

The Walk Within

A nodal based framework on the implementation of Walkable and Regenerative urbanism within Māngere East, Auckland, New Zealand.

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A nodal based framework on the implementation of Walkable urbanism and green city strategies within Auckland suburbs.

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Abstract

Re-stitching the Suburban Fabric

Tāmaki Makaurau Auckland is currently grappling with the consequences of decades of low-density suburban sprawl, characterized by single-use zoning and a road network designed primarily for private vehicles. This urban model has resulted in high car dependency, fragmented ecological systems, and a hostile environment for pedestrians. While strategic planning documents like the Auckland Plan 2050 promote a “quality compact city,” the lived reality in many suburbs remains one of social isolation and environmental vulnerability to climate-related risks such as flooding. Architecture and urban design are central to this issue, as they have historically prioritised vehicular mobility over human-scale movement and ecological health.

This thesis responds to these challenges by asking the central research question: How can principles of walkable urbanism and regenerative urbanism be implemented within Auckland suburbs in ways that respond meaningfully to local social, cultural, and ecological contexts?. The primary aim is to move beyond theoretical ideals and test the applicability of these frameworks through place-based design responses that integrate walkability, ecological repair, and social wellbeing.

The research employs a design-led methodology centred on a nodal framework and the tactical application of urban acupuncture, small, precisely targeted interventions designed to catalyse broader systemic change. This framework reinterprets the fragmented suburban form as a connected system of social and ecological anchors.

The strategic framework for urban revitalisation begins with Purpose Mapping, an analytical phase focused on identifying high-traffic trip generators such as schools, supermarkets, and healthcare facilities where the pulse of local life naturally clusters. Once these hubs are identified, Node Selection occurs by positioning targeted interventions at specific intersections where significant walkability deficits meet untapped ecological potential. Finally, the process of Stitching weaves these disparate

points into a unified fabric by connecting the nodes through green loops, which are safe and legible corridors for pedestrians and cyclists that simultaneously function as vital ecological habitats. The suburb of Māngere East serves as the primary case study and live testing ground. The site was selected because it typifies the Auckland suburban condition: it is spatially fragmented by post-war “Radburn” planning and arterial barriers, yet it possesses significant latent potential through its community anchors (such as Middlemore Hospital and the Māngere East Shopping Centre) and its existing green-space network.

The research demonstrates that meaningful transformation within car-dominated environments does not necessitate large-scale redevelopment but can instead be achieved through incremental and tactical change. By building upon established patterns of use, these design interventions show that walking follows purpose, meaning improvements are most effective when concentrated where everyday programmes already overlap. Furthermore, the findings suggest that ecology supports walkability, as integrating green infrastructure like bioswales, rain gardens, and shade trees improves micro-climatic comfort to make walking a more viable and pleasant choice. By focusing on the central node as both a destination and a connector, planners can facilitate nodal connectivity that allows for the re-stitching of divided urban fabrics. Walkable urban spaces that reduce traffic volumes, noise, and physical barriers can also function as permeable habitats for non-human species, creating safer and more ecologically supportive environments by lowering wildlife and vehicle collisions, reducing disturbance, and enhancing habitat connectivity within urban landscapes. Ultimately, the thesis concludes that when spatial proximity and ecological restoration are pursued simultaneously through a nodal approach, suburbs can transition into neighborhoods that are not only more accessible but also more socially connected and environmentally resilient.

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor used artificial intelligence tools or generative artificial intelligence tools (unless it is clearly stated, and referenced, along with the purpose of use), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning..

How We Got Here

Tāmaki Makaurau Auckland is experiencing sustained population growth and spatial expansion that has intensified long-standing structural issues in its urban form. Over several decades, development has largely followed a low-density suburban model characterised by greenfield expansion, single-use zoning, and an extensive road network designed primarily for private vehicles. This pattern has produced a city that is highly car reliant, where everyday activities such as accessing shops, schools, healthcare, and public spaces often require motorised travel. As the metropolitan footprint has expanded outward, infrastructure costs have increased, ecological systems have been fragmented, and travel distances have lengthened, disproportionately affecting communities with limited access to private transport. Car dependence has also contributed to rising carbon emissions, air pollution, and sedentary lifestyles, compounding public health and climate challenges.

Urban sprawl in Auckland has further eroded ecological resilience. Development on former agricultural land, wetlands, and volcanic soils has reduced biodiversity, altered hydrological systems, and increased exposure to climate-related risks such as flooding and heat stress. At the same time, the spatial separation of housing, employment, and services has weakened social cohesion and reduced opportunities for everyday social interaction in public space. While strategic planning documents promote intensification and a quality compact city, the lived reality across many suburbs remains one of fragmented street networks, hostile pedestrian environments, and limited access to nature within walking distance. These conditions form the critical issue this thesis addresses: how Auckland can transition from a car-oriented, extractive urban model toward neighbourhoods that support walkability, ecological repair, and social wellbeing.

Questions and Aims

Responding to these challenges, this thesis is guided by the central research question: how can principles of walkable urbanism and regenerative urbanism be implemented within Auckland, New Zealand, in ways that respond meaningfully to local social, cultural, and ecological contexts? Rather than treating walkability and regeneration as abstract or universal ideals, the research interrogates how these frameworks can be adapted to Auckland's suburban fabric, governance conditions, and environmental systems. The question foregrounds implementation, seeking to move beyond theoretical alignment toward spatial strategies that can operate within existing neighbourhoods shaped by car dependency and socio-spatial inequality.

The primary aim of this research is to test the applicability of walkable urbanism and regenerative urbanism within a specific Auckland suburb, evaluating how established theoretical themes translate into place-based design responses. The research seeks to analyse the selected suburb's spatial structure, pedestrian conditions, ecological networks, and community needs, using these findings to inform a design framework grounded in local realities. Key objectives include identifying barriers and opportunities for walkability, assessing the capacity of urban landscapes to support ecological regeneration, and exploring how small-scale, targeted interventions can catalyse broader neighbourhood change. Through design-led testing, the research aims to demonstrate how walkable and regenerative principles can be integrated rather than applied in isolation, producing urban environments that are both socially vibrant and ecologically restorative.

Why Is It Relevant?

As Auckland's population continues to grow and the impacts of climate change intensify, the need to shift toward more sustainable and resilient urban models has become urgent rather than optional. Car-dependent suburban development is increasingly incompatible with emissions reduction targets, infrastructure affordability, and public health outcomes. This study is significant because it positions walkable and regenerative urbanism as complementary strategies capable of addressing these intersecting pressures at the neighbourhood scale. By focusing on an existing suburb rather than a greenfield development, the research engages directly with the conditions that define much of Auckland's urban area.

The study also contributes to a growing body of design research that argues for context-responsive, people-centred urban transformation. By integrating ecological systems, pedestrian life, and community aspirations, the research demonstrates how urban design can support climate adaptation while improving everyday quality of life. In doing so, the thesis provides a transferable framework that can inform future regeneration efforts across Auckland and other similarly structured cities facing the combined challenges of growth, inequality, and environmental stress.

Scope and Limitations

The scope of this research is focused on neighbourhood-scale urban and community analysis. The study develops an urban and community research model grounded in Māngere East, using this suburb as a live testing ground for integrating walkable and regenerative urban principles. While acknowledging that a project of this nature should be co-designed directly with the local community, the research instead makes a concerted effort to understand their needs through existing consultative data. Community needs drawn primarily from Auckland Council. (n.d.). *Māngere East: Streets for People*, <https://akhaveyoursay.aucklandcouncil.govt.nz/mangere-east> engagement, which documents resident perspectives on safety, accessibility, and everyday movement. This approach ensures that the design responses are informed by local voices rather than assumed needs, aligning spatial interventions with lived experience even within the constraints of a desk-based study.

However, the research also acknowledges important limitations. Māngere East is a socially deprived area with complex, systemic challenges related to housing, income inequality, health outcomes, and historical underinvestment. While these issues shape the urban environment, they are not comprehensively addressed within the scope of this thesis. The research does not attempt to resolve broader socio-economic or policy-driven inequities, focusing instead on spatial, ecological, and public-realm interventions that can operate within existing constraints. As such, the findings should be understood as partial and situated, offering design strategies that contribute to improved walkability and regeneration but do not claim to address all underlying structural issues affecting the community.



The Components



Figure 1

Introduction page

Note. Image summary of literature topics. Own work.



Introduction

Tāmaki Makaurau / Auckland, New Zealand's most populous city, is undergoing a period of intense spatial and demographic change. With the population projected to surpass 2.2 million by 2043 (Auckland Council, 2021), the pressures of urban growth are increasingly visible in the city's form, infrastructure, and ecological health. Historically shaped by suburban expansion, Auckland has evolved into a low-density, car-reliant city, a model widely recognised as environmentally unsustainable and socially inequitable (Arbury, 2010). Much of this expansion has occurred on greenfield land, reinforcing automobile dependency, inflating infrastructure demand, and intensifying climate vulnerability, particularly to flood risk (Mees & Dodson, 2006; Auckland Council, 2020).

In response to these conditions, new interdisciplinary models are emerging that position pedestrian priority, ecological renewal, and tactical intervention as central to urban resilience. Walkable urbanism promotes compact, mixed-use neighbourhoods that reduce car dependence, improve health outcomes, and enhance access to daily needs (Gehl, 2010; Speck, 2012). Regenerative urbanism moves beyond harm reduction, aiming to restore ecological systems and deepen reciprocal relationships between people and place (Roggema, 2022; Blanco et al., 2022). Urban acupuncture, introduced by Jaime Lerner (2014), offers a tactical approach in which small, precisely targeted interventions catalyse broader systemic transformation.

These frameworks collectively form the basis of this literature review, which examines how compactness, ecological function, and micro-scale design can be integrated within Auckland's context. Six sections follow: walkable urbanism, regenerative urbanism, urban acupuncture, Auckland's spatial context, case studies, and an integration analysis. Together, these establish the conceptual ground for understanding how human-centred, ecologically aligned, and incremental strategies could inform future design responses in Auckland.

Figure 2

Human / ecology integration

Note. Collage of people integrating with wildlife as their own. Own work.



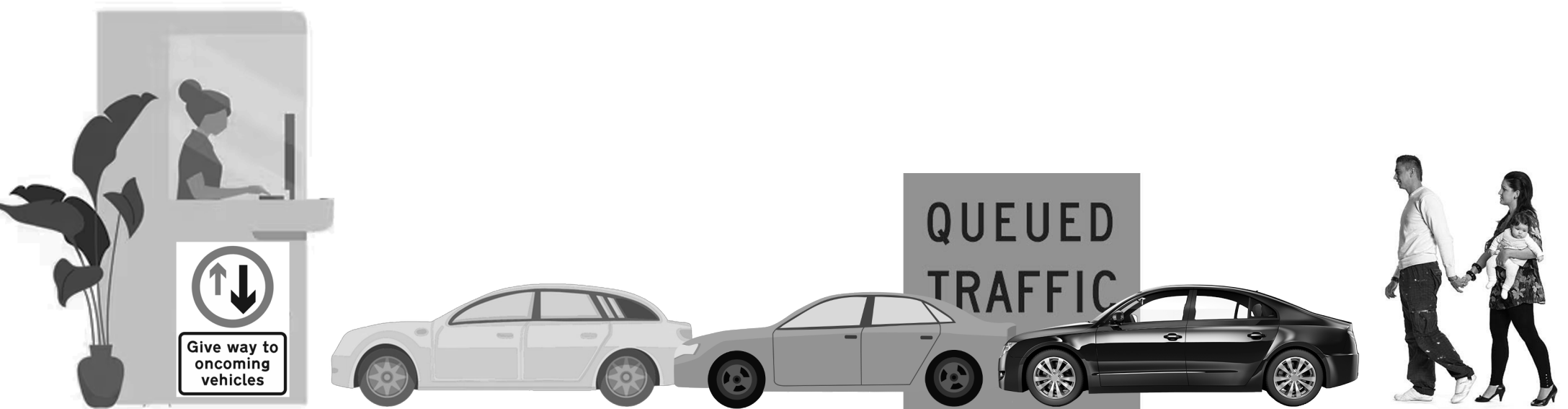
Auckland's Context

While the Auckland Plan 2050 encourages a “quality compact city,” walkability remains unevenly distributed. Inner suburbs like Grey Lynn and Mt Eden exhibit walkable qualities due to their historic grid layouts. However, outer suburbs such as Flat Bush, Hobsonville, and Millwater are largely car dependent, with cul-de-sac road patterns, zoning separation, and wide arterial roads that inhibit pedestrian movement (Arbury, 2010). As Arbury (2010) notes, this pattern undermines efforts to develop compact urban form, often resulting in neighbourhoods that lack street connectivity, mixed-use zoning, and public transport integration. These environments are typically not conducive to walkability, as they prioritise vehicular access over pedestrian permeability and local amenity. Furthermore, MRCagney (2020) highlights that disconnected suburban layouts disproportionately affect transport-poor communities by increasing travel times and reducing access to essential services.

Figure 3

Context of Auckland's urban environment

Note. Collage of issues within Auckland . Own work.



Walkable Urbanism

Walkable urbanism is a planning paradigm focused on creating human-scaled environments where people can live, work, shop, learn, and socialise without dependence on private vehicles. Rooted in principles of accessibility, density, and diversity, walkable urbanism promotes spatial configurations that encourage short, safe, and pleasant walking journeys. While it is often presented as a contemporary urban movement, the model itself is not new, it revives the spatial logic of pre-automobile cities, where compact form, mixed uses, and interconnected streets naturally supported walking as the primary mode of mobility (Jacobs, 1961; Speck, 2013). By challenging the dominance of the car and the fragmentation of land uses, walkable urbanism advocates for compact neighbourhoods, vibrant street life, and multi-modal connectivity (Gehl, 2010; Speck, 2012).

In the mid-twentieth century, mainstream planning was dominated by modernism, separating city functions and prioritising car-oriented layouts; everyone was focused on modernism, separate functions in cities, and car-oriented cities until Jane Jacobs's book started to question this model. In *The Death and Life of Great American Cities* (1961), Jacobs argued that urban vitality arises from mixed uses, short blocks, and dense, diverse streets where an everyday “sidewalk ballet” generates safety and civic life (Jacobs, 1961). Building on this turn, Jan Gehl's *Cities for People* (2010) translated these social insights into a human-scale design method, using decades of observation to show how seating, active frontages, and edge conditions invite people to linger and connect, putting “life between buildings” at the centre of design (Gehl, 2010). Jeff Speck then synthesised this lineage for contemporary practice in *Walkable City* (2012), articulating the General Theory of Walkability: walking must be useful, safe, comfortable, and interesting, with “useful” placing daily needs within walking distance; “safe” slowing traffic and improving visibility; “comfortable” shaping outdoor rooms with shade, shelter, and good edges; and “interesting” providing visual and social stimulation along the route (Speck,

2013). For cities with constrained budgets, Speck's “urban triage” focuses limited interventions where latent demand is highest, transit corridors, town centres, and school zones, rather than thinly spreading effort city-wide (Speck, 2012). In short, Jacobs reframed the problem, Gehl operationalised it at eye level, and Speck systematised it into a clear playbook: walkable places are not just about footpaths but about compact, human-scaled, mixed-use environments where people want to walk.



Figure 4

Walking within Auckland

Note. Collage of walking to amenities. Own work.

Urban Acupuncture

Urban acupuncture is a micro-intervention strategy in which small, carefully placed projects trigger larger transformations in the urban “body.” Drawing from the metaphor of medical acupuncture, Lerner (2014) describes cities as living organisms that can be revitalised through precise “pinpricks” that release blocked energy and stimulate social, cultural, and ecological healing. Examples include the pedestrianisation of streets, small public squares, temporary art projects, or community markets that restore civic pride and vitality (Lerner, 2014). Rather than replacing long-term planning, Lerner positions acupuncture as a catalytic complement: a way to demonstrate change quickly, generate collective optimism, and “spark currents that begin to spread”. Its strength lies in adaptability and immediacy actions can occur within days rather than decades, proving to citizens that transformation is possible.

Figure 5

Urban Acupuncture

Note. Collage of Urban acupuncture examples. Own work.





Regenerative Urbanism



Figure 6

Regenerative Urbanism

Note. Collage of the natural environment blended with urban life. Own work.

Regenerative Urbanism

Regenerative urbanism positions cities not merely as centres of human activity but as living, dynamic systems capable of restoring ecological health and cultivating social vitality. Distinct from sustainability frameworks that focus on harm reduction, regenerative design aspires to net-positive outcomes, actively repairing damaged ecosystems, restoring biodiversity, and strengthening the reciprocal relationship between people and place (Roggema, 2022). Rather than asking how cities can do less harm, regenerative approaches ask how they can become active participants in planetary healing.

A defining feature of regenerative urbanism is its context-driven nature. There is no universal formula; successful interventions respond to the specific ecological, climatic, and cultural conditions of place. As Blanco et al. (2022) emphasise, regenerative planning requires ecological intelligence, a deep understanding of local systems and materials developed collaboratively between planners, ecologists, engineers, *mana whenua*, and community actors. This interdisciplinarity ensures that regenerative outcomes are both technically robust and socially meaningful, embedding long-term stewardship within community practice. This sensitivity to context marks a key departure from the more generic tendencies of walkable urbanism, which, while vital for promoting active mobility and urban vitality, often applies standardised principles across diverse geographies. Walkable frameworks typically prioritise measurable spatial indicators, density, block length, proximity, whereas regenerative frameworks prioritise relational indicators such as ecological function, cultural belonging, and interspecies cohabitation. As this thesis later demonstrates, regenerative design can complement walkable urbanism by grounding universal principles of connectivity and compactness within site-specific ecological and cultural realities. Camrass (2022) situates regenerative practice within an ecological worldview that perceives cities as complex networks of feedback loops, flows, and relationships.

From this systems perspective, regeneration is not a finite project but an evolving, co-creative process in which human and natural systems continually shape one another. Allam and Newman (2023) similarly describe regenerative cities as those that “restore the capacity of ecosystems to support life while improving human wellbeing through circular, place-based design”. Beatley (2010) adds that biophilic design principles such as everyday access to nature, urban biodiversity, and ecological connectivity are essential to this process, helping cities act as habitats rather than mere settlements.

Ultimately, regenerative urbanism reframes the city as a key agent of ecological and cultural renewal, a landscape where urban form, social processes, and natural systems are designed to mutually reinforce resilience. It is not a static end-state but an adaptive continuum, continuously learning from local ecologies and communities. Through this lens, urban regeneration becomes not just about restoring land but about re-establishing right relationships between humans and their environment, between cultural identity and ecological integrity, and between the built and the living city.

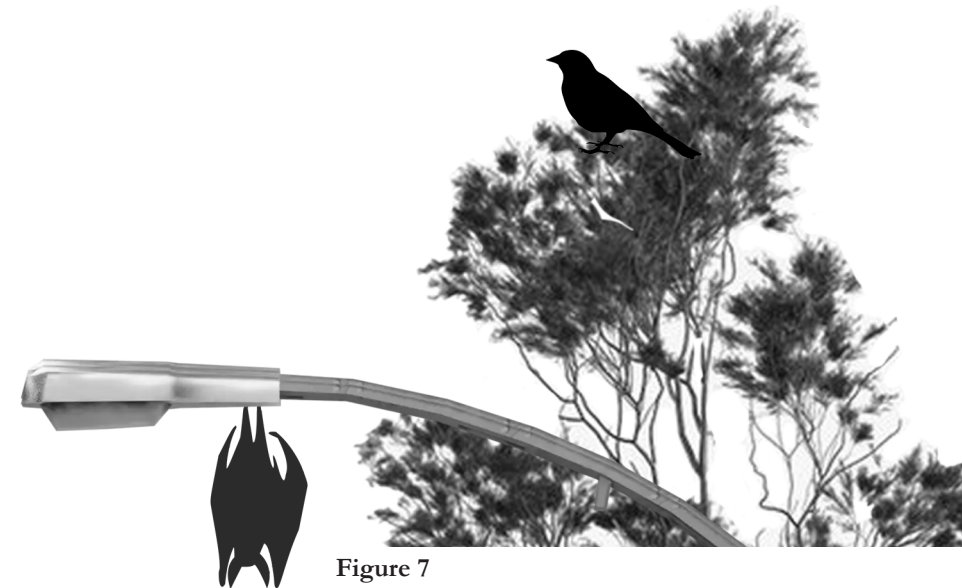


Figure 7

Regenerative Urbanism heights

Note. Collage of different species at different heights. Own work.

Case Studies

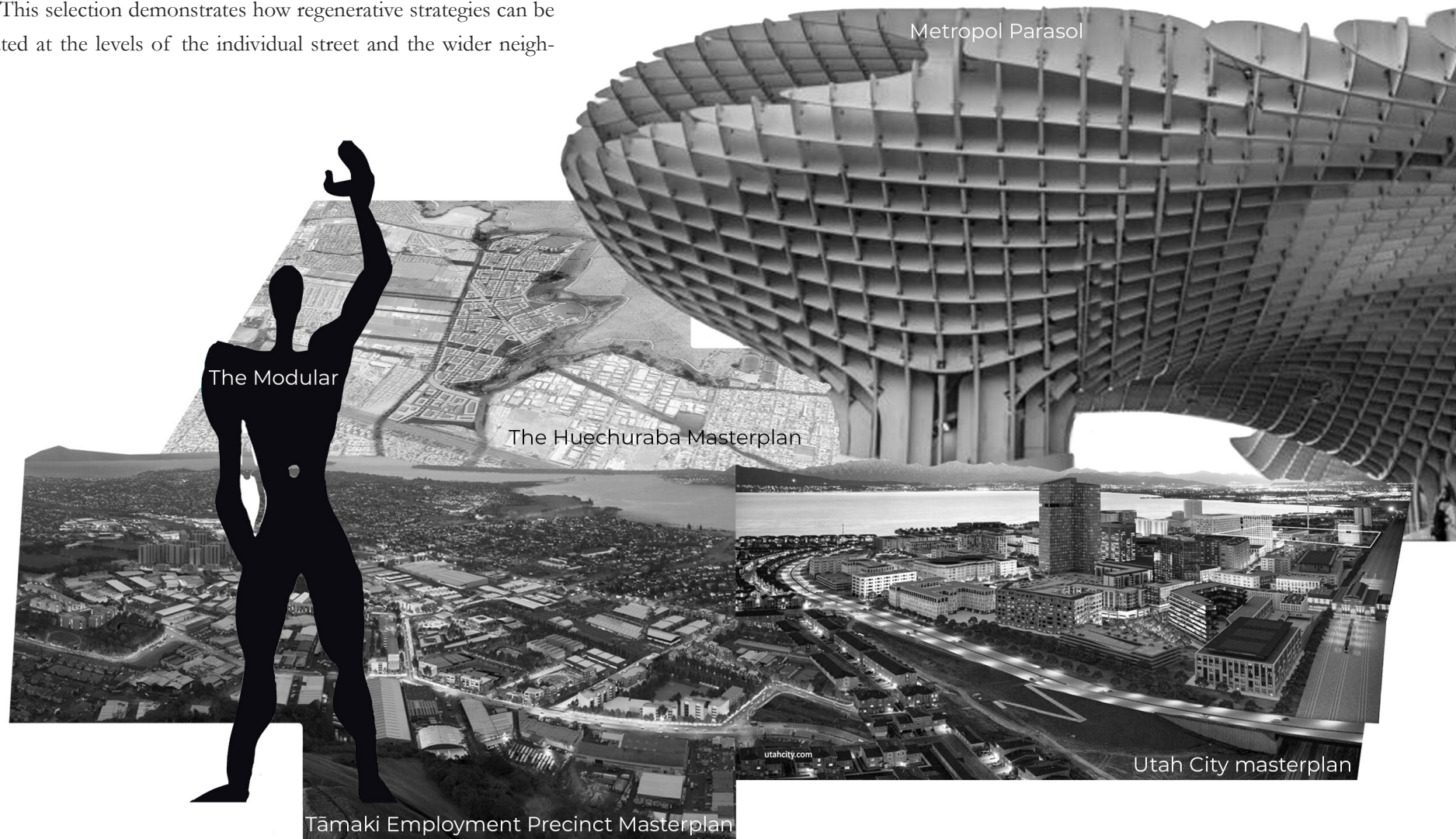
Across diverse urban contexts, walkable and regenerative urbanism are increasingly shaping long-term planning frameworks rather than isolated architectural interventions. The following case studies examine how these principles are translated into practice across a range of scales, reflecting the multi-scalar approach of this thesis. By acknowledging the complexity, time horizons, and implementation challenges involved, these examples highlight the role of public space, ecological systems, governance, and pedestrian prioritisation in supporting resilient and inclusive urban environments. This selection demonstrates how regenerative strategies can be successfully integrated at the levels of the individual street and the wider neighbourhood.

Figure 7

Case Study Examples

Note. Collage of the different case study projects analysed.

Own work.



The Tāmaki Employment Precinct Masterplan

Developed by Isthmus Group with the Tāmaki Regeneration Company and multiple public and community stakeholders, seeks to reposition a key East Auckland industrial area as a connected, mixed-use employment and innovation precinct. The 236-hectare precinct supports over 500 businesses and approximately 4,000 employees and is located between Glen Innes, Panmure, and Maungarei / Mount Wellington, embedding it within an emerging network of town centres, residential intensification areas, and public transport corridors as shown in figure 8 (Isthmus Group, 2023).

Figure 8

Map of Tamaki Employment Masterplan

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Note. Map showing size and relation to surrounding contexts. From *Prosperous people. Tāmaki Employment Precinct Masterplan*, by Isthmus, n.d. (<https://isthmus.co.nz/project/tamaki-employment-precinct-masterplan/>)

Independent planning assessments reinforce this positioning, identifying the precinct as one of the few remaining city-fringe industrial areas in a constrained land market and noting its proximity to rail infrastructure, planned cycleway networks, and mixed-use zoning transitions (Barker & Associates, n.d.). These conditions underpin the masterplan's emphasis on reducing car dependency and enabling a

gradual modal shift toward walking, cycling, and public transport as intensification occurs. Isthmus' vision of "a place for business and people to be connected, allowing enterprise and innovation to thrive and the community of Tāmaki to prosper" is operationalised through five principles: strengthening connections, creating activity nodes, establishing a community hub, enabling supportive planning and policy frameworks, and delivering digital and physical infrastructure as shown in figure 9 (Isthmus Group, 2023). While such principles are common within contemporary regeneration discourse, the New Zealand Institute of Architects jury notes that the Tāmaki Employment Precinct distinguishes itself through "concrete actions and tangible social, economic and environmental implementation," rather than remaining at a conceptual level (NZIA, n.d.).

Figure 9

Project Principles

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Note. The key driving principles to the Tāmaki employment masterplan. From *Prosperous people. Tāmaki Employment Precinct Masterplan*, by Isthmus, n.d. (<https://isthmus.co.nz/project/tamaki-employment-precinct-masterplan/>)

The NZIA jury further highlights the masterplan's 20-year horizon and its flexibility, supported by early and ongoing engagement with mana whenua, local boards, businesses, and the wider community. This approach is seen to establish a credible foundation for incremental change, reinforcing the importance of governance and stakeholder alignment in delivering long-term regeneration outcomes (NZIA, n.d.).

Figure 10

Community Engagement

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Note. Communal board for all stakeholders to share opinions. From *Prosperous people. Tāmaki Employment Precinct Masterplan*, by Isthmus, n.d. (<https://isthmus.co.nz/project/tamaki-employment-precinct-masterplan/>)

Rather than framing sustainability solely in environmental terms, the masterplan adopts a wellbeing-centred approach that positions social, ecological, and economic regeneration as interdependent. This aligns with statutory regeneration priorities that emphasise social wellbeing, economic resilience, placemaking, and housing as mutually reinforcing objectives within Tāmaki (Barker & Associates, n.d.). Initiatives such as the Tāmaki Loop exemplify this integration by combining walking and cycling infrastructure with cultural narratives, bilingual signage, and mana whenua-led storytelling, reinforcing tūrangawaewae while functioning as everyday transport infrastructure.

Taken together, the Isthmus masterplan, NZIA, and independent planning assessments position the Tāmaki Employment Precinct as a credible example of long-term, walkable, and regenerative urban strategy. While its outcomes remain contingent on staged delivery and policy follow-through, the project establishes a robust framework that balances economic productivity with community wellbeing, cultural recognition, and ecological responsiveness.

Utah City Masterplan

Is a large-scale master-planned development proposed for a 700-plus acre former industrial and greenfield site on the eastern edge of Utah Lake in Vineyard, Utah as seen in figure 11, intended to function as a new mixed-use urban core for Utah County (Woodbury Corporation, 2023; Planetizen, 2023).

Figure 11

Utah City Masterplan Map

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Note. Map showing Utah cities vast green space and design layout. From *Rising from the Desert: A 15-Minute City is Coming to Utah*, by Arch Daily, 2022. (<https://www.archdaily.com/979585/rising-from-the-desert-a-15-minute-city-is-coming-to-utah>)

Developed through a partnership between The Flagship Companies and Woodbury Corporation, the project is anchored to the existing Vineyard FrontRunner commuter rail station and structured around transit-oriented development principles that prioritise walkability, mixed uses, and compact urban form. More than

17 million square feet of residential, commercial, civic, and employment space is planned, supported by an extensive public realm network including a central green spine connecting the station to the lakefront, neighbourhood promenades, and over 50 acres of parks and open space (Woodbury Corporation, 2023).

Figure 12 from a walkable urbanism perspective, Utah City demonstrates a clear commitment to pedestrian prioritisation through its integration of daily amenities, employment, and civic uses within a transit-accessible, fine-grained street network.

Figure 12

Utah City Spatial Proximity Diagram

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Note. Map showing key transit corridors and connections. From *Utah is building a '15-minute city' on the site of a former prison*, by Ethen Freedman, 2022. (<https://www.independent.co.uk/climate-change/news/utah-toxic-dust-salt-lake-drought-b2201533.html>)

The early delivery of essential services, such as a centrally located grocery store, reflects an intentional sequencing strategy aimed at supporting everyday life rather than treating walkability as a secondary aesthetic outcome (Herald Extra, 2023). However, when evaluated through a regenerative urbanism lens, the project reveals important limitations. While sustainability ambitions are articulated through aspirations such as LEED community certification, the development largely represents a top-down, master-planned urban extension rather than a regeneration of an existing urban fabric or community. Its success is strongly enabled by favourable conditions, including large-scale land consolidation, limited existing infrastructure constraints, and proximity to a regional rail line, conditions that are rarely replicable in more complex, lived-in urban contexts (Planetizen, 2023).

As such, Utah City operates more convincingly as a model of walkable greenfield urbanism than as a fully regenerative urban project. While it advances principles of reduced car dependency, transit integration, and high-quality public space, its long-term regenerative potential will depend on whether social, ecological, and economic systems meaningfully co-evolve over time, rather than being delivered primarily through form and certification. This distinction highlights a key tension within contemporary walkable urbanism: the difference between designing for walkability and cultivating regeneration through embedded social and ecological relationships.

The Huechuraba Masterplan

Developed by Gehl People in collaboration with the Chilean developer Tanica, represents a strategic attempt to reframe a 150-hectare peri-urban site at the northern edge of Santiago as an ecologically grounded, human-scaled urban district (Gehl People, n.d.; UNEP Neighbourhood Guidelines, n.d.). Located between existing residential neighbourhoods, agricultural land, and the foothills of the Andes, the site presented complex physical and social conditions that challenge conventional perimeter-driven development as shown in figure 13.

Figure 13

Huechuraba Site Location

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Note. Huechuraba and surrounding contexts. From *Masterplan framework with ecology at its heart*, by Gehl architects, n.d. (<https://www.neighbourhoodguidelines.org/master-plan-framework-with-ecology-at-its-heart-in-chile>)

Gehl's approach began with a comprehensive Health Check to map existing infrastructure, movement flows, and public life opportunities, revealing stark contrasts between gated communities with limited public life and adjacent areas with more vibrant mixed uses. This diagnostic phase provided a baseline for the Masterplan Framework, enabling an evidence-led design that aims to unify disparate urban edges through intentional public space interventions and ecological integration.

(UNEP Neighbourhood Guidelines, n.d.; Gehl People, n.d.).

Central to the Huechuraba strategy is a Public Space Strategic Framework that prioritises the hierarchy of streets, pathways, and open spaces in relation to the site's unique topography, hydrology, and existing vegetation. Figure 14 shows the typology Studies that propose a “kit of parts” of building types, from courtyard houses to townhouses and mixed-use blocks intended to produce a diverse, inclusive public realm capable of supporting varied modes of everyday life and micro-climatic responses (UNEP Neighbourhood Guidelines, n.d.).

Figure 14

Huechuraba Design Typologies

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Note. Typology study example undertaken by project designers. From *Masterplan framework with ecology at its heart*, by Gehl architects, n.d. (<https://www.neighbourhoodguidelines.org/master-plan-framework-with-ecology-at-its-heart-in-chile>)

The plan also integrates ecological features and landscape transitions from urban to mountain edge, with public spaces near the foothills designed to be more vegetated and permeable, reinforcing biophysical connectivity and everyday access to nature as seen in figure 15.

