



Understanding Public Participation in Thailand's Khon Kaen Light Rail Transit Project through the COM-B Framework: A Behavioral Science Perspective

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Abstract

For transportation planning to be truly inclusive and effective, public participation plays a significant role. However, various structural and behavioral barriers often cause engagement levels to fluctuate. This study explored the influencing factors on public involvement in urban infrastructure projects, using Thailand's Khon Kaen Light Rail Transit (LRT) project as a case study. This study applies the COM-B framework as the conceptual lens to identify key behavioral factors influencing citizen participation. A quantitative survey of 505 residents who living along the LRT route was conducted. The questionnaire used in the survey was developed based on the COM-B model to assess respondents' knowledge, motivation, and access to participation channels. To study the relationship between behavioral factors and the level of participation, data were analyzed statistically using regression analysis, Spearman correlation, and descriptive statistics. The findings reveal that capability ($p = 0.632$) and opportunity ($p = 0.524$) were significantly statistical associated with participation levels, while motivation shows a weaker correlation ($p = 0.124$). To improve participatory, the study highlighted the importance on educational initiatives which enhanced by digital participation platforms and strategies to build the public trust. Thus, integrating scientific and behavioral perspectives into transportation planning can provide valuable insights for policymakers. The public awareness can improve accessibility, trust building, and leading to more equitable and successful transportation projects. The study also contributed empirical evidence for designing more inclusive and participatory urban development policies in Thailand and comparable contexts.

Keywords: Public participation, COM-B framework, Behavioral insights, Transportation planning

Introduction

Public participation (PP) is a core principle of democratic governance and integral to transportation planning, particularly in the justification of infrastructure investment reflecting the aspirations and objectives of the community. Increasing citizen engagement is the way to go to better facilitate transparency, accountability and inclusivity in governmental and policymaking decisions (Arnstein, 1969). Despite this, there remain many structural and behavioral barriers to public participation such as limited awareness, lack of access to engagement venues, and skepticism about the usefulness of public input

(West et al., 2020). However, more statutes demanding agencies to hold public hearings and more vigorously enforcement of such statutes. Unfortunately, many of these agencies still find it challenging to reach the diverse populations they serve. The key to sustainable planning is therefore to understand the behavioral drivers of participation.

Although the constitution promotes public participation in the project, participation in the transport projects in Thailand is still difficult. Article 67 of the Thai constitution requires public consultation and consultation for projects that may have environmental and social impacts. However, in reality, participation rates remain

inconsistent and uneven (Panyavaranant, 2023). The main reasons for Thailand's low or inconsistent participation are largely influenced by socio-economic differences, poor access to information, and public confidence in government agencies. Furthermore, the lack of integration of various online participation platforms is also contributing to the problems associated with effective engagement (Sudhipongpracha & Dahiya, 2019). Without such a structure, however, the disparate nature of public participation poses its own challenges. When policymakers draw upon insights from behavioral science, they can craft engagement strategies that facilitate broader and deeper citizen participation. Khon Kaen Light Rail Transit (LRT) project is a significant urban mobility project that aims to improve sustainable transportation in the area. This study looks at public participation in the project. The LRT system is expected to be crucial in influencing urban development as Khon Kaen establishes into a smart city. However, behavioral factors like perceived accessibility, motivational drivers, and knowledge levels have influenced the moderate level of engagement in the planning process (Panyavaranant, 2024). This research aims to use the COM-B framework (Capability, Opportunity, Motivation – Behavior) to explore influencing factors on citizen participation and provide insight into how behavior change interventions can be used to increase engagement. This study contributes to more inclusive and effective urban infrastructure planning. To guide this investigation, the study addresses the following key question that which of the three COM-B factors—capability, opportunity, or motivation—has the strongest association with public participation levels?

Literature Review

2.1 The Role of COM-B in Social Science Innovation

The COM-B framework describes how three components—capability, opportunity, and motivation—converge to facilitate behavior, thus it can provide a useful model applied to understanding public participation (Michie et al., 2011). This framework is used to design measures or programs that promote desired behaviors, such as encouraging citizen participation in transport planning. Thus, the term “capability”

here refers to an individual's physical and mental ability to participate in public life. While psychological capability includes knowledge, cognitive abilities, and decision-making processes, physical capability includes access to channels or platforms for participation.

