FROM THE GROUND UP

REDESIGNING AUCKLAND PUBLIC TRANSPORT USER EXPERIENCE

- MASTER OF ART & DESIGN [PRODUCT] 2013 -

- NICK HAYES -

This thesis is submitted to Auckland University of Technology for the degree of Master of Art and Design, [Product Design].

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 nor material which to a substantial extent has been accepted for the award of any other degree or diploma of a university or other institution of higher learning, except where due acknowledgement is made in the acknowledgements.'

Signature :  **Date:** 03/12/2013

ACKNOWLEDGEMENTS

The completion of this thesis would not have been possible without the support, guidance and advice from a number of people to whom I am greatly thankful.

- To my industry contacts at MRCagney and Auckland Transport - Kent Lundberg, Anthony Cross and Rob Mayo - thank you for all the knowledge you shared with me, both on and off camera.

- To my supervisor Dr. Stephen Reay, for your support and enthusiasm in helping me believe in the power of the project and my own capabilities.

- To my parents, for putting a roof over my head, food on my plate, and loving support over the five year slog.

- To my girlfriend - thanks for being there every step of the journey.

ABSTRACT

Auckland has a vision to become the world's most liveable city by 2040. The path towards a more liveable future requires that Auckland address its highly ineffective and unsustainable public transport network. Over the coming years, Auckland Transport plans to roll out a newly designed, high frequency network that reconsiders our current public transport network from the "ground up". To achieve and maintain high frequency, a fundamental shift from direct service to connective service is required. The initial hypothesis developed was that the new network - a collaborative initiative between transport planners, council agencies, urban designers, engineers and government officials - had been designed from a "top-down", system/network level, without first deeply understanding the experiences of its users.

This practice-based research project applies an inverse, 'bottom-up' approach to explore the role of a human-centred design methodology in addressing the physical and emotional complexities a connective network poses to service users. The project explores various design opportunities/interventions aiming to improve the user experience of public transport, focusing largely on the development of a graphic/interactive system that articulately communicates service information to public transport users. The practice applies human-centred, service design frameworks to develop a deep level of empathy for public transport users, whilst considering key stakeholders of the wider service and network.

"HOW CAN A BOTTOM-UP, USER-CENTRED APPROACH TO AUCKLAND'S NEW PUBLIC TRANSPORT NETWORK CREATE EMPATHIC SERVICE EXPERIENCES FOR ITS USERS?"

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PREFACE

PREFACE

My relationship with public transport began almost six years ago when I started university. Until then, I had rarely ever caught a bus, train or ferry in Auckland, which is nothing out of the ordinary if you know anything about Auckland's public transport system. During five years of architecture and design studies, I caught the bus from the North Shore to the city and back at least five days a week. And in retrospect I had very little to complain about; the Northern Busway – Auckland's first Bus Rapid Transit (BRT) system (Auckland Transport, 2010) – had not long opened before I began studying. Trips were fast, frequent, and easy. But I still felt there was a significant problem.

The problem was not the bus journey itself but the journeys either side of it. Getting to the Northern Busway and getting beyond Britomart (downtown) where it terminated, were made difficult for various reasons. Driving to Northern Busway 'Park and Ride' stations was made difficult by a scarcity of parking; feeder bus services were few and far between or only operated frequently during peak hours; walking was time consuming, and the inability to take your bike on the bus meant cycling only solved half the problem.

The following chapter documents the first action research cycle of my research, exploring an alternative transport solution to the perceived problem.

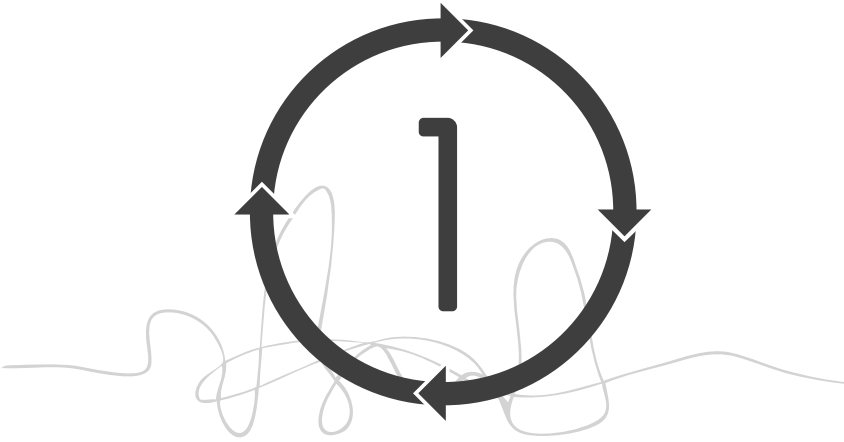


Figure 1. Nature of Action Research in this project.

SCOOTER

This project began with an observation I made eleven years ago. When I left intermediate school, along with all the other kids in my year, we left behind an object that for many of us was our primary method of transport – the kick scooter. With the passing of just one summer break, scooters had gone from being the coolest recreational vehicle around to a socially unacceptable toy, fit only for children, and were nowhere to be seen on high school grounds. Since that day I have always pondered the phenomenon and wondered what makes them so inherently 'uncool' for anyone above the age of twelve.

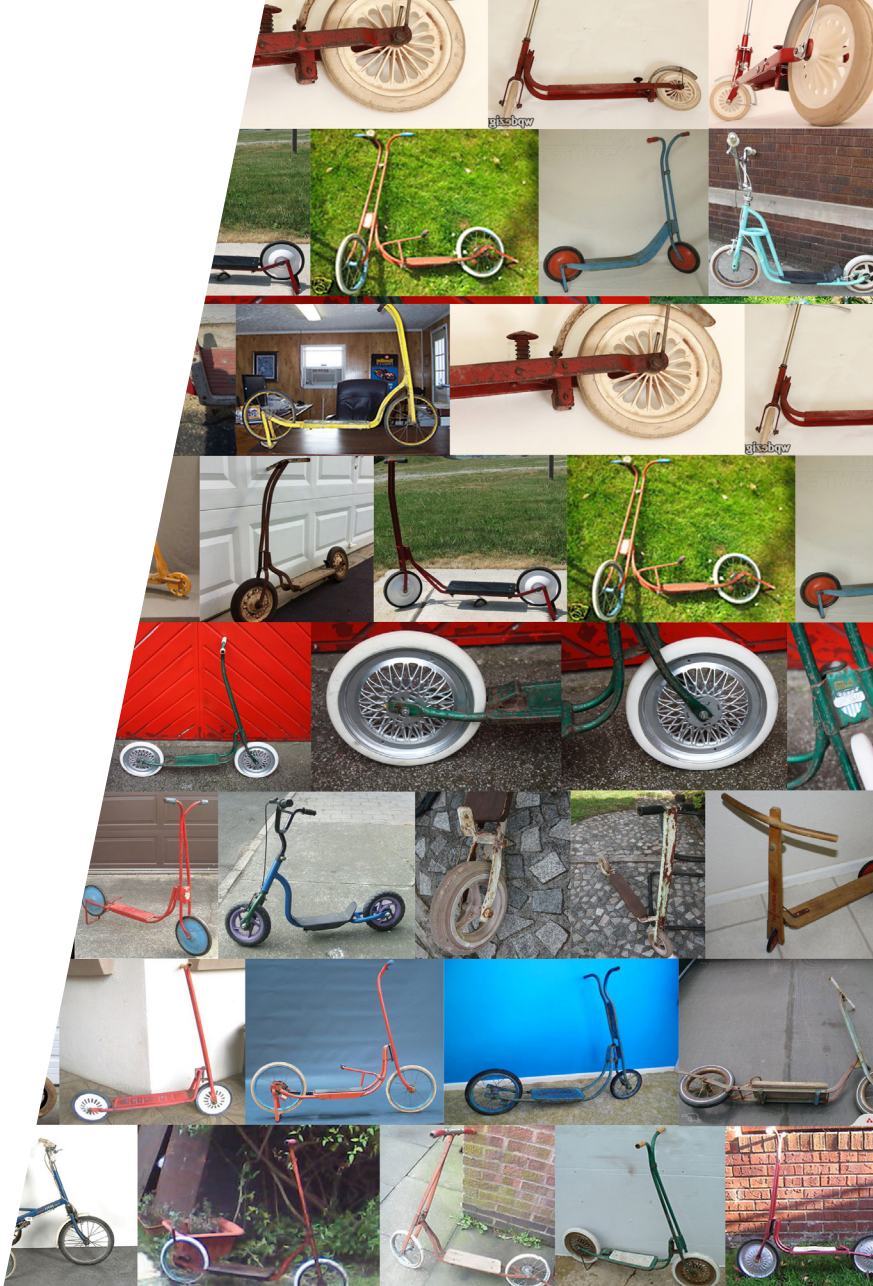
Fast-forward ten years and I began seeing an increasing number of adults, particularly businessmen and city dwellers, using these scooters (designed for children) to move around town more quickly and efficiently. It was at that point that I began to question their potential as a valid method of short-distance, urban transport. But this was a notion I questioned with caution. As much as I wanted to see potential in scooters as a legitimate form of transportation, I was very aware of the social stigma attached to them. The minority of adults (businessmen and city workers) embracing the kick scooter were also responsible for the stigma it had adopted (Geraci, 2011). Simply put, fully-grown adults in suits and sneakers looked ridiculous riding throughout the city streets on a product designed and styled for kids. But behind the controversial image, I saw potential in the kick scooter as a functional and practical solution to short distant, urban travel.

