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Overcoming obstacles to accessibility and inclusivity in an Australian regional city: A transdisciplinary research approach

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ABSTRACT

This paper describes research asking what is required to overcome entrenched obstacles to accessibility and inclusivity in an Australia regional city, in particular for those living with disability. A transdisciplinary, systems thinking approach allowed a range of stakeholders, including many with lived experiences of disability, to create a collective plan of action. This plan included interdependent interventions, independent and ahead of national governance, connecting urban planning policy to education, public transport, housing provision, co-design of public buildings, community infrastructure and inclusive employment practices. Interdisciplinarity and transdisciplinarity within regional planning research was seen as impacting the process and outcomes.

摘要

本文描述了一项研究，该研究询问了澳大利亚的一个地区性城市，特别是对那些残疾人仕来说，要克服根深蒂固的无障碍和包容性的障碍需要什么。一个跨学科的系统思考方法使一系列的利益相关者，包括许多有残疾生活经历的人，能够制定一个集体的行动方案。该计划包括相互依存的干预措施，独立并领先于国家治理，将城市规划政策与教育、公共交通、住房供应、公共建筑的共同设计、社区基础设施和包容性就业实践联系起来。区域规划研究中的跨学科性和跨学科性被认为影响了这一过程和结果。

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Australia; regional city; disability; systems thinking; accessibility; social inclusion

1. Introduction

While globally, legislation, policy and the underlying mechanisms that drive urban planning and development commonly aspire to principles of access and inclusion, rarely in practice do outcomes live up to these aspirations (Johnson *et al.* 2019). When the United Nations Convention on the Rights of Persons with Disability (United Nations 2007) was ratified by Australia in 2008, there followed the National Disability Strategy 2010–2020 (Commonwealth of Australia 2011), which aimed to address the significant barriers to access and inclusion faced by people with disability in all areas of community life. Despite advances in legislation and policy, the needs of many people remain unmet and opportunities for social participation and the attainment of human rights is restricted

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by environmental barriers, particularly across cities (National People with Disabilities and Carer Council 2009a, Australian Government Department of Social Services 2019). This paper posits that prioritising accessibility and inclusivity at a regional city scale can be catalysed by harnessing systems-thinking to a collective impact approach, for this creates solid understanding of the complex and interdependent structural, social, economic and political processes that both obstruct and drive change. The research process was informed by the incorporation of systems thinking into planning methods: for local governments (Seymoar 2004); to frame community-based participatory research to address complex health issues; and to enhance the study of neighbourhood functioning (BeLue *et al.* 2012).

The study took place in Geelong, a regional urban centre of Victoria, Australia, where there is widespread commitment to addressing discrimination and exclusion based on disability. To that end, a state government department asked a multi-disciplinary research group to determine the feasibility of making Geelong a "world-class" accessible and inclusive city. While the aim was ambitious, a regional-scale city with an already-engaged community presented a uniquely fostering context to realise this end. Moreover, the timing of the project promised advantages, because Geelong is recently home to key agencies with particular concerns for people with disability – the National Disability Insurance Agency (NDIA), the Traffic Accident Commission (TAC), and WorkSafe (the trading name of the Victorian WorkCover Authority). In addition, Geelong has a highly knowledgeable, engaged and determined disability community as a result of many years of lobbying for inclusion, visibility and change. However, slow progress suggested the need to move to a more participatory and holistic process recognising the city as a complex and changing system of "underlying dynamics, and patterns of interaction" (Sanders 2008, p. 275). Such a process echoes the use of systems thinking to inform sustainability policies and practices (Davidson and Venning 2011, Barton 2013).

It is argued that community-based participatory research can benefit from systems thinking to (a) visualise and specify the complex and dynamic characteristics of problems faced by people with disability and (b) identify intervention points to inform a collective plan of action (BeLue *et al.* 2012). Such plans have potential to holistically link actions as interdependent regional interventions, connecting urban planning policy to education, public transport, housing provision, co-design of public buildings, community infrastructure and inclusive employment practices for more equitable economic participation. This form of participatory decision-making and integrated planning echoes the design of public policy and urban governance for social inclusion in Ottawa (Andrew and Doloreux 2012), and the process of design for green infrastructure in Rotterdam (Tillie and van der Heijden 2016).

Before defining accessibility and inclusion within the context of urban planning and research, and within the particular geographical and socio-political context of this study, we will first locate the research in the literature on the geographies of disability. We then consider the historical use of systems thinking in urban regional planning and research.

2. Background

2.1. Studying Disability in the City

There is a body of research that focuses on the processes by which urban environments may create barriers and, in the process, further marginalise those living with disability. Here, key thinkers like Robert Imrie have detailed the links between disability and the built environment by highlighting the socio-cultural and political processes underpinning the social construction and reproduction of disability as a state of marginalisation and oppression in the city (Imrie and Imrie 1996, Imrie 2001). Such an approach directs attention to the built form, how it is riddled with boundaries and barriers that create particular geographies of exclusion for people with disability, as the city subtly preferences the mobility and presence of able bodies within it (Imrie 2001). The city therefore has spaces

and processes of exploitation, marginalisation, cultural imperialism, violence and generates powerlessness; all of which direct attention to points of intervention (Imrie and Imrie 1996). Imrie hints at what needs to be added to such socio-structural analyses, which is the notion of embodiment and how the "disabled" body is variously demonised, medicalised and actively not planned for or accommodated in cities.

