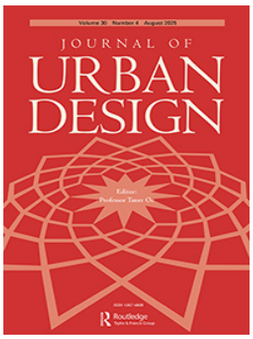

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From push to partnership: evolving public engagement strategies in pandemic-induced street experiments

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ABSTRACT

This study explores the evolution of public engagement strategies and their impact on pandemic-induced street experiments. Analysing 24 cases worldwide, it identifies three engagement structures: Push-Pull, Lean Push-Pull-Network, and Rich Push-Pull-Network. The first two structures revealed challenges, including public dissatisfaction with rapid, low-cost designs, limited governmental capacity to integrate feedback, and inadequate evaluation mechanisms. In contrast, the Rich Push-Pull-Network structure – characterized by two-way communication and participatory decision-making – significantly increased the likelihood of street experiment continuation, underscoring the crucial role of public engagement in co-creating inclusive and resilient urban design outcomes during and beyond crisis contexts.

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Tactical urbanism; public engagement; urban experimentation; people-centric street

Introduction

Tactical urbanism advocates for an iterative urban design process that incorporates temporary and experimental interventions (Lydon and Garcia 2015; Silva 2016). By placing design interventions in the public sphere, implementers can quickly test design feasibility and adjust them based on user feedback. Intervention materials are meant to be temporary and adjustable. Through public engagement activities, implementers can analyse and improve the designs iteratively. In recent years, this technique has been used to reallocate street spaces for people-centric uses, including promoting active mobility and placemaking. These intentional changes in street materials, regulations, and forms, aimed at instigating people-centric street transitions, are referred to as street experiments (Bertolini 2020).

During the COVID-19 pandemic in 2020, transportation authorities in cities worldwide deployed temporary street interventions to support public space, mobility, and the local economy (McCormick 2020). These interventions are referred to in this study as pandemic-induced street experiments (PISEs), as their emergence was largely influenced by the pandemic disruption. Documentations on these interventions showed that over 300 cities worldwide implemented street changes

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between March and December 2020. These changes took the form of reallocating kerb space and partially or fully closing street sections to car traffic. They provided safe gathering spaces, activity spaces, and commercial spaces. While a small portion was fast-tracking existing plans, most were new initiatives in response to the pandemic (Combs and Pardo 2021). These interventions were tactical, as they were deployed under time constraints, with spatial and temporal uncertainty, and sometimes with limited resources and regulatory flexibility. They were experimental because the implementers were trialling in an unprecedented situation set out by the pandemic; as a result, the interventions were temporary, adjustable and extendable. These pandemic-induced street experiments started as short-term interventions, but some aimed at long-term street transformations (Verhulst, Casier, and Witlox 2022).

Government actors can make better-informed decisions when delivering street experiments with public engagement (Hahn and Te Brömmelstroet 2021). Communities would also support those experiments with public engagement activities (Shirgaokar, Reynard, and Collins 2021; Smeds and Papa 2023). However, due to the short notice and planning period, pandemic-induced street experiments were initially implemented by local governments with little public engagement. This led to public concerns about the risk of coercive use of power to change public space (Glaser and Krizek 2021; Verhulst, Casier, and Witlox 2022). The public engagement process constraints under the pandemic were unclear, but it would be key to understanding how and why certain street experiments continued to evolve for multiple years.

The research investigates the breadth and depth of public engagement and its influence on the development of tactical urbanism projects, using empirical cases of pandemic-induced street experiments. Initiated around the same time and prompted by a global disruption, these street experiments offer a valuable basis for comparative analysis. A total of twenty-four cases were selected from Europe, North America, Latin America, Oceania, and Asia to examine the diverse methods employed by government actors to engage the public. These cases were drawn from the Global Geospatial Database for Pandemic-Induced Street Experiments as representative examples (Zhao, Sun, and Webster 2024). The research analysed engagement approaches, tactics, and institutional structures used to solicit feedback from residents. The dataset spans the period from March 2020 to January 2023, encompassing both the acute phase of the pandemic and its gradual transition to a post-pandemic context. Through a multi-year observation, the research aims to understand how public engagement is integrated into the iterative design processes of government-led street experiments.

Literature review

Street experiments and public engagement

Street experiments are inherently communicative and mobilizing. Situated in public spaces, they often capture the attention of people who may not typically engage with planning processes (Bertolini 2020). By offering tangible, visible changes, these pop-up designs foster discussion and public involvement, making the experimentation process a medium for engagement (Rowe and Frewer 2005). The visibility and immediacy of

interventions often drive citizen engagement (Mould 2014), which can help generate local support, a crucial element for their success (Glaser and Krizek 2021; Lak and Kheibari 2020; Pfeifer 2013).

Public engagement plays a critical role in shaping the outcomes of street experiments, as iterative adjustments to the physical environment often involve diverse stakeholders, including city councils, grassroots organizations, and private developers (Webb 2018). Notably, frontloading project implementation – by deploying temporary interventions before extensive public consultation – has been shown to enable direct user interaction with the transformed street environment. This approach shortens feedback loops and accelerates iterative design adjustments. To facilitate communication, many initiatives employ comprehensive media outreach campaigns to raise awareness and gather feedback (Bertolini 2020). These campaigns incorporate both formal mechanisms, such as surveys and focus groups, and informal approaches that encourage broader community interaction (Innes and Booher 2004). Research from the United States on Open Streets, for example, underscores the importance of effective communication, with implementers prioritizing both the breadth and depth of public engagement (Eyler, Aaron Hipp, and Lokuta 2015). Various studies have documented public engagement methods, such as focus groups, surveys, and public vetting sessions, as valuable tools for integrating citizen input into the development of street experiments (Glaser and Krizek 2021; Verlinghieri, Vitale Brovarone, and Staricco 2023).

Governmental actors are normatively expected to facilitate co-productive and participatory processes (Rosen and Painter 2019). As pandemic-induced street experiments were predominantly government-led, it is crucial to understand the public engagement strategies employed during a time marked by restricted in-person interactions. Recent research has primarily focused on public feedback gathered through non-governmental channels, such as social media and surveys, to assess public sentiment on urban interventions (Noland, Iacobucci, and Zhang 2022; Sainz-Santamaria et al. 2023; Shirgaokar, Reynard, and Collins 2021). While these studies offer valuable insights into user perspectives, they fall short of capturing the public engagement efforts undertaken by local governments in their role as service providers, particularly in adapting strategies to the unique challenges of the pandemic. A clearer conceptualization of how public engagement is orchestrated in and shapes government-led street experiments is essential for a more comprehensive understanding of these initiatives.

Public engagement typologies

Public engagement is a desirable procedure for implementers to establish connections between experts and non-experts. Conceptualizing public engagement as a singular type or stage often fails to capture the reality of the process that involves multiple tactics to achieve diverse goals (Mergel 2013b). A foundational framework is Arnstein's (1969) Ladder of Citizen Participation, which conceptualizes public engagement as a linear progression from non-participation to tokenism and, ultimately, to citizen power. Arnstein framed participation as a redistribution of power between the powerful and the powerless, an idea that inspired subsequent works. However, the framework has been criticized for its exclusive focus on power dynamics (Tritter and McCallum 2006) and its hierarchical dichotomy, which oversimplifies the complexities of public engagement

(Loeffler and Bovaird 2017). Later research shifted the focus from power redistribution to the dynamics and processes involved in engagement, emphasizing collaboration as a key objective.

Rowe and Frewer (2005) developed a typology based on directionality, categorizing public engagement into three forms: *public communication* (one-way from authority to public), *public consultation* (one-way from public to authority), and *public participation* (two-way between both parties). While this typology provides a useful starting point, it does not account for more integrated forms of engagement, such as co-creation, where the public plays an active role in decision-making. Loeffler and Martin (2015) expanded on this by incorporating intensity into their typology. They classified engagement into four levels: *information* (one-way communication), *consultation* (two-way exchange of information), *participation* (two-way dialogue), and *co-production* (two-way joint action, such as co-design). These classifications draw lineage from Arnstein's ladder, corresponding to non-participation, tokenism, and citizen power. However, Loeffler and Bovaird (2017) argued against the hierarchical structure of the ladder model, suggesting instead that public engagement directionalities and intensities are non-hierarchical and thus should be presented horizontally.

Mergel's *push-pull-network* typology provides an alternative lens for analysing public engagement tactics, emphasizing their directionality and intensity while linking them to public engagement goals – transparency, participation, and collaboration (Mergel 2013b). This typology, originally developed to assess social media-based engagement, is transferable to non-technological contexts. It identifies three tactics as follows. The *push* tactic involves one-way communication to ensure information transparency. Government actors aim to disseminate information through various media platforms. The *pull* tactic aims to involve citizen participation. By inviting citizens to provide feedback, the pull tactic activates bilateral communication between the government and the public. The *network* tactic seeks to establish collaboration and deeper engagement, often leading to the co-production of policy innovations. Unlike earlier typologies, the push-pull-network typology highlights how engagement activities can be combined and used collectively, providing a more flexible and holistic approach to analysing public engagement. The practical implementation of engagement tactics occurs through specific approaches, such as public hearings, focus groups, and action-planning workshops. Rowe and Frewer (2005) reviewed over 100 approaches by categorizing them into communication, consultation, and participation mechanisms. Despite this classification, they acknowledged overlaps and uncertainties, as many approaches involve mixed forms of interaction and serve multiple purposes. For example, Ataman and Tuncer (2022) found that internet-based participation tools often facilitate one-way information flows, requiring other interaction approaches to enable two-way exchanges. This suggests that engagement approaches are not fixed but can combine to promote deeper and more meaningful interactions.

