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**Thesis title: Effects of stakeholder
participation on the quality of bicycle
infrastructure. A case of Rattanakosin
bicycle lane, Bangkok, Thailand.**

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Summary

In purpose to promote the bicycle usage in the capital city of Thailand, Bangkok Metropolitan Administration started to transform the bicycle tourist route in Bangkok's old town (Rattanakosin island) into a proper bicycle lane in 2008. Since the implementation of this project received harsh criticize about stakeholder participation and problem regarding the quality of the bicycle infrastructure, it has brought interest to this research about the effect of stakeholder participation on the quality of Rattanakosin bicycle lane. The objective of this research is to explain this phenomenon through the research question: How does stakeholder participation (power distribution to stakeholders, inclusiveness of stakeholders and coordination among stakeholders) affect the quality of Rattanakosin bicycle lane (Coherence, Directness, Safety, Comfort, and Attractiveness)? Literature reviews in this research cover the concept of participation and its relations to respective outcomes and present the concept to determine the quality of bicycle infrastructure. This research applies a single case study with a longitudinal study as a research strategy. The semi-structured interview is selected as a research method with the triangulated sources of content analysis from secondary data and observations. Key informants are officers in Bangkok Metropolitan Administration, bicycle-related NGOs, local residents, academia, and public organization who have been involved with the bicycle lane project. The finding of this research shows that stakeholder participation affects the quality of Rattanakosin bicycle lane in terms of safety (segregation from other traffics) and comfort (hindrance or obstacles in the bicycle lane). An active participation which mostly is a bottom-up initiation from the civil sector has the most influence on the physical condition of the bicycle lane whereas passive participation from both top-down and bottom-up approaches takes more time to affect the quality of the bicycle lane. Inclusiveness of bicycle users causes an improvement to the bicycle lane through many social campaigns and cooperation with potential stakeholders whereas a late-inclusion of local residents along the bicycle lane led to conflicts and negative changes to the bicycle lane. Coordination among stakeholders from the existence of professional facilitator and conflict resolution has a low influence on the bicycle lane depending on the participation context. The recommendation to the policymaker is to encourage the environment of active participation where proper stakeholders, especially the bicycle user and local residents can compromise their interests, discuss their virtual needs, and share their resources in the development process.

Keywords

Bangkok, Rattanakosin, stakeholder participation, quality of bicycle infrastructure, bicycle lane

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Abbreviations

BMA	Bangkok Metropolitan Administration
DPW, BMA	Department of Public Works, Bangkok Metropolitan Administration
MoU	Memorandum of Understanding
MOT	Ministry of Transport
NGO	Non-governmental organization
TCHA	Thai Cycling for Health Association
TDCSTD, BMA	Tourism Division, Culture, Sports and Tourism Department, Bangkok Metropolitan Administration
THPF	Thai Health Promotion Foundation
TPD	Traffic Police Division
TTD, BMA	Traffic and Transportation Department, Bangkok Metropolitan Administration
TWCIF	Thailand Walking and Cycling Institute Foundation

Table of Contents

Summary	ii
Keywords	ii
Acknowledgments	iii
Abbreviations	iv
Table of Contents	v
List of Figures	vii
List of Photographs	vii
List of Tables	vii
Chapter 1: Introduction	1
1.1 Background.....	1
1.2 Problem statement	2
1.3 Research Objective	4
1.4 Provisional research question	4
1.4.1 Main Research Question	4
1.4.2 Research Sub questions	4
1.5 Significant of the Study	4
1.6 Scopes and Limitations.....	5
Chapter 2: Theory Review	6
2.1.1 Stakeholder participation	6
2.1.1.1 Definition and overview of participation concept	6
2.1.1.2 Participation and its outcome	7
2.1.1.2.1 Power distribution to stakeholders.....	7
2.1.1.2.2 Inclusiveness of stakeholders.....	8
2.1.1.2.3 Coordination among stakeholders.....	9
2.1.1.3 Participation in infrastructure provision and bicycle infrastructure	10
2.1.2 Bicycle infrastructure and quality criteria	10
2.1.3 Relationships of participation and bicycle infrastructure	12
2.2 Conceptual framework	13
Chapter 3: Research Design and Methods	16
3.1 Research question	16
3.2 Research strategy.....	16
3.3 Research methodology	17
3.4 Operationalization: variables, indicators	17
3.5 Sample size and selection	21
3.6 Data collection methods	21
3.7 Data analysis methods	21
3.8 Validity and reliability.....	22
Chapter 4: Research Findings	23
4.1 General background of the case.....	23
Stage 1: The creation of Rattanakosin bicycle lane (2008 – 2013).....	23
Stage 2: The upgrade of Rattanakosin bicycle lane (2014 – 2015).....	25
Stage 3: The replacement of Rattanakosin bicycle lane (2016 – present).....	27
4.2 The effect of stakeholder participation on the quality of Rattanakosin bicycle lane.....	28
4.2.1 The effect of power distribution to stakeholders on the quality of Rattanakosin bicycle lane.....	29
4.2.1.1 Passive participation.....	29
4.2.1.2 Active participation	31

4.2.1.3 Decision-making involvement.....	35
4.2.2 The effect of inclusiveness of stakeholders on the quality of Rattanakosin bicycle lane.....	37
4.2.2.1 Stakeholder identification.....	37
4.2.2.2 Type of stakeholders	38
4.2.3 The effect of coordination among stakeholders on the quality of Rattanakosin bicycle lane	42
4.2.3.1 Partnerships between stakeholder organizations	42
4.2.3.2 Professional facilitator.....	44
4.2.3.3 Conflict resolution.....	45
Chapter 5: Conclusions and recommendations	47
5.1 Conclusions	47
5.2 Reflexion on the existing literature.....	49
5.3 Recommendations and suggestions for future research.....	50
5.4 Final conclusion.....	51
Bibliography/References	52
Annex 1: Research Instruments and Time schedule	58
Annex 2: Guiding questions for semi-structured interview	63

List of Figures

Figure 1: Map of Rattanakosin bicycle route	3
Figure 2: Arnstein's Ladder of Participation	8
Figure 3: Wheel of Participation	8
Figure 4: Stakeholder classification based on power and interest	9
Figure 5: Conceptual Framework	15
Figure 6: The bicycle tourist route from Bangkok Smile Bike project.....	24
Figure 7: The Rattanakosin bicycle lane stage 2 indicated in green line.....	27
Figure 8: The strategic plan of TTD, BMA	38
Figure 9: Inclusiveness of stakeholder in stage 1.....	40
Figure 10: Inclusiveness of stakeholder in stage 2.....	41
Figure 11: Inclusiveness of stakeholder in stage 3.....	42
Figure 12: The revised conceptual framework according to research findings.....	49

List of Photographs

Photograph 1: Bicycle facilities that were provided during the implementation of Bangkok Smile Bike project.....	24
Photograph 2: The opening ceremony of the Rattanakosin Bicycle lane.	26
Photograph 3: The evolution of bicycle lane (Bang Lamphu area)	28
Photograph 4: The drainage cover campaign that led to the physical change of bicycle lane.....	32
Photograph 5: Physical change during the bicycle lane protection campaign in 2012-2013.....	33
Photograph 6: The bicycle law assessment by Thammasat University	34
Photograph 7: The meeting during the bicycle protection campaign.....	39
Photograph 8: The communication tools to vehicle driver during the bicycle lane protection campaign.....	40

List of Tables

Table 1: Bicycle infrastructure requirement principle adapted from CROW (2007).....	12
Table 2: The operationalization table	19
Table 3: Coding of qualitative data regarding passive participation in different stages of the project.....	29
Table 4: Coding of qualitative data regarding the co-occurrence of quotation between passive participation and bicycle infrastructure quality in stage 1.....	29
Table 5: Coding of qualitative data regarding the co-occurrence of quotation between passive participation and bicycle infrastructure quality in stage 2.....	30
Table 6: Coding of qualitative data regarding active participation in different stages of the project	31
Table 7: Coding of qualitative data regarding the co-occurrence of quotation between active participation and bicycle infrastructure quality in stage 1.....	31
Table 8: Coding of qualitative data regarding the co-occurrence of quotation between active participation and bicycle infrastructure quality in stage 2.....	33
Table 9: Coding of qualitative data regarding decision-making involvement in different stages of the project.....	35
Table 13: Coding of qualitative data regarding Stakeholder identification in different stages of the project	37

Table 14: Coding of qualitative data regarding Type of stakeholder in different stages of the project	38
Table 15: Coding of qualitative data regarding the co-occurrence of quotation between type of stakeholder and bicycle infrastructure quality in stage 1.....	38
Table 16: Coding of qualitative data regarding the co-occurrence of quotation between type of stakeholder and bicycle infrastructure quality in stage 2.....	40
Table 17: Coding of qualitative data regarding Partnerships in different stages of the project	42
Table 18: Coding of qualitative data regarding the co-occurrence of quotation between partnerships and bicycle infrastructure quality in stage 1&2	43
Table 19: Coding of qualitative data regarding Professional facilitator in different stages of the project.....	44
Table 20: Coding of qualitative data regarding the co-occurrence of quotation between professional facilitator and bicycle infrastructure quality in stage 1&2.....	44
Table 21: Coding of qualitative data regarding Conflict resolution in different stages of the project	45
Table 22: Coding of qualitative data regarding the co-occurrence of quotation between conflict resolution and bicycle infrastructure quality in stage 1.....	45
Table 23: Coding of qualitative data regarding the co-occurrence of quotation between conflict resolution and bicycle infrastructure quality in stage 2.....	45

Chapter 1: Introduction

1.1 Background

Cycling is recognized by international academia and policymaker as one of the best modes of transport in terms of sustainability. It introduces a variety range of benefits according to the fact that it causes zero greenhouse-gas emissions, promoting the health of a user, alleviating social inequality and requiring less investment cost of infrastructure. This non-motorized transport not only suit for the short trip (first-mile and last-mile travel) but also applicable for medium-distance journey which cannot be accomplished by walking (Buehler R., 2017). Moreover, cycling proves to generate an external benefit of 0.18 euros per kilometer, whereas driving car generates an external cost of 0.11 euros per kilometer (Gössling, S., Choid A., Dekkere K., Metzlerf D., 2019). Realizing these obvious merits, worldwide transport policies are experiencing a ‘paradigm shift’ from car-based transport policies to people-centered transport policies where public transport and non-motorized transport is the core element. Cycling, as one of non-motorized mode of transport, is included in the SHIFT strategy which is one of the three approaches (Avoid-Shift-Improve) in building sustainable transport aiming to introduce alternatives for mobility solutions together with sustainable transport systems development (Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ) GmbH, 2016).

To apply an effective SHIFT strategy, cycling-inclusive transport planning is needed to put in place. Due to the integration nature of cycling-inclusive transport planning, stakeholder participation is considered as one of the important components. According to Cycling Inclusive Policy Development Handbook, stakeholder participation is a key factor for a successful project and three conditions are needed – 1) citizen and their organizations must be involved and committed throughout the planning, implementation and evaluation process; 2) the authorities must have a positive attitude to ensure the occurrence of good relationships, common understanding and ongoing organization; 3) mutual trust is needed to be built among all authorities and related stakeholders (Pettinga et al. (2009). Stakeholder participation, by general, is also an important key success factor in infrastructure development projects. Apart from other factors such as financial & investment budget, legal framework and technical aspect, stakeholder participation ranks among the top factors that affect the outcome of project, representing in terms of public support (Hsueh and Chang, 2017); stakeholder and local authority management (Zakaria, Zin, et al., , 2017); social responsible-based stakeholders management; assessment of stakeholders’ requirements and limitations to the project; and communicating stakeholder in a proper way and time (Yang, Shen, et al., 2009). Nevertheless, the knowledge about the influence of stakeholder participation in the quality of bicycle infrastructure is still scant, meaning that more understanding of this casual effect is needed to establish.

Meanwhile, many public policies from the Thai national government start realizing the importance of cycling, not only from the perspective of health and tourism promotion but also as a mode of travel. As a result, cycling, for the first time, is included in the National Economic and Social Development Plan of 2018 – 2023, which is the country’s most important development framework obligating related public agencies to follow. (Office of the National Economic and Social Development Council, 2017). Not only the recognition in national-level planning, the Royal Thai Government has been emphasizing the encouragement of bicycle usage through its national policy towards all municipality and local governments including Bangkok.

Given that Bangkok is Thailand's capital city with the jurisdiction area of 1,569 square kilometres with 5.7 million residents (Official Statistics Registration Systems, 2018) together with the traffic congestion issue considered one of the most severe in the world according to many traffic index report (annual loss of USD 350 million opportunity cost and USD 190 million energy waste cost (Kasikorn Research Center, 2016)), its chronic problem arouses attempts from the central and local government to alleviate with more sustainable solution – one of them is promoting bicycle commuting. The bicycle commuting development is also a pressing policy responding to the phenomenon that bicycle usage in Bangkok has gradually gained popularity throughout recent decades as the number of bicycle user in Bangkok has risen up to 150,000 in 2016 despite the poor bicycle infrastructure provided (The Department of City Planning, Bangkok Metropolitan Administration, 2016).

Following this catalyst, Bangkok has experienced the most enormous investment in bicycle infrastructure since 2008. In Bangkok, the length of bicycle infrastructure network is totally 228 kilometers, containing bicycle lane, bicycle path and supporting facilities (Terrabkk, 2015). Unfortunately, the overall quality of bicycle infrastructure in Bangkok is relatively low. According to Bakker et al. (2018), the quality of the overall bicycle lane or path in Bangkok fails to achieve all criteria of the Bicycle infrastructure requirement principle which are coherence, directness, safety, comfort, and attractiveness (CROW, 2007). The issue of quality of the bicycle infrastructure is broadly criticized by the public, stating that bicycle infrastructure provision in Bangkok aims to achieve only the quantitative goals (number of kilometers of bicycle lane constructed) but neglect the virtual needs of bicycle users and stakeholder as a whole (Chutima K., 2015).

1.2 Problem statement

Starting from 2008, bicycle infrastructure development in Bangkok has been driven by policy from both national and the local government to respond to the trend of bicycle usage. Shedding a light on the context of bicycle infrastructure development in Bangkok, it can be stated that the context is similar to other cities in Thailand. As jurisdiction area of Bangkok is under the authority of Bangkok's local administration - Bangkok Metropolitan Administration (BMA), is responsible for providing supporting infrastructure for bicycle usage according to Bangkok Metropolis Administrative Organisation Act, BE 2528 (1985) stating the responsibility of BMA to perform the duty related to city planning, transportation engineering and maintenance of public infrastructure and public spaces.

Bangkok's bicycle policy and implementation are also directly influenced by top-down intervention from the central government according to the fact that Thailand is still a unitary country with a centralized administrative system (The World Bank, 2012). This structure sometimes causes a rush implementation of bicycle projects to favor the central government.

The case of the Rattanakosin bicycle lane can be a prominent example of these phenomena. Initiated by BMA in 2008 (stage 1: 2008-2013), it was built in purpose to promote tourism in 'Rattanakosin island', which is one of the famous tourist destination areas in the city. Fundamental bicycle infrastructure including bicycle signage and bicycle sign on the road surface marked the first move of dedicated bicycle infrastructure development. This project did not have any improvement until in 2014 (stage 2: 2014-2015) when central government demanded BMA to upgrade the existing bicycle lane into more practical condition. The upgrade started and completed in 2014 containing the network length of 8 kilometers protected bicycle lane, passing many tourist attractions in old town and aims to attract a wider group of tourists and residents (Prachathai, 2014). The project experienced another unplanned change as the bicycle lane was temporary replaced with car lane during the preparation period of the royal cremation ceremony of King Rama 9 in 2016 (stage 3: 2016 - present).

project. Therefore, the analysis of stakeholder participation in the Rattanakosin bicycle lane project will be conducted for all stages of the project from 2008 to present. Moreover, input components of stakeholder participation will be examined and discussed. According to literature, power distribution to stakeholders together with the inclusiveness of stakeholders and coordination among stakeholders are key dimensions of stakeholder participation that ensure its effectiveness toward the outcomes. Nevertheless, participation is a ‘context-specific’ methodology which cannot universally applied and expect the same results. As participation is a subjective term, understanding its virtual meaning and its casual impacts are important as different context of participation indicates different results of project outcome. To sum up, the problem statement can be stated that inadequate stakeholder participation can lead to low quality of Rattanakosin bicycle lane in Bangkok, Thailand.

1.3 Research Objective

To explain the effects of stakeholder participation on the quality of Rattanakosin bicycle lane, Bangkok, Thailand.

1.4 Provisional research question

1.4.1 Main Research Question

How does stakeholder participation (power distribution to stakeholders, inclusiveness of stakeholders and coordination among stakeholders) affect the quality of Rattanakosin bicycle lane?

1.4.2 Research Sub questions

- 1) How does power distribution to stakeholders influence the quality of Rattanakosin bicycle lane?
- 2) How does inclusiveness of stakeholders influence the quality of Rattanakosin bicycle lane?
- 3) How does coordination among stakeholders influence the quality of Rattanakosin bicycle lane?

1.5 Significant of the Study

Rattanakosin bicycle lane project is a well-known case of a conventional bicycle infrastructure implementation in Bangkok. Realizing that improper stakeholder participation was one of the elements during the implementation process, this research would present how stakeholder participation can affect the quality of the bicycle lane in both positive and negative ways. Understanding stakeholder participation context and its impacts on Rattanakosin bicycle lane project would help policymaker to determine a proper policy that encourages an occurrence of effective participatory process in order to enable the development and enhancement of bicycle infrastructure. As Rattanakosin bicycle lane project is a pilot project for other bicycle infrastructure developments in Bangkok, the lesson-learned regarding participatory process would pave the way for future development projects to consider having a proper typology of stakeholder participation in the implementation phase and provides an opportunity to apply the participatory guidelines to other municipality in Thailand and any area that has similar context.