In addition to those attempting to develop an explanatory framework for examining social differentiation in cities, others focus on how to address the issue and here there are an array of agendas around the notion of the healthy city (WHO 1990), the smart city (Bates and Friday 2017), the good city (Amin 2006), the just city (Fainstein 2014), the care-full city (Rachele *et al.* 2020) the open city (Gleeson 2001), and physically removing barriers to inclusion (Imrie 2001, Gleeson 2002). Such work identifies key dimensions of the city, the assumptions underlying them, how they in turn create boundaries and barriers to many people living with impairments and disability across the lifespan, and alternatives: its built form, mobility, employment and economic participation, political voice, pride and representation, and sense of belonging and inclusion. The work has also focused on principles that can guide the unpacking of broad concepts such as *access* and *inclusion*, including uncovering and changing systems of exclusion within institutions and discourses and their replacement with principles of justice, rights and care, which in turn infuse policies, practices and attitudes. Such principles were enshrined in 2015 in the 17 United Nations Sustainable Development Goals, which explicitly include disability and persons with disabilities 11 times; specifically in relation to education, growth and employment, inequality, and accessibility of human settlements.

Despite years of lobbying and the implementation of many ameliorative actions, for those living with disability the city remains a hostile and unwelcoming place. It is therefore appropriate, indeed urgent, to go beyond piecemeal approaches to conceptualising and intervening in the inaccessible city towards a more integrative, systems approach that captures the broad, interconnected nature of lived disability in the city in both understanding and action.

2.2. Systems Thinking in Urban Regional Planning and Research

Sanders (2008, p. 275) argues that the current and future challenges of cities "require new ways of thinking about and understanding the complex, interconnected, and rapidly changing world in which we live and work", and offers systems research as a "lens for exploring the development and ongoing evolution of cities" within larger environmental contexts. This lens informs understanding of cities not as linear cause-and-effect systems, but rather as dynamic systems where the variables are constantly interacting and changing to create nonlinear feedback loops.

Systems thinking, which system dynamics is nested within, is an analytical approach to complexity that is applied to issues, problems and contexts where there are many possible solutions or ways of creating solutions. System dynamics, first developed by Forrester (Forrester, 1958, 1961), was adapted to examine problems emerging from intense and rapid urbanisation (Forrester 1969). While at the turn of the century, the practical application of systems thinking in urban planning came to be increasingly proffered to cope with issues of sustainability, which required non-linear and organic thinking (Tippett *et al.* 2007, Martin 2008, Nguyen *et al.* 2011, Pisano 2012), systems approaches for sustainable development have only recently been widely applied in practice (Davidson and Venning 2011).

Integrated planning theory aligns to a systems thinking approach (Yigitcanlar and Teriman 2015); incorporating into rational planning approaches aspects of consensus building and participatory design, and encompassing procedures to take urban ecosystems into consideration during planning (Pettit and Pullar 1999, devries *et al.* 2005, Abukhater 2009, Ravetz 2016). Integrated approaches have been advanced for changing planning practices for sustainable accessibility in urban environments, with participatory approaches central (Curtis 2008, Straatemeier and Bertolini 2008).

In this research we have used systems thinking as a participatory method "for involving communities in the process of understanding and changing systems" (Hovmand 2014, p. 1). Our approach builds on work addressing complex health issues, how community factors are interrelated, and how they can best intervene in it (BeLue *et al.* 2012). Its applicability and appropriateness for use as an analytical framework acknowledges that access and inclusion is constrained by a number of factors that feel immutable to many people. While these factors have been historically challenged and some improvements made, a systemic inertia and preference for actions that only leverage singular parts of the whole system has set in. In order to arrive at an understanding of how feasible certain actions, goals and visions are, we must identify how those actions, goals and visions are behaving in the current state of the system.

2.3. Defining Accessibility and Inclusion

Accessibility is a "broad and flexible concept that can be defined as the ability to approach something by someone" (La Rosa *et al.* 2018, p. 346), as quoted by Rebernik *et al.* (2019, p. 196). Accessibility can be perceived from a variety of perspectives: from economic, physical, information and communication aspects to medical services and many others. Social exclusion tends to be more associated with the risk of poverty, with solutions usually conceived as operating through the social welfare system or via job creation and training (Atkinson 1998, Marlier *et al.* 2007, Hayes *et al.* 2008). Social inclusion is more about a sense of belonging, or as Dovey and Gordon note: "the unconditional opportunity to participate in key activities" (2017, p. 234). Concerning people with disability, accessibility reflects the ability to access and use a particular environment, product, service or information (Burchardt and Le Grand 2002), and represents a strong conceptual tool for empowering those with disability to live an everyday life like any other citizen. Accessibility is thus a precondition for inclusive cities and societies. In the project described here, the terms "accessibility" and "inclusion" primarily, but not exclusively, refer to: (1) accessibility of public spaces, community services and infrastructure, and economic participation; and (2) inclusive urban planning, design governance and employment practices to ensure positive attitudes and sense of belonging.