Participation levels may be lowered by a lack of knowledge or comprehension of transportation projects (West et al., 2020). The external elements that will facilitate or impede participation are referred to as opportunities (Panyavaranant et al., 2023)—such as accessibility, available times of day to participate, and what digital engagement platforms are given, as well as community outreach/prioritization efforts. Access to decision-making processes is influenced by social factors and structures, while motivation to participate can arise from both conscious and unconscious processes, which may include personal beliefs and attitudes. Dispositional behaviors and social norms, or other factors such as perceptions of one's own impact on society, are also part of the civic participation experience. Trust in government also affects individuals' willingness to participate. (Michie, et al., 2014).

The use of interest-based approaches in public participation plans for infrastructure projects can greatly enhance citizen participation. Thus, the COM-B model allows for participation through tools such as online platforms, which have features that make them more accessible and functional, as well as reward systems that encourage positive participatory behavior, thereby motivating citizens in general. Also, improving knowledge with focused campaigns (capability) can lead to changes in behavior and better results for organizations (Cane et al., 2012).

Figure 1 illustrates the COM-B framework's multi-layered approach, integrating behavioral sources, theoretical domains, intervention functions, and policy categories. The inner green layer represents the three main components: capabilities (both physical and mental), opportunities (both physical and social), and motivation (both automatic and deliberative). Covered by yellow rings, it stands for significant behavioral domains that affect the participation included beliefs, culture, abilities, thinking skills, emotional reactions, and social influences. While,

intervention functions like training, motivation, persuasion, and education are covered by the outer red ring. These can be utilized as tactics to boost participation rates. The outer grey layer represents policy categories such as environmental planning, legislation, and regulations, which are fundamental to changing human behavior. Urban planners and policymakers can use these approaches to promote public participation in

transport planning in a way that is inclusive of public needs and effective in planning. They can do this by using this framework to come up with better ways to get people involved in tackling obstacles to behavior. The COM-B model provides a full way to understand and fix problems with public participation. It makes sure that actions are based on facts and fit the situation.

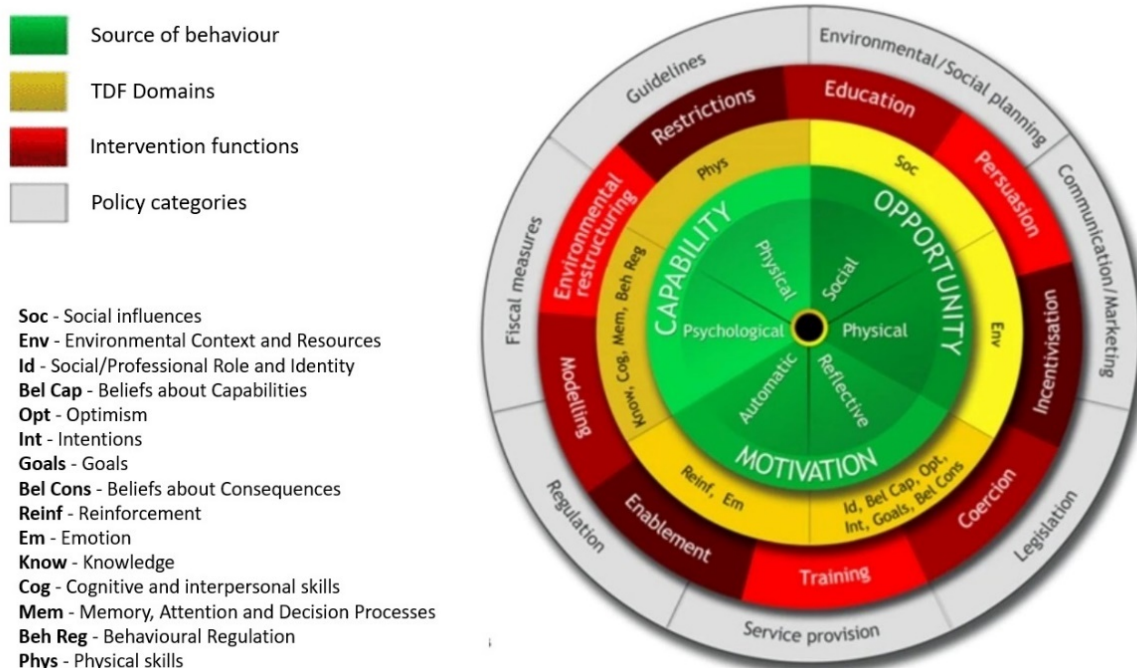


Figure 1 COM-B model Source: Michie S, Van Stralen MM, West R., 2011.