Outcomes of public engagement

In feedback-driven design approaches, such as street experiments, public engagement can enhance the iterative design processes and potentially influence the project's

development trajectory. However, the effectiveness of public engagement in street experiments remains understudied.

The broader public engagement studies have hinted at potential outcomes. Rowe and Frewer (2000) evaluated the effectiveness of public participation methods based on the acceptance and process criteria. They found that public opinion surveys, which would be classified as *pull* tactics, presented higher public acceptance but were less effective in implementation than other methods. Surveys could lack a sufficient explanation of the meanings and backgrounds, which could diminish their influence in policymaking. On the other hand, negotiated rule-making, resembling a *network* tactic, tended to be highly effective in implementation but with lower transparency and public representativeness. Further, citizen advisory committees tended to bring highly variable results in terms of public acceptance and implementation.

Research on street experiments should consider not only the mechanisms of public engagement but also their influence on the development of the interventions. Informed by public engagement typologies and outcomes, an analytical framework was developed, as outlined in the following section.

Analytical framework

An analytical framework was developed based on the *push-pull-network* typology to examine how the actions of government actors align with engagement goals – transparency, participation, and collaboration (Mergel 2013a). This typology has been applied in previous studies to analyse government use of social media (DePaula, Dincelli, and Harrison 2018; Górska et al. 2022; Lovari and Bowen 2020). The present study extends its application to a broader spectrum of public engagement activities.

The analytical framework consists of two interrelated parts. The first part organizes public engagement into a hierarchy of *approaches*, *tactics*, and *structures*. *Approaches* are at the most granular level, which are grouped into *tactics* and nested within *structures*. Public engagement *approaches* refer to the methods used by government actors to engage with citizens, including community meetings, surveys, and online tools. They can be summarized into *tactics* based on their directionality (one-way or two-way communication) and intensity (the depth of interaction). Importantly, multiple tactics can be employed simultaneously to achieve multiple goals. Further, engagement tactics are combined to form comprehensive engagement *structures* and coordinated engagement toolsets that support the development of pandemic-induced street experiments.

Within tactics, the *push* tactic is characterized by one-way information dissemination, with the primary aim of achieving transparency and representation. Communication in this category typically features official language and lacks explicit invitations for public feedback. Regarding social media activities, a push tactic is reflected by posting behaviour with minimal replies to actions from official accounts. The *pull* tactic, by contrast, involves bidirectional communication between government actors (including relevant agencies and their commissioned workforce) and the public to foster engagement and participation. The pull tactic is reflected by the capacity of a communication approach to take user inputs and the languages in a way that invites feedback. For instance, an interactive map allowing user input exemplifies a pull tactic. Social media posts that followed a *pull* tactic featured brief conversations between the official account and online users, suggesting

that the posts were actively monitored and evaluated by government actors. Finally, a *network* tactic represents extended communication, inviting the public to participate in decision-making. This tactic is characterized by frequent, conversation-style interactions and deeper engagement with specific stakeholders, often involving shared responsibility. On social media, network tactic is identified by frequent and conversation-style replies that could lead to deeper engagement.

The second part of the analytical framework examines the influence of public engagement structures on the outcomes of street experiments (Figure 1). Broad and deep public engagement structures are hypothesized to enhance the iterative development of street experiments by creating mechanisms through which public feedback can be continuously integrated. By employing diverse approaches and fostering richer communication, public engagement structures have the potential to shape street experiments in ways that are more responsive to community needs and adaptable to public input.

Public engagement activities can reach a broader range of citizens and present greater *breadth* or representativeness through multiple approaches, as shown in the diagonal trend in Figure 1. These approaches can vary in their use of technology, ranging from non-internet-based methods (e.g., community meetings, phone calls) that provide direct interaction to internet-based methods (e.g., social media, map-based commenting tools) that facilitate interactive engagement but may be less accessible to certain demographic groups (Mergel 2013b). In addition, with richer information exchanged through each approach, public engagement offers a deeper level of communication. *Depth* refers to the effectiveness with which feedback is incorporated into the iterative design process. For example, designated engagement approaches – such as programme-specific websites or programme-specific community meetings – offer timely updates to the public and allow for concentrated information exchange. This enables stakeholders to track updates and provide iterative feedback. In contrast, generalized approaches, such as governmental press releases or social media platforms, often cover a wide range of updates and may hinder stakeholders' ability to follow project changes or contribute meaningfully.

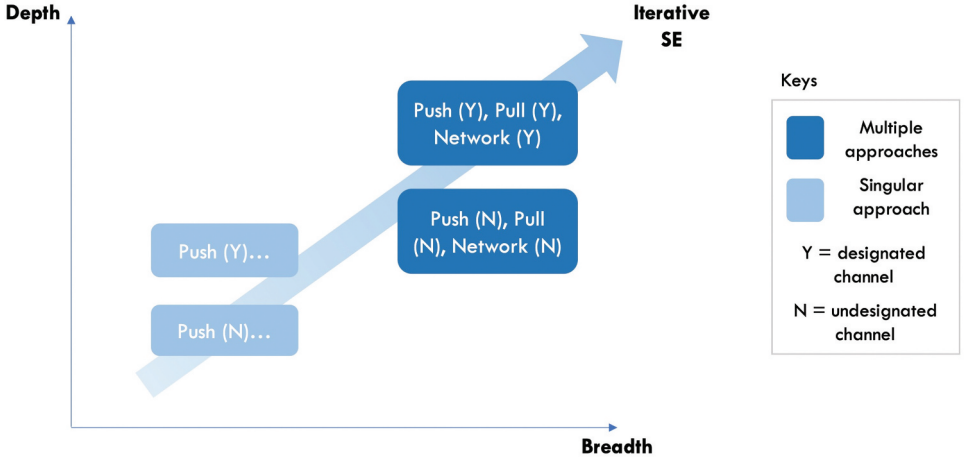

Figure 1. The analytical framework for public engagement in street experiments.

The analytical framework revealed three distinct public engagement structures in this study: the Rich Push – Pull – Network (Rich PPN), the Lean Push – Pull – Network (Lean PPN), and the Push – Pull (PP); examples are presented in Table 1. These structures were categorized based on the combination of approaches and tactics employed in the cases. The numerical thresholds were determined by identifying the clusters in the number of public engagement tactics shown in Appendix Table A3 (see endnote[1]). The Rich PPN structure refers to government actors using multiple approaches (≥6) and activating all three public engagement tactics. Government actors who adopt the Rich PPN structure usually rely on diverse and designated approaches, reflecting a deliberate and expansive outreach effort. As corroborated by interview data, these government actors strongly relied on public engagement to guide project development and implementation. The Lean PPN structure refers to using fewer approaches (<6 and ≥3) while still activating all three tactics. In addition, the Lean PPN structure relies on streamlined communication channels and external inputs through civil society groups, with less emphasis on frequent or interactive engagement with the public. The PP structure refers to using only two tactics. Government actors employing the PP structure would exhibit the lowest outreach, reflecting minimal emphasis on public engagement. Note that numerical benchmarking was applied heuristically to classify public engagement structures efficiently and was not intended to be a generalized rule.

Case study approach

Case selection

A multiple case study approach was employed (Stake 2006) to identify generalizable mechanisms in public engagement efforts for pandemic-induced street experiments across geographical regions. Cases were drawn from the Global Geospatial Database for Pandemic-Induced Street Experiments (PISE Database), which documents the spatial distribution and detailed attributes of 540 PISE cases across 333 cities (Zhao, Sun,

Table 1. Typical approaches for each public engagement structure.

Public engagement Structure	Example Case	Approaches used for *Push* tactic	Approaches used for *Pull* tactic	Approaches used for *Network* tactic
Rich push-pull-network	Transportation Planning, City of Vancouver (NA01)	Webpage (Y) Flyer and signages (Y)	Social media (N) Mobile Phone App (N) Email (Y) Phone (N) Online commenting platform (N) Online surveys (Y)	Stakeholder and advisory group support (Y)
Lean push-pull-network	Ministry of Mobility (SEMOVI), Government of Mexico City (LA02)	Webpage (N)	Social media (N) Business owners' engagement (Y)	Civil society groups (N)
Push-pull	Senate Department for District Office Friedrichshain-Kreuzberg; Mobility, traffic, climate protection and the environment, City of Berlin (EU07)	Webpage (N)	Social media (N) Email (N) Phone (N)	

and Webster 2024). While most cases were initiated during the first year of the pandemic in 2020, the database tracks their evolution through January 2023, providing a longitudinal perspective. To ensure a representative sample, cases were selected based on the following considerations: the street experiments should serve a sizable population, represent key world regions covered in the PISE Database, encompass major experiment types, and reflect different stages of development. The considerations were refined into four criteria:

(1) Initiation in major world cities: cases were selected from cities ranked as significant global urban centres based on the GaWC (Globalization and World Cities) rankings (GaWC 2020). As the PISE Database indicates that street experiments predominantly occurred in large cities, priority was given to these urban contexts.
(2) Geographical diversity: cases were distributed across six geographical regions – Africa, Asia, Europe, Latin America and the Caribbean, North America, and Oceania.
(3) Inclusion of major intervention types: cases included outdoor dining, shared streets, and temporary cycle lanes, representing the three primary forms of pandemic-induced street experiments in the PISE Database.
(4) Diverse intervention statuses: cases represented different stages of intervention development, including termination, continuation, and permanence.