Moreover, this research contributes to academic knowledge as it would build more understanding of the concept of ‘participation’. It would broaden the frontier of this catchword toward the area of assessment of the relationships with the quality of infrastructure. This

significant can add to the fundamental knowledge about participation as a means to enhance performance and project outcome.

1.6 Scopes and Limitations

Keep in mind that bicycle infrastructure comprises of two important elements – ‘hard’ and ‘soft’, this research emphasizes the term “bicycle infrastructure” as a ‘hard’ infrastructure (built environment) mainly a physical condition of on-street bicycle lanes or off-street bicycle paths, and bicycle parking facilities. A ‘soft’ infrastructure, which is a societal aspect of bicycle usage, is not defined as a bicycle infrastructure in this research (the example of a ‘soft’ infrastructure are cultures (existing norm of bicycle usage), behaviours (the characteristic of bicycle usage), attitudes (perception about bicycle usage), discourses (spoken or written communication toward bicycle usage), and beliefs (trust about bicycle usage) (Mitullah, Vanderschuren, et al., 2017). Additionally, other factors that might have a potential influence on the quality of bicycle infrastructure (for example, legal framework, political power from national government, BMA’s organizational changes, BMA’s management direction) are not considered in this research.

The limitation of this research lies in the selection of key informants as “We love Bangkok, we love bicycle” committee has already dismissed at the time of the study. Therefore, the selection of key informants is based on researcher’s views combined with snowball sampling derived from interviews of variety groups of stakeholders. Moreover, due to the changes in physical condition of Rattanakosin bicycle lane, the observation that took place during the data collection period can only be a triangulated source for stage 3 of the project.

Chapter 2: Theory Review

This chapter presents the theoretical review related to the scope of this research. The participation concept related to infrastructure is introduced to scope down the area of participation in the infrastructure-related field. On the other hand, the concept to determine the quality of bicycle infrastructure is presented together with related literature emphasizing a relationship between stakeholder participation and the quality of bicycle infrastructure. Finally, to summarize the background theoretical findings, a conceptual framework with an explanation of chosen variables and sub-variables is shown.

2.1.1 Stakeholder participation

2.1.1.1 Definition and overview of participation concept

Stakeholder participation consists of the term ‘stakeholder’ (as actors involving actions) and ‘participation’ (as actions). These two terms are widely used and replaced with other familiar terms to delineate the phenomenon of individuals, groups of people or organizations which are influenced by or can influence a decision, involving in making decisions whether passively or actively (Freeman, 1984; Reed, 2008). In various pieces of literature, it is normal to use the term ‘participation’ and ‘engagement’ in the same context as they share a common meaning, which is how people ‘taking part’ in activities (Vroom and Jago, 1988). Meanwhile, there is some slightly different between these terms and the term ‘involvement’ since it refers to a subjective psychological sense about how people feel important and related to an object (Barki and Hartwick, 1994). However, when considering participation in development literature, the term ‘stakeholder participation’ is frequently used, according to the fact that the term ‘stakeholder’ illustrates the dynamic of people’s interest affected by development projects or policies.

Stakeholder participation is beneath the umbrella of participation concept, which is a broad theoretical perspective perceived by different people in different meanings (Kelly, 2001). The theory behind participation occurs mainly from development studies and political science studies and can be traced back to the 1950s when participation is first seen as a new mechanism to support a rapid industrialization trend (Buchy, Ross, et al., 2000). The boom of participation concept has shifted from the way to involve expertise in a production process to the emphasis on giving an opportunity to ‘the voiceless’ and stakeholders (Claridge, 2004). Nevertheless, the concepts of participation still contain some vagueness and lack of conceptualization which causes obscurity over expectations and evaluations of its outcomes (Lyons, Smuts, et al., 2001). Many studies attempt to define the meaning of participation and mostly end up with a set of phrases such as ‘a social process’, ‘a share and identification of participant’s needs, concerns and values’, ‘involvement in the decision-making process’ and ‘a distribution of power and control’ (Cascetta and Pagliara, 2012; (Ndekha, Hansen, et al., 2003); (Chamala, 1995); (Devas and Grant, 2003). Participation can also be viewed in two aspects – one as ‘a mean to the end’ and another as ‘an end’. To illustrate this, (Nelson and Wright, 1995) explained that ‘participation as a means’ is a process to reach the objective of a project to be more efficiently and effectively on operation and cost, whereas ‘participation as an end’ is when the community or group of people form up a process to harness their own developments.

Stakeholder participation also contains the perspective of timing and continuation (Arnstein, 1969). In order to reach shared goals and co-produced outcomes, the need to include participation with stakeholders in decision-making in earliest possible has been widely mentioned as crucial in leading to a high quality of decision making and project performance since *‘the extent to which engagement (via deliberation) shapes the values of participants is highly dependent on the temporal scales over which engagement occurs’* (Reed et al.,(2018),

p.13). It can guarantee that stakeholders are involved with consideration of their needs and priorities (Reed (2008); Barki and Hartwick (1994)).

2.1.1.2 Participation and its outcome

Participation tends to influence the performance of decision making, project, product or even a built environment. Many studies legitimate the merit of participation and perceived it as a persuasive concept to address the shortcoming of traditional top-down development strategy, which cause an ineffective in project outcome and failure in response to stakeholder needs (Arnstein, 1969; Reed, 2008). Chambers (1994) address that participation brings to the recognition of diverse local reality and needs; introduce cost-effectiveness; preoccupation with sustainability concept and support the ideology of empowerment. In design literature, the participation of users is the key aspect to guarantee user satisfaction which is one of the most important concerns in product and service performance. (Barki and Hartwick, 1994) states that in general, when participation occurs, it would bring up participant's satisfaction towards outputs of the project due to the opportunity given to a participant to intervene in the planning process and develop a sense of belonging. (Magnusson, 2003) also added to this point in his service innovation literature, emphasized that participation of users can contribute to the originality of service innovation and enhance perceived user value, however, it tends to reduce the ease of service reproduction. In participative decision-making literature, it is claimed by Vroom and Jago (1988) that quality of decision making is correlated with the level of actual participation. Moreover, Ibeas, dell'Olio, et al. (1995) who study the association between participation and rural water project performance by a quantitative approach, also found that the increasing beneficiary participation can cause higher project outcomes.

In contrast, the view toward participation is still relatively fragmented due to the existence of some doubts about the outcome of participation which is seen to vary in different contexts. The controversy arises as there are *'examples of a participatory process that failed to meet its goals or the expectations of those who participated or led to unintended negative outcomes'* (Reed et al., 2018, p.2). One of the most relevant study about limitation and failure of participation is from Cooke and Kothari (2001) who view participation as 'a new tyranny', in a way that it might become a tool for authority who governs oppressively, unjustly and arbitrarily, which led to a less self-reflectivity of participation itself (Cooke and Kothari, 2001).

For further illustration, this part will discuss concepts lied beneath participation that influences the variation of outcomes.

2.1.1.2.1 Power distribution to stakeholders

Power distribution and participation are not separable. While participation is about involving action or decision-making process, power distribution *'represents sharing control, the entitlement and the ability to participate, to influence decisions, as on the allocation of resources'* (Holcombe, 1995, p.17). Therefore, it can be stated that participation causes power distribution and, another way around. The famous Arnstein's ladder of participation is frequently mentioned by many studies that aim to categorize citizen's power according to the level of participation. It emphasizes participation as the mean of power distribution from the powerholder to the have-not citizen and distinguish the gradation of participation into 3 groups and 8 rungs - Non-participation (1.manipulation and 2.therapy), Tokenism (3.informing, 4.consultation, and 5.placation) and Citizen Power (6.Partnership, 7.Delegated power and 8.Citizen control) (Arnstein, 1969). The ladder of participation, though, is relatively out of date but can be referred to how the power distribution is perceived as higher when the opportunity is given to or seized by citizen more which theoretically leads to the more desired outcome.

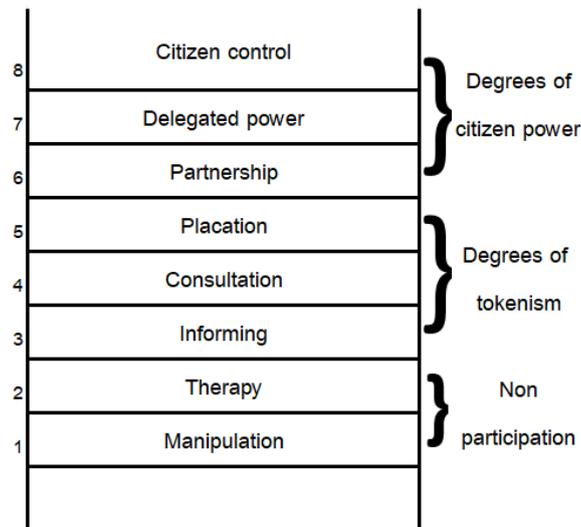


Figure 2: Arnstein’s Ladder of Participation (Source: Arnstein, 1969)

However, the higher level of power distribution does not guarantee a better outcome. This model leads to the modern description of participation typology by (Davidson, 1998), who suggests ‘wheel of participation’ which enables the adjustment of power distribution into different levels. Reed et al. (2018) also develop more on this model by inserting more dial into the wheel, which is the agency. From this fundamental, participation wheel comprises of two dials that can be spun - the agency and the mode of engagement. The agency indicates the initiator of participation which can be top-down or bottom-up, whereas the mode of engagement ranges from participation by communication and consultation (passive participation) to by deliberation and co-production (active participation). Comment of this participation wheel is that *‘rather than always aiming for bottom-up and co-productive types of engagement, the wheel of participation can be used to match the appropriate type of engagement to the purpose and context in which engagement is needed’* (Reed et al., 2018, p.7). As the approach is quite new, more academic evidence is needed to explain how different levels of distributed power would be suitable for the specific context and purpose of participation.

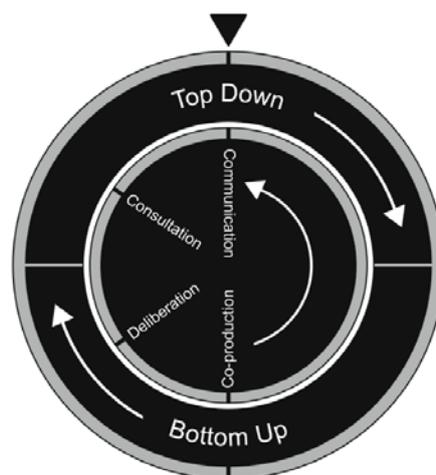


Figure 3: Wheel of Participation (Source: Reed et al., 2018)

2.1.1.2.2 Inclusiveness of stakeholders

Inclusiveness of stakeholders is one of the main dimensions of participation that influence performance. It is the perspective of participation to involve related groups of stakeholders into actions, in order to ensure that all stakeholder’s interests are represented.

Ibeas, dell’Olio, et al. (2011) discussed this aspect of participation in their study regarding citizen participation in developing sustainable mobility where the explanation of the relationship between different sizes of public participation and the quality of information obtained is emphasized. They found that mega focus group (a larger and more varied group of stakeholders) can contribute to a wider range of information gathering and suitable for general discussion, whereas the focus group (a smaller and less variety group of stakeholders) can provide in-depth and necessary information for the planning process. However, Devas and Grant’s (2018) discussed that the more diversity of user involvement in sustainable innovation tends to make negative outcomes for sustainable innovation transitions.

Moreover, the stakeholder identification is another interesting issue when discussing inclusiveness. (Gardner, Rachlin, et al., 1986) mentioned this aspect by introducing the classification of stakeholder which based on a different level of interests and power. It is recommended that key stakeholder (high power, high interest) is the key group of stakeholders that must be included in the decision-making process, whereas operational stakeholder (low power and high interest) which normally is a citizen who directly affected by the project, is needed to listen and properly treated. For institutional stakeholders and marginal stakeholders, communication is enough to keep them participated.

POWER	STRONG	INSTITUTIONAL STAKEHOLDER	KEY STAKEHOLDER
	WEAK	MARGINAL STAKEHOLDER	OPERATIONAL STAKEHOLDER
		LOW	HIGH
		INTEREST	

Figure 4: Stakeholder classification based on power and interest (Source: Gardner et al., 1986)

2.1.1.2.3 Coordination among stakeholders

Participation also contains coordination. Reed et al. (2018, p.5) state that participation is ‘a process of collaboration between those with formal power, derived from the roles, functions, and responsibilities that are typically held by organizations, and those with informal power, derived from the knowledge, needs and moral rights of stakeholder and publics’. Considering the term coordination, it is an interdisciplinary principle that explains how the action of individuals can be coordinated (Malone and Crowston, 1990). To simplify, the word ‘coordination’ itself describes how two or more actors/organizations/systems work together harmoniously toward the desired goal(s). It can be stated that coordination is the result of the relationship between actors, cannot occur by oneself, and is becoming more necessary when the overarching system is more complex.

Though participation seems to trigger collaborative activities among related actors, it can also generate conflicts due to the crash of stakeholder’s interest. Therefore, good coordination is needed as a management tool to reduce the likelihood of conflict and ensure the smooth flow of power dynamic among stakeholders, which is how participation can be perceived as mediation (Reed, 2018). In addition, conflict resolution and satisfaction of stakeholders have a positive relationship which would consequently enhance the outcome of the project (Leung, Liu, et al., 2005). Coordination in terms of facilitator plays a crucial role in dealing with conflicts and driving the discussion. A trained facilitator would help to reach the desired level of outcome through an active involvement of participants however any participation tools are used (Richards, Carter, et al., 2004).

Coordination can also be performed by the creation of ‘partnerships’ which is the jointness of two or more actors to compile and share resources, risks, and rewards (Pennink, 2017). The mutual characteristic of coordination and partnership is the utilization of dependency management to exchange resources between actors such as information, consultation, negotiation, rules or other agreements (Touwen, 2014). The occurrence of partnerships helps create a clear role and responsibility among partners and can influence the effectiveness of participation (Skinner, 1997).

2.1.1.3 Participation in infrastructure provision and bicycle infrastructure

Participation is considered as one of an important strategy in infrastructure service management. According to Schubeler (1996, p.2), participation in infrastructure service management is “a process whereby people – as consumers and producers of infrastructure services, and as citizens – influence the flow and quality of infrastructure services available to them”.

He also introduces four main participatory strategies in infrastructure service management which inherently occurs simultaneously and complementarily support infrastructure provision from the public sector, including;

- *Community-based support strategies*: the form of participation arising from initiation by community or social group in a self-organized way in order to advocate the enhancement of local infrastructure service, strengthen the community’s capacity in infrastructure management and enhancing supporting legal, technical and policy processes. A group of community or Community-based organizations (CBOs) is a core mechanism of this strategy.
- *Area-based involvement strategies*: a government-directed participatory program that involves beneficiaries into infrastructure development process with an aim to improve efficiency and cost-effectiveness of government activities. Partnerships and coordination between government and groups of stakeholders are found in this strategy.
- *Functioning-based collaboration strategies*: a participation delegated to a stakeholder that has proper interest and capacity based on functions of infrastructure management. A social group that steps in to take responsibility with the tendency of less involvement from the public sector is a common thing in this strategy.
- *Process-based decentralization strategies*: participation that decentralizes an entire process of infrastructure provision to the non-public sector to enable operational efficiency, demand supports, and accountability building of infrastructure management. Public-private partnerships and privatization, with strong partnerships between entities, are categorized in this strategy.

Stakeholder participation is one of the major concerns in planning, designing and implementing bicycle infrastructure according to cycling inclusive transport planning guidelines. Most participatory strategies can be characterized as *area-based involvement strategies* according to Schubeler (1995) as it is the government’s strategy to involve stakeholders in designing and implementing a bicycle infrastructure project.

2.1.2 Bicycle infrastructure and quality criteria

Bicycle infrastructure or Cycling infrastructure refers to the built environment and facilities that are designed for and used by a bicycle user. According to (Garrett, 2014) ,p.275), bicycle infrastructure consists of ‘*on-street bike lanes, off-street bike paths, bicycle boulevards,*

rails-to-trails, and other bicycling infrastructure, such as speed humps, curb extensions, pedestrian crossways, and cycle tracks (an on-street bike lanes that are physically separated from motor vehicle lanes) and road markings (such as bike boxes, shared lane markings, and coloured bike lanes with graphics and signs)’. Another supporting built environment for cycling is a bicycle facility, containing ‘bicycle parking facility, changing stations and showers at origins and destinations, and wheeling ramps alongside steps’ (Garrett, 2014, p.264).

Like other types of infrastructure, bicycle infrastructure has its unique characteristic which requires a specific standard and evaluation methodology. The standard requirement principle that most of the bicycle infrastructure design manual has referred to is the concept of the Netherlands Bicycle Infrastructure Design Manual (CROW, 2007), indicating five main requirements for good bicycle infrastructure design - coherence, directness, safety, comfort, and attractiveness. This concept introduces the key fundamental rule of thumb in designing good quality of bicycle infrastructure emphasizing the perceived quality of bicycle infrastructure from the bicycle user point of view and the importance of bicycle infrastructure as a separate matter from road infrastructure. This requirement principle is appropriate with qualitative research where opinions, behaviors, and perceptions of bicycle users are the core focus of the study. Many academic pieces of literature have used this principle as a guideline in operationalizing bicycle infrastructure quality (Pettinga et al., 2009; (Hull and O’Holleran, 2014); Bakker et al., 2018).

