



Overcoming barriers to delivering active travel infrastructure: inter-agency collaboration in a state-led neighbourhood redevelopment

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ABSTRACT

This research investigates the challenges to collaboration government agencies face in delivering active travel infrastructure as part of neighbourhood regeneration projects. Through a sociotechnical systems lens, we examine the influence of governance structures, decision-making processes, and institutional norms on inter-agency collaboration. Drawing on document analysis and key informant interviews, we identify opportunities and challenges faced by housing and transport agencies in coordinating the design and delivery of active travel infrastructure. Challenges include a disconnect between strategic objectives and funding mechanisms, bureaucratic inertia and complexity, and a reliance on informal networks within a complex regulatory structure. Despite these challenges, the research highlights the value of forums for knowledge exchange and relational approaches to collaboration, as well as the potential for pragmatic solutions such as collaborative working groups to overcome structural barriers within sociotechnical regimes. Achieving mode shift towards healthier and more sustainable forms of transport requires formalised effective mechanisms for integration of land use and transport planning. Our findings have implications for policymakers, practitioners, and stakeholders involved in shaping urban environments and promoting active mobility as a viable transportation option.

1. Introduction

Achieving a mode shift toward healthier and more sustainable transportation options is critical for promoting urban sustainability and ensuring equitable access to travel (Brand et al., 2021; Giles-Corti et al., 2016). In car-dependent nations like Aotearoa New Zealand (NZ), however, deeply entrenched ‘automobility’ has led to transport systems and urban planning paradigms that continue to prioritise car-centric infrastructure. This creates significant barriers to safe and enjoyable active mobility options, such as walking and cycling. Shifting away from these prevailing norms to embrace sustainable urban planning approaches necessitates a concerted effort (Mackie et al., 2021).

Urban street design plays a pivotal role in facilitating this shift. Pedestrian-friendly neighbourhoods offer numerous benefits, including enhanced public health, increased social interaction, greater economic vibrancy, and reduced emissions (Buehler et al., 2017; Frank et al., 2019; Marquart & Schicketanz, 2022; Marshall & Garrick, 2011; Plowden, 2020; Pucher & Buehler, 2010). However, retrofitting existing streets and neighbourhoods to support active travel demands intensive coordination and knowledge sharing among stakeholders (Gasco-

Hernandez et al., 2022). This task requires an adaptive, inter-agency collaborative approach, particularly in neighbourhood-scale redevelopments where both housing and street renewal are involved (authors; Lovell & Taylor, 2013).

While the importance of collaboration in sustainable transport planning is well-documented (Beiler, 2016; Meyer et al., 2005), contemporary transport and urban planning efforts often struggle to achieve effective integration and coordination at the delivery level. Although many transport planning agencies have developed sustainability policies, a critical weakness is the lack of a coordinated and integrated implementation approach (Barrella et al., 2013). The context in which active travel stakeholders operate is complex, marked by competing interests and strong path dependency that prioritise speed and efficiency as key indicators of growth and development (Tuominen et al., 2022). Consequently, a deeper understanding of the dynamics between stakeholders across different contexts and scales is crucial to support transitions toward a more sustainable transport system (Beiler, 2016).

Studies of collaborative governance networks similarly emphasise the need to examine the nature of network relationships and the effects

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of individual and organisational actors within these networks (Zambrano-Gutiérrez et al., 2023; Emerson et al., 2012). While nomenclature differs across sectors, the importance of relationships, leadership and institutional arrangements are consistently identified as cornerstones of effective collaborative governance (Beeton et al., 2024, Emerson et al., 2012, Torfing et al., 2020). In the forestry sector Beeton et al (2024) identified principled engagement, shared motivation, leadership, resources, knowledge and learning and institutional arrangements as key dimensions of collaborative governance. Within urban planning, the importance of governance structures, decision-making processes, and organisational stakeholder involvement are noted as significantly influencing urban planning outcomes (Dawes et al., 2009; Hrelja, 2015; Rye et al., 2018).

For collaborations to be successful, high levels of trust and robust knowledge exchange processes are crucial, both within and between stakeholder organisations (Politis et al., 2017). Institutional trust, alongside interpersonal relationships, plays a critical role in establishing the shared understandings necessary for effective collaboration (Ellonen et al., 2008; Kamaşak & Bulutlar, 2010). Without trust, organisations may view collaborations with scepticism, perceiving them as competitive rather than cooperative efforts, particularly when resources are scarce (Austen, 2018; Linden, 2010).

Transaction costs, such as inefficiencies in time, coordination, and resource allocation, can significantly hinder the progress of active mode shift initiatives. These costs are particularly pronounced in novel collaborative efforts where established frameworks are lacking (Scott & Merton, 2021). To reduce transaction costs and facilitate effective collaboration, it is essential to clarify leadership and governance structures, establish shared objectives and responsibilities, and ensure all stakeholders are committed to shared goals (Scott & Boyd, 2023).

Active travel infrastructure planning takes place at the nexus between landuse, housing, public health and transport and necessitates cross sector engagement. Within AoNZ, *mana whenua* (indigenous people/tribes with authority over land in an area) also have a mandated role in planning processes through the Resource Management Act (RMA) (Jacobson et al., 2016). To better understand the character of existing urban planning collaborations in AoNZ, as elsewhere, requires analysis of the multi-scalar interactions between land use and transport agencies as policies, funding, and planning often operate at different scales within government regimes, and practices and decision-making processes can vary significantly depending on the hierarchical level (Moliterno & Mahony, 2011). These differences can challenge agency representatives at all levels, underscoring the need for effective horizontal and vertical collaboration within and between organisations (Booz Allen Hamilton, 2014).

