



ARTICLE



<https://doi.org/10.1057/s41599-023-01600-6>

OPEN

# Power relations are central to shaping collaborative governance of the urban sharing economy

Jun Cao <sup>1✉</sup>, Jason Prior <sup>1</sup>, Damien Giurco<sup>1</sup> & Dasong Gu<sup>2,3</sup>

Since its rise in the early 2000s, the sharing economy has expanded and developed rapidly worldwide. While the sharing economy can boost resource-use efficiency and encourage sustainable urban living, it also challenges urban governance. Recently, a collaborative governance (CG) approach involving public and private partnerships has been adopted in various global cities to address these governance dilemmas. However, the influence of stakeholder power relations on the CG of the sharing economy remains inadequately explored in the literature. This article argues that multi-actor collaboration can be enhanced by clarifying how power relations shape effective governance, actor engagement, shared motivation, and capacity for joint actions. This article draws on practical insights by discussing examples of the governance practices of urban bike-sharing programs to demonstrate how the nature of public-private power relations can result in specific (and quite different) forms of CG. This article will help CG researchers, policymakers, urban planners, and communities understand CG practices in the new era of shared cities and global cities.

<sup>1</sup>University of Technology Sydney, Institute for Sustainable Futures, Ultimo, NSW, Australia. <sup>2</sup>Southeast University, School of Law, Nanjing, China. <sup>3</sup>Traffic Law and Development Research Center of Southeast University, Nanjing, China. ✉email: [Jun.Cao-2@student.uts.edu.au](mailto:Jun.Cao-2@student.uts.edu.au)

## Introduction

The concept of sharing is foundational to all human societies (Agyeman and McLaren, 2017). In recent years, driven by information and communications technologies (ICT) and commercial capital, modes of sharing have evolved into a new economic form, that of the urban sharing economy (Ryu et al., 2019). With a wide range of urban services increasingly shareable (Hamari et al., 2016), many global cities are embracing the concept of a ‘sharing city,’ and encouraging sharing economy entrepreneurship to open up a new way towards sustainable urban living (Agyeman and McLaren, 2017). However, these same innovations can sometimes pose unexpected challenges to urban governance: bike-sharing users, for instance, often park shared bikes disorderly on pedestrian paths and in public squares, disrupting public urban spaces (Zhao and Wang, 2019). One of the most innovative solutions to this problem has been a collaborative governance (CG) approach, where actors from government and privately owned sharing platforms work together (Cao et al., 2022). CG is well-suited to resolving urban sharing economy governance issues that are too complex to be adequately handled by any single organisation (Ma et al., 2018).

All CG, at some level, is shaped by power relations (Jill, 2016), and the CG of the urban sharing economy is no different. As innovative forms of CG between public and private actors have emerged in recent years in global cities to govern the sharing economy, we need to be closely attuned to the power relations that undergird them. Many factors influence CG’s effectiveness, but the power relations between private and public stakeholders are foundational because they define how actors engage with one another in practice.

Power relations directly affect the CG of any sharing economy because they are key to every practical process, including convening actors, framing problems, negotiating meaning, and making decisions (Jill, 2016). Power relations shape actors’ participatory motivations and perceptions, as well as fostering (or eroding) trust and mutual understanding. This, in turn, affects actors’ commitment to CG as a concept or principle, and encourages or constrains actors’ capacity to leverage key resources and build institutional arrangements and leadership to implement joint actions (Emerson and Nabatchi, 2015).

A growing body of sharing economy literature has begun to recognise the importance of urban contextual factors to the evolution of CG in any sharing economy (Davidson and Infranca, 2016, Barile et al., 2021). These factors can be socio-economic (Vith et al., 2019), cultural (Barile et al., 2021, Cao et al., 2022a), political (Wang et al., 2020, Cao et al., 2022), institutional (Wang et al., 2019, Van Waes et al., 2020), policy-related (Chen, 2019, Han, 2020, Aguilera et al., 2021) and legal (Tremblay-Huet et al., 2018). However, only limited research (Wang et al., 2020, Cao et al., 2022) has thus far investigated the impact of power relations on determining the specific collaborative processes that emerge in these urban governance regimes.