Figure 2. Micro Speed V2 Scooter, 2012.

CAN I KICK IT?

After initial research online it became clear that I was not alone in this view. Over the last decade the market for adult kick scooters had grown notably and along the way, a new movement had developed. Where it appeared to have caught on most was in New York City; several websites and blogs had been created to celebrate and document the emerging trend. There were now several manufacturers of kick scooters designed specifically for adults, both in size, durability and aesthetic appeal, although the latter was highly subjective and the focal point of controversy surrounding the product. In his blog post, 'Microtransportation is the Future of Getting Around Cities', New York blogger John Geraci (2011) praised the adult kick scooter as an extremely efficient and affordable product that could cut travel time between public transport modes by up to 70% (Geraci, 2011). But despite their benefits and increased adoption rate, Geraci (2011) noted the lack of mainstream adoption and pointed to the stigmatisation and aesthetic tendencies of kick scooters as the culprit of their unpopularity.

I saw this as an opportunity to explore both the aesthetic and functional potential of the kick scooter, as well as investigate the psychology of social stigmas within the context of urban transport in Auckland City. While the aesthetic of modern adult kick scooters is largely characterised by brushed aluminium or chrome frames, small polyurethane wheels and brightly coloured graphics, I looked to the era of vintage scooters for aesthetic inspiration. Using the search terms 'vintage scooter', 'retro scooter', and 'old scooter' on Trademe (New Zealand's own eBay), I found an abundance of listings (pictured right) ranging in price, age, quality, condition and style.



It was here that I purchased my first kick scooter in over a decade - a 30 year-old, New Zealand made 'Triang' branded scooter for $50 [Figure 3]. Once I received the scooter I immediately began riding, analysing, testing and critiquing it, identifying its pros and cons. The design was simple and minimal, with no folding or breaking mechanisms. Although it was constructed out of steel, it did subside slightly under heavy weight. The size and proportions were comfortably compact aside from the handlebars, which were too low and narrow and weren't height adjustable. The raised foot platform gave it good clearance over roadside curbs or uneven paving on footpaths. The biggest hindrance was its wheels - soft, cracked rubber, making for an extremely slow and energy-intensive riding experience. Overall, this scooter was less functional than it was elegant and charming. The classic, minimal aesthetic was its most attractive characteristic.

To compare and contrast old from modern, my second purchase was a brand new Micro branded kick scooter, with a RRP of $279 [Figure 2]. The first thing that was apparent was the build quality - crafted from high quality aluminium, the Micro was solid yet relatively lightweight and included a fairly simple folding mechanism. This was combined with medium sized polyurethane wheels with a built-in shock-absorbing system. Although the handlebars were height adjustable to suit older/larger riders, the styling and graphics - green, grey and black flames - were very much targeted towards a younger audience. The Micro was essentially the opposite of the Triang - a functional, practical and well-paced scooter that lacked attractive aesthetics and styling.

Figure 3. Vintage Triang Kick Scooter

ROLE-PLAY

Over the summer break I had been interning in the User Experience (UX) team at Orion Health, a medical software company on the corner of Grafton Rd and Kyber Pass Rd. Every day I would drive to, or be dropped off, at Constellation busway station to catch one of two buses that would drop me at the Symonds St and Karangahape Rd intersection. I would then walk across Grafton Bridge and up Grafton Rd to Orion Health. This journey would take about 45 minutes in total. If I walked the distance from my house to Constellation station, it would add another 15-20 minutes to the journey, or around 10 minutes if I cycled. The distance from the Symonds St/Karangahape Rd intersection to Orion Health was a walk of approximately 10 minutes.

The short periods of travel either side of this regular bus journey gave me an opportunity to test using a scooter to travel between home, public transport, and work. Having recently purchased two vastly different scooters, I decided to test the new and modern Micro scooter for its speed benefits.

The journey from home began at 8:00am. The first 500 meters contained a mixture of steep and low-incline uphill sections, which meant most of it had to be walked. The following 400 meter section was a steep downhill, allowing me to gain significant speed, followed by 800 meters of flat pavement all the way to the Northern Busway. This part of the journey took approximately 20 minutes. Once I arrived at the busway, I quickly folded down the Micro scooter and soon after boarded my bus towards Newmarket (25-30 minute journey).

On this particular morning, the service was operating on an articulated bus (bendy bus), meaning there were plenty of seats and room available to stow my scooter. At approximately 8:45am I exited the bus at the Symonds St Karangahape Rd intersection and unfolded the Micro scooter. The journey from here to Orion Health combined 500 meters of flat pavement with a 450 meter uphill section. My final arrival time at Orion Health was around 8:55am, meaning the entire journey took approximately 55 minutes.

Following this role-playing exercise, I documented my thoughts and reflections of the experience. My initial thoughts were that what I had perceived as an ideal solution to short distance, transport between public transport services was in fact rather impractical. Along flat sections of the journey, the energy expelled to maintain a constant speed was very inefficient. Unlike a bicycle, where a constant pedalling motion produces a constant forwards movement, the kicking motion required on the scooter created a constant acceleration/deceleration effect. The opposite occurred on steep downhill sections, where it quickly became hard to control the scooter as it gained speed. At high speed, the effectiveness of the rear metal brake was noticeably reduced, and any inconsistencies in the riding surface affected the stability and control of the Micro scooter.

Overall, this role-playing exercise revealed the inherent limitations of the kick scooter as a viable method of short distance, urban transport within the Auckland City context.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MINUTES
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MINUTES
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A
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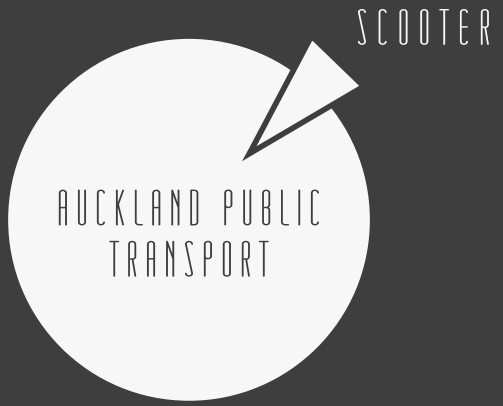
KMS

REFLECTIONS

I began the year with a design research project based on a personal issue of an unmet need: getting to, between, and from public transport services more effectively and efficiently. I had identified the limitations and constraints of various transport modes - walking, cycling, and driving - and developed a hypothesis that foot-powered, kick scooters were a potential (or under-realised) product solution to short distance, urban transport between public transportation services. By utilising several design research methods, I was able to develop a clearer understanding of the inherent limitations of the product. By conducting this research early in the year, I was able to quickly test, evaluate and, to several extents, disprove my initial hypothesis. Although the insights revealed (both in relation to physical design aspects and social aspects of the kick scooter) unique opportunities for an engaging, product-focused research project, I had lost a significant amount of confidence in the purpose of the project following these early phases of research.

It had become clear to me that the initial hypothesis I had developed was perhaps not the where the best opportunities for this project existed. Although not immediately apparent, my initial research had expanded the project context to the much broader topic of Auckland public transport. As shown in the diagram pictured right, this first action research cycle exploring the potential of the kick scooter was in fact a 'wedge' into the much broader topic of Auckland public transport. I had identified a problem at a surface level but now needed to broaden the scope of the enquiry to reveal the larger issues at play.



INTRODUCTION

02

INTRODUCTION

Auckland has a vision to become the world's most liveable city by 2040 (Auckland Council, 2013). To define the term 'liveable' by dictionary standards means "worth living", or "fit to live in" (Oxford Dictionaries, 2013). But to define what liveable means in the context of an urban environment seems more complex and widely variable. The Auckland Plan - a fifteen-chapter document issued by Auckland Council - is a manifestation of how liveability is defined in the context of Auckland city, and represents a collective vision of how Auckland plans to grow and prosper, now and into the future (Auckland Council, 2012).