Figure 15

Huechuraba Site Map

Viewed through a walkable and regenerative framework, Huechuraba exemplifies how master planning can move beyond static zoning to foreground ecology and public life as co-equal drivers of urban form. Unlike conventional development that treats open space and built form as separate compartments, the project embeds a multi-scalar public space network that links human movement patterns to environmental systems. By aligning street hierarchies and diverse building types with ecological conditions, the Masterplan aims to support sustained pedestrian activity, social interaction, and local climate adaptability outcomes that align closely with regenerative urban ambitions of relational, ecological, and socially inclusive urban environments rather than purely functional efficiency.

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Note. Ecological elements planned around the site to enforce everyday access to nature. From *Masterplan framework with ecology at its heart*, by Gehl architects, n.d. (<https://www.neighbourhoodguidelines.org/master-plan-framework-with-ecology-at-its-heart-in-chile>)

Le Corbusier's Modulor

Le Corbusier's Modulor is included in this thesis as a critical reference point for examining how human scale and proportional systems are conceptualised and operationalised in design, particularly given this research's use of geometric ordering and the golden ratio in the design phase. Developed between the 1920s and the post-war reconstruction period, the Modulor was conceived as an anthropometric and proportional system intended to provide a universal measure for architecture and urban production. Formally articulated by Le Corbusier in *Le Modulor* (1950) and *Le Modulor II* (1955), the system combines two numerical series, known as the red and blue scales, derived from the golden ratio and anchored to the height of an idealised male body measuring approximately 1.83 m, as shown in figure 16.

Figure 16

Le Corbusier, Modular

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Note. Scales derived from the golden ratio applied to architectural scale. From *On the Dislocation of the Body in Architecture: Le Corbusier's Modulor*, by Arch Daily, 2018. (<https://www.archdaily.com/902597/on-the-dislocation-of-the-body-in-architecture-le-corbusiers-modulor>)

Le Corbusier presented the Modulor as a “harmonious measure on the human scale universally applicable to architecture and mechanics,” positioning it as a rational tool capable of unifying design, industrial standardisation, and human experience across cultural and geographic contexts (Mameli, 2015).

Subsequent analysis demonstrates that the Modulor emerged not from mathematical rigour alone but through a hybrid process of geometric reasoning, approximation, and ideological projection. Mameli (2015) notes that while the system draws on long-standing traditions of proportional theory, including Pythagorean geometry and Renaissance humanism, its claim to universality conceals a historically and culturally specific conception of the human body. This critique is extended by Cohen (2014), who argues that the Modulor functioned as a neo-humanist narrative device, aligning post-war reconstruction with ideals of order, harmony, and technological progress rather than responding to the diversity of lived bodily experience.

Architectural criticism has further challenged the Modulor's anthropometric assumptions as exclusionary and reductive. The Failed Architecture critique identifies the system's reliance on a singular, able-bodied, Western male figure as emblematic of a broader modernist tendency to abstract and normalise the human subject, thereby marginalising women, children, elderly bodies, and non-Western populations. Rather than enhancing human-centred design, this abstraction is argued to produce spatial standards that privilege efficiency and visual order over social inclusivity and adaptability (Failed Architecture, n.d.).

When assessed through a regenerative urbanism framework, the Modulor's limitations become particularly evident. Although it foregrounds bodily proportion, it treats the human body as a static and universal constant, disconnected from ecological systems, cultural specificity, and evolving social practices. Regenerative urbanism, by contrast, emphasises relational, place-based, and multi-species approaches

that recognise variability, interdependence, and change over time. In this context, the Modulor is best understood not as a regenerative tool but as a historically influential example of human-scaled rationalism whose legacy clarifies the need to move beyond singular notions of “the human” toward more inclusive, adaptive, and ecologically embedded design frameworks.

The Metropol Parasol

Located in the Plaza de la Encarnación, Seville, represents a landmark achievement in modern timber construction and parametric design, completed between June 2008 and March 2011. Designed by Berlin-based architect Jürgen Mayer H. and engineered by Arup, the project was part of a redevelopment initiative to revitalise a 19th-century square in Seville's Old Town that had spent decades as a derelict parking lot. The site presented a complex urban challenge: it needed to reconnect city districts previously severed by a main road shown in figure 17 while integrating and protecting significant archaeological excavations of Roman mosaics discovered five meters below the square.

Figure 17

The Metropol Parasol

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Note. Reconnecting city districts through large scale architectural design. From *etropol Parasol, the Redevelopment of the Plaza de la Encarnación*, by J.MAYER.H, 2004. (<https://jmayerh.de/metropol-parasol/>)

The project's strategic framework is defined by six interlocking, tree-like “mushrooms” or parasols, reaching heights up to 28 meters. This multi-layered urban intervention utilizes a “parametricism” style that rejects conventional Euclidean geometry in favor of fluid, curvilinear forms that promote social interaction and information exchange as seen in figure 18.

Figure 18

Fluid / Curvature Based Design

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Note. The Metrosol Parasols tree like mushrooms and curvature supporting pedestrian life. From *Metropol Parasol*, by Sacyr, n.d. (<https://archello.com/project/metropol-parasol>)

The structure creates a vertical hierarchy of public functions: an underground museum (Antiquarium) for Roman mosaics, market stalls and shops at street level, and an elevated concrete platform that serves as a new public square for performances and gatherings. Above this, a restaurant, café, and panoramic walkways are nested within the timber lattice, offering views of the historic city center. Viewed through the lens of regenerative urbanism, Metropol Parasol exemplifies the integration of

advanced digital technology with material sustainability and microclimatic comfort. Figure 19 shows how the structure is built from approximately 3,400 individual Laminated Veneer Lumber (LVL) elements, totaling 3,500 m³ of timber. These elements are connected by a complex system of over 3,000 nodes, including moment-resisting connections and glued-in rods, designed to withstand local climatic conditions through iterative computer modeling. To ensure durability, the timber is sealed with a polyurethane spray coating that is resistant to UV radiation, allowing the use of timber in an outdoor environment.

Figure 19

Interlocking Parasols

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Note. The structures individually joined LVL via glued in rods. From *Update: Metropol Parasol* / J. Mayer H. *Architects*, by Arch Daily, 2010. (<https://www.archdaily.com/97661/update-metropol-parasol-j-mayer-h-architects>)

By providing a vast, permeable “urban canopy,” the structure mitigates the intense Sevillian heat, creating a shaded sanctuary that encourages prolonged pedestrian occupancy and outdoor commerce. This environmental mediation is paired with a programmatic diversity that ensures the site remains active throughout the day.

From the morning activity of the street-level market to the evening social gatherings on the elevated plaza, the project fosters a continuous cycle of urban life. The transition from the heavy, mineral-based Roman ruins shown below in figure 20 to the lightweight, biologically sourced timber lattice above creates a temporal dialogue, bridging the city’s ancient origins with a future-oriented commitment to renewable materials. Ultimately, the Metropol Parasol transforms a former void into a vibrant, walkable public realm that positions bold architectural intervention as a tool for restoring the social, economic, and ecological fabric of a dense city center.

Figure 20

Below The Parasol

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Note. Heavy mineral based ruins located below the Metropol Parasol. From *New Photos of Seville's Gorgeous Metropol Parasol*, by Lori Zimmer, 2011. (https://inhabitat.com/new-photos-of-sevilles-gorgeous-metropol-parasol/parasol_franck6679/)

Reflections on Case Studies

Taken collectively, these case studies demonstrate that walkable and regenerative urbanism succeed through a balance of spatial clarity, social intention, and context responsiveness. The Tāmaki Employment Precinct illustrates how regeneration can be culturally grounded and implementation-focused, linking land, people, and economy through a wellbeing-centred framework that prioritises mana whenua narratives. Utah City highlights that while transit-oriented walkability is most readily achieved through large-scale coordinated governance, true regenerative potential requires moving beyond top-down master planning to foster evolving social and ecological relationships. The Huechuraba Masterplan exemplifies how evidence-led “Health Checks” and ecological integration can unify disparate urban edges, treating public life and biophysical connectivity as co-equal drivers of form. Metropool Parasol reveals the potential of a single, technologically advanced architectural intervention to revitalise a derelict district by layering programmes vertically and providing bioclimatic comfort through an innovative timber canopy. In contrast, the Modulor offers a cautionary theoretical framework; while it emphasises human-scaled proportion, its reliance on universal abstraction highlights the need

For more inclusive, and adaptive design standards. Together, these examples suggest that the most transferable principles for this thesis include prioritising human-scale movement, embedding community and cultural values, leveraging multi-layered programming, and designing for microclimatic and ecological resilience. These lessons inform the emerging design direction by reinforcing the need for walkable connectivity, public activation, and a sensitive architectural language that recognises the interdependence of social, historical, and environmental systems.

Figure 21

United



Note. Collage representing Human and ecology united. Own work.

Integrating the Components

Integrating walkable and regenerative urbanism involves designing environments where spatial compactness, ecological function, and tactical intervention reinforce one another. While walkable urbanism focuses on creating environments that support proximity, accessibility, and active street life, regenerative urbanism adds a further layer, one where the built environment actively restores natural systems and deepens human relationships with nature. Romanazzi et al. (2023) illustrates this through the concept of landscape architecture, where streets and open spaces serve not only circulation but also ecological roles, managing stormwater and cooling the urban microclimate. In this context, pedestrian corridors are not isolated mobility paths but become green spines embedded with permeable materials and bioswales that regenerate hydrological flows while enhancing the walking experience. Similarly, Beatley (2011) emphasises that daily exposure to nature should be integrated into the structure of the city, not just through isolated parks but through networks that link streets, courtyards, and neighbourhoods. When urban form encourages walking and simultaneously fosters biophilic contact, cities achieve both mobility justice and ecological wellbeing.

Urban acupuncture, as articulated by Jaime Lerner (2014), complements these frameworks by demonstrating how small, precise interventions “pinpricks of change that enrich city life” can catalyse the larger ecological and social transformations that walkable and regenerative strategies seek to achieve. Lerner argues that a “simple, focused intervention can create new energy motivating others to engage with their community”. Such tactical projects whether pocket parks, temporary pedestrianisations, or water-sensitive installations translate broad sustainability goals into visible and immediate urban actions. As Gehl (2014) observes, Lerner’s approach “has to do not only with physical features but also psychological and cultural factors,” showing that the liveliness of cities grows from small, human-cen-

tered gestures. These micro-interventions ecological elements interact symbiotically to produce living, adaptive urban can activate dormant public spaces, test regenerative ideas at minimal cost, and demonstrate how everyday urban life can coexist with ecological repair.

This integrated lens reframes how designers approach streets and public space. Gehl (2010) calls for the design of life between buildings, spaces that invite lingering, conversation, and community. If these spaces are also designed to clean air, absorb water, or restore native planting, they become multifunctional, socially vibrant, and ecologically active. Blanco et al. (2022) reinforces this by showing that successful regeneration occurs when ecological processes are not appended to urban form but co-shaped through collaborative design. By embedding ecological and acupuncture interventions into the fabric of streets, blocks, and buildings, the qualities that make neighbourhoods walkable, connective, and human-centred can also serve as the foundation for regeneration. In this way, integrating these three models is not a compromise but a unification, one in which spatial, social, and



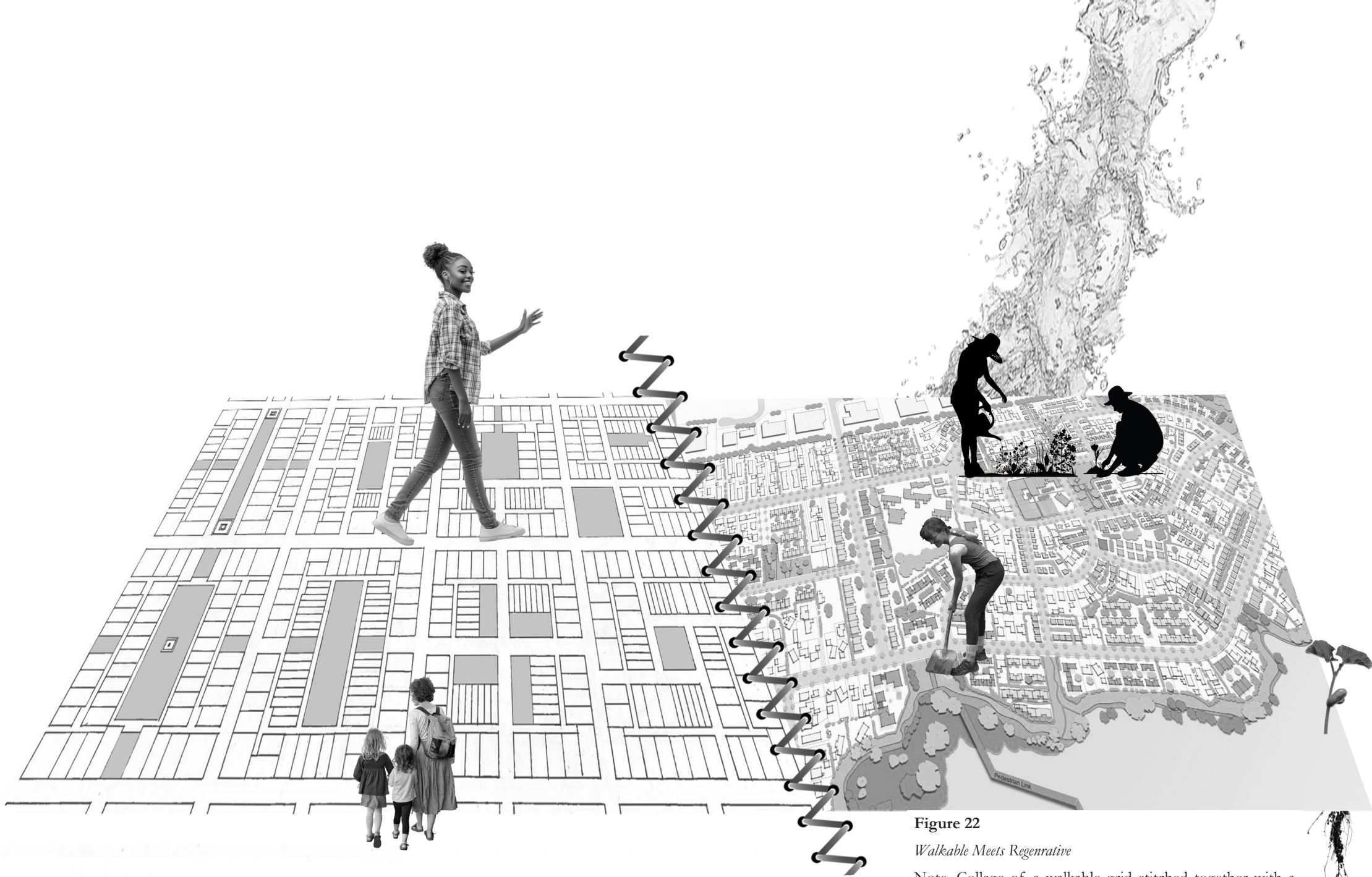


Figure 22

Walkable Meets Regenerative

Note. Collage of a walkable grid stitched together with a regenerative based urban layout. Own work.

Conclusion

Auckland's urban development is at a pivotal moment. Rapid population growth, spatial expansion, climate vulnerability, and entrenched car dependency require new approaches to city-making. This literature review has examined three interconnected strategies to address these pressures: walkable urbanism, regenerative urbanism, and urban acupuncture. Walkable urbanism prioritises proximity, active mobility, and quality public space; regenerative urbanism frames the city as a living system capable of ecological restoration; and urban acupuncture demonstrates how strategic micro-interventions can activate community and initiate wider change.

Across the revised literature and case studies, a consistent insight emerges: walkability, regeneration, and human-centred design are most effective when treated as interdependent systems rather than isolated objectives. The Tāmaki Employment Precinct demonstrates how long-term governance alignment, mana whenua engagement, and incremental delivery can embed walkable infrastructure within a broader framework of social, cultural, and economic wellbeing. Utah City, by contrast, illustrates the strengths and limitations of walkable urbanism when applied to a greenfield context, highlighting the distinction between designing for pedestrian movement and cultivating genuinely regenerative, place-based relationships. The Huechuraba Masterplan advances this discussion by foregrounding ecology and public life as co-equal drivers of urban form, showing how walkability can be reinforced through the alignment of street hierarchies, building typologies, and biophysical systems. Metropol Parasol offers a complementary perspective at the architectural scale, demonstrating how bold civic intervention can repair fragmented public realms, mediate climate, and restore pedestrian vitality in dense historic contexts. Finally, the critical reassessment of Le Corbusier's Modulor underscores the limitations of universalised human-scaled rationalism, reinforcing the need for regenerative frameworks that recognise bodily diversity, cultural specificity, and ecological interdependence. Taken together, these precedents suggest that effec-

tive urban strategies align spatial form, governance, ecology, cultural identity, and community agency to support walkable, resilient, and adaptive urban environments over time.

Despite this international evidence, limited research addresses how such principles can be adapted within Auckland's fragmented, low-density, and ecologically disrupted suburban fabric. This thesis seeks to respond to that gap by exploring how walkable, regenerative, and tactical design frameworks can be meaningfully integrated at the neighbourhood scale. Ultimately, merging these approaches offers more than a design methodology: it represents a shift in how cities are imagined. When spatial proximity, ecological restoration, and incremental action are pursued simultaneously, neighbourhoods become not only accessible and efficient but also socially connected and environmentally regenerative. This integrated perspective provides a compelling foundation for resilience and equity in Auckland's urban future.

Figure 23

Mangere East



Note. Image of Northern entry into Māngere East.

Own work.

Research Through Observation

This thesis adopts a design-based research methodology that integrates theoretical inquiry with applied spatial testing. Design is positioned not only as an outcome but as a primary research instrument, capable of generating knowledge through iterative analysis, proposition, and evaluation. Māngere East is employed as a live case study through which principles of walkable urbanism and regenerative urbanism are tested within an existing suburban context characterised by car dependency, fragmented urban form, and disrupted ecological systems.

The methodological approach combines quantitative spatial analysis with qualitative, human-scale observation. GIS mapping is used to establish a macro-scale understanding of urban structure, including street connectivity, land use, pedestrian permeability, flood risk, vegetation cover, and ecological corridors. These layers provide an evidence base for identifying spatial constraints and latent opportunities, informing the selection of nodes, movement corridors, and intervention sites. This analytical phase aligns with Speck's concept of urban triage, prioritising locations where targeted interventions can generate the greatest public-realm benefit with minimal disruption to existing fabric (Speck, 2012).

Complementing this macro-scale analysis, on-site observation is employed to capture experiential and behavioural dimensions that are not visible through mapping alone. Guided by Jan Gehl's emphasis on "life between buildings," fieldwork documents pedestrian movement patterns, desire lines, crossing behaviour, micro-climatic conditions, and the quality of edge conditions such as seating, shade, lighting, and frontage activity (Gehl, 2010). This observational method allows the research to assess how spatial configurations either support or inhibit walking, lingering, and social interaction at the scale of everyday experience.

Community-informed data further grounds the methodology in lived realities. Figure 23, Auckland Council's Māngere East Streets for People project provides qualitative insight into local perceptions of safety and accessibility, with residents identifying speeding traffic, wide crossings, and obstructed footpaths as key deterrents to walking (Auckland Council, 2021). These findings reinforce the need for design strategies that simultaneously address pedestrian comfort, ecological performance, and neighbourhood identity rather than treating mobility, environment, and social life as separate concerns.

Figure 23

Māngere East Streets for People

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Note. Examples of small scale interventions based on community feedback within Māngere East. From *Māngere East Streets for People*, by Auckland Council, n.d. (<https://akhaveyoursay.aucklandcouncil.govt.nz/mangere-east>)

The methodological framework draws from three complementary bodies of theory. Walkable urbanism, informed by Jane Jacobs, Gehl, and Jeff Speck, provides criteria for evaluating pedestrian environments through compactness, connectivity, safety, comfort, and interest (Jacobs, 1961; Gehl, 2010; Speck, 2013). Regenerative urbanism, as articulated by Chrisna du Plessis Roggema and Camrass, reframes the city as a living system, emphasising ecological repair, place-based responsiveness, and long-term adaptability rather than static optimisation (Roggema, 2022; Camrass, 2022). Urban acupuncture, introduced by Jaime Lerner, informs the scale and precision of intervention, advocating small, targeted spatial actions capable of catalysing broader social and ecological change (Lerner, 2014).

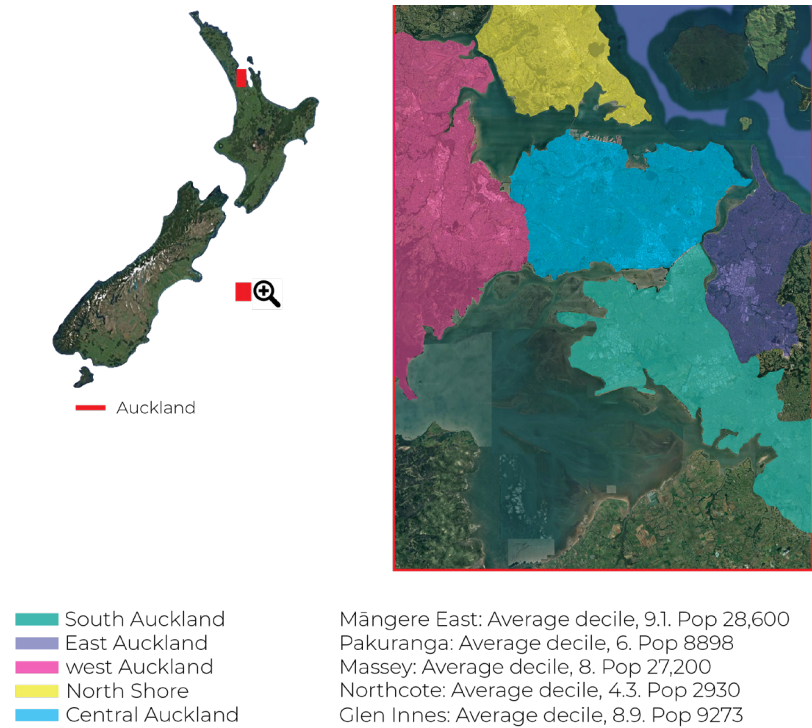
Integrating these frameworks enables the research to operate across scales, from the territorial to the tactile. The nodal framework developed in the design phase translates analytical findings into spatial propositions by concentrating interventions at locations where pedestrian demand, ecological potential, and community activity overlap. These nodes are then stitched together through walking and green corridors, allowing design to be tested as a relational system rather than as isolated objects. Through iterative design exploration, the methodology evaluates how walkable and regenerative principles can be meaningfully embedded within Auckland's suburban fabric, generating transferable insights for similar contexts.

Urban Triage

Figure 24 shows how Māngere East was selected through a comparative analysis of Auckland suburbs using two primary criteria: social deprivation scores and population density. These indicators were chosen because, when considered together, they reveal locations where the need for improved walkability and regenerative intervention is most acute, while also indicating where such interventions have the greatest capacity to generate meaningful public-realm benefits. These were assessed using an adapted Urban Triage Framework (Speck, 2012), which prioritises areas where targeted design interventions can achieve the greatest public-realm improvement with the least disruption to existing fabric.

Figure 24

Map of Highest Scored Suburbs

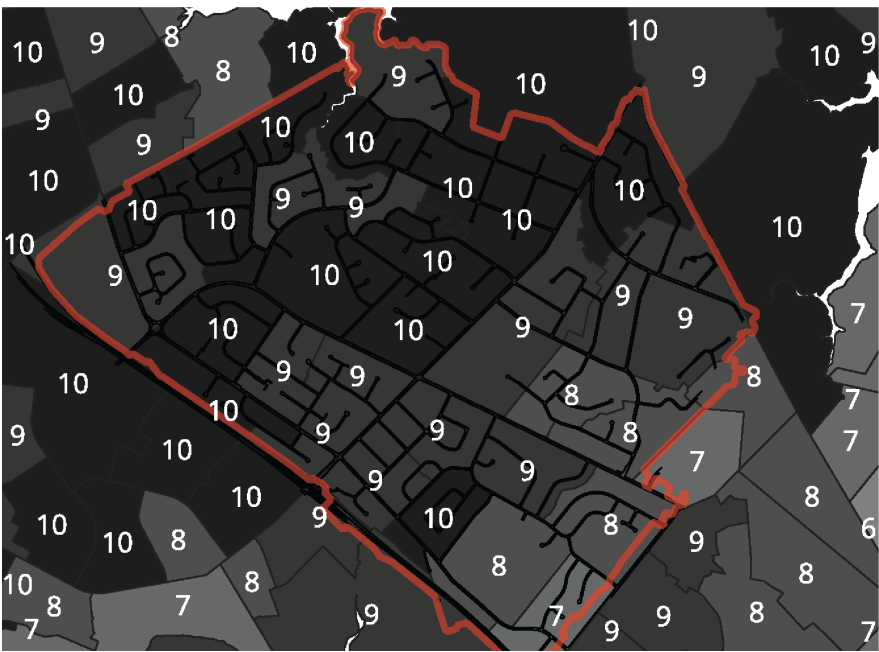


Note. Highest ranking suburb from each Auckland region. Own work.

Social deprivation scores were employed to identify communities experiencing structural disadvantage, including reduced access to services, lower mobility options, and heightened exposure to environmental and health inequities. Walkable urbanism literature consistently demonstrates that car-dependent urban form disproportionately affects lower-income communities by increasing transport costs, limiting access to employment and amenities, and reducing everyday opportunities for physical activity and social interaction. (Speck, 2012) argues that walkability is not merely an amenity but a critical determinant of health, economic resilience, and social equity, particularly in neighbourhoods where residents are least able to absorb the costs of automobile dependence

Figure 25

Social Deprivation of Māngere East



Note. Social deprivation scores within and adjacent to Māngere East. Own work.

Population density was selected as the second criterion because it signals both existing pedestrian demand and the feasibility of walkable urbanism. Higher-density suburbs already contain a critical mass of residents capable of supporting local services, public transport, and street life, making them more responsive to pedestrian-oriented and regenerative design strategies. Speck's Urban Triage framework emphasises the importance of "picking winners" by prioritising areas where modest, targeted interventions can leverage existing density and urban fabric rather than attempting to retrofit low-density environments where walking is structurally constrained

Figure 26

Population Density of Māngere East



Note. Population density within and adjacent to Māngere East. Own work.

Using these two criteria, all Auckland suburbs were ranked to identify locations where high social need coincides with strong spatial potential. Māngere East emerged as one of the highest-scoring suburbs in this analysis, combining elevated deprivation indicators with comparatively high population density within a predominantly suburban context. This positioning identifies Māngere East as a site where walkability deficits are both socially consequential and spatially addressable. Accordingly, Māngere East is understood not only as a place of need but as a place of opportunity. Its selection reflects the methodological logic of this thesis, which seeks to test how small-scale, targeted interventions can reconcile pedestrian experience, ecological performance, and neighbourhood identity in suburbs where the stakes for successful regeneration are high and the potential for positive impact is substantial.

Location and Context

Figure 27 shows how Māngere East lies within the Māngere-Ōtāhuhu Local Board area of South Auckland, approximately 15 kilometres south of the city centre. The suburb is bounded by two major transport corridors: State Highway 20 (the South-western Motorway) to the west and State Highway 1 (Southern Motorway) to the east. These high-speed routes provide regional accessibility but act as physical and psychological barriers between communities (Auckland Council, 2021). Internally, Massey Road bisects the suburb east–west, functioning as a commercial spine but also as an arterial that prioritises vehicular throughput over pedestrian comfort.

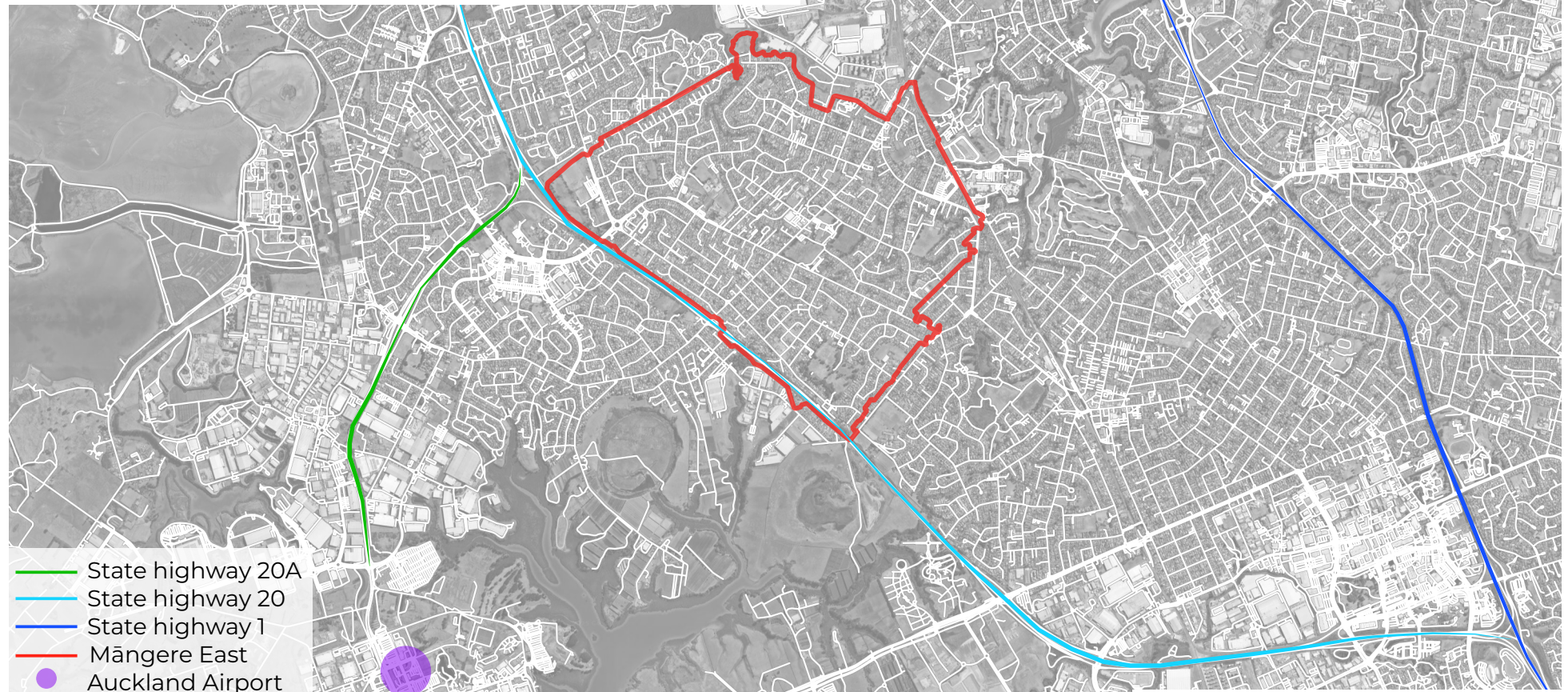


Figure 27

Location of Transit Corridors

Note. Location of Auckland's main transit corridors in relation to Māngere East. Own work.

Figure 28

Timeline Collage of Māngere East

Māngere East Urban Expansion

14th century
Fertile soils and good fishing created comfortable living conditions for Māori, who named the area Ngā Hau Māngere, meaning 'gentle lazy winds'.

Pre-20th Century
Māngere East was part of a wider farming district, with early European farms and small residential plots.