The existing sharing economy literature (Wang et al., 2020) mainly delineates two types of CG: authoritarian CG, and self-organised CG. Each type clearly signifies the nature of the power relations between actors. In authoritarian CG, power relations among actors are centralised, creating a significant power imbalance. In self-organised CG, power relations are decentralised, with less power disparity between actors. The question that has not yet been sufficiently considered in existing research literature is *how* these two types of power relations determine the collaborative dynamics of actors (such as engagement, motivation, and capacity for joint actions) in the governance of a sharing economy. By addressing this question, our paper makes an original contribution to the field of CG of the sharing economy.

Our insights on this topic emerge from detailed research into the CG practices of dockless bike-sharing schemes (DBSS) in different global cities. Shared mobility services like bike-sharing form an important part of the backbone of the sharing economy. In recent iterations, the collaborative governance regimes of these schemes mainly include two key groups of actors: government officials, and representatives from private DBSS enterprises.

We have observed that the power relations established within any CG regime designed to govern DBSS have a significant impact on how government and private DBSS enterprises engage. The type of power relations (centralised versus decentralised) sets the tone for actors’ involvement and motivations, and strongly shapes how governance structures operate in everyday practice. Given the importance of the sharing economy in global cities today—and the rise of CG as an innovative public-private partnership to address policy challenges—we hope this discussion will interest CG researchers working in any field. To keep things grounded, we have included concrete examples of how power dynamics affect the CG of DBSS in global cities, based on our fieldwork.

We believe that looking at the CG of DBSS is a useful lens through which to explore the impact of power relations on the CG of any urban sharing economy. Yet we also acknowledge that—due to the necessarily limited length of a ‘Comment’ paper—we cannot cover the full range of possible power relations between actors involved in the CG of a sharing economy, and that insights from the CG of DBSS may not always apply to other sharing economy domains.

## Power relations strongly influence the engagement of actors in CG

In a typical example of an authoritarian CG of DBSS, the government dominates the collaborative process, while private DBSS enterprises are marginalised. In this mode of CG, the government is the stronger, more dominant actor. This puts enterprises in a weaker position of being ‘invited assistants,’ there to follow the orders of government actors who behave as ‘commanders.’

In the DBSS of Chinese cities such as Beijing (Wang et al., 2019) and Shanghai (Ma et al., 2018), for instance, the government had the power to make macro-regulations and to set management policies, while the DBSS enterprises played the role of simply complying with the government’s directives, due to their low discursive legitimacy.

Another common factor of authoritarian CG is that the collaborative process is mandated—rather than voluntary—on the part of private DBSS enterprises. Governments thus have the power to intervene in all decisions, in an all-encompassing manner. This means that the government, as the stronger actor, controls the agenda, including the process design and content of the collaboration, manoeuvring the sequence of joint actions, and triggering policy windows (Purdy, 2012). The government also has the ability to make rapid decisions and adjust existing targets in line with their interests.

The negotiation processes in the authoritarian CG of DBSS in Chinese cities such as Nanjing (Cao et al., 2022), for instance, were not always inclusive. Indeed, inclusivity was only encouraged when government goals were not being challenged. As the final decision-maker, the strategic needs of the local government took priority, and they often unilaterally made decisions based on their administrative powers and judgement. These decisions were converted into management policies without the relevant opinions of the DBSS enterprises.

By contrast, in instances of self-organised CG of DBSS—such as in Boston’s Metropolitan Area, in the U.S. (Hauf and Douma,

2019)—the regional governance processes are led by both local governments (or their subordinate departments, who are right-of-way owners) and private DBSS enterprises. Each actor takes seriously their responsibility to provide leadership, and each plays a role in promoting the collaborative process.

