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Evaluating Citizen Participation in Local Public Meetings: Exploring a Large Language Model Approach Using Transcripts from the United States

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Abstract

Citizen participation in local public meetings is crucial for planning decision-making processes. This study employed large language models (LLMs), specifically ChatGPT models, to analyze more than 4,000 transcripts of local planning public meetings in the United States between 2006 and 2023. We quantify citizen participation levels and explore their relationship with public meeting topics. Findings align with previous scholarship that local public meetings do not consistently result in citizen empowerment. We also identify actionable strategies—such as fostering solution-oriented discussions and increasing civic organization involvement—that can enhance participatory planning. These insights suggest data-driven approaches for inclusive and equitable planning processes.

Keywords

citizen participation, evaluation, public meeting, large language model, ChatGPT

Introduction

Citizen participation has long occupied a central position in urban planning scholarship and practice in the United States and internationally. Its intellectual roots can be traced to Davidoff (1965) advocacy planning, which emphasized the role of citizens in shaping governmental decision-making, and to subsequent work highlighting participation as a means to expand individual agency and reflect the diverse needs of communities, particularly marginalized groups (Glass 1979; Talen 1998). The normative case for citizen participation is further supported by claims that participatory institutions can mitigate political inequality (Einstein, Palmer, and Glick 2019), enhance service provision efficiency (Ojha 2006), and empower historically disenfranchised populations (Ojha 2006). However, real-world implementations frequently reveal deep structural challenges. Equitable participation is inconsistently realized across different sociodemographic contexts, shaped by entrenched power asymmetries, the motivations of participants, and the institutional conditions under which participation is facilitated (Osmani 2008).

Local public meetings have long been regarded as essential venues for facilitating citizen participation in planning processes (Bratt and Reardon 2013; Stapper and Duyvendak 2020). Most local governments hold regularly scheduled meetings to discuss and decide public issues, with citizens voicing their opinions typically being a part of these gatherings (Adams 2004). However, their effectiveness and deliberative qualities remain highly controversial. While much scholarly attention has been given to the normative role of public meetings, empirical evaluations of their effectiveness in fostering meaningful participation are limited. Persistent concerns focus on whether these meetings genuinely empower citizens or merely create an appearance of inclusion that fails to influence decision-making by authorities. Two core challenges underlie this critique.

First, much of the existing literature has focused on representativeness rather than on the broader question of whether participation translates into influence or empowerment (Einstein, Palmer, and Glick 2019; Gundry and Heberlein 1984; Johnson et al. 1993; McComas 2001; Sinclair 1977). A central question that remains is whether citizens' participation leads to empowerment (Fitzgerald 2022; Garrison 2019). Participation in public meetings could serve merely as a ritualistic performance for the dominant to defend their wishes

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(Scott 1990), in which the actual outcomes deviate from citizen's empowerment (Checkoway 1981; Fainstein 2005; McComas, Besley, and Black 2010). Second, the absence of appropriate analytical tools to process the vast volume of unstructured textual data generated by public meetings (Fu 2024), along with the continued lack of standardized, reliable datasets (Einstein, Palmer, and Glick 2019; Osmani 2008), has hindered the development of quantitative studies capable of identifying long-term patterns and relationships within these participatory processes and identify relationships among various attributes of the meetings.

This study addresses these limitations through an exploratory quantitative analysis of citizen participation in local public meetings held by planning boards and commissions across the United States between 2006 and 2023. Drawing on more than 4,000 meeting transcripts, we employed large language models (LLMs), specifically OpenAI's ChatGPT models, to systematically evaluate participation dynamics at scale. The analysis is guided by three core objectives. First, we assessed longitudinal trends in citizen participation across jurisdictions using LLMs to process the textual data. Second, we operationalized a multidimensional framework of participation grounded in Arnstein (1969) ladder, evaluating citizen involvement, engagement, alteration, and concession, with each capturing distinct aspects of empowerment. Third, we examined how broader contextual factors shape participation, including the types of projects under discussion, the nature of topics raised, and the presence of institutional actors. This study thereby provides an empirical foundation for understanding the structural conditions under which citizen participation occurs and offers actionable insights to support more equitable and inclusive planning practices.

Literature Review: Can Citizen Participation in Public Meetings Bring Empowerment?

Historically, greater citizen involvement in community development programs was stimulated by the negative effects of many urban renewal programs and the War on Poverty in the early 1960s (Bratt and Reardon 2013). Highly centralized, developer- and bureaucrat-driven urban renewal policies oriented toward the new development of highways, shopping centers, and higher-end residential areas led to the destruction of working-class and low-income neighborhoods in many cities (Einstein, Glick, and Palmer 2023). Sherry Arnstein's seminal 1969 paper on the "ladder of citizen participation" was written during this period when planners and policymakers favored processes that empowered the voices of neighbors and community residents. The ladder has framed much of the subsequent discourse on this topic. Arnstein used the ascending rungs of a ladder as a metaphor to illustrate the degree to which citizen participation results in real power. Progression up the ladder shifts control away from existing powerholders to citizens (Rosen and Painter 2019; Tritter and McCallum 2006).