Criteria	Explanation
Coherence	To have a coherent bicycle infrastructure means the network supports consistency and continuity of bicycle usage. The network design is required to ensure the encouragement of travel speed stabilization by minimizing the travel time when crossing the junction, removing obstacles in the bicycle lane and avoiding any design that might cause a sudden stop during the trip. Moreover, coherence also means the ease of connectivity with other modes of transport including the alternate choices of connection and the recognizable wayfinding to join the network.
Directness	Directness means the potential of bicycle infrastructure to provide the shortest distance and time for traveling from one place to another. It is important to avoid any detour, reduce delays, and prioritize the use of bicycle users with supporting facilities and services. Measures to promote directness of the network contains, for example, traffic lights, shortcuts between roads, and other traffic management (e.g. two-way cycle traffic on one-way roads (contraflow lanes), two-way cycle lanes on both sides of the roads).
Safety	Safety is the most important requirement of bicycle infrastructure. Good quality of bicycle infrastructure would ensure the safety of bicycle users from other road users. The design for safety contains avoiding conflicts at intersection, providing segregated and protected bicycle lanes, ensuring visibility by a motorist, encouraging traffic calming, ensuring uniform traffic sign and signal, and applying different bicycle infrastructure in different road categories.
Comfort	Bicycle infrastructure is comfortable when it encourages bicycle users to have a smooth movement and use less physical energy. This condition can be derived from the good quality of pavement, flat network, low incline pavement, less traffic nuisance, and a wide bicycle lane. Adequate maintenance can also support the comfort of the bicycle infrastructure network.
Attractiveness	Bicycle infrastructure is attractive when it is furnished with supporting facilities and located among pleasant surrounding environment that makes bicycle user feel more enjoyable. The example of measures is the light installation for bicycle usage

Criteria	Explanation
	at night; putting more tree and shading facility, and locating bicycle network in a potential location that can support tourism and recreation.

Table 1: Bicycle infrastructure requirement principle adapted from CROW (2007)

On the other hand, some design manual proposes a more technical aspect of these design principles. For example, a report narrated by Heydon and Lucas-Smith (2014) defines three key aspects of bicycle infrastructure referring to the CROW concept and. First, cycling requires safe and enough space. The bicycle infrastructure needs to have enough width (at least 2.1 meters) and located separately from the traffic. Second, bicycle infrastructure must have a priority to ensure the continuity of the network by avoiding unnecessary stops or way giving to other traffic users in order to maintain the momentum of cycling. Third, a good design for the junction is needed. Since junction is the most place causing a collision, the design of bicycle infrastructure to minimize conflict spots, increase visibility, indicate signalization, and reduce traffic speed would build a sense of safety for bicycle users. Sanders (2008) also measure the quality of bicycle lane by observing with a set of technical parameters i.e. lighting, roadside flatness, car parking next to bicycle lane, mixed road space or separated bicycle track, a width of the bicycle track, delay due to barriers, a number of post and bollards, bicycle lane surface quality.

2.1.3 Relationships of participation and bicycle infrastructure

Though there is no theoretical evidence directly explaining the relationship between stakeholder participation and the quality of bicycle infrastructure, stakeholder participation is considered as a key process in bicycle infrastructure project in order to gain more information to enhance project outcome. It is important that any new bicycle infrastructure projects *'...should be consistent with a comprehensive plan considering the different bicycle users, existing conditions and community goals'* (AASHTO, 1999, p.15).

There are a handful of studies introduce stakeholder participation as a tool to help designing bicycle route network design. Butler (2015) proposed stakeholder perception as one of the important criteria in assessing the friendliness of bicycle routes in Christchurch, New Zealand. His methodology incorporates stakeholder participation process into the assessment framework which helps identifying the bicycle-friendly road, providing policy guidelines to improve the standard of bicycle route and obtaining an up-to-date perception of target cyclist groups (Butler, 2015). Mirakis, Athanasopoulos, et al. (2012) also present participative multicriteria analysis as a methodology to identify the bicycle route network in Athens, Greece that is practical to local's daily life and ensure the safety, directness, convenience (comfort) and attractiveness. This analysis contains four-steps participatory activities including; 1) identification of the major urban pole as nodes of cycle networks; 2) development of cycle route scenario; 3) participatory evaluation of scenario; and 4) area coverage assessment and conclusion on the network. The integration of technical applied by expert and preference of bicycle network by bicycle users allows the researcher to propose a better bicycle network which is directly towards the center of Athens.

The inclusiveness of stakeholder participation is mentioned in the urban design study of Forsyth and Krizek (2011) when the point of view from a bicycle user in the design process is proposed to be a central place of urban design regarding layout of community and cycling facilities installation. This paper found that bicycle user has unique needs regarding the view of urban design that significantly different from a motorist, pedestrian, and transit user. Moreover, bicycle users even have a different class of skills, therefore, involving view of different bicycle users earlier into urban design aspects help to enhance design guideline related to a bicycle facility, for example, creation of a mix level of separation of bicycle route with

road or pedestrian path (safety), an indication of the proper width of bicycle lane based on volume characteristic of riders (comfort), suggestion strategies to avoid accidents at intersections (safety), helping in designing clear signage and signals (coherence), suggest appropriate level and form of lighting (attractiveness) and suggest how to use space effectively for bicycle parking (attractiveness). In other words, a bicycle user's opinion encourages cycling-oriented urban design and enables the implementation of good bicycle infrastructure.

2.2 Conceptual framework

According to a literature review, sub-variables and indicators are selected and explained in the conceptual framework according to the following reasons.

For independent variable 'stakeholder participation', sub-variables of 'power distribution to stakeholders', 'inclusiveness of stakeholders' and 'coordination among stakeholders' are selected as the main key elements because they cover a comprehensive view of stakeholder participation according to participation literature which includes a participation typology, actors, and a relationship between actors respectively. These variables and sub-variables are analyzed throughout stages of the Rattanakosin Bicycle lane project including stage 1 in 2008 – 2013, stage 2 in 2014 – 2015 and stage 3 in 2016 to present.

- *Power distribution to stakeholders* is considered a heart of participation concept according to literature reviews since participation encourages the interchangeable of power and control of decision making from one to another. Considering its indicators, according to literature reviews, the emphasize of participation typology which mainly consists of passive and active participation is broadly mentioned (Arnstein, 1969; Davidson, 1998; Reed et al., 2018). Meanwhile, the decision making involvement or citizen control is also a ponderable controversy over many conventional pieces of literature regarding participation concept and needed to be studied about its optimal level (Davidson, 1998; Reed et al., 2018). Hence, *active participation*, *passive participation* and *decision making involvement* are chosen as indicators of power distribution to stakeholders.
- *Inclusiveness of stakeholders* is chosen according to its importance on the extent of who should be involved in participation. The right selection of stakeholders, especially the extensive range of bicycle users, is considered a key process to enhance the quality of bicycle-related projects and schemes. The selection of this variable is thus necessary since it is the only variable that is mentioned by previous works of literature to have potential in drawing causal effect to the quality of bicycle infrastructure. To measure this sub-variable, *stakeholder identification* and *type of stakeholders* are chosen as indicators since they can draw a clear picture of how and what group of stakeholders is included in the stakeholder participation process in purpose to alter the outcome of a bicycle infrastructure.
- *Coordination among stakeholders* is the last sub-variable of stakeholder participation. As stakeholder participation in the Rattanakosin bicycle lane project is driven by the policy from BMA, the participation strategy is considered as 'area-based involvement strategies' where partnerships and coordination between the public and stakeholders are the main tools. In addition, building good relationships among stakeholders is also accepted by planners as a valid component of stakeholder participation in Cycling Inclusive Policy Development Handbook, therefore, sub-variable of coordination and

its indicators regarding partnerships (*partnerships with stakeholder organization*) and building good relationships (*professional facilitators* and *conflict resolution*) are suitable and relevant to the analysis of stakeholder participation in this study.

For the dependent variable of ‘Quality of bicycle lane’, its sub-variables including ‘Coherence’, ‘Directness’, ‘Safety’, ‘Comfort’ and ‘Attractiveness’ are chosen from the CROW’s Bicycle infrastructure requirement principle which is a worldwide standard for bicycle infrastructure design. These five variables also cover most area of the quality of bicycle lane mentioned in other bicycle infrastructure design manual and literature. Indicators for each sub-variable are selected from related literature, considering the applicability with Bangkok’s context base on the researcher’s judgment as a native Bangkokian and reviewing local secondary sources.

- *Coherence* refers to how the bicycle lane is consistent, continued and easily connected with other transportation modes. To measure the consistent aspect, *speed maintenance* is mentioned by CROW (2007) and Heydon and Lucas-Smith (2014). The *sudden stop* is chosen to measure the continuation of the bicycle lane in the sense that it must decrease the unnecessary stop as mentioned by Heydon and Lucas-Smith (2014). For the connectivity aspect, the *park-and-ride facility* is used by Sanders (2008) and can be adapted to this research.
- *Directness* is how the bicycle lane can reduce travel distance and travel time. The direct and oriented bicycle lane that offers the shortest route to a destination is mentioned by Mirakis, Athanasopoulos, et al. (2012) as the quality of the bicycle lane and can be interpreted as an indicator of *shortcuts*. Meanwhile, the minimization of travel time is presented by Sanders (2008) as the delay due to barriers, combining the emphasis of junction designed by Heydon and Lucas-Smith (2014), therefore, the indicator of *delay at a traffic light* is created.
- *Safety* is the most important aspect of the bicycle lane quality. CROW (2007) and Heydon and Lucas-Smith (2014) mentioned about the safety regarding how the bicycle lane design can offer a segregated and protected bicycle lane, avoiding conflicts at intersection and ensuring visibility by a motorist, therefore, the indicators of *segregation from other traffic*, *blind spots* and *intersection and junction* are created.
- *Comfort* means that the bicycle lane can give bicycle users a smooth movement and less physical energy used. These two aspects of comfort can be measured by a *width of bicycle lane* which is broadly mentioned by many sources of literature (CROW, 2007; Sanders, 2008; Heydon and Lucas-Smith, 2014); the *quality of bicycle lane surface* which is used by Sanders (2008); and the measurement of *hindrance or obstacles* in the bicycle lane which is emphasized by CROW (2007).
- *Attractiveness* is the pleasantness of bicycle lane usage. It is described by CROW (2007) that the attractiveness can be measured by the availability of supporting facilities and a great environment for bicycle usage. Therefore, in Bangkok’s context where the bicycle supporting facility is not that variety, *bicycle parking facilities* can be a proper indicator. Moreover, in a tropical country like Thailand, *shading* is important to create a pleasant experience for bicycle users, whereas *lighting* is also mentioned by CROW (2007) and Sanders (2008) as the way to measure the attractiveness of the bicycle lane, especially at night.

To sum up, the conceptual framework presents a straightforward relationship between the independent variable and dependent variable beneath the umbrella of Participation Concept, showing that participation has a causal impact on the quality of bicycle lane throughout different stages of the Rattanakosin project.

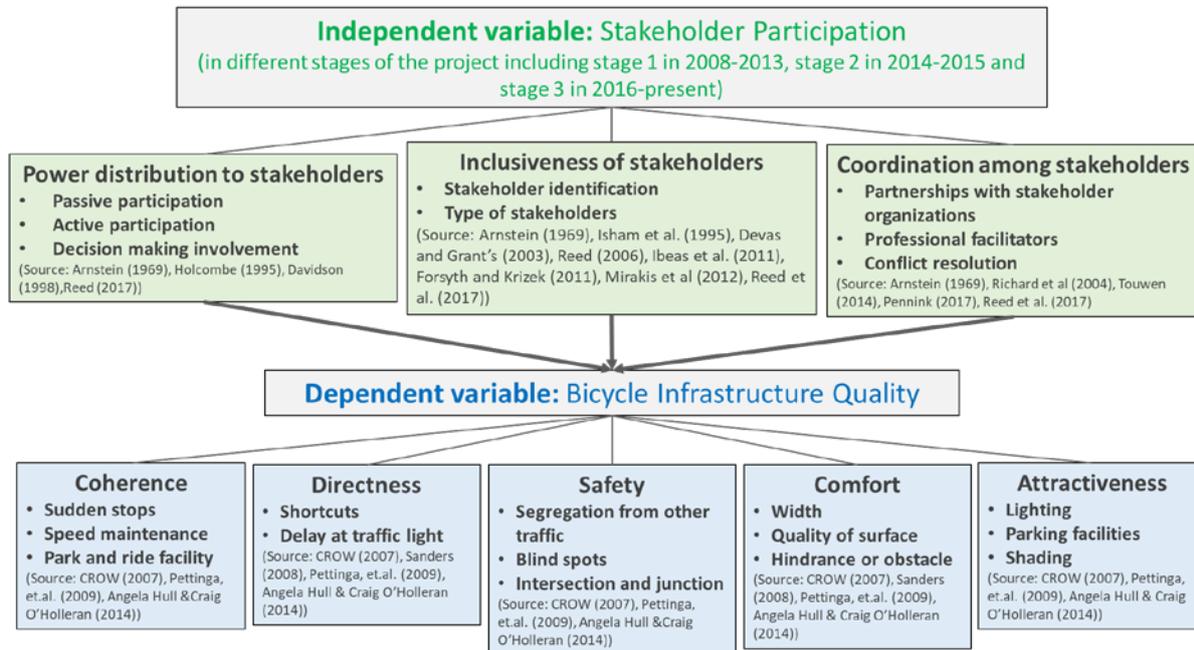


Figure 5: Conceptual Framework (Source: Author)

Chapter 3: Research Design and Methods

This chapter presents the methodology of this research. The research strategy and research methodology are introduced to illustrate how the conceptual framework is treated. The operationalization table then gives a more solid explanation about how the variables and sub-variables would be measured. Detail of data collection is explained through the sections of sample size and selection; data collection methods; and data analysis method. Lastly, the validity and reliability of the research are explained.

3.1 Research question

The main research question of this study is “*How does stakeholder participation (power distribution to stakeholders, inclusiveness of stakeholders and coordination among stakeholders) affect the quality of Rattanakosin bicycle lane?*” The research sub-questions are;

1. How does power distribution to stakeholders influence the quality of Rattanakosin bicycle lane?
2. How does inclusiveness of stakeholders influence the quality of Rattanakosin bicycle lane?
3. How does coordination among stakeholders influence the quality of Rattanakosin bicycle lane?

3.2 Research strategy

The selection of research strategy needs a mindful consideration of the research question, the extent of existing knowledge and the number of units of study (Van Thiel, 2014). Considering the research question mentioned above, it aims to find the explanation of the relationship between the independent variable and dependent variable in a certain context. Meanwhile, the existing knowledge about this relationship is relatively small according to the literature review, whereas the units of study, which is the number of stakeholders involved in Rattanakosin bicycle lane project, is also low. Therefore, this study uses **case study** as a research strategy due to its suitability in studying real-life settings in very great detail (Thiel, 2014). A great benefit of the case study is to examine the empirical phenomenon within a certain context where the extent between phenomenon and context are not explicit (Yin, 2017). This advantage increases the internal validity of this research as case study strategy can deal with the specific context of bicycle infrastructure provision by BMA. The case study research strategy is, by nature, qualitative research. Base on the research question, qualitative research is suitable due to the advantage that it can reach in-depth information about the phenomenon in a case study. It should be kept in mind that qualitative research has limitations in terms of generalization capacity for the whole population, hence, research findings are relatively case-specific.

To draw a conclusion about how stakeholder participation (independent variable) affects the quality of bicycle infrastructure, the co-variational approach is used in order to emphasize ‘*the effects of specific causes and not on the causes of specific effects*’ (Blatter and Blume, 2008, p.318). The researcher conducts a single case study research with the consideration of all stages of the Rattanakosin bicycle lane project. However, the observed case selected by the researcher also aims to generalize its conclusion to the whole population as it represents other similar bicycle infrastructure projects in Thailand which are directly funded and influenced by interventions from central government (totally 101 projects) (Rider.in.th, 2015).

Since this research deals with a time dimension, given that stage 1 of the Rattanakosin bicycle lane project has been started since 2008, the analysis of stakeholder participation and

bicycle infrastructure quality requires a longitudinal study which allows the analysis of data at more than one-time point that the researcher can make comparisons across time (Johnson, 2001). Therefore, though a single case study is applied in this study, the longitudinal research allows the conduction of within-case comparison which overcomes the problem of finding comparable case(s) in cross-case design (Levy, 2008).

3.3 Research methodology

Considering the suitable research method that can fit in the research strategy of the case study, an **interview** is selected as it enables the researcher to obtain in-depth information about the case. Small units of study and availability of data cause the necessity to choose this research method in order to reach the answer to the research question. To meet the validity and reliability of research, a semi-structured interview is appropriate due to its advantage to reach the required data (the in-depth information about stakeholder participation) according to the planned measurement and to provide the opportunity to receive more related data from interviewees. As this research is an inductive study, which aims to form up axiom and theoretical outcome, the semi-structured interview enhances the effectiveness of the research because the interview questions can present a doubt beneath the research's problem statement (Thiel, 2014). The focus group discussion was initially planned to use in order to understand the pattern of perception of experienced bicycle users toward the quality of bicycle infrastructure, however, due to the difficulties in appointing experienced bicycle users into one session, the semi-structured interview was used instead. Semi-structure interview with bicycle user also allows the researcher to obtain patterns of satisfaction and dissatisfaction on the usage of bicycle infrastructure and to be able to understand the existing condition of bicycle infrastructure through the eyes of bicycle users who are familiar with the selected bicycle lane.

3.4 Operationalization: variables, indicators

Based on literature reviews, the adapted definitions of the variables and sub-variables and their indicators are shown in table 2. Further description of each indicator can be found in Appendix 1.