In this kind of self-organised CG, government and enterprise actors more equitably share both the burdens and privileges of partnership. This mode of collaboration is usually initiated from the bottom up rather than from the top-down; partnerships are formed based on voluntary and more equal participation, not hierarchical control. Decentralised power relations limit certain actors' unilateral actions in the collaboration process (Ran and Qi, 2018). Government and enterprise actors become co-founders and facilitators of self-organised CG, and pursue collaborative approaches instead of entrenching their dominance. Negotiations and meetings in a self-organised CG tend to be informed by a sense of equity and inclusivity, with no one actor exerting undue power or influence.

Yet decentralised power relations can often frustrate rather than expedite decision-making, as each actor tends to defend their turf and prevent decisions from being taken contrary to their interests (O'Flynn and Wanna, 2008). In the self-organised governance of Sydney's DBSS in Australia (Cao et al., 2022a), for instance, actors often struggled to consistently or reliably reach agreement, and this considerably slowed down the consensus-building and policymaking process. This was, in part, due to the large number of participating local government officials, members of subordinate departments, and representatives of DBSS enterprises who needed to agree in order to move forward. There was always one actor who had a different perspective.

### Power relations affect actors' motivations to collaborate in CG

An authoritarian CG is usually not conducive to fostering trust, and may even undermine the level of trust between actors. When the power relations between the government and DBSS enterprises are asymmetrical, their shared motivation to engage in CG is driven by an intrinsic awareness of necessary trade-offs or compromises, rather than by trust or mutual understanding. Enterprises in a weaker power position aim to help the government achieve its goals in exchange for support and favourable treatment (Wang and Yin, 2012). The legitimacy of authoritarian CG is derived from the government's political authority, which actors must acknowledge to participate and reap any rewards of collaboration.

For instance, in the CG of DBSS in most Chinese cities, the local government was usually willing to collaborate actively with enterprises only because establishing the CG regime for DBSS was itself a 'political task' set by a higher authority (Wang et al., 2020). China's bureaucratic system puts political performance front and centre in evaluating officials' progress (Zhu, 2017). Promoting the CG of DBSS was an important ritual for officials to display respect and loyalty to higher authorities, and a chance to recommend their own established CG models as a significant indicator of their performance.

When the government approached DBSS enterprises with the invitation to collaborate, those enterprises became willing partners with the government, even though they were aware that the power relations within the CG regime would be asymmetrical. They remained willing partners because the government controlled critical political, administrative and financial resources that DBSS enterprises needed, and could unilaterally decide which enterprises would be allowed to operate (and survive or thrive in the long-term) in the city.

Within a self-organised CG, the motivation of government and private enterprises to collaborate is instead driven by high levels of trust and mutual understanding. Decentralised power relations encourage actors to cultivate reciprocal and trustful relations (Linder, 1999). This allows participants to achieve greater distributive justice through power-sharing, and to cultivate a robust collective identity they all believe in—exactly *because* they perceive the collaboration to be based on inclusion, equal representation, shared accountability, shared goals, and collective interests.

In December 2020, Lime (an American DBSS enterprise) established self-organised CG schemes with some local governments in NSW and Victoria (in Australia). These schemes were designed as equal partnerships between local governments and DBSS enterprises, enabling them to share their respective strategies and plans as transparently as possible (Mehmet, 2020). They could thus look after each other's interests, and improve inter-organisational responses. Both government and enterprise actors were very open to collaboration, willing to listen to each other, and able to respect each actor's advice when it came time to share ideas for the successful management of urban DBSS (Cao et al., 2022a). This strong collective identity strengthened the internal legitimacy of the collaboration, and allowed local governments and DBSS enterprises to make shared commitments.