3. Study Context

3.1. Geographical Scope

Located 75 kilometres from Victoria's capital city of Melbourne (Figure 1), Geelong is the second city of the State with 244,000 people. More than 14,000 – or 6% of the population – declared in the 2016 Census that they needed help in their daily lives because of disability (ABS 2016). Like many other Australian cities, it also has a rapidly ageing population whose need for services and an accepting environment will only grow over time.

3.2. Social Policy Context

In Australia, long term advocacy by carers, family members and those with disabilities culminated in the ratification of the UN Convention on the Rights of Persons with Disability (UNCRPD) in 2008, the Disability Discrimination Act (Australian Government 1992) and disability action plans at Federal, State and Local government levels. The preparation of the National People with Disabilities and Carer's Council's 2009 *Shut Out* Report was followed by a Productivity Commission Inquiry into *Disability Care and Support* (2011), which confirmed the many problems raised by activists – of underfunding, fragmentation, unequal and ineffective care (Productivity Commission 2011). These reports and advocacy highlighted the marginalisation, medicalisation and infantilisation of those with a disability and they were met by a bi-partisan call and actions for change.

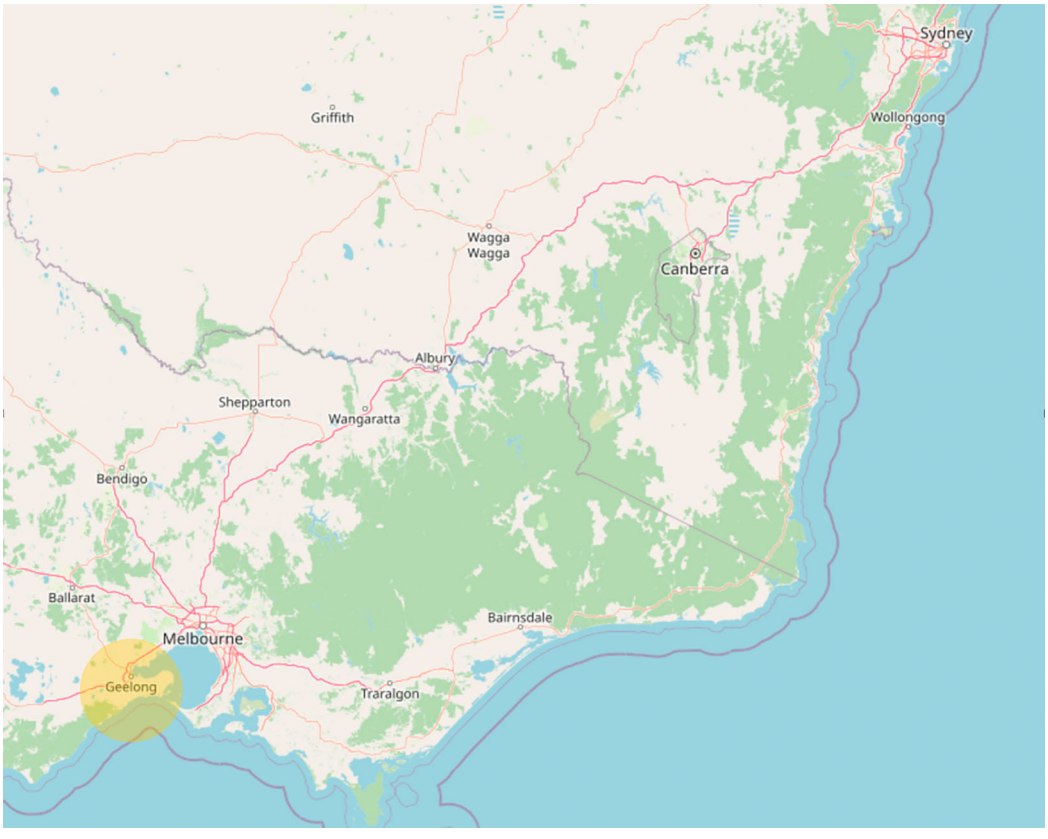

Figure 1. Location map for Geelong (source: https://www.openstreetmap.org).

Out of this reform and activism emerged the National Disability Insurance Scheme (NDIS), overseen by the National Disability Insurance Agency (NDIA). The NDIS promises to revolutionise the care and support of those designated to have "high needs" in Australia by locating responsibility and funding at the highest Federal level of government, delegating service delivery to competing agencies and the power of choosing what is needed along with adequate resources to those most in need (Weisel *et al.* 2017). Significantly, Geelong city centre was the chosen location for the head office of the NDIA. Like other Local Government Areas, the City of Greater Geelong (CoGG) is required to have an Access and Inclusion Plan for 2018–2022 (CoGG 2018). The vision of the Plan "is to uphold the rights of equal and dignified access for everyone while setting out how we will work towards full equality for people with disability to participate and be included in our broader community" (CoGG 2018, p. 5). The CoGG also joined the Global Compact on Inclusive and Accessible Cities in 2018 and in its various plans mention the word "accessibility" over 700 times (Johnson *et al.* 2019).

4. Method

Systems thinking were used to arrive at a solid understanding of the complex social, economic and political processes that impact urban change. The approach was guided by inclusion of the voices of those largely excluded and through adoption of an intersectional perspective. The methodology was therefore co-designed with a project taskforce of community leaders in access and inclusion. The project team regularly sought the expertise and experience of this taskforce, which included a significant number of those with lived

experience of disability, as well as service providers and advocates, whose insights were integral to the work conducted.

