisions that reflect community values, efficient project implementation, and enhanced agency credibility (O'Connor, 2000). The National Research Council (2008, p. 33) reports that critics of PI believe that public participation in practice does not always achieve ideal goals and may inhibit good decision-making. They argue that the benefits of utilizing PI may not justify the costs, positioning the public as ill-equipped for complex analyses necessary for the decision making tasks associated with PI. Critics further describe gathering and incorporating PI as rarely achieving equity in the process or its outcomes (NRC, 2008). In contrast to this criticism, Bailey et al. (2015) argue these presented issues as nothing more than a reflection of professionals' failed methodologies for engaging lay participants in effective PI. To improve the PI process, multiple researchers have identified an abundance of techniques and best practices for effective PI in infrastructure projects. However, only a limited number of metric-based frameworks exist that evaluate their level of effectiveness. Metric-based evaluations take into account the complex decision making of project governance by providing structured means for improving the quality of PI.

This research uses a comparative content analysis of metric-based evaluative frameworks of PI for transportation infrastructure. The researchers sought to investigate the extent to which participants' perspectives are considered when evaluating the effectiveness of PI within the metric-based frameworks. The researchers believe that professionals are provided with insight on how well they facilitate the dynamic two-way communication of PI, when they consider participant perspectives in evaluation.

LITERATURE REVIEW

This literature review discusses ideas to consider when evaluating PI processes and the importance of the perspective of evaluation.

EVALUATING PUBLIC INVOLVEMENT

Public involvement is the basis of a democratic society. Fundamentally, PI is used to ensure a public voice in decision making at all levels of government. However, this involvement varies greatly depending on the type, complexity, and importance of policy

deliberations and decision-making (Arnstein, 1969; Nelkin and Pollak, 1979; Wiedemann and Femers, 1993). To preserve and improve the quality of PI processes and ensure the continued participation of lay citizens in the development of their environment, many researchers have identified best practices and developed frameworks for evaluating PI (see Chess and Purcell (1999); Sewell (1979); Rowe and Frewer (2004)). However, most of this work focuses on topics related to policy, environmental issues, and health; few studies focus their efforts on infrastructure, particularly within transportation (Bickerstaff et al., 2002; Grossardt et al., 2003; Wagner, 2013).

Due to the complex nature of evaluating PI, researchers have sought to develop tools that guide PI planners through the process of developing evaluation frameworks (Bryson et al., 2013; Rowe and Frewer, 2004). For this study, the researchers used a highly-cited research agenda for evaluating public participation exercises developed by Rowe and Frewer (2004) as a guide to frame this content analysis. The research agenda breaks up the process of evaluating PI effectiveness into three steps: (1) define effectiveness, (2) operationalize the definition, and (3) conduct the evaluation and interpret results. The work presented in this research focuses mainly on Step 1; Steps 2 and 3 are beyond the scope of this study.

Rowe and Frewer (2004) divide the task of defining effectiveness into three different components: (1) universal or local application definition, (2) evaluation perspective, and (3) outcome versus process effectiveness. *Universal definitions* encompass all types of PI exercises and mechanisms, whereas *local definitions* focus on a specific mechanism or outcome (e.g., public hearings or increasing public understanding of transportation planning). The *evaluation perspective* acknowledges the numerous parties involved in the PI process (e.g.,. facilitator, sponsor, representatives, stakeholders, and citizens) and the varying conceptions of effectiveness from different vantage points. *Outcome effectiveness* focuses on the specific aims of the PI exercise; for example, if the purpose of focus groups as part of a PI program was to provide recommendations about a planned design, outcomes would evaluate the quality of feedback related to actual implementation. Outcomes effectiveness evaluations can be difficult to formulate in a timely manner due to the duration of planning and policy decisions within a specific project. *Process effectiveness* is used as a substitute for outcome evaluation, as it evaluates how the PI exercise execution is aligned with its goals. It is based on the premise that decision makers would be less likely to consider or accept recommendations if they perceive that the PI exercise was poorly executed. (Rowe and Frewer, 2004).