It is predicted that Auckland's population will grow by approximately one million people over the next thirty years (Auckland Council, 2013). Urbanisation is a global trend with more than half the world's population now living in urban areas (United Nations, 2011), and like many other cities, Auckland faces numerous complex challenges associated with such rapid growth (Kenworthy, 2013). Among issues of environment, economy and housing, there is the issue of transportation. Despite being addressed in the thirteenth chapter of The Auckland Plan, the enormity and extent of Auckland's transport problems cannot be understated. With growing rates of congestion costing the city approximately $1.25 billion annually, and an ever-increasing population, the importance in addressing Auckland's crippling transport network has never been so great (Kenworthy, 2013).

FOR THE LOVE OF ROADS

Auckland has one of the lowest rates of public transport usage per capita in the world, lower than any Australian or Canadian city, and many parts of the United States (Mees & Dodson, 2001). In the early 1950s, public transport accounted for nearly 60% of all motorised trips throughout Auckland, with approximately 105 million trips annually. Despite a growth in population from 360,000 to the current 1.5 million, public transport patronage has drastically declined, falling to as low as 37 million trips in 2000 (Mees & Dodson, 2001).

The cause of this dramatic decline in public transport patronage can be linked to the transport planning and policies followed for the last half-century (Auckland Council, 2012). In 1955, the Master Transportation Plan was created to determine Auckland's urban transport priorities, the outcome of which would have a strong influence on the future development and growth of the city. Following the completion of Wellington's rail electrification in 1940, the New Zealand Railways department argued that investments should be spent on public transport infrastructure and the electrification of Auckland's rail network to create a multi-modal transport network integrating bus and rail services. To the contrary, the Nation Road Board argued that the rigid structure of rail could not efficiently service the widely dispersed Auckland isthmus, and instead proposed a plan that favoured the development of expansive road and motorway networks that would link all parts of the city and free people from dependence on the inflexibilities of public transport (Mees & Dodson, 2001). Although controversial, it was this notion that created a bias towards the development of a transport network that strongly favoured the private vehicle over public transport (Matthews & Imran, 2010).

Nearly twenty years later in 1972, the Rapid Rail Transit Plan for Auckland was released. Based on the 1965 De Leuw Cather report (1965), and heavily supported by the then current mayor Dove Myer Robinson, the revolutionary plan proposed a hub-and-spoke transport network that combined bus feeder services and rapid rail to create a network that would transform the speed and reach of public transport within Auckland City (Reid, 2011). Under the plan of Dove Myer Robinson, rapid rail would extend from an inner-city line and loop to all cardinal points of the Auckland isthmus [Figure 4]. Although the De Leuw Cather report clearly communicated the numerous benefits of a coordinated bus and rapid rail system, as well as its operational and economic feasibility (De Leuw, Cather & Company, 1965), the Labour government was unable to produce the necessary funding to bring the project to fruition. Following the election of 1975, where an entirely unsupportive National government was voted into power, the prospects of a high speed, multi-modal public transport network seemed grim. Within a year of National's rise to power, the Rapid Rail Transit Plan for Auckland had been abandoned (Reid, 2011). In its place, the National government implemented an alternative transport strategy that largely consisted of road and motorway developments, as well as incremental improvements to the existing bus network (De Leuw et al., 1965). The De Leuw Cather (1965) report had suggested majority of improvements be made to the downtown area of Auckland due to the employment density around the vicinity of Queen Street. This decision, combined with the relocation of Auckland's main train station from downtown to Parnell in the 1930's, severely reduced the opportunity for rail to be the key mode of Auckland's public transport network (Mees & Dodson, 2001).

Figure 4. Proposed Rapid Rail Transit Plan Network Map, 1972.

Despite strong recommendation in the De Leuw Cather report (1965) to maintain balance between public transport and private transport modes to prevent and/or reduce the effects of congestion, transport policies and planning favoured the development of car-centric models and infrastructure with little development or investment into public transport - a trend that has since been followed for the last 50 years (Mees & Dodson, 2001).

Today, private transport accounts for 85% of all trips made in Auckland, and an additional 15,000 cars join Auckland's roads annually (Auckland Council, 2013). Worsening congestion, air pollution and rising petrol prices are all stark consequences of a half-century of car dependence (Mees & Dodson, 2001).

People who care about their cities should be worried about the automobile.

- Jane Jacobs, 1961

A NETWORK OF WASTE

Increasing congestion and pollution aren't the only detrimental outcomes of over 50 years of pro-automobile policies and planning. Underinvestment in a balanced, multi-modal transport system has had serious adverse effects on Auckland's public transport network. The current system is a convoluted clutter of overlapping bus services, a stunted freight railway line (Kenworthy, 2013) being used to run age-old diesel commuter trains, and a handful of ferry services - all of which run at dismal off-peak frequencies. This tangle of inefficient, overlapping services is the result of a network that has grown incrementally over several decades without revision or reconsideration from the ground up (Walker, 2012).

The relatively dispersed nature of the Auckland isthmus creates a large area for public transport to service. In addition to the considerable size, there are multiple centres and points of activity that need to be serviced. American transit consultant Jarrett Walker (2013) refers to this as a 'many-to-many' network structure, where many locations need to be connected to many other locations. The current network prioritises connecting multiple points and centres directly to prevent or minimise the need for users to make connections/transfers between different services; however, this creates a significant amount of service overlapping (Auckland Council, 2012). Preventing connections may increase convenience for users (being able to catch a single bus from right outside their point of origin, all the way to their final destination) but providing direct service to a city as large as Auckland comes at a cost.

The need to provide such wide-reaching direct service means the transit agency must run huge volumes of half and quarter empty buses whilst trying to maintain service frequencies that users can justify waiting for (Walker, 2012). As a result, an enormous amount of waste is created in the network - unequivocally the case for Auckland's network.

> *"I've never seen a network with so much waste as I have in Auckland.*
>
> *- Jarrett Walker, 2013*

UNLOCKING POTENTIAL

The sheer amount of waste within Auckland's public transport network is the result of decades of incremental development and expansion of a network that priorities the provision of far-reaching, direct service to as many parts of Auckland as possible (Walker, 2012). Under this notion of providing service where and when it is demanded, a huge amount of complexity develops within the network. Under the current network there are over 350 individual bus services, many of which duplicate or overlap one another rather than work together as an integrated system (Auckland Transport, 2013). The result of this complexity and duplication is waste, locked up within the operational structure of the network. What is required to unlock this waste is a fundamentally new way of thinking about how public transport operates effectively in large urban environments (Walker, 2012).

In recognising the importance of addressing Auckland's crippled public transport network, Auckland Transport partnered with U.S. transit consultant Jarrett Walker and transport and planning consultancy MRCagney, to radically rethink Auckland's public transport network from the ground up (Dearnaley, 2013). By designing a network of fewer but more integrated services, Auckland Transport was able to significantly reduce the amount of waste and complexity in the current network. Removing service duplication and overlapping saw the total number of bus routes fall from over 350 to just 150. This dramatic simplification was made possible by shifting from a direct service network to a connective service network, where "frequency is freedom" (Auckland Transport, 2013).

The operational structure of a direct service network [Figure 5] means services operate along singular routes directly from a point of origin to a destination point, typically resulting in routes that are significant in length. Under this type of network structure, a large number of individual services are required to connect multiple points of a city. Due to number of buses, and the length that each have to travel, transit agencies operating direct service networks can only afford to run services at low frequencies (Walker, 2012).

In contrast, a connective service network [Figure 6] can connect the same number of points of a city with a third the number of buses by operating services along fewer, shorter routes, which connect at a central interchange point. Because routes are shorter, and require fewer buses to operate, transit agencies can afford to run services at much higher frequencies than under a direct service network. Furthermore, the efficiency of a connective network means services can operate at high frequencies for a much longer span, enabling an all-day network (Walker, 2012). The benefits that a connective service network creates for users is the ability to travel at nearly any time of day without having to deal with long wait times or structure their travel around complex timetables (Auckland Transport, 2013). Furthermore, a connective network opens up a much larger area of the city that users can travel to by public transport. The biggest trade-off for users of a connective service network is, of course, the need to transfer between different services along the journey to get to the end destination - a small compromise for the freedom a connective service network provides (Walker, 2012).