2.2 Citizen Participation

The United Nations set SDG-Goal 11 in 2015 with an intention of building inclusive, secure, resilient, and sustainable cities because it helps to match infrastructure planning with community needs and environmental sustainability, citizen participation is crucial to reaching this goal. Furthermore, by encouraging accountability, transparency, and inclusivity in decision-making processes, true citizen participation improves good governance (Arnstein, 1969).

Equitable participation thus becomes essential for long-term sustainability, as it not only empowers marginalized or underrepresented communities but also gives them a say in shaping the direction of urban development (Fung, 2006). One of the most well-known frameworks for understanding citizen participation is Arnstein's Ladder of Citizen Participation (see Figure 2). This model identifies levels of citizen participation, ranging from full citizen empowerment to no

participation at all.

The degree of citizen participation, according to Arnstein (1969), indicates the capacity to affect the decision-making process, highlighting the direct correlation between decentralization and citizen participation. There are three primary categories on the citizen participation ladder:

- **Non-Participation:** at this stage it is the lowest level, the public involvement is purely symbolic and has no actual influence over decision-making. This approach is commonly used to mislead communities rather than truly involving them.

- **Tokenism:** The middle level of participation which included informing, consulting, and placement. Even the people are informed or asked for their input, they have very little power to make decisions or influence the outcome. Therefore, consultation can create the illusion that participatory activities or processes

have been carried out, but the final decision-making power still lies with those in power.

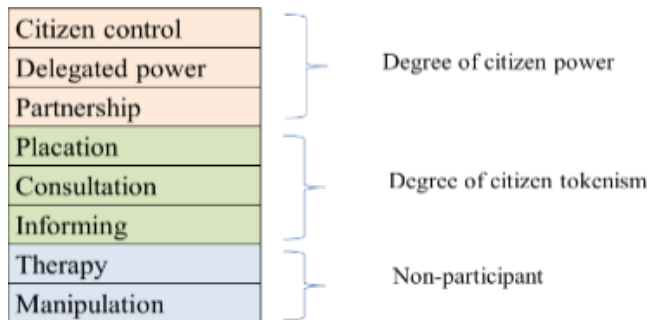


Figure 2 Ladder of Citizen Participation. Source: Arnstein (1969).

Since the highest levels of Arnstein's Ladder of Citizen Participation started with the citizen control, partnership, and delegated power can represent true citizen participation in which people actively influence laws and policies. In these cases, the power is either entirely transferred to communities or shared between citizens and decision-makers to truly influence results. Arnstein's model suggests that increasing citizen influence promotes equitable urban development and fully democratic governance. Gaber (2019) supports this view that empowering communities helps create a more balanced relationship between citizens and local government. Importantly, the model suggests that "genuine participation" does not only mean outcomes, but also the processes that ensure that participation mechanisms are transparent, inclusive, and capable of driving policy change. The policymakers can go beyond token consultation and genuinely empower citizens by implementing Arnstein's framework in transportation systems. It encourages an equal participation of communities and permits efficient urban development that takes the needs of all societal segments (Innes & Booher, 2004).

2.3 Literature gaps

A few applications of behavioral science to public involvement. Although a lot of research has been done on public participation in transportation planning, most of it has focused on technical aspects, governance structures, and policy frameworks rather than behavioral science viewpoints. Further exploration remains on the use of the COM-B framework in analyzing

participation patterns, particularly in the context of transport infrastructure projects (Michie et al., 2011). A deeper understanding of the behavioral factors that influence participation is required as it can help develop effective participation strategies that can be tailored to a wider range of populations.

Lack of empirical studies on participation in Thailand's transportation projects, while public participation has been widely studied in western contexts, there is a lack of empirical research examining participation behaviors in Thailand, particularly in urban transportation projects. Studies focusing on legal and institutional frameworks dominate the literature, but research on the practical challenges of engagement, especially using behavioral science models, remains limited (Sudhipongpracha & Dahiya, 2019).

The review's identification of gaps in the literature showed that while numerous studies from the past to the present have put an effort toward theoretical frameworks for public participation, there is, however, missed the empirical data regarding these frameworks' efficacy, particularly when it comes to mass transit projects. Empirical research on the behavioral factors influencing participation that is data-driven and insightful is required to close this gap. This research therefore contributes to the practice of developing evidence-based policy recommendations for public participation in transport planning (Panyavaranant, 2024).