Based on the established criteria, a set of suitable cases was shortlisted for data collection. The process resulted in the identification of 24 cases from 17 cities for inclusion in this study (Figure 2). Cases lacking sufficient data were excluded from the final sample. The majority of selected cases originate from Anglo-European regions, reflecting the distribution observed in the PISE Database. For clarity and consistency, the cases are referenced by their *Case IDs* in subsequent sections. Detailed programme information – including intervention types, geographical locations, and informant characteristics – is provided in Appendix Table A2.

Figure 2. Locations of case studies. Basemap source: Google map.

Data collection

Data collection covered the period from March 2020, when COVID-19 was declared a global pandemic, to January 2023, when pandemic-induced street experiments had largely stabilized. The data collection process included desktop research and semi-structured interviews to capture broader perspectives from official documents, online citizen participation, and local governments' accounts of their public engagement rationales.

The desktop research was conducted in two parts, aiming to encompass a range of public engagement records, both official and unofficial, as well as online and offline. The first part starts with official announcements about street experiments. These initial sources were expanded to include additional materials such as programme websites, meeting recordings, and study reports published by reputable organizations with a good track record. These documents provided valuable foundational data on the design, implementation, and progression of the street experiments. The second part focuses on social media collection. Social media has emerged as an e-governance tool in recent years, thanks to its accessibility and rapid dissemination of information, particularly during the COVID-19 pandemic (Mergel 2013a, 2023). Despite issues with political polarization and misinformation, social media platforms remain a channel for enhancing democratic transparency and citizen participation (Feeney and Porumbescu 2021; Kubin and von Sikorski 2021; Li et al. 2024). Posts and replies from official government accounts on Twitter (now X) related to PISE programmes were collected using the Twitter v2 API. These data provided insights into the interactions between governments and citizens, reflecting how public feedback was addressed during the development of street experiments. The specific algorithms and search queries used for this process are detailed in Appendices 1 and 2.

Semi-structured interviews were conducted with 33 government representatives who were directly involved in the management and decision-making processes of the street experiments. Between one and three informants were recruited per case, as outlined in Appendix Table A2. The interview questions addressed the following topics: (1) the approaches used by the government actors to receive public feedback, (2) the individuals or groups engaged, (3) the nature of the feedback received, and (4) the ways in which this feedback influenced project changes. These interviews helped rationalize the public engagement approaches adopted by government actors and provided a deeper understanding of their role in shaping the outcomes of the experiments.

The interviews were conducted in English, primarily via virtual conference platforms, to accommodate participants across various geographical regions. Each session lasted between 40 and 100 minutes, allowing sufficient time to address key topics in detail and ensure information saturation. All interviews were recorded with the participants' consent and subsequently transcribed verbatim for analysis.

Content analysis

Guided by the analytical framework presented in Figure 1, content analysis was applied to identify the public engagement approaches, tactics, and structures in the street experiment cases. Engagement tactics were categorized into push, pull, and network types,

Table 2. Classification rationale for public engagement tactics.

Public engagement tactics	Keywords/patterns	Social media interaction by count and content
PUSH	Government release with only announcements, without an invitation for feedback or concerns. e.g., 'The Administration's project for a more sustainable and safe city. Lazzaretto and Isola pilot projects in the neighbourhood 15 minutes walk away' (Milan City Council)	Having many original tweets but very few self-replies, meaning they rarely engage with the online audience: Condition: • $\frac{\#\text{tweets}}{\#\text{self-reply}} > 5$ & • $5 < \#\text{ tweets} \leq 50$ & • Self-reply ≤3 e.g., Brussels: 34 tweets, 0 self-reply
PULL	Street intervention programme invites for feedback. e.g., 'Send comments by Email: rules@dot.nyc.gov Fax: 1 (212) 839–9685 Mail: Director of Public Space' (NYCDOT)	Having many original tweets and some replies, meaning they monitor the posts and reply occasionally: Condition 1: • $\frac{\#\text{tweets}}{\#\text{self-reply}} > 5$ & • $5 < \#\text{tweets} \leq 50$ & • #Self-reply > 3 Condition 2: • $\frac{\#\text{tweets}}{\#\text{self-reply}} \leq 5$ & • $5 < \#\text{tweets} < 50$ & • #Self-reply > 2 e.g., Vancouver: 40 tweets, 7 self-replies
NETWORK	Programme staff hosts meetings or individual connections to talk about comments or concerns: e.g., community engagement staff go to community meetings to make sure everyone is bought in (LADOT)	Having original tweets and also abundant self-replies, meaning they are actively establishing connections with netizens: Condition 1: $\frac{\#\text{tweets}}{\#\text{self-reply}} \leq 1$ & #self-reply > 5 Condition 2: #tweets > 50 & #self-reply > 20 Condition 3: self-replies present an in-depth interaction with the online users, otherwise, considered as a pull tactic.

based on the nature of the communicated content and the intensity of communication. The classification criteria for each tactic are detailed in Table 2.

In addition to classifying tactics, each engagement approach was evaluated by its depth of communication based on its designation for the street experiment. An approach was 'designated' if it was specifically created or used exclusively for communicating a particular street experiment case. A binary variable (Y/N) indicated whether an approach was designated. Existing platforms, such as general municipality social media accounts, were classified as non-designated. In contrast, new platforms like online commenting interfaces set up specifically for the programme were classified as designated. In our analytical framework, programmes that employed broad and deep public engagement approaches were hypothesized to facilitate more iterative adjustments during their development. Engagement structures were then derived by summing the approaches

across their respective tactics, allowing for an aggregated view of public engagement efforts.

Further, the breadth and depth of public engagement activities across the selected cases were visualized to facilitate comparative analysis. Breadth was represented by the total number of adopted approaches, while depth was indicated by the number of designated approaches. Programmes with abundant, diverse, and designated approaches were considered to place greater emphasis on facilitating deep public engagement, potentially fostering iterative feedback loops. This visual representation is intended as a heuristic tool for comparing public engagement efforts across cases rather than as a method for scientific measures.

Lastly, the influence of public engagement on the development of pandemic-induced street experiments was examined through content analysis. Reports, public meeting recordings, and interview transcripts were reviewed to trace connections between public feedback and shifts in programme development. Development statuses were identified using programme websites and interview data, with keywords such as *extend*, *halt*, or *remove*, signalling programme expansion or contraction.

Findings: public engagement in street experiments

Using the public engagement analytical framework (Figure 1), the characteristics of various tactics were examined by categorizing engagement approaches and analysing the three structures identified in the empirical study. Furthermore, the study analysed how public engagement structures influenced the development trajectories of street experiments.

Approaches and tactics

Push – Public engagement during the pandemic-induced street experiments utilized both online and offline approaches, with online communication primarily consisting of webpage announcements, and offline efforts including flyers and signage (Figure 3). In the initial phase of the programmes, from March to May 2020, government actors' communications were predominantly one-directional, focusing on disseminating updates to the public. Due to the pandemic's constraints, which limited personal contact, governments relied heavily on online methods. Press releases were disseminated across social media platforms, serving as a more accessible medium for reaching citizens. However, recognizing that online methods would not cover all residents, governmental staff supplemented these efforts with offline methods. Flyers were distributed, road closures were marked with signage, and in some cases, staff reported knocking on doors to notify residents about the changes verbally.