Concept	Variables	Sub-variables	Source	Indicators		
Participation concept	<p>Stakeholder Participation: a social process where groups of people who have different interests (mainly consumers and producers of infrastructure services) are participated to share and identify their needs, concerns, and values, get involved in the decision-making process, and obtain power and control. This independent variable is translated into 3 sub-variables which are investigated in different stages of Rattanakosin bicycle lane project including stage 1 in 2008-2013, stage 2 in 2014-2015 and stage 3 in 2016-present.</p> <p>Source:</p> <ul style="list-style-type: none"> • Cascetta and Pagliara (2012) • Hansen et al. (2003) • Chamala (1995) • Devas and Grant 2003) <p>Nelson and Wright (1995)</p>	<p>Power distribution to stakeholders: a sharing of control and distribution of power from powerholder to stakeholder which can influence the decision-making process. This research transforms this definition into the measurement of the mode of power distribution (ranging from passive participation: inform and consultation, and active participation: deliberation, co-production) and level of stakeholders involving in decision-making process (citizen control)</p>	<ul style="list-style-type: none"> • Arnstein (1969) • Holcombe (1995) • Davidson (1998) • Reed et al. (2018) 	<p>Level & type of passive participation tools applied to stakeholder</p>		
				<p>Level & type of active participation tools applied to stakeholders</p>		
				<p>Level of stakeholders involved in the decision-making process</p>		
				<p>Stakeholder Inclusiveness: an extent of groups of stakeholders and stages and continuation of their participation which strive to involve in actions to ensure that their interests are represented and or reconciled. It would be measured by the availability of the stakeholder identification process and type of stakeholder groups.</p>	<ul style="list-style-type: none"> • Arnstein (1969) • Isham et al. (1995) • Devas and Grant's (2003) • Reed (2006) • Forsyth and Krizek (2011) • Ibeas et al. (2011) • Mirakis et al. (2012) • Reed et al. (2018) 	<p>Availability of the stakeholder identification process</p>
					<p>Type of stakeholder groups</p>	
				<p>Coordination among stakeholders: A management between powerholder and those with informal power to enhance collaborations by reduce conflicts, facilitate discussion, and create partnerships between stakeholders.</p>	<ul style="list-style-type: none"> • Arnstein (1969) • Richard et al. (2004) • Pennink (2017) • Reed et al. (2018) • Touwen (2014) 	<p>Numbers of agreements/MOU of partnerships with stakeholder organizations</p>
Bicycle infrastructure requirement principle	<p>Bicycle infrastructure quality: A condition of bicycle infrastructure (on-street bike lanes or off-street bike paths, and bicycle parking facilities) that can be determined by five requirements of requirement principle namely, coherence, directness, safety, comfort, and attractiveness.</p>	<p>Coherence: The consistency and continuity of bicycle usage in the network and ease of connectivity with other modes of transport and the recognizable wayfinding to join the network.</p>	<ul style="list-style-type: none"> • CROW (2007) • Pettinga et al. (2009) • Hull and O'Holleran (2014) 	<p>Level of sudden stops during the trip</p>		
				<p>Level of speed/flow maintain</p>		
				<p>Level of park and ride in public transportation</p>		

Concept	Variables	Sub-variables	Source	Indicators
	<ul style="list-style-type: none"> Source: Garrett (2014) 	Directness: The quality of bicycle infrastructure that minimizes delays and detours.	<ul style="list-style-type: none"> CROW (2007) Sanders (2008) Pettinga et al. (2009) Hull and O'Holleran (2014) 	Level of shortcuts
				Level of delays at a traffic light
		Safety: The quality of the bicycle infrastructure that supports safety to the bicycle user.	<ul style="list-style-type: none"> CROW (2007) Sanders (2008) Pettinga et al. (2009) Hull and O'Holleran (2014) 	Level and type of barrier or segregation from other traffic
				Level of blind spots from other traffic
				Level of intersection and junction
		Comfort: The bicycle infrastructure that encourages bicycle user to have a smooth movement and use less physical energy	<ul style="list-style-type: none"> CROW (2007) Sanders (2008) Pettinga et al. (2009) Hull and O'Holleran (2014) 	Width of the bicycle lane
				Quality of bicycle lane surface
				Type of hindrance or obstacle in the bicycle lane
		Attractiveness: Bicycle infrastructure criteria that contain supporting facilities to make bicycle user feel more enjoyable during biking	<ul style="list-style-type: none"> CROW (2007) Pettinga et al. (2009) Hull and O'Holleran (2014) 	Level of the lighting facility
				Level of bicycle parking facilities along the bicycle lane
				Level and type of shading

Table 2: The operationalization table (Source: Author)

3.5 Sample size and selection

This research applies non-probability sampling since there are few units of study available, which are stakeholders related to the Rattanakosin bicycle lane project (Thiel, 2014). Due to the challenge of finding relevant respondents who involve in Rattanakosin bicycle lane project, the researcher applied both purposive and snowball sampling in order to reach out to as many interviews as possible and ended up having 20 respondents. For purposive sampling, the researcher selected respondents who have in-depth knowledge and experience about this bicycle infrastructure projects, mainly the managers and civil servants in TTD, BMA. For other stakeholders, the researcher approached the respondents who are experienced bicycle users and have been using the Rattanakosin bicycle lane, NGO officers and academia who have in-depth knowledge about this project. The challenge did happen during the selection of traffic police due to the time constraint, so the researcher can reach out to only one respondent. Apart from the selection of key informants, snowball sampling is also applied during the interview with officers in BMA and bicycle-related NGO who can indicate other related stakeholders involved in Rattanakosin bicycle lane project. Local residents and other related public officers were reached out during the snowball sampling. Considering the number of samplings, the researcher also monitors the saturation of information when conducting data collection. Please see the details of key informants in annex 1.

3.6 Data collection methods

This research aims to obtain qualitative data, which is a non-numerical data, from both primary and secondary sources. Primary qualitative data is collected mainly by interviewing selected key informants with the semi-structured method. To triangulate, observation of bicycle infrastructure was conducted whereas the secondary qualitative data was also collected through content analysis of related documents derived from key respondents (BMA officers and bicycle-related NGO), content in the website, online blogs, and images from online map. These secondary sources are used with care as the researcher attempts to select reliable and complete sources of data. Observation allows the researcher to gather information from a real setting and can support the primary data of current bicycle infrastructure quality. However, the researcher realizes the weakness of this method as the derived data is specifically from time and place in which researcher conducts observations (applicable for only stage 3 of the project). The detailed data collection methods for each indicator are explained in appendix 1.

3.7 Data analysis methods

Qualitative data analysis is systematically applied in this research to enhance validity and reliability. Since the qualitative data is non-numerical units of information, the treatment approaches including data ordering and data coding are needed to formulate the comparable patterns for qualitative data. First, the collected primary qualitative data in Thai derived from the interview was translated into English and transcribed. Second, this data was transferred into Atlas.ti program in order to help to extract the keyword and to order in a clear index of the filing system. Due to the inductive nature of this research, the initial coding is supplemented from collected primary qualitative data and is repeated until no new codes are found, called this stage as 'reaching an exhaustive coding scheme' (Thiel, 2014). The secondary qualitative data from the content analysis and observation were also used as a triangulated source and help to support the validity of primary qualitative data.

3.8 Validity and reliability

Since this research applies the case study as a research strategy and interview as a research method, validity and reliability are the key concern. For validity, it can be discussed in two aspects – the internal and external validity. This research achieves a high internal validity by ensuring the existence of a presupposed relationship between the independent and dependent variables from literature reviews regarding outcomes of participation and relationships between stakeholder participation and bicycle infrastructure project. The operationalization of each variable is also backed up with previous studies, incorporate with time dimension of the project by applying a longitudinal research design, carefully selected, and reviewed by supervisor. Considering data collection, this research uses a semi-structured interview and applies interview protocol to increase internal validity by minimizing researcher's biases. On the other hand, external validity is another key consideration. Bear in mind that a case study contains a limitation on the generalization of population, the consideration of data collection was done until reaching the saturation level of data. This method applied for semi-structured interviews conducted in this research.

Considering reliability, which is how well the research is repeatable, case study research brings up substantial challenges due to the difficulty of dealing with qualitative data which might cause a risk of obtaining inconsistency in data interpretation. To deal with these challenges, database and log for every decision making during data collection and data analysis phase were applied. Meanwhile, the researcher realizes that an interview might cause some data collection error from the shortcoming of interviewer bias (a character of interviewer that alter the quality of data collection) and interviewer variance (a different data derived across different interviewers)(Groves, Fowler Jr, et al., 2011). Therefore, to build a standardized interview method, the researcher acted as neutral and professional as possible during the interview with respondents. The interview procedure was explained to every respondent before the interview and the non-directive probes were used throughout the interview to motivate the respondent to answer and give more explanation about questions. Finally, the voice recorder was used during the data collection process, allowing the researcher to gain the most information from the respondent without self-interpretation. Though there was one missing recording file due to technical error, the researcher applied a notetaking for a data collection and asked a respondent to review (called this process 'a member check'). The researcher applies triangulation for data collection methods through interviews of various groups of stakeholders, secondary qualitative data collection and observation (applicable for stage 3) to support the reliability of primary data.

Chapter 4: Research Findings

This chapter aims to present the findings from data collection and to answer the research question “*How does stakeholder participation (power distribution to stakeholders, inclusiveness of stakeholders and coordination among stakeholders) affect the quality of Rattanakosin bicycle lane?*”. The findings are presented in two sections; The first section summarizes the general background of the case and the second section contains an analysis of findings regarding the effects of stakeholder participation and the quality of Rattanakosin bicycle lane.

4.1 General background of the case

Rattanakosin Island is Bangkok’s old town containing richness of historical and cultural context. The area comprises of 2.3 square kilometers of land, situated on the eastern bank of Chao Phraya River and surrounded by Chao Phraya river in the west and Khlong Rop Krung (canal encircling city) in the east. Due to its magnificent character, Rattanakosin island magnetizes millions of tourists every year, making it is one of the most popular tourist destination zones in Bangkok and Thailand. Rattanakosin bicycle lane project is the bicycle infrastructure project situated in the area of Rattanakosin Island, stretching 8 kilometers in a circle and passing many tourist attractions and historical areas.

According to in-depth interviews and secondary data collection, the project can be described in 3 stages.

Stage 1: The creation of Rattanakosin bicycle lane (2008 – 2013)

It is important to elaborate on the context of bicycle usage in the Rattanakosin area before the implementation of the bicycle lane since it was the fundamental condition of the installation of bicycle infrastructure. Back in 1998, Rattanakosin area was already a well-known tourist destination for local and international tourists. The recreational bicycle usage trend was ignited after Thailand’s tourism campaign “Amazing Thailand” in 1998. There were many bicycle tour events and schemes held in the Rattanakosin area to promote the bicycle tourism, for example, the bicycle night tour scheme by Tourism Authority of Thailand (the government’s organization under Ministry of Tourism and Sports); the bicycle morning and night tour by BMA’s Tourism Bureau (currently is Tourism Division, Culture, Sports and Tourism Department, BMA :TDCSTD, BMA) and once-a-month independent bicycle tour event held by Thailand Cycling Club (currently is TWCIF) with supports from BMA’s Tourism Bureau and THPF during 2003-2008 (Ploypro, 2015). Moreover, TDCSTD, BMA also stepped in to arrange the formal bicycle tour during 2003-2008, and this time, having more advanced supporting facilities to facilitate the activity including bicycle borrowing service, parking facility, bicycle route map, and private organizer providing assistant officers in every bicycle borrowing service stations. This project is called “Bangkok Green Bike” / “Bangkok Smile Bike”.

The creation of the Rattanakosin bicycle lane is a consequent circumstance occurring during the successful implementation of the Bangkok Green Bike / Bangkok Smile Bike project in 2008. The implementation of the project was ordered by BMA’s mayor Apirak Kosayodhin who wanted to support the availability of basic bicycle infrastructure for tourism. The project contains the installation of bicycle lane signpost and painting the bicycle sign and white line on eight roads and one footpath along the road in Rattanakosin area. There was a cooperation between TDCSTD, BMA, and TTD, BMA in order to choose the proper bicycle route to implement the bicycle lane.



Photograph 1: Bicycle facilities that were provided during the implementation of Bangkok Smile Bike project in 2008-2014 (Source: (Ploypro, 2015))

The bicycle lane in stage 1 was completed in 2008 and was being maintained its operation through the period of new Bangkok mayor – Sukhumbhand Paribatra. It continued to receive broad criticize from bicycle users about its comfort and safety. According to the interview of NGOs, there was an average of 60 obstacles per 1 kilometer of bicycle lane including any possible type of stuff, for example, car parking, street vendors, gas tank, table, chair, trash, police’s motorcycles.

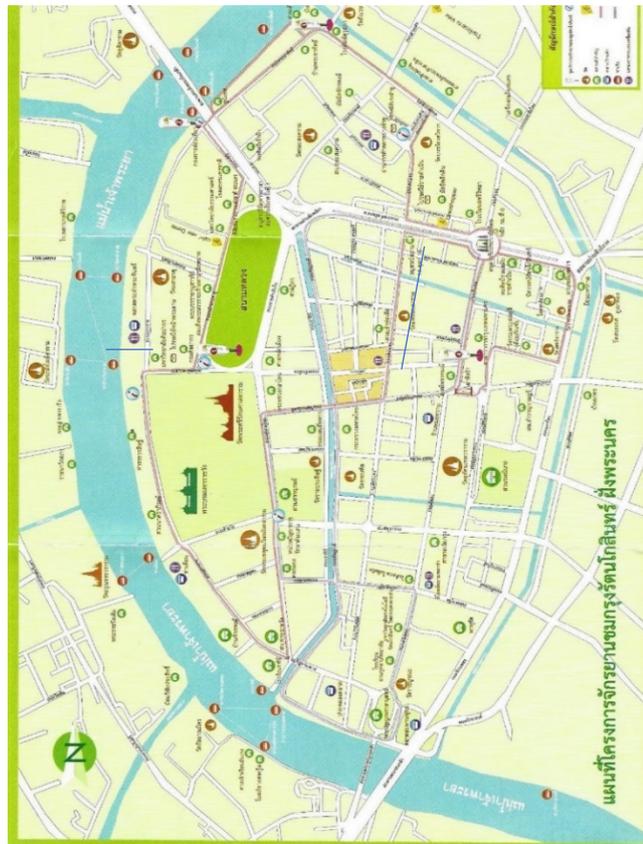


Figure 6: The bicycle tourist route from the Bangkok Smile Bike project that was later chosen to implement the bicycle lane. (Source: (TDCSTD, 2013))

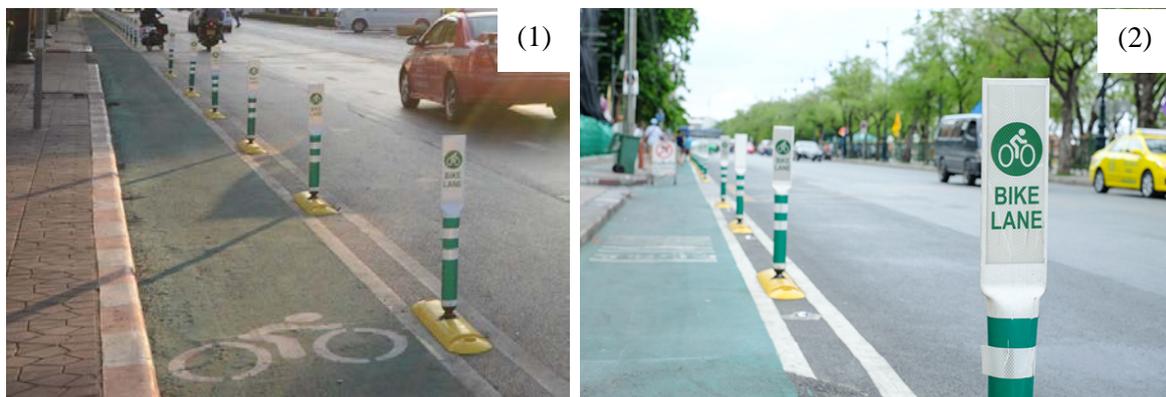
BMA also realized about the safety and comfort issues since there was no law protection on bicycle lane which causes the inability of traffic police officer to prevent any

encroachment of vehicles and street vendors in the bicycle lane¹. This fact led to the progressive move by BMA to cooperate with Traffic Police Division (TPD) to legalize the bicycle lane in the Rattanakosin area. The result of the cooperation was the legalization of four on-street bicycle lanes and one off-street (on footpath) bicycle lane specifically in the Rattanakosin area in 2010.

Stakeholder participation during stage 1 of the project started to become solid from both BMA itself and other stakeholders. From BMA, the establishment of the committee '*We love Bangkok, we love bicycle*' involved key stakeholders that work in bicycle-related issue into a formal process for the first time in 2011, however, it should be noted that this committee has a responsibility on the development of every bicycle-related project in Bangkok. Meanwhile, there were many participatory events conducted by group of NGOs and bicycle user including the social campaign to change the pattern of drainage covers throughout Bangkok in 2012 (campaign raised through the website Change.org); and the bicycle lane protection campaign from the cooperation of bicycle-related NGOs, Thammasat University, Chana Songkhram Police station and BMA in 2013.

Stage 2: The upgrade of Rattanakosin bicycle lane (2014 – 2015)

There was no major development by BMA on the Rattanakosin bicycle lane until 2014. According to the impressive trend of bicycle usage for sport and recreational purpose in 2013-2014, the new junta government intervened by commanding BMA to upgrade Rattanakosin bicycle lane to be 'a present for Thai citizen' by the new year of 2015. This upgrade of bicycle lane aims to improve the practical and safety aspects of the existing bicycle lane by widening the bicycle lane, installing an elastic type of bicycle lane delineator² that separates bicycle lane from the car lane and improving the quality of road surface.



Photograph 2: Elastic bicycle lane delineator used in Rattanakosin bicycle lane during stage 2

(source: (1) www.cleantraffic.com, (2) <https://highlight.kapook.com/view/121057>)

¹ There are two traffic laws related with a bicycle lane in Thailand. The first one is Land Transport Act B.E. 2522 stating that a bicycle user must only use the designated bicycle lane if it is available. The second law is Road Traffic Act B.E.2522 states that bicycle lane would be a recognizable one when there is an announcement of specific traffic rule to responsible person (traffic police). The process of legalizing a bicycle lane in order to allow the traffic police to enforce the traffic law on the bicycle lane is based on the requirement of the second law.

² An elastic bicycle lane delineator is a polypropylene post acquired by BMA to install along the 8 kilometers of Rattanakosin on-street bicycle lane. It is designed to build segregation between a bicycle lane (on the left side of the road) and a car lane and prevent encroachment of any vehicles into the bicycle lane. In the same time, the flexibility of the post allows some side-street parking and is believed by BMA as a proper solution to deal with local resident's and bicycle user's need.