The lowest two rungs are manipulation and therapy, where powerholders intend to mislead the nature of citizen participation and change the behavior of participants. This denies citizens from expressing their voices (Rosen and Painter 2019). The middle rungs are tokenism—informing, consultation, and placation, where citizens can provide input on policies, but decisions are already made by officials representing elite interests. Citizens' voices can be heard, yet their participation does not translate into sufficient control, to alter decisions (Rosen and Painter 2019). The top rungs are partnership, delegated power, and citizen control where trade-offs are made between the powerful and citizens, who have a major role in decision-making processes. Citizen control represents the most transformative citizen participation, where citizens have the real power to influence decision-making through direct citizen participation (Arnstein 1969, 216).

Public meetings as a form of participatory venue are among the most common and traditional ways to involve citizens in decision-making in the United States (McComas 2001). Public meetings provide ideal opportunities for people to gather, confront issues, and work toward finding solutions. Despite the varying formality of public meetings, the common format usually consists of technical presentations followed by questions and comments from participants in the audience. Compared to other techniques, public meetings appear to be a relatively quick, simple, and inexpensive way to involve the public in decision-making, thus having eaned some legitimacy as a valid tool for public involvement (Sinclair 1977).

Yet public meetings are frequently criticized for their limitations in fostering genuine citizen participation. Although Gundry and Heberlein (1984) argued that public meetings in general can represent public opinions, many scholars including Sinclair (1977), Johnson et al. (1993), McComas (2001), and Einstein, Palmer, and Glick (2019) found that public meetings on specific topics, such as water management, deer hunting, environmental concerns, and housing and redevelopment policies, may favor an unrepresentative group of individuals. Beyond the issue of representativeness, another central concern focuses on who is empowered to make the decisions that truly matter (Slotterback and Lauria 2019). Despite the potential of public meetings to reinforce civic values and foster group cohesion (McComas, Besley, and Black 2010), formal public involvement efforts rarely concede the power to shape and make decisions (Karner et al. 2019). While public meetings may provide a venue for conveying information to officials and influencing agendas, they often fail to offer citizens meaningful opportunities to directly shape policy decisions (Adams 2004). This compromises the merits of citizen participation and its significance in redistributing power (Rivera, Jenkins, and Randolph 2022). Due to this reason, Arnstein (1969, 219) herself also characterized public meetings only as a form of "consultation" due to its "window-dressing ritual," which is one of the tokenism rungs.

Building on this critique, the precarity of citizen participation in public meetings concerns whether participation

brings actual empowerment to citizens. Checkoway (1981, 572) in discussing the politics of public hearings also expressed concerns that public meetings were not held to influence decisions. Democratic processes in public meetings can be skewed by the interests of the most powerful (Fainstein 2005, 125), hence promises to the public at each rung of the ladder do not always result in empowerment (Fitzgerald 2022). Furthermore, Arnstein's ladder has been criticized for oversimplifying citizen participation as a binary of inclusion or exclusion, with greater inclusion implying greater power (Collins and Ison 2009; Tritter and McCallum 2006). However, inclusion and exclusion techniques may be manipulated by institutions and organizations to reinforce power inequalities (Chaskin, Khare, and Joseph 2012).

As a result, citizen participation does not always yield positive outcomes (Bratt and Reardon 2013; Innes and Booher 2004). Even with high levels of citizen participation, the process is often designed to lead to disempowerment (Bickerstaff and Walker 2005; Clark 2021). For instance, public meetings could turn out to be arenas that lure participants into believing they have participated or a single-directional informing process of the already-made decisions (Arnstein 1969). Therefore, measuring citizen participation in public meetings requires a rationality that extends beyond "greater involvement" and addresses actual empowerment. Beyond the representativeness of participants (Berry et al. 1984; Herberlein 1976), empowerment should be considered a criterion for participatory success in the decision-making process (Fitzgerald 2022; Garrison 2019).

An important yet often overlooked aspect of local public meetings is the set of contextual factors that influence the extent and quality of citizen participation. First, *project types* under discussion frequently shapes meeting dynamics. For instance, housing development projects are closely tied to community-level power struggles and typically elicit strong public responses (Einstein, Palmer, and Glick 2019). Similarly, land use and economic development initiatives such as zoning changes or commercial real estate projects tend to involve conflicts between competing stakeholder interests (Han, Laurian, and Dewald 2021; Loh and Kim 2021). Second, *topics of concern* often reflect the tensions outlined in Campbell (2016, 389) "planner's triangle," which conceptualizes conflicts among three core planning priorities: property conflicts (economic development vs. equity and social justice), development conflicts (environmental protection vs. equity and social justice), and resource conflicts (economic development vs. environmental protection). These tensions are central to planning debates on topics like gentrification, housing unaffordability, and environmental degradation (Loh and Kim 2021). Third, public meetings regularly include a range of institutional actors beyond the planning boards and the general public, including both organized and unorganized public members. These *institutions involved*, such as developers, construction firms, legal consultants, and professional service providers (Fu et al. 2025), as well as nongovernmental organizations (NGOs) and community-based organizations (Cannon et al. 2024; Rosen and Painter 2019), often play influential roles in shaping meeting outcomes.

As planners and policymakers deal with increasingly fractured publics, a deeper understanding of citizen participation in public meetings is warranted. However, local governments do not collect systematic data on who participates in their public forums (Einstein, Glick, and Palmer 2023). Technical obstacles caused by the scarcity of data and tools to evaluate public meetings have limited existing studies to rely on conventional methods of surveys, voting, case studies of meetings, and aggregate-level analyses of meeting participation that have primarily based on small quantities of data (Barari and Simko 2023; Einstein, Palmer, and Glick 2019; Gundry and Heberlein 1984; McComas 2001; Sinclair 1977). The opportunity of evaluating the actual public meeting transcripts and processes thus has been largely untouched. Due to such limitations, studies have not extended to the construction of a systematic framework to evaluate public participation in public meetings. In response, this research aims to provide an explorative approach to evaluate citizen participation in local public meetings, which is anchored to the principles of empowerment.