During this period, several government representatives reported using new information dissemination approaches to enhance their outreach, either by expanding their online presence or increasing direct, in-person efforts. A distinctive feature of this phase was the unidirectional nature of engagement. The urgency of the pandemic required most street experiments to be implemented immediately, bypassing typical planning procedures and public consultation. Consequently, public engagement was primarily focused on disseminating updates. This finding aligns with previous research (Glaser

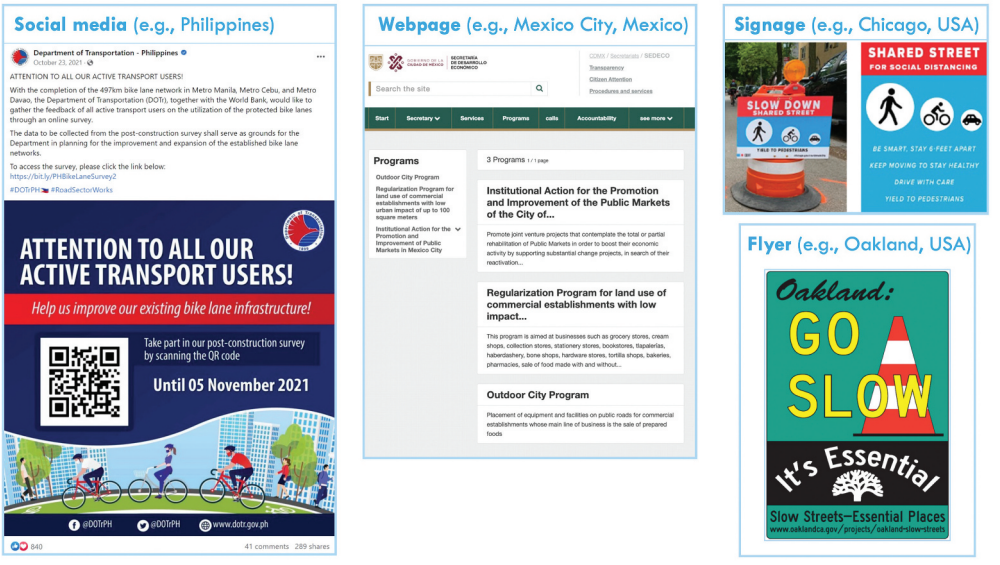

Figure 3. Examples of push approaches: webpage, social media, flyers, and signage. Sources: left: DOTr Philippines; middle: Mexico city; upper-right: Chicago DOT; lower-right: OakDOT.

and Krizek 2021), which documented the reactive and expedited nature of these implementations.

What was not highlighted in earlier studies is how implementers adjusted their engagement strategy after the initial installations. Acknowledging the unusual circumstances in which normal planning processes were suspended, government actors proactively formulated approaches to foster public engagement post-implementation. They aimed to collect user feedback on the street experiments after installation, enabling iterative adjustments to the intervention. This shift from unidirectional information dissemination to feedback-oriented engagement reflects an adaptation to sustain the development of street experiments during the pandemic situation.

Pull – To address the need for public engagement, government actors developed various approaches to gather feedback from citizens. Government representatives recognized the need to invest additional effort in public engagement to address the novelty and uncertainty surrounding these interventions. They actively sought public input through interactive platforms, including social media and virtual community meetings. Public comment efforts included tools such as online surveys, dedicated commenting platforms, mobile apps, and interactive maps (Figure 4), enabling citizens to highlight areas of interest or concern. Beyond interactive technologies, more traditional methods were also employed to accommodate citizens with varying levels of technological access. This included email, phone, fax, postal mail, and, less frequently, street intercept surveys. For example, an informant from Denver Shared Street highlighted the scale of their outreach efforts:

> This last year, through the creation of the permanent [Shared Streets] programme, we did reach out to the community at great length. [We] had thousands of comments and responses from the community. (NA05 Interview, programme lead)

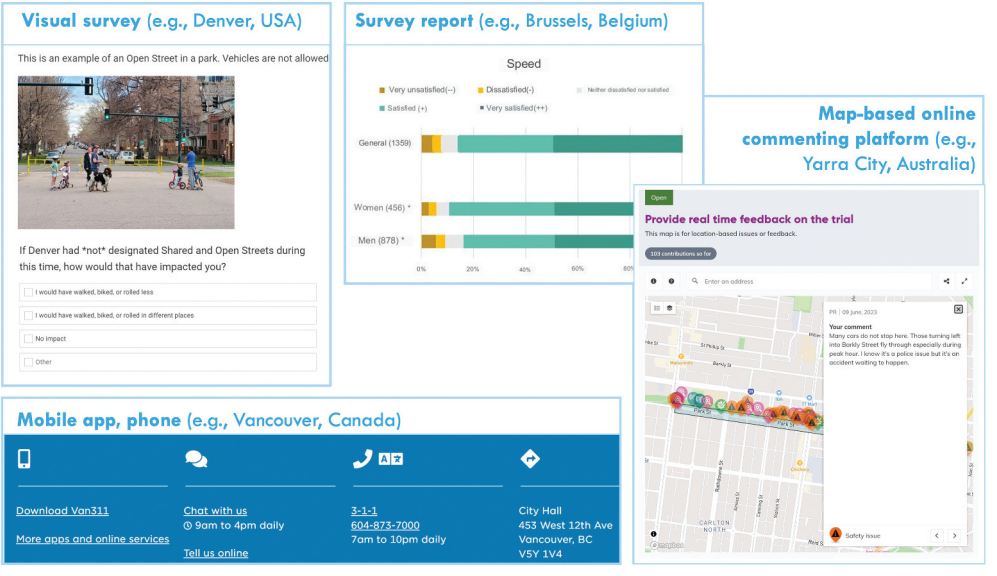

Figure 4. Examples of pull approaches: visual survey, digital mapping and mobile phone app. Sources: left: Denver DOTI; lower-left: City of Vancouver; middle: Brulocalis; right: Yarra City Council.

This was considered an unprecedented quantity of responses from public engagement efforts, compared to pre-pandemic projects.

Significant effort was directed towards refining *push* and *pull* tactics to ensure sufficient public engagement with these newly implemented interventions, many of which lacked prior public consultation due to the rapid pace of their deployment during the pandemic. These efforts reflect the government actors' acknowledgement of the importance of fostering community buy-in and addressing public concerns as part of the iterative development process.

Network - Some street experiments were collaboratively delivered and maintained, and thus required *network* tactics to establish and sustain local partnerships. The tactics often involved direct, in-depth interactions, such as meetings and ongoing stakeholder dialogue. The primary goal of these tactics was to foster collaboration with stakeholders such as business owners, community organizations, and other relevant associations.

Network tactics were particularly evident in outdoor dining and shared street interventions, where government actors worked closely with local partners to co-deliver and manage the programmes. For instance, in the Los Angeles Slow Street programme, a new role was created to maintain community relationships, underscoring the significance of network tactics. As an informant explained,

> It was a very community-oriented process. The guidelines, concepts and even treatments were developed from a perspective of hearing from community members [about] what they would like to see and thinking about what we can do. (NA07 Interview, planner)

Another critical aspect of networking involves engaging with individuals or organizations specializing in public response collection, including local elected officials and civil society groups. Local elected officials were instrumental in gauging public acceptance of

street experiments and providing feedback for programme adjustments. In the Denver Shared Street programme, implementers relied on city councilors to act as intermediaries during the temporary phase of the intervention, when direct community engagement was limited. One informant noted,

> During the temporary version, we couldn't have conversations with the community, so we relied on our city councillors, who were the representatives of their communities. . . Some of them had feedback on how to change [the shared streets], or whether [their community] liked it; many others asked to get it in their neighbourhoods. . . (NA05 Interview, programme lead).

Advocacy groups also played a significant role in the networking process, particularly when administrative pressure necessitated consultation with specialized organizations. For example, during the implementation of the Corona Cycle Lane in Paris, regular meetings were held with biking advocacy groups.

> We also have regular meetings with biking advocacy groups, which criticize much of what we do, which is a good thing, but these biking advocacy groups are really listened to by the elected [officials], the decision makers (EU06 Interview, planner)

In such cases, government agencies 'outsourced' the public engagement process to organizations with expertise in facilitating community dialogue and collecting feedback.

The network tactics involved more intense communication, typically through meetings, which is a more direct and in-depth approach than push or pull tactics. These approaches allowed government actors to build strong partnerships and incorporate nuanced feedback into the iterative development of street experiments, highlighting the crucial role of networking in promoting collaboration and supporting programme success.

Public engagement structures

Public engagement approaches and tactics were combined in various ways, as illustrated in Figure 5. A linear trend was observed between the breadth (number of approaches) and the depth (use of designated approaches) of engagement. Government actors employing a wider range of approaches also tended to establish more designated approaches, signalling an intent to enhance transparency and foster government-citizen partnership. The analysis further revealed that public engagement efforts varied by project type. Shared streets and outdoor dining projects exhibited richer engagement structures than temporary cycle lane projects. The full analysis results are presented in the Appendix Table A3.

Rich Push-Pull-Network Structure

Government actors employing the Rich PPN deployed up to eleven approaches, with over half of these approaches being designated (Figure 5). This shows a deliberate investment in inclusive engagement processes. These implementers viewed public feedback as a vital component of the street experiments, shaping both implementation and outcomes.