During this period, the committee ‘*We love Bangkok, we love bicycle*’ was unstable due to the changes of BMA’s internal organization so the committee did not involve in the development of the Rattanakosin bicycle lane. However, there was the participatory process regarding the assessment of specific bicycle lane implementation (driven by Thammasat University) which is the consideration in legalizing every bicycle lane in Rattanakosin area (previously there were only five legalized bicycle lanes). This direction is fully supported by the government which led to the implementation in announcing the enforcement of traffic law together with debut of the brand-new bicycle lane at the end of 2014.



Photograph 3: Prime Minister Prayuth Chan-O-Cha and Bangkok’s mayor Sukhumbhand Paribatra rode a bicycle together during the opening ceremony of Rattanakosin Bicycle lane.

(Source: <http://www.thairath.co.th/gallery/9908>)

Unfortunately, after completion of the upgrade, there were resistances from local residents and shop owners along the bicycle lane as they were affected by the traffic law that prevent them from parking the car along the road. The situation was getting worse as many neighborhoods formed up to protest the implementation of the bicycle lane and there were confrontations between local residents and bicycle users. The public hearing session was held by Thammasat University to relieve this anger and ended up with the solution to compromise the traffic law enforcement by traffic police and remove some of elastic bicycle lane delineator off the bicycle lane. The deterioration of the bicycle lane was gradually visible after 6 months to 1 year of the operation as the bicycle lane delineator was removed and destroyed, and the traffic police was more flexible to the offender which again led to more obstacles in the bicycle lane.



Figure 7: The Rattanakosin bicycle lane stage 2 indicated in green line (Source: (Old City Group, 2015))

There were attempts from civil sectors to solve the problem in the Rattanakosin area. The first one is the research from the Old City Group and Silapakorn University, with financial support from TWCIF, which aims to address the traffic issue in the Rattanakosin area by promoting walking and cycling. With cooperation from BMA and Traffic Police Division, there was a pilot implementation of one-way traffic pattern in some road to ease the traffic flow and offered opportunity to widening a bicycle lane, but the implementation was not successful. Another public participation was from the invention of crowdsourcing application called “Pun Muang” by Green World Foundation. This application allowed people to report the problem about pedestrian and bicycle infrastructure to related public organization which helped to address many minor hindrances in Rattanakosin bicycle lane as well.

Stage 3: The replacement of Rattanakosin bicycle lane (2016 – present)

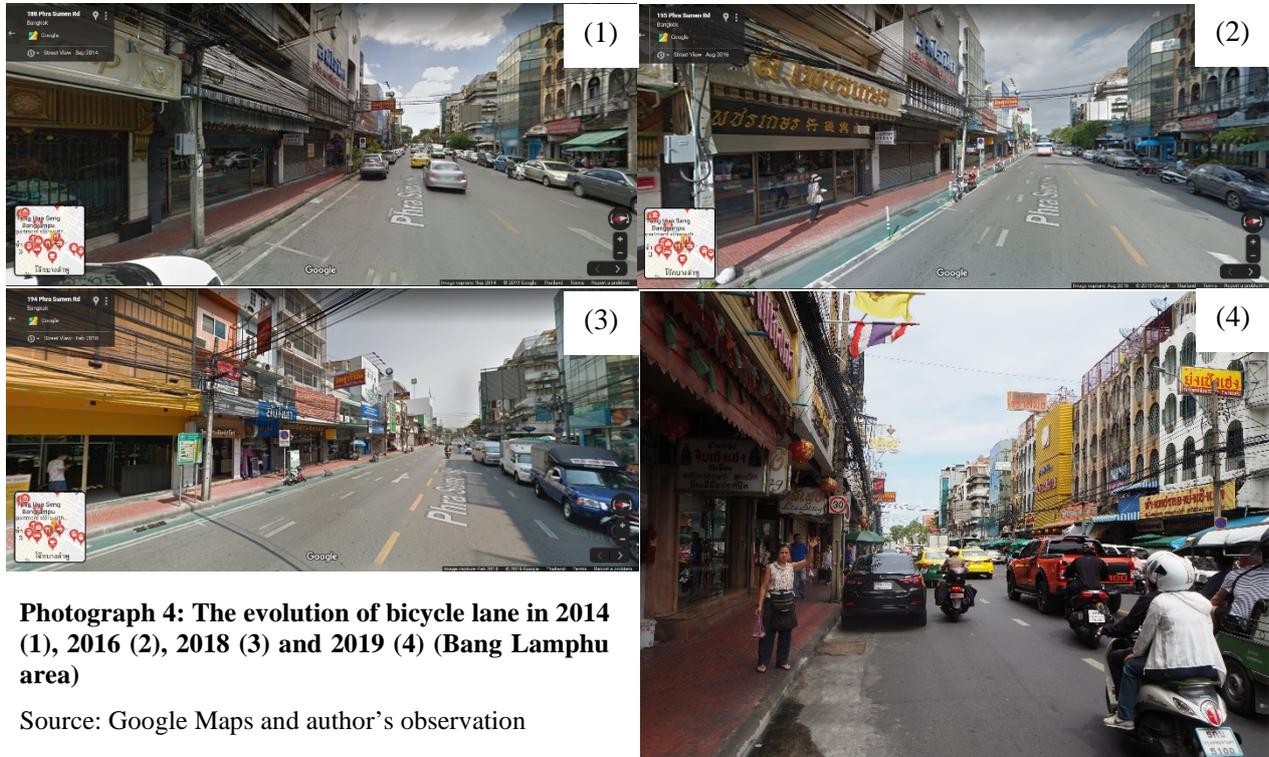
This stage of the Rattanakosin bicycle lane project is an unplanned circumstance. In 2016, the preparation of the Royal Cremation Ceremony of King Rama 9 was held in Rattanakosin area. To facilitate the preparation of the royal event, the decision to return the road space by temporarily removing any untidiness on the road around where the royal event would take place was sent to related organizations including BMA. Therefore, in 2016, the bicycle lane was gradually removed and replaced with car lanes.

In this period, the operation of the committee ‘*We love Bangkok, we love bicycle*’ was paused because of the changes in BMA’s management direction. The physical part of the bicycle lane in the Rattanakosin area was gradually no longer visible, having only some part of the bicycle lane left including the off-street (on the footpath) bicycle lane along Radchadamnoen road and some bicycle-sign painting on the Bamrungmuang road surface. Even though experienced bicycle user was not affected by this change that much, the issue of safety was the main concern for inexperienced or vulnerable user as mentioned by one of the bicycle users;

Respondent 12;

“The good thing about this (street pavement for royal event) is that all the pothole was gone, so it’s more comfortable to ride the bike. However, when there is no bicycle

lane, other motorists wouldn't care about bicycle users anymore, so I need to be more cautious. The car driver's behavior is not improving, so I preferred having a bike lane over not having it"



Photograph 4: The evolution of bicycle lane in 2014 (1), 2016 (2), 2018 (3) and 2019 (4) (Bang Lamphu area)

Source: Google Maps and author's observation

4.2 The effect of stakeholder participation on the quality of Rattanakosin bicycle lane

This section explains the analysis of data collection regarding the effects of stakeholder participation (power distribution to stakeholders, inclusiveness of stakeholders and coordination among stakeholders) on the quality of the Rattanakosin bicycle lane. The coding tables, figures, photographs and quotes from the interview are shown in this section to elaborate and triangulate the factual findings from the case study. Considering the coding tables, two types of table are displayed; the first one is the coding table that shows the frequency of quote mentioned by interview regarding particular code or sub-code which can project how important the respondents perceived about each topic of stakeholder participation; the second table is the coding table that shows the co-occurrence of quotation related to stakeholder participation and the quality of bicycle lane which can draw a rough explanation about the effect of particular area of stakeholder participation on each sub-variables of the quality of bicycle lane.

According to the general background of the case, participatory process in Rattanakosin bicycle lane project mainly happened outside the operation of the 'We love Bangkok, we love bicycle' committee, therefore, the analysis of each variable regarding stakeholder participation would be conducted without considering the operation of 'We love Bangkok, we love bicycle' committee. However, since this committee is the only formal partnerships between BMA and stakeholder organization, details about 'We love Bangkok, we love bicycle' committee will be elaborated in the section of Partnerships with stakeholder organizations.

4.2.1 The effect of power distribution to stakeholders on the quality of Rattanakosin bicycle lane

4.2.1.1 Passive participation

Passive participation refers to the type of participation in which stakeholder has an opportunity to be informed or provide consultation to the project team. Throughout the stages of the Rattanakosin bicycle lane project, passive participation is perceived by stakeholders in different way. In stage 1 and 3, passive participation is not realized by stakeholders to have a potential role as they mentioned the lack of passive participation more. In contrast, the existence of passive participation is mentioned by stakeholders more during stage 2 of the project, which means it played a crucial role in the perception of stakeholders.

Table 3: Coding of qualitative data regarding passive participation in different stages of the project

Code (1)	Sub-code (1)	Code (2)	Frequency
Passive participation	Passive participation_No	Period_2008-2014_Stage 1	5
		Period_2015-2016_Stage 2	18
		Period_2017-present_Stage 3	1
	Passive participation_Yes	Period_2008-2014_Stage 1	2
		Period_2015-2016_Stage 2	22
		Period_2017-present_Stage 3	-

Stage 1

Table 4: Coding of qualitative data regarding the co-occurrence of quotation between passive participation and bicycle infrastructure quality in stage 1

	Safety_ segregation	Comfort_ obstacle
Passive parti_ yes	2	1

Passive participation in stage 1 of Rattanakosin bicycle lane project is mentioned by officer in TDCSTD, BMA during the bicycle tourist route selection process. The creation of the route was performed through the feedbacks from bicycle tourists that involve in the events, which can be categorized as a consultative participation though it was done in an informal way. This activity was also mentioned by one of respondent who is the residents of Bang Lamphu neighborhood, expressing his opinion about the route that “(the route) is mostly get through the area in small alleys, not pass the main road that much. We were happy about the bicycle trip back there because it boosted up the local economy and promote the history and cultural stories of neighborhoods in Rattanakosin area”. However, the need from this informal passive participation, especially about the bicycle route preference which gets into small alleys, did not alter the identification of the bicycle route during stage 1 which can indicate the lack of decision-making involvement.

After the implementation of the bicycle lane, there were many passive participation through the conduction of the public hearing and informing session during 2010 – 2014 by Thammasat University as part of the bicycle lane protection campaign (covered only the area of bicycle lane on Phra Arthit road – with a length of 400 meters). It provides the opportunity for neighborhood leaders of community, shop owners and public and private organizations located along Phra Arthit road to involve in communication and public hearing sessions in

which BMA officers attended. Opinion and concern raised by local residents have built understanding among BMA's officers about the lifestyle of people in the area regarding the way they need to park the car along the side road where the bicycle lane is located. It is mentioned by TTD, BMA's officer that this understanding gradually builds up the idea to install the elastic bicycle lane delineator along the bicycle lane in stage 2 of the project, in order to enhance the safety and suit local resident's lifestyle in the same time. However, things that are lack from this process is the developing of a sense of ownership in local resident as most of the session was only the informing or consultative pattern, which consequently led to the conflict in stage 2 that arises from the resident's side.

Stage 2

Table 5: Coding of qualitative data regarding the co-occurrence of quotation between passive participation and bicycle infrastructure quality in stage 2

	Safety_ segregation	Comfort_ obstacle
Passive parti_yes	4	1

The passive participation plays a crucial role during the operation and maintenance process of the project in stage 2. Again, the passive participation took place after the implementation of bicycle lane and happened after the occurrence of intense situation about the impact of the bicycle lane to local resident's life, especially in Phra Arthit, Bang Lamphu and Sam Phraeng neighborhood. The public hearing session was conducted by Thammasat University in 2015 to receive the feedback from local residents and shop owners in these neighborhoods which later led to the conclusion to remove the bicycle lane delineator (negative impact on a safety issue). This session was mentioned by Professor Prinya, who is the facilitator of the session as below;

“The session ended with the conclusion not to enforce the law of bicycle lane in some sensitive area that previously contained conflict with residents.... For the physical aspect, there was a conclusion to do things that relieve the resident's suffering, including removing some bicycle lane delineator. Overall, it was about compromise with residents so that the bicycle lane would be usable for the public and residents would be happy”

Even though the bicycle lane delineator was not removed right after the session, it was the formal process that led to the realization by related public organizations about the impact of the bicycle lane on local people's living. Lack of sense of ownership makes the progress even worse as local residents continue to raise the issues many times after the session which led to the permanent removal of the bicycle lane delineator.

Stage 3

In this stage, there was no passive participation mentioned by stakeholder or any secondary sources. It is mentioned by the officer of TTD, BMA that every participatory process was paused during the preparation of the royal cremation ceremony of King Rama 9.

In summary, passive participation can be found as one of the participation typology in the Rattanakosin bicycle lane project. The outcome of passive participation varies in both positive and negative way and seems not to have a sudden impact to the bicycle infrastructure but led to more realization of needs and problems which would alter the physical condition of the bicycle lane in the following period. Moreover, not every passive participation led to the

change of bicycle lane quality because, as nature of this participation, the stakeholder’s voice is heard but not be guaranteed by powerholder to influence the decision-making process.

4.2.1.2 Active participation

Active participation is an engagement of stakeholders in the way to have deliberation and coproduction. It is also a type of participation that stakeholder has a delegated responsibility(s) to contribute to the project. Considering the frequency of active participation mentioned in data collection, the active participation apparently exists in stages 1 and 2. However, no active participation is mentioned by stakeholders in stage 3 which aligned with the pattern of passive participation as well.

Table 6: Coding of qualitative data regarding active participation in different stages of the project

Code (1)	Sub-code (1)	Code (2)	Frequency
Active participation	Active participation_No	Period_2008-2014_Stage 1	-
		Period_2015-2016_Stage 2	1
		Period_2017-present_Stage 3	-
	Active participation_Yes	Period_2008-2014_Stage 1	15
		Period_2015-2016_Stage 2	10
		Period_2017-present_Stage 3	-

Stage 1

Table 7: Coding of qualitative data regarding the co-occurrence of quotation between active participation and bicycle infrastructure quality in stage 1

	Safety_ segregation	Comfort_ obstacle
Active parti_yes	2	9

During stage 1, especially after the implementation of the Rattanakosin bicycle lane, many active participation happened and cause an improvement to the quality of the bicycle lane. These participations can be categorized as a bottom-up co-production type of participatory process as they were initiated by civil sectors and opened opportunities to other stakeholders including public organizations to share resources and take responsibility. However, not all active participation was successful, especially if the public organization did not respond to the action of civil sector.

The first visible active participation during stage 1 is the formation of bicycle-related NGO and active bicycle users who started to report the problems about the obstacles in the bicycle lane. This bottom-up initiation uses a one-way communication to BMA and attempted to raise public awareness regarding issues of bicycle lanes including many obstacles in the Rattanakosin area. It is mentioned by Green World Foundation officer that it was not a successful project in the sense that it cannot let to the physical changes to the bicycle lane, but it was successful to boost up awareness of public and mark a beginning of cooperation between BMA and civil sector regarding bicycle infrastructure development.

The following event is the social campaign to change the pattern of drainage covers throughout Bangkok from an up-down pattern to a left-right pattern since the up-down pattern causes an accident to the bicycle user. This campaign was also mentioned by Green World Foundation officer and showed in the website Change.org as a successful campaign as there

were 1,594 supporters signed their name on the website. Different from the first voluntary event, strong power of public caused a quick response from BMA and led to the prompt improvement of quality of Rattanakosin bicycle lane in terms of comfort (obstacle) as explained by the respondent from Green World Foundation;

“During this period, Change.org approached our team, demanding us to help to create a campaign on their website. After launching this campaign, BMA stepped in to solve the problem because there were tons of emails directly sent to mayor Sukhumbhan. We actively monitored the repairment process of drainage cover done by BMA.”



Photograph 5: The drainage cover campaign that led to the physical change of bicycle lane.

(1) The site of the campaign on Change.org. (source: <https://bit.ly/2Z9LgBc>), (2) The interview of Nonlany Ungwiwatkul, the bicycle user who created the campaign (source: <https://www.youtube.com/watch?v=xIsbNMkwdnY>), (3) The drainage cover before the campaign ((source: <https://www.youtube.com/watch?v=xIsbNMkwdnY>), (4), (5) The observation of drainage cover after the campaign (source: author)

The bicycle lane protection campaign in 2012-2013 was another bottom-up initiation from bicycle-related NGOs. This time, Thammasat University was involved to play a crucial role in cooperating with other stakeholders including Bang Lamphu neighborhood leader, Chana Songkhram Police station and TTD BMA, TDCSTD. Apart from passive participation mentioned earlier, there were deliberation sessions and coproduction activities that allow stakeholders to share resources, exchange information and delegate responsibilities to each other's. Traffic police was delegated to strictly enforce the law to offender, BMA helped installing the temporary bicycle lane delineator to mark the line of bicycle lane with the help from NGOs who put the plastic rope into the space between each bicycle lane delineator, and bicycle users were called to come to ride a bicycle on Phra Arthit bicycle lane in order to increase the bicycle usage and build awareness to local people that bicycle lane was still viable. This cooperation causes an increase in the quality of bicycle lane regarding comfort (obstacle)

and safety (segregation), even for only 400 meters of Phra Arthit road. It was mentioned by one of the NGO respondents as below;

Respondent 5;

“There was an activity held by K.Nonlany and K.Sira which is about protecting the bicycle lane on Pra Arthit road. They and other bicycle users gathered to ask for cooperation from people nearby the bicycle lane to avoid parking their cars in the bicycle lane. The cooperation was good, especially from the Manager Publishing, which stopped parking their cars in the bicycle lane.”



Photograph 6: Physical change during the bicycle lane protection campaign in 2012-2013.