Recently, LLM methods, especially ChatGPT models, have been adopted as tools to evaluate textual data for planning research (Fu 2024; Fu et al. 2024, 2025; Fu, Li, and Zhai 2023; Fu, Wang, and Li 2023; Han, Laurian, and Dewald 2021; Yin, Han, and Nie 2024). Advanced LLM methods have opened up opportunities to apply natural language processing to the evaluation of public meetings due to LLMs' powerful capability of reasoning and long-text processing. Previously, analyzing lengthy transcripts was a daunting task for individuals, as this manual process was both time-consuming and costly. It often required the involvement of multiple people, which could introduce varying personal biases related to the analysis dimensions and criteria (Fu 2024).

In contrast, LLMs can read and evaluate long transcripts from a consistent perspective based on the given instruction within a short time, unaffected by the diverse personal viewpoints that multiple humans might bring. Although it was alerted that LLMs such as ChatGPT cannot replace humans in evaluating plans (Fu, Wang, and Li 2023), the barriers largely stem from planning terminologies or the omission of details in technical planning documents (Fu et al. 2024). Public meeting transcripts, unlike technical plans that are prepared for planning professionals, are the documentation of conversations between the planning board and the public. They are less likely to involve a large number of terminologies. Furthermore, LLMs have performed more successfully in topic modeling (Fu et al. 2024, 2025; Fu, Li, and Zhai 2023), proving their competency in content analysis and topic classification. We believe that LLM methods can now provide insights generated from a large amount of conversational data

in local planning meetings without entanglement with details and jargon that are more ubiquitous in technical plans.

Methods

Research Data and LLM Selection

We downloaded local public meeting data from LocalView, a platform developed by Barari and Simko (2023) and is the largest existing dataset of real-time local government public meetings.[1] The advantages of these data are the scale, time, and standardization[2] (Barari and Simko 2023, 2), which overcome the scarcity of reliable data on public meetings and access to detailed interactions among meeting participants in the textual format that has been conventionally unavailable. The downloaded data contain a total of 6,401 transcripts of local public meetings, with text ranging from less than 10,000 words to more than 240,000 words in length, from 280 cities in the United States between 2006 and 2023. Among them, we identified 4,416 valid public meeting transcripts (transcripts that have actual content and are non-empty) held by local planning and zoning boards or commissions.

We primarily utilized the latest OpenAI's GPT-4 and GPT-4o models due to the accessibility and convenience of the OpenAI's application programming interface (API) and the superior performance of these models. Based on rigorous result validation and model comparison for different tasks,[3] an optimal model with better performance for each specific task was selected among the GPT-4 and GPT-4o models according to their overall effectiveness in this task. The LLM temperature was set to zero for all tasks to guarantee the consistency and robustness of the model output (Fu, Wang, and Li 2023). We also engaged in detailed prompt engineering for each task, starting with a small subsample of testing data and being as specific as possible with the instructions, to optimize the model's performance and reasoning process, directing it to analyze and evaluate the transcript according to the specified dimensions and criteria closely.

Furthermore, GPT-4 and GPT-4o models are subject to input token length limitations. For transcripts exceeding the model limit, we segmented them into smaller sections, each containing approximately 6,000 words. Each section was then independently assessed and analyzed by the LLM. The results from these segments were subsequently compiled and synthesized into a comprehensive assessment through an additional LLM analysis step. This approach has proven to be an effective and widely adopted method for analyzing extensive text documents (Fu, Wang, and Li 2023).

Our prompting approach is zero-shot prompting, wherein the LLM is tasked to complete assignments without being given specific example outcomes in the prompts (Fu, Wang, and Li 2023; Kojima et al. 2023). Few-shot prompting, which includes examples in the prompt, has the potential to enhance the model's ability to tailor its responses according to the given examples. However, during the prompt engineering stage of our research, we were still exploring the optimal reasoning processes based on the specified dimensions and criteria. It was also pointed out in the literature that few-shot prompting should be cautiously used to avoid the reproduction of unreliable results (Mittelstadt, Wachter, and Russell 2023). Given this uncertainty, we were concerned that our examples might not be robust enough and could inadvertently restrict the LLM's reasoning capabilities. Poorly chosen examples could introduce significant biases, undermining the LLM's inherent reasoning abilities. Consequently, we chose to maintain the LLM's original reasoning power developed through extensive pretraining on a broad spectrum of internet data.

Prompt Engineering: Dimensions for Evaluating Citizen Participation

For the numeric assessment of citizen participation in each public meeting, we constructed a four-dimensional framework based on the indicators of empowerment, with each dimension consisting of three criteria. The first dimension is *Involvement*—whether participants speak up during the meeting (binary, assessed per meeting), since this is the fundamental indicator of public involvement. The second dimension is *Engagement*—whether public comments elicited meaningful, responsive engagement from officials, for example, acknowledgment, clarification, or discussion, which reflects interaction beyond a single-directional consultation (Arnstein 1969). The third dimension is *Alteration*—whether public input resulted in reframing or modifying the content of a project or issue under discussion, as a criticism of public meetings is that crucial decisions have already been made and citizen involvement has limited influence (Smith and McDonough 2001). The fourth dimension is *Concession*—whether the meeting showed evidence of institutional decision-making change, for example, delays, cancellations, or modifications, based on citizen input, since the aim of citizen participation is transferring power, in varying degrees, from the government to other actors to shape and make decisions (Cohen-Blankshtain and Gofen 2022; Karner et al. 2019).