Methodology

3.1 Research Design

This study examines the variables affecting public participation in transportation planning within the context of Khon Kaen Light Rail Transit (LRT) project, Thailand by using a quantitative research approach and the COM-B framework. To learn more about public participation, a case study approach is also employed. The research explores which factors, Capability, Opportunity, and Motivation, affect effective public participation. Data were collected through a survey of local residents along the entire length of the Khon Kaen LRT project. The results of this study will provide valuable guidelines for developing strategies to enhance community participation

in urban infrastructure planning and urban development.

3.2 Population and Sampling

The study's target population included people who were at least eighteen years old and lived in both urban and suburban areas along the Khon Kaen Light Rail Transit (LRT) route. Due to their close proximity to the planned infrastructure and the expected impact on their daily transportation, these individuals were recognized as key stakeholders. A stratified random sampling technique was used to guarantee representativeness. Geographic zones that corresponded to the planned LRT stations were used to divide the study area into groups. Respondents were chosen at random from each group in order to capture a wide range of demographic characteristics, including age, gender, occupation, and level of education.

Only offline methods were used to collect the data. At specific community locations, such as neighborhood markets, public areas, and community centers, enumerators personally distributed structured questionnaires. Participants with low digital literacy or limited internet access were guaranteed accessibility with this method. There were 505 valid responses in all. To guarantee adequate precision for correlation and regression analysis with three independent variables, the sample size was established through statistical power analysis. This approach made sure the data were reliable, representative, and appropriate for the behavioral analysis goals of the study.

3.3 Tool Development

Using the COM-B framework, a structured questionnaire was created to evaluate public participation practices. The questionnaire was developed based on the COM-B model and included 20 items, categorized into four sections:

1. Demographic Data (5 items): Age, gender, occupation, degree of education, and duration of residency in Khon Kaen.
2. Capability Factors (5 items): Questions assessing previous experiences with public participation as well as knowledge and awareness of the LRT project.
3. Opportunity factors (5 items): include

the perceived convenience of participation, access to information, and the availability of engagement platforms.

4. Motivational factors (5 items): encompass personal interests, trust in the government, and prior involvement in civic activities, all of which influence individuals' decisions to participate.

Each item in the capability, opportunity, and motivation sections used a 5-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree). Before distribution, the questionnaire was reviewed by experts in science, behavioral science, and urban planning to ensure content validity. The peer-reviewed questionnaire was then pilot-tested with 30 participants who closely matched the sample to assess its clarity and reliability. The pilot-test results revealed that only minor improvements were made to the questions and questionnaires to improve understanding of the research objectives. The degree of public involvement in the LRT project is represented by the dependent variable in this study, which is the level of public participation. The three elements of the COM-B framework comprise the independent variables: Capability (knowledge and experience), Opportunity (access and external enablers), and Motivation (internal drive and trust). Multiple questionnaire items on a 5-point Likert scale were used to measure each component. Regression analysis and Spearman's correlation were used to look at the relationships between the dependent and independent variables.

3.4 Data Collection

Data collection was conducted entirely through onsite surveys to ensure engagement with residents living along the Light Rail Transit (LRT) corridor. Trained enumerators administered the surveys in person through face-to-face interviews at designated locations, including community centers, local markets, public events, within the project area.

The survey period lasted for two months to allow adequate time for participation across various neighborhoods. Ethical procedures were strictly followed, including obtaining informed consent from all respondents and ensuring the confidentiality and anonymity of the data collected.

3.5 Data Analysis

The information obtained was analyzed through both descriptive and inferential statistics. The population distribution and participation trends were summed up using descriptive statistics including mean, percentage, and standard deviation. Spearman's correlation analysis was used to examine the relationship between the degree of participation and the three COM-B framework components—capability, opportunity, and motivation. The regression analysis was also employed to evaluate the impact factor on participation behavior. Hence, the SPSS software was used for all analyses in order to guarantee the reliability of the statistical interpretation. The study's findings offer insightful behavioral information for creating plans to increase public involvement in effective transportation planning.

3.6 Ethical Considerations

All necessary measures were taken to ensure ethical research conduct, even though this study did not receive formal approval from an Ethics Committee. Before data was collected, participants received a thorough and unambiguous informed consent form that explained the goal of the study, that participation was voluntary, that confidentiality was guaranteed, and that data would only be used for academic purposes. All responses were kept completely confidential, participation was completely voluntary, and no personally identifiable information was gathered. The study was carried out in accordance with academic research standards and the Declaration of Helsinki's ethical guidelines (World Medical Association., 2013).