(source: (1) <https://pantip.com/topic/31038823>, (2) <https://pantip.com/topic/31041581>)

Stage 2

Table 8: Coding of qualitative data regarding the co-occurrence of quotation between active participation and bicycle infrastructure quality in stage 2

	Safety_ segregation	Comfort_ obstacle
Active parti_yes	2	1

In stage 2, most of active participation that mentioned by stakeholders is the period of Specific Bicycle Lane Assessment (a planning phase of stage 2) held by Thammasat University in 2014. This active participation has a strong intervention from BMA and central government since it happened during the time that the new junta government wanted to promote the usage of bicycle and demanded related organizations to support this policy. It can be categorized as a top-down deliberation participation even though BMA did not work in assessing the law by themselves but asked Thammasat University to be a moderator. This event led to the progress of legalizing all bicycle lane in Rattanakosin area (later increase the quality of the bicycle lane in terms of safety (segregation) and comfort (obstacle)), with a fair stakeholder’s needs assessment performed by students of Thammasat University. Ironically, this project was driven smoothly with support from local residents and cooperation from police organizations which contradicts with the opinion received from these stakeholders during the interview.



Photograph 7: The bicycle law assessment by Thammasat University

(1) Thammasat University students went to collect opinion from local residents (2) Bicycle law assessment workshop session by Thammasat University (source: (Piyatida et al., 2014))

Example of comment from the local resident:

From the minute of meeting of the Specific Bicycle Lane Assessment workshop;

Using a bicycle is useful as it can solve the traffic problem. If the bicycle is more convenient, there will be more people using the bicycle lane.... I support the idea of bicycle-related NGOs that the community should have some participation and decision making during the planning of the project. This will make the project more sustainable.

From the interview;

“.... there was no public hearing before the implementation of the bicycle lane. However, BMA officers came to inform us about the project. They said that it’s the policy from the government. Residents didn’t agree that much but we didn’t want to resist the policy.”

Active participation was also found after the implementation of the bicycle lane upgrade. The research conducted by Old City Group and Silapakorn University was mentioned by one of the respondents who is a consultant of this project and manager of TWCIF, the NGOs who provided budget to this study. It was a bottom-up participation with a direct communication of the project’s results to BMA and traffic police, however, the consequent of this project did not lead to any physical change on the bicycle lane in Rattanakosin area as there were no commitment from public sector, as mentioned by respondent 16;

“After finishing the project, Aj.Xantharid arranged a public session to announce the result of the project and submit to BMA. However, there was no further progress after that. The project is just the suggestion from academia and civil sectors to BMA regarding how to do after the failure of implementation of the bicycle lane, mostly about the traffic arrangement in the area. No commitment made between BMA and the research team.”

In contrary, the crowdsourcing application called “Pun Muang” by Green World Foundation in 2016 has made some improvement to the bicycle lane in the Rattanakosin area. Imitating the success of the drainage cover campaign, it is a bottom-up approach with good cooperation with BMA which led to the increasing level of safety as broken bicycle lane delineators was reported and repaired. Also, the level of comfort increased because permanent and temporary obstacles in the bicycle lane were removed.

Stage 3

In this stage, there was no active participation mentioned by stakeholder or any secondary sources, in line with the finding of passive participation.

To conclude, active participation can trigger an impressive improvement to the bicycle lane development, especially regarding the issue of comfort and safety. Most cases of active participation in the Rattanakosin bicycle lane project are a bottom-up initiation and the successful cases mostly contain strong pressure from citizen and kind cooperation from the BMA.

4.2.1.3 Decision-making involvement

Decision-making involvement indicates a level of citizen control over participatory processes. The more involvement in decision making means the more power delegated from powerholder to the have-not people. From data collection, it is obvious that decision making involvement is lack in every stages of Rattanakosin bicycle lane project according to the perception of stakeholders.

Table 9: Coding of qualitative data regarding decision-making involvement in different stages of the project

Code (1)	Sub-code (1)	Code (2)	Frequency
Decision making	Decision making _No	Period_2008-2014_Stage 1	4
		Period_2015-2016_Stage 2	16
		Period_2017-present_Stage 3	4
	Decision making _Yes	Period_2008-2014_Stage 1	1
		Period_2015-2016_Stage 2	1
		Period_2017-present_Stage 3	-

Stage 1

As mentioned earlier, there is no control over the decision of bicycle lane creation in stage 1 of the project. When considering about the bicycle route to implement the bicycle lane, it was considered only by the officers in TDCSTD, BMA and TTD, BMA, led to the planning of bicycle lane located only in the main road (this is due to the limitation of TTD, BMA's authority as well), causing negative impact to the quality of the bicycle lane in terms of directness (shortcut). It is mentioned by TTD, BMA officer that this project is perfectly a top-down policy with no participation involved as below;

Respondent 20;

“The Rattanakosin bicycle lane project is somewhat a policy-driven project, ordered by BMA’s top management. This kind of project comes with a rush deadline which led to a missing process of planning, designing, and participation. With this limited time (less than 6 months), we can’t do anything that much, not even hiring a consultant to do a planning or data collection process. Therefore, the design of this bicycle lane was based on our engineering and architect knowledge from traffic flow implementation”

Stage 2

Lack of decision making involvement was mentioned by stakeholders during the upgrade of bicycle lanes in stage 2. It was clear from both the government side and civil sector side that the upgrade was purely driven by demand from the government and stakeholders

cannot do anything but accept it. The only event that involves some participation from various stakeholder was the Specific Bicycle Lane Assessment meeting which can be perceived as a consultative process with lack of control over the policy. The physical condition of Rattanakosin bicycle lane was upgraded in a short time (less than two months) as mentioned by many stakeholders, which not only causes the following conflict in the area but also prevent any in-depth assessment on the bicycle lane pattern. This issue was mentioned by NGO and bicycle user as below;

Respondent 2;

“As Thai traffic system uses left-hand side, the bicycle lanes that force bicycle user to turn right in every intersection would therefore hinder other motorists and potentially causes serious accidents, especially in the Suan Chao Chet area. I was so frustrated that BMA didn’t invite us to give any consultation.”

Respondent 6;

“The bicycle lane also forces us to cross the intersection which is quite dangerous. The most dangerous one is where the bicycle lane crosses the big intersection on Ratchadamnoen road. I had to be cautious about the cars that would come toward me anytime. The bicycle lane is not designed for any safety when crossing the intersection.”

The feeling about the lack of decision making involvement is well presented by one of the bicycle-related NGO who disagree about the rush upgrade of the bicycle lane in stage 2 as below;

Respondent 16;

We expressed our opinion and didn’t follow up on the comments because we are not the working team of this project. We don’t have any decision-making power over the project, and we can’t resist the trend and the top-down decision.... We accept that we were offended as BMA didn’t respond to our suggestion about this project.

Stage 3

As there was no participation during this period, decision making involvement was totally gone. It is stated by both BMA officer and bicycle-related NGO about the direction of the new Bangkok’s mayor Aswin Kwanmuang as below;

Respondent 2;

At that time (stage 3), some part of the bicycle lane is demolished, and the direction of BMA’s governors has changed, so the bicycle lane was not in their focus anymore.

During the replacement of the bicycle lane, stakeholders had no control over the decision as well. Fortunately, the replacement of the bicycle lane increased the quality of comfort since the road surface was getting more even, however, the safety of the bicycle lane is affected since all physical conditions of bicycle lane, especially the bicycle lane delineator and the green painting on the road surface was removed.

To summarize, decision-making involvement in the Rattanakosin bicycle lane project is totally lacking. Therefore, this condition allows other potential factors to negatively influence the quality of the bicycle lane, for example, the issue of directness of the route and the safety at intersection. The top-down decision with a short-period implementation is found as a main characteristic of the Rattanakosin case.

4.2.2 The effect of inclusiveness of stakeholders on the quality of Rattanakosin bicycle lane

4.2.2.1 Stakeholder identification

Stakeholder identification is an important process of stakeholder management. It is a prerequisite stage to reach out to a proper group of stakeholders that relates to the project and led to a better project outcome. Stakeholder identification is mentioned by BMA's officer and NGOs throughout three stages of Rattanakosin bicycle lane project, however, this process seems to be neglected by related stakeholder.

Table 10: Coding of qualitative data regarding Stakeholder identification in different stages of the project

Code (1)	Code (2)	Frequency
Stakeholder Identification	Period_2008-2014_Stage 1	2
	Period_2015-2016_Stage 2	2
	Period_2017-present_Stage 3	2

Stage 1 and 2

Throughout stage 1 and 2 of the projects, the process of stakeholder identification is considered an informal activity which is about choosing stakeholders based on trust and cooperation experience. It is mentioned by BMA's officer that stakeholder identification process happens in the meeting of 'We love Bangkok, we love bicycle' committee as the committee would discuss people whom they should contact in order to proceed any bicycle-related activities or projects. The criteria to choose the stakeholder to involve in the project was based on the connections with people in the committee, for example, when considering to involve local resident into participatory process, the neighborhood leaders would be the one to be picked, but the people who live along the bicycle lane which tends to be more affected by the project is marginalized. In other word, stakeholder which has a weak power and a high interest (operational stakeholder) according to Ibeas, dell'Olio, et al. (1986) would always be ignored. No classification of stakeholders is done, and no formal procedure of stakeholder treatment is found.

Respondent 20;

"I would say it hits only 50-70% of the target group... The identification of stakeholders was from the meeting of the committee....They discussed who should be the stakeholders of the project and invited people who they know. This is the shortcoming that makes the participatory process lack of inclusiveness.

Moreover, in most cases, BMA did not conduct any participative session by themselves but ask other organizations, for example, Thammasat University to work on this task. Therefore, stakeholder identification process is sometimes intervened by other organizations as well.

Stage 3

In this stage, even though there was no participatory process happening, but the willingness to redesign the stakeholder identification and participation process was found from the interview of the director of TTD, BMA and DPW, BMA. According to the content analysis of document from BMA, there is a strategic plan in which the process of stakeholder identification is shown.

Respondent 11;

...there should be more analysis of the real user of this bicycle lane. We want to redesign our working procedure to include the analysis part of user experience.

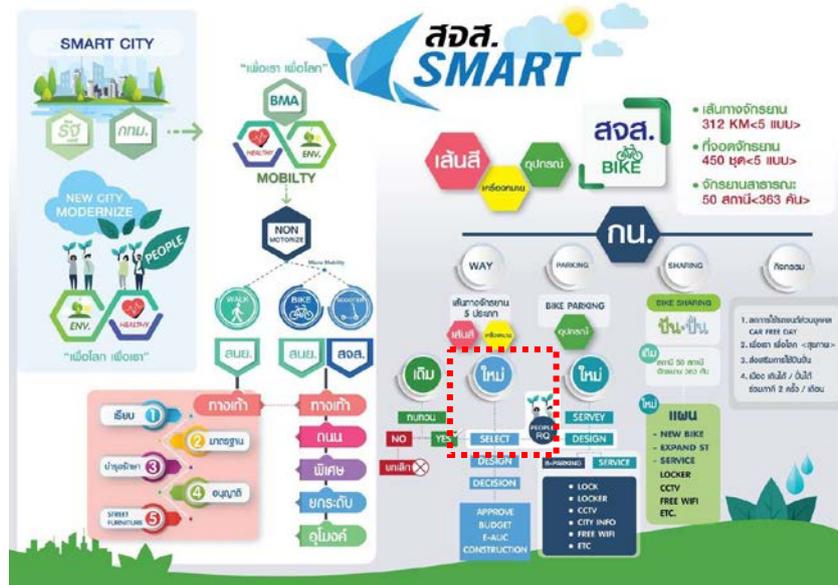


Figure 8: The strategic plan of TTD, BMA that involves the stakeholder identification process into the prerequisite stage of bicycle lane implementation (source: (TTD, 2019))

To conclude, there is no formal and proper stakeholder identification process happening during stages 1 and 2 of the projects which causes a rough inclusion of target stakeholders. However, there was some progress to improve the stakeholder identification process in stage 3. It can be concluded that stakeholder identification has no direct effect on the quality of Rattanakosin bicycle lane.

4.2.2.2 Type of stakeholders

The type of stakeholders is another important aspect that ensures the breath-and-depth of interest and information derived from stakeholder participation process. It is mentioned in stage 1 and 2 about the inclusion of stakeholders, whereas it was absent in stage 3.

Table 11: Coding of qualitative data regarding Type of stakeholder in different stages of the project

Code (1)	Sub-code (1)	Code (2)	Frequency
Type of stakeholder	Type of stakeholder_include	Period_2008-2014_Stage 1	8
		Period_2015-2016_Stage 2	11
		Period_2017-present_Stage 3	1
	Type of stakeholder_not include	Period_2008-2014_Stage 1	2
		Period_2015-2016_Stage 2	3
		Period_2017-present_Stage 3	-

Stage 1

Table 12: Coding of qualitative data regarding the co-occurrence of quotation between type of stakeholder and bicycle infrastructure quality in stage 1

	Comfort_obstacle
type stake_include	2

In stage 1, stakeholder inclusiveness happened after the implementation of the bicycle lane (late-stage inclusiveness) with a strong movement from the civil sector including bicycle-related NGOs (Bangkok Bicycle Campaign, TCHA) and bicycle user. It marks the starting point of further inclusion of other group of stakeholders into the participatory process and later influenced the quality of bicycle lane in terms of comfort (reducing number of obstacles in the bicycle lane). This situation supports the finding from previous literature emphasizing the power of bicycle user to be able to enhance the quality of bicycle infrastructure (Forsyth and Krizek, 2011; Mirakis, Athanasopoulos, et al., 2012).

NGOs' strategy to involve Thammasat University (Professor Prinya Thawananarumitkul) into the participatory process also enhances the quality of participatory meetings as they are perceived by society as a neutral and knowledge-based actor. Thammasat University played a crucial role in facilitating the meeting place and coordinating with related public organizations (especially polices) to support the bicycle protection campaign in 2013. NGO and Thammasat University also proceed to embrace local residents, shop owner and public organizations locate along the bicycle lane into informing and consultative meetings which opened the opportunity for them to express their concerns about the bicycle lane. The small group discussion among NGOs, Thammasat University, police, BMA, and neighborhood leader (Bang Lamphu) helped deriving in-depth information and kind cooperation among stakeholders. However, this inclusiveness was limited only the people along Phra Arthit road which is the only small part of Rattanakosin bicycle lane.



Photograph 8: The meeting during the bicycle protection campaign, held in Café Velo Dome, Thammasat University (source: (1) <https://pantip.com/topic/31038823>, (2) author)

The marginalized group of stakeholders is always a vehicle user who still insist to park their vehicles in the bicycle lane, however, during the bicycle protection campaign, this group of stakeholders was treated by communication activities including the poster attachment and verbal informing by traffic police.



Photograph 9: The communication tools to vehicle driver during the bicycle lane protection campaign (source: <https://pantip.com/topic/31038823>)

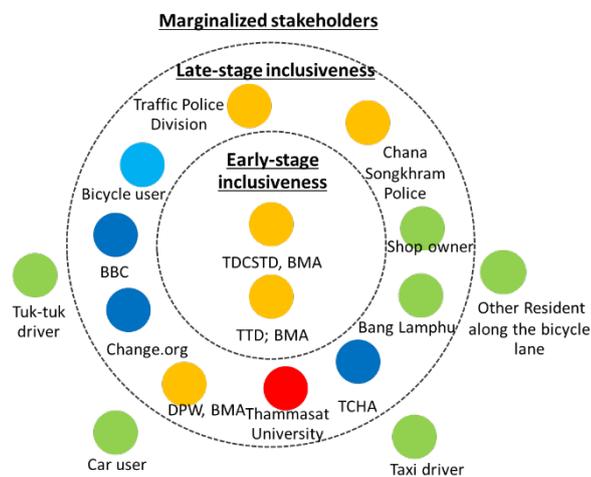


Figure 9: Inclusiveness of stakeholder in stage 1 (source: author)

Stage 2

Table 13: Coding of qualitative data regarding the co-occurrence of quotation between type of stakeholder and bicycle infrastructure quality in stage 2

	Safety_segregation	Comfort_obstacle
type stake_include	2	2

From a good cooperation among stakeholder in stage 1, various stakeholders were involved in the early stage of the project, especially during the Specific Bicycle Lane assessment by Thammasat University which can be considered as part of the planning process of bicycle lane upgrade. However, due to the tight timeline of bicycle lane upgrade project, this inclusion of various groups of stakeholders tended to create a general discussion without any insightful analysis about stakeholders’ needs. Furthermore, the main purpose at the beginning of the meeting is to propose the legalization of all bicycle lane in Rattanakosin area so other opinions regardless this agenda were not responded. Obviously, the inclusiveness of stakeholders in this stage contains an intervention from the government which tends to accelerate the pace of the project and obstruct further participatory processes. It can be stated that the improvement of safety (segregation from the installation of bicycle lane delineator) and comfort (legalize of bicycle lane to prevent any encroachment from other motorists) of bicycle lane in stage 2 was mainly from a cooperative experience during stage 1 and it might

be better if there is more time for participatory process in stage 2. It is mentioned by BMA officer as below;

Respondent 3;

At the time we did that (upgrade of the bicycle lane), it was close to New year, so the government demanded us to finish the implementation before New year, as a New year gift. Therefore, the participatory process wasn't settled at that time. We just thought that the bicycle lane requirements concluded from our discussion at Thammasat University was good enough to reach safety and practical matters.

Moreover, the late inclusion of other resident along the bicycle lane, especially resident outside Phra Arthit area who never participate in any meeting before, was another failure in the participatory process. All respondents who are residents expressed their opinion about the bicycle lane in the same way that it negatively affected the local economy and lifestyle so much. It was not surprising why the public hearing session held by Thammasat University after the upgrade of bicycle lane in 2015 ends with the conclusion to remove some bicycle lane delineators off the bicycle lane.