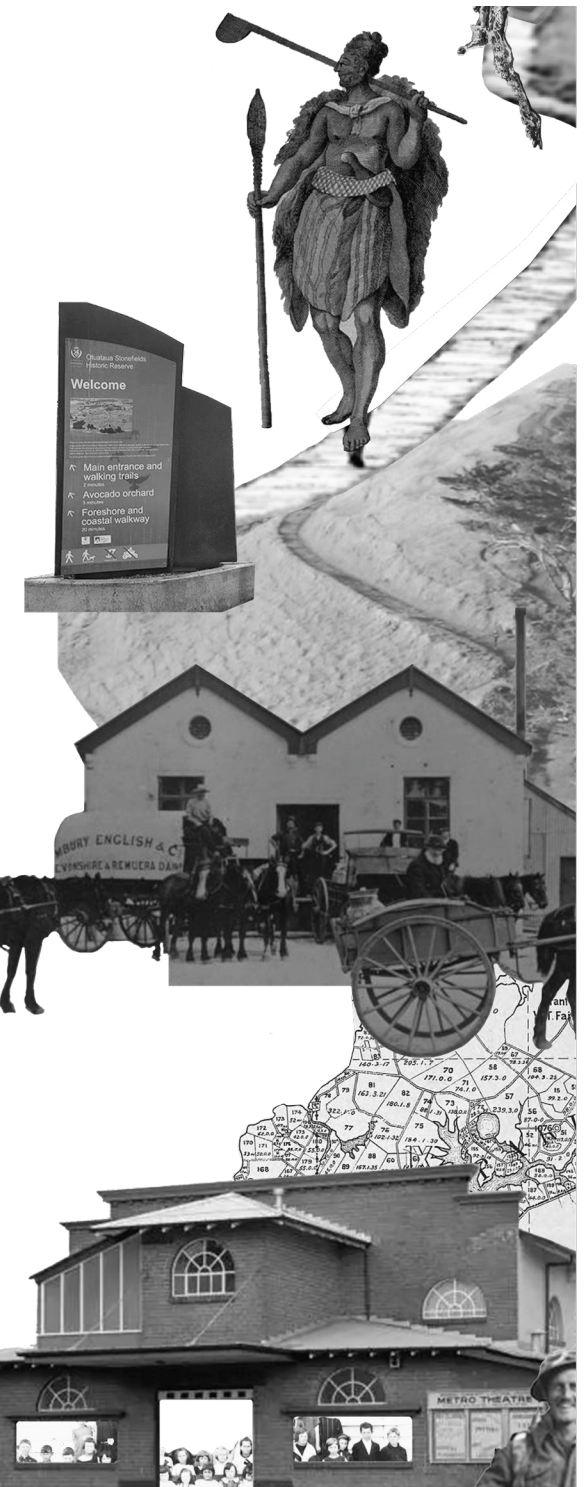
1900
Subdivisions began north of Hain Road towards the railway, forming smaller residential plots.

1920
1920s: Otahuhu Railway Workshops opened nearby, catalysing growth.

1932
Māngere Mountain Reservoir

1940
Site of Camp Euart, a U.S. military base supporting 5,000 troops on 84 acres.

1900–1939 – Early Residential Growth



1955 — Māngere East officially declared a town district.

1962 — Central Māngere (including parts of Māngere East) chosen for large-scale state housing, following Glen Innes and Ōtara.

1965 — Incorporated into the newly created Manukau City

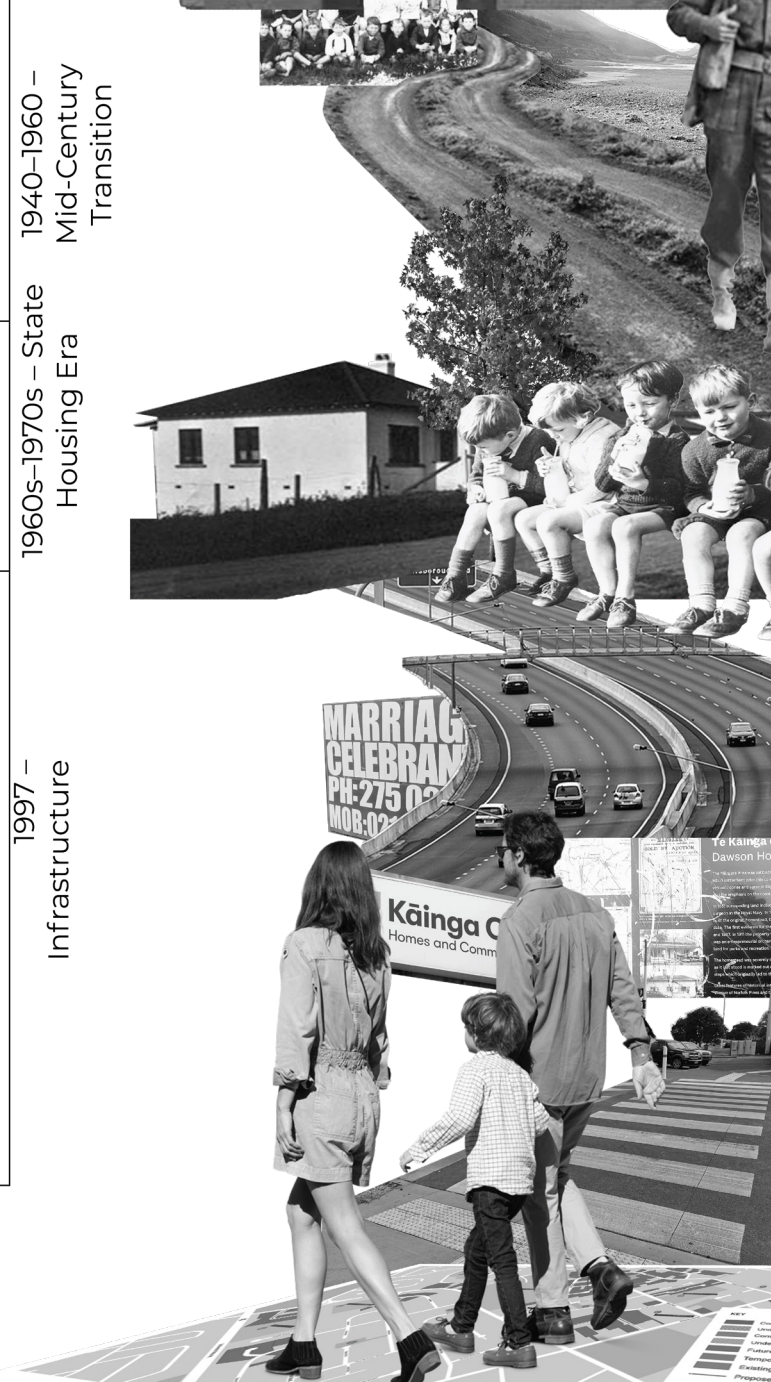
1997 — State Highway 20 (Southwestern Motorway) extended to Massey Road (Māngere East), improving regional connectivity.

2021 — Māngere East Streets for People. The Māngere East project sits alongside events and trial installations at over 30 sites across Auckland that are funded through Waka Kotahi NZ Transport Agency's Innovating Streets for People pilot fund. Māngere-Ōtāhuhu Local Board is co-funding this project.

1940–1960 — Mid-Century Transition

1960s–1970s — State Housing Era

1997 — Infrastructure



Note. Timeline of Māngere East's urban expansion.
Own work.

Ecological, Cultural, and Climatic Context

Māngere East has transformed from a strategic Māori landscape into a vibrant, multicultural cornerstone of South Auckland. Originally known as Ngā Hau Māngere (gentle lazy winds), the area was cherished by tangata whenua for its fertile volcanic soils and its role as a vital portage linking the Manukau Harbour to the Waitematā and Kaipara. While 19th-century European colonization shifted the land toward intensive dairy and market gardening, the modern urban form of the suburb truly crystallized after 1945 (Te Ara, n.d.).

Driven by state housing initiatives and the 1950s southern motorway, the area underwent rapid industrialization to support the Auckland International Airport and the Māngere sewage treatment plant. This era of Radburn-inspired planning introduced cul-de-sacs and arterial barriers that fragmented the previous farming mosaic. However, it also drew waves of Māori and Pacific Island migrants, establishing a rich Pasifika cultural fabric that ranges from community churches to local markets (Te Ara, n.d.).

Now home to 165 ethnic groups, Māngere East stands as the most ethnically diverse urban node in New Zealand. Yet, this history of rapid, car-oriented development has intensified climatic vulnerabilities such as flood-prone lowlands and urban heat islands. Addressing these legacies requires regenerative interventions that honor the intertwined ecological and cultural heritage of the suburb (Te Ara, n.d.).

Māngere East is part of the Tāmaki Makaurau urban landscape, where remnant vegetation, gardens, and green infrastructure provide habitat for native birds. In this modified context, these birds maintain critical ecosystem functions, including seed dispersal and pollination (Science Learning Hub, n.d.). The kererū (*Hemiphaga novaeseelandiae*) is a particularly significant species. As a keystone forest pigeon, it is uniquely capable of dispersing the large seeds of native trees like pūriri, taraire, and karaka. Consequently, kererū are essential for

forest regeneration across urban patches. Other common native species include tūi, pīwakawaka, riroriro, tauhou, and ruru. These birds exhibit ecological adaptability by utilising a mosaic of street trees, parks, and forest fragments for survival (Auckland Council, 2019).

The southern Auckland volcanic and alluvial landscape features fertile soils derived from basaltic activity and fluvial sediments. Historically, these conditions supported lowland broadleaved forests, specifically WF7-2 pūriri and taraire forest. This ecosystem thrives in warm, frost-free environments and is characterised by a canopy of pūriri (*Vitex lucens*), taraire, and kohekohe, alongside species such as karaka and northern rātā (Auckland Council, 2017). In poorly drained areas, WF7-3 kahikatea and pūriri forest occurs on alluvial terraces with high water tables. Here, pūriri and kohekohe form the canopy with occasional emergent kahikatea (*Dacrycarpus dacrydioides*). This reflects the transitional relationship between lowland forest and wetland environments typical of the Māngere East landscape (Auckland Council, 2017).

Figure 29

Forest Ecologies



Note. Māngere East defined by two forest zones. Own work.

Constraints

The macro-scale GIS analysis of Māngere East shown in figures 31 and 32 reveal a suburb defined by both spatial barriers and latent ecological and social potential. Its physical form, dominated by cul-de-sacs, large superblocks, and wide arterial corridors, reflects the legacies of post-war state housing and Radburn planning. These characteristics now create structural constraints to walkability and ecological continuity but also point toward clear opportunities for targeted regeneration.

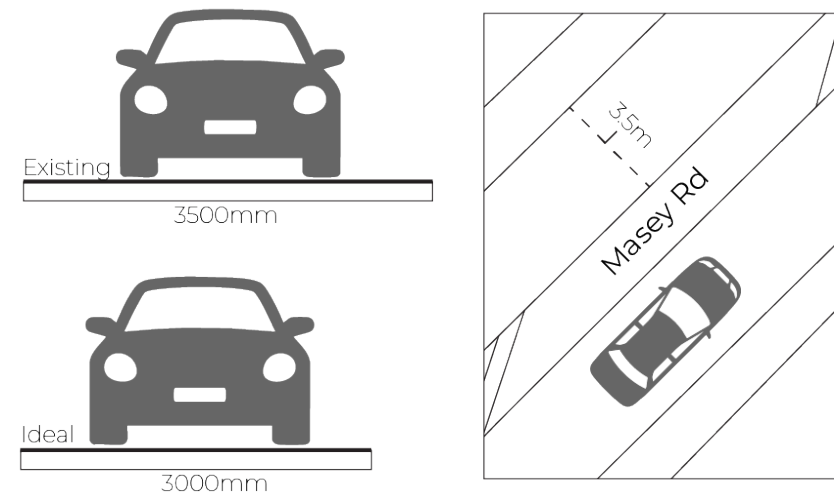
The local street network typifies Radburn-influenced planning, yielding limited connectivity and few alternative routes. Speck (2018) demonstrates that larger blocks correlate with higher pedestrian injury rates and lower pedestrian counts, while Jacobs (1961) argues that short blocks are essential to “multiply opportunities for contact and cross-use”. Māngere East’s elongated blocks and minimal intersections suppress spontaneous street activity and contribute to social isolation shown in figure 31. Safekids NZ (2010) similarly reports that Manukau City has some of the nation’s highest driveway run-over injury rates, a pattern linked to low-density, car-dependent suburbs such as Māngere East. figure 31 also shows how arterial barriers present further constraints. Massey Road functions as a north to south corridor carrying high traffic volumes that fragment pedestrian movement shown in figure 32. Gehl (2010) notes that wide streets “diminish the sense of enclosure and make walking unpleasant,” advocating narrower cross-sections and frequent crossings to restore human scale. Current conditions include lane widths of approximately 3.5 m, well above Speck’s (2018) recommended 3.0 m maximum for urban contexts, encouraging speeding and reducing safety as seen in figure 30.

Figures 33 and 34 show The State Highway 20 on-ramp at Bader Drive and Massey Road exacerbate severance, introducing slip lanes and merge zones that are difficult for pedestrians to navigate. Speck (2018) describes such hybrid “stroads” as streets that serve neither pedestrian nor driver well, among the most dangerous and least

productive urban forms These intersections limit east–west permeability and weaken connections between residential areas and civic amenities. Active-mode infrastructure remains incomplete. While a painted cycle lane extends along Robertson Road, it terminates abruptly at arterial intersections, discouraging everyday cycling as seen in figure 35. Speck (2018) argues that “a bike lane that disappears at the point of greatest danger is worse than none at all” Similarly, many bus stops lack shelters or clear pedestrian linkages, reducing the practicality of multimodal transport. Together, these conditions produce an urban fabric optimised for vehicles rather than people.

Figure 30

Lane Sizing

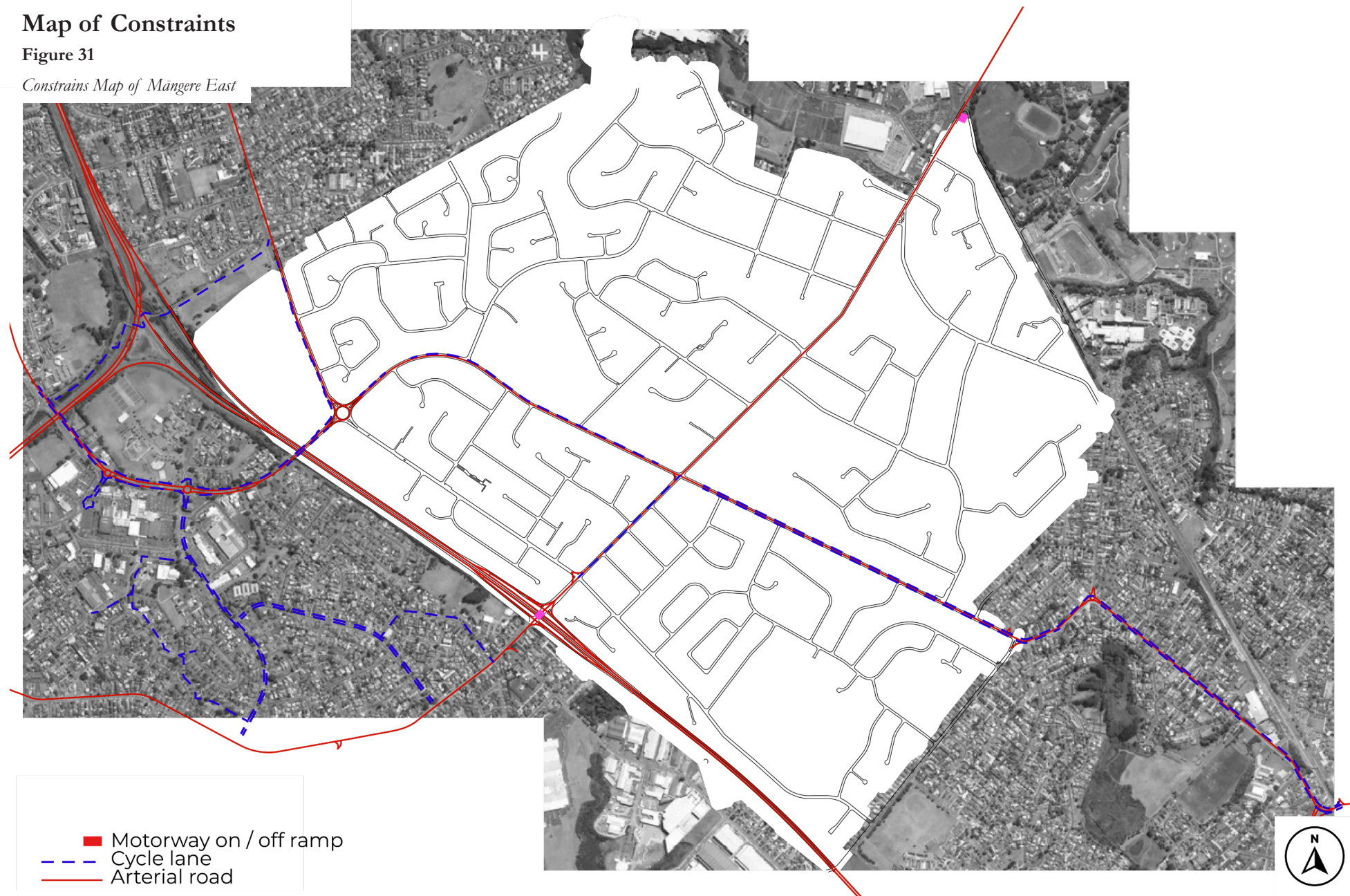


Note. Lane width of arterial roads, existing versus ideal. Own work.

Map of Constraints

Figure 31

Constraints Map of Māngere East

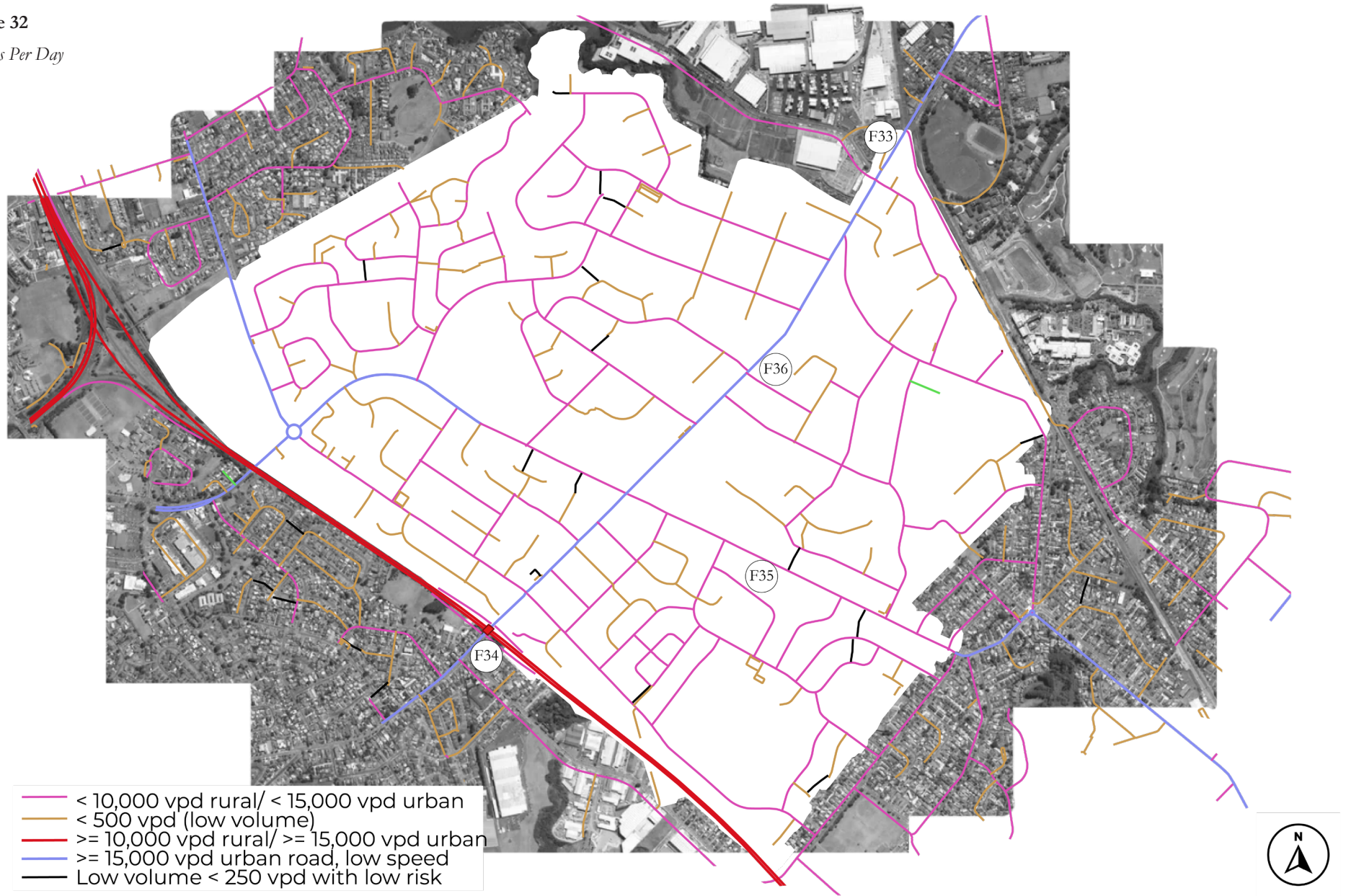


Note. Map showing the main constraints to the pedestrian within Māngere East. Own work.

Map of Constraints

Figure 32

Vehicles Per Day



VPD = Vehicles per day

Note. Map showing the vehicles per day for each street within Māngere East. Own work.

Figure 33

Massey Road Northern Entry



Note. Northern entry shared with Middlemore main exit. Own work.

Figure 35

Buckland Road Bike Lane



Note. Buckland roads bikelane abruptly ending. Own work.

Figure 34

Massey Road Southern Entry



Note. Southern entry to Māngere East shared with state highway 20 onramp. From *Google Street View*, by Google, 2024. (<https://www.google.com/maps/place/M%C4%81ngere+East,+Auckland+2024/>)

Figure 36

Massey Road Arterial



Note. Massey road arterial which separates Māngere East. Own work.

Opportunities

Despite existing constraints, Figure 37s GIS-mapped features reveal significant regenerative potential. Middlemore Hospital acts as a civic anchor, enhancing accessibility and activity. Gehl (2010) observes that essential destinations foster the necessary activities that sustain street life, while Beatley (2011) views health infrastructure as a cornerstone of community resilience. The constant flow of staff and visitors provides natural surveillance, seeding a more vibrant pedestrian realm.

Adjoining the hospital, Middlemore Train Station provides access to Auckland's Southern Line. Speck (2018) identifies transit hubs as magnets of walkability that enable compact, mixed-use neighbourhoods. Moreno (2024) positions rail nodes as anchors of the 15 minute city, promoting equitable access to employment. Strengthening multimodal connections between the station and surrounding streets would deliver substantial social benefit as seen in figure 37.

Figure 37s analysis also identifies an emergent public transport spine. Regular bus routes and the planned Airport to Botany rapid transit corridor establish a foundation for transit-oriented renewal. Integrating these with safe pedestrian and cycle infrastructure can transform linear corridors into active, mixed-use streets.

Ecologically, green space distribution presents valuable opportunities. Parks and residual spaces form a framework for both recreation and ecological corridors as shown in figure 37. The Canopy Analysis Report (2019) identifies these as under-utilised assets. Reinforcing these areas with stormwater treatment and native planting aligns with Roggema's (2022) principle that urban design should co-evolve with natural systems. Furthermore, existing alleys and reserve paths offer latent pedestrian routes. Jacobs (1961) emphasises that frequent cross-connections generate safety and spontaneity; these alleys represent immediate opportunities for tactical urbanism and community reactivation.

A further opportunity lies in the over-supply of surface parking at the Māngere East Shopping Centre. Repurposing portions of these lots for rain gardens or public seating aligns with Auckland's low-carbon objectives and Speck's (2012) view that removing parking to fill the void with life is a primary way to heal urban centres.

Collectively, these opportunities frame Māngere East as a microcosm of the Auckland suburban condition: disconnected yet green, and socially rich yet spatially fragmented. The mix of arterial barriers and civic anchors presents suitable ground for urban acupuncture and small, strategic interventions capable of re-stitching ecological systems and human activity at the neighbourhood scale.

Map of Opportunities

Figure 37
Opportunities Map



Amenities mapped include:
 Supermarket, Takeaways / fast food, Medical,
 Places of worship, education, Restaurants.

Note. Map showing the opportunities to the pedestrian and more
 than human. Own work.

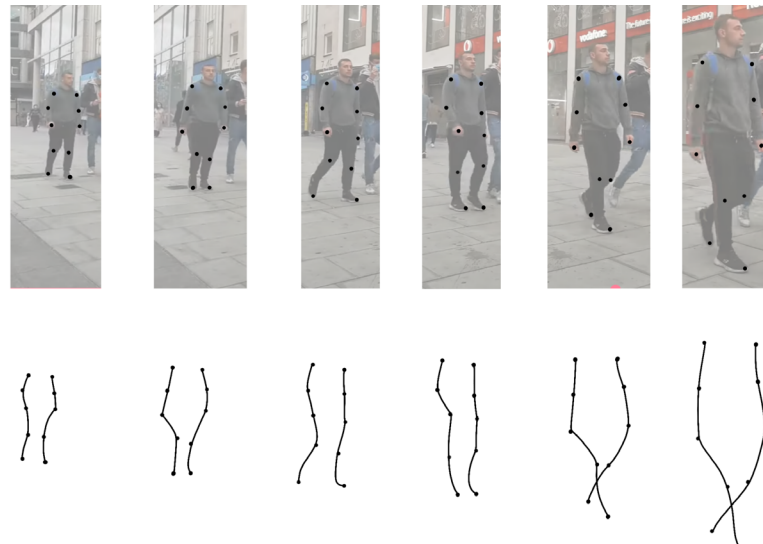
The Nodal Approach

The design development phase translates the analytical findings into a spatial strategy that integrates walkable urbanism and green city principles through a nodal framework. This framework reinterprets Māngere East's fragmented suburban form as a connected system of ecological and social anchors. Rather than imposing large-scale redevelopment, it applies urban acupuncture, targeted interventions that repair disconnection and catalyse new forms of public life (Lerner, 2014; (Casprini et al., 2024).

The nodal approach responds directly to GIS evidence of barriers and opportunities identified across the suburb. Nodes are positioned where multiple conditions converge walkability deficits, ecological corridors, and community activity centres. Each node acts as a self-sustaining focus of local life, while the connective network between them, formed by walking, cycling, and green corridors, embodies the regenerative objective of a city designed for both people and nature.

Figure 38

Mapping Movement



Note. Mapping the movement of the human body. Own work.

The Purpose

The purpose map shown in figure 39 identifies trip generators that reliably produce short, frequent journeys: supermarkets and small food outlets, community centres, schools and kindergartens, places of worship and marae, sport parks, and Middlemore Hospital. Together these destinations structure routine movement for shopping, learning, care, cultural practice, and recreation. Walkability follows purpose: people walk when daily needs are close, routes are continuous, and the environment is legible and comfortable (Speck, 2012; Gehl, 2010). Council evidence for Māngere East confirms both the demand and the barriers, with residents describing crossings as difficult and footpaths as blocked or unsafe (Auckland Council, 2021). The purpose map therefore operates as a design brief. It concentrates improvements where they convert necessary trips into pleasant ones and where multiple public purposes overlap, so each intervention supports a larger share of daily life.

Purpose Map

Figure 39

Mapping the Purpose



Note. Outlining the reasons pedestrians might walk throughout Māngere East. Own work.

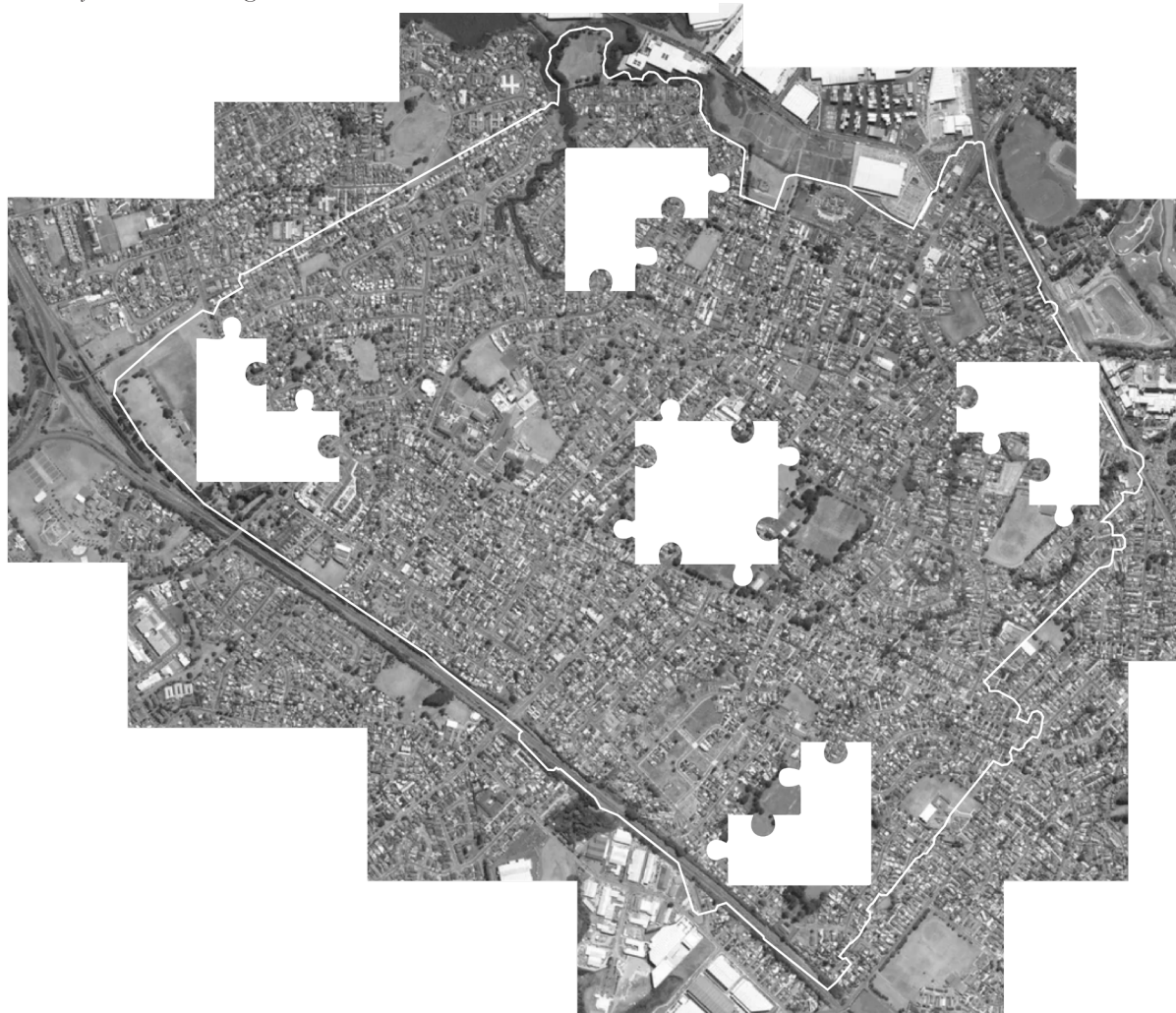
Establishing the Centralised Area and Nodes

The nodal framework translates the purpose map into spatial organisation. A centralised area along Massey Road figure x is designated as the civic heart because it concentrates public transport, small businesses, schools, and community facilities within short distances. This choice reflects proximity and catchment logic in walkable urbanism and the 15-minute city: centrality belongs where everyday programmes already cluster and can be reinforced rather than displaced (Moreno, 2024; Speck, 2012). From this core, four supplementary nodes figure x are established to complete a connected network: Middlemore Train Station as the metropolitan gateway, Aorere Park and Māngere Centre Park as green anchors capable of carrying stormwater and habitat functions, and Vine Street Shops as a fine-grain neighbourhood centre. Spacing responds to block structure, arterial barriers, and existing alleys, aiming for ten-to-fifteen-minute walks between nodes and the centre while aligning links with desire lines and green corridors (Gehl, 2010). The result is a simple rule: reinforce the middle, then stitch outwards, so each node strengthens both public purpose and ecological continuity.

Map of Nodes in Relation to Boundary

Figure 40

Nodes Defined Within Māngere East



Vine street node



Māngere centre park



Central node



Aorere Node



Middlemore node

Note. Location of nodes internal to Māngere East. Own work.

Spatial Analysis of Nodes (Micro-Scale)

The micro-scale analysis focuses on how spatial, social, and ecological factors operate at ground level. Each node is examined for frontage activity, façade permeability, lighting and surveillance, kerb geometry, crossing distances, footpath width, micro-climate, and vegetation. These combine to define what Gehl calls micro-comfort, enabling optional as well as necessary activities (Gehl, 2010). At this scale, ecological quality supports walking: shade trees, bioretention and bioswales moderate temperature, filter stormwater, and improve comfort. As Vilanova, Sardà Ferran, and Concepción (2024) emphasise, well-integrated urban green infrastructure can create multi-scale ecological linkages that enhance micro-climatic regulation, while Daraojimba et al. (2024) shows that such interventions simultaneously improve thermal comfort, reduce air pollutants, and support biodiversity within pedestrian environments.

Central node

The central node is the principal intervention area because it sits at the suburb's midpoint and concentrates the greatest number of everyday purposes within a short radius. This aligns with Moreno's characterisation of local nuclei in the 15-minute city (Moreno, 2024). The node is bisected by Massey Road shown in figure 41, whose lane widths and turning geometry prioritise vehicle throughput and visually divide the pedestrian realm. Arterials designed for speed suppress safe walking and weaken local commerce (Speck, 2018). Desire-line observation in figure 44 shows walkers crossing at mid-block points and through car-park entries, repeatedly intersecting driveways shown in figure 43. Every driveway breaks the walk; continuous pedestrian routes with reduced lane widths, frequent crossings and refuge space are required (Speck, 2018).