Each dimension of citizen participation—Involvement, Engagement, Alteration, and Concession—is evaluated based on three criteria—*de jure*, *de facto*, and *spontaneous*. First, *de jure* empowerment is the type of power allocated by political institutions and powerholders, as sometimes institutions are required to do so (Checkoway 1981). It is assessed through references to legal or institutional frameworks that grant citizen formal power. Second, *de facto* empowerment represents citizens' actual power gained under the given institutional framework (Acemoglu and Robinson 2006). It refers to observable evidence that citizen input led to influence or action by officials and is identified from interactions in which citizens input leads to actual change or is seriously

considered by officials. Third, *spontaneous* empowerment suggests whether the authority is open and willing to concede power to citizens. It suggests citizen influence initiated without institutional prompting or formal structure (e.g., grassroots pressure that visibly changed the discussion) and is observed when citizens influence the direction of the meeting or discussions without explicit institutional prompt or formal power. These criteria are translated into specific instructions for the assessment of each dimension and were assessed by the LLM through analysis of the language used in the transcripts, with scores assigned based on the presence and strength of these indicators.

We meticulously defined the four dimensions and three criteria in the prompt, providing detailed, step-by-step instructions without including actual examples of the analyses. We ask LLM to evaluate each of the four dimensions based on the three criteria and provide a score on a 5-Likert scale, which is commonly used in evaluation studies (Sullivan and Artino 2013), for each criterion, where 5 indicates higher citizen empowerment and 1 indicates the lowest. This process leads to 12 scores in total – 3 scores for each dimension. The LLM was also instructed to output its reasoning behind the given score over the three criteria. After rigorous result validation, the GPT-4 model turned out to perform better on this task. To improve transparency, we include an example of the step-by-step prompt used to guide the LLM's evaluation, along with an illustrative model output showing how the system justified its scores based on transcript content in Supplemental Appendix 1.

Prompt Engineering: Content Analysis and Topic Classification for Contextual Factors

In addition to numerical assessments, we employed content analysis and classification to gain deeper insights into the nature of citizen participation as it relates to the specific characteristics of public meetings. The process was streamlined into the following steps: (1) *Project extraction and classification*: we extracted individual projects and their names from each transcript. Each project was subsequently classified into a project type based on its content and intended use or purpose. (2) *Topics identification and classification*: for each extracted project, we identified the topics of concern raised during the project discussion, which were then categorized into specific conflict types. (3) *Identifying and classifying institutional entities*: for each extracted project, we identified all institutional entities either mentioned in the meeting discussion or present at the meeting, explicitly excluding meeting hosts and participating citizens. These entities were then classified into institutional categories based on their functional roles.

Specifically, *project types*, guided by classifications in existing studies (Einstein, Palmer, and Glick 2019; Han, Laurian, and Dewald 2021; Loh and Kim 2021; Loukaitou-Sideris and Sideris 2010; Shin 2021; Zandiatashbar and Laurito 2023), are classified into "housing and residential," "public facilities," "transit system and infrastructure," and "retail and commercial." All other project-related discussions were grouped under a "miscellaneous" category. *Topics of concern*, informed by the three core planning priorities identified in the "planner's triangle" (Campbell 2016, 389), are classified into "property conflict," "development conflict," and "resource conflict." All other topics were grouped into a "miscellaneous" category. *Institutions involved* intend to capture the participation from government, business, and civic actors, other than the planning board and general public participants (Cannon et al. 2024; Fu et al. 2025; Rosen and Painter 2019). They were identified based on their presence or mention in the transcript, excluding the hosting body (e.g., planning board), whose involvement was assumed across all meetings. These institutions are categorized into "government agencies," "real estate and property management companies," "professional service companies," and "civic organizations" that are mostly relevant to planning decision-making processes. All others are grouped under a "miscellaneous" category. The above classification steps were implemented in a single LLM prompt and repeated for all transcripts. After thorough result validation, the GPT-4o model turned out to perform better on this task.

In addition, to explore how the above contextual characteristics of public meetings are associated with patterns of citizen participation, the study used the proportions of each category present in a given meeting as independent variables. These were analyzed to determine their correlations with citizen participation scores in each corresponding local public meeting, which served as dependent variables. To ensure the robustness of the findings, additional control variables such as video length, meeting year, and meeting location[4] were included in the analysis. Given the large sample size, we note that some statistically significant results reflect relatively small effect sizes. Readers should interpret these findings with caution. A correlation study among the contextual factors was conducted and showed weak relationships. Also, given the exploratory nature of this study and the lack of established empirical models linking these variable groups, we conducted separate multivariate regressions for project types, topics of concern, and institutional actors. This approach minimizes potential multicollinearity across groups and allows for clearer interpretation of each factor's relationship with citizen participation. Future work may build on this framework by integrating these dimensions into a unified model.