In this paper, we explore the challenges faced by individuals delivering active travel infrastructure in brownfield residential developments through multi-partner governance processes. Specifically, we examine how the interplay between regional and central governance structures, decision-making processes, and institutional norms shapes inter-agency collaboration within an urban regeneration project. The aim of this research is to identify the key barriers to effective collaboration and explore the opportunities for enhancing coordination between agencies in delivering active travel infrastructure at a neighbourhood scale. Building upon existing literature, we present a case study analysis that highlights the complexities inherent in these efforts. We argue that path dependence, perpetuated by existing sociotechnical regimes and shaped by individual practices and governance structures, significantly influences collaborative efforts. Our findings offer valuable insights into how such collaboration can support low-carbon transitions, particularly in countries with high car dependence and entrenched 'automobility' regimes. These insights have broader governance implications for regions facing similar organisational challenges when planning active travel infrastructure and transitioning toward more sustainable urban mobility.

1.1. Sociotechnical perspective on collaboration in transport planning

A sociotechnical lens is particularly valuable for understanding the complex interplay between social dynamics and technical systems that influence inter-agency collaboration in transport planning. The term 'sociotechnical' emphasises the co-evolution and interrelation of technology and society in both the stability and transition of systems (Bijker, 1995; Bijker & Law, 1992; Janssen et al., 2010). By neglecting the social dimensions of these systems, there is a risk of perpetuating ineffective practices and path-dependent behaviours that hinder sociotechnical transitions to more sustainable transport systems and technologies (Geels, 2004; 2014; Maassen, 2012). From this perspective, policy and strategy documents are not fixed blueprints, but are social artefacts contingent on the collaborative dynamics this paper investigates.

The sociotechnical 'regime' is stabilised through the alignment between its social actors and their working methods, regulations and standards, and sunk investments (Geels & Schot, 2007; 2010). As the *meso*-level of the Multi-Level Perspective (MLP) framework, this regime is influenced by macro-level landscape pressures from above and challenged by micro-level niche innovations from below (Canitez 2025). This alignment, reinforced by vested interests and significant infrastructural lock-ins, can limit innovation and transitions. The 'automobility' regime is a dominant sociotechnical framework that prioritises car use and shapes urban design, policy, and infrastructure development to support traffic speed and flow (Geels, 2012; Geels et al., 2017; Hebert, 2005). Transport agencies operate within this sociotechnical regime with shared rules and norms maintained by social groups and actors that shape operations and outcomes (Auvinen & Tuominen, 2014; Bijker, 1995; Bijker & Law, 1992; Tuominen & Ahlqvist, 2010). In New Zealand, land use and transport agencies are deeply embedded within an automobility regime, making it difficult to implement changes that promote active mobility and a transition to a more sustainable transport system (Hopkins, 2017).

The impacts of active travel infrastructure intersect with the interest of multiple governmental agencies, including those responsible for transport network management, sports and recreation, public health, education, and urban planning (Tuominen et al., 2022). This intersection necessitates cross agency communication and collaboration which in turn complicates the prospect of transformational change in street design. and.s. This is particularly true for active mobility, which represents a transition pathway reliant on urban planning and cultural shifts, rather than purely technological substitution (Sonnberger & Graf, 2021). The complexity of land use and transport planning legislation in New Zealand further exacerbates these challenges, with limited connections between key policy documents and a lack of statutory authority to guide decisions (Smithers, 2020; Crossland et al., 2022). Also, entrenched institutional preferences for car-centric development mean strategies promoting active mobility frequently struggle to gain traction. For instance, funding hierarchies from local to national governments often prioritise traffic flow and minimising car travel times, thereby marginalising active modes of transport (Mackie et al., 2021).

In this context, a sociotechnical approach proves invaluable by illuminating the underlying barriers to inter-agency collaboration. Previous research across various sectors—such as health, environmental management, and urban planning—has shown that integrating both human and technological dimensions can help identify and overcome these barriers (Alhassan et al., 2021). However, despite strategic alignment at higher levels, significant challenges often arise during the implementation and delivery of collaborative efforts (Sørensen & Torfing, 2021). For example, Zuzul's (2019) study on the delivery of 'smart city' concepts revealed that ambiguities and divergent perspectives at the conceptual level frequently led to conflicts among delivery teams.

Few studies have explored how collaboration, or its absence, between different agencies impacts infrastructure implementation to promote active modes of transportation. By examining this nexus in a neighbourhood-scale study, our research illuminates the complexities,

challenges, and opportunities for collaboration in multi-stakeholder efforts to enhance active mobility. This perspective is crucial for understanding the dynamics between social practices and technical systems and the potential for sustainable transport transitions.

2. Methods

This research employed a single-case study design focusing on the Māngere West development undertaken by Kāinga Ora (KO), the NZ government's state housing and development agency. The development presented an opportunity to study inter-agency collaboration due to its neighbourhood scale and planned inclusion of active travel infrastructure in an area with historically low levels of active mobility and poor infrastructure. Beyond providing practical examples, case studies can help researchers and practitioners make sense of local contexts and determine the impacts of complex inter-agency interactions (Le Gouais et al., 2021).