Pushing through unconventional ways. Government actors adopting Rich PPN exhibited a strong commitment to reaching diverse audiences, often employing innovative

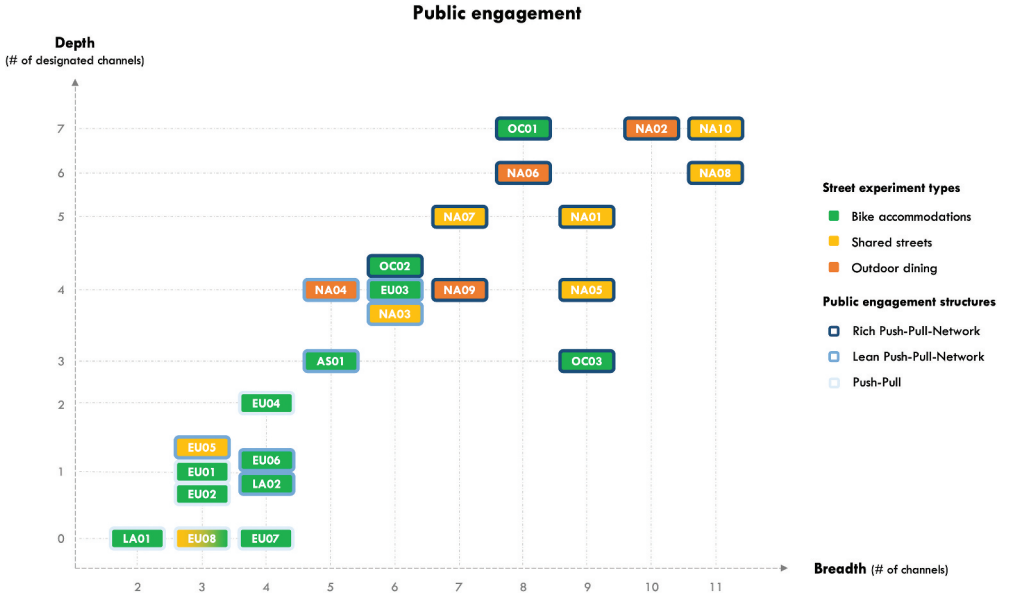

Figure 5. Public engagement comparisons among case studies.

methods to overcome engagement barriers. A notable example was the use of both online and offline *push* approaches to mitigate technological access issues. Webpages were deployed as soon as programmes were launched and were frequently updated to reflect evolving intervention locations, policies, and timelines. For instance, the Oakland Slow Street webpage was progressively enriched by the local government with programme updates, timelines, and meeting records (NA10).

In some cases, the urgency of the pandemic necessitated significant deviations from traditional public engagement practices. For example, during the implementation of Denver Shared Streets, conventional engagement methods such as public meetings were abandoned in favour of rapid and direct communication strategies, including flyers and signage (NA05). As a transport department manager explained:

> Before we figured out how to do virtual public meetings, we weren't able to have conversations with the community in real-time. We weren't allowed to do [the traditional way], . . . and all information had to go through our mayor's office, as they wanted to just communicate very important messages. And [the shared streets] wasn't something that they wanted to communicate. So [it was us] putting spaced out yard signs, and people figuring it out on their own. (NA05 Interview, programme lead)

Similarly, during the Pop-up Bike Lane trials in Melbourne, the government actor took an unprecedented step to engage with local councils proactively and led an active mobility programme (OC01). The implementers employed in-person and direct notification methods to ensure key stakeholders, including business owners, were informed about the rapid changes. While these engagements were primarily one-directional, the diverse formats enhanced inclusivity and fostered trust between the government and the public. As described by a transport planner:

> [At the beginning of the project], we did door knocking, spoke with the businesses face to face to let them know it was coming and sent people letters and information about the project… there's a whole big [community engagement process] process that we had to condense into six weeks, so it was a much more direct communication style in the first instance. (OC01 Interview, programme lead)

Pulling from online interactions. Government actors adopting the Rich PPN structure utilized various online tools, including maps, visual surveys, and interactive platforms, to engage and reach a broader audience. These tools provided a richer context, greater clarity, and increased accessibility for participants. As the Victoria State Government representative explained:

> We established an online map that we would show [community members] where we were going to work, how [the bike lane] might look like, the work descriptions, and a time frame. Then they could comment directly on the map, which we analyse. (OC01 Interview, programme lead)

Interactive mapping translated spatial knowledge into communicable information, enabling participants to visualize planned interventions and provide location-specific feedback. This aligns with findings from other research that demonstrated that participatory GIS promotes wider and more meaningful public participation (Kahila-Tani, Kytta, and Geertman 2019).

Online surveys were also used strategically across different stages of the engagement process. During the planning stage, surveys invited collaboration, particularly for outdoor dining and shared street programmes. These preliminary surveys acted as outreach tools, targeting potential collaborators. After implementation, surveys shifted to serve as evaluation tools, gathering feedback from a broader audience. For example, in the Vancouver Slow Streets programme, the online survey received 3,344 responses, significantly surpassing other engagement approaches, such as emails (195) and direct inquiries (25) (Figure 6). This stark difference suggests that people were more inclined to share feedback when invited through accessible online platforms. Additionally, the high volume of online

Notification letters	Sent to residents and businesses within 1-block radius at key project milestones
On-site signage	Installed sandwich boards and decals at all plazas
Pop-up Plazas survey (location-specific)	Received 767 responses
Making Streets for People survey (public life recovery initiatives, not location-specific)	Received 3,322 responses
Survey to local businesses	Received 34 responses
Social media promotion	Through City of Vancouver & VIVA social media channels
Media releases	Released 6 information bulletins
Direct emails from public	Received 195 emails
311 cases	Received 25 inquiries
On-site monitoring	At all 10 locations at different times of day and days of week, in 30 minute intervals

Figure 6. Vancouver Slow street public engagement approaches. Source: City of Vancouver.

responses may reflect increased digital engagement during the pandemic, as individuals spent more time online and were more attuned to neighbourhood announcements.

Virtual community meetings were another key engagement tool used during the pandemic, serving essential functions such as disseminating updates, providing immediate responses, and enabling broader participation. However, their communication intensity was limited due to the constrained opportunities for interaction. For example, in the Denver Shared Streets programme, virtual meetings typically consisted of 30–40 minutes of presentations and 10–20 minutes of participant questions. With participant groups ranging from 30 to 50 people, the time allocated for interaction was insufficient for in-depth discussions. Furthermore, audience members were muted, and their questions were read aloud by organizers, which hindered natural dialogue and risked misinterpretation. Due to these limitations, this approach is considered a *pull* tactic rather than a network tactic.

Government actors also utilized social media platforms employing the Rich PPN structure, primarily as tools for broadcasting updates and gathering impressions. The data presented in Table 3 show the frequency of social media posts by government actors relevant to their pandemic-related street initiatives, including the number of original posts and their replies. Overall, government agencies using the Rich PPN structure were active in posting updates and often received high impressions, as shown in the Total likes and Total replies. NYCDOT's active social media activities attracted greater attention, accumulating 9,394 likes for 307 posts and more than 30 likes per post on average (NA08, NA09). However, the replies were relatively sparse and lacked focus, as shown in an X reply:

> In addition to 34th Ave, nearly 100 locations, including Open Streets, #NYCPlazas and other commercial corridors will be open for car-free activities on Monday, October 31st from 4–8 pm. See location list here: https://t.co/0qfGkTduiJ. https://t.co/SFXk5ETEml. (NA08 Document, official account social media reply).

These official-tone replies were not conducive to natural conversation, a key feature of the network tactic.

Social media primarily served as a platform for posting updates, answering public inquiries, and receiving feedback. However, evidence of two-way engagement, such as

Table 3. Social media activities for cases with Rich PPN structures.

Cases (aggregated by agencies)	Tactic	Post type	Post counts	Total likes	Total quoted	Total replied	Total retweeted
NA01, NA02	pull	post	40	877	81	83	302
		reply	7	1	0	4	0
NA05, NA06	pull	post	17	301	42	48	120
		reply	3	1	0	1	0
NA07	push	post	12	200	15	36	52
		reply	1	1	0	0	0
NA08, NA09	pull	post	307	9,394	887	1,377	2,318
		reply	100	848	92	120	224
NA10	pull	post	9	201	17	14	51
		reply	13	68	6	13	7
OC02	pull	post	15	4,225	350	216	959
		reply	21	131	8	22	18
OC03	pull	post	1	105	5	9	25
		reply	3	0	0	3	0
OC01	No Data						

idea generation or collaborative discussions, was minimal. As envisioned by Mergel (2013a), social media can serve as a tool for fostering participatory governance; however, in practice, the observed usage fell short of facilitating collaboration or co-creation.

Networking through the conventional way. *Networking* in the Rich Push-Pull-Network structure involved personal and direct communication, relying less on online channels and engaging smaller participant groups. In general, partnerships and meetings were approaches used to develop network tactics.

For outdoor dining programmes, government actors worked closely with business owners to ensure that seating arrangements aligned with local conditions and requirements (NA06, NA08). To lower technical barriers, implementers did not require formal technical drawings in the application process. Instead, dedicated staff validated plans and collaborated with business owners who lacked design expertise. This hands-on approach facilitated broader participation, even though it required increased communication efforts.

For shared streets, where government-community partnerships were central, the planning process was more co-productive. Local partners were engaged through meetings to ensure that responsibilities for maintaining and programming the space were mutually agreed upon and sustainable. NYCDOT emphasized the importance of these partnerships in enhancing street activation and responsiveness to local needs:

> Even when we bring the resources and the management, it still works better when we have a local partner that we can work with, because they help make the street work better, they have eyes on the street, they can tell us if something is going wrong, or if we need to change the hours or change the length. They give us very good feedback. (NA08 Interview, programme lead)

Lean Push-pull-network structure

The Lean Push-Pull-Network structure activated all three tactics but used fewer approaches than the Rich PPN structure. Typical approaches are presented in Figure 4.

For *push* tactics, programme updates were typically disseminated through government press releases, often accompanied by simple, static web pages with limited functionalities (Figure 7, left). These press releases were usually issued at the launch of interventions or during major updates, with intermediary updates remaining infrequent. This approach reflected reduced effort in public engagement and programme development, contrasting with the frequent updates and interactive features characteristic of the Rich PPN programme-specific websites.