Results

Four-Dimensional Numeric Measurements of Citizen Participation

Table 1 presents the distribution of numeric scores across the full dataset, indicating how frequently each level of participation was observed. Overall, the distribution of numerical

Table 1. Overall Distribution of Citizen Participation Scores.

Dimension	numeric.mean	numeric.sd	numeric.hist (score 1–5)
Involvement	3.2275	1.1060	
Engagement	3.1902	1.2094	
Alteration	2.4718	0.8609	
Concession	1.8098	0.9024	

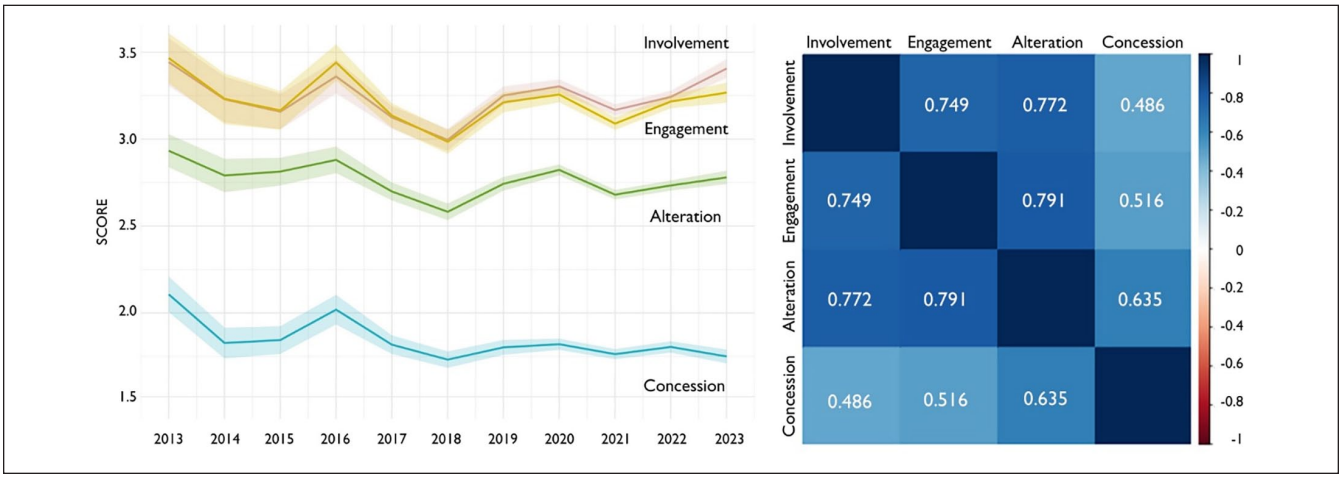

Figure 1. The four dimensions of citizen participation: yearly trend of the national average with error margins (2013–2023) and their correlation matrix.

measurements generated by LLM across the four dimensions aligns with our initial hypotheses regarding the increasing demands for citizen empowerment inherent in each dimension. As illustrated in Table 1, the mean scores for the four dimensions show a continuous decline in the sequence of Involvement, Engagement, Alteration, and Concession (see Supplemental Appendix 2 for example transcript quotations). The histogram in Table 1 also reveals that the frequency of higher scores diminishes as one progresses from Involvement to Concession. In addition, Figure 1 on the left displays the annual trend of national average scores from 2013 to 2023, based on continuous data availability. This graph indicates that while the national average scores for Involvement and Engagement have fluctuated between 3.0 and 3.5, those for Alteration have declined from just below 3 to slightly above 2.75 over the observed period. Concession shows the lowest scores, decreasing from around 2.0 between 2013 and 2016 to approximately 1.75 after 2018.

Figure 1 on the right delineates the correlations between the four dimensions. Involvement is highly correlated with Alteration (0.772) and Engagement (0.749), but least with Concession (0.486). Engagement similarly shows high correlations with Alteration (0.791) and Involvement (0.749), but minimal with Concession (0.516). Alteration, in turn, is highly correlated with Engagement (0.791) and Involvement (0.772), but less so with Concession (0.635). Concession exhibits correlations in descending order with Alteration (0.635), Engagement (0.516), and Involvement (0.486). Viewing Involvement as the baseline and Concession as the zenith of power shifts, Alteration's higher correlation with all dimensions highlights its potential to become a critical intermediary that could stimulate other dimensions.

Topic Classification and the Relationship with Numeric Measurements

Table 2 presents the results of the topic classification analysis conducted using LLM, with 18,257 distinct projects, 64,179 topics of concern, and 54,852 involved institutions identified across all 4,416 meetings, which were further classified into pre-defined categories. The table presents the distribution of subcategories within three distinct contextual dimensions. The percentages in each row represent the share of that subcategory within its respective group. These rows are analytically independent and are not intended to be compared or summed across categories. Housing and residential projects were the most common, followed closely by public facilities. These two categories together accounted for roughly half of

Table 2. Topic Classification Analysis of All Transcripts (N = 4,416).

Project types		Topics of concern		Institutions involved	
N = 18,257		N = 64,179		N = 54,852	
Housing and residential	39.89%	Property conflict	6.37%	Government agency	67.01%
Public facilities	11.67%	Development conflict	5.17%	Real estate and property management companies	5.28%
Transit system and infrastructure	13.40%	Resource conflict	7.44%	Professional service companies	8.88%
Retail and commercial	18.09%	Miscellaneous	81.02%	Civic organizations	7.84%
Miscellaneous	16.95%			Miscellaneous	10.90%

Table 3. Multivariate Regression: Project Types.