The primary data collection involved document analysis and key informant interviews. The document analysis focused on strategy and policy documents from key agencies influencing or involved in the Māngere precinct (Auckland Council, 2018; 2022; Auckland Council et al., 2019; Auckland Transport, 2015; 2021a; 2021b; Kainga Ora, 2022; Ministry for the Environment, 2020; Ministry of Transport, 2021). The analysis highlighted a complex policy landscape where the need for enhanced coordination was frequently acknowledged, but clear regulatory pathways for action were often absent. The interview topics covered with key informants (Table 1) were informed by the document review to ensure their relevance to the political and regulatory context (Emerson et al., 2012), as well as to reflect the literature reviewed earlier. (Further information on the document analysis process and its findings are detailed in reports available from the authors).

The key informant interviews were conducted face-to-face either online or in person¹ with representatives of organisations involved in the Māngere West development: Kāinga Ora (KO), Auckland Council (AC) and Auckland Transport (AT). Eighteen interviews were conducted with 16 participants: KO (n = 6), AC (n = 2), AT (n = 5), and independent consultants (n = 3) involved in the project. There were two rounds of interviews, with eight conducted between July 2021-March 2022 and ten between May-June 2023. Participants included strategic planners (n = 2), urban designers (n = 4), project managers (n = 2), development

managers (n = 2), transport specialists (n = 2), a local board member (n = 1) and consultants (n = 3). Repeat interviews were conducted with two participants (one from AC and one from AT). The interviews ranged between 29 and 70 min, with an average duration of 52 min.

As outlined in Table 1, participants were asked about their roles, responsibilities, involvement, and experiences in Māngere West as well as their knowledge of relevant plans and policies for active travel infrastructure delivery. They were also asked about their observations and experiences on topics such as intra- and inter-organisational decision-making, cross-agency interactions, and collaborative challenges.

All interviews were recorded, transcribed, and anonymised, with participants given the option to review transcripts before analysis. The data was analysed using a thematic 'codebook' approach (Braun & Clarke, 2019), which incorporated both deductive as well as inductive coding. Initial codes were derived from the semi-structured interview guide, as outlined in Table 1. Then as emerging issues and concepts were identified through multiple readings of the data, inductively derived codes were added to the codebook. Inductively derived themes such as 'strategy delivery disconnect', 'spatial scale planning discrepancy', and 'funding constraints' were developed to capture specific challenges that arose in the data. These emergent themes formed the final analytical framework that directly structures the findings.

2.1. Context: Kāinga ora's māngere west development

KO is responsible for delivering large-scale neighbourhood intensification projects.² To deliver these projects, they must collaborate with local and regional authorities and share responsibilities for planning and funding. This multi-scalar inter-agency collaborative context is illustrated in Fig. 1, which maps the relationships between three types of relationships: hierarchical regulatory relationships (double-lined arrows), collaborative partnerships (solid lines), and influence pathways (dashed lines). At a regional level, the key collaborative entity is the Auckland Housing Programme (AHP), a partnership between Kāinga Ora (KO), Auckland Council (AC), and its Council-Controlled Organisations (CCOs) like Auckland Transport (AT). The central box in the diagram represents the focus of this research: the neighbourhood-scale project team and working group meetings for the Māngere West development.

The AHP began as a government response to the severe shortage of private and public housing and downstream consequences of high private rents, house prices, and increasing rates of overcrowding and homelessness (Gordon et al., 2017; Murphy, 2020). The age and poor condition of many clusters of state housing presented an opportunity to master plan renewals at a neighbourhood scale (Kāinga Ora, 2020). The AHP is presented as an opportunity to transform existing low-density housing into medium-density, mixed-tenure neighbourhoods, focusing on sustainable urban designs, including promoting a shift towards active mobility.

As part of their commitment to doing medium-density well, KO released a Sustainable Transport Outcomes strategy document stating an intention to "enable active travel through well-designed walking and cycling facilities, supported by high-quality public transport infrastructure and services" (Kāinga Ora, 2022, p. 6). This aligns well with AC's 'Auckland Plan 2050', which aims "to make walking, cycling and public transport a preferred travel choice" (Auckland Council, 2018). AC has also set a target to reduce transport-related greenhouse gas emissions by 64 % by 2030 through its Transport Emissions Reduction

Table 1

Overview of key interview topics and focus areas used to guide semi-structured interviews in the Māngere West case study.

Topic	Focus
Role & Responsibilities	Participant's job title, area of expertise, and core responsibilities
Project Involvement	Nature of the participant's involvement in the Māngere West development, including specific responsibilities, experiences of applying relevant tools, policies, or legislation; any new or unfamiliar tasks encountered; challenges or constraints faced.
Collaboration Experience	Experience working with external agencies or stakeholders: frequency and style of communication (e.g., meetings, formal/informal contact), nature of interpersonal relationships, shared projects, goals, conflicts and resolutions.
Community Engagement	Level and type of engagement with local residents and mana whenua including feedback and influence on decisions.
Organisational Dynamics	Internal structures and processes within organisations, decision-making authority at different scales (e.g., regional, local), and how institutional norms, culture, or siloed practices shaped collaboration and project delivery.

¹ The specific mode for each interview was not systematically recorded.