For *pull* tactics, government actors employed a narrower range of approaches, including surveys, social media, and suggestions filtered through civil society groups. In the case of temporary cycle lane programmes, government actors often relied on the reports and policy recommendations from external organizations (Figure 7, right) (EU06, LA02). For example, the Department of Transportation (DOTr) in the Philippines incorporated findings from civil society groups and academic studies into their decision-making process:

> There has been much feedback from civil society groups and communities … and studies conducted by academics saying that trip facilities are important. (AS01 Interview, Architect)

Additionally, public sentiment was monitored through social media activities, with occasional interactions between government agencies and online users (Table 4).

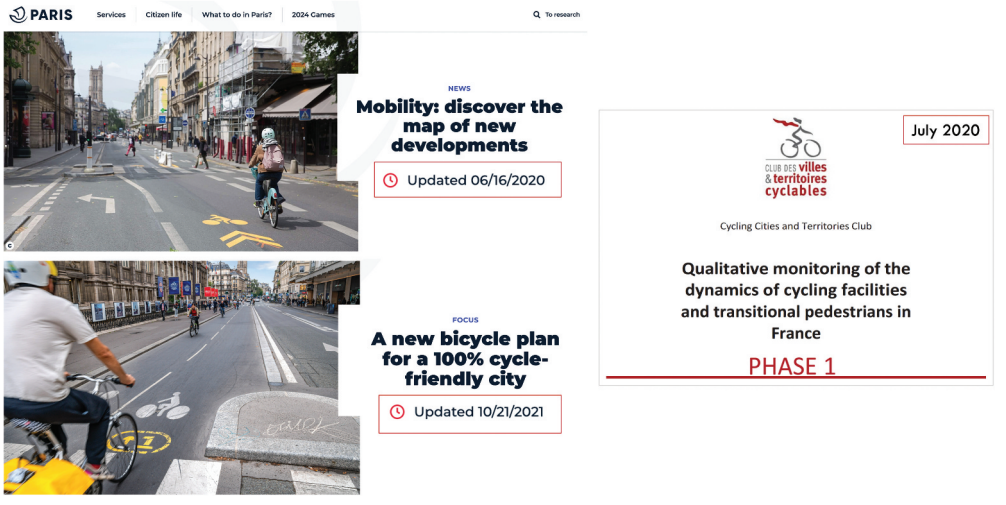

Figure 7. Examples of programme website (left) and survey (right) for Lean Push–Pull–Network Structure. Source: City of Paris, modified by author.

Table 4. Social media activities for cases with Lean PPN structures.

Cases (aggregated by agencies)	Tactic	Post type	Post counts	Total likes	Total quoted	Total replied	Total retweeted
EU06	pull	post	38	4,600	375	1,238	1,108
		reply	8	313	6	33	47
EU03	pull	post	30	6,120	197	618	578
		reply	2	4	0	2	0
EU04, EU05	pull	post	20	618	24	95	157
		reply	4	0	0	3	0
NA03, NA04	pull	post	10	435	41	57	98
		reply	0	0	0	0	0
LA02	pull	post	2	163	22	28	75
		reply	0	0	0	0	0
AS01	pull	post	10	210	11	9	56
		reply	0	0	0	0	0

For the network tactic, government actors primarily engaged with civil society groups and local elected officials, rather than directly interacting with citizens within the Rich PPN structure. For instance, implementers of Paris Corona cycle lanes worked closely with advocacy groups to guide the programme's development (EU06 Interview). Direct public engagement events, such as community or stakeholder meetings, were also employed; however, these meetings primarily focused on resolving concerns rather than fostering collaborative input (EU06, LA02, AS01). As shared by government representatives, stakeholder meetings served as a platform for them to clarify and justify the project to various groups.

> Several components of the projects were delayed because we had to conduct meetings, consultations to justify and convince those agencies, groups and individuals that bike lanes will not actually adversely or significantly affect the traffic flow (AS01 Interview, programme lead).

Push-pull structure

Government actors adopting the Push-Pull (PP) structure employed fewer approaches, most of which were non-designated and lacked networking components (Table 5). For *push* tactics, they typically issued a single press release at the start of implementation or posted basic updates on social media. Limited follow-up information about programme updates or evaluations reflected a light effort in developing or advancing the street experiments.

For *pull* tactics, government actors relied on social media platforms to monitor and respond to public feedback (Table 5). Responses were typically direct and reactive, addressing specific questions from online users. For instance, Barcelona Mobilitat used Twitter (now X) for clarifications:

> Guarantee bicycle parking exclusively in the spaces provided in accordance with current regulations (anchored in inverted U-shaped parking lots) and not to concentrate more than 50% of each operator's fleet in the central area for a period of more than two consecutive hours. (EU08 Document, Twitter)

While press releases and social media enabled communication, these approaches lacked in-depth network tactics. Furthermore, as these approaches were considered non-designated, programme updates were interspersed with unrelated information, making it challenging to target specific audiences.

Public collaboration or deep engagement was rarely observed in the PP structure. Feedback collection involved limited direct interaction with the public, with government actors often relying on civil society groups or local elected officials to report public sentiment. This reliance on third-party organizations allowed for broader feedback coverage but introduced longer feedback loops and the potential for biased emphasis based on the expertise or priorities of these intermediaries.

Effects on street experiment development

The study findings show that government actors with broader and deeper public engagement processes delivered more dynamic and responsive changes. By contrast, government actors with less engagement efforts, such as those using the PP structure, showed

Table 5. Social media activities for cases with PP structures.

Cases (aggregated by agencies)	Tactic	Post type	Post counts	Total likes	Total quoted	Total replied	Total retweeted
EU01	push	post	7	146	9	10	45
		reply	3	29	1	3	14
EU02	push	post	34	149	11	23	56
		reply	0	0	0	0	0
EU07	pull	post	10	1,687	54	191	195
		reply	3	10	0	4	0
EU04, EU05	pull	post	20	618	24	95	157
		reply	4	0	0	3	0
EU08	pull	post	463	2,003	196	849	714
		reply	40	169	9	71	51
LA01	pull	post	103	2,491	205	782	1,068
		reply	22	123	6	32	45

fewer programme updates and limited reflection of public input in programme development.

Programme continuity

The findings highlight the importance of extensive public engagement that follows the Rich PPN structure. Programmes with this structure were responsive, flexible, and aligned with community needs. Programmes receiving positive feedback were more likely to gain political support, transition to permanent status, or expand. This connection was stronger in Rich PPN programmes compared to Lean PPN and PP programmes. For example, Denver (NA06) and New York (NA09) outdoor dining programmes received widespread community support and demonstrated economic benefits. As a result, both government agencies developed their temporary permits into permanent ones. In addition, government actors adopting this structure recognized the benefits of street experiments and were more likely to continue using this method in future urban street changes. In contrast, government actors adopting a Lean PPN structure invested less effort in deep engagement, resulting in fewer iterative interventions. Those with a PP structure demonstrated even less motivation to continue applying street experimenting techniques, with some partially removing interventions due to vandalism or maintenance challenges (LA01) and others discontinuing tactical urbanism altogether after the pandemic emergency (EU01).

Programmes lacking public support could be terminated. In Melbourne, public concerns about pop-up bike lanes – highlighted by major news outlets citing economic recovery delays, cyclist safety, and traffic congestion – led to the rollbacks of the experiment. Headlines such as '*Calls to remove some bike lanes to aid CBD recovery*' (OC02 Document) and '*Causing mayhem': Pop-up bike lanes in Port Phillip a danger to cyclists, review finds*' (OC01 Document) captured the public's dissatisfaction. These debates led to the removal of cycle lanes in Port Phillip (OC01) and the postponement of installation in the Melbourne CBD (OC02). Similarly, programmes with declining public support were discontinued. Chicago's Shared Street programme (NA03) was discontinued after the second year (2021), as public support dropped from 66% to 53%, and response rates fell from 4039 entries to 313. Facing reduced interest, the informant expressed their decision to stop the programme. Additionally, interventions can be removed when deemed ineffective. In Dublin's Grafton Street Pedestrianisation Trials (EU03), public consultations and foot traffic evaluations led to the discontinuation of one street intervention after it failed to meet expectations.

The analysis indicates that shared street projects were more likely to involve thorough public engagement, whereas temporary cycle lane projects generally featured less engagement. Although the research did not directly examine the reasons for this difference, existing literature suggests that street experiments aimed at enhancing public life tend to generate more positive user feedback than those focused primarily on active mobility (Smeds and Papa 2023). This divergence may have stemmed from a confluence of factors, including the type of street experiment and the influence of local planning cultures. Further research is needed to clarify the mechanisms that shape variations in engagement efforts and outcomes across different types of street experiments.

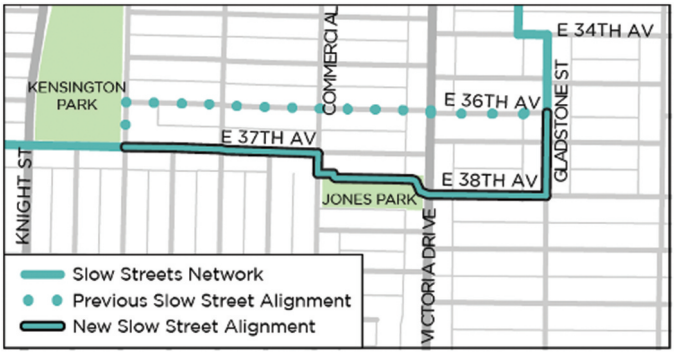

Figure 8. Slow Streets design adjustments (source: City of Vancouver).