Results and Discussion

Five items that evaluated various forms of engagement—such as attending public meetings, giving feedback, obtaining information, and using digital platforms—were used to gauge the degree of public participation. Every item was scored using a 5-point Likert scale, where 1 represented strongly disagree and 5 represented strongly agree. An individual's composite participation score was calculated by averaging their responses across the five items. These scores were then categorized into three levels:

- Low participation: ≤ 2.49

- Moderate participation: 2.50–3.49
- High participation: ≥ 3.50

This classification provides an overview of engagement levels among the 505 respondents and serves as the basis for the correlation and regression analyses. The results of this research indicate that public participation in the Khon Kaen Light Rail Project remains at a moderate level. The behavioral component of the COM-B framework plays an important role in influencing participation. Of the three factors, Capability has the strongest impact on participation. Additionally, it was discovered that respondents are more likely to participate if they have more education and prior experience with participation procedures. Another crucial element is the opportunity, since people who have greater access to digital platforms, information, and channels, they tend to participate more. While motivation had a comparatively smaller effect, it still played a role, particularly for those with strong personal or community-driven reasons to participate.

Spearman's correlation analysis (Table 2) confirmed these relationships: Capability showed a moderately positive correlation with participation ($\rho = 0.632$, $p \leq 0.001$), indicating that individuals with more knowledge and skills were more likely to take part. Opportunity showed a moderate relationship ($\rho = 0.524$, $p \leq 0.001$) with participation, supporting the idea that external environment and access to participation channels have a significant impact on participation and motivation. However, the weaker relationship ($\rho = 0.124$, $p = 0.005$) indicated that, although motivation played a role, it was not always the main factor driving public participation in the Khon Kaen Light Rail Project.

The respondents' demographic data, which are compiled in Table 1, offer crucial background information for understanding the behavioral elements affecting participation. A comprehensive representation of the target population is ensured by the sample's important balanced distribution across gender, age, education levels, occupation types, income ranges, and length of residence. These demographic factors are essential for comprehending how participants' access levels and individual capabilities vary from one another.

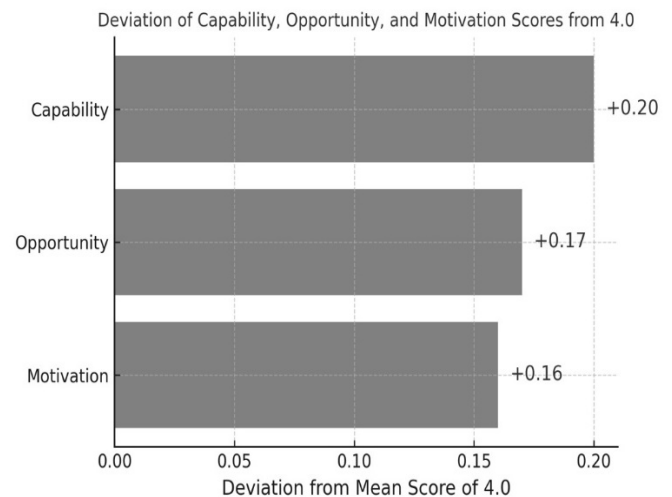
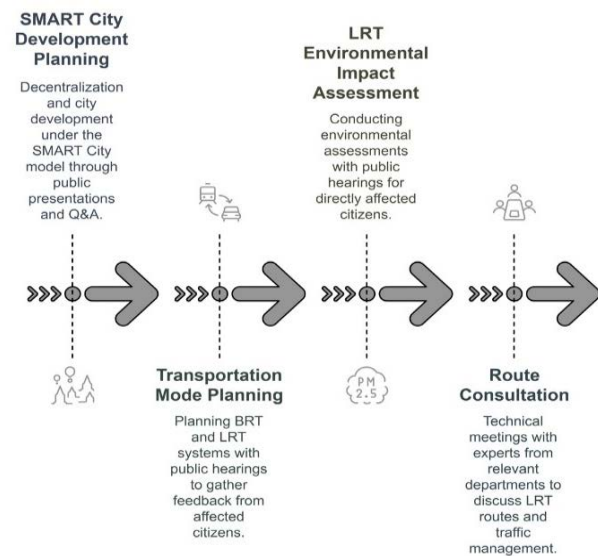
Table 1 Demographic Information.