Data collection was approved by the Deakin University Human Research Ethics Committee (DUHREC – 2019-023). Two modes of primary data collection were used: (1) workshops that utilised the Systems Thinking in Community Knowledge Exchange (STICKE) tool, and (2) focus groups with people with lived experience of disability. A detailed review of the research and policy context preceded and ran in to underpin stakeholder knowledge with a firm evidence base.

There are many city domains where people with disabilities have limited access and/or feel excluded e.g. the built environment, community participation, rights, justice and legislation, employment, accommodation, education, transport, health and wellbeing (National People with Disabilities and Carer Council 2009b). In this project, these domains were collapsed to three subsystems to allow for focused analysis of stakeholder knowledge within the confines of a year-long study: (1) the built environment; (2) community infrastructure; and (3) employment and economic participation.

4.1. STICKE

STICKE is a software application developed by the Institute for Intelligent Systems Research and Innovation at Deakin University in collaboration with the World Health Organization Collaborating Centre for Obesity Prevention. The application aims to facilitate community knowledge exchange to foster shared understanding of complex problems. STICKE is based on the group model building (GMB) methodology (Peck 1998), which leads participants through a series of tasks (guided activities), facilitated by a small team of trained researchers, to examine participants' cognitive representations of interdependent causes and effects of a given situation or problem. The method as adapted for the study consisted of three key steps: (1) group discussion of the research question, and model building (consisting of the creation of a system "map", theme by theme, of the obstacles to accessibility and inclusion that, preceding the building of the map, have been prioritised by participants in small groups); (2) model review and development; and (3) confirmation of systems map and generation of prioritised action ideas. Actions were prioritised at the end of the workshops by the participants according to their perceived feasibility and impact. Here, *feasibility* relates to how participants understood the ease with which such an action can be implemented, given perceptions of cost, effort and the will of those endowed with the responsibility to act upon those actions, and *impact* relates to how they perceived the actions effect their own lives or bring about change to the system. The higher the score allocated via consensus by participants (from 1 to 10) for impact and feasibility, the higher is the perceived impact and feasibility.

The use of STICKE offered three key advantages: (1) directly sharing knowledge and experience between people with and without lived experience of disability on the barriers to accessibility and inclusivity; (2) allowing diverse stakeholders to generate a mutually agreed plan of action for overcoming city-scale obstacles to accessibility and inclusivity; and (3) maximising sustainability of change through collective impact, by providing opportunity for positive attitude shift towards disability in the process of conducting the research.

Three STICKE workshops took place with a mix of 11–25 persons with and without disability, each lasting one day and divided into two sequential sessions. Participants were members and/or patrons of professional and advocacy networks or had engaged and/or worked with peak organisations that focus on accessibility and inclusion issues. The facilitating researchers were drawn from a team of 21, spanning the range of disciplines necessary for understanding the complex urban context: architecture, health, homelessness, disability, accessibility and universal design, indigenous communities, human geography, policy, law, property and economics. In each workshop, the ratio of facilitators to participants was around one to five.

Recognising the complexity of accessibility and inclusivity issues, each of the three workshops concentrated on a separate "sub-system": (1) building, planning, and building regulations; (2)

community infrastructure; and (3) employment and economic participation. Here, a balance was sought between delineating city domains to represent the traditional divisions of stakeholder expertise, and minimising separation of the systems context overall.

4.2. Focus Groups

The actions identified in the STICKE workshops were evaluated via three focus groups. Participants represented a wide spectrum of disability experiences, including mobility, hearing, sight impairment and persons with complex needs. Each focus group centred a series of narratives through which participants were able to better understand how particular actions can be used to leverage change in the system. By asking participants to then estimate the impact of a proposed change (on a scale of 1–10), the data allowed for comparison with the feasibility evaluations made in the STICKE workshops, and with a leverage points analysis of the actions made by research team after the workshops (see Findings section for a description of the leverage analysis). Thus, the community evaluation techniques used in the focus groups allowed participants with experience of disability to assess the analytical process performed by the research team and assess the wider stakeholder evaluations made in the STICKE workshops.

The focus groups were attended by: a customer reference group for a disability support provider (12 participants); a support group for survivors of stroke and acquired brain injury (6 participants); and representatives from the project taskforce (7 participants).

4.3. Recruitment

Stakeholders from a range of backgrounds were recruited. Article 12 was followed of the UNCRPD in upholding the rights of persons with disability; recognising "that persons with disabilities enjoy legal capacity on an equal basis with others in all aspects of life". To gather a comprehensive understanding of the factors influencing the accessibility and inclusivity of Geelong, it was important that the sample was diverse and included people with a range of ages, professions and abilities. Here, the diversity of ability and disability must be noted. Many people who identify as having a disability do not have reduced capacity to consent but, rather, experience their social lives with physical or sensory impairment and intersecting barriers to inclusion. Additionally, it is highly likely that some participants who were stakeholders in their professional capacity, such as architects, educators, policy and project workers or advocates, might at the same time identify themselves as having a disability.

5. Findings

5.1. Systems Thinking Workshops

Data from the STICKE workshops consisted of two primary forms of output: (1) systems maps; and (2) priority actions. Three pervading themes were common across all three systems maps:

- Attitudes towards inclusion/access;
- Ability pride and inclusion as a value; and
- Valuing inclusion.