² Following the election of a National-led government in late 2023, significant changes were signalled to Kāinga Ora's role. A 'reset' in the agency's focus emphasised its function as a social housing landlord, while minimising its role as a large-scale urban developer. This shift has so far led to the loss of over 500 jobs, which will likely impact future collaborative efforts in urban development and infrastructure projects like those discussed in this paper.

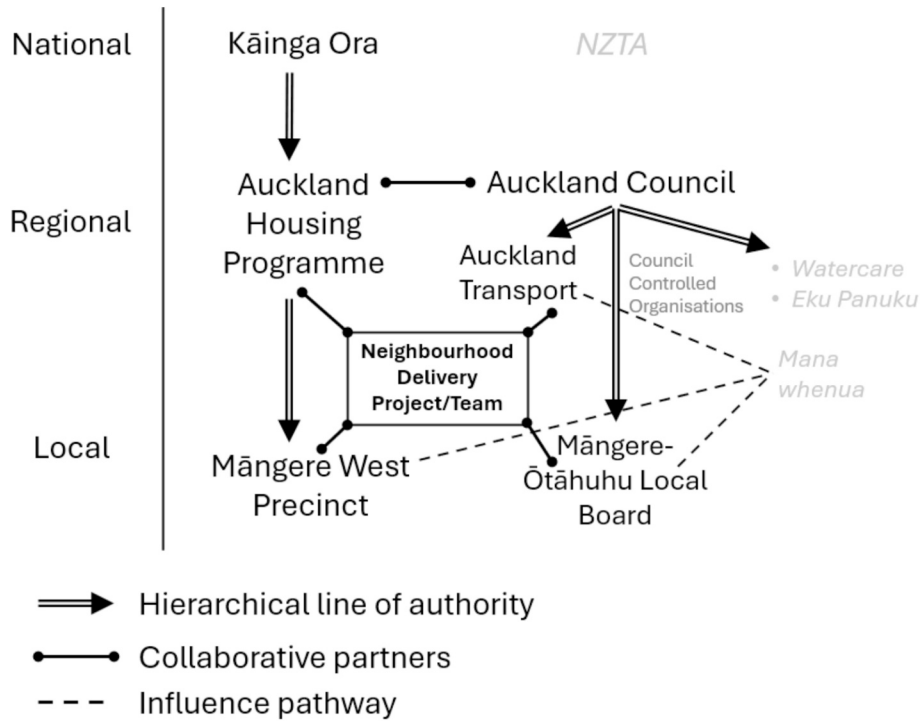


Fig. 1. The inter-agency collaboration framework for the Māngere West Precinct, illustrating the relationships between national, regional, and local public bodies. Italics indicate entities with influence on the case study area that were not interviewed as part of this study.

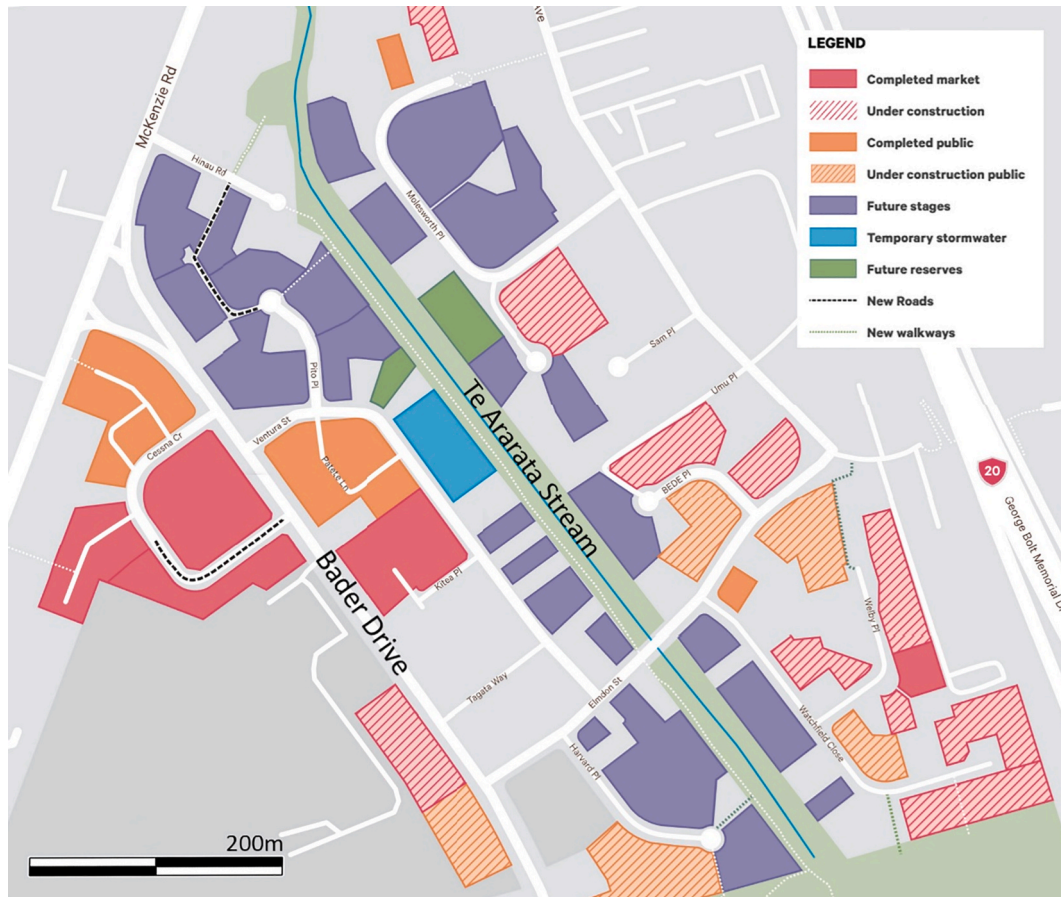


Fig. 2. A map showing the Māngere West precinct taken from the development promotional website circa 2022. The map indicates the various development zones completed and under construction, as well as the intended future stages and park reserves. Source: <https://mangeredevelopment.co.nz/neighbourhood/te-ararata/>