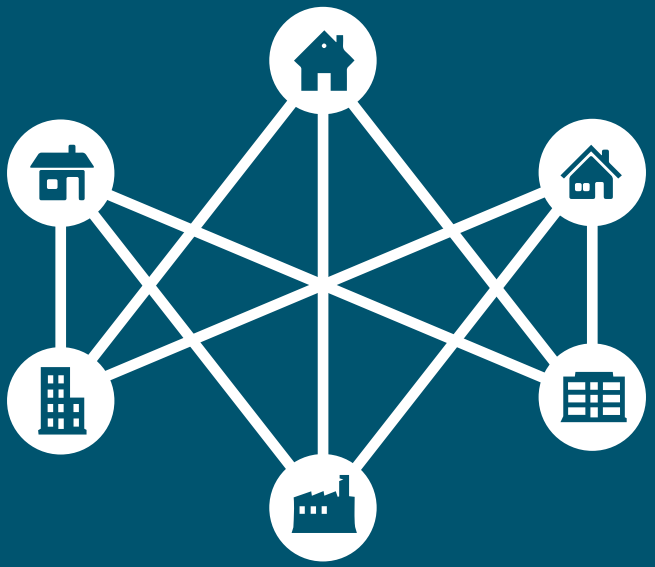


Figure 5. Direct Service Network Structure (2012)

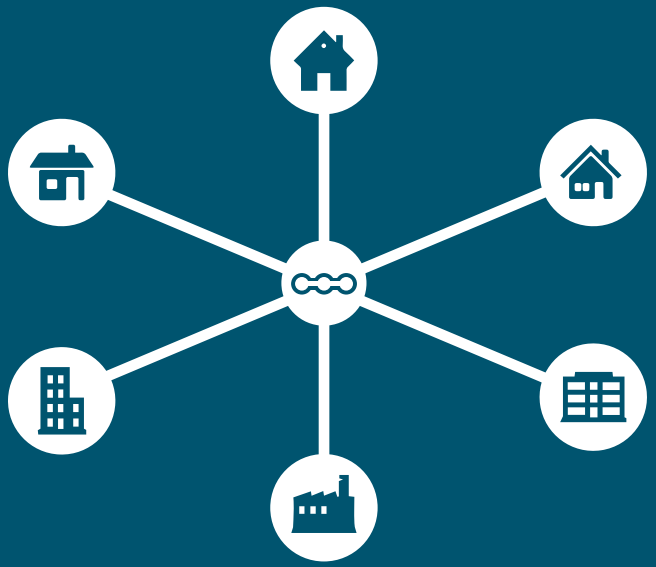


Figure 6. Connective Service Network Structure (2012)

GETTING THINGS RIGHT

Despite a rather chequered history over the last half-century, more recent initiatives to improve Auckland's public transport network have seen huge success over the last decade (ref).

Now ten years since its completion, the Britomart Transport Centre has played a pivotal role in the regeneration of public transport in Auckland (The New Zealand Herald [NZH], 2013). The construction of the large underground transport centre at the bottom of the CBD saw the return of trains to the centre of Auckland city for the first time in more than 70 years (Lowrie, 2013). Following its opening in 2003, rail patronage increased dramatically from around 2.5 million to 10 million annually, over an eight-year period (Lowrie, 2013). But it was the positive influence that Britomart had on Auckland's public transport network beyond rail that added to its enormous success. Annual bus and ferry patronage climbed from 46 to 56 million, and 3.7 to 5.4 million, respectively, since its opening (Lowrie, 2013). Britomart was "a major step in creating a modern, integrated public transport network" according to Councillor Greg McKeown (Scoop, 2003).

The construction of Britomart has also hugely influenced the regeneration of the surrounding environment and urban form through the development of the Britomart precinct (NZH, 2013). Home to a vast array of retail outlets, restaurants, bars, and apartments, Britomart is now one of Auckland city's most popular and fastest developing precincts, with the number of new businesses in the area expected to double by 2015 (Britomart, 2013).

Another hugely successful initiative was the Northern Busway - Auckland's first Bus Rapid Transit (BRT) system - an 8.7km high-speed, bus-only road network from the centre of the North Shore to the Auckland CBD. Buses run at high speed alongside the Northern motorway through five key interchange stations, which offer 'Park and Ride' facilities at the two furthest north stations (Auckland Transport, 2010). Services operate all day at a minimum frequency of 15 minutes during off-peak and every 5 minutes during the morning and evening peak (Auckland Transport, 2011). Since its official opening in 2008, the success of the Northern Busway has been immense, with annual patronage surpassing predicted figures each year and doubling estimates in 2011/2012 (Lowrie, 2013). Today, buses operating along the Northern Busway carry more people from the North Shore to Auckland CBD during the morning peak than by car (Auckland Transport, 2012).

With Auckland Transport rolling out a new, high frequency, connective network over the next three years, what will the impact be on the growth of public transport patronage, and how may it shape Auckland and its urban environment as we move towards a vision of becoming the world's most liveable city?

1955

360

THOUSAND

105

MILLION

PASSENGER TRIPS

2012

1.5

MILLION

69

MILLION

PASSENGER TRIPS

2040

2.5

MILLION

?

MILLION

PASSENGER TRIPS

METHODOLOGY

03

METHODOLOGY

This research project employed an inductive, mixed-method research design, combining both qualitative and quantitative data to ensure a successful outcome. Quantitative data consists of closed-ended, measurable information such as quantities and statistics (Collins, 2010). Quantitative research can provide valuable insight into customer patterns and trends through the analysis of large data pools and web analytics (Adaptive Path, 2013). In contrast, qualitative data deals with open-ended, subjective information such as the opinions and perceptions of individuals involved in a particular study (Creswell, 2006). Although quantitative data can reveal significant statistical 'truths', such as the percentage of people who use a particular product/service, it does not reveal the reasons why they use that product/service (Polaine, Lovlie, & Reason, 2013).

Qualitative data helps the researcher gain a deep and holistic understanding of the various intangible aspects associated with human behaviours and emotions that influence how people interact or choose to interact with different products or services (Polaine et al., 2013). For this reason, qualitative research is often the predominant method of data collection within human-centred design research, as it allows the designer to better understand the problems they are tackling in context (Grey, 2009) and "can uncover deeply-held needs, desires, and aspirations...of the participants" (IDEO, 2011).

Adopting a mixed-methods research design allows the researcher to compensate for the intrinsic limitations within quantitative and qualitative data, and can help develop a more comprehensive understanding of the research problem than if each data set were to be used in isolation (Creswell, 2006).

ACTION RESEARCH

Action research is a methodology that combines the synthesis and development of theory and practice (Somekh & Noffke, 2003), typically within a social context that requires change (Swann, 2002). Acting as an agent of change, action research allows the researcher to engage in real world issues with a focus on improving the organisations and processes within the research enquiry (Gray, 2009). The methodology follows a cyclic, iterative process of planning, acting, observing and reflecting [Figure 7], with resulting outcomes feeding into subsequent cycles. Although these cycles can continue indefinitely, without clear direction, it is important to initiate each cycle with clear purpose and mark its completion to maximise the success of each outcome (Groundwater-Smith, 2009). Due to its cyclic nature, action research is an appropriate methodology for mixed-methods research designs where the research methods, frameworks and direction may change or augment as the project develops (Collins, 2010).

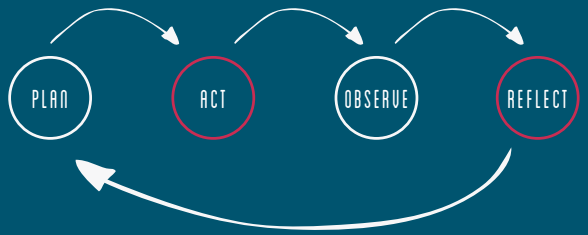


Figure 7. Action Research Cycle (Kolb, 1984)

The role of the researcher is to gain a deep, intense and 'holistic' overview of the context under study, often involving interacting within the everyday lives of individuals, groups, communities and organizations.

- Creswell, 2006

CRITICAL FRAMEWORKS

HUMAN-CENTRED DESIGN

Human-centred design is a framework and approach to design that puts the user at the centre of an enquiry. The framework consists of a set of processes and techniques that allow the designer to gain a deep level of empathy for the people they are designing for (IDEO, 2011). Viewing problems through the three lenses of desirability, feasibility and viability [Figure 8], human-centred design represents the overlap of people, business and technology, and harnesses the power of design to create innovative solutions to social problems (Popova, 2010). The process of developing user empathy can reveal opportunities where complex issues can be addressed through creative product, service, system or environmental solutions (IDEO, 2011).

The process of human-centred consists of three phases: Hear, Create, and Deliver [Figure 9]. Starting at the 'Hear' phase, several qualitative research methods, such as role-play, observation, and user interviews are employed to help reveal the deeply held needs and desires of the user. In response, the 'Create' phase applies the methods and tools of the designer to generate meaningful and innovative solutions to the problems of the user. Finally, the 'Deliver' phase brings technology and business together to determine what is technically and financially possible (IDEO, 2011).

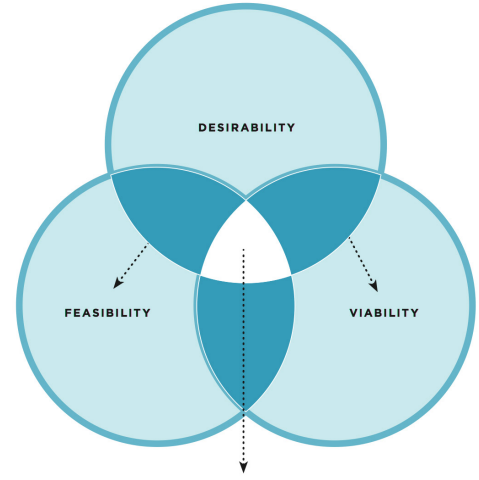


Figure 8. The Three Lenses of Human-Centred Design, 2011.