Extended trading hours at the supermarket shown in figure 42 add eyes on the street, which supports perceived safety (Jacobs, 1961). However, there is a notable lack of fixed public seating and consistent shade. Optional activity depends on

places to stay and weather protection (Gehl, 2010). Early actions: narrow lanes to an urban target of about 3.0 m where feasible, add continuous zebra or raised-table crossings at desire-line locations, convert select parking bays to bioretention and seating, and upgrade lighting at corner niches.

Figure 41

Massey Road



Note. Massey road separating the existing buisness local centre. Own work.

Figure 42

Woolworths Māngere East



Note. Woolworths provides additional vision within the area when normal business hours are over. Own work.

Figure 43

Entry to Vegetable Store and Butchery

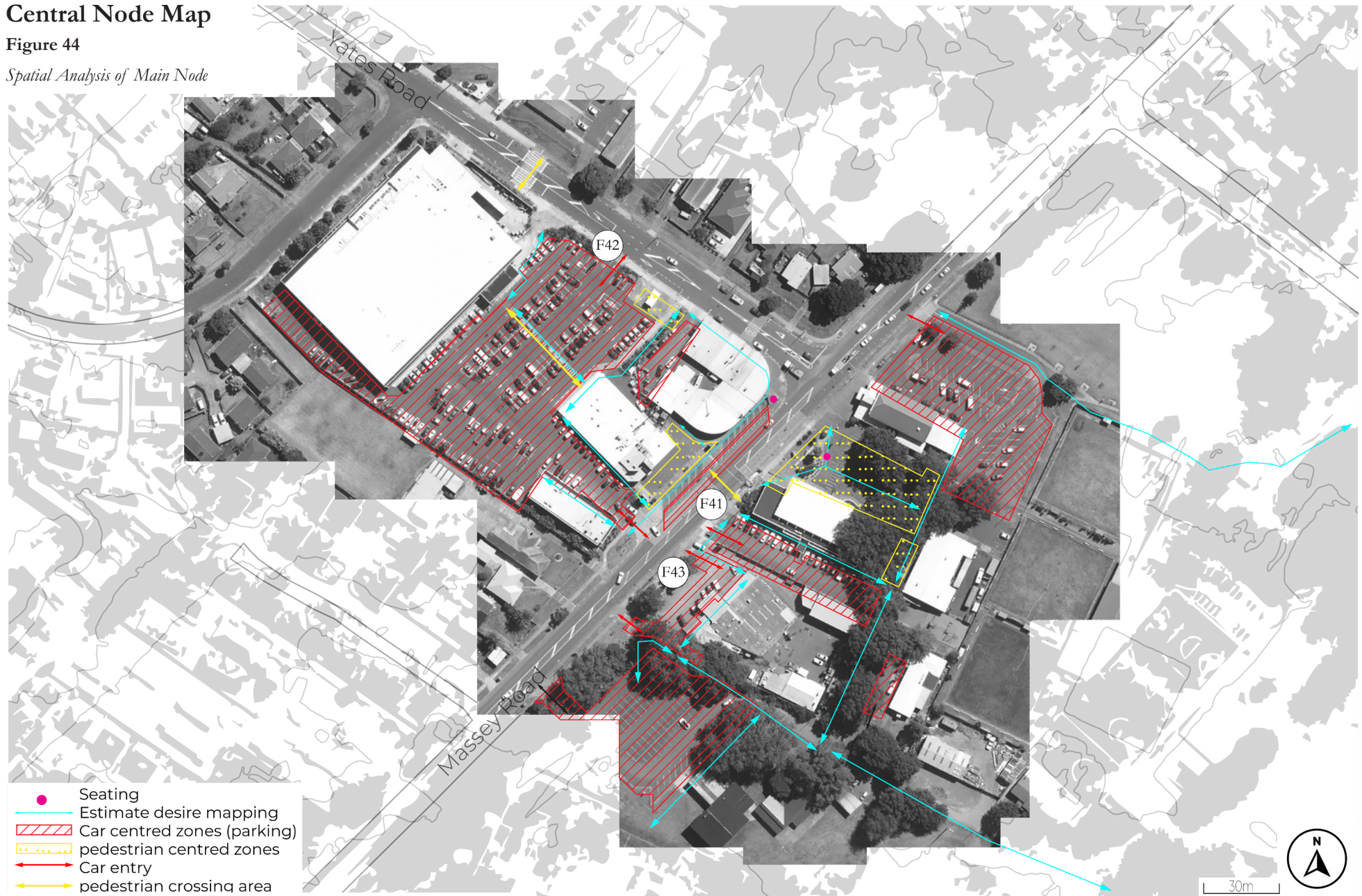


Note. Pedestrian movement obscured by vehicle entry and exit. Own work.

Central Node Map

Figure 44

Spatial Analysis of Main Node



Note. Car dominated areas obscure pedestrian movement around the main local business centre within Māngere East. Own work.

Node 1: Middlemore

Middlemore was selected for its dual significance as Māngere East's principal transit interchange and the site of Middlemore Hospital shown in figure 45. These functions generate constant pedestrian activity, positioning the node as the suburb's most active edge and its primary link to the wider metropolitan network.

Despite its importance, spatial analysis reveals an imbalance between vehicular and pedestrian domains. While the hospital's extensive surface parking serves a regional role, it dominates the local streetscape. Mapping of desire paths within figure 48 indicate discontinuous pedestrian circulation and direct conflicts with vehicle routes. In several areas, the lack of defined footpaths forces people to traverse car lanes. Gehl (2010) describes such conditions as inherently exclusionary, as treating the pedestrian as a guest in the car's domain erodes safety and discourages walking.

Speck (2018) notes that frequent driveway crossings erode pedestrian priority at points of high activity. This is evident at the station forecourt and hospital entrances, where vehicular access interrupts the lines linking rail platforms, bus stops, and hospital doors shown in figure 46. This environment privileges through traffic over local movement and fails to reflect the site's civic significance.

Figure 47 shows the Gray Avenue entry, approximately thirty on-street spaces are fenced off from the main car park. Given the high volume of patients, staff, and commuters, repurposing this zone would immediately improve safety and legibility. Speck (2012) identifies reclaiming car-dominated frontage near key destinations as a vital step toward walkability. Converting redundant parking into shaded forecourts and clear walking routes would transform the station approach from a service yard into a civic threshold.

Moreno (2024) emphasises that the 15-minute city relies on transit-anchored realms

where walking is prioritised. Applying this at Middlemore requires an interface that unites transport, healthcare, and public space. Bioswales and tree canopies could buffer the car park edges, while continuous paving and improved crossings would integrate the hospital into Māngere East's wider walkable network.

Figure 45

Middlemore Trainstation



Note. Main transit system in and out of Māngere East. Own work.

Figure 46

Middlemore Main Outdoor Carpark



Note. Middlemore carpark lacks any pedestrian orientated systems to facilitate safe movement. Own work.

Figure 47

Gray Avenue Middlemore Entry



Note. Gray Ave entry harbours a multitude of on-street parking adjacent to the Middlemore carpark. Own work.

Middlemore Node Map

Figure 48

Middlemore Node Map



Note. The Middlemore node analysis shows multiple a car dominated area where planned pedestrian paths intersect with the main flow of traffic. Own work.

Node 2: Aorere Park

Figure 52 shows that Aorere Park was selected for its extensive street frontage and its spatial relationship to the central Buckland Road node, ensuring legible connections across the suburb. Occupying a strategic position within the green space network, the park acts as a hinge between residential areas and the main urban corridor. Its open geometry and high visibility make it an ideal site for integrating recreational and ecological infrastructure.

Field observations identified significant existing water-sensitive design features, including bioswales that filter stormwater runoff before it enters the park shown in figure 49. These elements represent a shift toward multifunctional green infrastructure. Beatley (2011) and Vilanova et al. (2024) describe such systems as hydrological sponges that manage stormwater while moderating the microclimate and strengthening biodiversity. Similarly, Daraojimba et al. (2024) highlight that well-designed urban green infrastructure simultaneously mitigates flooding and enhances ecological resilience. Aorere Park thus functions as a small-scale regenerative system, absorbing the pressures of surrounding impermeable surfaces. Despite these environmental strengths, pedestrian access remains poor.

Figure 52s desire-line mapping reveals numerous informal grass entries where residents cross verges to reach shops, schools, and bus stops. None of these are formalised with continuous paths or accessible surfacing shown in figures 50 and 51. Gehl (2010) notes that unmarked paths indicate where people wish to walk when the city does not yet invite them. Paving these tracks would legitimise existing movement and embed the park into the everyday mobility network.

By coupling ecological performance with accessibility, the Aorere Park node embodies regenerative urbanism principles. It demonstrates how a suburban park can evolve from passive open space into an active connector that filters water, fosters biodiversity, and anchors community life within a five-minute walk of local destinations.

Figure 49

Aorere Park Bioswale



Note. Natural stormwater movement and retention via bioswales implemented around Aorere park. Own work.

Figure 50

Informal Western Entry



Note. The western informal entry shows no designated pathways or wayfinding. Own work.

Figure 51

Informal Northern Entry

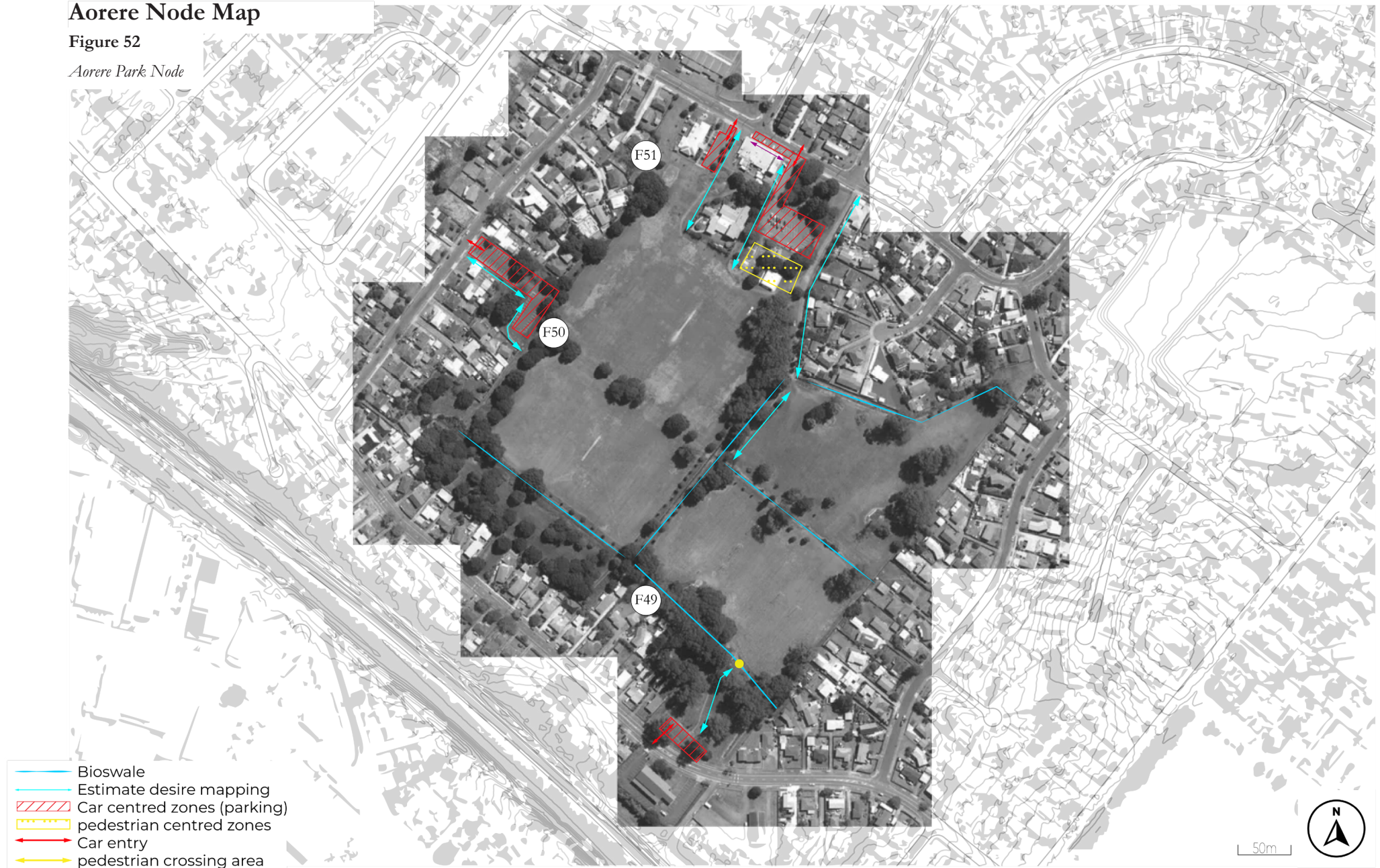


Note. The northern informal entry shows no designated pathways or wayfinding. Own work.

Aorere Node Map

Figure 52

Aorere Park Node



Note. Aorere park analysis shows an ecologically functional space with lack of designated pathways and entries throughout. Own work.

Node 3: Māngere Centre Park

Māngere Centre Park was selected for its dual northern and southern gateways and its role as the only safe pedestrian connection across the Southern Motorway shown in figure 56. This connectivity establishes the node as a strategic threshold linking neighbourhoods otherwise divided by regional infrastructure.

Figure 53 shows field observations at the adjacent four-way intersection revealed an absence of traffic calming or marked refuges. Speck (2018) notes that uncontrolled multi-leg intersections multiply conflict points and suppress movement, while Gehl (2010) stresses that perceived safety is a prerequisite for street use. Introducing raised tables or kerb extensions would align this junction with contemporary walkability standards and re-prioritise pedestrians. The adjoining heritage precinct, featuring mature native trees and remnants of a heritage train track, holds significant ecological and cultural value but remains visually isolated as shown in figure 54. Jacobs (1961) warned that secluded spaces lacking eyes on the street risk becoming avoided voids. Enhancing visual permeability through selective clearing and framed sight-lines would improve safety and site legibility. Furthermore, interpretive elements referencing the rail history could better root the space in local context. The southern fields and northern car park shown in figure 55 currently lack shaded seating and weather protection. Gehl (2010) observes that optional activities depend on protection from the elements, while Beatley (2011) identifies shaded rest points as vital for biophilic comfort. Installing benches beneath canopy trees and incorporating permeable paving would transform the park into a multi-functional green node supporting social interaction and ecological function.

Ecologically, the park is a major link in the suburb's green-blue network. Open grass areas could accommodate additional rain garden systems and habitat corridors connecting to motorway embankment planting. Such interventions exemplify

Roggema's (2022) regenerative approach, where landscapes perform as living systems mediating water and well-being. By coupling heritage identity with ecological renewal, Māngere Centre Park can operate as a gateway and green lung, reconnecting divided urban fabrics.

Figure 53

Māngere Centre Park Intersection



Note. Four way intersection lacking pedestrian / traffic calming measures. Own work.

Figure 54

Māngere Centre Heritage Precinct



Note. The heavily vegetated heritage precinct sits secluded and visually isolated from surrounding street vision. Own work.

Figure 55

Māngere Centre Park Carpark and Fields

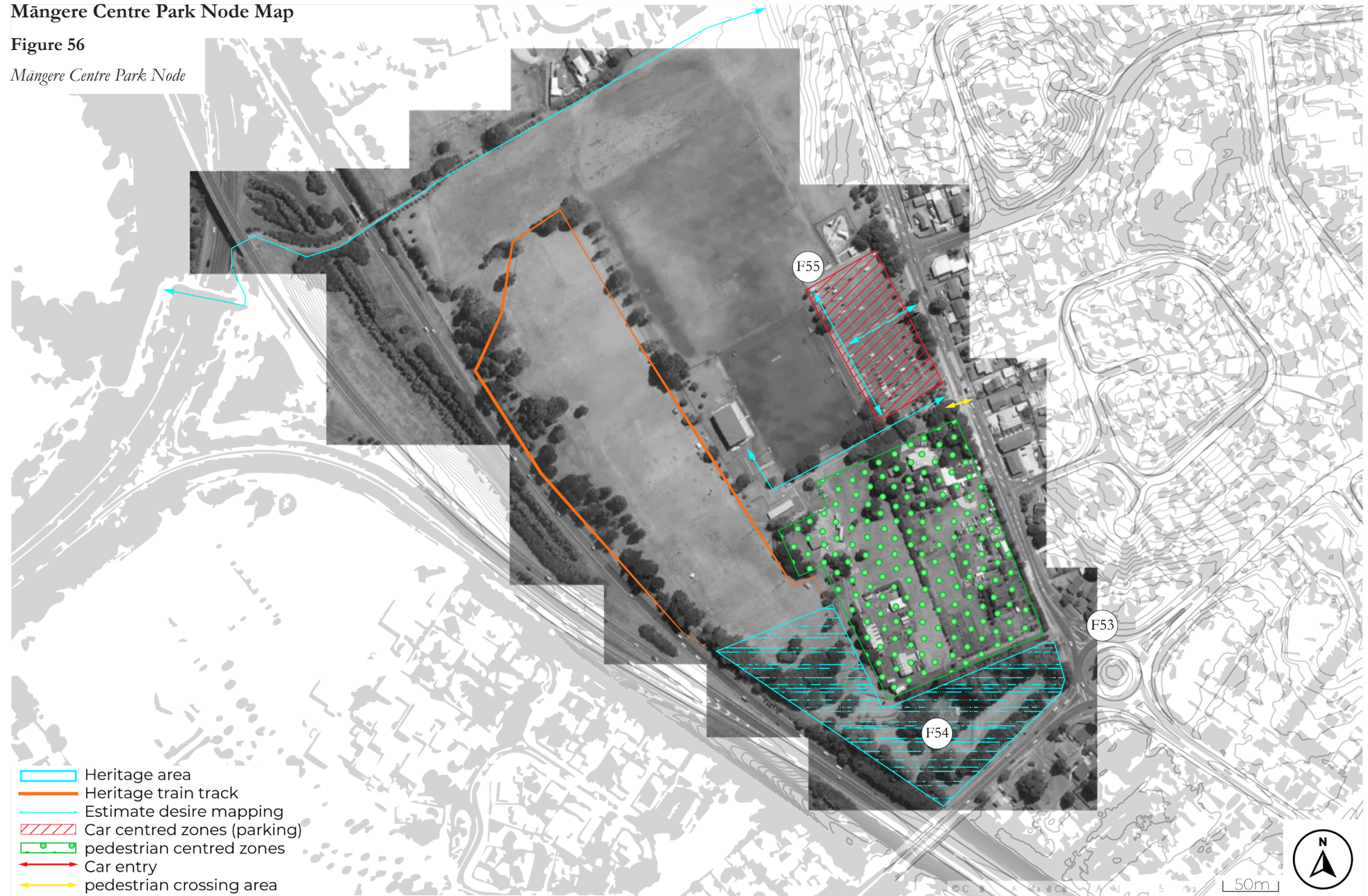


Note. Carpark and fields lacking public seating and shading. Own work.

Māngere Centre Park Node Map

Figure 56

Māngere Centre Park Node



Note. Māngere Centre park sits adjacent to two main entries into Māngere East and the only pedestrian friendly access through State highway 20. Own work.

Node 4: Vine Street Shops

The Vine Street Shops node shown in figure 61 was selected, like Aorere Park, for its close spatial proximity to the centralised node and its concentration of everyday functions. As one of Māngere East's smaller commercial zones as seen in figure 58, it anchors much of the local purpose within its catchment and serves adjacent residential areas by providing essential amenities. This spatial relationship aligns with Moreno's (2024) concept of the 15-minute city, in which "small commercial centres act as social and functional anchors within local networks".

Although the site contains pedestrian alleys linking shops with surrounding housing, on-site observation seen in figure 57 shows that these remain largely undefined and visually concealed, like the unmarked paths identified previously at Aorere Park figure 52. According to Love & Kok, (2021), successful neighbourhood nodes rely on visible entries, porous edges, and comfortable transitional zones that invite people to pause and interact. At present, poor lighting, limited sightlines, and inconsistent paving prevent these alleys from functioning as genuine connectors. Gehl (2010) similarly argues that when entrances and paths are hidden, "the city fails to extend an invitation to walk," reducing both safety and perceived accessibility.

Figure 60 shows the adjoining parkland contains a defined path to recreational facilities but lacks seating, shade, and micro-climatic comfort for passive users. Vilanova et al. (2024) demonstrate that small-scale green-infrastructure elements, such as bioswales, street trees, and vegetated pergolas extend ecological continuity and improve thermal conditions within dense neighbourhood fabrics. Daraojimba et al. (2024) further show that such micro-interventions "enhance social interaction, inclusion, and well-being" while reducing heat and air pollutants. Introducing shaded seating, planting pockets, and permeable surfacing would transform Vine Street from a transient retail strip into a neighbourhood node that supports both ecological function and social activity, completing its role within the wider walkable network.

Why a Nodal Framework?

This framework is nodal because daily life is nodal. People do not traverse suburbs at random; they move among a limited set of meaningful destinations. By starting with purpose, locating central and supplementary nodes where purposes concentrate, improving the micro-experience of those places, and routing them together through safe, green, legible connections, the design process embeds walkability and ecological value within the suburb's structure.

The approach stands on three intertwined rationales:

It realises the 15-minute city's principle of proximity and polycentricity, multiple local centres distribute opportunity, shorten trips, and strengthen everyday economies (Moreno, 2024)

It follows Speck's design logic that walking occurs where the walk is useful, safe, comfortable, and interesting; the framework tests each of those conditions (Speck, 2013)

It centres Gehl's human-scale method, observe, test, and adjust, so that interventions match real patterns of use (Gehl, 2010)

Figure 57

Access Through Park



Note. Pathways through parks remain undefined restricting access through. Own work.

Figure 58

Vine Street Shops



Note. Building frontage of Vine street shops. Own work.

Figure 59

Access Through Park



Note. Undefined pathway restricting access. Own work.

Figure 60

Sutton Park

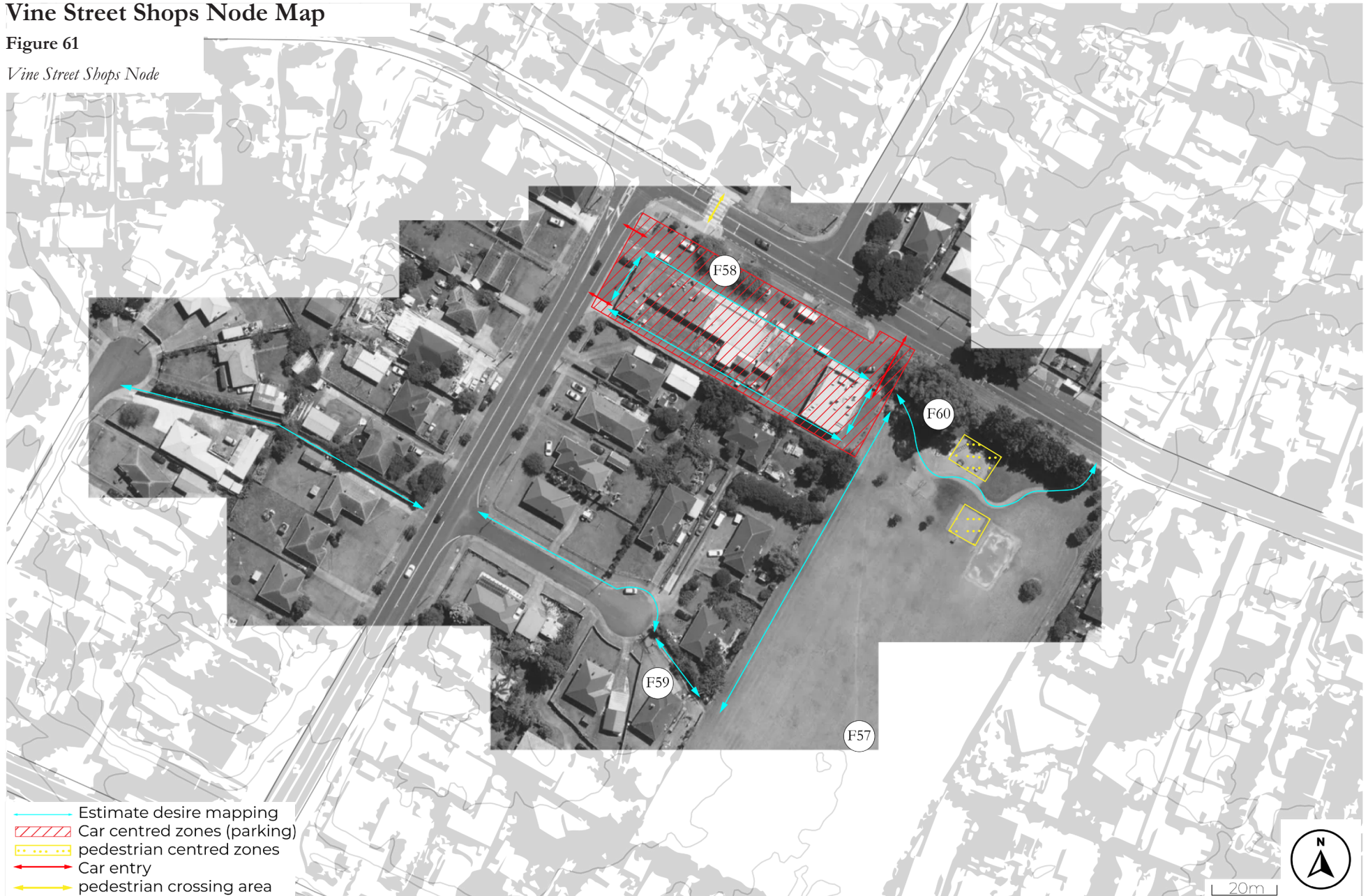


Note. Designated pathway through park, lacking public seating and shading. Own work.

Vine Street Shops Node Map

Figure 61

Vine Street Shops Node



Note. Vine street node connects adjacent streets via park connectors and alleys. Own work.

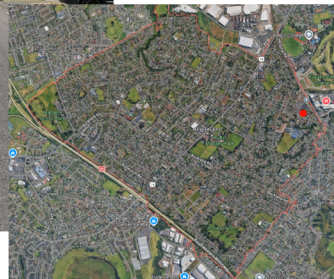
Example of Nodal Intervention (Middlemore)

Figure 62

Example of Middlemore Node



Middlemore back entry



Location within Māngere East

Note. Middlemore back entry carpark reduction allows for new interventions to support the pedestrian and more than human. Own work.

The In-Between

The fourth step stitches the network into daily habit by designing routes that make the most likely trips the most pleasant ones, aligning with the Purpose Map previously shown in figure 39 and broader walkability goals established for Māngere East (Auckland Council, 2021). The routing strategy operates across three layers:

- Main loops: Legible, continuous paths link the centralised area to primary nodes and major entries, such as the train station and main bus corridors. These form the backbone of a green-corridor system: shaded footpaths, protected cycle tracks, and storm-water-integrated planting that double as ecological infrastructure. Vilanova et al. (2024) and Beatley (2011) describe such systems as multi-scale frameworks that combine biodiversity support with climatic resilience, ensuring that the most walked routes are also the most regenerative.
- Secondary passages: Short cuts and “quiet ways” extend catchment and redundancy, alley links, park-edge paths, and mid-block passages consistent with Jacobs’s (1961) advocacy for many small, inter-visible routes that multiply opportunities for encounter and choice.
- Nodal connection: Each node is joined by continuous, human-scale routes that prioritise shade, visibility, and safety. Daraojimba et al. (2024) emphasise that green-infrastructure networks are most effective when social accessibility and environmental performance are designed together

Transit integration is central. Routes should provide direct, protected connections to bus stops and the nearest rail station. Crossings at bus stops should be raised or median refuge for universal safety, and cycle lanes must remain continuous through intersections rather than ending abruptly at arterials (Speck, 2018; Gehl, 2010). Wayfinding along the main loop follows Moreno’s (2024) guidance: express distances in minutes, not metres, and cluster local services to shorten routine trips and strengthen the everyday 15-minute structure.

Nodes in Relation to Loops

Figure 63

Nodes In Relation to Loops



Note. Nodes and their location to planned pedestrian pathways to circulate through the suburb. Own work.

Loop 5 (Existing)

Figure 67 replicates the Māngere East Streets for People initiative (Auckland Council, 2021), an established pedestrian route developed through community co-design to create connected, slow, and active streets. This loop not only links directly to the central node shown in figure 44 but also connects key local destinations including Māngere East Primary School, Little Feed Childcare, and The Church of Jesus Christ of Latter-day Saints. These connections embody the project’s stated objective of supporting “safe and enjoyable walking routes between schools, parks, and community facilities” (Auckland Council, 2021).

Figure 64 demonstrates how pedestrian flows are redirected through Williams Street and behind Massey Homestead, enhancing permeability across the neighbourhood while avoiding arterial traffic. A minor linkage introduced through Yates Park as seen in figure 66 removes the need for pedestrians to cross approximately thirteen residential driveways, significantly improving continuity and reducing potential conflict points. As Speck (2018) observes, each driveway or parking access “breaks the pedestrian realm and introduces risk”; the Yates Park connection exemplifies how small network adjustments can yield substantial safety gains.

At figure 65 Royton Park, this same principle operates at a larger scale. Integrating pedestrian paths through green-space corridors adjacent to amenities and carparks demonstrates how routing can reposition foot traffic away from high-risk vehicle zones, aligning with Gehl’s (2010) principle that coherent, uninterrupted pedestrian paths “invite movement and create visual clarity”. The resulting network not only strengthens connectivity between nodes but also enhances walkability and user confidence throughout the suburb As shown in figure 67.

Figure 64

Pedestrian Route



Note. Pedestrian route behind massey homestead to avoid surrounding main roads. Own work.

Figure 65

Royton Park Connection



Note. Key pedestrian corridor through Royton park. Own work.

Figure 66

Yates Park Connection

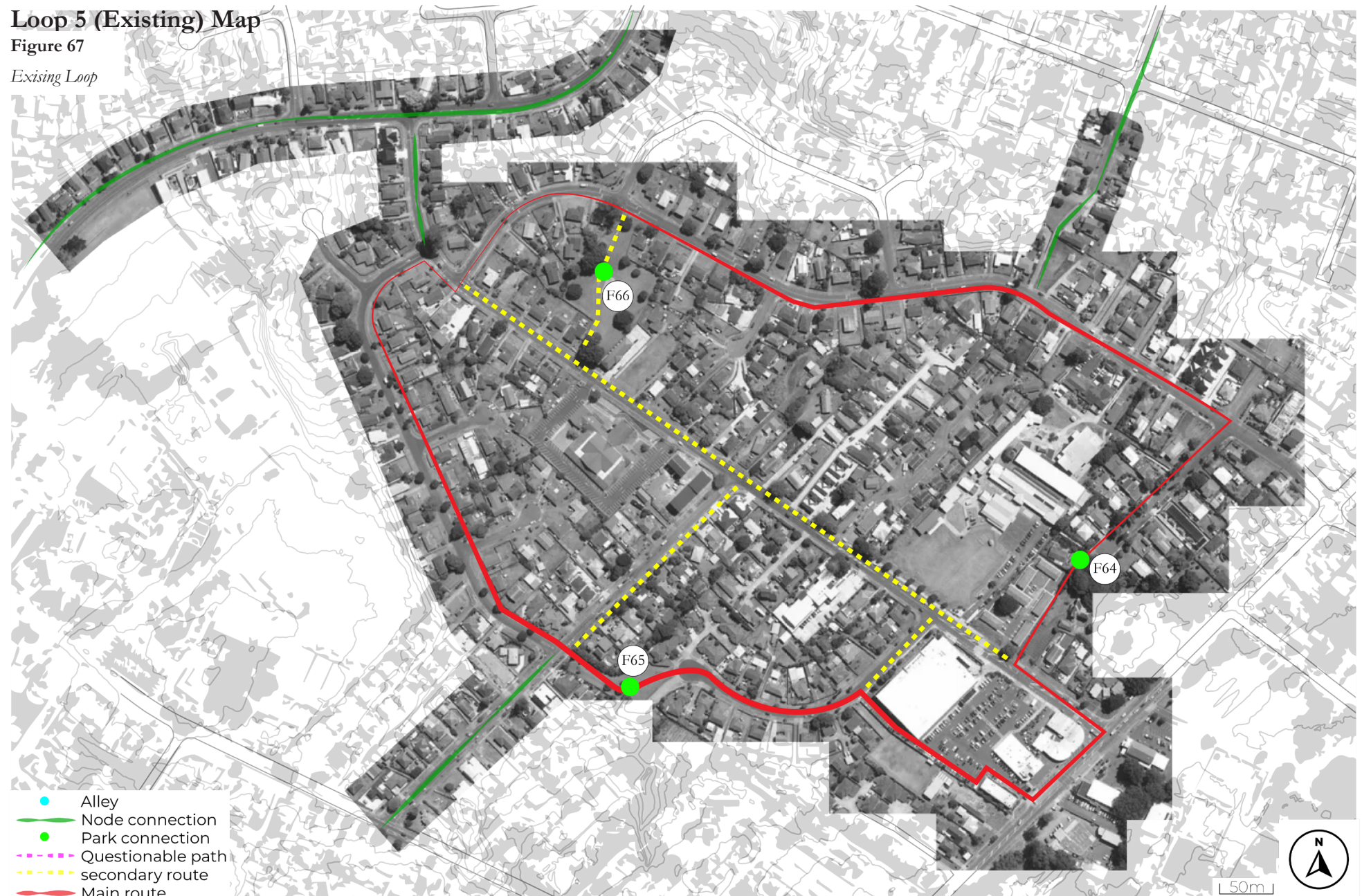


Note. Key pedestrian corridor through Yates park. Own work.