Given the centrality and relatedness of these three themes and their ubiquity across the three workshops, they were regarded as expressing *paradigmatic* goals with capacity to influence the overall system. Key factors that emerged across all three maps included: education, the built environment, federal government funding for those with disability (via the NDIS), and policy and empowerment.

Participants used the systems maps to help generate ideas for action to overcome obstacles to change in the systems. In total, 109 ideas across the three workshops were suggested, with 37 of these prioritised according to their likely impact and feasibility . Meadows's (1999) framework of leverage points in systems analysis was used by the researchers to evaluate participants' ratings of the 37 priority actions from least effective (a 12-point value) to most effective (a 1-point value). Leverage points denote places within a complex system where interventions can be staged. Meadows (1999, p. 1) termed these "points of power". After all actions were allocated a value by the research team through a process of consensus, they were synthesised into themes. These themes were expanded as narratives that were disseminated back to the stakeholders and research participants for feedback via the focus groups. Malhi *et al.*'s (2009) "intervention level framework" was used to perform this synthesis. Here, 12 leverage points used in the initial analysis were collapsed into five corresponding intervention levels. These five intervention levels – paradigm, goals, systems structure, feedback and delays and structural elements – encompass all priority actions and rank them from most effective (1) to least effective (5), see Figure 2.

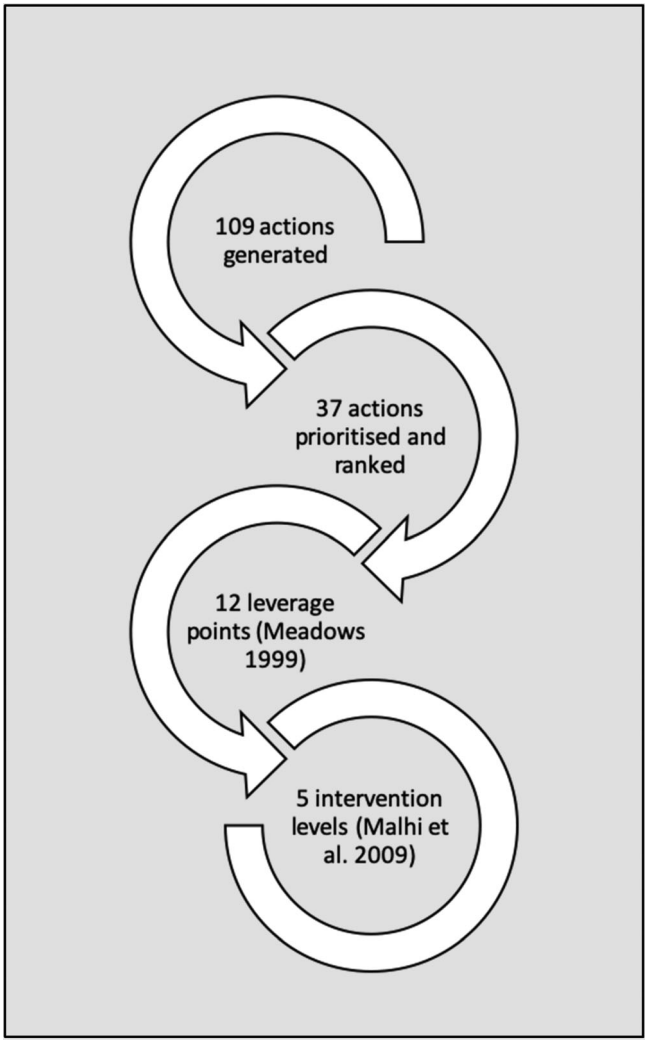

Figure 2. Flow diagram of priority actions into intervention levels.

5.2. Focus Group Evaluation of STICKE Outcomes

The evaluation of actions in the focus groups closely resembled both the distribution of impact scores from the STICKE workshops and the intervention level analysis completed by the researchers – therefore confirming the perceived level of impact that these priority actions might have on bringing about meaningful change. Feedback was used to refine or elucidate the actions. For instance, it was found that while many actions were rated as having a large impact, or would be effective in bringing about change to the system, there were often caveats to their implementation. These caveats identified that key actions with high leverage points would be unlikely to create systemic change if they were not enabled by a number of lower leverage point actions.

6. Analysis

Here, analysis of the key priority actions and their correlating leverage points is described, with focus upon the sets of actions that were identified to yield greater impact upon the entire system. Actions deemed to have lower feasibility were seen to become more feasible when tied with interrelated actions, while actions with higher feasibility were seen to have greater impacts when coupled with actions at higher intervention levels.

6.1. Built Environment

Intuitively, attempts to address constraining factors in the built environment often target upgrades to the built form to enable unencumbered mobility, adequate shelter and meaningful participation. Many actions suggested by our stakeholders reflect this. For example, adding ramps to public buildings, providing adequate shelter at transport stops, increasing accessible parking, and increasing the supply of appropriate and affordable housing are intuitive responses to addressing physical barriers to access and inclusion. These factors are matters of human rights and the right to the city more generally, and they should be a part of the ongoing development of Geelong and all cities. However, it should be acknowledged that such actions involve large delays, are constrained by system parameters, do not challenge the fundamentals of the system and are costly. In order to realise the full leveraging power of these actions, they must be implemented at a critical scale. Therefore, the recommended actions presented below target key points in the system that will facilitate a more effective implementation of such pragmatic responses. In this way, this study allows recommendations to move beyond those usually suggested in relation to environmental modification.