### Power relations affect actors' capacity for joint actions

Within an authoritarian CG, the capacity for joint action is dictated by the government, and this is the wheel that starts turning before other factors (such as engagement, or the motivation to participate) are set in motion. The government ensures their goals will be reached by firmly establishing their status as the CG partnership leader, and by making top-down, target-oriented rules so that DBSS enterprises have to act according to their requirements (Ma et al., 2018).

In the CG of DBSS in major Chinese cities such as Shenzhen, Jinan and Chengdu (Wang et al., 2020), the first step in the collaboration was the government promulgating their official guidance on DBSS operation. This articulated a government-led leadership structure and pre-established management policies that DBSS enterprises had to follow—essentially forcing (rather than coaxing) joint action. In this way, the government created very effective drivers, and mobilised significant resources to establish the collaborative scheme (Provan and Milward, 1995). They insisted on enterprise participation, using all the administrative powers and resources at their disposal.

However, this heavy-handed intervention by the government (and their investment in DBSS infrastructure) may also have predisposed DBSS enterprises to free-riding on that government investment. These enterprises only played a marginal role in investing in these kinds of large-scale governance infrastructure. They had strong incentives to let the government do as much as possible—not only to reduce their operational costs, but to avoid the risk of criticism (Wang and Yin, 2012).

Within a self-organised CG, leadership is instead equally shared by government and private enterprise representatives. Both parties tend to have a positive attitude towards facilitating collaboration, getting people together, informing colleagues, organising meetings, formulating ground rules, and inspiring others to take action.

In the CG of Sydney's DBSS (Cao et al., 2022a), local governments and DBSS enterprises jointly formulated the shared leadership ground rules by releasing the *Inner Sydney Bike Share Guidelines*. This document set out rules and expectations for DBSS management, which were not formulated in advance by

any single actor, but developed based on all actors reaching a consensus.

However, when power is shared more equitably between government and enterprise actors, this can sometimes mean that the CG structure is without a dominant leader. Achieving consensus and taking concrete steps toward real outcomes can, as a result, require more time and effort from everybody involved (Wang et al., 2020). Self-organised CG can be a time-consuming and slow-moving process. The resulting capacity of local governments and DBSS enterprises to mobilise resources to fund essential governance infrastructure is, as a result, more limited.

As a concrete example, in the early stages of the self-organised CG of DBSS in Sydney, actors agreed to collaborate but invested few resources. Over time, as trust levels between the government and DBSS enterprises grew, both parties gradually invested more resources (financial, logistical, political and legal) in the CG scheme. The NSW State Government, for instance, eventually gave legal support to the municipal (or local) government CG schemes by creating the *Share Bikes Impounding Amendment Act*. This empowered local governments in Sydney to address the disorderly parking (or dumping) of bikes under a new, mandated code of practice recognised by DBSS enterprises.

### Concluding discussion

Global researchers, urban policymakers, and practitioners have already recognised that CG is a sophisticated solution for addressing the dilemmas of governing the sharing economy in diverse contexts.

This commentary—drawing on case studies of the governance of DBSS in specific global cities—reveals the central role that power relations play in shaping the governance of any urban sharing economy. The nature of the power relations in CG schemes (which are increasingly used to govern and regulate the sharing economy in international urban contexts) determines how stakeholders engage, what motivates them to participate, and what capacity they have to promote collaboration.

It is never as simple as saying that an authoritarian CG is “better” or “worse” than a self-organised CG. Both forms of power arrangement and sharing have advantages and disadvantages. What is important is to pay close attention to how these differences in power relations encoded in each mode of CG play out in the practical collaborative work of governments and companies. It is these fine-grained insights (informed by real-world practice) that we hope will be useful to other CG researchers, planners and policymakers, and will contribute to the advancement of knowledge across all of these overlapping communities.