Loop 5 (Existing) Map

Figure 67

Existing Loop



Note. The existing loop shows pedestrian paths taking advantage of park connections and low traffic roads. Own work.

Main Loop

Building upon the established Māngere East Streets for People loop, the main loop shown in figure 71 strengthens its relationship to the central node by layering ecological function and micro-scale comfort onto the existing pedestrian spine. The route reinforces its civic role as both movement corridor and public landscape, linking the central retail core with residential, educational, and recreational anchors across the suburb. Where the existing loop focuses on safety and connection, the proposed design advances a green-corridor model: the continuous canopy trees, storm-water-absorbing verges, and integrated seating pockets positioned along desire-line crossings. Vilanova et al. (2024) describe such hybrid corridors as “multi-scale ecological frameworks” that unite mobility and biodiversity, while Daraojimba et al. (2024) confirm their capacity to improve air quality and thermal comfort in pedestrian environments. Bioswales placed between kerb and footpath slow runoff from adjacent carparks, creating a soft, vegetated buffer that improves both water management and perceived safety.

At intersections with Massey Road and other arterials, raised-table crossings and textured paving signal pedestrian priority. Speck (2018) argues that “every clear, continuous crossing reinforces the idea that walking is expected”. Lighting, signage, and wayfinding elements along the loop adopt Moreno’s (2024) human-scale principle, distances expressed in minutes rather than metres to guide residents through the 15-minute network intuitively.

Micro-scale interventions address comfort and usability. Following Gehl’s (2010) criteria for human-centred design, the loop’s edge conditions integrate seating, tree shade, and enclosure without restricting sightlines. These create pauses between destinations, encouraging casual encounters and spontaneous activity. Collectively, the upgraded loop becomes the structural and ecological spine of Māngere East’s walkable network: a safe, shaded, and regenerative pathway that links everyday life with natural systems.

Figure 68

Park Connection



Note. Pedestrian route through park to Buckland road. Own work.

Figure 69

Park Connection



Note. Pedestrian route behind community centre heading towards Middlemore node. Own work.

Figure 70

Buckland Road Alley



Note. Pedestrian barriers restricting wheelchair access / mobility required devices. Own work.

Main Loop Map

Figure 71

Main Loop



Note. The main loop shows planned pedestrian movement and means of an ideal route to avoid car dominated areas. Own work.

Loop 1

Figure 76 extends eastward to connect with the Middlemore node previously shown in figure 48, the suburb's primary transit gateway providing regional access via the rail network. This alignment reinforces the framework's multi-modal intent, supporting Moreno's (2024) assertion that integrated local and regional mobility is essential to the polycentric structure of a 15 minute city.

While the design prioritises routes that avoid the Massey Road arterial shown in figure 31, complete avoidance was unfeasible where adjoining lots lack park corridors or side street alternatives. In these instances, crossings were positioned at visible, well controlled points. This follows Speck's (2018) guidance that when arterials cannot be bypassed, crossings must be direct and aligned with pedestrian desire lines.

The loop utilises Miami Reserve to create a green link between Rosella Road and Miami Street shown in figure 72. Beatley (2011) identifies such connectors as biophilic corridors that support biodiversity while enhancing the sensory quality of walking. At the arterial interface, the alignment repurposes an under-utilised laundromat car park shown in figure 73 and employs an existing crossing to facilitate safe movement across Massey Road. This meets Gehl's (2010) standard that pedestrian continuity depends on recognisable sequences of space that sustain trust in the route.

However, several questionable path segments shown in figures 74 and 75 were identified during site assessments. One currently serves as temporary construction access, while another is a gated private property. These sections introduce uncertainty and potential conflict. Jacobs (1961) cautions that when public routes are visually or functionally ambiguous, pedestrians hesitate and streets lose their sense of safety. Resolving these conflicts through clear boundary design or alternative routing is critical to ensuring the continuity of Main Loop 1.

Figure 72

Miami Reserve



Note. Green link through Miami street and Rosella road. Own work.

Figure 73

Massey Road Laundromat



Note. Carpark provides clear and safe access for pedestrians. Own work.

Figure 74

Questionable Route



Note. Semi private housing complex. Own work.

Figure 75

Questionable Route



Note. Temporary construction access to Middlemore hospital. Own work.

Loop 1 Map

Figure 76

Loop 1



Note. Loop 1 shows planned pedestrian movement and means of an ideal route to avoid car dominated areas. Own work.

Loop 2

Figure 80 interfaces directly with the Aorere Park node, incorporating the existing green-space corridor to provide four-way pedestrian access from adjacent residential streets. This design strengthens permeability and reinforces the nodal network's spatial logic, aligning with Gehl's (2010) principle that "a fine-grained street structure offering many possible routes invites movement and choice". The green open space functions simultaneously as circulation, ecological, and social infrastructure consistent with Beatley's (2011) assertion that interconnected parks and corridors "extend daily contact with nature and support both biodiversity and recreation"

The loop maintains continuity with the wider framework by connecting to Buckland Road's existing cycle lane shown in figure 77 and re-joining the main loop via a short alley links seen in figures 78 and 79. Speck (2018) advocates for this kind of multimodal integration, noting that "the success of walkability depends on seamless transitions between walking and cycling networks". Through this connection, Main Loop 2 enhances both local accessibility and intermodal continuity, an essential component of Moreno's (2024) 15-minute city, where diverse mobility options are spatially and functionally intertwined.

Figure 77

Buckland Road Cycle Lane



Note. Buckland road arterial with adjacent cycle lane. Own work.

Figure 78

Buckland Road Alley



Note. Cnnection alley with existing pedestrian obstacles. Own work.

Figure 79

Hokianga Street



Note. Cnnection alley with existing pedestrian obstacles. Own work.

Loop 2 Map

Figure 80

Loop 2



Note. loop two shows planned pedestrian movement and means of an ideal route to avoid car dominated areas, whilst providing four way pedestrian access. Own Work.

Loop 3

Loop 3 forms the southern gateway into Māngere East, encompassing two primary entry routes that pass beneath and across the Southwestern Motorway shown in figure 85. Functionally, this loop establishes a key arrival point for residents and visitors, anchoring the suburb's southern access within the wider nodal network. Moreno (2024) describes such gateways as “thresholds of accessibility” that integrate external mobility systems with the fine-grained walkable structure of local life.

The route leverages existing green spaces and alleyways to complete its connections shown in figures 81-84, ensuring permeability while preserving ecological continuity. This approach aligns with Beatley's (2011) principle that urban green infrastructure should “serve simultaneously as habitat corridors and human movement networks”. Framing these corridors with vegetation and clear sightlines follows Gehl's (2010) observation that well-defined, green-edged entrances “extend an invitation to walk” by combining spatial clarity with visual comfort.

Loop 3 links both community centres, facilitating reciprocal flows between residents and those arriving from adjoining suburbs. Speck (2018) highlights that connecting civic and cultural amenities through continuous, legible pedestrian routes promotes “inclusive accessibility and social exchange”. The loop therefore consolidates the southern edge of Māngere East as a welcoming, green, and multimodal entry corridor, one that complements the suburb's central and eastern networks while strengthening ecological function and neighbourhood identity.

Figure 81

Green Connection



Note. Existing ecological corridor facilitating dual pedestrian access. Own work.

Figure 82

Buckland Alley #2



Note. Pedestrian route obstructed. Own work.

Figure 83

McKinstry Reserve



Note. Green connection through loop. Own work.

Figure 84

Cottingham Reserve



Note. Green connection through loop. Own work.

Loop 3 Map

Figure 85

Loop 3



Note. Loop 3 shows planned pedestrian movement and means of an ideal route to avoid car dominated areas. Own work.

Loop 4

Loop 4 links the Vine Street Shops and Sutton Park School to the broader Māngere East community network, forming a vital east–west connector. The route makes strategic use of existing alleys and park corridors shown in figures 86–89. Gehl (2010) emphasises that such fine-grained pedestrian routes “offer choice and legibility, inviting continuous movement through the city”

This loop also reinforces the proximity-based logic central to Moreno’s (2024) 15-minute city, in which schools, small business clusters, and green spaces act as interlinked daily destinations within walking distance. By connecting these functions through existing open spaces, Main Loop 4 transforms residual alleys into functional green corridors. Beatley (2011) observes that “small park linkages and vegetated passages create biophilic continuity” while simultaneously supporting active mobility. Likewise, Speck (2018) argues that alleyway upgrades and short-cut paths “enhance walkability by shrinking perceived distance and increasing network density”. Collectively, these interventions strengthen both the social and ecological fabric of Māngere East’s southern precinct.

Figure 86

Trembath Ave Park Connection



Note. Green connection through Sutton park to Trembath Ave. Own work.

Figure 87

Farmer Street Alley #1



Note. Pedestrian route obstructed. Own work.

Figure 88

Farmer Street Alley #2

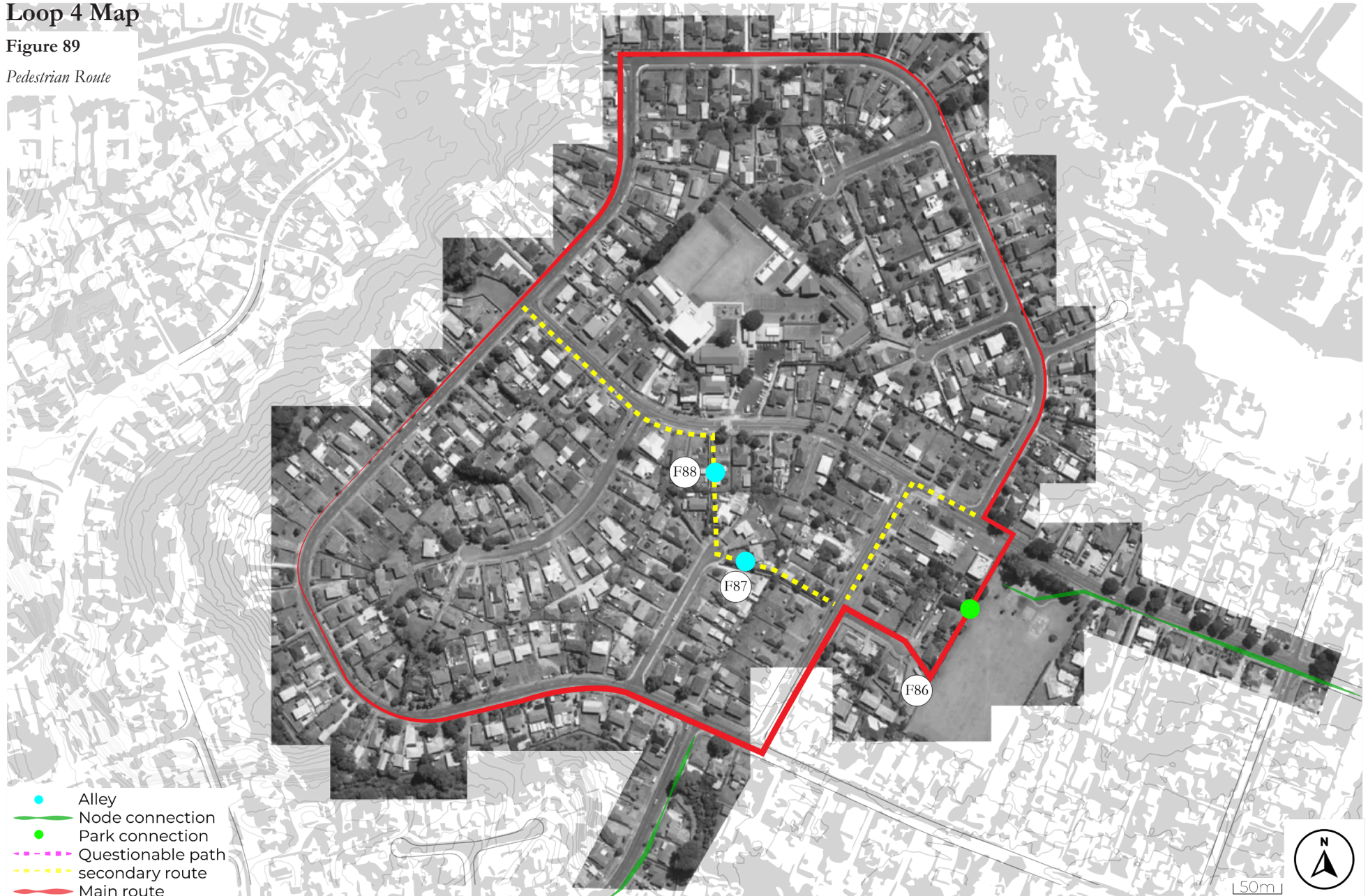


Note. Pedestrian route obstructed. Own work.

Loop 4 Map

Figure 89

Pedestrian Route

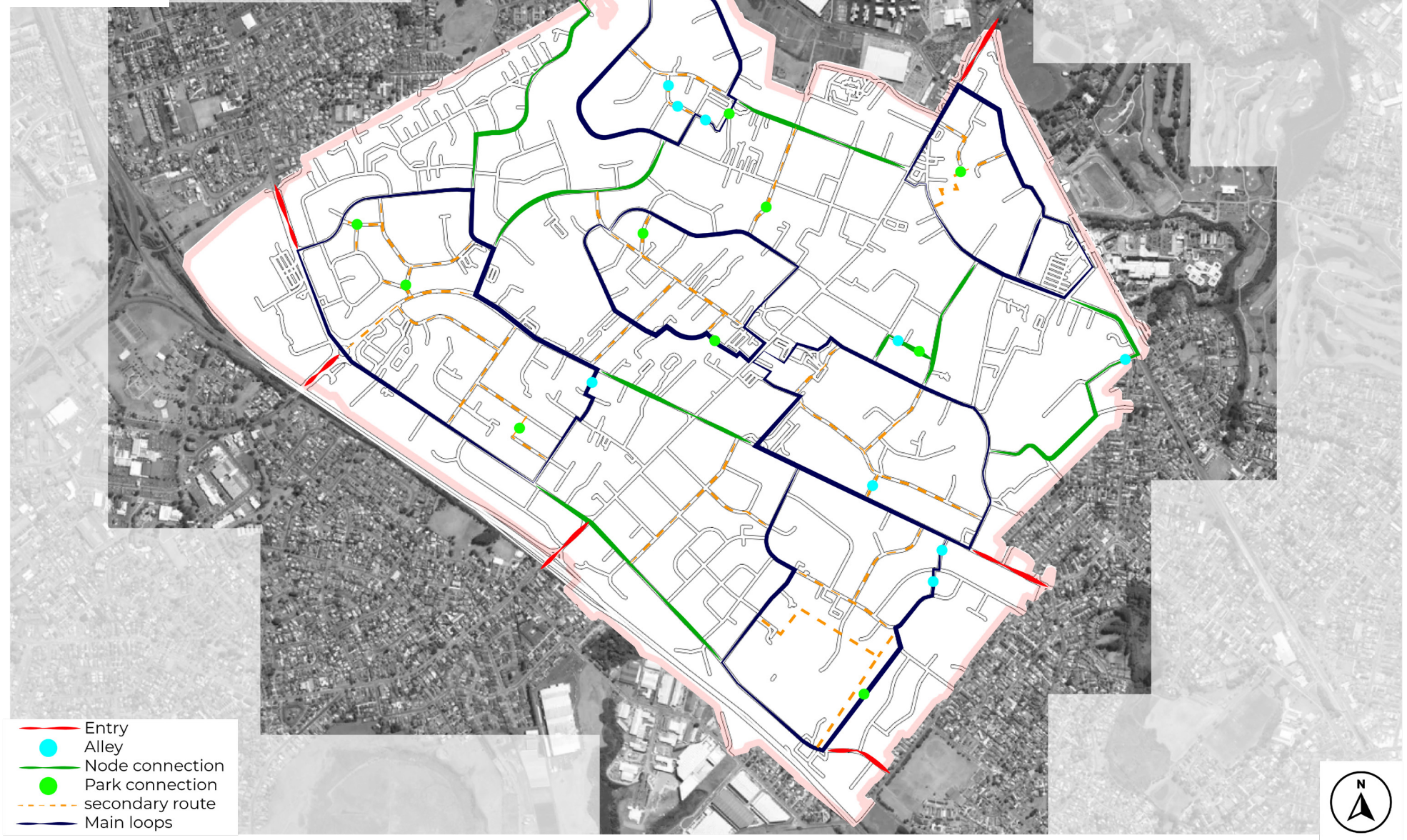


Note. Loop 4 shows planned pedestrian movement and means of an ideal route to avoid car dominated areas. Own work.

Loops In Relation to Eachother

Figure 90

Whole Loop System

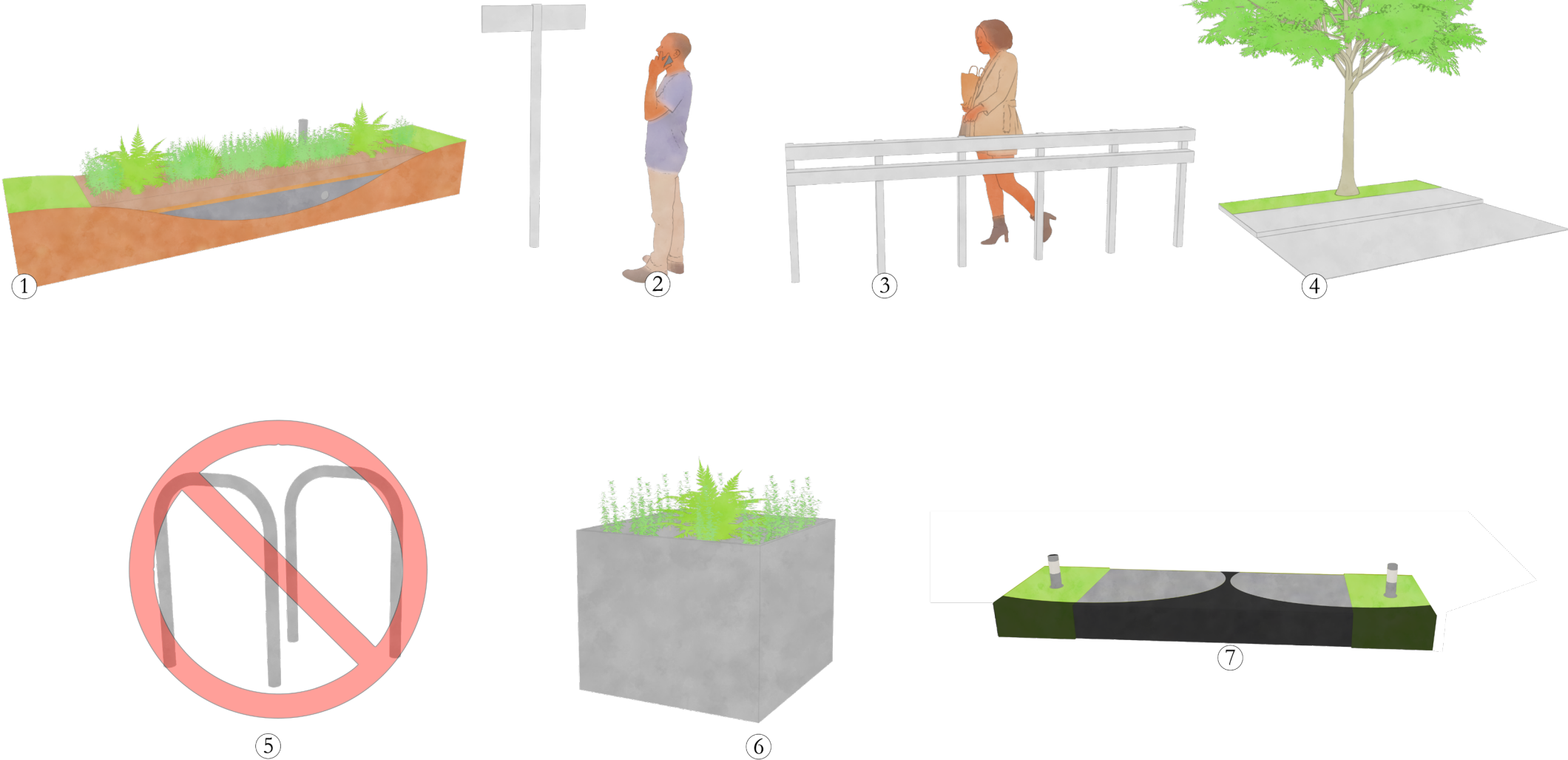


Note. Full loop map showing connections to eachother. Own work.

Example Implementations Within Loops

Figure 91

Loop Implementation Examples



Note. Examples of installments located within loops. Own work.

- | | |
|-----------------------|--------------------------------|
| ① Rain gardens | ⑤ Pedestrian obstacles removed |
| ② Way finding | ⑥ Planter boxes |
| ③ Pedestrian barriers | ⑦ Lights for improved safety |
| ④ On-street greening | |

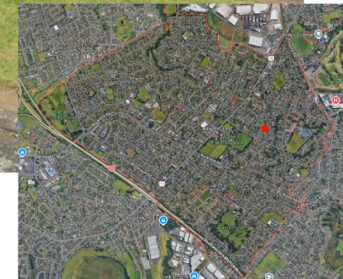
Example Loop Intervention - Calvert Park

Figure 92

Calvert Park Intervention



Existing space - Calvert park



Location within Māngere East

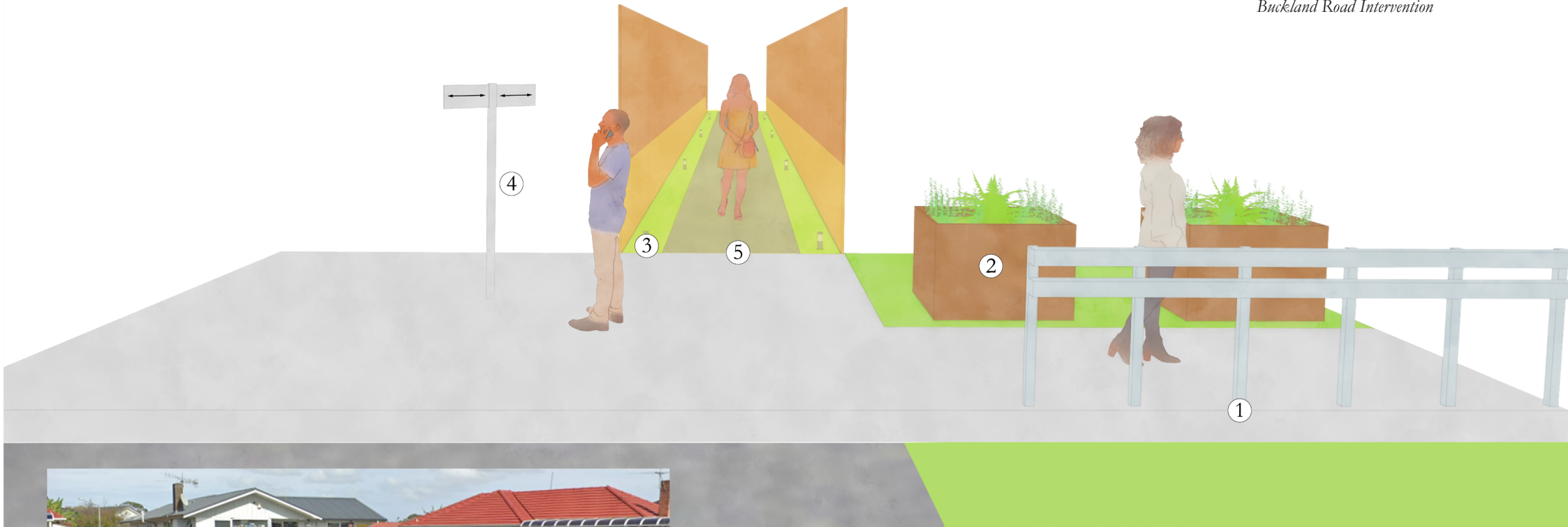
- ① Rain garden - Retain stormwater through pedestrian flows
- ② Way finding - Show pedestrian newly implemented paths
- ③ On-street greening - Improve more than human movement

Note. An example of nodal implementations located at Calvert park. Own work.

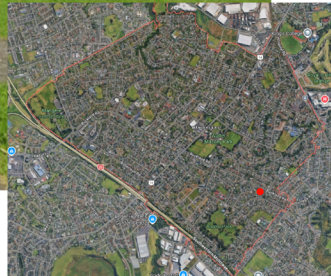
Example Loop Intervention - Buckland Road

Figure 93

Buckland Road Intervention



Existing space - Buckland road alleyway



Location within Māngere East

- ① Pedestrian barriers next to arterial
- ② Planter boxes
- ③ Lights for improved safety
- ④ Way finding - Show pedestrian newly implemented paths
- ⑤ Pedestrian obstacles removed

Note. An example of nodal implementations located at Buckland road .Own work.

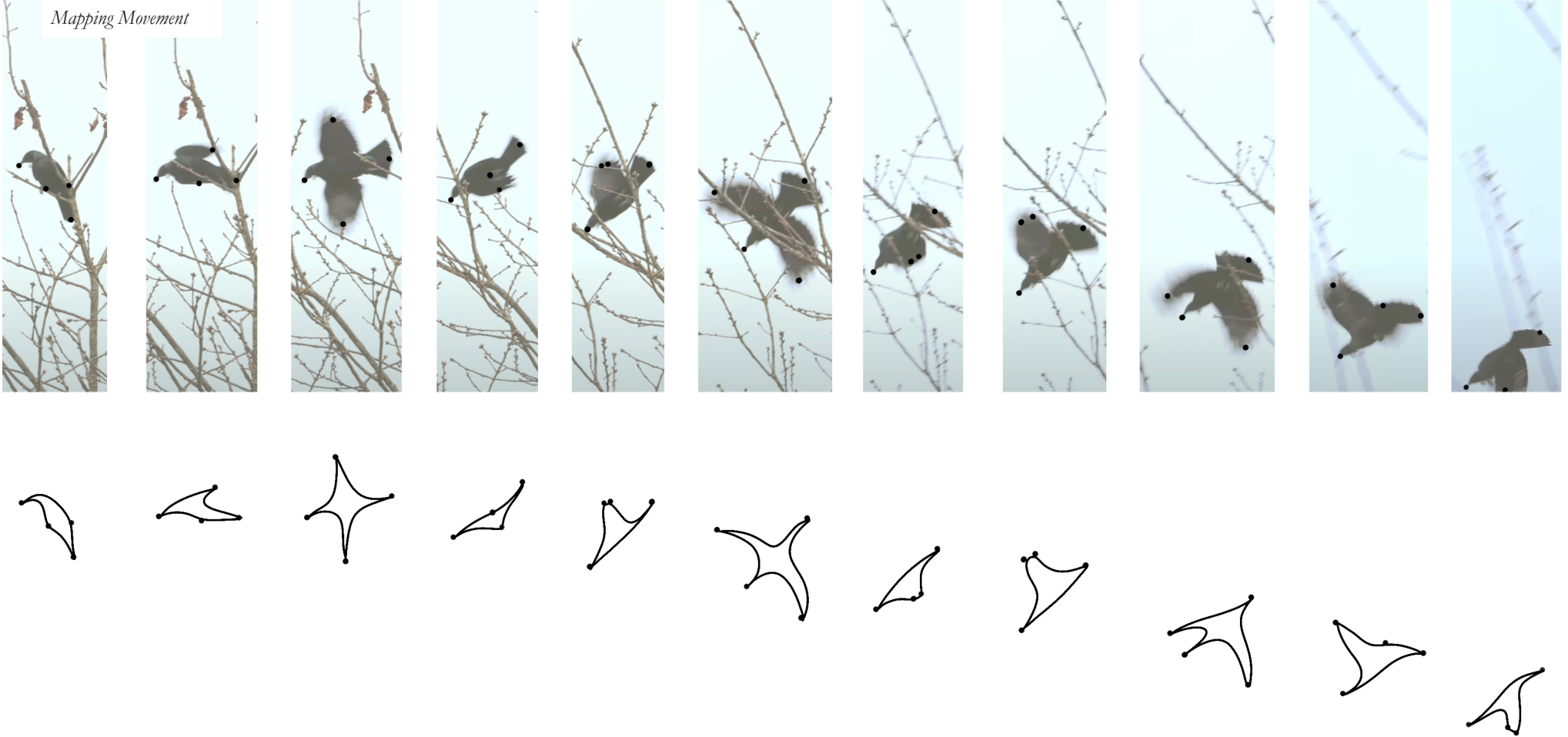
The routing phase consolidates the nodal framework into a coherent, human-scaled movement network, transforming fragmented suburban structure into a continuous web of safe, legible, and ecologically responsive paths. Through strategic use of existing green spaces, alleys, and underutilised corridors, each loop reinforces proximity and accessibility while reducing pedestrian exposure to traffic-heavy arterials. Gehl (2010) stresses that the success of walkable environments depends on “the continuity and clarity of the route”, a principle achieved here through incremental alignment of pathways with natural desire lines and ecological corridors.

Together, the four main loops transform Māngere East’s fragmented street fabric into a coherent and legible system of everyday movement. Each loop builds on existing pathways, reinterpreting them as part of a continuous, multimodal, and ecologically active framework. The result is a network that not only connects nodes but also embeds walkability and regeneration into the physical and social structure of the suburb. In combination, these loops enact Moreno’s (2024) 15-minute city ideal of proximity-based living, Gehl’s (2010) call for human-scale continuity, Beatley’s (2011) vision of biophilic urbanism, and Speck’s (2018) pragmatic rule that safety and comfort are the non-negotiable foundations of walkable design. The routing framework therefore serves as the spatial and conceptual bridge between macro-scale planning and micro-scale design, setting the stage for the following Design Phase, where these principles are translated into site-specific architectural and landscape interventions that embody a regenerative, human-centred future for Māngere East.

Design Phase

Figure 94

Mapping Movement



Note. Mapping the movement of ecological form. Own work.

Planning Designated Areas

As discussed earlier, Speck (2013) argues that “the first step in reclaiming downtowns for people is reducing parking”. However, compliance with statutory requirements constrains how much parking can be removed within this site. Under Rule 51 - Parking, Loading and Access of the Auckland Council District Plan (Franklin Section), supermarkets located in a Business “Centre” zone must provide one space per 40 m² of gross floor area (Auckland Council, 2014). Given the estimated gross floor area of the Woolworths Māngere site at approximately 4,379 m², a minimum of 109 carparks must remain to satisfy compliance. Figure 95 shows the existing carpark whilst figure 96 illustrates the potential reduction zone achievable while maintaining the existing circular manoeuvring pattern of the carpark. This reconfiguration would release peripheral space for pedestrianisation and landscape integration, while surplus demand could be redirected to adjacent lots within the wider centre.

Figure 95

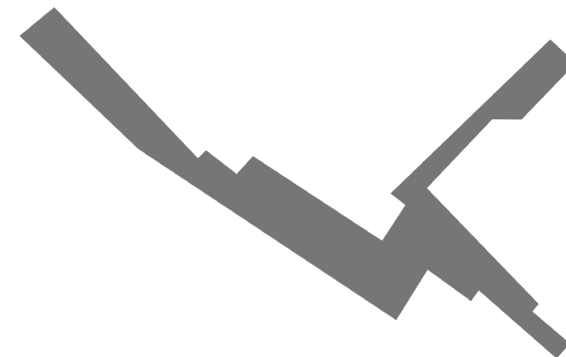
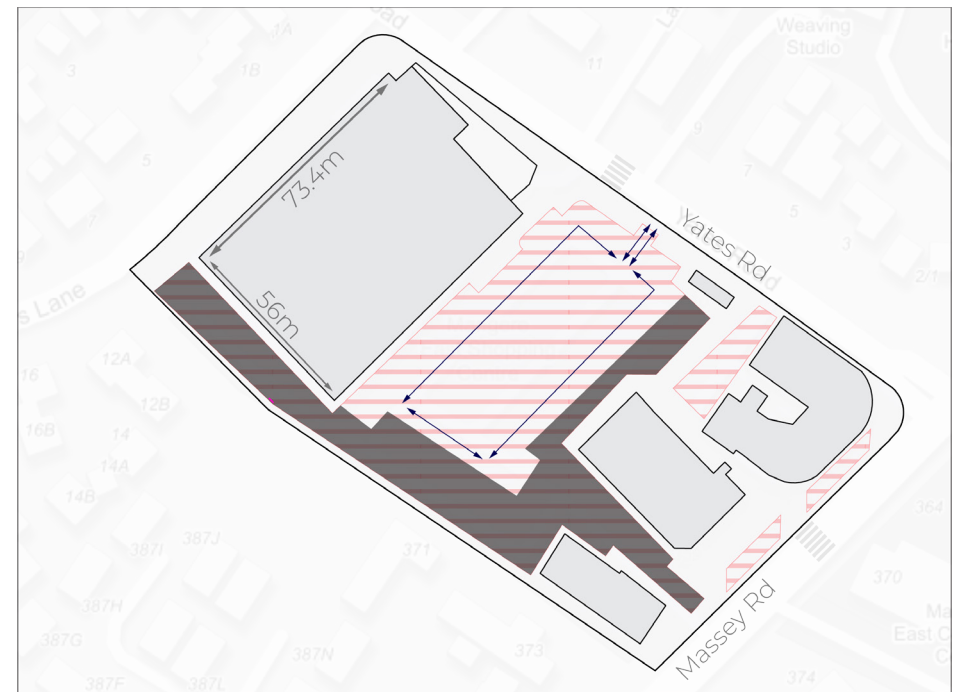
Existing Carpark



Note. Existing carpark with circular movement pattern. Own work.