A factor central to the built environment systems map was attitude towards access and inclusion. In order to break negative feedback loops within the system, this factor must be changed. One action emerged as being a key leverage point in addressing this: *raise awareness of and improve attitudes towards access and inclusion across different platforms.* This was seen to involve engaging with existing champions in the community and developing an online resource of examples of best practice of accessibility and inclusion. This action was identified to be of high priority due to the level of impact it will have across the system, for intervention at this level will bring about effectual change to a range of other factors in the built environment system. Addressing this action in isolation from other factors will address the mindset or paradigm from which the system – its goals, structure, rules, delays, parameters – arises. A renewed focus on engagement, awareness and representation will target attitudes related to disability, promote wider levels of access and inclusion considerations, and grow the capacity of champions to enact further change.

While this action will make a significant change to the system, it is likely to have multi-actor involvement and require continual effort to maintain its positive effects. Implementation of this action will unlock new opportunities to engage the community and reduce delays in incorporating new rules or operating parameters. However, this action is impeded by constraining factors within the system, a condition that reduces its feasibility. The systems map indicated that the successful

implementation of this action will become more feasible if two interrelated actions are implemented concurrently or prior to raising attitude awareness:

- Formulate policy to involve persons with lived experience of disability in the co-design of all new public buildings; and
- Employ a high-profile advocate for people with disability and older people who has a lived/living experience of disability, to advocate to policymakers.

These actions relate to the power to add, change, evolve or self-organise the system structure, and have potential to unlock leverage points of higher value. For them to become feasible the following interrelated actions were identified, relating to the structure of information flows, which can unlock leverage points of higher value:

- Create a priority list of upgrades to transport networks, nodes and services; and
- Create/use an app that allows access and inclusion issues that can be identified and responded to in a timely fashion.

The list of actions described above is presented below (Table 1) in two columns labelled "Prioritised actions" and "Interrelated actions" with associated impact, feasibility, leverage points, and leverage point description.

6.2. Community Infrastructure

A number of factors were seen to influence how ability, pride and inclusion might be realised to the degree called for by community stakeholders: the provision of fully accessible schools, homes, public places, services and community groups; the presence of a government policy on inclusion; the

Table 1. Actions related to improving attitudes towards access and inclusion.

Prioritised actions	Interrelated actions	Impact	Feasibility	Leverage point	Leverage point description
Raise awareness of and improve attitudes towards access and inclusion across different policy initiatives, platforms of communication, events and spaces.		10	2	2	The power to bring about effectual change to a range of other factors in the system.
	Formulate a policy to mandate involvement of people with lived experience of disability in the co-design of all new public buildings.	10	8	4	The power to add, change, evolve or self-organise system structure
	Develop a policy advocacy role for people with disability that is filled by a high-profile person with disability.	10	7	4	The power to add, change, evolve or self-organise system structure
	Create a priority list of upgrades to transport networks, nodes and services.	8	10	6	The structure of information flows (who does and does not have access to information)
	Create/use an app like Snap, Send, Solve where access and inclusion issues can be identified and responded to in a timely fashion.	7	8	6	The structure of information flows (who does and does not have access to information)

provision of education by people with disability; and an enlarged capacity for collective, inclusive community belonging and social connection.

An action was identified as having high leverage that would change the mindset or paradigm out of which the system arises – its goals, structure, rules, delays, parameters: build an "inclusive" visitor centre run and managed by people with disability, with accessibility support staff. While intuitively the construction of a visitor centre does not immediately represent a leverage point action, given that it is a physical structure, its high value relies upon its accompanied services, information and supports, the employment of those with lived experience within it and its ability to be accessed across a range of geographies both physical and virtual. It is of high priority due to the impact it will have across the system if fully implemented. Intervention at this level will bring about effectual change to a range of other factors in the community infrastructure system and has the power to unlock space in the city where ability and pride can flourish and encourage related services to improve. The centre was conceived as an exemplar of Universal Design; not framed as a separate space for people with varied access needs, but an inclusive space able to be accessed by all; for people to make informed choices about accessible travel, accommodation, services and other aspects of participation, staffed by qualified support workers and people with disability. The centre does not therefore merely represent physical infrastructure, but it addresses obstacles in the systems map associated with multiple city domains and community infrastructures.

While this action can be a key leverage point in the community infrastructure system, it could easily be compromised by insufficient funding, incorrect planning and/or lack of advocate oversight. To ensure the centre remains feasible the systems map identified the following action to be implemented prior to its planning, and which relates to the power to add, change, evolve or self-organise the system structure and can unlock leverage points of higher value:

- Meaningful participation of people with disability in:
  - Development of government policy;
  - Grant design; and
  - Funding decisions for inclusion activities.

For the this to become feasible, the following action was identified that relates to the power to increase gains around driving positive feedback loops in the system structure:

- Cultivate champions: develop relationships with an organisation that has the values and provide training, guidance and to make change – use as example/ambassador for others.