	Involvement	Engagement	Alteration	Concession
Housing and residential	**0.141***	**0.219****	**0.138***	**0.221*****
	(0.068)	(0.075)	(0.054)	(0.058)
Public facilities	0.025	0.188	**0.158***	**0.160***
	(0.089)	(0.098)	(0.070)	(0.075)
Transit system and infrastructure	−0.152	−0.047	−0.046	−0.117
	(0.089)	(0.097)	(0.070)	(0.075)
Retail and commercial	0.035	0.114	**0.180****	**0.164***
	(0.080)	(0.087)	(0.063)	(0.067)
Video length (minutes)	−0.000	−0.001**	−0.002***	−0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
City	Included	Included	Included	Included
Year	Included	Included	Included	Included
R^2	0.259	0.249	0.229	0.261
Adj. R^2	0.211	0.201	0.179	0.213
Num. obs.	4,084	4,084	4,084	4,084

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

the meeting content. Among the institutional entities that are mentioned or present at the meetings, the meeting host (e.g., planning board or commission) was excluded from this categorization, as it was present in all meetings. The listed institutions reflect additional organizational actors present or referenced in the meeting. Government agencies were the most frequently identified institutional actors beyond the meeting hosts, which aligns with our expectations given the public nature of urban planning processes. Other institutional participants, such as real estate firms, professional service companies, and civic organizations, appeared less frequently and were more evenly distributed across meetings. However, in topics of concern, the majority of discussions did not align with the three conflict categories outlined by Campbell (2016). Property, development, and resource conflicts together accounted for less than one-fifth of all topics, indicating a broader and more diverse issue landscape in local public meetings.

Table 3 outlines the correlations between the percentage of each project type discussed in local public meetings and the citizen participation scores corresponding to each meeting. The results reveal that Housing and Residential projects generally receive higher scores across four domains of citizen participation. Projects categorized under Public Facilities and Retail and Commercial tend to register higher scores, specifically in the Alteration and Concession domains, indicating that these project types may facilitate more significant changes in planning outcomes. However, projects related to Transit Systems and Infrastructure do not show a significant correlation with any specific citizen participation scores, suggesting that these topics might not resonate as strongly with the level of citizen participation in the meetings.

Table 4 explores the correlations between topics of concern and citizen participation scores. The analysis indicates that projects involving Property Conflict and Development Conflict tend to achieve higher scores on Involvement, with Development Conflict also scoring higher in Engagement. However, Property Conflict exhibits a negative association with Alteration, while Resource Conflict is negatively associated with Concession. Despite this, these conflicts do not necessarily lead to significant achievements in Alteration and Concession, indicating that public participation remains largely superficial when addressing these issues. However, Campbell's planner's triangle captured only a subset of all

Table 4. Multivariate Regression: Topics of Concern.

	Involvement	Engagement	Alteration	Concession
Property conflict	**0.776*** **	0.351	**−0.324***	−0.177
	(0.187)	(0.205)	(0.148)	(0.158)
Development conflict	**0.663****	**0.464***	0.191	0.208
	(0.205)	(0.224)	(0.162)	(0.173)
Resource conflict	−0.231	−0.125	−0.086	**−0.406****
	(0.166)	(0.182)	(0.131)	(0.140)
Video length (minutes)	−0.001*	−0.001**	−0.002***	−0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
City	Included	Included	Included	Included
Year	Included	Included	Included	Included
R^2	0.261	0.248	0.226	0.256
Adj. R^2	0.214	0.200	0.177	0.209
Num. obs.	4079	4079	4079	4079

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

Table 5. Multivariate Regression: Institutions Involved.

	Involvement	Engagement	Alteration	Concession
Government agency	**0.352****	0.228	0.168	0.170
	(0.116)	(0.127)	(0.092)	(0.098)
Real estate and PM companies	−0.277	−0.379	**−0.443****	**−0.342***
	(0.201)	(0.220)	(0.159)	(0.170)
Professional service companies	0.006	−0.061	0.039	−0.057
	(0.184)	(0.201)	(0.145)	(0.156)
Civic organizations	**1.130*****	**0.893*****	**0.674*****	**0.495****
	(0.188)	(0.206)	(0.149)	(0.159)
Video length (minutes)	−0.000	−0.001***	−0.003***	−0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
City	Included	Included	Included	Included
Year	Included	Included	Included	Included
R^2	0.266	0.252	0.232	0.258
Adj. R^2	0.218	0.204	0.183	0.210
Num. obs.	4073	4073	4073	4073

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

topics raised. Over 80% of discussion topics fell outside these categories and were grouped as "miscellaneous." This likely reflects the heterogeneity of local public issues, thus suggesting future research that considers expanding the typology or employing unsupervised methods to characterize the issue landscape more fully in public meetings.

Table 5 presents the correlations between the institutions involved and citizen participation scores. Government Agency, which is a dominant actor in all the public meeting transcripts, has a positive association with Involvement. However, this does not extend to significant impacts on Engagement, Alteration, or Concession. Professional Service Companies do not exhibit significant relationships with any of the citizen participation measurements, suggesting their neutral role in these public meetings. Conversely, Real Estate and Property Management Companies are significantly correlated with declining scores in Alteration and Concession. Civic Organizations, on the contrary, show significant positive relationships with all citizen participation measurements, albeit with diminishing impact from Involvement to Concession. This indicates a promising avenue for fostering authentic citizen empowerment.