Figure 9. The Human-Centred Design Process, 2011.

SERVICE DESIGN

Service design is an emerging interdisciplinary field of design focused on creating services that are holistic, human-centred and empathic towards user needs, whilst ensuring efficiency, effectiveness and competitive advantage for service providers (Stickdorn & Schneider, 2010). As developed nations shift from industrialised/manufacturing economies to information and service-based economies (Service-Design-Network), competitive market advantages and employment prosperity sit firmly within the expanding service sector (Polaine et el., 2013).

Service design, as a field and practice, emerges and expands out of the challenges facing modern society. With growing consumer demand and expectations for customer-focused and user-centred products and services, companies and organisations at large are recognising the value of service design and its ability to transform insights into innovative, desirable and customer-focused services (Samalionis, 2010).

Human-centred in nature, service design draws from a range of both qualitative and quantitative methods and techniques to reveal opportunities where services can be improved, or new service offerings be created, to better meet the needs and desires of its users (Stickdorn & Schneider, 2010).

However, unlike human-centred design, which focuses principally on the needs of the user, service design considers holistically both the needs of users and the various stakeholders involved within a service offering (Polaine et el, 2013).

Service design drills deep into the inner workings of organisations, companies, and businesses to orchestrate the various elements of a service offering in order to improve the quality of the interactions that occur between service providers and customers (Service Design Network, 2013).

Similar to human-centred design, service design follows a highly iterative four-phase process of exploration, creation, reflection and implementation [Figure 10]. This process is a series of divergent and convergent cycles, guided by the five key principles of service design, as described by Stickdorn and Schneider (2010).

The application of human-centred and service design frameworks took place throughout the entire length of this practice-based research project. Human-centred design was adopted and applied during the first action research cycle to help develop a better understanding of the issues and complexities associated with the use of adult kick scooters. Following the reframing of the project, human-centred and service design frameworks were used throughout the process of research and design to help develop a holistic comprehension of the interactions that occur between users, service providers and the various touchpoints throughout the public transport experience. By developing deep empathy for users, these frameworks helped reveal the needs and desires of public transport users, and develop innovative and meaningful product and service solutions in response.

THE 5 PRINCIPLES OF SERVICE DESIGN

1

USER-CENTRED

Services should be experienced through the customer's eyes.

2

CO-CREATIVE

All stakeholders should be included in the design process.

3

SEQUENCING

The service should be visualised as a sequence of interrelated actions.

4

EVIDENCING

Intangible services should be visualised in terms of physical solutions.

5

HOLISTIC

The entire environment of a service should be considered.

(Stickdorn & Schneider, 2010)

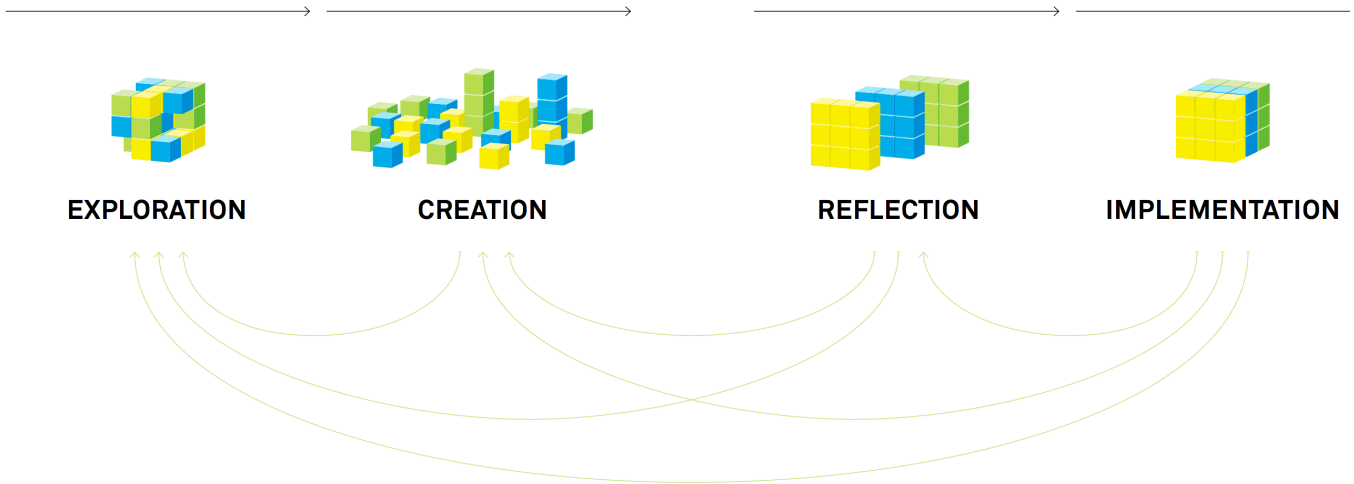


Figure 10. The Service Design Process, 2010.

Services are about interactions between people, and their motivations and behaviours... understanding people is at the heart of service design.

- Polaine, Lovlie & Reason, 2013

MODES & METHODS

This research project was applied through three modes of design research. The first mode, *research for design*, involved investigation into secondary (existing) data and the synthesis of primary data through quantitative and qualitative research methods. The second mode, *design as research*, focused on the synthesis of design interventions in response to findings through the *research for design* mode. The insights generated through reflection of design interventions and outcomes fed into the third mode, *research into design*, contributing to the existing body of knowledge within the field of design. The first two modes of research occurred concurrently in a cyclic nature so that each was mutually supportive and informative to one another. The third mode, *research into design*, manifested through the completion of this masters research project, as both a body of practice-based work and a supporting written exegesis.

RESEARCH FOR DESIGN

LITERATURE REVIEW

A literature review is a summarising text that examines, interprets and evaluates the existing field of knowledge in which the research project is situated. It enables the researcher to gain a comprehensive understanding of the field of study (Gray, 2009), often revealing gaps in the research and/or helping to define the topic of enquiry (Collins, 2010). An extensive literature review was conducted early in the research to gain a clearer understanding of the topic of public transport within the Auckland context.

The initial focus of the review included literature on the history of transportation (both public and private) in Auckland, the development of Auckland's new public transport network, and the design of connective service transit networks. The literature review was continually developed throughout the project as the focus of the research narrowed. Subsequent topics of enquiry included the role of public transport in the development of urban environments, and the user experience of public transportation.

EXPERT INTERVIEWS

Expert interviews are a commonly used method by qualitative researchers and designers to gain greater understanding of the people they are designing for or the field in which the research is situated. The nature of these interviews can be highly structured, semi-structured or unstructured (Designing With People [DWP], 2011). Semi structured interviews are typically a process of collaboration, where the researcher focuses on specific topics whilst allowing in-depth conversation to develop around the perspective and opinions of the interviewee (Gray, 2009).

A number of expert interviews were conducted throughout the research to further develop my understanding of the topic of public transport in Auckland, as well as the issues and complexities associated for public transport users. These interviews also provided insight into the perspectives of several experts who played significant roles in the design of Auckland's new public transport network. The majority of these interviews were semi-structured in nature, allowing for further expansion of the topics in focus.

OBSERVATIONS

Observation is a research method used by ethnographic researchers and designers to help reveal the interactions that occur between users and the touchpoints of their surrounding environment (Stickdorn & Schneider, 2010). By observing these interactions in real-time, the researcher can reveal the true nature of the actions and behaviours of users to gain a holistic understanding of the situation and context (DWP, 2011).

Observations were used as a key research method to gain a deeper understanding of the actions, behaviours and interactions of public transport users and their surrounding environments or scenarios. Observations were documented through note-taking, sketching and photographic techniques, including timelapse photography. This technique enabled the ability to observe and identify patterns and sequences in both real-time, during the process of the study, and following the process of the study at much higher playback speeds.

ROLE-PLAY

Role-playing is a practical research method where the researcher seeks to gain empathy by simulating the scenarios or experiences of the users they are designing for. This method allows the researcher to develop a deeper understanding of the complexities and constraints of a given scenario through first-hand experience in the context of the user (DWP, 2011). Role playing techniques provide the researcher with a holistic and intimate understanding of the contextual interactions that occur between groups, services, and touchpoints as they happen (Stickdorn & Schneider, 2010).

Role-play was used extensively throughout this research project to develop a deeper understanding of the issues and complexities associated with a connective service network for public transport users. Simulating connective service journey experiences across bus, train and ferry services allowed me to gain empathy and understanding for users by experiencing both the physical and emotional complexities associated with connective service. These role-play experiences revealed valuable insights, which drove the development of the research and design developments.