Figure 96

Carpark Removal



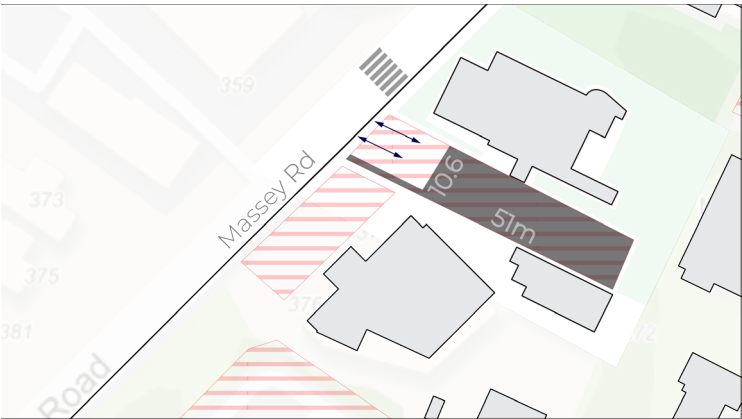
Useable space

SIDE A

Note. Carpark removal whilst maintaining circular car movement. Own work.

On the opposite side of the site, the Māngere East Library presents a contrasting condition. One façade fronts a pedestrian-oriented area, while the rear contains approximately 892 m² of sealed surface providing 18 parking spaces shown in figures 97, 98 and 99. Because this property sits outside the designated Business Local Centre Zone, the mandatory parking provision does not apply. This spatial flexibility enables most of this area to be converted into pedestrian or ecological space, retaining only mobility parking to ensure universal access. Such reallocations align with Gehl’s (2010) advocacy for “soft edges and spaces for staying” that transform residual vehicular surfaces into vibrant, human-scaled public environments.

Figure 97
Carpark removal



Useable space
SIDE B

Note. All carparks removed except Mobility parks. Own work.

Figure 98
Street Art



Note. Existing street art painted by the community. Own work.

Figure 99
Entry Way To Removed Carpark



Note. Entryway to partially removed carpark. Own work.

Analysis emphasises creating “ecological corridors to connect areas of parks and open spaces” and protecting/adding street trees to link patches into a functional network (Auckland Council, 2021). Because urban ngahere (urban forest) benefits span social (shade/heat mitigation, wellbeing), environmental (biodiversity, air/water quality), and economic outcomes (flood risk reduction), the green network is advanced in tandem with the walkable network (Auckland Council, 2021). Soil systems and understory selection are also important: habitat composition and plant species strongly shape invertebrate communities and trophic function, which in turn affects ecological resilience in planted urban sites, evidence that micro-vegetation choices matter for performance over time (Santorufu et al., 2012). Accordingly, planting palettes at nodes and along routes privilege native species supportive of local birdlife (e.g., kererū diets vary seasonally and benefit from fruiting and foliage resources across the year; Mander et al., 1998).

Ecological structure is treated as first-order infrastructure: overland flow paths and are used to steer green-blue alignments figure 100, and opportunities for canopy expansion and connectivity are prioritised where they also support pedestrian comfort (shade, microclimate) and biodiversity.

Figure 100

Stormwater Planning



Note. Locating areas for stormwater planting based upon existing hydrology. Own work.

The Golden Ratio and Its Relevance

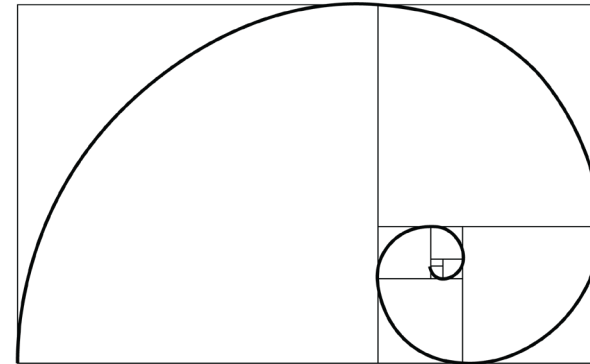
This design phase centres human and more-than-human needs in decision-making, using proportional systems to translate comfort, movement, and perception into spatial rules. An initial exploration drew on Le Corbusier's Modulor, a proportional framework rooted in human stature, intended to imbue architecture with a "mathematical order oriented to the measure of man." While its humanist ambition remains compelling, the Modulor's scalar emphasis on objects and individual buildings aligned imperfectly with the neighbourhood-scale goals of walkable, green urbanism. This led to a reframing of the golden ratio ($\varphi \approx 1.618$), the same harmonic proportion underpinning the Modulor, now applied as a flexible parametric rule to structure open-space networks, paths, edges, and cross-member spacing across multiple scales and contexts. Building on the site analysis and nodal framework established earlier, a golden-ratio grid serves as the primary design instrument, guiding dimensions and intervals in varied applications throughout the project.

The golden ratio describes a proportional relationship in which the whole relates to its larger part as the larger part relates to the smaller ($\approx 1.618:1$) as shown in figure 101. Figure 102 shows this proportion appears pervasively in nature, often in forms with length-to-height ratios near $3/2$ that optimise the flow of visual information to the brain, aligning with the constructal law of design evolution. As Bejan (2009) illustrates, these φ -like geometries support a unified evolutionary logic connecting vision, cognition, and locomotion, facilitating efficient scanning of horizontal visual fields and the perception of harmonious, "breathing" structures in both biological and human-made systems. In architectural discourse, the golden ratio has long been linked to visual equilibrium and human-scaled harmony, from classical precedents through to modern works. Le Corbusier deliberately incorporated it, along with the Fibonacci series, into the Modulor to create "rhythms visible to the eye" through anthropometric proportioning. For an urban framework prioritising walkability and green performance, the golden ratio offers dual advantages: it

supplies a repeatable mathematical basis for spacing and sizing that people intuitively perceive as orderly yet non-monotonous, while modular grid applications demonstrate its ability to govern movement networks and landscape patch dimensions without enforcing a singular architectural style.

Figure 101

Golden Ratio



Note. Example of golden ratio proportions. Own work.

Figure 102

Golden Ratio Within Nature



Note. Golden ratio proportions naturally occurring. Own work.

Creating a Golden-Ratio Grid

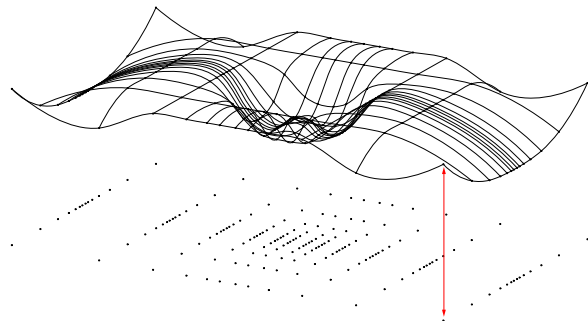
Each designated design area is inscribed with a φ -based system of “rings” and cross-members shown in figure 104:

1. Start with the area’s bounding rectangle (length $\times$ height).
2. Scale down successively by φ (≈ 1.618) to generate a nested series of rectangles/rings.
3. Connect corresponding ring vertices and mid-segments vertically and horizontally; the intersections form a luminous grid whose spacings are proportional by φ .
4. Use these grids as spacing for cross members within the design.

This approach aligns with research emphasising how the golden ratio can structure architectural and spatial composition to produce perceptible harmony and balance. Zeina (2022) explains that applying the golden ratio directly to architectural form “creates visual relationships that are easily recognised by the human eye as balanced and unified”.

Figure 103

Lifting Points Vertically

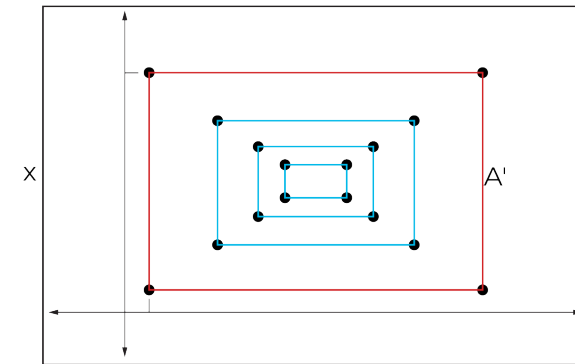


Note. Example of lifting the created golden ratio grid points to form 3D form. Own work.

Figure 103 shows an example of golden ratio grid applied on the verticle axis to create cross members

Figure 104

Creating the Grid



$$A = X \times Y$$

$$A' = \frac{A}{\varphi} = \frac{X \times Y}{1.618}$$

A = original area

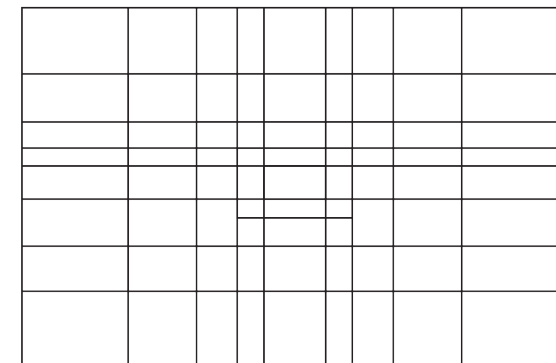
A' = scaled-down area = —

φ = golden ratio ≈ 1.618

— = Repeated scaling process

• = Point to be extended to x and y end

Result = Example cross member spacing



Note. Golden ratio grid attained from desired area. Own work.

Heights: Reconciling Planning Controls

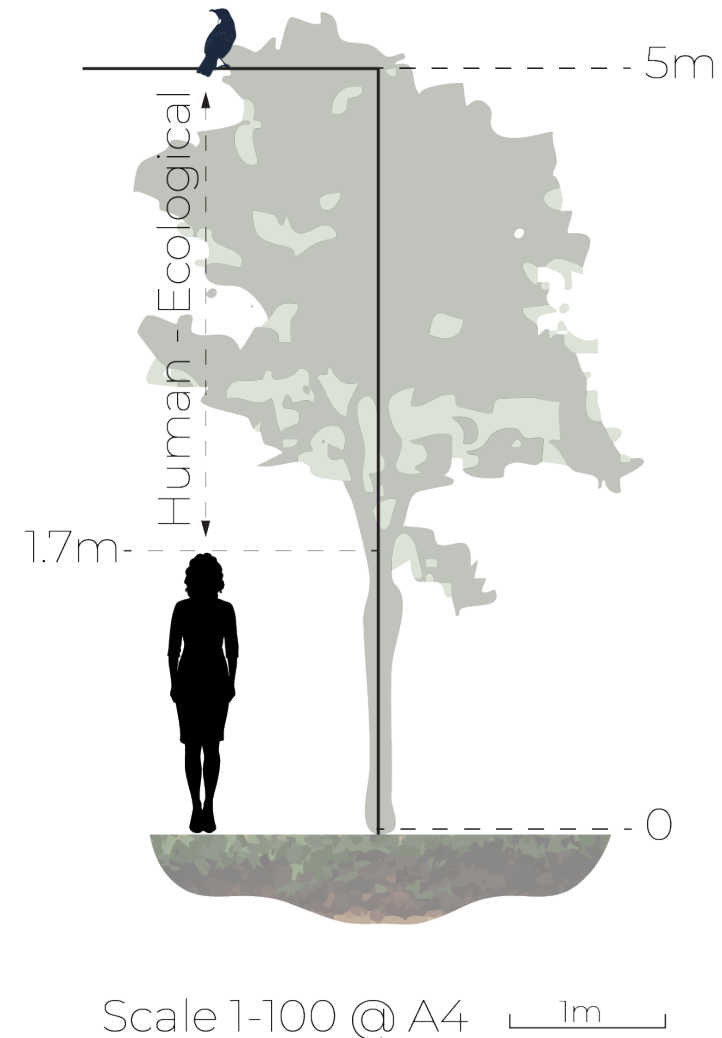
Maximum heights are first bounded by the Auckland Unitary Plan (AUP) zoning that applies at each site. For instance, operative zone chapters specify height caps (e.g., 8 m in the Single House Zone; 11 m in the Mixed Housing Urban Zone, subject to roof allowances), alongside related amenity/objective statements about character and dominance (Auckland Council, 2025). These regulatory envelopes are then moderated by contextual design judgement edge conditions, adjacent dwelling typologies, and street width to avoid intrusive massing.

Critically, heights are also tuned to ecological performance. Kererū (*Hemiphaga novaeseelandiae*) commonly nest within a vertical band of roughly 2–20 m above ground, with several sources reporting means around ~5 m and frequent use of mid-canopy branches with overhead cover (Mander et al., 1998, ; NZ Birds Online, n.d., “Nest height,” n.d.; Urban Ark, 2019). Using 5 m as a design threshold for mid-canopy continuity (rather than a strict biological minimum) allows the public-realm structure, street trees, courtyard groves, and green corridors to sustain habitat function while also delivering human-scale shade and enclosure as shown in figure 105. In practice, that means:

- aligning primary canopy clearances and branching heights so continuous “canopy bridges” occur at 4–6 m.
- ensuring building base-zones (0–5 m) and setbacks accommodate soil volume for mature trees; and
- integrating perch and food species along φ -spaced routes to extend habitat through the walkable network (cf. Mander et al., 1998).

Figure 105

Planning Heights



Note. Planned heights to benefit the human and the more than human. Own work.

Design Process

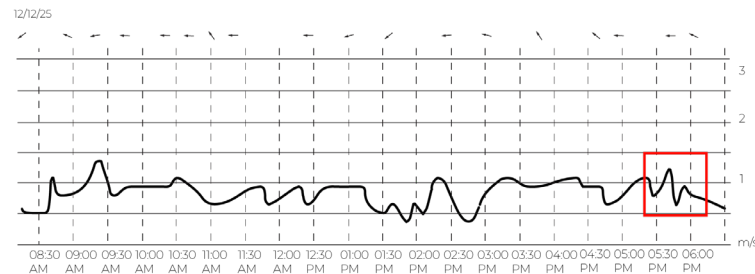
The form-generation process draws direct inspiration from the cultural and environmental identity of Māngere. The area's traditional name, Ngā Hau Māngere, translates to “the gentle, lazy winds,” referring to the calm breezes that characterise the local microclimate (Te Ara, 2009). This concept of flowing, adaptive movement provides both metaphorical and environmental grounding for the design's curvilinear geometry.

To maintain contextual relevance, the curve profiles were generated using hourly wind-pattern data specific to Māngere, producing forms that respond to the predominant wind directions and velocity variations throughout the day as shown in figure 106. These datasets informed a series of parametric curves representing the oscillating rhythm of air movement across the site. The curves were filtered to maintain structural feasibility while preserving the natural cadence of the recorded patterns, ensuring that the resulting geometry remains both site-derived and performative.

In doing so, the project translates Māngere's atmospheric qualities into its gentle, shifting winds into spatial expression. The resulting forms are not arbitrary but emerge directly from the local environmental character, embodying the dialogue between cultural naming, climatic behaviour, and computational design.

Figure 106

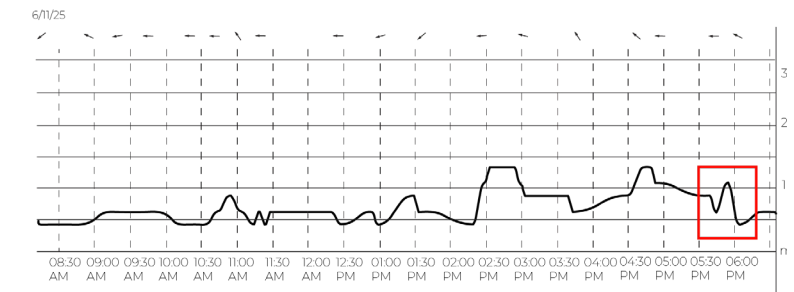
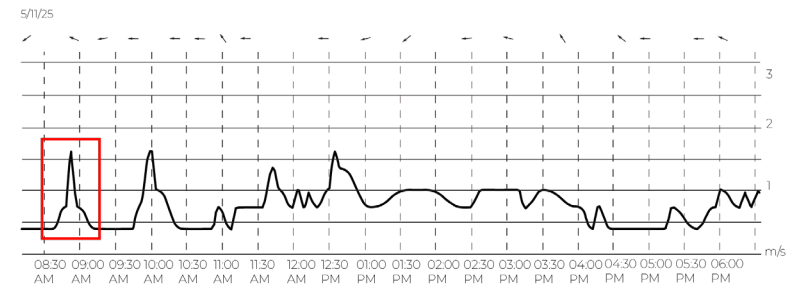
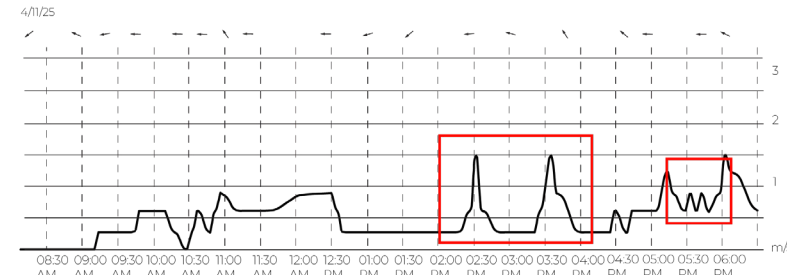
Māngere East Wind Charts



Note. Previous wind patterns with highlighted shapes for design concepts.

Own work.

Wind chart - Closest meteo station 6.45km

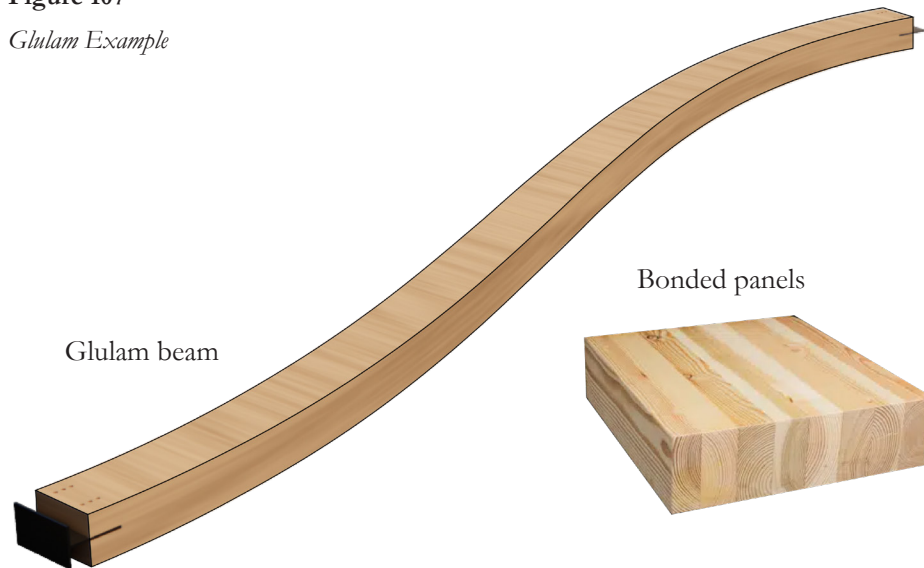


Materiality

Glued laminated timber (glulam) was selected as the core structural material for this project due to its capacity to operate simultaneously as a primary load-bearing system and a form-generating architectural element. Its inherent strength, dimensional stability, and adaptability allow it to support complex, sweeping geometries while maintaining structural efficiency. This dual performance makes curved glulam particularly well suited to the project's design intent, where structural expression and spatial fluidity are integral to the architectural language.

Figure 107

Glulam Example

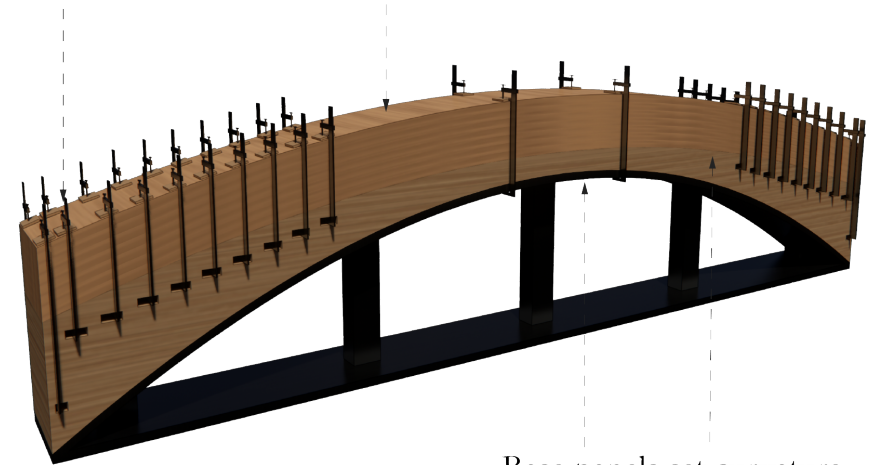


Note. Example curved glulam beam and bonded panels. Own work.

Figure 108

Glulam Assembly

Individual panels stacked, glued then clamped to base



Base panels set curvature

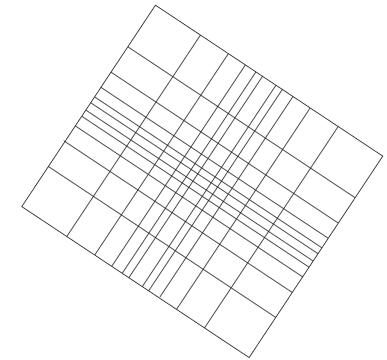
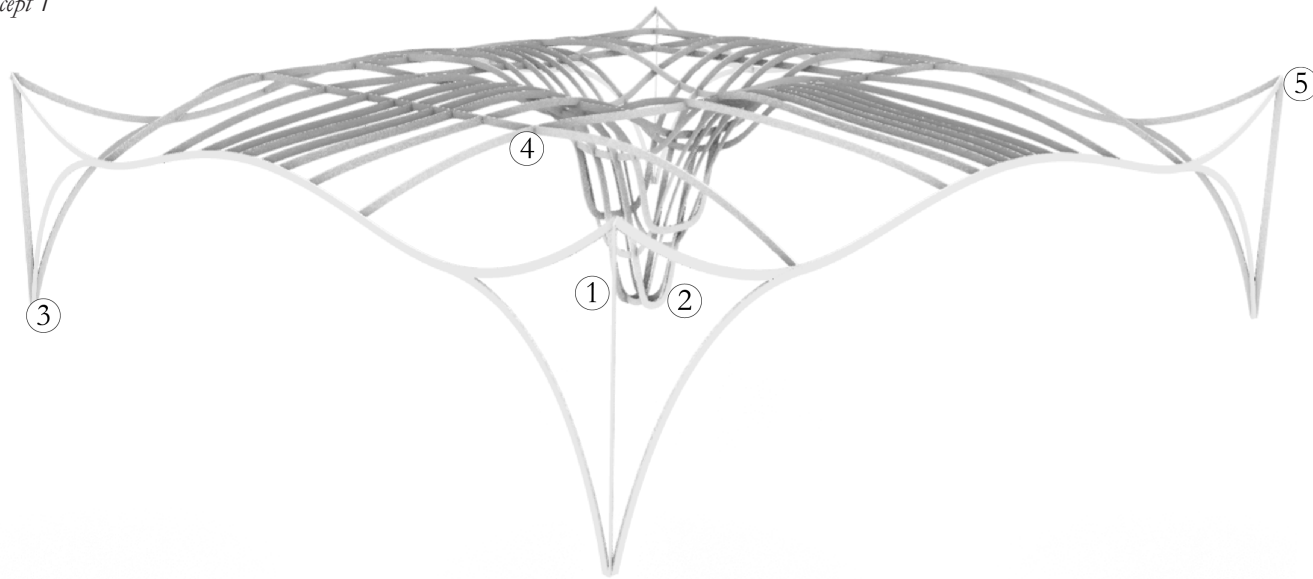
Note. Process of creating curved Glulam beams. Own work.

Curved glulam is manufactured by laminating and bonding multiple thin timber pieces together as seen in figure 107 in a controlled process that sets the desired curvature. The laminations are formed into the required shape in a factory environment and bonded under pressure so that, once cured, the timber retains its curved profile without loss of structural integrity (Binkley Construction, 2024) as shown in figure 108. According to the curved beams and arches data from a New Zealand manufacturer, these curved members can be engineered into a wide range of practical shapes, including constant radius curves, continuous curves, and more complex forms, with the thickness of the laminations tailored to the radius of curvature to ensure performance and manufacturability (Red Stag TimberLab, n.d.). This process permits both aesthetic flexibility and structural robustness in bespoke architectural applications.

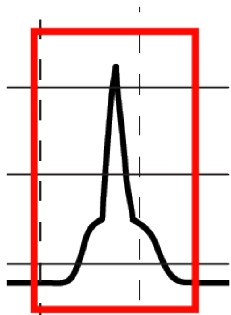
Design Concept 1

Figure 109

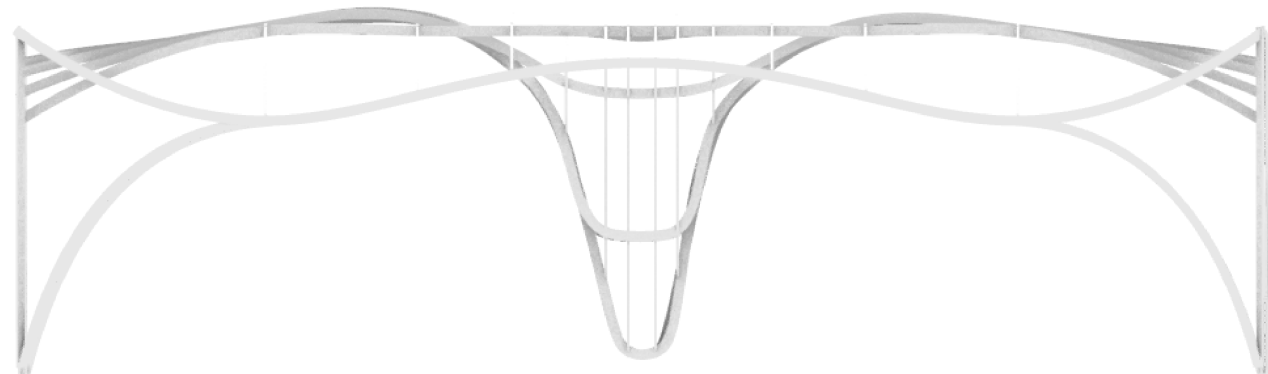
Concept 1



Golden ratio cross member patten



Wind pattern interpreted



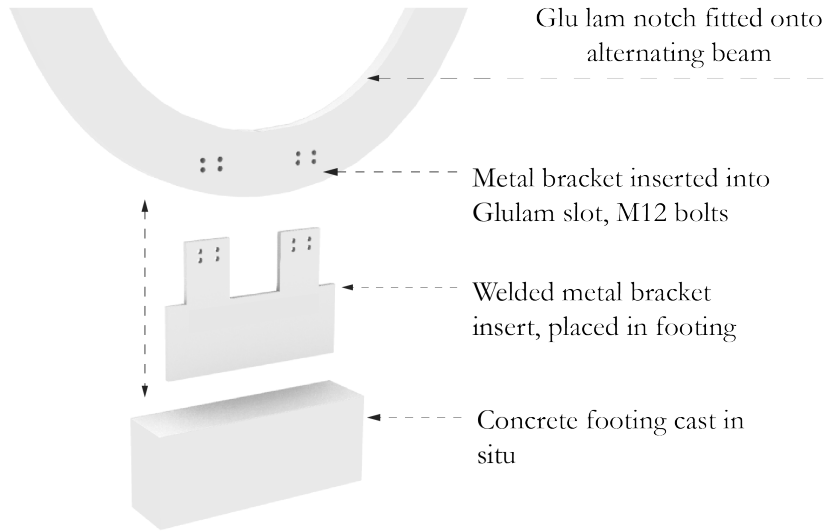
Note. Concept 1 showing which wind pattern inspired the design and golden ratio grid it's derived from. Own work.

Assembly of Design Concept 1

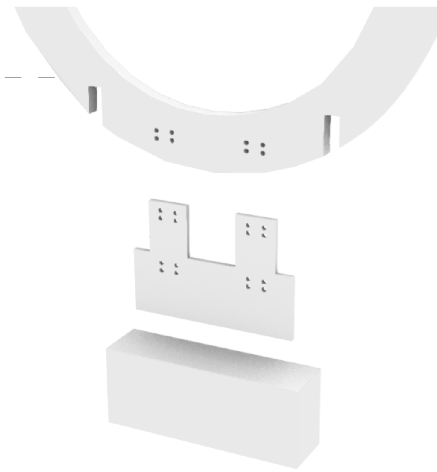
Figure 110

Concept 1 Assembly

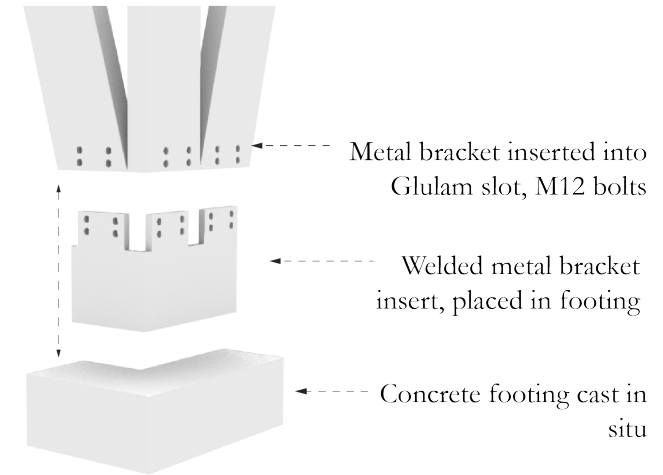
① Middle Beam foundation connection



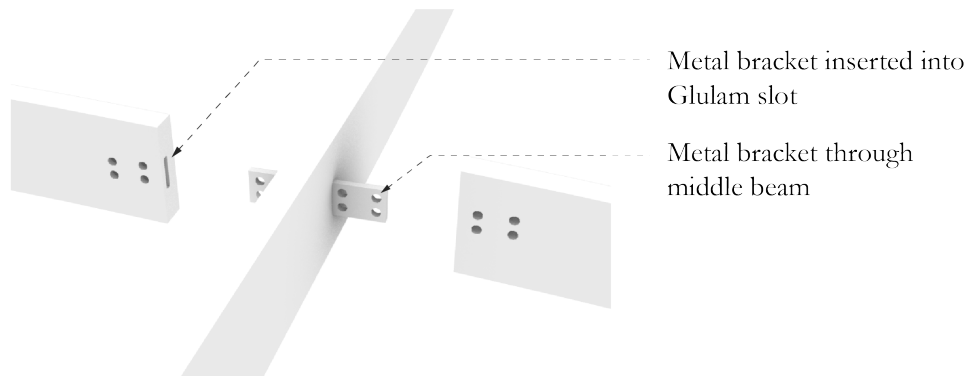
② Middle Beam foundation connection



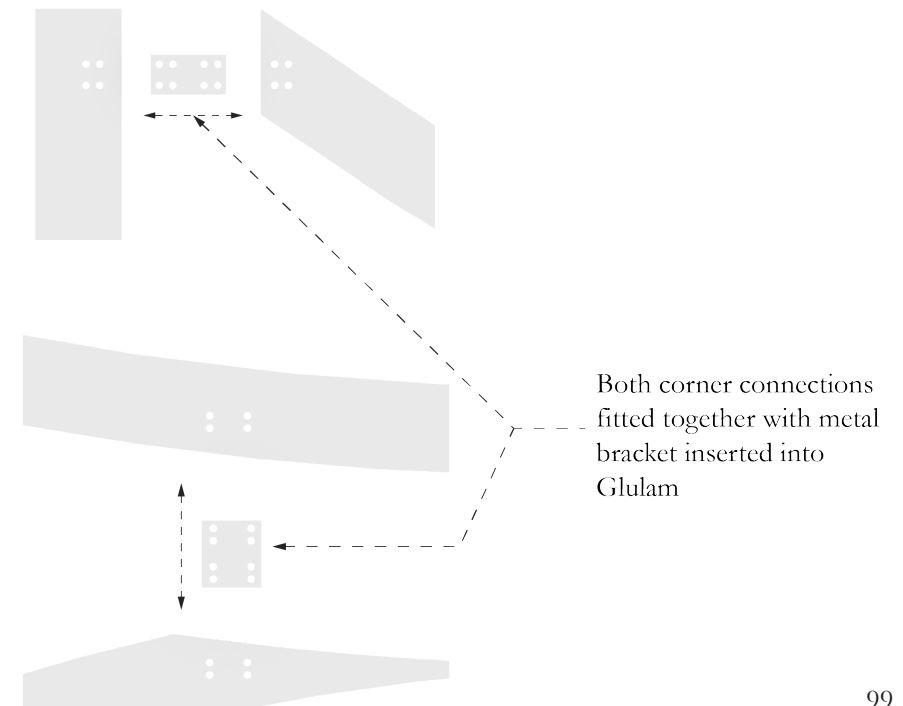
③ Corner beam foundation connection



④ Cross member connection



⑤ Corner support connections

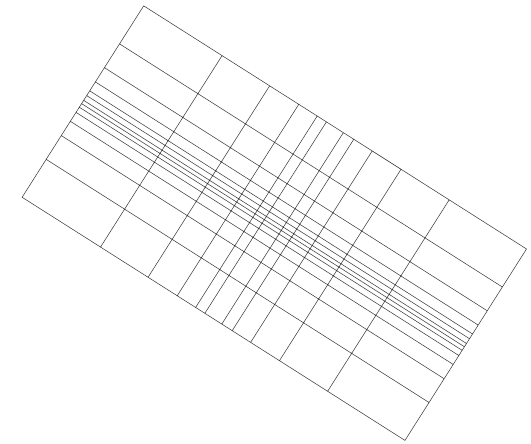
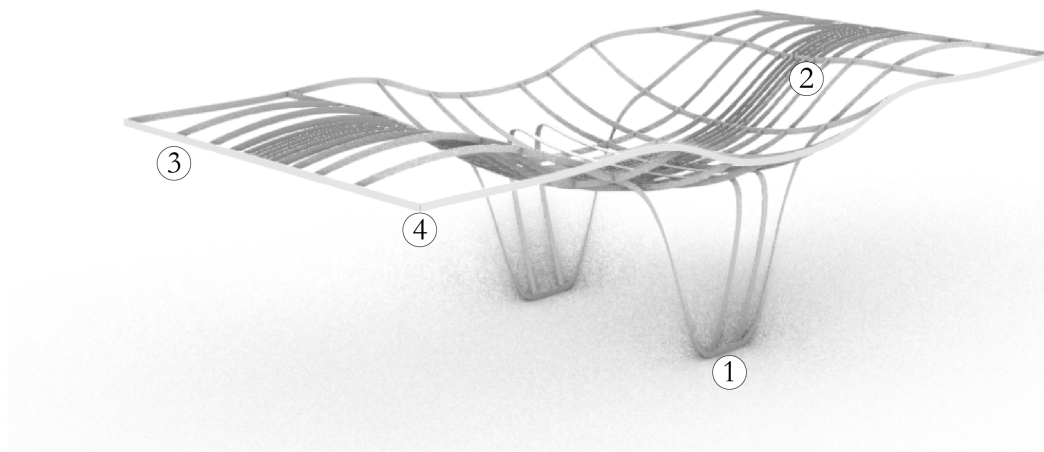


Note. Diagram showing the core design strategy to concept 1. Own work.