Discussion: The Precarity of Citizen Participation in Local Public Meetings

Decades after the challenges raised by advocacy planning and related scholarship (Davidoff 1965; Krumholz 1982), local public meetings have largely sustained their role in facilitating citizen participation. To maintain and justify their "public" nature, these meetings have embraced consensus-based procedures that enable citizens to express their opinions.

However, our analyses also suggest several areas of precarity where citizen participation can be impeded. First, public meetings do not consistently result in pragmatic solutions or citizen empowerment. In Table 1 and Figure 1, moving beyond the superficial involvement of tokenism (Arnstein 1969; Rosen and Painter 2019), public meetings also engage citizens through active interaction during the meetings. However, the declining scores in Table 1 and Figure 1 for Alteration and Concession resonate with persistent critiques that formal public involvement efforts seldom relinquish the power to shape decisions (Karner et al. 2019). Alteration implies significant citizen control over decisions (Rosen and Painter 2019), while Concession requires a transfer of power, enabling citizens to become empowered decision-makers (Slotterback and Lauria 2019). Resistance between citizen involvement efforts and genuine power concession to reshape decisions or alter outcomes has been a persistent characteristic of public meetings in the United States (Checkoway 1981; Karner et al. 2019). This, in the planning literature, has been repetitively highlighted and criticized (Arnstein 1969; Fainstein 2005; Rosen and Painter 2019).

Second, structural barriers exist in democratic governance. Public institutions and authorities preserve the discretion of relinquishing decision-making power to citizens or withholding it to avoid potential conflicts with the interests of the dominant elites. As shown in Table 3, public meetings about housing and residential, public facilities, and retail and commercial project types are typically solution-oriented and demonstrate a higher level of commitment to genuinely considering citizens as stakeholders since citizen participants are often the ones directly impacted by decisions about the projects. At the local level, public meetings are often structured by local governments to modulate the ambitions of growth-driven developers and restrain their negative impacts on communities (Gerber and Phillips 2003; Logan and Rabrenovic 1990). However, projects related to Transit Systems and Infrastructure do not exhibit a significant association with any particular citizen participation scores. Decision-making on transit and infrastructure projects is usually dominated and predetermined at the Fed- or regional-level authorities (Sciara 2017; Slotterback 2010), from which local planning boards are excluded and thus become the "informed" in this bureaucratic setting. Local public meetings, therefore, play a minor role in these types of projects since some projects are not subject to review by planning boards. Furthermore, citizen empowerment could be particularly hard in this category due to the prevalent public-private partnerships (Innes and Booher 2004). Coalitions between capital and authority are often coupled with legal instruments such as eminent domain (Pritchett 2003).

Third, in the context of prevalent urban renewal initiatives that have caused discontent from local communities in the United States (Bratt and Reardon 2013; Einstein, Glick, and Palmer 2023; Logan and Molotch 1987), equity and social justice have remained at the heart of urban planning decision-making processes. According to Campbell's (2016, 389) "planner's triangle," both Property Conflict and Development Conflict intersect with the fundamental priority of equity and social justice. As shown in Table 4, public meetings that address property and development conflicts tend to show a stronger commitment to involving and engaging citizens. However, reluctance to power redistribution is specifically evident in discussions about resource conflicts, where equity and social justice and equity is less integrated.

Meanwhile, our findings also suggest opportunities for incremental changes that could enhance citizen empowerment, which add to the existing knowledge with actionable recommendations to participatory planning processes. First, one exploratory observation from our analysis, as shown in Figure 1, suggests that meetings involving more solution-oriented discourse were associated with higher Engagement and Alteration scores. This pattern may indicate that structuring meetings around problem-solving can create opportunities for more responsive and participatory outcomes. The emphasis of solutions in public meetings aligns with the core principles of citizen empowerment to transform decision-making processes that determine the distribution of resources and conditions (Meerow, Pajouhesh, and Miller 2019; Schlosberg 2009). Alteration is solution-oriented, which requires citizens' authentic participation in "analyzing issues, generating visions, developing plans, and monitoring outcomes" (Godschalk and Rouse 2015, 3). The imperatives for issue analysis and solution creation through authentic participation necessitate power shifts from authority to citizens, thus eventually enabling citizen empowerment. An example of citizen empowerment through alteration is the co-production of public services that involves communities, minorities, the government, and NGOs from the beginning (Cannon et al. 2024; Rosen and Painter 2019). However, we caution that not all meetings are designed to produce immediate solutions, as some serve important deliberative, informational, or agenda-setting purposes that are equally vital to participatory governance.

Second, civic organizations could reshape power dynamics in local public meetings. As shown in Table 5, the involvement of government agencies alone in local public meetings does not necessarily lead to substantial citizen empowerment. While they are committed to citizen involvement, this effort is not carried further to Alteration and Concession that signify power redistribution (Rosen and Painter 2019; Slotterback and Lauria 2019). In addition, the involvement of profit-driven interest groups, such as real estate and property management companies, often impedes the provision of solutions and the redistribution of power in local public meetings. This trend underscores the persistent influence of pro-growth and developer-centric urban planning paradigms in the United States (Logan and Molotch 1987), and highlights the ongoing challenge of constraining developer influences to genuinely empower citizens (Gerber and Phillips 2003; Logan and Rabrenovic 1990). Civic organizations, characterized by their

nonprofit-driven nature and community-rooted motivations, have shown significant capacity to counterbalance these interests and reshape power dynamics in planning decision-making (Cannon et al. 2024; Rosen and Painter 2019). These organizations introduce perspectives that prioritize community interests and challenge the status quo, creating pathways toward more equitable outcomes.