Demographic Variable	Distribution of Respondents (%)
Total Respondents	505 respondents
Gender	Male: 43%
Distribution	Female: 57%
	Total 100%
Age Groups	18–24: 13%
	25–34: 18%
	35–44: 17%
	41–54: 28%
	>54: 24%
	Total 100%
Education Levels	Less than high school: 15%
	High school: 40%
	Bachelor and above: 45%
	Total 100%
Occupation Types	Student: 9%
	Unemployment: 17%
	Government officer: 14%
	Employee: 25%
	Retired: 18%
	Others: 18%
	Total 100%
Income Ranges	≤7,000: 38%
	7,001–30,000: 54%
	≥30,001: 8%
	Total 100%
Length of Residence	≤10 years: 12%
	11–30 years: 30%
	31–50 years: 34%
	>50 years: 24%
	Total 100%

To further visualize the respondents' behavioral tendencies, Figure 3 shows the average deviation of the Capability, Opportunity, and Motivation scores to further visualize the behavioral tendencies of the respondents. The relative strength of each component is shown in this figure, which supports the statistical conclusions and provides a more accurate representation of how the behavioral components affect public participation.

Additionally, Figure 4 describes the transportation planning and engagement process

used in the project to put the engagement process in context. This figure illustrates how public input is incorporated into the decision-making process by showing the sequential steps from route consultation to city planning. Gaining an understanding of this process helps to further understand the stages in which public participation is facilitated as well as the behavioral factors that affect involvement at every stage.

**Figure 3** Level of Respondent's COM-B.**Figure 4** Transportation planning and engagement process.

Beyond structural and informational factors, understanding the motivations behind public participation is crucial. Figure 5 highlights the key internal motivators that influence individuals' decisions to participate in any activities. These include the need for transparency, sense of belonging, environmental concerns, and the

existing relationships. These finding variables become motivators that emerge during participation activities. It provides researchers with insights into the complex personal factors that can drive the participation. In particular, the results of the study found that individual and community motivators, such as a sense of community, trust in leaders, or commitment to local development, play a role in determining participation at multiple levels. These findings complement the behavioral analysis of capability, opportunity, and motivation, allowing researchers to gain a more comprehensive view of people's participation in the project.

Table 2 illustrates the correlations between the COM-B behavioral components and public participation levels. The analysis shows that capability and participation level have a strong positive correlation ($\rho = 0.632$, $p \leq 0.001$), confirming that people with more knowledge and skills are more likely to participate in public participation activities in a meaningful way. The same as there is a moderate correlation between opportunity and participation level ($\rho = 0.524$, $p \leq 0.001$), indicating that participation is significantly influenced by access to engagement platforms and resources.

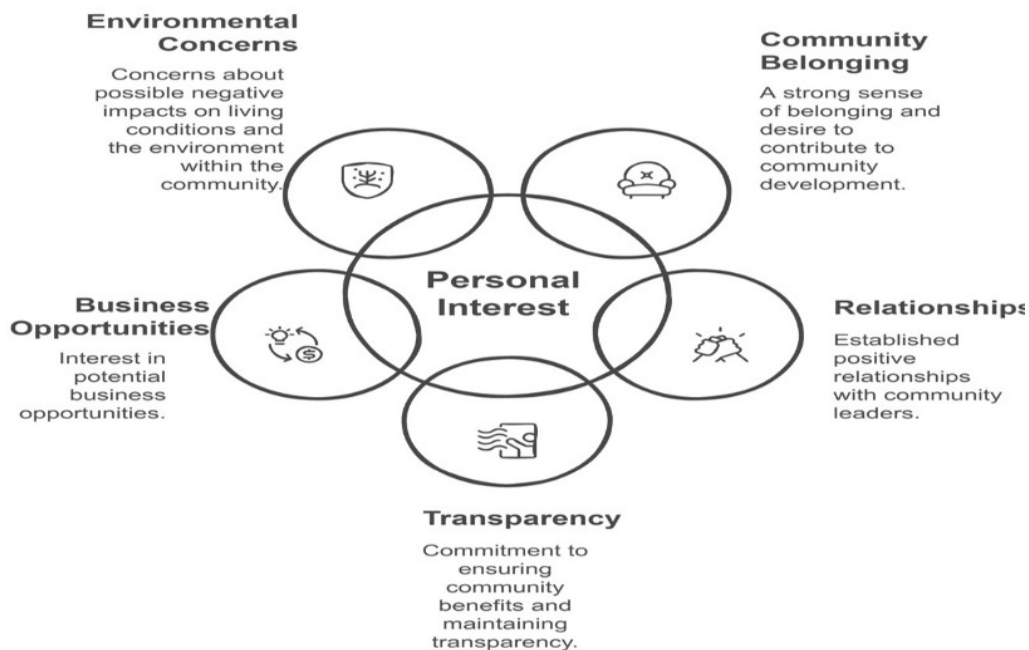


Figure 5 Personal interest.