EXISTING PRODUCT ANALYSIS

Existing product analysis is a method commonly used by designers to study the market landscape in which their product or service will be situated. It can help the designer identify opportunities and areas for improvement over products or services which currently exist by critically analysing their characteristics, such as form, function, usability, cost, etc. (Compton, 2011).

After defining the design deliverables of the project in the ninth action research cycle, I conducted studies of existing public transport mobile applications, including the current Auckland Transport application. I also examined and critically analysed existing ticketing solutions, including current thermal paper tickets. Through this process of critical analysis, I was able to identify strengths and weaknesses of current design solutions, allowing me to build and expand upon these through my own design developments.

DESIGN AS RESEARCH

IDEATION

Ideation (idea generation) can take form through various methods and techniques such as visual research, mind mapping, brainstorming and drawing. Mind mapping is recognised as a valuable method of quick idea generation where hierarchical or categorical order can be visually depicted and relationships or associations can be made between ideas (Collins, 2010). Similarly, brainstorming is used to generate a large number of ideas in a short amount of time. Often performed in groups, brainstorming allows members to listen, share and build upon ideas of one another through collaborative thinking (Institute of Design at Stanford [IDS], 2011).

A full range of ideation methods and techniques were used throughout this research project, in response to the insights revealed through the Research for Design mode. Multiple group ideation sessions took place following the Research for Design mode, including brainstorming and mind mapping, to generate large volumes of ideas and concepts in a collaborative environment. Drawing and sketching were used extensively throughout various stages of the project, initially to explore rough ideas and concepts, and then later to develop these ideas in more detail.

PROTOTYPING

Prototyping is a highly effective method of communicating design ideas and concepts in a clear and tangible manner. The process of physically or digitally mocking-up a concept is an effective way of evaluating a design idea by revealing flaws that may not have been apparent during other phases of the ideation process. In comparison to sketching and drawing methods, prototyping can communicate ideas more clearly than verbal or illustrative descriptions, which are more open to misinterpretation (DWP, 2011). Similarly, service prototyping – where interaction between products, systems and end-users are mocked-up – can generate a clearer and deeper understanding of services through in-context simulation (Stickdorn & Schneider, 2010).

Several prototyping methods and techniques were used extensively during the Design as Research mode to develop ideas and concepts through physical and digital exploration and investigation. In earlier phases of the Design as Research mode, various small-scale models and full-scale prototypes were developed to explore ideas of signage and wayfinding solutions. In later phases of the Design as Research mode, service prototypes and digital mock-ups were used extensively during the development of a digital application and system concept. A combination of low-fi and hi-fi digital prototypes were developed using Balsamiq Mockups and Adobe Illustrator to explore different aspects of the design at varying levels of detail.

EXPERIENCE MAPPING

An experience map, or customer journey map, is a tool that provides a high-level overview of the complex interactions that take place during a user's experience of a particular product, service or system (adaptive path). They are useful for capturing the richness of the human interactions that occur at various touchpoints throughout the journey. Through the action of mapping out these interactions and the key insights revealed during phases of research, the researcher can develop a more comprehensive understanding of the overall user experience of the journey (Stickdorn). Using the experience map as an artefact allows the researcher/designer to develop design solutions that improve or enhance the user experience (Adaptive Path, 2013).

An experience map was created towards the later stages of the project, following the development of research insights, to help position developed design solutions and interventions within the overall user experience of public transport.

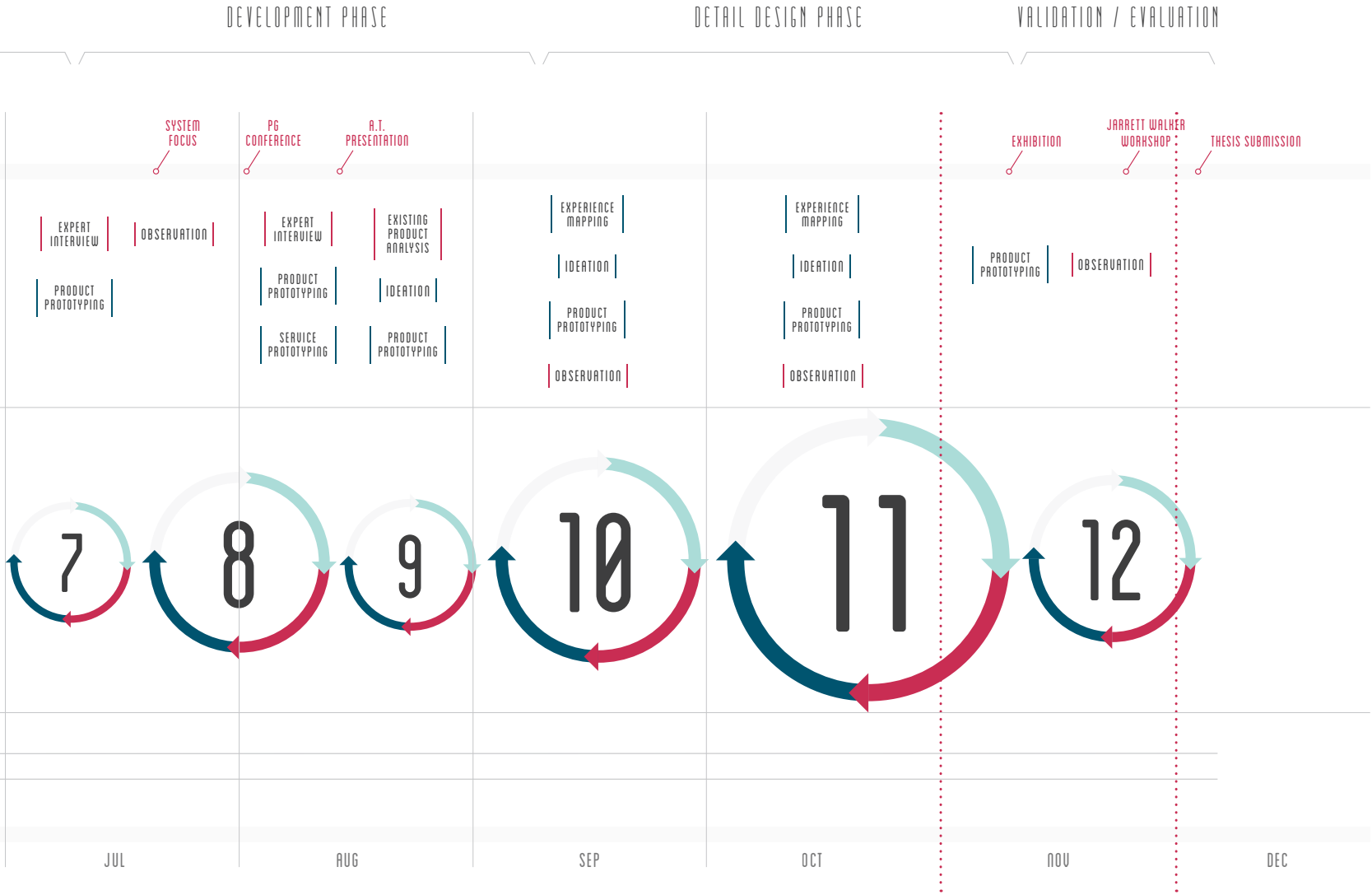
ETHICS

Ethics in research is the application of moral principles that ensure the researcher engages in moral issues of right and wrong. Ethics ensure the researcher is aware of the difference between what he or she has the right to do and what is right to do (Collins, 2010).

Ethics approval was not required to conduct interviews with experts, however each participant was informed of the intent and purpose of the interview, as well as the situations in which the recorded footage would be used, before agreeing to participate. A release form, which documented these terms of agreement, was signed by each participant and held for record. [Release form can be found in appendix A].

If I were to engage with real users through interviews or other collaborative forms of study, ethics approval would be required. Similarly, ethics approval would be needed in order to test developed design interventions/solutions with real users, in context. To overcome these limitations, I adopted and applied research and design methods that would allow me to develop empathy for users without direct user involvement.