Centralised power relations have the benefit of enabling the dominant actor (usually the government) to quickly mobilise access to key public resources through administrative mobilisation. This is in keeping with the research findings of Provan and Milward (1995), who note that within a government-dominated, centralised collaboration, the capacity to leverage resources is enhanced. This kind of central authority is useful—and sometimes necessary—in addressing urgent problems posed by the sharing economy (such as the illegal parking or dumping of bikes in shared urban spaces within bike-sharing schemes), as actors don't have to spend too much time or effort to reach agreement or make decisions (Ran and Qi, 2018).

Our findings, however, also support those of Cao et al. (2022b), who has shown that there are other potentially negative impacts of a centralised power system in any CG regime, such as not encouraging independent innovation by private actors in a weaker position, or less meaningful collaboration between stakeholders.

Establishing decentralised power relations is a useful strategy used in self-organising CG to cultivate trust among actors, and can lead to a more sustainable governance regime in the long run. This insight is confirmed by the empirical research on shared garbage management in Dortmund, Germany by Barile et al. (2021). They found that a broadly inclusive and participatory process is useful in fostering sustainable governance practices. For CG schemes that are intended to operate over the long-term, sharing power, negotiating equal leadership, and fostering trust among actors are key to healthy collaboration.

Power-sharing in CG may not, however, always lead to agreement. To the contrary, power-sharing can often extend the amount of time and resources all actors have to invest to take meaningful action. This finding is supported by research published by Wang et al. (2020), who note that if a CG framework has no dominant leader, the collaboration requires much more effort to carry out effective joint actions and achieve success.

### Wider implications

Our findings have far-reaching implications both theoretically and practically, and we hope that these can be applied in practice to improve the future CG of any urban sharing economy.

By focusing on the influence of power relations in determining how CG actors engage and interact, this paper presents a relatively new theoretical perspective that has not yet been explored in CG theory related to the sharing economy. We challenge a theoretical hypothesis about the evolution process of CG in some of the existing literature, where an actor's willingness or ability to engage is seen as the key factor and necessary first step of CG, and is assumed to naturally foster shared motivation and, in turn, the capacity for joint action (Emerson et al., 2012, Ma et al., 2018, Cao et al., 2022a). Our findings suggest that the capacity for joint action within authoritarian CG schemes is, in fact, often pre-determined by existing power relations, which strongly influence whether an actor is likely to engage, or whether shared motivation can be cultivated.

From a practical perspective, our findings have clear implications for urban governance policy and practice in the growing sharing economy, especially in relation to three key collaborative dynamics (engagement of actors; actors' motivation to collaborate; and the capacity of actors to take joint action).

Firstly, we have highlighted how authoritarian CG schemes have the advantage of being able to rapidly mobilise key resources, and thus fast-track collaboration processes. Yet these hierarchical schemes (which often mandate rather than invite engagement from actors) can also hinder trust-building between actors, and stifle incentives for innovation and resource investment by private companies. We offer a suggestion to enhance the efficiency of these collaborations: authoritarian CG schemes should incorporate equitable negotiation and shared decision-making, even if the power dynamic is in the government's favour. The benefits are that private enterprises become more motivated to stay involved, and have the incentive to contribute resources (logistical and financial) to the overall CG scheme.

Secondly, we have shown that self-organising CG schemes have the advantage of encouraging actors to engage in an equitable and transparent manner, which is useful in building and maintaining trust. However, we have also noted that this decentralised approach to collaboration does not always lead to agreement, and sometimes discourages actors from mobilising key resources in the early stages of collaboration. We recommend that government actors in self-organising CG learn from this and play a more active role in mobilising policy, legislative and financial resources to support the governance regime in a timely fashion, while concurrently developing mediation and conflict resolution mechanisms to ensure that decisions or actions aren't stalled unnecessarily.

## Research limitations and future research agenda

By acknowledging that our research on how power relations between actors affect the CG of a sharing economy is by necessity limited, we hope to inform and guide the design of future sharing economy research that could fill these gaps.