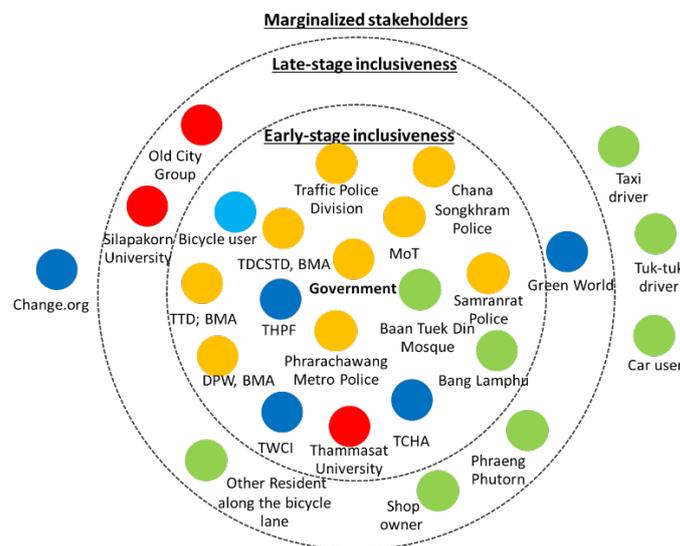


Figure 10: Inclusiveness of stakeholder in stage 2 (source: author)

Stage 3

Most of the stakeholders were marginalized during this stage of the project. Only government organizations took part in the (temporary) removal of the bicycle lane. This time, type of stakeholder was no variety at all so the interest from stakeholders was not presented. Ironically, there was no resistance from any groups of stakeholders as they prioritized the preparation of the royal event over the bicycle lane.

Bangkok Car Free Day event. It was perceived by stakeholders as a first step of good cooperation between BMA and bicycle-related agencies.

Table 15: Coding of qualitative data regarding the co-occurrence of quotation between partnerships and bicycle infrastructure quality in stage 1&2

	Safety_ segregation	Comfort_ surface	Comfort_ obstacle	Attractiveness_ parking
Partner_yes	1	1	5	1

Though the establishment of this committee did not directly serve the Rattanakosin bicycle lane development, some general issue about the problem of existing bicycle lanes in Bangkok has been raised in the committee meeting. Considering minute of meeting, the issue about obstacles, surface quality, and bicycle parking facilities of many bicycle infrastructure project including Rattanakosin bicycle lane can be found which led to the physical assessment of the bicycle lane in 2013 by Thammasat University students. Also, the issue about the incompleteness of bicycle law implementation of Rattanakosin bicycle lane was found to be informed in the meeting and led to the idea to legalize all bicycle lane in Rattanakosin area in stage 2. However, it is unclear how the operation of the committee leads to the development of bicycle infrastructure quality since there was no follow up about the issue raised in this meeting, for example, the issue of bicycle parking facilities was mentioned by six bicycle user respondents that it was not improving throughout 3 stages of the project.

Moreover, it is clear from the BMA’s order that the responsibility of people in the committee ‘*We love Bangkok, we love bicycle*’ is to respond to BMA’s direction by providing supporting information, resources or activities, therefore, this partnership tends to prevent the involvement of decision making by other stakeholders. NGO officer who is part of this committee also mentioned as below;

Respondent 5;

This committee is for ‘rubber stamp’. If you don’t have any idea, you will be there to approve the project initiated by BMA. On the other hand, if you have an idea, this committee will do a rubber stamp for you. ...There was some discussion in the meeting, and mostly, there was no real voting in the meeting as there would be a lobby before any voting.

Moreover, the status of this committee is also fragile as it depends on the direction of BMA’s top management. This led to the pause of the operation of the committee during stage 3.

Apart from the establishment of the committee ‘We love Bangkok, we love bicycle’, there is no MoU or formal contract between BMA and other stakeholder organizations. The informal cooperation depending on experience and trust is common when asking stakeholders about their relationship with BMA.

Respondent 16;

There is no MOU. It’s a Thai-style informal connection between stakeholders. No formal MOU is made. Dealing with BMA is in an ad hoc pattern. It might be better if we have an MOU because BMA is a very complex organization. They are like one of ministry.

To summarize, the only formal partnerships related to the Rattanakosin bicycle lane project is the committee ‘We love Bangkok, we love bicycle’. There was a general discussion

about physical condition of bicycle infrastructure that paves the way to the improvement of quality of Rattanakosin bicycle lane in some cases. The current stage of partnerships among stakeholder organizations is in the way of informal cooperation.

4.2.3.2 Professional facilitator

Professional facilitator plays a major role in coordination as it can form up a smooth participatory environment and good relationships among stakeholders. In this case, a professional facilitator that is mostly mentioned by stakeholders is Professor Prinya Thaewanarumitkul (Ph.D. Public Law, and Thammasat University’s vice-rector). He became the facilitator of many participatory meetings of Rattanakosin bicycle lane project during stage 1 and 2 and was perceived by stakeholder as a good facilitator.

Table 16: Coding of qualitative data regarding Professional facilitator in different stages of the project

Code (1)	Code (2)	Frequency
Professional Facilitator	Period_2008-2014_Stage 1	5
	Period_2015-2016_Stage 2	5
	Period_2017-present_Stage 3	-

Table 17: Coding of qualitative data regarding the co-occurrence of quotation between professional facilitator and bicycle infrastructure quality in stage 1&2

	Safety_ segregation	Comfort_ obstacle
Professional Facilitator	2	1

During stage 1, the successful implementation of the bicycle protection campaign was partly due to professor Prinya’s competency and therefore influence to the quality of the bicycle lane in terms of comfort (obstacle) as stated by one of NGOs.

Respondent 5;

“Other activities to protect this bicycle lane were taking a pole and rope to separate the bicycle lane from the car lane and inviting bicycle users to ride their bike in this route. Some of the residents were still not satisfied with the bicycle lane, but Professor Prinya negotiated with them and the session ends with satisfaction.”

During the Specific Bicycle Lane assessment session at the beginning of stage 2, Professor Prinya also plays a crucial role as a leader and mediator of the meeting. Considering minute of meetings, his strong character made the environment of the meeting to be more effective and hit to the point, which is about assessing the process to make the bicycle lane in stage 2 become more safety. Though this session contained so many groups of stakeholders and was a general discussion, the output of the session is solid and led to the process of legalization of all bicycle lane in Rattanakosin area. However, it should be noted that this smooth cooperation also influenced by the intervention from the government.

Again, in stage 2, Professor Prinya also took part in the public hearing session that aims to deal with conflict from local residents. This time, it is mentioned by NGOs that his competence led to the compromised solutions (which is to remove the bicycle lane delineator), but the local residents expressed some slight dissatisfaction about this session as detail below;

Respondent 13;

“We did join the meeting with Professor Prinya in the second round (stage 2). We informed our problems by writing down the post-it and spoke up in the meeting. After meeting, we also sent our problem to related organizations and posts on social media. We would say that after the meeting, there was no feedback from Aj.Prinya side so we didn’t know the progress and what to follow up”

In summary, the professionalism of facilitator did positively and negatively influence quality of Rattanakosin bicycle lane, depending on the context of participatory meetings.

4.2.3.3 Conflict resolution

Another activity that ensures good relationships among stakeholders is conflict resolution. Depending on the conflict occurring, conflict resolution is mentioned the most in stage 2 of the project when the conflict from local resident along bicycle lane arose. Throughout the project timeline, there is no protocol stating about how to deal with conflict as most of them were addressed in different approach.

Table 18: Coding of qualitative data regarding Conflict resolution in different stages of the project

Code (1)	Code (2)	Frequency
Conflict resolution	Period_2008-2014_Stage 1	4
	Period_2015-2016_Stage 2	25
	Period_2017-present_Stage 3	1

Table 19: Coding of qualitative data regarding the co-occurrence of quotation between conflict resolution and bicycle infrastructure quality in stage 1

	Safety_ segregation	Comfort_ obstacle
Conflict resolution	1	1

Though there was no major conflict happening in stage 1, it is found that some bicycle-related NGOs have conflict with each other, and this issue was realized by BMA when they arranged the committee meeting. No resolution is found, and it is mentioned by BMA officer that they needed to learn how to deal with these NGOs when they were together in the meeting. Apart from this, the conflict also happened during the self-organized campaign of bicycle lane protection between the working team and car user who resisted to park their cars in the bicycle lane. The conflict was part of what the working team had projected, and it was mentioned by NGOs about the way they learned to reduce the level of aggressiveness of the campaign.

Respondent 2;

“(During the campaign) we created notes and stick it to the parking cars. Professor Prinya’s note contained some strong content and causes some dramatic situations to the public, so we changed the strategy of sticking vinyl and speak to residents.

Table 20: Coding of qualitative data regarding the co-occurrence of quotation between conflict resolution and bicycle infrastructure quality in stage 2

	Safety_ segregation	Comfort_ obstacle
Conflict resolution	7	1

During stage 2, major conflicts happened from residents in Bang Lamphu, Phra Arthit and Sam Phraeng neighborhood after the upgrade of the bicycle lane. This time, the conflict

was intense that residents in these areas gathered themselves and went to raise their concern at BMA's office. It was mentioned by local residents, NGOs and BMA officers about the situation which seems to become worse as the top management of BMA and local resident did not understand each other's view. The conflict was not addressed by BMA but was finally solved by Thammasat University (Professor Prinya) during the public hearing session. However, due to the environment of the session that contains high pressures from local residents, the only way to please the stakeholders is to accept their requests by removing some part of bicycle delineator which decreases safety and comfort of the bicycle lane.

The conflict also happened between local resident and bicycle user since some local resident blamed the bicycle user as a cause of this fail implementation of bicycle lane. It is mentioned by bicycle-related NGOs that the conflict was not addressed by BMA and they had to step in to deal with this problem.

In summary, BMA was not a key responsible person to solve conflicts. The unclear conflict resolution exists throughout the timeline of the project led to an inconsistent impact on the quality of the bicycle lane. Interestingly, the resolution of major conflict during stage 2 is addressed by a professional facilitator but still cause a negative impact on the quality of bicycle lanes.

Chapter 5: Conclusions and recommendations

This chapter presents the conclusions to the research question and research sub-questions of this research. The reflexion on the existing scientific studies is also introduced. Finally, the policy recommendation and suggestions for future research are shown in detail.

5.1 Conclusions

In purpose to promote the bicycle usage in the capital city of Thailand, an impressive improvement was made by BMA in 2008 to transform the bicycle tourist route in Bangkok's old town, which is called Rattanakosin area, into a proper bicycle infrastructure where on-street and off-street bicycle lane together with parking facilities were provided to support an increasing number of bicycle user. As the implementation throughout the timeline of this project came up with a harshly criticize stakeholder participation and problem regarding quality of bicycle infrastructure, it has brought the interest to this research through the question about the effect of stakeholder participation on the quality of Rattanakosin bicycle lane.

According to findings based on data collection, it shows that stakeholder participation influences the quality of Rattanakosin bicycle lane throughout the project's timeline. This fact supports the participation concept 'as a means to an end' which defines how participation can alter the outcome of the project (Nelson and Wright, 1995). However, stakeholder participation can lead to whether an improvement or a deterioration of the bicycle lane, depending on the context of power distribution to stakeholder, inclusiveness of stakeholders and coordination among stakeholders.

How does power distribution to stakeholders influence the quality of Rattanakosin bicycle lane?

Power distribution to stakeholders influence the quality of Rattanakosin bicycle lane in term of safety (segregation) and comfort (obstacle).

The way power is distributed from the BMA to other stakeholders has indicated the typology of participatory process in Rattanakosin bicycle lane project, ranging from public hearing session that involve stakeholders to express their needs to the co-production activities initiated by civil sectors. Though stakeholders still have no control over the decision-making process, these participatory activities tend to have some impact on the quality of the bicycle lane, especially the active participation. To illustrate, the bottom-up co-productive participation caused the cooperation to avoid encroachment into the bicycle lane in Phra Arthit road which suddenly improve the quality of the bicycle lane in terms of comfort in stage 1. Active initiation from bicycle-related NGO in form of social campaign and crowdsourcing application also reduce number of obstacles regarding drainage cover and other various types of hindrances in a very short time.

On the other hand, passive participation also causes impacts on the physical condition of the bicycle lane, but at a slower pace. For example, the safety regarding segregation improved as many public hearing sessions in stage 1 (2010-2013) had built the understanding to BMA officer and led to the implementation of elastic bicycle lane delineator along the bicycle lane in stage 2 (2014). Passive participation also causes a reduction in quality of the bicycle lane. The obvious case is the public hearing session after the upgrade of bicycle lane in stage 2 which gradually led to the removal of bicycle lane delineator.

In the case of Rattanakosin bicycle lane project, decision making involvement is lack in every stage of this project. Therefore, it cannot be granted that the deterioration of the quality of the bicycle lane in terms of directness and safety in stage 1 and 2 and positive improvement

to the bicycle lane project in aspect of comfort (smooth surface) in stage 3 is the result of decision-making involvement, because it might be the influence from other factors, for example, political power, management direction, and authority of BMA.

How does inclusiveness of stakeholders influence the quality of Rattanakosin bicycle lane?

Inclusiveness of stakeholders influence the quality of Rattanakosin bicycle lane in terms of comfort (obstacle).

Speaking of how the stakeholder is involved, systematic stakeholder identification methodology is not found in the Rattanakosin case. This situation does not have direct causal effect to the quality of Rattanakosin bicycle lane but led to inclusion of wrong actors and late-inclusiveness of some important stakeholder, especially the local resident along the bicycle lane who had been affected the most by the implementation of the bicycle lane.

Meanwhile, bicycle users or bicycle-related NGO are found to be able to make an impressive change to the bicycle lane, aligned with the finding of Forsyth and Krizek (2011). Their smart strategy through initiations of many social campaigns and cooperation with potential academia and public organizations has improved the comfort (by reducing obstacles and encroachment of other motorists) of the bicycle lane together with the formation of public awareness about the problem of the bicycle. However, inclusiveness of too many types of stakeholder still has some shortcoming (for example, during the planning process in stage 2) since it tends to create a general discussion that cannot offer the opportunity for each group of stakeholders to speak up about what they really want and causes an dissatisfaction in the following period.

How does coordination among stakeholders influence the quality of Rattanakosin bicycle lane?

Coordination among stakeholders influences the quality of Rattanakosin bicycle lane in terms of safety (segregation) and comfort (obstacle) but seems to have a low impact since it relies on the context of participatory process.

The formal partnerships between BMA and stakeholder organizations (*We love Bangkok, we love bicycle*' committee) is a place where problems about the bicycle lane is registered, however, it is hard to conclude that this formal committee causes impact to the quality of the Rattanakosin bicycle lane because this committee did not have specific duty for only Rattanakosin bicycle lane and there was no follow up about the bicycle lane's issue raised in the meeting. Informal partnerships, on the other hand, is more general in Rattanakosin case and seems not to influence the physical change at all.

Professional facilitator is found in the participatory process of the Rattanakosin case which led to smooth cooperation, kind negotiation and solid output of the meeting. However, the outcome of each session tends to depend on the result of consensus which might not guarantee the increase in the quality of the bicycle lane.

Considering conflict resolution, there was no conflict resolution protocol found in the Rattanakosin project, so each case of conflict is solved in an ad hoc manner. Conflict resolution also related to the competency of the facilitator and influence different outcomes depending on how the participatory activities were held and what groups of stakeholders involved.

In conclusion, this study shows that stakeholder participation has effects over the quality of Rattanakosin bicycle lane regarding safety and comfort. Considering the frequency of coding from semi-structured interviews and content analysis, it can also draw a conclusion that active participation has the most influence on the quality of Rattanakosin bicycle lane. To sum up, the revised conceptual framework can be presented as below;

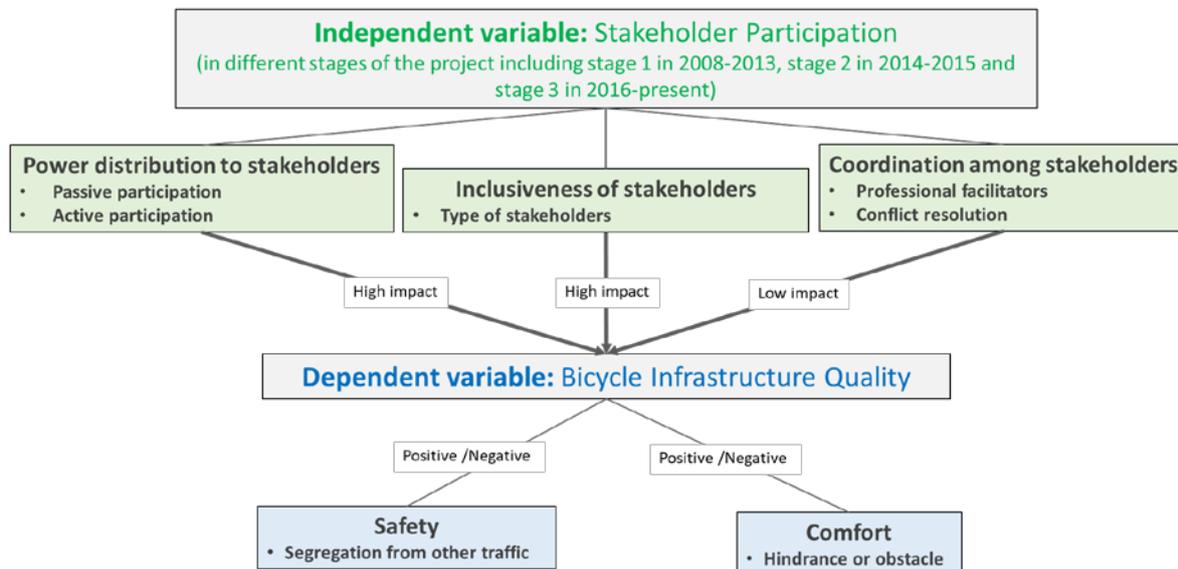


Figure 12: The revised conceptual framework according to research findings (source: author)

5.2 Reflexion on the existing literature

Many reflexions in the literature are found. Speaking of power distribution aspect, Rattanakosin bicycle lane project has a typology of power distribution ranging between level of informing (level 3) and consultation (level 4) according to a conventional Arnstein's ladder of participation concept. However, it is not clear and aligned with Arnstein's concept that the higher of distributed power to stakeholders can cause a better outcome in bicycle lane quality since consultation participation can also led to negative outcome in the quality of Rattanakosin bicycle lane, supporting the Reed et al. (2018)'s statement that a participatory process can influence unintended negative outcomes. The wheel of participation concept can better explain this phenomenon of power distribution since the variety type of agent and mode of engagement are found to also lead to different impacts on a bicycle lane quality. To illustrate, the bottom-up co-production type of participation (or *Community-based support strategies* according to Schubeler (1996)) tends to influence the quality of Rattanakosin bicycle lane in a positive way, meaning that it led to public acceptance and improvement of physical condition of the bicycle lane at the same time, whereas every top-down type of participation led to a rush implementation, caused unavoidable conflict and reduced a quality of bicycle lane in a long term. Therefore, it can contribute to the framework of Reed (2018) in the sense that bottom-up and active participation (coproduction) is still a proper typology of participation even though participation is a context-specific concept.