EXPLORATION PHASE
CONCEPT PHASE
REFRAMING PROJECT
DOCUMENTARY CONCEPT
PROJECT FOCUS
FOCUS DEVIATION
INTERVENTION FOCUS
RESEARCH FOR DESIGN
DESIGN AS RESEARCH
ROLE-PLAY
OBSERVATION
IDEATION
LITERATURE REVIEW
ROLE-PLAY
OBSERVATION
IDEATION
LITERATURE REVIEW
ROLE-PLAY
OBSERVATION
EXPERT INTERVIEW
OBSERVATION
IDEATION
OBSERVATION
EXPERT INTERVIEW
EXISTING PRODUCT ANALYSIS
OBSERVATION
IDEATION
ROLE-PLAY
OBSERVATION
ACTION RESEARCH CYCLES
1
2
3
4
5
6
CRITICAL FRAMEWORKS
HUMAN-CENTRED DESIGN
SERVICE DESIGN
JAN
FEB
MAR
APR
MAY
JUN


DEVELOPMENT PHASE
DETAIL DESIGN PHASE
VALIDATION / EVALUATION
SYSTEM FOCUS
PG CONFERENCE
A.T. PRESENTATION
EXHIBITION
JARRETT WALKER WORKSHOP
THESIS SUBMISSION
EXPERT INTERVIEW
OBSERVATION
PRODUCT PROTOTYPING
EXPERT INTERVIEW
EXISTING PRODUCT ANALYSIS
PRODUCT PROTOTYPING
IDEATION
SERVICE PROTOTYPING
PRODUCT PROTOTYPING
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This thesis is a highly visual, multi-media document that aims to present the complexity of the research in a clear and coherent manner. For the sake of clarity and readability, I have attempted to group research methods and processes together throughout each action research cycle, where possible. However, it is important to gain a sense of the inherent messiness of my design process, thus certain sections of the document maintain a level of fidelity to the actual process and development of this masters research project.

The project undertaken was situated within a large scale and highly complex social context. The research reflects my personal journey, navigating and engaging within the complex subject of public transportation, bringing my personal perspective and empathy as a public transport user to the research enquiry.

PROCESS

04

REFRAMING

MARCH

REFRAMING THE PROJECT

Following the first action research cycle of this project, it was clear that the initial topic - alternative solutions to short distance, urban transport - was no longer the focus of the enquiry. However, this initial phase of research broadened the scope of the research to encompass the much larger, overarching topic of public transport. This divergent process allowed me to explore and examine the issues associated with Auckland public transport from a much broader perspective.

During the early stages of initial research I attended several presentations and seminars hosted by experts within the fields of transport, planning, and sustainability that focused on Auckland's new public transport network and the role of public transport in achieving Auckland's vision of becoming the world's most liveable city.

It was during this early phase of research that I began developing a more comprehensive understanding of the overarching topic and more specifically, the design of Auckland's new public transport network.

- Jarrett Walker, 2013

Critical to the design of Auckland's new public transport network, U.S. transit consultant Jarrett Walker presented an Auckland seminar providing a comprehensive overview of the principles of designing resilient transit networks, with particular focus on the process of redesigning Auckland's public transport system. In his seminar, Jarrett explored the notion of 'Abundant Access' typically made possible through a simple, connected network that prioritises high frequency and long span over peak-only, direct service with maximum coverage (Walker, 2013). To achieve a network design such as this, there are seven typical compromises between two desirable outcomes that transit planners and agencies must make. Of these seven compromises, the choice between connections or complexity was of particular focus given the importance of its consideration during the redesign of Auckland's network. Jarrett explained the success of the Auckland Link services, which embrace the notion of 'Abundant Access', and encouraged the audience to think of Auckland under the new network as a "city of Links" (Walker, 2013) to understand its potential in creating wide spread 'Abundant Access'.

In order to successfully redesign a highly complex transit network such as Auckland's, Walker (2013) stressed the importance of maintaining a high level of altitude - that is to view problems from a network/system level of thinking before considering the specific details or implications of these choices at a low, ground level.

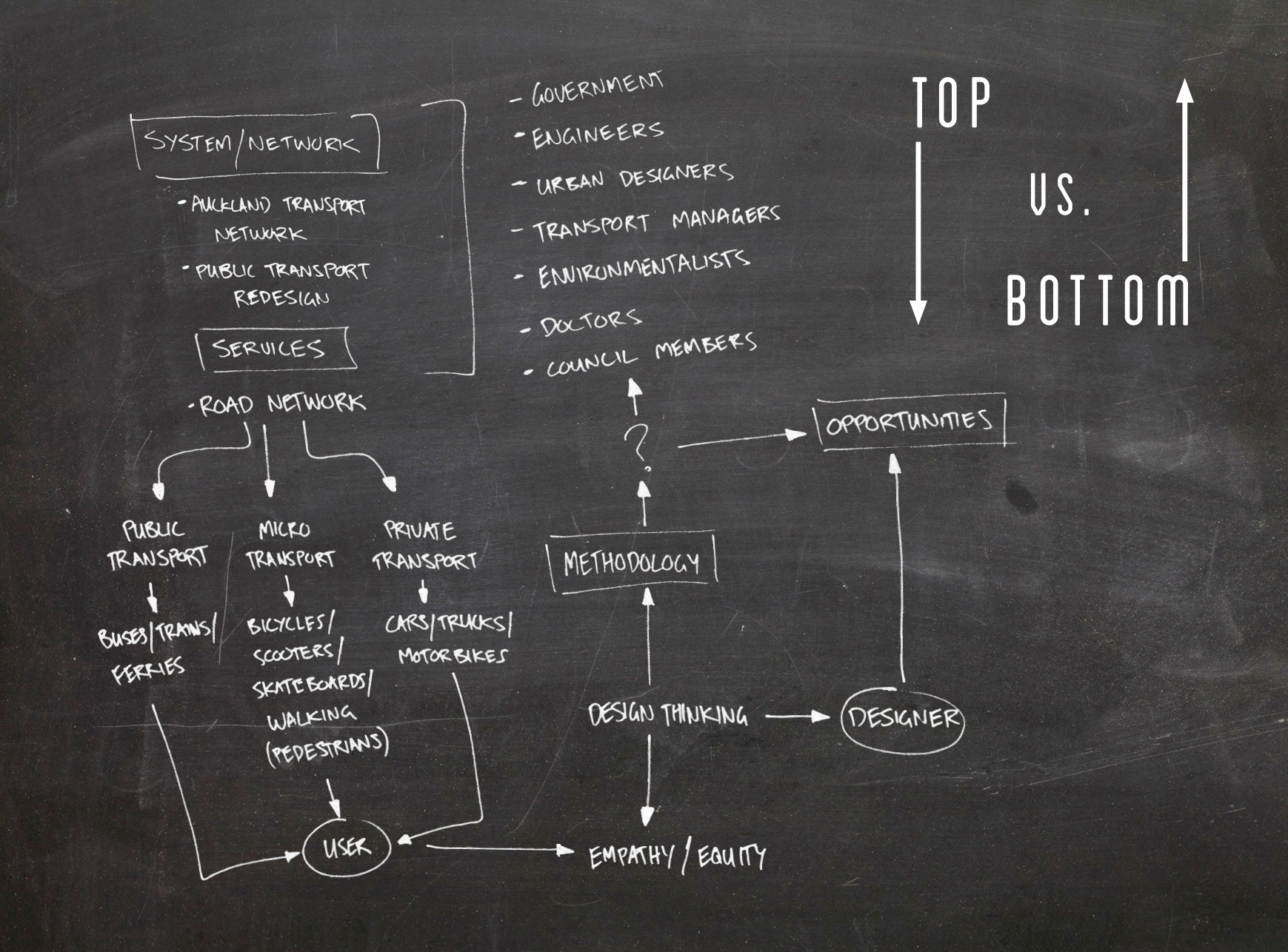
When we designed Auckland's new public transport network we had to work really hard to stay at a high altitude, at a system/network level of thinking. It's not until we achieve this that we can begin thinking about how it's going to work on the ground for its users.

- Jarrett Walker, 2013

FORMING A HYPOTHESIS

After learning more of Auckland's new public transport network in detail, my initial assumptions situated around the notion that the redesigned network had not sufficiently considered the complexities, both physically and emotionally, posed to users by a connective network. It was at this point in the research that I developed a hypothesis that Auckland's new public transport network had been designed from a 'top-down', system/network level, without first deeply understanding the needs of its users. I had identified an opportunity to explore the role of human-centred, service design frameworks within the context of public transport to develop a deeper understanding of the complexities posed to users of Auckland's new public transport network. Furthermore, the developed hypothesis created an opportunity to explore the role of the designer/design researcher in bringing an empathic, user-centred approach to public transport.

The following sketch diagram demonstrates the developed hypothesis, which formed the basis of my research question: "How can a bottom-up, user-centred approach to Auckland's new public transport network create empathic service experiences for its users?"