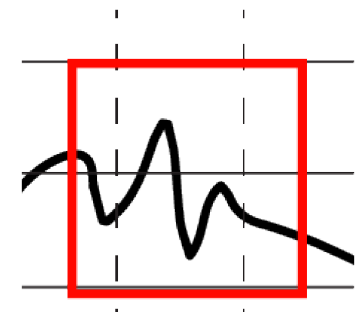
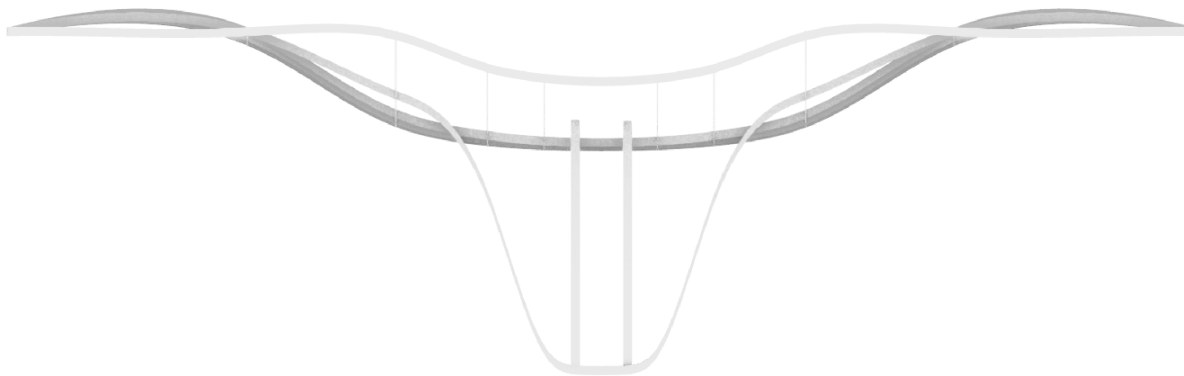
Design Concept 2

Figure 111

Concept 2



Golden ratio cross member patten



Wind pattern interpreted

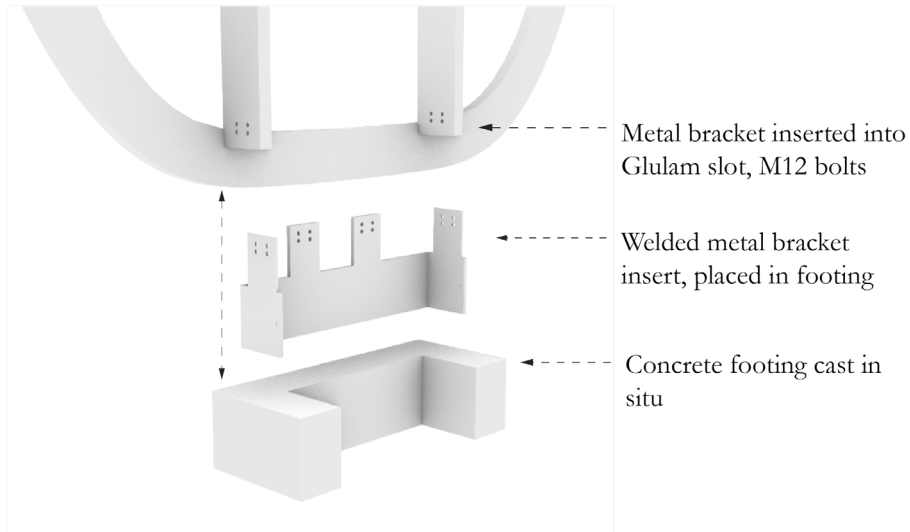
Note. Concept 2 showing which wind pattern inspired the design and golden ratio grid it's derived from. Own work.

Assembly of Design Concept 2

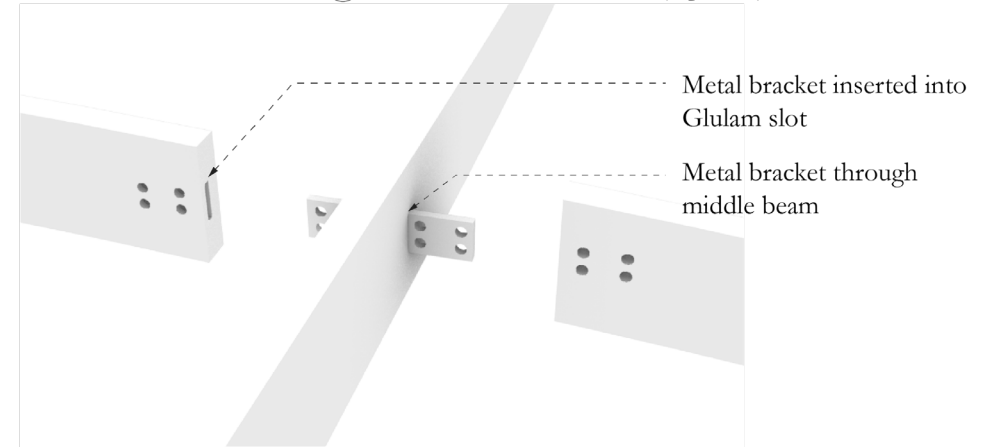
Figure 112

Concept 2 Assembly

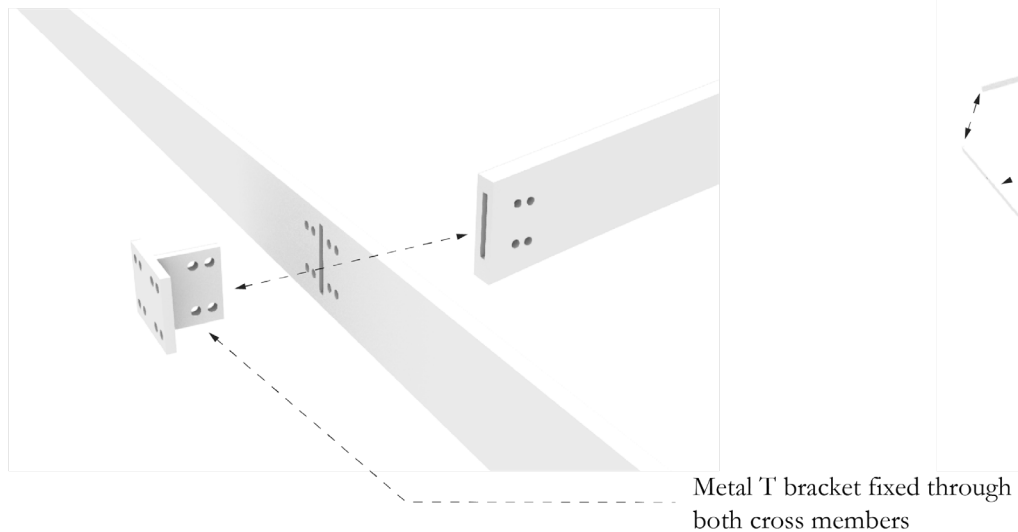
① Foundation connection



② Cross member connection (repeated)

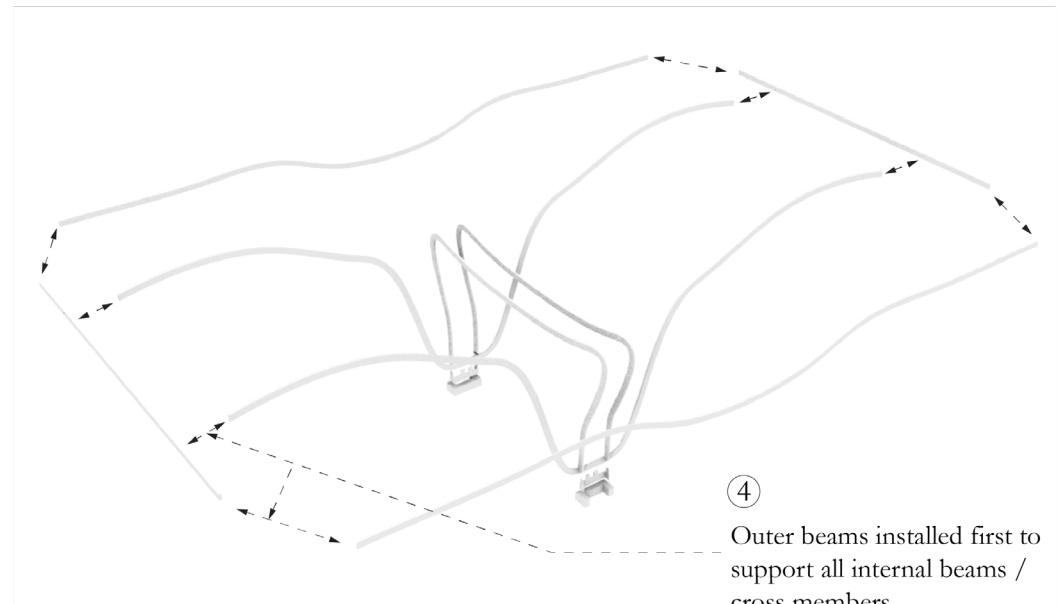


③ End bracket connection



④

Outer beams installed first to support all internal beams / cross members

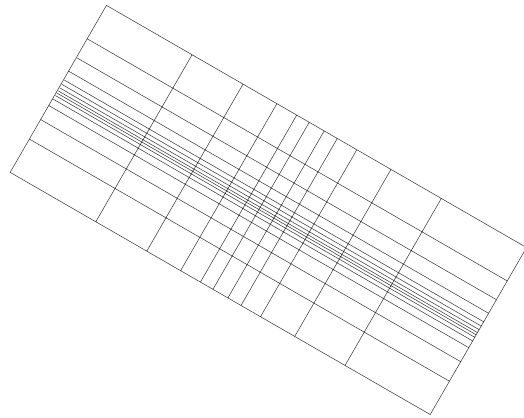


Note. Diagram showing the core design strategy to concept 2. Own work.

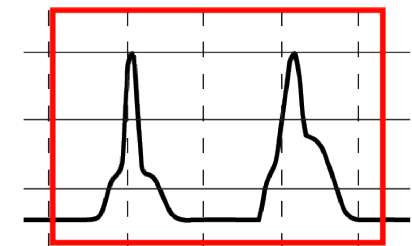
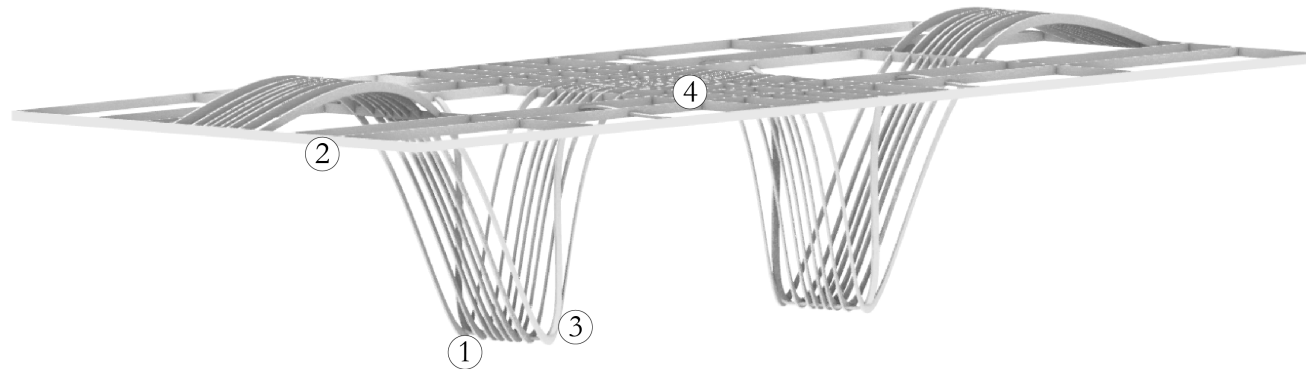
Design Concept 3

Figure 113

Concept 3



Golden ratio cross member pattern

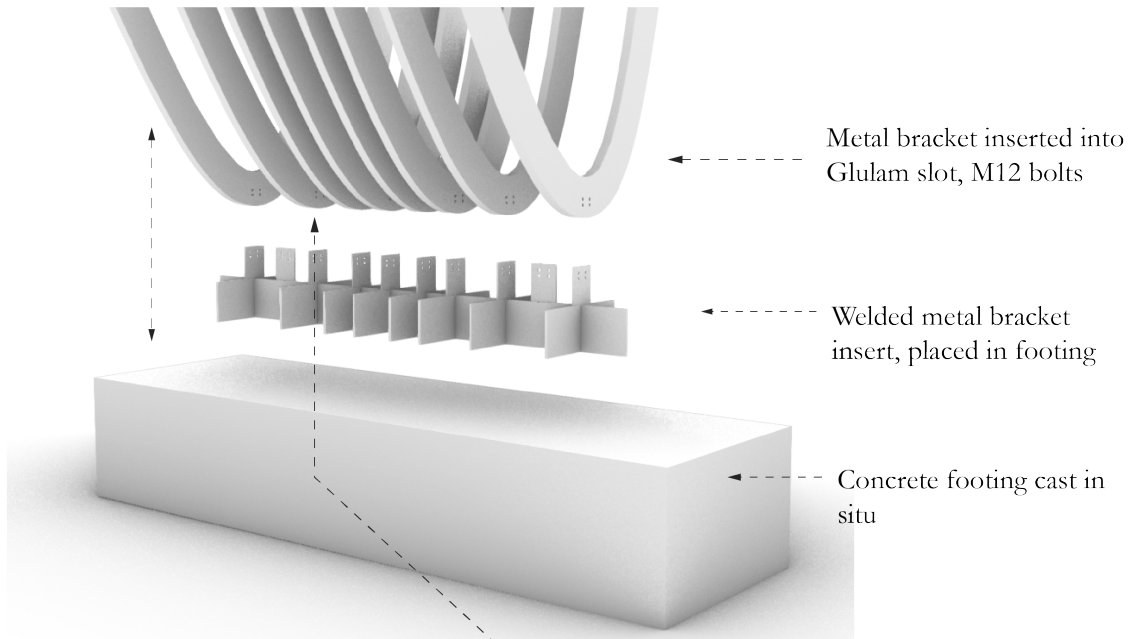


Wind pattern interpreted

Note. Concept 3 showing which wind pattern inspired the design and golden ratio grid it's derived from. Own work.

Assembly of Design Concept 3

① Foundation connection



③ Secondary foundation connection

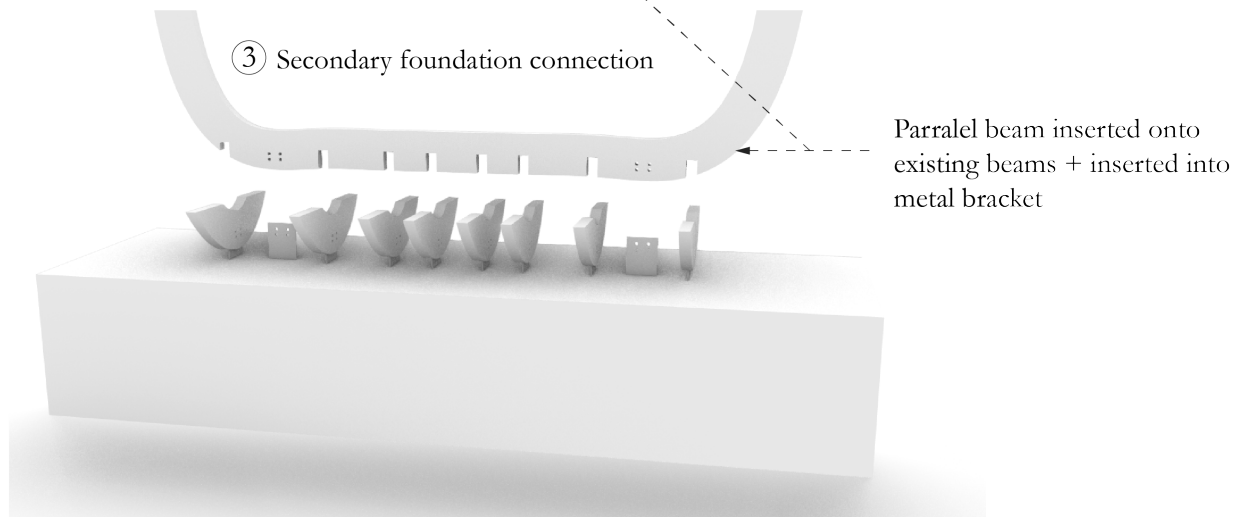
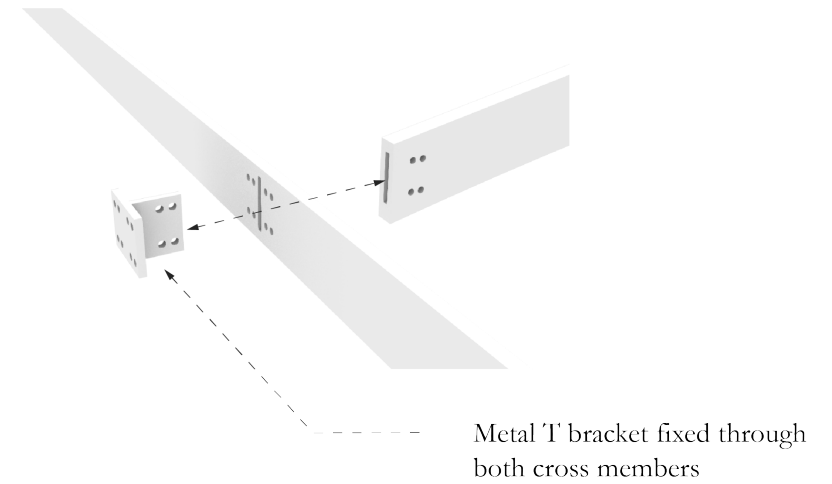


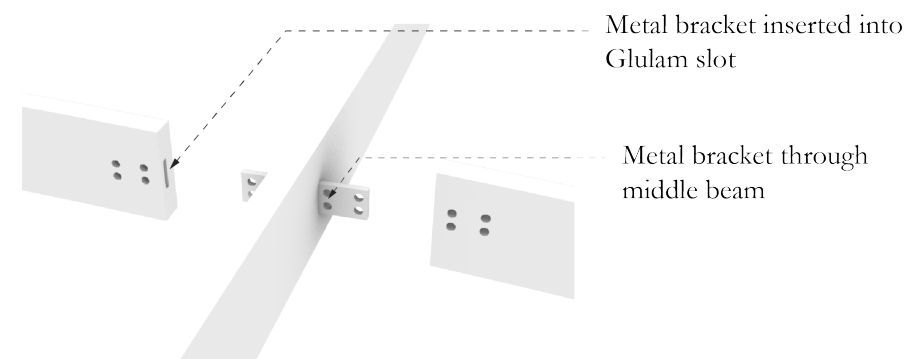
Figure 114

Concept 3 Assembly

② End bracket connection (repeated)



④ Cross member connection (repeated)

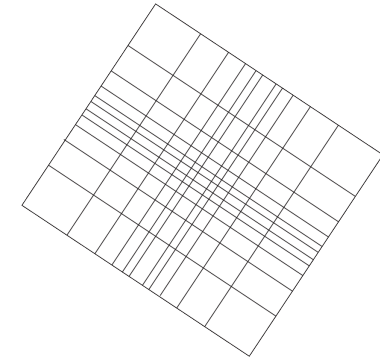
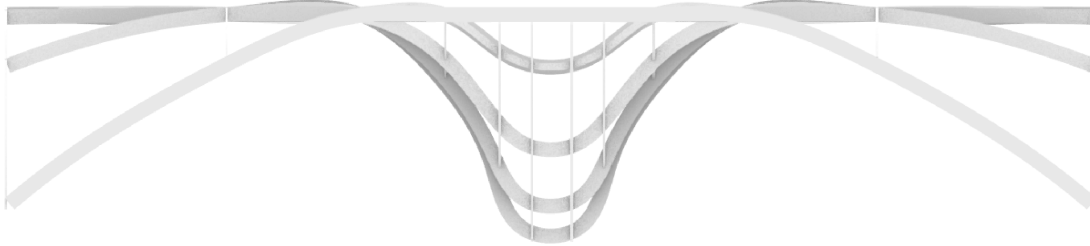


Note. Diagram showing the core design strategy to concept 3. Own work.

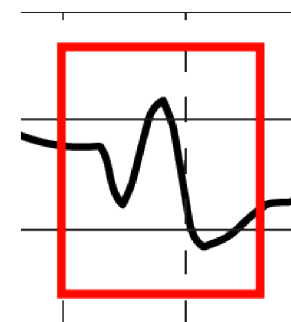
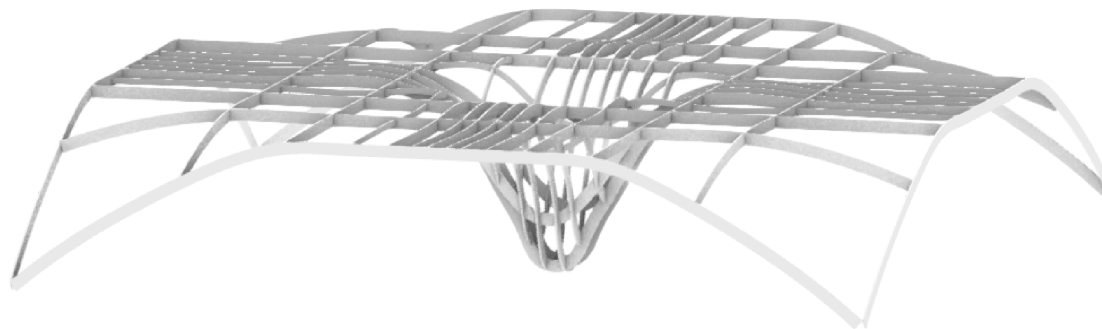
Design Concept 4

Figure 115

Concept 4



Golden ratio cross member patten



Wind pattern interpreted

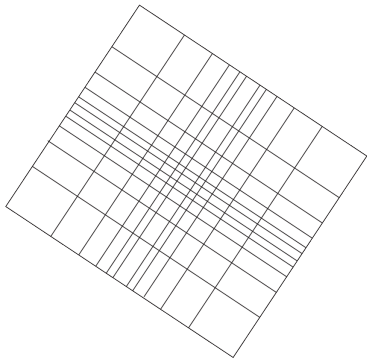
Non implemented concept

Note. Concept 4 showing which wind pattern inspired the design and golden ratio grid it's derived from. Own work.

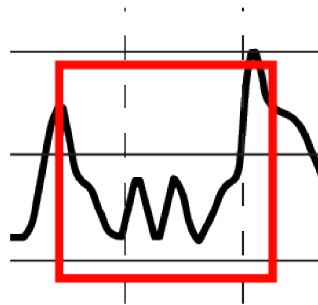
Design Concept 5

Figure 116

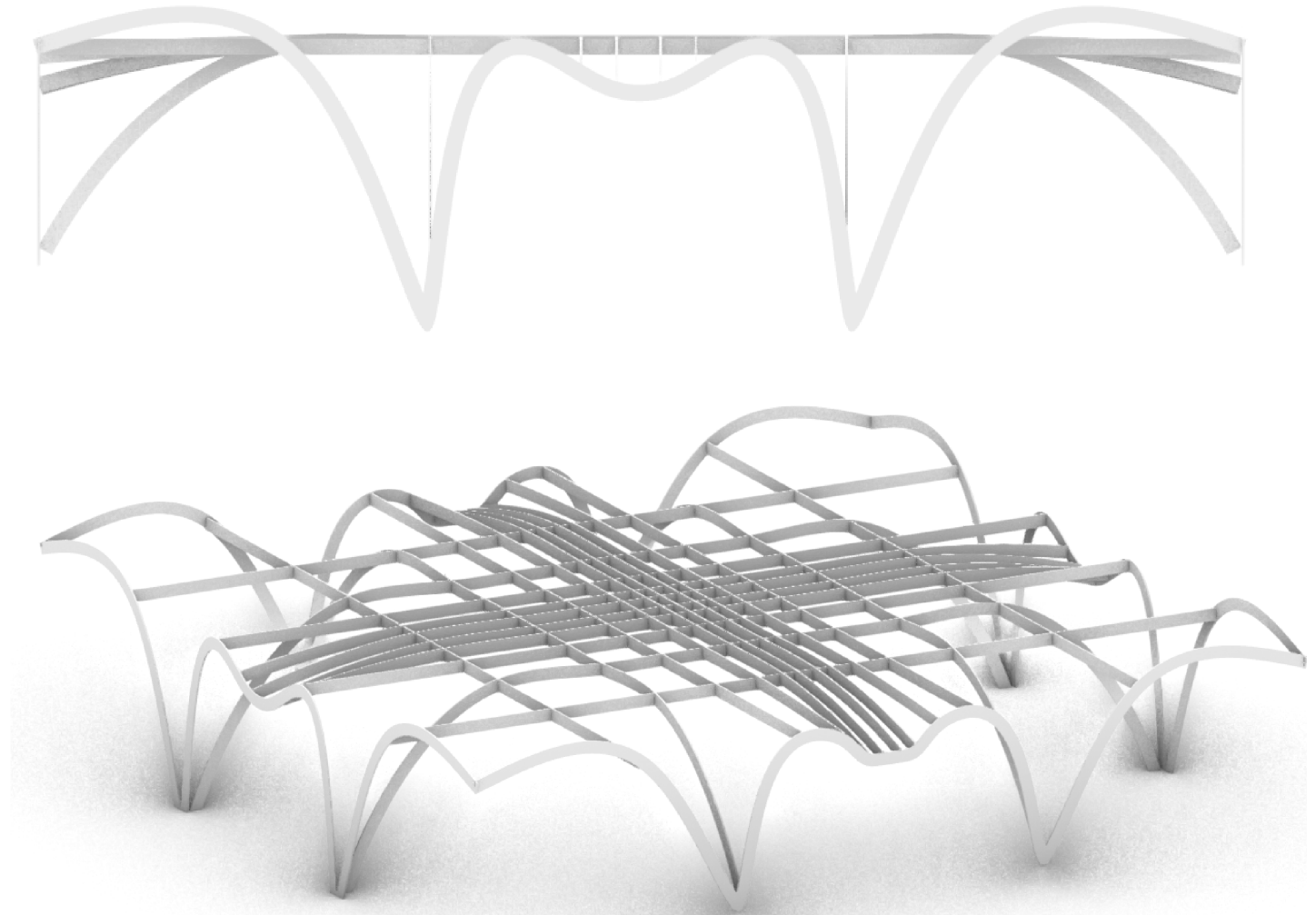
Concept 5



Golden ratio cross member patten



Wind pattern interpreted



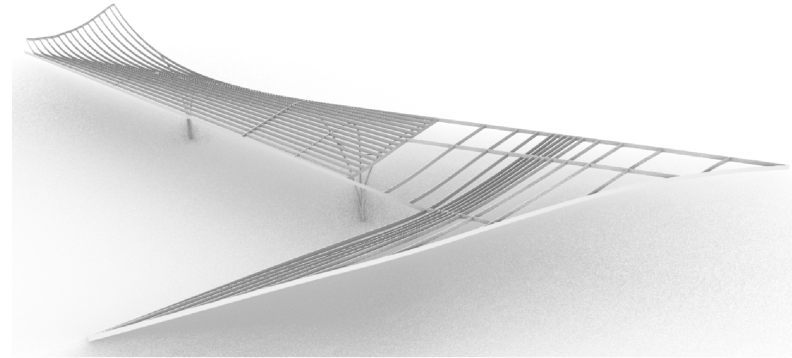
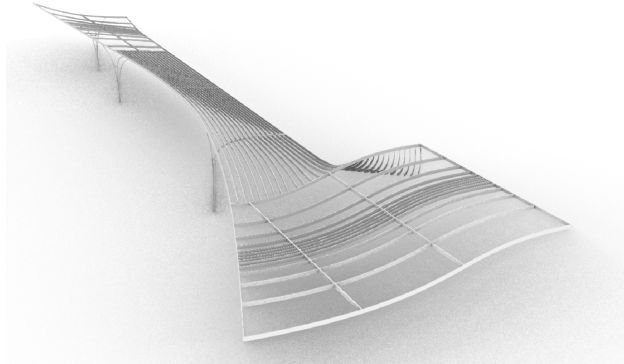
Non implemented concept

Note. Concept 5 showing which wind pattern inspired the design and golden ratio grid it's derived from. Own work.