Table 2 behavior source association with participation level.

		Level of Participation	Capability Factor	Opportunity Factor	Motivation Factor
Level of Participation	Spearman's rho	1.000	0.632	0.524	0.124
	Correlation				
	p-value		≤ 0.001	≤ 0.001	0.005
Capability Factor	Spearman's rho		1.000	0.605	0.134
	Correlation				
	p-value			≤ 0.001	0.003
Opportunity Factor	Spearman's rho			1.000	0.085
	Correlation				
	p-value				0.056
Motivation Factor	Spearman's rho				1.000
	Correlation				
	p-value				

Table 3 Regression Analysis.

Predictor	Coefficient	Standard Error	t-value	p-value
Capability	0.45	0.06	7.5	<0.001
Opportunity	0.38	0.05	6.2	<0.001
Motivation	0.09	0.04	2.1	0.036
$R^2 = 0.49$, Adjusted $R^2 = 0.4$, $F(3, 501) = 160.2$, $p < 0.001$				

Furthermore, Capability and Opportunity are moderately correlated ($\rho = 0.605$, $p \leq 0.001$), implying that individuals who possess greater knowledge also tend to have better access to participation opportunities. These findings emphasize the importance of integrated strategies that address both capacity-building and equitable access to participation. Simply improving access may not be enough to strengthen internal motivation, as shown by the weaker and statistically non-significant correlation between Opportunity and Motivation ($\rho = 0.085$, $p = 0.056$). To foster motivated participation, additional strategies such as customized incentives, community recognition, and trust-building are essential. Furthermore, while the relationship between Motivation and participation level is statistically significant ($\rho = 0.124$, $p = 0.005$), it remains relatively weak. This confirms that high engagement cannot rely on motivation alone—it must be supported by opportunity and capability to effectively increase public participation.

To further assess the influence of capability, opportunity, and motivation on public participation, a multiple linear regression analysis was conducted. The dependent variable was the level of public participation, and the independent variables were the COM-B components.

The model summary shows that the overall regression model was statistically significant ($F = 160.2$, $p < 0.001$) and explained $R^2 = 0.49$ of the variance in public participation.

Table 3 shows that these results indicate that capability has the strongest positive effect on participation, followed by opportunity. While motivation is statistically significant, its influence is relatively weaker. No multicollinearity issues were observed (VIF values < 2.0). The regression results support the correlation analysis, confirming that enhancing knowledge (capability) and

removing access barriers (opportunity) are more impactful than motivational factors alone. Based on the results from both correlation and regression analyses. It can create the visual diagram to show the findings in the figure below.

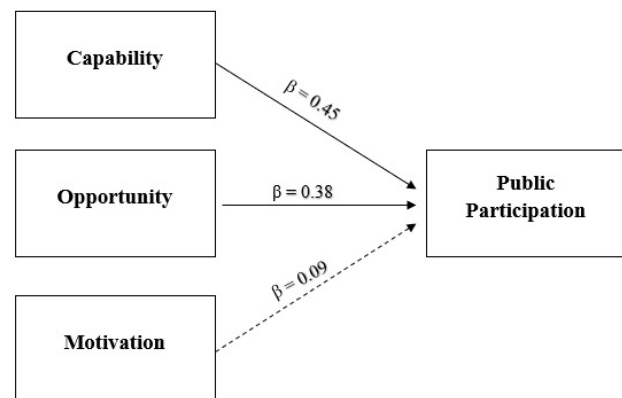
**Figure 6** Relationship Analysis of each Factor.

Figure 6 shows that the strongest relationships with public participation are between capability and opportunity. Despite being statistically significant, motivation has a relatively smaller impact. These results imply that increasing access and knowledge are better ways to increase public participation in infrastructure planning than depending solely on incentives.