Pathway (TERP) initiative (Auckland Council, 2022). This plan emphasises a significant modal shift towards walking, cycling, and public transport. As AC's transport agency, AT has produced policy documents outlining a commitment to delivering sustainable transport options. For example, the Auckland Regional Land Transport Plan "aims to increase active transport mode share by delivering safe and more integrated walking and cycling infrastructure" (Auckland Transport, 2021a, p. 57).

KO's Māngere West development is a useful case study to examine how these strategic goals are being implemented collaboratively at the neighbourhood level. Māngere West is the first neighbourhood to be redeveloped as part of the AHP's Māngere precinct and was partially completed during the research. Around 230 existing state homes are being removed to build approximately 340 new state homes and 600 affordable and market-rate homes (authors). As stated by KO in its feedback to AT's Māngere cycleway plan, the neighbourhood should have "accessible, healthy, safe and sustainable transport". Another desired AT outcome is that "people in Māngere have multiple transport options, active and shared modes are prioritised in development, and people choose to get about using them, reducing dependency on private vehicles" (Auckland Transport, 2021b, p. 63). To achieve this outcome, KO is collaborating with AT on transport initiatives within Māngere.

Fig. 2 shows the various stages and development zones in the Māngere West development, which includes most of the land along the northern end of Bader Drive. At the time of the research, the zones along Bader Drive to the northwest were complete, while most of the development zones to the south and east of Bader Drive remained in the planning stage. During the Auckland Anniversary Weekend Floods in 2023, the Te Ararata Stream that runs through the centre of the development overflowed into neighbouring properties, causing significant damage. Consequently, many of these properties were condemned, and development alongside the stream has been temporarily suspended.

3. Findings

3.1. Strategy delivery disconnect

The interviews revealed the disconnect between strategy and delivery as a fundamental challenge to inter-agency collaboration. As outlined above, each agency produced strategy documents that make increasing sustainable transport options and achieving active mode shift a key objective. KO strategy team members reported working closely with local government. For example, they characterised the development of their Sustainable Transport Outcomes strategy as "collaborative ... right from the beginning" and emphasised that they were pursuing "the same outcomes" as transport agencies (KO1). However, despite the alignment of their high-level strategies, delivering on these objectives collaboratively at neighbourhood scale in Māngere West has been a challenge and has remained relatively uncoordinated across the agencies. A common theme running through the interviews was the lack of clear delivery pathways and alignment of organisational structures, meaning collaboration was reliant on informal agreements and negotiation.

The character of inter-agency collaboration varied across different organisational levels. An AC participant remarked on the difficulty of translating strategic direction into delivery, stating, "We find, in general, that ... strategic direction does get lost at the delivery phase" (AC1). This sentiment was echoed by a representative from KO, who suggested bridging the gap between what is envisioned and execution is a missing skill: "There are lots of people who get the big picture vision and lots of people that know the detail. But ... drawing the connection between the two [is] ... a missing skill in the wider built environment profession" (KO2).

A critical issue related to this gap was the poor alignment of funding mechanisms needed to achieve sustainable transport objectives. This led to uncertainty and misunderstandings between the KO and AT delivery teams. An external consultant working with AT and KO on walking and

cycling activations within the Māngere West project noted that while each agency had put significant effort into producing strategy documents, "nobody funded the implementation" (C1). As explained by a senior design team member from KO:

"If there's no requirements attached, there's nothing to enforce ... While we advocate for things, it doesn't mean that they always get done ... and that comes from the fact that there is no funding attached." (KO6).

Technical details between KO and AT have also proven difficult to resolve at a project level. The example of planting street trees in Māngere West illustrates how strategic direction can be lost amidst the complexity of sociotechnical systems required to deliver transport projects. A KO strategy team member highlighted street trees as an important part of providing a walkable environment and noted that "Māngere is under-catered for in street trees" (KO1). This aligns well with AC's 'Urban Ngahere (Forest) Strategy,' which emphasises the benefits of street trees and acknowledges their unequal distribution, particularly their absence in many social housing areas.

However, a KO urban designer expressed frustration that far fewer trees had been planted than intended, causing the street design to fall short of the Urban Ngahere strategy:

"I'm working on a street design that's got ... three trees when it should have twelve ... we're losing the ability to plant trees, because of pipes and setbacks, and all these like really specific engineering things ... once you get down to the micro-scale you start to run into a bivvy of engineers that all have their individual opinions." (KO2).

Engineering issues like these threatened significant delays as designs had to be renegotiated with project partners, often leading to the minimisation or abandonment of certain features. Limited funding for the master plan's active travel infrastructure meant these elements were likely the first to be scaled back or dropped when design challenges occurred.