PERSPECTIVE OF EVALUATION

One challenge of evaluating PI is identifying the perspective from which effectiveness is defined. A stakeholder is defined as any individual or group affecting or potentially affected by a project who claim rights, ownership, interests in, and risks associated with that project (Freeman, 1994; Leung et al., 2013; Post et al., 2002; Savage et al., 1991). With the numerous stakeholders involved in PI processes and the development of

infrastructure projects, there are varying perceptions of what is considered to be a successful PI process, opening the door for potential conflict. For example, a municipality might hold a public workshop to develop recommendations for a new transit project. If the workshop was interactive and engaging, it might yield a positive evaluation from the participants. However, if the feedback produced was inadequate for the designers, the sponsors and designers would provide a negative evaluation. Rowe and Frewer (2004, p. 520) suggest the "need for an unambiguous, a priori statement of what is meant by effectiveness and how it might be ascertained, to reduce contention and dispute about the merits of the exercise later [sic]." To address this problem, some evaluators develop objective criteria that include the contentment, satisfaction, and acceptance of specific parties involved instead of trying to decide on one vague, agreed-upon definition. Although there are numerous stakeholders involved in infrastructure projects, this study specifies the participant's perspective as that of the lay citizens involved in PI and investigates how it is incorporated into PI evaluation for transportation infrastructure projects.

Moro and Network (2005) highlight the multidimensional nature of evaluation from a citizen's perspective while considering the object of evaluation as citizens' participation in policy making. This opens the door for citizens' evaluation to be viewed from the following perspectives: participation of citizens in the evaluation processes, citizens' evaluations of the evaluation processes, and citizens' evaluation of participation processes (Moro and Network, 2005). This research focuses on the third perspective, citizens' evaluation of participation processes, to more specifically focus on the citizens that participate in PI.

METHODS

This study uses content analysis to compare and contrast frameworks for evaluating public involvement for transportation infrastructure projects. A content analysis involves coding, categorizing, comparing, and drawing conclusions from units of the text (Cohen et al., 2007). In the section, the researchers explain the methods for data collection and analysis of the metric-based evaluative frameworks used in this study.

DATA COLLECTION: THE SEARCH FOR FRAMEWORKS

Evaluation frameworks to be used for the content analysis were identified by conducting searches in web-based databases such as Web of Science and Google Scholar. The following search terms were used to identify relevant frameworks: *citizen* or *public*, AND *participation* or *involvement* or *engagement*, AND *measur** or *metric*, AND *transport**. To scope the search, the researchers initially chose to narrow the search from 2004 to present, which captured relevant research published after the Rowe and Frewer (2004) research agenda that guided this analysis. The search was later expanded to the year 1999, due to limited findings. The researchers also conducted searches of references of relevant papers and corresponding journals to identify frameworks that may not have

been found within the database searches.

There are numerous frameworks for evaluating PI, and while some similarities across "best practices" exist, not all frameworks are created equal (e.g., in detail, practicality, organization), making them difficult to compare. Therefore, in addition to the search terms, the researchers sought to narrow the articles to those that explicitly included the following characteristics for defining effectiveness, as presented by Rowe and Frewer (2004): universal application definition; evaluative perspective; and whether the evaluation focused on process or outcome, or both. Additionally, the criteria needed to include corresponding metrics and practical examples of how these metrics could be operationalized. These criteria helped to set a frame of comparison among the frameworks that helped to ensure that their methods could be critically analyzed.

By narrowing the search for frameworks, the researchers were able to examine the need for metric-based frameworks for evaluating PI for transportation projects. Upon applying these criteria to search results, only two scholarly frameworks (Bailey et al., 2015; Wagner, 2013) and one practical assessment tool (TRB, 1999) satisfied each criterion and were included in the framework comparison. These frameworks are further discussed in the Results section.

ANALYSIS: FRAMEWORK COMPARISON

To address the purpose of this study, the researchers defined participant perspective as the participants' opinion or perception of the effectiveness of the PI process. Each framework's criteria were coded based on the perspective from which the data would be evaluated: the three perspectives to be considered are the expert (e.g., planner, designers, engineers), evaluator , and the participant. The researchers extracted instances when the participant was sought to evaluate the PI process and their voice was given power over the evaluative outcome. Although there were various criteria focused on observing the behaviors and interactions of participants from the evaluator's perspective, they were not included in this analysis. The frameworks used in this study were critically analyzed based on the following categories that describe the extent to which each framework measured participant perspective: breadth and depth of participant perspective, dimensions of PI, instrument reliability, and implication of evaluation results. The descriptions of each category is listed below:

1. *Breadth and depth of participant perspective:* Breadth describes the number of framework criteria and metric dedicated to exploring different aspects of effective PI from the participant perspective in proportion to the entire framework. Depth describes the richness of data collected to capture participant perspectives (e.g., using qualitative participant feedback in interviews versus using quantitative feedback in which participants submit feedback on a quantitative scale).
2. *Dimensions of PI:* Content validity is described as "the extent to which the questions on the instrument and the scores from these questions are representative of all the possible questions that could be asked about the content or skills

(Creswell, 2012, p. 618). This category seeks to identify different *dimensions* of effective PI that are evaluated from the participant perspective.