For the above action to become feasible, the following actions were recommended because of their connections in the systems map that relate to changing the structure of material stocks and flows:

- More accessible parking to be provided by local government; and
- Upgraded, safe bus stops with lighting, shelters and even footpaths.

In turn, for the above actions to become feasible, the systems map linked the following action as one that might shift attitudes in favour of the capital investment required to fund these two actions, and which relates to changes in constants, parameters and numbers in the system structure:

- Hold an inclusive event which celebrates diversity through lived experience led storytelling.

6.3. Employment and Economic Participation

Valuing inclusion was identified as a key hinge factor in the behaviour of the subsystems that relate to employer actions, the agency of people with disability, support mechanisms and funding

arrangements. The most powerful action that can be taken to address this is to re-imagine the very conceptualisation of work and how it is performed. This is a paradigm-shifting action that would radically change all social relations, requiring a whole-of-society effort and an overhaul of the prevailing economic system. While no combinations of actions were identified that can enable this change, actions were seen to represent a step in this direction.

Two actions were identified as having high leverage points due to the catalysing force their implementation will have to bring about effectual change to a range of other factors in the employment and economic participation system. Furthermore, addressing these actions *together* will significantly address the mindset or paradigm from which the system – its goals, structure, rules, delays, parameters – arises. Both actions are based upon a co-designed, lived experience and expertise-driven formulation of policy and action in relation to how people with disability experience work.

The first was to *increase business groups' collective participation in developing initiatives around inclusion policy*. This entails a reorienting of the role and function of employers in such processes, whereby employers should collectivise their approach to access and inclusion barriers and seek to enable the inclusion of people with disability in forging pathways to inclusion. The imperative should be placed on business groups to work together on access and inclusion, rather than seeking to out-compete each other (often only marginally and to little systemic effect). Access and inclusion should be realised as a profitable aspect of whole industries, rather than the domain of niche businesses that corner markets or move into this space as a form of charitable action. This involves viewing access and inclusion as profitable resources that do not diminish bottom lines through, for instance, strengthening social networks, increasing trust, and reducing barriers for individuals to realise their potential.

The second action addresses the active and ongoing role of people with disability in the co-design of work arrangements, to raise expectations and aspirations of the employment and economic participation system by co-designing work arrangements with people with disability. The combination of this and the preceding action presents an opportunity to reorient how the employment and economic participation system works for people with disability. It was suggested that, as a combined action, employers should be enabled, incentivised or mandated to co-design working arrangements with employees (workplace design, job descriptions, productions targets etc.) and policies related to access and inclusion. In other words, people with disability should be part of every workplace initiative on the development of workplace standards so that the expectations of employers and employees are optimised for the benefit of both. This involves radically revaluing the participation of people with disability in the system so that their expertise can inform and reformulate the goals and aspirations of the system. At the time of the research this seemed to demand a paradigm shift in attitudes towards workforce participation, but in light of flexible working arrangements introduced for most people due to COVID within a year of the project concluding, at least the option of home-working for people with disability should no longer be an obstacle.

While these two actions will make significant positive alterations to how the system works, this is likely to mean multi-actor involvement and to require continual effort to maintain its positive effects. These actions are very feasible but can be enhanced by initiatives that relate to multiple action ideas created by community stakeholders. It is highly likely that the successful implementation of actions that relate to support mechanisms will enhance the feasibility of higher leverage points in the system.

The following three interrelated actions, as indicated by the systems map, should be implemented to facilitate this:

- Practical local support for employers to enhance employment conditions;
- Support/mentoring for business enterprise – people with disability to become employers; and
- Develop inclusivity support network for businesses to adopt and source help.

These actions can be combined to establish and support initiatives that service local businesses and grow the capacity of people with disability to become employers. As such networks exist, these should be developed to incorporate the above actions, including adequate funding and evaluation. The following actions could be packaged as an initiative with a number of functioning aspects:

- Government departments to adopt procurement and incentive policies that support employers that employ people with disability;
- Develop employer incentives – certification, accreditation or recognition at local levels that enable tax breaks, tender preferences, etc.; and
- Implement mandatory targets and policies related to access and inclusion that penalise non-compliance.

Moreover, as an enabler of industrial activity, the community suggested that government agencies should provide incentives or evaluation measures in the tendering processes of all new public contracts. Minimum standards should be set at world-class levels and attainment of those standards should be recognised by accreditation.

7. Discussion: Efficacy of Systems Thinking for Collective Impact Towards Urban Regional Change

The literature on systems thinking for urban planning raises two issues particularly relevant to the findings and outcomes of the project: transdisciplinarity within urban planning instruments (Barton 2013); and scale in relation to governance and decision making (Andrew and Doloreux 2012).

Transdisciplinary approaches have clear benefits for integrated planning in relation to wicked problems, such as inclusivity across multiple city domains. Moreover, governance of the implementation of integrated planning is strengthened by "in-depth participation of users and the integration of relevant knowledge from both practice and research in real-world problem contexts produce socially robust results" (Polk 2014). Yet to date, research and policy debate focusing on accessibility and social inclusion have largely failed to embrace this reality. As previously noted, "accessibility" and "inclusion" were defined in our study as encompassing the planning and design of public spaces, community services, infrastructure, transport, economic participation, governance, and employment practices. This expansive definition intentionally framed the research as transdisciplinary; demanding wide understanding of existing structural, social, economic, and political conditions. To influence policy and planning, the project demanded multi-entity, multisector engagement with influential stakeholders across multiple city domains. Only through such an approach would mutual understanding of current obstacles be achieved; with the ability to clear a pathway for longer-lasting structural and attitudinal changes for sustaining social inclusion. Our argument here extends beyond the contexts of accessibility and sustainability, evidencing social inclusion, transdisciplinarity and community participation as essential elements of integrated urban planning.