Programme adjustments

Public feedback also influenced modifications to routes, designs, and regulations, with such adjustments more frequently observed in Rich PPN cases. For example, OakDOT (NA10) modified slow street locations by removing less popular sections based on resident surveys, online comments, social media responses, and budget evaluations. Similarly, Vancouver's Slow Streets programme revised intervention routes based on feedback from ten approaches (Figure 8).

In Denver's Outdoor Places programme, design and zoning regulations were updated incrementally through ongoing public consultation as the programme transitioned from temporary permits to permanent ones. Launched in April 2020 as a temporary measure, the programme was extended multiple times before Denver DOTI formalized it as a permanent permit in October 2022. Feedback was collected through online surveys, virtual community meetings, and public reviews of zoning code updates. As summarized in the zoning change proposal:

> The recommended zoning code revisions in this draft are based on extensive outreach with community members, stakeholders and the Outdoor Places Stakeholder Working Group. (NA06 Document)

Beyond route changes, government actors also adjusted street design and traffic management orders to address public concerns. In Melbourne, feedback on pop-up cycle lanes highlighted issues with car accessibility, prompting design modifications. As noted on the programme webpage:

> To address resident concerns, we're removing the audible, tactile strips … removing signage … and temporary bollards at the central island of Scotchmer, Kneen and Falconer streets … (OC01).

The government representative acknowledged the value of collecting onsite user feedback and emphasized the flexibility of temporary structures over permanent ones.

Similarly, traffic management orders were revised in Dublin to address concerns about vehicular access. Following stakeholder feedback, the city council implemented a more sophisticated traffic order to improve car accessibility:

> The recommendation is to change the access to the street from the Exchequer Street/ Wicklow Street junction to be 'from between 6 am and 11 am for deliveries only and after 11:00 to close South William Street at its junction with Exchequer Street to through traffic' (EU03 Document)

These adjustments underscore the influence of public feedback on programme development, with Rich PPN programmes demonstrating greater adaptability due to their broader and deeper engagement efforts.

Discussion and conclusion

This study investigated the public engagement structures employed by governmental actors to communicate and implement street experiments during the COVID-19 pandemic. Engagement approaches, tactics, and structures were analysed across 24 pandemic-induced street experiments in Europe, North America, Latin America, Oceania, and Asia. Drawing on the Push-Pull-Network (PPN) typology, three distinct engagement structures were identified: Rich PPN, Lean PPN, and Push-Pull, each representing varying levels of public engagement by government actors. Cases classified under the Rich PPN structure exhibited a diverse range of engagement approaches, which supported more iterative design processes and increased the likelihood of project continuation. This study contributes comparative evidence on emergency design responses.

The findings underscore the capacity of street experiments to support iterative design processes through active public engagement. Engagement can create a feedback loop between the communities and government actors, facilitating the co-creation of project outcomes (Lydon and Garcia 2015). Although the case studies were categorized into three distinct engagement structures, their practices reflect a continuum of engagement intensity (Figure 5). In practice, public engagement approaches can be combined and adapted to suit different contexts. Crucially, ensuring that all three engagement tactics are addressed is essential for enabling iterative and participatory street experiments.

Several challenges were identified in implementing design feedback loops within government-led street experiments, revealing key dilemmas in achieving effective public engagement and desired project outcomes. First, the public often expressed dissatisfaction with the low-cost and rapid deployment approach central to street experiments. Negative feedback cited disorderliness, poor aesthetics (e.g., bright colours), and perceived substandard quality (EU06, OC01). This public opposition aligns with findings from recent studies highlighting citizens' resistance to temporary, low-cost interventions (Smeds and Papa 2023). Such responses indicate a mismatch between planners' intentions to experiment with temporary, inexpensive materials and the public's expectations for an impeccable urban image and permanent improvements. This tension jeopardizes the communicative potential of street experiments (Bertolini 2020; VanHoose et al. 2022) by sparking dissent, particularly around visual and material quality.

Second, government actors often faced limitations in incorporating public feedback into design updates. In practice, only the most dominant and obvious public opinions tend to be reflected in final designs. While online engagement approaches drew broader participation, government actors sometimes struggle to use online feedback effectively. Online submissions frequently lack sufficient contextual information, making them

difficult to interpret and act upon (NA10). In recent years, the use of social media in e-governance has introduced risks associated with political polarization and the spread of misleading content (Feeney and Porumbescu 2021; Kubin and von Sikorski 2021; Li et al. 2024), further complicating the integration of online feedback into design processes.

Conflicting priorities between the public input and the goals of street experiments also presented significant challenges. For instance, in temporary cycle lane projects, residents' requests often conflicted with the need to maintain critical route connectivity. When such public input cannot be accommodated, projects occasionally encounter resistance or public scrutiny. These instances underscore the importance of ensuring both equity in feedback collection and transparency in decision-making processes (Rosen and Painter 2019). Failure to address or balance diverse public inputs can erode public trust (Petts 2008). This issue is further compounded by gaps in translating public engagement into urban design outcomes. A recent review highlighted the disconnect between participation tools and urban design processes, underscoring a need for better integration of data collection, analysis, and design implementation (Ataman and Tuncer 2022). These reflections emphasize that successful public engagement should prioritize quality over quantity of feedback to ensure that input is meaningful and actionable.

Third, limitations in evaluating the outcomes of street experiments further constrained their long-term impact. In several cases, government actors relied on indirect or passive forms of feedback – often channelled through elected officials – rather than engaging with the public directly. Moreover, government actors employing Rich PPN engagement structures noted that extensive public outreach made projects more resource-intensive and difficult to sustain over time. This aligns with findings from other community-based street experiments, where the resource demands of inclusive engagement were often underestimated (VanHoose et al. 2022). These challenges highlight the importance of understanding the public engagement structures and selecting appropriate combinations of engagement approaches. The analytical framework proposed in this study may support practitioners in mapping and refining their engagement strategies to balance participatory depth with resource constraints.

By focusing on pandemic-induced street experiments, this research examined projects implemented under similar conditions to explore the application of tactical urbanism across geographical regions. While the pandemic provided a unique context where government actors had significant flexibility to act under immense pressure, these initiatives reflect broader practices in street experiments. The conceptual foundations of these projects, rooted in pre-pandemic ideas, make them a valuable lens for evaluating public engagement strategies in urban interventions.

As tactical urbanism continues to gain traction within formal planning processes (Ferreri 2021; Spataro 2016), it is timely to examine its adoption by government actors and the ways in which it is being institutionalized. This study contributes to the growing body of literature by documenting the diversity of public engagement strategies employed in street experiments and assessing their influence on project outcomes. Through a multiple case comparison, the analysis highlights the critical role of public engagement in shaping the success, acceptance, and longevity of such initiatives, while offering practical insights for urban practitioners. The findings prompted reflections on the effort needed for meaningful public engagement, the balance between rapid

implementation and community involvement, and the realistic outcomes that can be achieved. Ultimately, this research underscores the potential of street experiments to serve as a medium for co-creating more inclusive, adaptive, and resilient urban spaces in both crisis and non-crisis contexts.

Note

1. Appendices can be downloaded via https://www.uitlab.org/publication/2025-zhao-sun-jud-appenx/appendix-public-engage-tactics.pdf.

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Ethical declaration

This research has been approved by the Human Research Ethics Committee at the University of Hong Kong (ref: EA220068).

References

Arnstein, S. R. 1969. "A Ladder of Citizen Participation." *Journal of the American Planning Association* 35 (4): 216–224. https://doi.org/10.1080/01944366908977225.

Ataman, C., and B. Tuncer. 2022. "Urban Interventions and Participation Tools in Urban Design Processes: A Systematic Review and Thematic Analysis (1995 – 2021)." *Sustainable Cities and Society* 76 (May 2021): 103462. https://doi.org/10.1016/j.scs.2021.103462.

Bertolini, L. 2020. "From "Streets for Traffic" To "Streets for People": Can Street Experiments Transform Urban Mobility?" *Transport Reviews*: 1–20. https://doi.org/10.1080/01441647.2020.1761907.

Combs, T. S., and C. F. Pardo. 2021. "'Shifting Streets COVID-19 Mobility Data: Findings from a Global Dataset and a Research Agenda for Transport Planning and Policy'." *Transportation Research Interdisciplinary Perspectives* 9 (100322): 1–15. https://doi.org/10.1016/j.trip.2021.100322.

DePaula, N., E. Dincelli, and T. M. Harrison. 2018. "Toward a Typology of Government Social Media Communication: Democratic Goals, Symbolic Acts and self-Presentation." *Government Information Quarterly* 35 (1): 98–108. https://doi.org/10.1016/j.giq.2017.10.003.

Eyler, A. A., J. Aaron Hipp, and J. Lokuta. 2015. "Moving the Barricades to Physical Activity: A Qualitative Analysis of Open Streets Initiatives Across the United States." *American Journal of Health Promotion* 30 (1): e50–e58. https://doi.org/10.4278/ajhp.131212-QUAL-633.