3. *Instrument reliability:* This category examines the reliability of the participant perspective measurement instrument through the lens of objectivity and subjectivity, as it relates to accuracy. Participant perspectives are subjective in and of themselves, but when designing qualitative or quantitative data collection researchers should strive objectivity to increase the accuracy of the information.
4. Implications of evaluation results: This category examines how the results of each evaluation framework can be used to inform practitioners about their PI processes.

RESULTS

The three frameworks analyzed in this study were the Transportation Research Board Practical Assessment (TRB, 1999), Wagner's Performance Scorecard (Wagner, 2013) and Structured Public Involvement (Bailey et al., 2015). Overall, two comparisons of these frameworks were conducted: 1) a comparison of overall framework characteristics, and 2) a comparison of the extent to which participant perspectives of PI were incorporated.

OVERALL FRAMEWORK COMPARISON

The public involvement evaluation frameworks used in this study are featured in Table 1. The TRB Practical Assessment, developed in 1999, is a qualitative observation framework that uses 32 metrics to evaluate 14 performance criteria focusing on the effectiveness and efficiency of PI. The TRB framework uses a universal application definition of effectiveness that encompasses both process and outcome criteria. The 32 metrics are evaluated on a Likert scale of 1 to 5, with one being the least desirable outcome, based on evaluator observations of PI.

Wagner's Performance Scorecard (2013), a quantitative framework, uses a universal application definition and a combination of process and outcome criteria. Wagner's Scorecard is an opinion poll that measures participant experiences of the PI process through ten metrics across three evaluation criteria: accessibility, engaging, and outcome oriented (Wagner, 2013).

The Structured Public Involvement (SPI) framework is a mixed-method evaluation approach that uses various forms of data collection (e.g., interviews, surveys, numerical counts) to evaluate four performance criteria: quality, inclusion, efficiency, and clarity and utility of decision (Bailey et al., 2015). While the SPI framework is crafted mainly from the evaluators' perspective, it also evaluates PI from expert and participant perspectives.

Table 1: Comparison of all of the framework and the criteria used when determining

effective PI

	Transportation Research Board (TRB) Practical Assessment, (1999)	Wagner's Performance Scorecard, (2013)	Structured Public Involvement (SPI), (2015)
Definition	Universal, Process and Outcome	Universal, Process and Outcome	Universal, Process and Outcome
Criteria	14 Criteria and 32 metrics	3 Criteria and 10 metrics	4 Criteria
Type of Data	Qualitative with quantitative representation	Quantitative	Mixed-Methods; uses quantitative for participant perspective
Instrument	Observation Scorecard	Opinion Poll	Varies for each criterion; satisfaction rating for participant perspective
Perspective	Evaluator's Observation of Process	Participant's experience of process	Evaluator, with participant and expert perspective examined in separate criterion

PARTICIPANT PERSPECTIVES

The primary focus of this study was to investigate the extent to which each evaluation framework examined the participants' perspectives. To accomplish this objective, the researchers extracted criteria and metrics that examine participant perspectives from each framework, found in Table 2. The components highlighted in Table 2 are *criteria* and *indicators* extracted from the evaluative frameworks. Each framework is then analyzed based on the four categories that determine the extent each framework considered participant perspective: breadth and depth of participant perspective, dimensions of PI, instrument reliability, and implications of evaluation results.