Additionally, the hierarchical and siloed nature of organisational structures was suggested by an AT participant as a barrier to translating strategic priorities throughout the agency:

"We're a complex organisation we all sit in our different teams ... I'm sure ... our planning and investment team probably have a regular forum for working together, but it doesn't filter down to the rest of the organisation." (AT4).

While forums for collaboration may exist at higher levels within agencies, these interactions do not evenly permeate throughout the organisation.

3.2. Knowledge exchange

From the outset, representatives from the AHP stakeholder agencies have met monthly at 'round table' project working group meetings steered by AC. These meetings have established an open forum for knowledge exchange to improve the coordination of AHP neighbourhoods. An AC participant involved in the meetings described how master plans for the Māngere precinct were presented for feedback and to identify any aspects that required revision: "... if there's a problem ... then they come to us, and we try and get the right people in the room" (AC1). The AHP meetings have functioned as a relatively informal space for coordinating and aligning land use and transport plans between KO and AT. While the AHP was intended to provide strategic leadership for the collaboration, its influence was indirect and exercised at a distance from the delivery teams.

This informal and distant leadership proved to be a significant drawback. Since the AHP meetings held no statutory authority, the shared understandings and agreements reached were not legally binding. Interviewees from KO and AT noted that this had led to misunderstandings:

"We've been slightly burnt by Council, in that we thought we had agreement for the master plan ... and then ... the resource consent ... raised some problems ... We probably took a slightly too informal approach ... and over the course of two-or-three years people change." (KO2).

Without a more formalised structure, staff turnover had meant the loss of key relationships, and individual agreements had not always carried over. The lack of integration between different organisational levels meant that other teams were not always fully informed about shared agreements, as exemplified by the placement of cycling infrastructure within the Māngere West development. The KO master plan included the renewal of the Te Ararata Stream corridor to make it the main walking and cycling route running through the middle of the Māngere West development (see Fig. 2). Following community consultation, KO preferred a shared path cycleway along the stream rather than Bader Drive, viewing this as the best option to provide a safe cycling route for the community. However, confusion arose at a later stage in the project:

“I think that topic was kind of discussed at the master planning phase ... [but] might not have been completely resolved ... it was perhaps a slight surprise when it ended up in public consultation.” (KO2).

KO had signalled this preference at the AHP meetings. Therefore, the KO project team was surprised when AT representatives began community consultation in Māngere about the creation of an on-road cycleway along Bader Drive, which had been AT’s preferred option.

Although unavailable to KO during the Māngere master planning, AT interviewees suggested that their Future Connect digital platform could enhance future collaboration and knowledge exchange. As a data-sharing tool that maps AT’s long-term transport network (including active modes), it could provide local and central government development partners with a shared framework to align strategic objectives, improve coordination, and reduce planning uncertainties.

In contrast to these inter-agency challenges, the interviews suggest that mana whenua collaboration was an important, early influence that cut across multiple project partners. For parts of the Māngere West development, this engagement was initiated at the very outset, before master planning began. This early input was described as a “really positive part of the story” (KO6) and appears to have been an important influence on several aspects of the neighbourhood’s design, informing concepts such as “restoring the mauri of the whenua” (the life force of the land) and providing for equitable outcomes in public spaces. While inter-agency collaboration often involved informal meetings, the engagement with mana whenua appears more structured and intentional, supported by internal agency processes and the active stewardship of the Local Board.

3.3. Neighbourhood scale integration

Incompatibilities between the spatial scales around which organisations based their infrastructure planning posed a specific challenge to delivering active travel infrastructure. While KO has a master plan and dedicated project team for each neighbourhood, AT’s teams are organised around infrastructure delivery and do not have a dedicated manager for the Māngere West development.

“We don’t have an overarching delivery contact ... there’s no one who has necessarily been assigned to Māngere West. So all the improvements are kind of happening pretty incrementally ... that’s something that we’re working on at the moment.” (AT1).

As the various transport aspects have been developed in Māngere West, different teams within AT have become involved in the project. This has led to a more fragmented approach to delivering active travel infrastructure within the neighbourhood.

KO interviewees discussed how these organisational differences strained collaborative efforts. In particular, they noted that AT’s more hierarchical structure made maintaining inter-agency relationships more challenging:

“[AT] have a model where they have one point person ... who we need to go through ... It is a bit more hierarchical ... it’s a little bit more difficult to break into an organisation that operates under that model.” (KO1).

An AT participant acknowledged that their organisational practices posed challenges for inter-agency collaboration: “We have a project

management framework that requires us to step through these gates ... but it largely ... doesn’t consider other organisations.” Although this approach complicated inter-agency collaboration, AT has prioritised maintaining technical standards and providing consistent guidance to their development partners.

3.4. Funding constraints, complexities and responsibilities

Participants all emphasised that their capacity to deliver active travel infrastructure was significantly constrained by funding limitations. As with any developer, KO must mitigate certain environmental effects arising from their development (such as increasing traffic volumes). However, the agency’s stated goals and its mandate to create ‘thriving communities’ make a commitment to deliver social and environmental outcomes well beyond mitigation:

“[we have] a mandate to create thriving communities ... [but] where does that stop and start? ... there’s a limit to how much money we’re willing to spend, or how much influence we can have.” (KO2).