Feeney, M. K., and G. Porumbescu. 2021. "The Limits of Social Media for Public Administration Research and Practice." *Public Administration Review* 81 (4): 787–792. https://doi.org/10.1111/puar.13276.

Ferreri, M. 2021. *The Permanence of Temporary Urbanism: Normalising Precarity in Austerity London*, Amsterdam University Press. https://www.torrossa.com/en/resources/an/4922116 .

GaWC. 2020. "The World According to gawc 2020."

Glaser, M., and K. J. Krizek. 2021. "Can street-Focused Emergency Response Measures Trigger a Transition to New Transport Systems? Exploring Evidence and Lessons from 55 US Cities." *Transport Policy* 103:146–155. https://doi.org/10.1016/j.tranpol.2021.01.015.

Górska, A., D. Dobija, G. Grossi, and Z. Staniszewska. 2022. "Getting Through COVID-19 Together: Understanding Local Governments' Social Media Communication." *Cities* 121. February. https://doi.org/10.1016/j.cities.2021.103453.

Hahn, T., and M. Te Brömmelstroet. 2021. "Collaboration, Experimentation, Continuous Improvement: Exploring an Iterative Way of Working in the Municipality of Amsterdam's Bicycle Program." *Transportation Research Interdisciplinary Perspectives* 9 (September 2020): 100289. https://doi.org/10.1016/j.trip.2020.100289.

Innes, J. E., and D. E. Booher. 2004. "Reframing Public Participation: Strategies for the 21st Century." *Planning Theory and Practice* 5 (4): 419–436. https://doi.org/10.1080/1464935042000293170.

Kahila-Tani, M., M. Kytta, and S. Geertman. 2019. "Does Mapping Improve Public Participation? Exploring the Pros and Cons of Using Public Participation GIS in Urban Planning Practices." *Landscape and Urban Planning* 186 (February): 45–55. https://doi.org/10.1016/j.landurbplan.2019.02.019.

Kubin, E., and C. von Sikorski. 2021. "The Role of (social) Media in Political Polarization: A Systematic Review." *Annals of the International Communication Association* 45 (3): 188–206. https://doi.org/10.1080/23808985.2021.1976070.

Lak, A., and S. Z. Kheibari. 2020. "Towards a framework for facilitating the implementation of Tactical Urbanism Practices: Assessment Criteria in the Place-making Approach in Iran." *Geoforum*, 115, 54–66. https://doi.org/10.1016/j.geoforum.2020.07.003.

Li, Z., W. Zhang, H. Zhang, R. Gao, and X. Fang. 2024. "Global Digital Compact: A Mechanism for the Governance of Online Discriminatory and Misleading Content Generation." *International Journal of human-Computer Interaction*, ahead of print, 2024. 41 (2): 1381–1396. https://doi.org/10.1080/10447318.2024.2314350.

Loeffler, E., and T. Bovaird. 2017. "From Participation to co-Production: Widening and Deepening the Contributions of Citizens to Public Services and Outcomes." *The Palgrave Handbook of Public Administration and Management in Europe*: 403–423. https://doi.org/10.1057/978-1-137-55269-3_21.

Loeffler, E., and S. Martin. 2015. "Citizen Engagement." In *Public Management and Governance*, edited by T. Bovaird and E. Loeffler, 3rd ed, 284–301. London: Routledge.

Lovari, A., and S. A. Bowen. 2020. "Social Media in Disaster Communication: A Case Study of Strategies, Barriers, and Ethical Implications." *Journal of Public Affairs* 20 (1). 1. https://doi.org/10.1002/pa.1967.

Lydon, M., and A. Garcia. 2015. *Tactical Urbanism: Short-Term Action for long-Term Change*. Washington, DC: Island Press. https://doi.org/10.5822/978-1-61091-567-0.

McCormick, K. 2020. "Room to Roam: The Pandemic Has Underscored the Need for More Urban Parks. So What Comes Next?" *Land Lines*, October 2020. https://www.lincolninst.edu/publications/articles/2020-10-room-roam-pandemic-urban-parks-what-comes-next/

Mergel, I. 2013a. "Social Media Adoption and Resulting Tactics in the U.S. Federal Government." *Government Information Quarterly* 30 (2): 123–130. https://doi.org/10.1016/j.giq.2012.12.004.

Mergel, I. 2013b. "A Framework for Interpreting Social Media Interactions in the Public Sector." *Government Information Quarterly* 30 (4): 327–334. https://doi.org/10.1016/j.giq.2013.05.015.

Mergel, I. 2023. "Social Affordances of Agile Governance." *Public Administration Review* (November): 1–16. https://doi.org/10.1111/puar.13787.

Mould, O. 2014. "Tactical Urbanism: The New Vernacular of the Creative City." *Geography Compass* 8 (8): 529–539. https://doi.org/10.1111/gec3.12146.

Noland, R. B., E. Iacobucci, and W. Zhang. 2022. "Public Views on the Reallocation of Street Space Due to COVID-19." *Journal of the American Planning Association* 89 (1): 93–106. https://doi.org/10.1080/01944363.2022.2058595.

Petts, J. 2008. "Public Engagement to Build Trust: False Hopes?" *Journal of Risk Research* 11 (6): 821–835. https://doi.org/10.1080/13669870701715592.

Pfeifer, L. 2013. Tactical Urbanism and the Role of Planners. Master Thesis. McGill University.

Rosen, J., and G. Painter. 2019. "From Citizen Control to Co-Production: Moving Beyond a Linear Conception of Citizen Participation." *Journal of the American Planning Association* 85 (3): 335–347. https://doi.org/10.1080/01944363.2019.1618727.

Rowe, G., and L. J. Frewer. 2000. "Public Participation Methods: A Framework for Evaluation." *Science Technology and Human Values* 25 (1): 3–29. https://doi.org/10.1177/016224390002500101.

Rowe, G., and L. J. Frewer. 2005. "A Typology of Public Engagement Mechanisms." *Science Technology and Human Values* 30 (2): 251–290. https://doi.org/10.1177/0162243904271724.

Sainz-Santamaria, J., D. Moctezuma, A. L. Martinez-Cruz, E. S. Téllez, M. Graff, and S. Miranda-Jiménez. 2023. "Contesting Views on Mobility Restrictions in Urban Green Spaces Amid COVID-19—insights from Twitter in Latin America and Spain." *Cities* 132 (October 2022). 104094. https://doi.org/10.1016/j.cities.2022.104094.

Shirgaokar, M., D. Reynard, and D. Collins. 2021. "Using Twitter to Investigate Responses to Street Reallocation During COVID-19: Findings from the U.S. and Canada." *Transportation Research Part A: Policy and Practice* 154 (September 2020): 300–312. https://doi.org/10.1016/j.tra.2021.10.013.

Silva, P. 2016. "Tactical Urbanism: Towards an Evolutionary Cities' Approach?" *Environment and Planning B: Planning and Design* 43 (6): 1040–1051. https://doi.org/10.1177/0265813516657340.

Smeds, E., and E. Papa. 2023. "The Value of Street Experiments for Mobility and Public Life: Citizens' Perspectives from Three European Cities." *Journal of Urban Mobility* 4 (May): 100055. https://doi.org/10.1016/j.urbmob.2023.100055.

Spataro, D. 2016. "Against a De-Politicized DIY Urbanism: Food Not Bombs and the Struggle Over Public Space." *Journal of Urbanism* 9 (2): 185–201. https://doi.org/10.1080/17549175.2015.1056208.

Stake, R. 2006. *Multiple Case Study Analysis*. New York, NY: Guilford Press.

Tritter, J. Q., and A. McCallum. 2006. "The Snakes and Ladders of User Involvement: Moving Beyond Arnstein." *Health Policy* 76 (2): 156–168. https://doi.org/10.1016/j.healthpol.2005.05.008.

VanHoose, K., A. R. de Gante, L. Bertolini, J. Kinigadner, and B. Büttner. 2022. "From Temporary Arrangements to Permanent Change: Assessing the Transitional Capacity of City Street Experiments." *Journal of Urban Mobility* 2 (February): 100015. https://doi.org/10.1016/j.urbmob.2022.100015.

Verhulst, L., C. Casier, and F. Witlox. 2022. "Street Experiments and covid-19: Challenges, Responses and Systemic Change." *Tijdschrift Voor Economische en Sociale Geografie* 114 (1): 43–57. https://doi.org/10.1111/tesg.12542.

Verlinghieri, E., E. Vitale Brovarone, and L. Staricco. 2023. "The Conflictual Governance of Street Experiments, Between Austerity and Post-Politics." *Urban Studies*. 61 (5): 878–899. https://doi.org/10.1177/00420980231193860.

Webb, D. 2018. "Tactical Urbanism: Delineating a Critical Praxis." *Planning Theory & Practice* 19 (1): 58–73. https://doi.org/10.1080/14649357.2017.1406130.

Zhao, J., G. Sun, and C. Webster. 2024. "Global Street Experiment: A Geospatial Database of Pandemic-Induced Street Transitions." *Landscape and Urban Planning* 242:242. https://doi.org/10.1016/j.landurbplan.2023.104931.