Our research only considers power relations between two major actors (local governments, and private enterprises) in DBSS governance. Future research could focus on the power distribution modes and CG schemes among other groups of actors, such as the cross-boundary collaborations between volunteers, university think-tanks, public medias, DBSS users, and industry associations.

Our findings are also informed by a close case study of only one sharing economy domain, namely DBSS, and thus do not cover all possible power relations and interactive engagement among actors in the governance of other urban sharing economies. Future research could focus on comparing and contrasting the impacts of power relations on the CG of a broader range of shared urban economy initiatives, from the sharing of goods and services (Barile et al., 2021) to the increasingly widespread practice of sharing homes, cars, farmland, food delivery, pets, and even urban knowledge (such as maps or preferred urban routes or spaces) (Ryu et al., 2019).

## Data availability

Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

Received: 26 November 2022; Accepted: 27 February 2023;

Published online: 06 March 2023

## References

- Aguilera T, Artioli F, Colomb C (2021) Explaining the diversity of policy responses to platform-mediated short-term rentals in European cities: a comparison of Barcelona, Paris and Milan. *Environ Plan A* 53(7):1689–1712. <https://doi.org/10.1177/0308518X19862286>
- Agyeman J, McLaren D (2017) *Sharing cities*. Environment, Washington
- Barile S, Ciasullo M, Iandolo F, Landi G (2021) The city role in the sharing economy: Toward an integrated framework of practices and governance models. *Cities* 119(6):103409. <https://doi.org/10.1016/j.cities.2021.103409>
- Cao J, Prior J, Giurco D (2022) Government and private company collaboration in the governance of shared mobility schemes: a case study of dockless bike-sharing schemes in Sydney, Australia. *Sustainability* 20(14):13141. <https://doi.org/10.3390/su142013141>
- Cao J, Prior J, Gu D, Giurco D (2022) How do government and industry engage in the collaborative governance of dockless bike-sharing schemes in Nanjing, China? *Urban Policy Res* 40(3):1–15. <https://doi.org/10.1080/08111146.2022.2115478>
- Chen R (2019) “Bike litter” and obligations of the platform operators: Lessons from China’s dockless sharing bikes. *Comput Law Secur Rev* 35(5):105317. <https://doi.org/10.1016/j.clsr.2019.03.011>
- Davidson N, Infranca J (2016) The sharing economy as an urban phenomenon. *Yale Law Policy Rev* 34(2):215–279. <https://www.jstor.org/stable/43920368>
- Emerson K, Nabatchi T (2015) *Collaborative governance regimes*. Georgetown University Press, Georgetown
- Emerson K, Nabatchi T, Balogh S (2012) An integrative framework for collaborative governance. *J Public Adm Res Theory* 22(1):1–29. <https://doi.org/10.1093/jopart/mur011>
- Hamari J, Sjöklint M, Ukkonen A (2016) The sharing economy: why people participate in collaborative consumption. *J Assoc Inf Sci Technol* 67(9):2047–2059. <https://doi.org/10.1002/asi.23552>
- Han S (2020) Co-producing an urban mobility service? The role of actors, policies, and technology in the boom and bust of dockless bike-sharing programmes. *Int J Urban Sustain Dev* 14(1):1–16. <https://doi.org/10.1080/19463138.2020.1772268>
- Hauf A, Douma F (2019) Governing dockless bike share: early lessons for nice ride Minnesota. *Transp Res Rec* 2673(9):419–429. <https://doi.org/10.1177/036119811984565>