Determining the extent of funding for neighbourhood enhancements beyond housing remains a topic of contention within KO and a point of political debate. Since KO will not fund all the proposed infrastructure upgrades for the neighbourhood, they must negotiate with their project partners. AT participants stressed that they have limited financial capacity to fund the proposed upgrades: “we always have a long list ... [but] our funding envelope usually only ... can afford to fund two to three options” (AT4). Delivering the majority of active travel infrastructure in the Māngere West master plan will, therefore, require tapping into additional funding. Some capital funding is available from regional and national sources. However, each source has its own purpose, processes, and timelines. As a result, sections of the network may be completed but remain disconnected for extended periods while funding for other sections is secured, resulting in a piecemeal approach to infrastructure delivery.

Focusing specifically on the relationship between KO and AT, the separately funded aspects of the project have resulted in misaligned design elements. As an AT participant explained:

“AT is now delivering the permanent pathway to ... Viscount Street ... but also, we have Kāinga Ora’s shared path on the other end. So ... the widened path will be on the western side opposite the school, but Kāinga Ora’s design has the widened path on the eastern side in front of the school because of their ‘Maunga to Moana’ design concept ... [AT’s] project scope is ... addressing each intersection separately. So ... our strategic network is missing out” (AT5).

Participants highlighted ad hoc negotiations over funding responsibilities for delivering and maintaining active travel infrastructure as a major point of tension in the partnership. These funding negotiations have increased the workload and transaction costs required to deliver each piece of infrastructure. This situation highlights a failure in both institutional design, which lacked clear rules for aligning projects and budgets, and collaborative leadership, which was not present to mediate these inter-agency conflicts and steward the project’s strategic network goals.

While there is some capital funding available to deliver active travel infrastructure within Māngere West, the Council’s operating budget for asset maintenance seems to be a more limiting factor. Since the improvements will be vested to AT, KO must ensure its AHP partners accept the future ownership of any transport infrastructure they deliver. Consequently, AT carefully reviews the ‘fit’ and long-term costs associated with KO’s infrastructure plans:

“The operational expense aspect is a key thing. How much does it cost to maintain? What will it cost to renew it? Obviously, we would like KO to completely refresh all the streets ... [But] Council and AT do not have the revenue to support significant debt.” (AT2).

This effectively means that the design of active travel infrastructure upgrades included in KO’s master plan is contingent on acceptance from AT. As the quote below indicates, AT engineers have tended to favour

standardised designs:

“A lot of the responsibility sits with ... Kāinga Ora, but then the outcomes sit with [AT] ... [and] we're kind of forcing them into a very sort of standard approach to doing things because AT likes to standardise as opposed to having all of these deviations from the accepted design.” (AT4).

An interviewee from AC similarly stated that their maintenance budget was limited and they did not want “gold-plated” assets that they would be expected to maintain.

Ultimately, AT did not support several design aspects proposed by KO. According to a KO participant, the agency had stated “too much” was included in the design and they “can't maintain it all, so strip it down” (KO3). Participants acknowledged that the ad hoc negotiation of funding for each piece of infrastructure was suboptimal and would likely result in a fragmented walking and cycling network for the neighbourhood long after the housing was completed.

4. Discussion

Pursuing sustainability transitions through inter-agency collaboration presents a significant challenge in contemporary governance, with effective solutions still not fully understood (Scott & Merton, 2021). Focussing on a collaboration between a central government urban development agency and a regional government transport agency, this case study demonstrates the challenges encountered by individuals involved in delivering active travel infrastructure as part of a neighbourhood redevelopment. Applying a sociotechnical systems lens, the findings identify critical obstacles to inter-agency collaboration that arise from the interplay between social dynamics (e.g., interpersonal relationships) and technical-structural factors (e.g., planning scales and funding mechanisms). Specifically, we reveal how scalar disconnects between strategy and delivery within and between organisations, varying spatial scales underpinning organisational planning structures, and opaque funding responsibilities can constrain collaborations. To address these challenges, stakeholders in our case study relied on interpersonal relationships and informal knowledge exchange activities. Although these strategies were beneficial, their reliance on informal agreements and understandings underscores how a lack of regulatory guidance to integrate land use and transport decision-making at a neighbourhood scale stymies the transition to a more sustainable transport system.

Conflicting organisational priorities is a key challenge in collaborative networks (Alhassan et al., 2021; Piatak et al., 2017; Vangen, 2017). In this case, a central tension arose from the interplay between KO's ambitious mandate for transformative neighbourhood development and the budgetary, administrative, and asset management constraints guiding AT and AC. Difficulties arose in the design and delivery of specific infrastructure as part of the development. While strategy teams shared conceptual understandings and objectives, the failure to vertically integrate these to inform ‘downstream’ collaborations suggests a significant leadership deficit, which was compounded by the budgetary constraints that created further challenges for individuals at all levels of the institutional hierarchies (Booz Allen Hamilton, 2014; Torfing et al., 2020).

These challenges were multifaceted. Budget constraints, coupled with a lack of regulatory guidance to secure capital funding and manage operating budgets across national and regional levels, created further challenges. Additionally, AT's responsibility for long-term asset management gave them the authority to veto infrastructure designs deemed non-standard or too costly to maintain, reflecting a pragmatic focus that sometimes clashed with KO's broader placemaking vision.