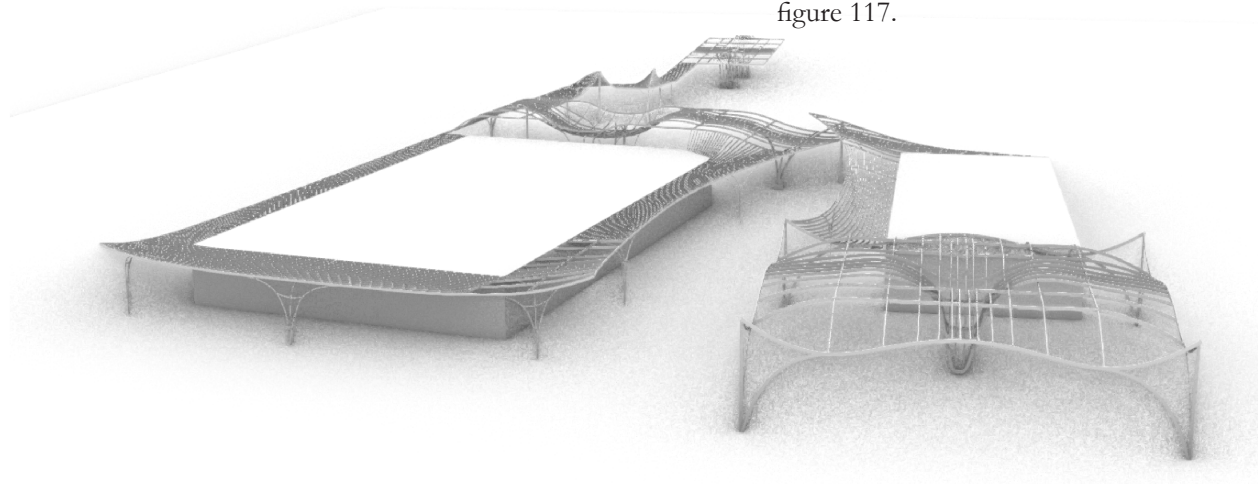
Supplementary Design

Figure 117

Supplementary Design

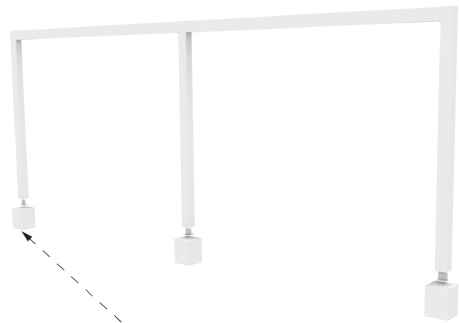


The supplementary design works to connect between the main free standing concepts shown in figures 109, 111 and 113. Unlike the main concepts which are free standing, these work with the existing structures as shown figure 117.

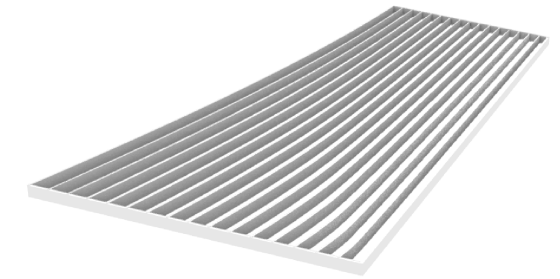
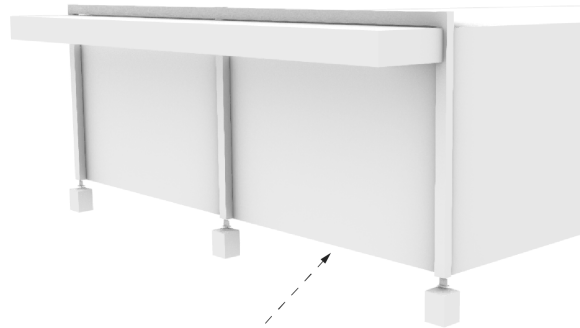


Note. Supplementary design works to connect the main design concepts. Own work.

Supplementary Design Assembly



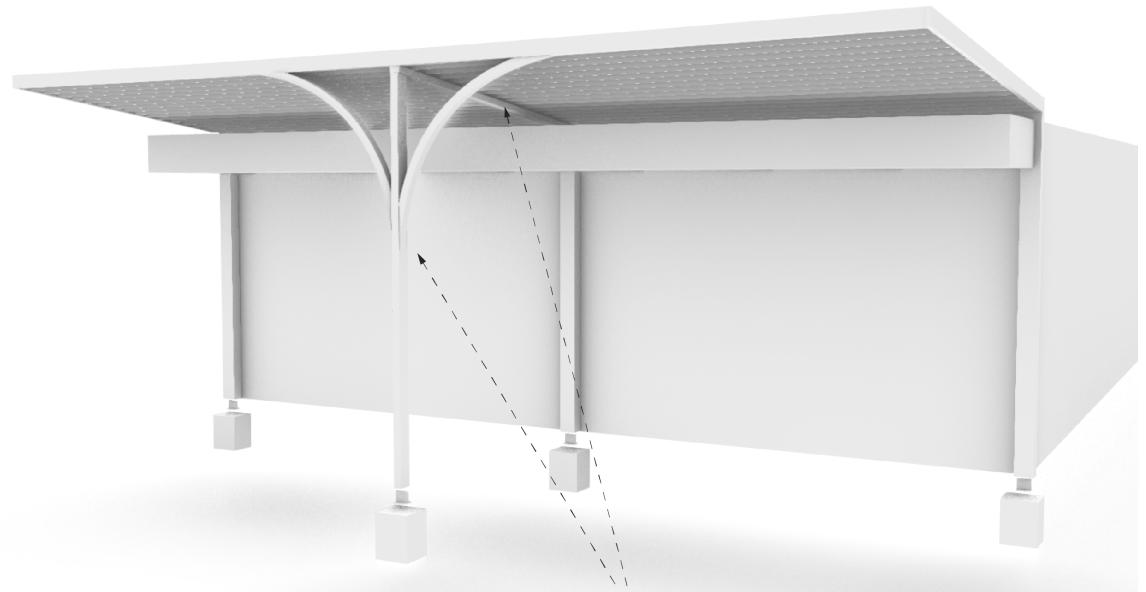
Glulam collum and beams installed on concrete footings in front of storefront. Collums run through existing buildings soffit then re-flashed.



Panels designed with previously shown metal brackets and bolts.



Panel fixed to glulam collum / beams resting above soffit.



Fixed to parallel collum / beam

Note. Diagram showing the core design strategy to the supplementary design. Own work.

Movement Through Site

Figure 119
Site plan

- ① Stormwater planted area
- ② reduced carpark
- ③ Connection to node
- ④ Connection to node
- ⑤ Māngere East library
- ⑥ Butchery + Vegetable store
- ⑦ Laundromat
- ⑧ Bakery
- ⑨ Takeaways, KFC, Pharamcy
- ⑩ Takeaways, Bank, Mart



Note. Site plan showing core design intentions and surrounding contexts. Own work.

Site Plan

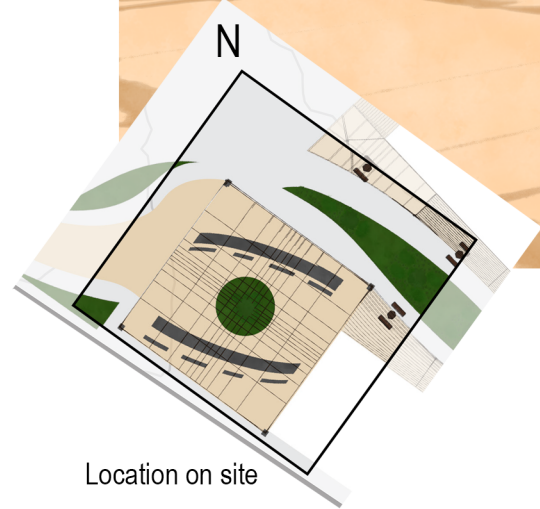


0 10 25m @A4 - 1-600

Figure 120

Concept 1

Perspective: Concept 1



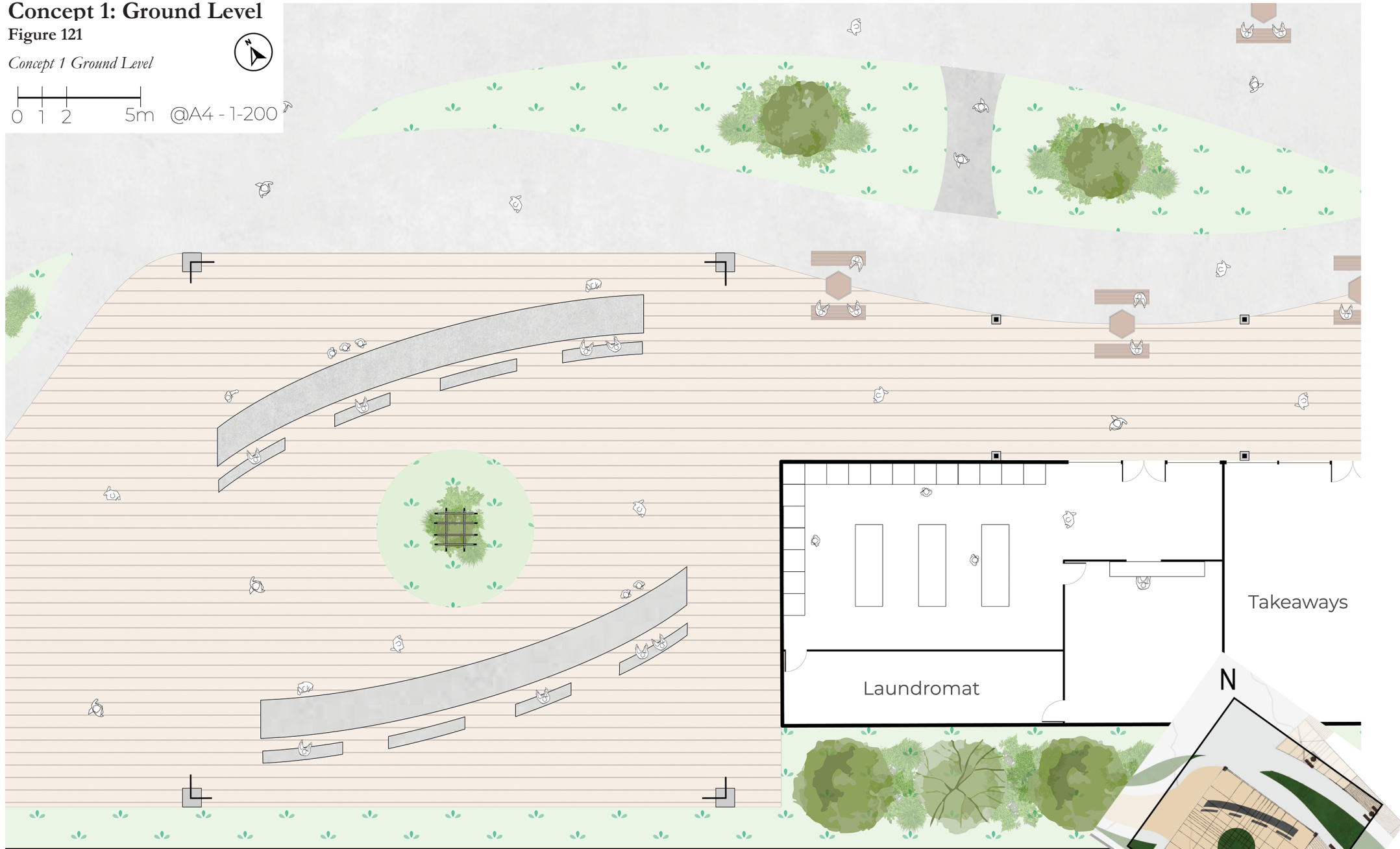
Note. Concept 1 shows the key pedestrian area implemented through carpark redundancy.

Concept 1: Ground Level

Figure 121

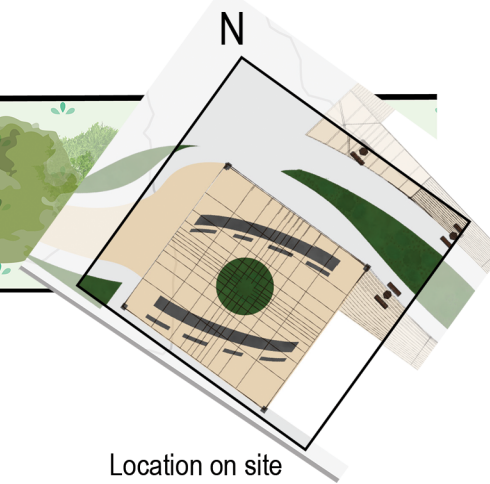
Concept 1 Ground Level

0 1 2 5m @A4 - 1-200



Note. Concept 1 shows the key pedestrian area implemented through carpark redundancy and surrounding contexts. Own work.

Location on site



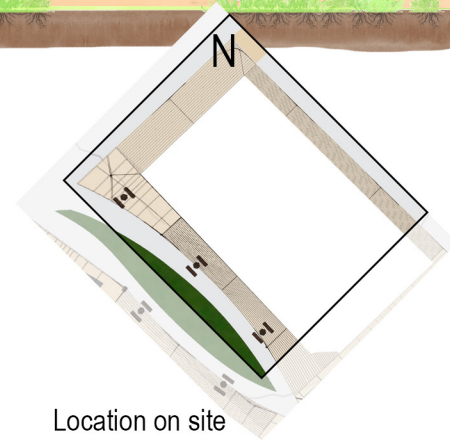
Section A

Figure 122

Section A



Note. Section A shows supplementary design expanding on the existing soft and rain garden planting for natural stormwater retention. Own work.

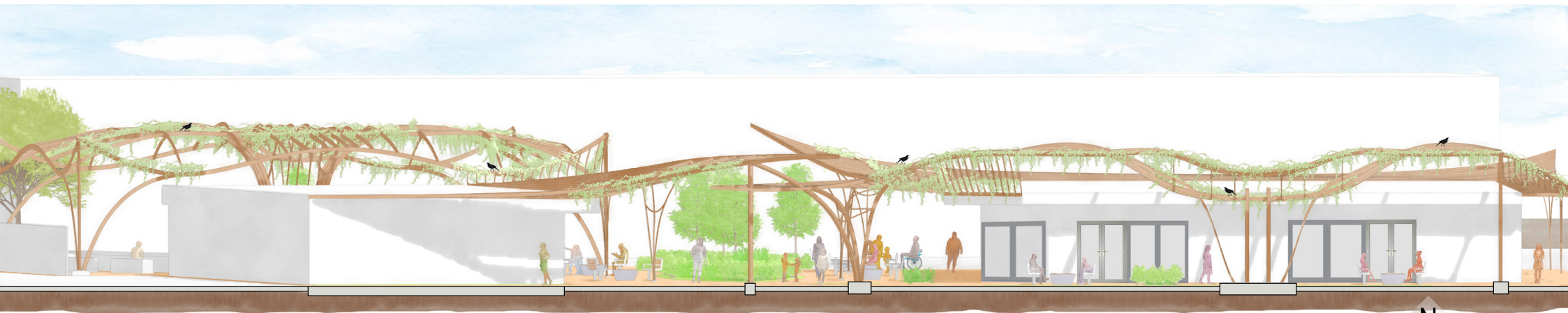


Location on site

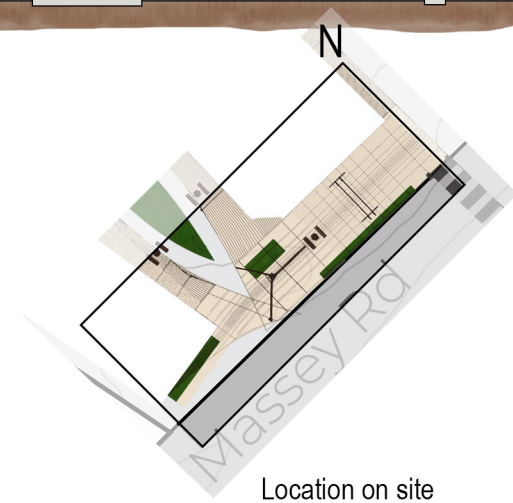
Section B

Figure 123

Section B



Note. Section B shows movement through site from the northern and southern entryways whilst picturing design concept 2. Own work.

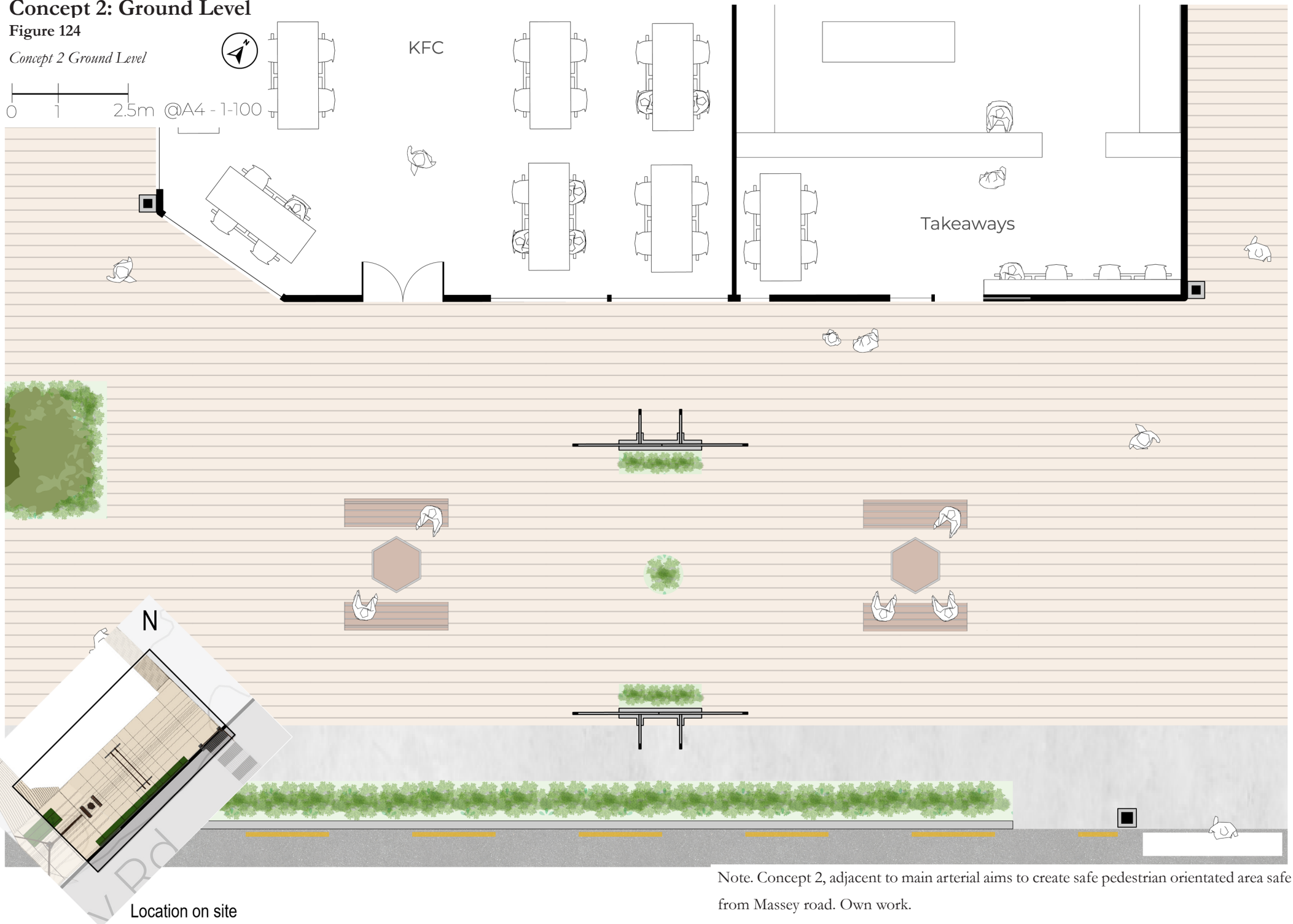


Concept 2: Ground Level

Figure 124

Concept 2 Ground Level

0 1 2.5m @A4 - 1-100



Note. Concept 2, adjacent to main arterial aims to create safe pedestrian orientated area safe from Massey road. Own work.

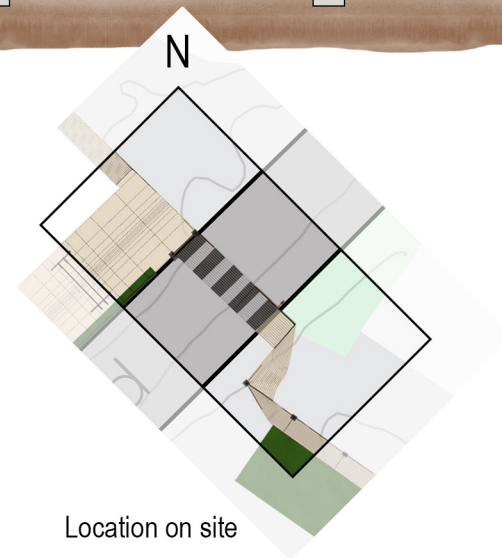
Section C

Figure 125

Section C



Note. Section C whilst providing shelter aims to connect both halves of the node which are separated by Massey road back together. Own work.



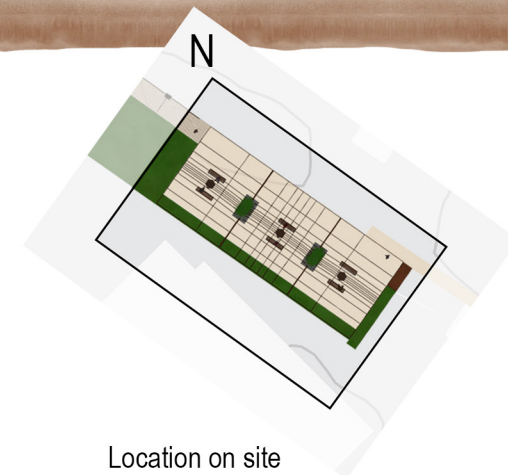
Section D

Figure 126

Section D



Note. Section D expands upon existing community characteristics whilst also being one of the key nodal entries. Own work.

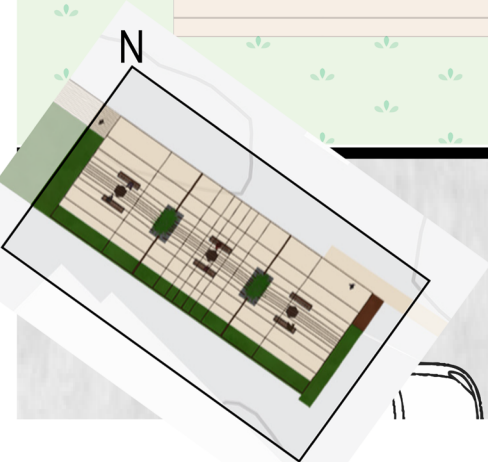
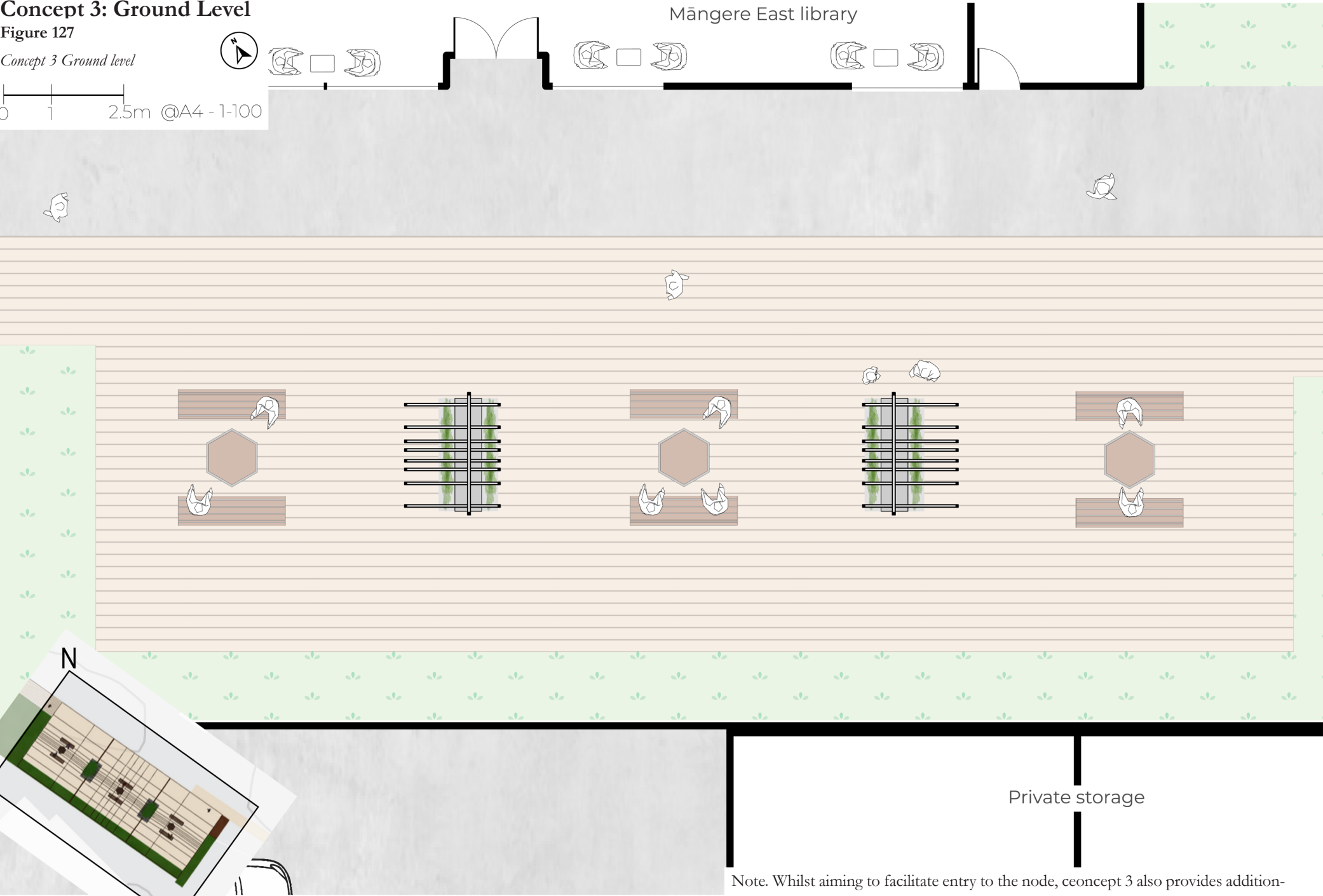


Location on site

Concept 3: Ground Level

Figure 127

Concept 3 Ground level



Location on site

Note. Whilst aiming to facilitate entry to the node, ceoncept 3 also provides additional seating for adjacent library. Own work.

Reflection

The central node site emerges as fundamental to the success of the overall urban strategy developed through this thesis. As the primary concentration of everyday amenities, public transport access, and community facilities, the central node operates as the social and spatial heart of Māngere East. The design interventions tested at this site demonstrate how targeted, place-based changes can amplify existing activity rather than attempting to generate new centres from scratch. By building upon established patterns of use, such as shopping, waiting, passing through, and informal socialising, the central node reinforces its role as a natural gathering point within the suburb. From a movement perspective, the site plays a critical role in improving pedestrian safety and legibility.

Existing conditions prioritised vehicular circulation and parking, resulting in fragmented walking routes, long crossing distances, and ambiguous pedestrian priority. The proposed design reconfigures these relationships to create clearer, safer pedestrian flows across and through the site. These improvements are not isolated interventions; they are explicitly designed to connect into the wider loop and nodal framework developed earlier in the thesis. As such, the central node acts as both a destination and a connector, stitching together multiple walking loops and reinforcing continuity between neighbourhood routes, green corridors, and key civic anchors. In this way, the site demonstrates how walkable and regenerative urban principles can be spatially anchored, translating abstract network strategies into tangible, lived urban space.

While the design performs strongly at a macro and meso scale, particularly in illustrating how people might move through and between spaces, a key limitation lies in the level of micro-scale resolution. The proposal effectively communicates flows, connections, and spatial hierarchy, but it does not fully articulate how each individual space within the central node might be inhabited, occupied, or adapted by users

over time. Questions around where people pause, how long they stay, how different age groups or cultural practices might claim space, and how informal uses emerge remain only partially resolved.

This limitation reflects a broader tension within design-led urban research. At a strategic scale, the project successfully demonstrates how walkable and regenerative frameworks can be integrated through a nodal approach. However, by not consistently zooming in to the scale of furniture, edges, thresholds, and everyday behaviour, the design risks abstracting lived experience. Gehl's emphasis on life between buildings highlights that the success of public space is often determined by small details, seating orientation, shade, shelter, sightlines, and micro-climatic comfort. While these principles informed the overall design intent, their full spatial and experiential implications are not exhaustively tested within the drawings. This gap suggests an opportunity for future work to further interrogate the human-scale occupation of space, bridging the final step between strategic urban structure and everyday use.

Discussion on Findings

A central finding of the design process is that space itself is the most constraining and defining factor within the site. The central node is already intensively used, particularly by vehicles, and much of its available land area is allocated to surface car parking and circulation. Without significant removal or reconfiguration of these car parks, opportunities to introduce new pedestrian, ecological, or social features are severely limited. This constraint revealed a fundamental challenge in applying walkable and regenerative urbanism within established suburban centres: spatial capacity is not neutral but is the product of long-standing prioritisation of the car. Attempting to introduce new design elements without fundamentally disrupting existing patterns of use proved difficult. Many users rely on the current layout for convenience, accessibility, and familiarity, and any reduction in parking or alteration of vehicle access carries social and political implications beyond the scope of spatial design alone. As a result, the design process was shaped by a constant negotiation between aspiration and feasibility. In several instances, recommended walkable or regenerative interventions, such as expanded green infrastructure, wider pedestrian zones, or continuous ecological corridors, had to be moderated or spatially compressed to avoid displacing existing uses. This compromise highlights a key insight: regeneration within lived-in suburban environments often requires incremental, tactical change rather than idealised implementation of bestpractice models.

The findings also reveal that designing to add value to a space, rather than replacing it, introduces its own set of limitations. Working around existing flows, habits, and expectations constrained the extent to which pedestrian priority and ecological repair could be fully realised. However, these constraints also reinforced the relevance of urban acupuncture as a methodological approach. Small, targeted interventions such as reassigning select parking bays, tightening crossing distances, or inserting bioswales and seating into residual spaces demonstrated that meaningful improvements remain possible even within tight spatial envelopes. Rather than undermining

the principles of walkable and regenerative urbanism, these obstacles clarified how such frameworks must adapt when applied to real suburban conditions. The central node therefore functions not only as a design outcome but as a critical testing ground, revealing both the potential and the limits of spatial transformation in car-dominated urban environments.

Conclusion

Tāmaki Makaurau Auckland stands at a critical juncture where the legacy of low-density, car-dependent sprawl no longer meets the needs of a growing population facing climate-related vulnerabilities. This thesis set out to address the “extractive” urban model that has historically prioritised vehicular mobility over human-scale movement and ecological health. By shifting the focus from large-scale, top-down redevelopment to incremental, tactical change, the research explores how established suburbs can be “re-stitched” into resilient, walkable communities.

The central research question asked how walkable and regenerative urbanism could be implemented meaningfully within Auckland’s unique suburban context. The findings demonstrate that implementation is most effective through a nodal framework and the application of urban acupuncture. By identifying “trip generators” such as schools, supermarkets, and healthcare facilities, designers can concentrate interventions where local life already clusters. The research confirms that when walkability and ecological restoration are pursued simultaneously, suburbs can transition from fragmented landscapes into connected, socially vibrant, and environmentally restorative neighbourhoods.

The design-led testing in Māngere East highlights that suburban centres are not neutral voids but active products of historic car prioritisation, necessitating a bold renegotiation of the vast areas currently dedicated to surface parking. Rather than imposing foreign structures, the research suggests that urban design achieves its greatest impact when it bridges existing community patterns with multifunctional infrastructure, such as “green loops” that seamlessly integrate pedestrian movement, stormwater management, and biodiversity. This approach demands a deep contextual sensitivity that moves beyond universal ideals to embrace local microclimates and cultural identities, exemplified by using specific wind-pattern data (Ngā Hau Māngere) and golden ratio-inspired geometry to root architectural forms in

their specific place.

This research suggests that architects must move beyond the “building as an object” and instead view their work as part of a wider, living urban system. Architecture in the suburban context should act as a “pinprick” of change that restores blocked social and ecological energy. It implies a shift toward “ecological intelligence”, where practitioners work collaboratively with ecologists and mana whenua to ensure built forms actively contribute to planetary healing rather than merely reducing harm.

To evolve the urban landscape of areas like Māngere East, future research must pivot from surface-level aesthetics toward addressing the systemic crises of income inequality and housing affordability through regenerative spatial design. By re-evaluating planning frameworks like the Auckland Unitary Plan, we can transition from merely managing “character and dominance” to mandating ecological and social outcomes, supported by longitudinal data on how “urban acupuncture” affects community wellbeing and biodiversity. As noted earlier in this thesis, a key limitation of this study is its reliance on existing consultative data rather than direct co-design with the local community; future projects of this nature should prioritise inclusive community consultation and co-design processes to ensure that interventions truly reflect resident voices, cultural values, and lived experiences. For practitioners in Aotearoa and beyond, this signals an end to car-centric design in favour of multi-scalar interventions where no building exists in isolation from its ecological “canopy” or pedestrian “loop”. Ultimately, this requires a shift from idealised, one-size-fits-all models toward tactical, site-specific changes that honour the lived reality of residents while relentlessly prioritising a nature-rich, pedestrian-first public realm.

The “walk within” is not just about the physical act of moving through a suburb; it is about finding the latent potential already residing within our communities. By repairing the “voids” left by decades of car-centric planning with life, water, and greenery, we can transform our suburbs from places we drive through into places where we truly belong. Meaningful change does not require a blank slate; it requires the courage to re-imagine the streets we already have.

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