Conclusion

Citizen participation in local public meetings is central to planning systems in the United States, yet related research has been limited. We analyzed more than 4,000 public meeting transcripts to assess citizen participation across four distinct dimensions and draw correlations between meeting topics and participation scores to identify characteristics that may influence citizen participation. Both the motivation and research question respond to existing studies (Einstein, Palmer, and Glick 2019; Gundry and Heberlein 1984; Johnson et al. 1993; McComas 2001; Sinclair 1977), and revisit a fundamental caveat in planning decision-making processes. In addition, the methodological approach highlights the capacity of tools like LLMs for urban planning research. When paired with structured and effective prompts, LLMs can handle large volumes of textual data, offering solutions that would otherwise be inaccessible due to human processing capacity.

Our analyses are driven by tools and data that were not available before, and our findings suggest the potential of data-driven approaches for planners to implement inclusive and equitable participatory planning processes. Local public meetings in the United States demonstrate the enduring "performative" (Scott 1990) nature to defend the authority (Fainstein 2005; McComas, Besley, and Black 2010; Scott 1990) and are devoid of real intent to alter outcomes (Checkoway 1981). Furthermore, the underlying roots of the precarity of citizen empowerment extend beyond planning itself. Bureaucracy, public–private coalition, and profit-seeking incentives could all impede citizen empowerment. Real changes in these areas require more progressive actions, which would also require pragmatic and incremental approaches within the existing institutional structures (Collins and Ison 2009; Tritter and McCallum 2006). Solution-driven public meetings that require genuine citizen participation can serve as an imperative that facilitates actual empowerment. Furthermore, the integration of equity-driven and social justice-focused agendas and the involvement of civic entities and organizations rooted in communities and their benefits exhibit merits.

Limitations

While staying optimistic, we also acknowledge the limitations of this study. First, missing information from the LocalView data could limit the performance of the analysis. Not all public meetings in the United States are included in the dataset,[5] and potentially important contextual variables such as the time of day of the meeting or the number of participants present were not consistently recorded in the available dataset. In addition, since the transcript data are captured from YouTube videos, the LLM model could only infer from the textual data and information available during the meetings.[6]

Second, the analysis and validation processes could be improved. This study treats each public meeting as an independent observation. While some projects may have been discussed across multiple meetings as part of an ongoing participation process, we were unable to systematically identify and link such cases due to inconsistencies in how project names and topics were referenced in the transcripts. Although the experiment attempted to address similar limitations (Deng et al. 2023), substantial efforts for model training are required and are not within the scope of our work, which employs an existing model. In addition, given the extensive length of these transcripts, it is challenging for humans to thoroughly track all four dimensions and their three criteria and to complete detailed reasoning for each. Consequently, we were unable to fully validate the LLM outcomes.[7] However, these are systematic limitations stemming from LLMs in general (Fu 2024), which cannot be resolved by this study. Future iterative studies that, for example, explore alternative prompt strategies, few-shot prompts with trusted precedents, and employ quantitative studies of fewer data samples that could be validated by humans (Fu et al. 2024), could also help validate the approach attempted in this study.

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Supplemental Material

Supplemental material for this article is available online.

Notes

1. By 2023, the dataset covers 139,616 videos and their corresponding textual and audio transcripts of local public meetings publicly uploaded to YouTube from 1,012 places and 2,861 distinct governments across the United States between 2006 and 2022.
2. With more than 100,000 videos in forty-nine states over many months or years. LocalView data instead records every word as it was said in the meeting. This standardization of meeting transcripts facilitates comparisons across localities. All of these were not possible for small-sample datasets in traditional research.
3. During our research, one of the authors attended two public meetings, thus offering firsthand insight for our validation of different LLMs and prompts. We utilized the transcripts from these two meetings as the standard for selecting models, crafting prompts, and comparing outcomes.
4. Location data in LocalViews uses Federal Information Processing Series (FIPS). The county subdivisions and places tables provide the 5-digit FIPS codes, formerly referred to as FIPS55. These are geographic identifiers used widely by the U.S. Census Bureau and others to identify geographic places in the United States. Meeting location was included as a control variable to account for geographic variation, but was not a focus of the substantive analysis.
5. The authors of LocalViews acknowledged that "although the largest cities in the US generally record videos of their public meetings, several (like New York City at the time of writing) rely on private, paid services and not YouTube."
6. For example, the alteration and concession dimensions of citizen participation may not be fully captured in the transcripts alone. Changes in decision-making or power shifts may occur after the meeting in private discussions or follow-up actions by officials, which are not reflected in this analysis.
7. We reviewed a sample of fifty transcripts, examining both the transcript content and the LLM's reasoning and scoring qualitatively. Generally, the LLM's outcomes, reasoning, and scores were relevant and reasonable, and its analysis is consistent across various transcripts. Nevertheless, there remains a possibility that the LLM could inherently possess biases or hallucinational results from the model, and its performance might not always precisely align with prompt instructions and expectations.

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