- Jill M (2016) The role of power in collaborative governance. In: Richard D (ed) *The Challenges of Collaboration in Environmental Governance*, 1st edn, Edward Elgar Publishing, Cheltenham, pp. 246–264
- Linder S (1999) Coming to terms with the public-private partnership: a grammar of multiple meanings. *Am Behav Sci* 43(1):35–51. <https://doi.org/10.1177/00027649921955146>
- Ma Y, Lan J, Thornton T, Mangalagu D, Zhu D (2018) Challenges of collaborative governance in the sharing economy: the case of free-floating bike sharing in Shanghai. *J Clean Prod* 197:356–365. <https://doi.org/10.1016/j.jclepro.2018.06.213>
- Mehmet S (2020) Shared e-bike services trial memorandum of understanding. In: Memorandum of understanding. City of Melbourne. Available via DIALOG. [www.melbourne.vic.gov.au](http://www.melbourne.vic.gov.au) of subordinate document. Accessed 15 Jan 2020
- O’flynn J, Wanna J (2008) Collaborative governance: a new era of public policy in Australia? ANU Press, Canberra, <http://www.jstor.org/stable/j.ctt24h315>
- Provan K, Milward H (1995) A preliminary theory of interorganizational network effectiveness: a comparative study of four community mental health systems. *Adm Sci Q* 40(1):1–33. <https://doi.org/10.2307/2393698>
- Purdy J (2012) A framework for assessing power in collaborative governance processes. *Public Adm Rev* 72:409–417. <https://doi.org/10.1111/j.1540-6210.2011.02525>
- Ran B, Qi H (2018) Contingencies of power sharing in collaborative governance. *Am Rev Public Adm* 48(8):836–851. <https://doi.org/10.1177/02750740177.45355>
- Ryu H, Basu M, Saito O (2019) What and how are we sharing? A systematic review of the sharing paradigm and practices. *Sustain Sci* 14(4):515–527. <https://doi.org/10.1007/s11625-018-0638-2>
- Tremblay-Huet S, Scassa T, Makela F, Mckee D (2018) Law and the “Sharing Economy” regulating online market platforms place of publication not identified. University of Ottawa Press, Ottawa
- Van Waes A, Farla J, Raven R (2020) Why do companies’ institutional strategies differ across cities? a cross-case analysis of bike sharing in Shanghai & Amsterdam. *Environ Innov Soc* 36:151–163. <https://doi.org/10.1016/j.eist.2020.06.002>
- Vith S, Oberg A, Höllerer M, Meyer R (2019) Envisioning the ‘Sharing City’: governance strategies for the sharing economy. *J Bus Ethics* 159(4):1023–1046. <https://doi.org/10.1007/s10551-019-04242-4>
- Wang F, Yin H (2012) A new form of governance or the reunion of the government and business sector? a case analysis of the collaborative natural disaster insurance system in the Zhejiang Province of China. *Int Public Manag J* 15(4):429–453. <https://doi.org/10.1080/10967494.2012.761063>
- Wang H, Chen B, Xiong W, Yang L, Zhu D (2019) Multiple pathways to public-private partnerships for urban public service delivery: a cross-city comparison of bicycle-sharing service in China. *Urban Policy Res* 37(4):1–15. <https://doi.org/10.1080/08111146.2019.1663725>
- Wang H, Xiong W, Yang L, Zhu D, Cheng Z (2020) How does public-private collaboration reinvent? A comparative analysis of urban bicycle-sharing policy diffusion in China. *Cities* 96:102429. <https://doi.org/10.1016/j.cities.2019.102429>
- Zhao D, Wang D (2019) The research of tripartite collaborative governance on disorderly parking of shared bicycles based on the theory of planned behavior and motivation theories—a case of Beijing, China. *Sustainability* 19(11):5431. <https://doi.org/10.3390/su11195431>
- Zhu X (2017) Inter-regional diffusion of policy innovation in China: a comparative case study. *Asian J Comp Politics* 25(3):266–286. <https://doi.org/10.1080/02185377.2017.1339619>

## Competing interests

The authors declare no competing interests.

## Ethical approval

This article does not contain any studies with human participants performed by any of the authors.

## Informed consent

This article does not contain any studies with human participants performed by any of the authors.

## Additional information

Correspondence and requests for materials should be addressed to Jun Cao.

Reprints and permission information is available at <http://www.nature.com/reprints>

**Publisher’s note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

© The Author(s) 2023