Efforts to improve integration at the delivery level were evident through AC's regular Māngere precinct working group meetings. These meetings served as forums for knowledge exchange and maintaining interpersonal connections, which are crucial for developing trust and shared understandings between project partners for effective collaboration (Ellonen et al., 2008; Kamaşak & Bulutlar, 2010; Politis et al.,

2017;). Additionally, these meetings allowed KO to receive immediate feedback on its AHP master plans from AC and its CCOs, creating opportunities to find pragmatic solutions to complex problems. However, resistance based on differing ways of working was particularly evident at the engineering and project manager levels and could frustrate attempts to reach solutions (Sørensen & Torfing, 2021; Zuzul, 2019).

Working group meetings present a pragmatic response to a regulatory deficiency in NZ that has been noted previously (Lips et al., 2011; Smithers, 2020). As observed by Alhassan et al. (2021), intentional efforts (such as workshops) to align project stakeholders and determine clear formal roles can increase the effectiveness of an inter-agency collaboration. However, although these informal meetings allowed the collaboration to activate, they provided no pathway for it to institutionalise into a more resilient process (Ulibarri et al., 2020). Consequently, the lack of a formalised collaborative structure resulted in misunderstandings that potentially damaged trust between the Māngere project partners and increased the transaction costs of collaboration (Scott & Boyd, 2023; Scott & Merton, 2021). Network flexibility (Corbin et al., 2018; Willem & Lucidarme, 2014) and informality (Rye et al., 2018) have been viewed positively in some collaborative contexts. However, our study demonstrates that collaboration can be impeded when formalised collaborative agreements are lacking and interpersonal relationships are relied upon.

Alongside funding limitations, lack of physical space is also frequently cited as a barrier to delivering active travel infrastructure (Liu et al., 2024). For example, increasing street tree canopy cover, also a shared strategic goal, was compromised in Māngere West by engineering decisions that did not leave space (literally and metaphorically) to include the planting of new trees.

The collaborative delivery of active travel infrastructure faces significant challenges due to a lack of funding at both local and national levels (Mackie et al., 2021). This financial scarcity pressured project partners to limit their respective responsibilities for infrastructure delivery. While KO interviewees claimed they had access to ‘patient’ capital to support the delivery of new infrastructure, the AT design team were hesitant to accept the proposed designs due to concerns about long-term asset maintenance obligations. Limited resources exacerbated inter-agency competition and heightened tensions, especially without strong trust between stakeholders (Austen, 2018; Linden, 2010). This relationship underscores how funding constraints can undermine collaborative efforts, making it challenging to achieve cohesive and sustainable infrastructure development. A potential solution is to improve vertical integration so that national-level policy and guidance can be directly tied to funding for local government delivery of infrastructure (Crossland et al., 2022; Koksal et al., 2021).

Reflections on leadership, as a driver of interagency collaboration (Emerson et al., 2012), were surprisingly absent from the participants' narratives. The enduring struggles to integrate planning processes, reach common design solutions and secure funding for mutually favoured projects, suggest a deficit of strong leadership by the AHP which was designed to provide collaborative leadership. However, regulatory and funding support is needed to underpin delivery of active travel infrastructure and the power of an ‘automobility’ regime within political discourse to undermine mode shift to active travel cannot be dismissed, even where it is a shared goal broadly endorsed at a strategic level. As suggested in previous studies, the delivery of active travel infrastructure can be undermined in subtle ways when underlying concepts and goals are not shared by all stakeholders (Mackie et al., 2021). This was evident where KO's more ambitious or bespoke design objectives encountered resistance rooted in AT's operational focus on standardisation and the perceived risks associated with deviations from standard practice. Such variations from standard infrastructure delivery are often perceived as risky, particularly by actors invested in existing design solutions and forms of mobility (authors).

This study contributes to theoretical discourse on sociotechnical systems by highlighting how conflicting organisational scales and

structures are a key challenge to achieving integrated land use and transport planning. Building on earlier insights into the role of governance structures and decision-making processes (Hrelja, 2015), this research demonstrates how such challenges manifest at the neighbourhood scale in the delivery of active travel infrastructure. In the Māngere West case, KO's neighbourhood focus allows for comprehensive business cases and dedicated project teams, while AT's infrastructure and network focus lacks a mechanism for place-specific responsiveness. These findings support recent critiques of entrenched mobility regimes and institutional silos that constrain sustainable transport transitions (Tuominen et al., 2022). As interview participants from AT themselves acknowledged, achieving sustainability goals will require improved mechanisms for coordination and cooperation between agencies. In addition to formalising existing working group meetings, these could include joint planning frameworks and digital data sharing tools such as AT's Future Connect.

5. Conclusion

Inter-agency collaboration is critical in delivering active travel infrastructure within neighbourhood-scale developments. Despite strategic alignment, in the Māngere West case study, conflicting organisational structures, budgeting processes and practices hindered collaboration and stymied the delivery of active travel infrastructure. Impediments to collaboration centred around lack of formal regulatory support for integrated land use and transport planning, varying organisational scales and structures, and limited capital funding and maintenance budgets for active modes. Interpersonal relationships and informal spaces for knowledge exchange were effective approaches to nudge change. However, rapid mode shift to active mobility requires a broader tranche of effective collaborative strategies. A joined-up regulatory response, integrated organisational structures, streamlined funding, strong leadership, and formalised spaces for inter-agency collaboration are needed to build momentum for change.

CRedit authorship contribution statement

Simon Louis Opit: Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Karen Witten:** Writing – review & editing, Project administration, Methodology, Funding acquisition, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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