Table 2: Summary of Framework Evaluation Criteria for participant perspective

Framework	Evaluation Criteria	Indicator	Data
Transportation Research Board Practical Assessment, (1999)	***Overall Framework Measurement Instrument:*** Each criterion is evaluated by an indicator that is measured through the observation of specific behaviors. The metrics are scored on a scale from 1 to 5, where one represents the lowest level of performance and five the highest.		
	Project/ Decision Acceptability	Stakeholder Response	1 – Negative response from stakeholders and media 5 – Positive response from all stakeholders and media
	Mutual Learning	Stakeholder Perspective	1 – Participants defend individual positions without compromise 5 – Feel responsible for finding and support a solution that is best suited to all stakeholders
	Indirect Opportunity Costs	Other Activities	1 – Participant regret participating, values other activities instead 5 – Participant places a high value on personal investment in the process
	Indirect Costs Associated with Emotional Issues	Stakeholder	1 – Process is frustrating, intimidating, disillusioning to participants 5 – Process is fulfilling and worthwhile to all participants
Wagner's Performance Scorecard, (2013)	***Overall Framework Measurement Instrument:*** Opinion poll using Likert scale with goal percentages for affirmative responses		
	Accessibility	Ability to participate without undue burden Events were democratic and representative of population	*Measures:* Individuals … ● Felt they were able to participate without an undue amount of trouble ● Who declined to attend did so out of choice and not inability ● Felt comfortable providing input in at least one of the platforms utilized ● Felt the platforms facilitated their attendance and participation ● Attending the events roughly represent the population
	Engaging	The process fostered and environment for favorable input and collaboration. The process was ongoing	*Measures:* Individuals felt … ● Their opinions were heard and valued ● The process encouraged collaboration ● The activities were engaging Individuals used the feedback mechanisms
	Outcome Oriented	The input provided from the public influence decision making process. Process successfully engaged the public	*Measures:* Individuals felt … ● Their opinions would influence the decision making ● The engagement process, as a whole, was successful
Structured Public Involvement	Quality	Participant Satisfaction	Process quality evaluation conducted anonymously by stakeholders at open meeting (e.g. surveys)

(SPI), (2015)	Inclusion	Number of organizations, citizens, and groups	Evaluate stakeholder perceptions of inclusion, along with other measures (e.g. Counting participants)

TRB Practical Framework

(1) Breadth and depth of participant perspective: The TRB framework is evaluated from the evaluator's perspective and indirectly considers participant perspective of the project within four of the 32 metrics, that are within four of the 14 criteria. These criteria included the effectiveness criteria: the project acceptability and the mutual learning criteria, and efficiency (cost) criteria: indirect opportunity and emotional costs criteria, featured in Table 2. These the metrics are equally weighted, thus each perspective represents about one-eighth (4/32) of the overall evaluation. The TRB framework does not specify the difference between stakeholders and participants; therefore, the researchers extracted criteria that best represented participant perspectives of the effectiveness of the process. Although this framework uses qualitative observation data collection, the data reporting instrument only codes the metrics on a 1-5 rating scale, which provides superficial information on participant perspective because it requires the observer to make inferences about participant perspective rather than have the participants self-report their feelings and opinions.

(2) Dimension of PI: This framework is multidimensional, by examining the participant's perspective from four dimensions of effective PI: acceptability of decisions, capacity building, and two facets satisfaction through indirect costs.

(3) Instrument reliability: This framework is behavior observation where majority of the metrics are based on evaluator interpretations of participant reactions without directly engaging with them. Although participant feedback is obtained within the four metrics identified in this study, the PI still evaluated subjectively from the evaluator's perspective, which lowers accuracy of the instrument. The framework authors suggested allowing some participants, along with other stakeholders, to evaluate the process based on the scorecard so that the results could be plotted for comparison to achieve a more objective evaluation.

(4) Implications of evaluation results: The metrics scores of this framework are designed to be calculated into two separate criteria categories: effectiveness, nine criteria, and efficiency, five criteria. The category summations are then to be graphically represented by plotting the values against each other to reveal the relationship of the PI process's efficiency and effectiveness. TRB recommends having multiple stakeholders complete the scorecard so that the results could be displayed on the same graph. Their "scattergram" technique graphically illustrates convergence or divergence of opinion regarding the "success" of the process (TRB, 1999).

Wagner's Public Engagement Performance Scorecard

(1) Breadth and depth of participant perspective: The Performance Scorecard is a framework that evaluates all of the criteria and metrics for effective PI through opinion polling from the participant's perspective. The performance scorecard is featured in Table 2 in its entirety because all of the criteria are based on participant perspectives.

(2) Dimension of PI: Wagner's framework measures three dimensions of PI that were derived from a review of best practices for PI: accessible events, engaging interactions, and outcome oriented processes.

(3) Instrument reliability: This framework uses quantitative survey data to evaluate the effectiveness of PI. This is an objective measure of participant perspective, which preserves the perspective of the individual participants. The instrument requires limited data analysis that allows for easy interpretation of the results securing its accuracy and reliability.