The finding of this research supports the framework of Stakeholder classification based on power and interest by Gardner et al. (1986) that operational stakeholders (stakeholders with high interest and low power) should be carefully treated. The marginalization of local residents along the bicycle lane during the participatory process in stage 2 that causes following conflict after the implementation of the bicycle lane is a solid evident to support the framework and is in line with the recommendation from Ibeas, dell'Olio, et al. (1995) who state that involving

more beneficiary participants into the project can cause a better project outcome. The negative effect arising from the involvement of too many groups of stakeholders also supports the finding from Devas and Grant's (2018) that the more diversity of user involvement can create a negative outcome. Moreover, the involvement of bicycle users can actually increase the quality of the bicycle lane which is aligned with Forsyth and Krizek (2011) who emphasize the role of bicycle users in the development of bicycle infrastructure quality.

It is interesting that the temporal aspect of participation plays a tricky role in the outcome of participation. It is true, literally, that early-stage participatory process tends to have a positive impact to the quality of bicycle lane (Isham et al. (1995); Devas and Grant's (2003) and Reed et al. (2018)) but it is more important to have a proper participation at any moment of the project timeline. From the stage 1, the bottom-up activities that happened after the implementation of the bicycle lane did led to the removal of obstacles in bicycle lane, but in the stage 2, even though there was a participatory process happened during the planning process, but it happened in a short period of time and did not let to the following in-depth discussion, which later led to an inarticulate situation and negative result to the project in the following months.

5.3 Recommendations and suggestions for future research

According to the research finding and conclusion, key policy recommendations can be presented in three topics. First, though the increase of stakeholder's decision-making process cannot be accomplished, related governmental organization should encourage the environment of active participation where stakeholders can compromise their interest, discuss their virtual needs, and share their resources in development process since this mode of engagement leads to more impact on the quality of bicycle infrastructure. By doing this, stakeholder identification is crucial to include the right stakeholder into the participatory process, especially the bicycle user and the people who are expected to be affected by the implementation of the project (e.g. local resident). Also, the professional facilitator and a proper conflict resolution are still important to drive the participatory meeting to reach effective results.

In addition, due to the flexible characteristic of stakeholder participation, numbers of recommendation about stakeholder participation process that might suits Bangkok's context are suggested by key informants. The first and most important thing of any participation is to build 'the sense of belonging' in order to make stakeholders (especially, the local residents) understand the virtual benefits of having a bicycle lane. Considering previous participative development projects, this concept has been proved to work in Rattanakosin area where local residents are considered an active citizen and have a strong bond with community-based organization (Office of the National Economic and Social Development Board, 2010). Moreover, the government side also suggests that strong movement and support from the civil sector are crucial in driving any bicycle-related development project. After many unsuccessful implementations of bicycle infrastructure project, BMA still needs support from public to legitimate any resolve or improvement of existing bicycle infrastructures. Without support from civil sector, it is hard for BMA to initiate any new development project.

Stakeholder participation is not the only factor that influences the quality of Rattanakosin bicycle lane. According to information found during data collection period, there are many interesting factors that tend to have major impact to the physical condition of the bicycle lane, for example, the political power (intervention from central government), institutional arrangement regarding the limitation of BMA's authority and the management direction and interest about bicycle-related development. These incremental factors interplay with the stakeholder participation to influence the quality of Rattanakosin bicycle lane throughout its timeline. Therefore, the research question about 'what factor influences the

quality of Rattanakosin bicycle lane' can contribute to the finding of this research. The case study with the approach of Casual Process Tracing would be suitable because it leads to the analysis of causal mechanisms, complex interactions of causal factors, and causal pathways throughout the timeline of the case (Blatter and Blume, 2008).

From this research conclusion, it is also interesting to notice that some aspect of quality of bicycle lane was not affected by stakeholder participation especially the coherence (sudden stop, blind spot, and park and ride facility), directness (shortcuts and delay at intersection), and attractiveness (parking facilities, lighting, and shading) of the bicycle lane. As mentioned by all bicycle users from semi-structured interview, these three aspects are also important factors that indicate their satisfaction toward Rattanakosin bicycle lane, therefore, future research to study about 'what factor influence the quality of Rattanakosin bicycle lane in term of coherence, directness, and attractiveness' is useful. The case study with the interview and triangulated secondary data source is proper for this research question.

5.4 Final conclusion

This research has extended the frontier of participation concept to the area of bicycle infrastructure development. It is proved that stakeholder participation can influence the quality of the Rattanakosin bicycle lane. The key strategy that creates a positive and sudden impact to the physical condition of the bicycle lane is a bottom-up active participation that contains group of bicycle users, 'NIMBY' stakeholders, and professional facilitator who can deal with conflict. On the other hand, to prevent any negative outcome, general discussion that fails to reach virtual needs of stakeholders should be avoided.

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Annex 1: Research Instruments and Time schedule

1. Description of indicators

Variables	Sub-variables	Indicators	Description
Stakeholder Participation:	Power distribution to stakeholders	Level & type of passive participation tools applied to stakeholder	Level and type of participative meeting ranging from an informed participation and opportunity to access information for stakeholders (e.g. Through news media, pamphlets, posters, and responses to inquiries) to a consultancy participation (e.g. through attitude surveys and public hearings)
		Level & type of active participation tools applied to stakeholders	Level and type of participative meeting ranging from a deliberation (two-way discussion that allows an exchange of information between powerholder and stakeholders and led to a compromise of stakeholder's interest) to a co-production participation (in-depth discussion that leads to the delegation of mission to stakeholders) for example, through neighborhood meetings, interactive discussion
		Level of stakeholders involved in the decision-making process	Level of the ability of stakeholder to take control over the decision-making process, ranging from no control over decision-making process to completely nominate the result of decision-making process
	Stakeholder Inclusiveness	Availability of the stakeholder identification process	The existence of stakeholder identification methodology used by BMA or any stakeholders in order to arrange the participatory process
		Type of stakeholder groups	The characteristic of stakeholders involved in the participatory process
	Coordination among stakeholders	Numbers of agreements/MOU of partnerships with stakeholder organizations	The amount of partnerships agreement with written responsibility between BMA and stakeholder organization or among stakeholder organizations
		Level of professional facilitators	The level of facilitator's skill and experience in participatory meeting or event, ranging from low skill to a professional skill
		Level of conflict resolution measures	The level of conflict resolution accomplishment that happened among stakeholders, ranging from no accomplishment at all to every-single-time accomplishment
	Bicycle infrastructure quality	Coherence	Level of sudden stops during the trip
Level of speed/flow maintain			Level of network design that encourages travel speed stabilization, ranging from less to more experience about speed maintenance in the bicycle lane
Level of park and ride in public transportation			Level of park and ride facilities provided to facilitate modal change from bicycles to other public transport, ranging from low to high satisfaction about the sufficiency of park and ride facilities
Directness		Level of shortcuts	Level of bicycle network that is designed to minimize detours, ranging from low to high satisfaction about the distance from A to B when using bicycle lane

Variables	Sub-variables	Indicators	Description
		Level of delays at a traffic light	Level of bicycle network that is designed to minimize delay, ranging from low to high satisfaction about the travel time used when experiencing a traffic light
	Safety	Level and type of barrier or segregation from other traffic	Level and type of build environment that ensures the safety of bicycle users from other road users. Level of segregation can be explained by the coverage of segregation in the bicycle lane, ranging from low to high coverage.
		Level of blind spots from other traffic	Level of perception of bicycle users toward their visibility perceived by other motorists, ranging from no experience to frequent experience about blind spots in the bicycle lane
		Level of intersection and junction	The number of conflicts at the intersection and the perception about the safety at intersection or junction, ranging from low conflict to high conflict at the intersection
	Comfort	Width of the bicycle lane	The perception of bicycle user about the width of the bicycle lane, ranging from low satisfaction to high satisfaction
		Quality of bicycle lane surface	The characteristic of pavement condition and how smoothness of bicycle lane surface is perceived by a bicycle user
		Type of hindrance or obstacle in the lane	The type and amount of hindrance and obstacle in the bicycle lane
	Attractiveness	Level of the lighting facility	Level of lighting facilities along bicycle lane and perception of bicycle user about the lighting, ranging from low satisfaction to high satisfaction
		Level of bicycle parking facilities along the lane	Perception about the sufficiency of supporting facilities for bicycle parking, ranging from low to high satisfaction about the sufficiency of parking facilities
		Level and type of shading	Type of shading and perception about shading in the bicycle lane, ranging from low satisfaction to high satisfaction

2. Sample size and selection

Respondent group	Respondent	Role	Involvement with 'We love Bangkok, we love bicycle' committee
Bangkok Metropolitan Administration (5)	Respondent 3	Chief of Traffic Information Center, TTD, BMA	Yes, as a committee member and secretary
	Respondent 8	Senior officer, TDCSTD, BMA	Yes, as a committee member
	Respondent 10	Director of Road Engineering Office, DPW, BMA	No, but having a representative from the department in the committee
	Respondent 11	Director of Policy and Planning, TTD, BMA	No, but having a representative from the department in the committee

Respondent group	Respondent	Role	Involvement with ‘We love Bangkok, we love bicycle’ committee
	Respondent 20	(Ex) Architect at TTD, BMA	Yes, as a committee member and assistant secretary
Traffic police (1)	Respondent 18	Head of Traffic and Engineering department, Chana Songkhram Police Station	No
NGO (3)	Respondent 2	Active member of Bangkok Bicycle Campaign Group / Green World Foundation	Yes, as a committee member
	Respondent 5	(Ex) Vice president of TCHA / Active member of Big Tree group	Yes, as a committee member
	Respondent 16	Manager, TWCIF	No, but has attended the meeting
Academia (2)	Respondent 9	Senior consultant, Old City Group / Professor at Silapakorn University	No
	Respondent 15	Vice-Rector, Thammasat University	Yes, as a committee member
Residents (3)	Respondent 13	Bang Lamphu Neighbourhood leader	No
	Respondent 17	Phraeng Phuthon Neighborhood leader	No
	Respondent 19	Phraeng Nara Neighborhood leader	No
Bicycle user (6)	Respondent 1, 4, 6, 7, 12, 14	Experienced bicycle user	No

3. Data collection methods

Variables	Sub-variables	Indicators	Primary Data collection method	Methodological triangulation
Stakeholder Participation	Power distribution to stakeholders	Level & type of passive participation tools applied to stakeholder	Interview	Interview other groups of stakeholders, Content analysis
		Level & type of active participation tools applied to stakeholders	Interview	Interview other groups of stakeholders, Content analysis
		Level of stakeholders involved in the decision-making process	Interview	Interview other groups of stakeholders, Content analysis
	Inclusiveness of stakeholders	Availability of the stakeholder identification process	Interview	Interview other groups of stakeholders, Content analysis

Variables	Sub-variables	Indicators	Primary Data collection method	Methodological triangulation
		Type of stakeholder groups	Interview	Interview other groups of stakeholders, Content analysis
	Coordination among stakeholders	Numbers of agreements/MOU of partnerships with stakeholder organizations	Interview	Interview other groups of stakeholders, Content analysis
		Level of professional facilitators	Interview	Interview other groups of stakeholders, Content analysis
		Level of conflict resolution measures	Interview	Interview other groups of stakeholders, Content analysis
Bicycle infrastructure quality	Coherence	Level of sudden stops during the trip	Interview	Observation
		Level of speed/flow maintain	Interview	Observation
		Level of park and ride in public transportation	Interview	Observation
	Directness	Level of shortcuts	Interview	Observation, Content analysis
		Level of delays at traffic light	Interview	Observation, Content analysis
	Safety	Level and type of barrier or segregation from other traffic	Interview	Observation, Content analysis
		Level of blind spots from other traffic	Interview	Observation
		Level of intersection and junction	Interview	Observation, Content analysis
	Comfort	Width of bicycle lane	Interview	Observation, content analysis
		Quality of bicycle lane surface	Interview	Observation, content analysis
		Type of hindrance or obstacle in bicycle the lane	Interview	Observation, content analysis
	Attractiveness	Level of lighting facility	Interview	Observation, Content analysis
Level of bicycle parking facilities along the bicycle lane		Interview	Observation, Content analysis	

Variables	Sub-variables	Indicators	Primary Data collection method	Methodological triangulation
		Level and type of shading	Interview	Observation, content analysis

4. Time Schedule

Time Schedule Activities	Month	May				June				July				August				September			
	Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Searching and connecting with key informants for interview and focus group		■	■	■	■	■	■	■													
Preparing and developing interview and focus group questions discussion					■	■	■														
Content analysis for independent and dependent variables						■	■	■	■	■	■										
Interview with key informants										■	■										
Conducting focus group discussion										■	■										
Observing bicycle route											■	■									
Translation and transcription of interview and focus group discussion											■	■									
Coding and analysis data through Atlas.ti											■	■	■								
Draft finding and conclusion													■	■	■						
Submission of draft thesis														■	■	■					
Revising and devolping final thesis															■	■	■				
Final submission of the thesis																	■				

Annex 2: Guiding questions for semi-structured interview

Semi-structure interview for stakeholder participation (independent variable)

General question

1. Please, can you explain your involvement in Rattanakosin bicycle lane project during stage 1, 2 and 3?

Inclusiveness of stakeholders

2. Is there any stakeholder identification process taken before any participatory activities during stages 1, 2 and 3? If yes, what is the form of that process?
3. Who are the stakeholders in the Rattanakosin Bicycle lane project during stages 1, 2 and 3?
4. Is there anything I did not ask that is about inclusiveness of stakeholders that you think it's good for me to know?

Power distribution to stakeholders

5. Is there any communication from BMA to related stakeholders about the project during stages 1, 2 and 3? If yes, what is the form of communication used in participation process in each stage of the project (e.g. news media, pamphlets, posters, and responses to inquiries) and how were these communications used?
6. Did BMA conduct any consultancy activities with related stakeholders during stages 1, 2 and 3? If yes, what is the form of consultancy in participation process in each stage of the project (e.g. attitude surveys and public hearings) and how were these consultation practice?
7. Is there any (two-way) discussion or meeting with related stakeholders Stage 1, 2 and 3? If yes, what is the form of active discussion and how were those active discussions?
8. Are there any related stakeholder involvement in decision making process Stage 1, 2 and 3? If yes, how was it? How much influence can stakeholders intervene in decision making?
9. Is there anything I did not ask that is about power distribution to stakeholder empowerment that you think it's good for me to know?

Coordination among stakeholders

10. Is there any formal memorandum of understanding (MOU) or partnerships agreement between BMA and groups of stakeholders Stage 1, 2 and 3? If yes, what is the detail about such partnerships?
11. What are the roles of a facilitator Stage 1, 2 and 3? Could you please explain his/her roles and responsibilities?
Additional Question to stakeholders: Do you feel that facilitator Stage 1, 2 and 3 is an experienced person? What do you think about his/her experience and skills?
12. Is there any conflict happening during the stakeholder participation process Stages 1, 2 and 3? If yes, how is such conflict resolved?
13. Is there anything I did not ask that is about Coordination among stakeholders that you think it's good for me to know?

Semi-structure interview for quality of bicycle infrastructure (dependent variable)

General question

1. What is your perception about the quality of the Rattanakosin bicycle lane?

Coherence

1. Please express your opinion about the coherence of this bicycle lane.
2. Can you maintain or accelerate the speed when riding your bike in Rattanakosin bicycle lane? Please explain your experience.
3. Mostly, is there any sudden stop you experience during the trip? If yes, what was experience?
4. Is it easy for you to ride a bike to take other transportation modes? Do you experience any difficulty in finding parking facilities at other transport stations?

Directness

5. Please express your opinion about the directness of this bicycle lane.
6. Do you feel that this bicycle lane can take you to your destination in a short distance? Is there any shortcut you can use in this route? How much do you think?
7. Do you feel that this bicycle lane can take you to your destination in a short time? Do you experience any delay at traffic light or any other incidents?

Safety

8. Please express your opinion about the safety of this bicycle lane.
9. Is there a protected area of bicycle lane that prevents you from other traffic? Do you think it is enough?
10. Do you feel that this bicycle lane has a blind spot area? How do you feel about this issue?
11. Do you need to cross many intersections or junctions?

Comfort

1. Please express your opinion about the comfort of this bicycle lane.
2. Do you feel the width of this bicycle lane is enough for you?
3. Do you feel that the bicycle lane surface is in good condition? How do you feel about this issue?
4. Do you experience any hindrance or obstacle? What type of hindrance or obstacle do you need to encounter?

Attractiveness

1. Please express your opinion about the attractiveness of this bicycle lane.
2. Are there enough lighting facilities at night?
3. Are there enough parking facilities along the bicycle lane?
4. Is there enough shading or tree along the bicycle lane for better temperature control?

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