Finally, it is worth highlighting that in Geelong the relationships of trust developed during the project between State, local government and community stakeholders have created potential to implement the actions identified to overcome obstacles to accessibility and inclusivity. However, recognising previous limits to participation in the decision-making process, the community-endorsed recommendations of the research included a vehement call for policy leaders, stakeholder organisations and researchers to continue working closely together with people with disability; to develop, fund, implement and continuously evaluate the recommendations and actions. This call to action recognises that many of the recommendations informed by the project require numerous actors to work together both horizontally and vertically, and some of the interventions will incur a significant cost. The relationships and actions arising from the study are therefore recognised as merely one step towards Geelong attaining its ambitions. Encouragingly, in the year after the

research was completed, a not-for-profit organisation who provide strategic leadership and influence to help advocate for the city funded a team of business leaders to develop an implementation plan for the actions. The plan commenced with the identification of key local stakeholder organisations that would need to be engaged, of existing policy and funding organisations with remit for addressing the actions, and of the degree and source of funding that would be required.

7.1. Challenges and Limitations

Despite the strengths and insights of this research, the study faced two obstacles that future researchers would be encouraged to address, and which pertain to the study scope and the methodological approaches used.

First, the team was conscious of falling short of Oliver's gold standard of "research done by and for people with disability" (Oliver 1992). This was particularly acute in relation to accessing the harder-to-reach and often missing voices of some groups: people with mental health issues who do not identify as "disabled", including people with depression and anxiety; people with acquired drug- and alcohol-related cognitive impairments; people with other acquired injuries including brain injury; people on the autism spectrum and people whose experience of disability intersects with other issues that isolate them from society and/or make it harder for them to participate in community activities.

Second, the format of the STICKE workshops appealed to organisations much more than to people with disability. This resulted in lower than hoped for representation in the workshops of people with lived experience of disability, which impacted the process and results, especially in relation to breaking through the long-held and well-articulated beliefs of the caring profession. To address the STICKE shortcomings, focus groups were held that were more accessible to people with lived experience of disability. The focus groups led to actions that were more user-centred, user-created and user-managed, thus increasing the visibility and engagement of people with disability, and in doing so informing change that could catalyse community-wide attitudinal shift. Nevertheless, these focus groups were not entirely inclusive, for it was noted that people who were non-verbal communicators had limited opportunity to meaningfully contribute.

Lastly, it is worth noting here that many of the recommendations made require numerous actors to work together both horizontally and vertically, and some of the interventions will incur a significant cost. Implementation stages are identified for the actions, commencing with the formation of working groups at a study symposium. Importantly, it is highlighted that co-research, co-design and co-evaluation with people with disability need to be used for all stages of the implementation and then evaluation of the effectiveness of actions. The relationships and actions arising from the study were recognised as merely one step towards Geelong attaining its ambitions. The implementation strategies can be read as a call to action for government, policy leaders, stakeholder organisations and researchers to work closely together with people with disability to develop, fund, implement and continuously evaluate the recommendations and actions identified by the study.

8. Conclusion

Before a range of academic literatures and policy interventions that had isolated domains for relatively ineffective interventions, this study tried to model the principles of inclusive, emancipatory research and engagement to seed collective impact. A systems-thinking approach for implementing community-informed change was used to build positive attitudes to disability through direct knowledge exchange between people with and without disability.

While the systems-thinking workshops informed strong pathways to actions for addressing accessibility and social inclusion obstacles – and were almost universally positively viewed by participants and researchers alike – the approach resulted in lower representation than hoped for of

people with lived experience of disability. To redress these shortcomings, short-duration focus groups were used to evaluate the solutions envisaged by the wider community at the workshops via their translation into narratives onto which participants overlaid their own lived experiences. The focus groups proved to be a key step for ensuring the recommended actions are more user-centred, user-created and user-managed, thus increasing the visibility and engagement of people with disability, and in doing so informing change able to catalyse community-wide and sustainable attitudinal shift.

The findings from an evidence review of contextual research and policy, STICKE workshops and focus groups were brought together into groups of nested actions addressing obstacles aligned to different leverage points in the complex system which might deliver city-scale accessibility and inclusivity in Geelong. In common with previous studies, transdisciplinarity within regional and urban planning instruments, and scale in relation to governance and decision making, were seen as factors that impacted the process.

In conclusion, the study can claim to have brought together a plethora of research, strategic plans, diverse lived experiences and expertise in Geelong to forge new collaborative relationships. Outcomes were enhanced by the transformative nature of the knowledge exchange and knowledge creation between participants. As a result, the changes suggested and embraced by decision makers and the community should be sustainable. Importantly, the systems approach underlined that the actions recommended in the collective plan cannot occur in isolation, because they can only overcome systemic lassitude by being implemented in combination at different leverage points in the system to effect real and long-lasting change.

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