(4) Implications of evaluation results: Wagner's Scorecard opinion poll asks participants questions across all three of criteria developed from the best practices for PI. This allows for participants to provide their voice on various objectives of the PI process that organizers sought to achieve. Wagner suggests that practitioners seek to achieve a specific percentage of affirmative responses for each category, allowing them to set a target and strive to achieve it. Dividing the survey into specific goals allows practitioners to concentrate resources on specific improvement areas.

Structured Public Involvement

(1) Breadth and depth of participant perspective: Arnstein's Gap is the theory behind participant perspective for this framework, and the goal is to close the gap between participant's perceived and expected levels of involvement. The Arnstein Gap, based on *the Arnstein Ladder of Citizen Participation*, represents the perceived quality deficit in the public involvement processes conducted by transportation professionals. The SPI framework has four criteria, participant satisfaction being one of them. Participant satisfaction measures participant perspectives through a survey rating of the PI exercise on a 1 to 10 scale, where the results account for one-fourth of the evaluation. Aside from the rating scale, the SPI authors mentioned evaluating participant perspectives of inclusion, but they did not provide any information as to how this perspective to be acquired. While the participant perspective serves as an important category for SPI framework, the 1 to 10 scale does not provide detailed feedback regarding the effectiveness of the process. Rather, it only prompts a scoped response as to whether the participants thought the process was effective or not.

(2) Dimensions of PI: The SPI framework only measures one dimension of PI from the participant's perspective. It uses a survey to measure participant satisfaction of the overall process on a scale of 1 to 10, where 1 represents awful and 10 represents wonderful.

(3) Instrument reliability: This framework is a mixed-method analysis that uses a quantitative survey to objectively measure participant perspectives through a satisfaction rating. This is also an objective measure of participant perspective, that preserves the perspective of the individual participants like Wagner's framework.

(4) Implications of evaluation results: Although the first, completed introduction

of the SPI framework was not published until 2012, with a more robust explanation in 2015, the framework authors began quality data (satisfaction ratings) as early as the year 2000 (Bailey et al., 2015). Since the inception of the SPI framework, over 10,000 ratings on SPI projects have been collected, with the majority of projects receiving ratings ranging from 6.5 to 9. This allows practitioners to track ratings over time and compare satisfaction ratings based on mechanism of PI (e.g. comparing public meeting ratings against workshops).

DISCUSSION

PI is characterized as two-way communication between the public and the "governing body." To preserve the integrity of this communication, both parties' perspectives must be included. The National Academic Council emphasizes the importance of incorporating participant perspectives into an evaluation of PI to ensure accountability (NRC, 2008). When examining arguments presented for the development of each framework, the authors of the SPI framework were the only ones who developed a robust explanation for the extent to which they incorporated participant perspectives. The TRB framework authors recognized the need to include more perspectives into the evaluation of PI, which prompted their suggestion to have various stakeholders evaluate the PI using the scorecard (TRB, 1999). Wagner created his framework to emphasize the participant voice in the success of PI processes whereas, the SPI framework situated in closing the Arnstein Gap of participation. The Arnstein Gap, based on *the Arnstein Ladder of Citizen Participation,* represents the perceived quality deficit in the public involvement processes conducted by transportation professionals.

Breadth and depth of participant perspectives: Each framework examined in this study included participant perspectives to varying degrees. The TRB framework incorporates limited participant perspective through evaluator observation while Wagner's Scorecard evaluation is a framework that is fully dependent upon participant perspective across all PI objectives. The authors of the SPI framework criticize the TRB Practical Assessment because of the lack of participant perspectives, which limits the measure of credibility for the "design agents of authority" (Bailey et al., 2015). Although their mixed-method framework examines the evaluation of PI from multiple perspectives, their participant perspective is a scant rating that does not provide direction for improvement.

The TRB framework and Wagner's scorecard are both quantitative evaluations of PI. Although the SPI framework is a mixed-method analysis, it also used a quantitative evaluation of participant satisfaction. Benefits of quantitative frameworks include their ability to produce consistent, precise, reliable data that are easy and efficient to analyze. While these are all desirable qualities of evaluations, surveys require validity testing to ensure statistical reliability with results, often lacking the important and insightful context of the PI process that can be used to inform improvement processes. One way to solicit this information is by including a comment section within the surveys that allow

participants to elaborate on and explain their responses. Survey comment sections could also serve as an opportunity for evaluators to ask for suggestions, compliments, and additional thoughts regarding the PI process, as well as gather participant contact information for potential follow-up questions or interviews.