Discussion

The results of this study indicated that public participation in the Khon Kaen Light Rail Transit (LRT) project remained at a moderate level. The COM-B framework comprises with capability, opportunity, and motivation, is playing a significant role in influencing the participation. Among these three factors, Capability emerged as the most influential predictor driven by individual knowledge and awareness. Thus, this finding suggests that those with more knowledge and familiarity with

the prior participation process are more likely to participate in the project which is according to the previous study (Panyavaranant, 2024). In addition, those with higher levels of education and prior experience in public participation showed greater enthusiasm for participation. Meanwhile, Opportunity was another newly discovered factor that played a significant role, especially in terms of access to digital platforms and systematic participation channels, which significantly influenced public participation (Baum et al., 2000).

While motivation does influence participation, its connection to the other two factors was not as strong. This suggests that well-structured participation systems and external incentives may be necessary to boost engagement. These findings shed light on the behavioral side of public participation, emphasizing that bridging gaps in opportunity and capability can significantly enhance civic involvement in urban infrastructure projects.

This study expands the behavioral science perspective on public participation by addressing gaps in previous research, which has largely focused on the governance mechanisms and the policy frameworks rather than behavioral science only (Michie et al., 2011). Due to this study applied the COM-B framework to transportation planning, it, therefore, provides a structural understanding of how knowledge, access, and motivation interact to influence public participation. In addition, most previous research has focused on the Western context, so this study plays a role in filling the gap in empirical research on public participation in transportation projects in Thailand (Sudhipongpracha & Dahiya, 2019). By moving beyond theoretical debates, this study provides concrete empirical evidence on participation patterns through the analysis of real data from the Khon Kaen Light Rail Project. The results also reflect the socio-economic disparities that affect participation, indicating the need to develop more targeted strategies to achieve equitable and inclusive participation in infrastructure planning in Thailand (Panyavaranant, 2023).

This study offers a useful guidance for legislators and urban planners who want to increase the public participation toward

infrastructure projects. The findings emphasize on the value of campaigns, instruction, and awareness-building in enabling people to make wise decisions. It was stated in the research problem before that the opportunities can ultimately greatly raise participation levels since "opportunity" factors are crucial in growing digital participation platforms and simplifying and facilitating participation procedures. The issues of low participation level in Thailand's future transportation planning are addressed by these insights. In terms of building motivation and sustaining long-term participation, the research emphasizes the need for trust-building strategies such as transparent communication, feedback loops and incentive systems. Therefore, integrating the principles of science and behavioral science into urban planning can help policymakers develop more comprehensive and effective participation processes, leading to better urban governance and sustainable urban development.

Conclusions and Recommendations

As stated in the research problem, these insights address the challenges of low and uneven participation, which have left many gaps in the literature. Among the small number of previous studies, there were hardly to find the applying COM-B framework to examine public involvement in transportation planning, especially in Thailand. Moreover, this study emphasizes the behavioral dimensions—capability, opportunity, and motivation—and their interconnections in influencing citizen engagement, whereas previous research frequently focuses on structural or institutional factors. To complete the future of transport planning in Thailand, this research adds to the area of motivation and sustaining long-term participation. This study highlights the importance of trust-building techniques like incentive programs, feedback loops, and open communication. Therefore, integrating the principles of the COM-B framework into urban planning can help policymakers develop more comprehensive and effective participatory processes for enhancing urban governance and advancing sustainable development.

The results of the study allow for the formulation of a number of specific recommendations aimed at enhancing public

participation in transport planning. First, it is crucial to increase public awareness through educational campaigns and awareness programs, especially for communities that have little knowledge of infrastructure projects. To guarantee inclusion across socioeconomic groups, authorities should also enhance both digital and offline engagement platforms in order to broaden and simplify access to participation channels. Furthermore, establishing trust through open communication, frequent project updates, and feedback systems can encourage participation over time. Engagement may be further increased by implementing behavioral science techniques like social norm messaging or community recognition. Finally, in order to ensure that participation strategies are fair and responsive to the various needs of the population, outreach initiatives should be customized for various demographic groups.

Thus, future research should concentrate on intervention-based approaches, utilizing knowledge from areas such as psychology, science, law enforcement, and participatory policy to create more equitable and successful participatory frameworks for planning transportation infrastructure. This study's emphasis on public participation (PP) in the LRT project during the project planning stage reflects the inherent nature of the case study method. However, because of this narrow focus, the results might not be as widely applicable to other transportation planning initiatives or geographical contexts. Future studies should examine how similar participation strategies affect cities and communities outside of the study area.

Acknowledgement

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