Dimensions of PI: The Wagner framework evaluates all of the identified dimensions of effective PI from the participant perspective, while the TRB framework measured four out of 14 dimensions of effective PI from a participant perspective. The SPI framework was the only framework that measured only one dimension of PI. Due to the complexities of PI, practitioners should strive to capture as many dimensions of PI to ensure content validity.

Instrument reliability: This category measure the subjectivity and the objectivity of measures of participant perspective. Both the Wagner and SPI framework are objective quantitative measures of the subjective participant opinions and satisfaction ratings. The TRB framework accounts for participant perspectives through a subjective interpretation of the evaluator. The evaluator is required to "get a sense" of the feelings of the participants, synthesize these findings, and provide a rating between 1 and 5 on a scorecard. The framework does not provide further detail about how to obtain an interpretation of the participant's feelings. This method of evaluation captures the voices of participants as translated by the evaluator, which can threaten the measure of credibility. The TRB Practical Assessment was developed in 1999 following the initial push for "effective" public involvement from legislation; the aspects of accountability and improvement were not emphasized as reasons for the framework's development because it was produced before the criticism that brought about the creation of the other frameworks. Behavioral observations do not normally require the observer to make judgments about participant feelings and emotions because it requires them to make inferences that introduce biases. These biases make this method not accurate because each observer would likely get a different result. To minimize subjectivity you can operationalize the observation in being specific about what you are looking for.

Implications of evaluation results: All three frameworks evaluated in this study maintained the same goal of evaluating the effectiveness of PI in efforts to justify costs and provide information to improve the PI process. In addition, each framework hinted at the adaptability of the criteria for practitioners to adjust as they see fit to their project goals. The results from the TRB framework were to be used to justify the costs of PI processes and distinguish the opinions of PI success among various stakeholders. The SPI framework's results were designed to track the satisfaction ratings over time and compare the rating level across different PI mechanisms. Out of all of the frameworks, Wagner's Performance Scorecard is the only one that ties a direct connection between the participant's perspective and applying it to the improvement of PI.

IMPLICATIONS

This content analysis revealed that there is an extremely small number of practical frameworks for evaluating PI for infrastructure that fit the study criteria. The authors of this paper have not found current research that have tested the applicability of the evaluation frameworks examined in this study, which highlights the need for more research to be conducted in this field.

This study further emphasized the importance of incorporating participant perspectives into the evaluation of PI by identifying the shortcomings of each of these frameworks. All of the frameworks were developed to be used by an entity constructing a public project (e.g., a transportation department) and contained performance criteria that align with the entity's PI goals. The performance criteria allow project achievement to be cross-referenced with participant perspectives of PI. One major pitfall of this type of evaluation is that participants are not consulted when deciding on the evaluation framework and instruments through which to collect their feedback.

Evaluation effectiveness could be improved if the participant was brought into development of the evaluation (e.g., developing the type of questions for content validity)for consideration. Incorporating participants into the development of evaluation processes may improve engagement processes and increase citizen empowerment and capacity building for future projects. Research shows that effective PI processes lead to participant satisfaction, even if the outcome of the PI decision outcome is not desirable because the process is deemed as fair by participants (Leung et al., 2013; Rowe and Frewer, 2000).

CONCLUSION AND FUTURE WORK

Public involvement was created to ensure that designers and facilitators make decisions to benefit the greater good during various processes. This research focused on one of the many aspects of design effectiveness: evaluation perspective, which is key when evaluating public involvement processes. Preserving public voice within public infrastructure is needed to ensure their opinions are incorporated into the PI process. There are unique challenges and limitations that arise depending on the type of data and the extent to which participant perspectives are considered when evaluating PI. By achieving a better understanding of the complexities of evaluating public involvement, we can continue to refine the methodologies of evaluation to improve PI processes and result in successful delivery of public infrastructure projects.

This study outlines and employs initial steps for identifying how and to what extent participant perspectives are incorporated into the evaluation PI processes. Future work could investigate additional stakeholder perspectives; for example, research examining how expert perspectives are incorporated into PI process evaluation and how inherent power structures influence that evaluation could be used to improve future PI processes. In addition to examining additional perspectives, future research could investigate how to incorporate participants into the development of evaluations of PI

processes through participatory or collaborative methods for evaluation. Through this research, we can enhance public involvement in public infrastructure projects.

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