SYSTEM/NETWORK
- AUCKLAND TRANSPORT NETWORK
- PUBLIC TRANSPORT REDESIGN
SERVICES
- ROAD NETWORK
- GOVERNMENT
- ENGINEERS
- URBAN DESIGNERS
- TRANSPORT MANAGERS
- ENVIRONMENTALISTS
- DOCTORS
- COUNCIL MEMBERS
TOP
VS.
BOTTOM
PUBLIC TRANSPORT
MICRO TRANSPORT
PRIVATE TRANSPORT
BUSES/TRAINS/FERRIES
BICYCLES/SCOOTERS/SKATEBOARDS/WALKING (PEDESTRIANS)
CARS/TRUCKS/MOTORBIKES
?
OPPORTUNITIES
METHODOLOGY
DESIGN THINKING
DESIGNER
USER
EMPATHY/EQUITY

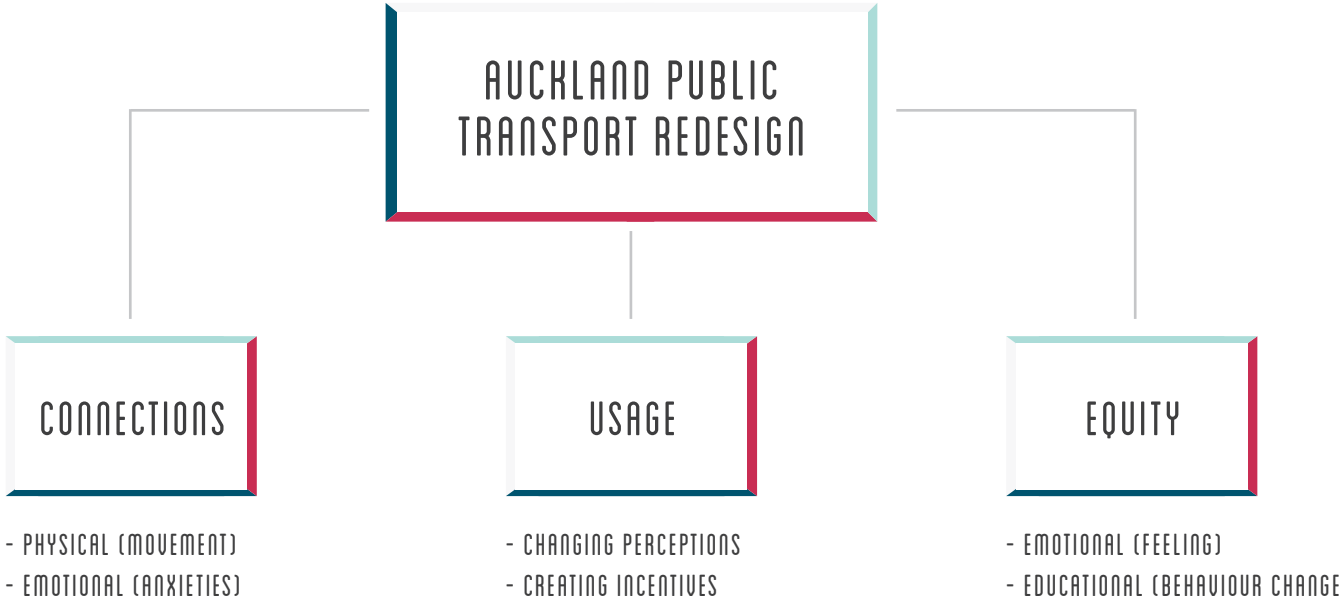
FINDING OPPORTUNITIES

Forming a hypothesis and research question allowed me to begin narrowing the focus of the research enquiry and identify opportunities where design intervention could improve the user experience of public transport.

In response to the initial research, I became interested in exploring three different aspects of the new network, all through the lens of user empathy. The first aspect focused on connections and connectivity (the fundamental difference between the current network and the redesigned network), and the complexities, both physically and emotionally, that connections created for users. The second aspect focused on increasing public transport patronage by creating incentives and challenging or changing current perceptions of public transport. Finally, the third aspect focused on the notion of equity between all users of Auckland's transport network - pedestrians, cyclists, transit users, and drivers - through the use of design for social and behaviour change.

To help determine which area(s) presented the best opportunity for design intervention, I began employing several qualitative research methods, including role-play and observation, to gain a better understanding of the complexities associated with public transport from a user perspective.

OPPORTUNITIES FOR INTERVENTION

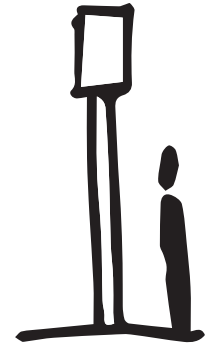


ROLE-PLAY

Although I had caught the bus countless times between home and university for the last four years, I had never documented my experiences in detail. In order to better understand the complexities, both physically and emotionally, of using public transport I began documenting various journeys along my regular route.

The first journey I documented was an early morning direct route from home to midtown. This particular route began on the North Shore before travelling along the Northern Busway. I caught the bus from a nearby bus stop, which was the most basic, sub-standard form of bus stop - a lamppost with an attached wooden pole and printed timetable. There was no shelter or seating provided, and I had no access to real-time service updates. The bus was scheduled to arrive at 08:12 but did not arrive until 08:25. Upon arrival, the bus was nearly full with very few seats left empty.

After joining the Northern Busway, the driver stopped to let a small number of passengers off at the second station. The driver then proceeded to let large numbers of passengers board the nearly full bus, until it was full of people standing to the very back. Meanwhile, at this time of morning, numerous other buses all heading in the same direction were flying past without picking up any of the waiting passengers. The amount of time spent letting passengers onto this one bus meant it was 15 minutes behind schedule by the time it reached the final stop.



The second journey I documented was of a new and exciting transit option. Auckland Transport had recently launched its first double-decker bus as part of the BRT Northern Busway. On this particular day, I was waiting at Constellation station for the 881 service, direct to university. This service is hugely popular for students from both the University of Auckland and Auckland University of Technology, as it travels along the main arterial road of each campus. As it approached the southbound platform where I was waiting, I noticed a much larger bus approaching behind it. Once I realised it was the new double-decker Northern Express bus, I suddenly changed my mind about the 881 direct service that was now boarding.

I boarded the double-decker and went straight for the front seat at the top level. The view from this level was rather impressive, particularly when crossing the Auckland Harbour Bridge. Furthermore, the extra elevation off the ground made the ride a lot smoother and quieter - a riding experience much closer to rail than bus. The trade-off of course was that I would have to walk (or catch another service) from Britomart up to university. In this first instance, the opportunity to ride on a double-decker bus outweighed the convenience of catching a direct service to my final destination.

This experience provoked thought around how transit choices could be influenced by creating incentives for users, which was a notion I wanted to explore further.

Figure 11. Northern Express Double Decker Bus, 2013.

OBSERVATION

During the course of these journeys (and many subsequent journeys) I observed the actions, behaviours and interactions between public transport users and the various touchpoints of the service. In particular, I took note of the interactions between users and drivers, as well as capturing some of the frustrations users would openly express during or pre/post service. These observations provided insight into the thoughts and emotions of users and revealed painpoints along different parts of the service.

USER QUOTES
DRIVER QUOTES

ARGH!

THERE ARE TOO MANY PEOPLE AT THE BUS STOP. I KNOW THERES GONNA BE PEOPLE STANDING ALL THE WAY TO THE BACK OF THE BUS WHICH MEANS THE AIR CONDITIONING WONT WORK PROPERLY... ITS JUST NOT WORTH IT.

SORRY

WE ARE FULL RIGHT NOW BUT YOUVE GOT THE NEXT UNIVERSITY BUS RIGHT BEHIND ME.

HERE'S AN IDEA

During the early phases of research I began documenting ideas and concepts in response to the findings or insights revealed through different research methods. These concepts formed a series of thought-provoking ideas, titled 'Here's An Idea'.

The first idea was a reimagining of the seemingly popular campaign run by major supermarkets across New Zealand, whereby shoppers are rewarded discount vouchers on fuel by spending a certain amount of money on their groceries; the amount spent increases the discount rewarded. In the wake of ever-increasing petrol prices, the scheme inherently encourages people to maintain their current driving habits instead of seeking or considering alternative solutions to transport.

I saw this concept as a potentially powerful way to encourage people to use public transport, and reward those who already do, by flipping the scheme inside out. Rather than spending more on your grocery bill to save on petrol costs, save money on your grocery bill by using public transport; the more you ride, the more you save.

Assuming the discount rewarded for each journey 3 stages or more was 25c, ten trips a week would equate to a savings of $2.50. A family of four public transport users travelling this regularly could combine their vouchers for a total savings of $10 a week, or a potential savings of $520 on groceries per year.

Figure 12. Pak'n Save Fuel Discount Voucher, 2013.

From the documentary film, 'Urbanised' by Gary Hustwit, this short segment tells a powerful story of the radical transformation of the city of Bogota in Colombia. Once considered one of the world's most dangerous cities (Hustwit, 2011), Bogota went through a radical transformation under the guidance of Mayor Enrique Penalosa, who's vision was to create a city that valued its people by "investing in people" (Hustwit, 2011). Through the implementation of 'TransMilenio' - a Bus Rapid Transit system - and a large cycling network, public transportation and cycling empowered citizens through freedom of movement and opportunity. Furthermore, the social stigmas once strongly associated with buses and bicycles were completely eradicated through these innovative and powerful interventions.

Figure 13. Bogota short from Urbanized Documentary, 2011.

UNDERSTANDING & INITIATING

APRIL

THE 7 DEMANDS OF USEFUL SERVICE

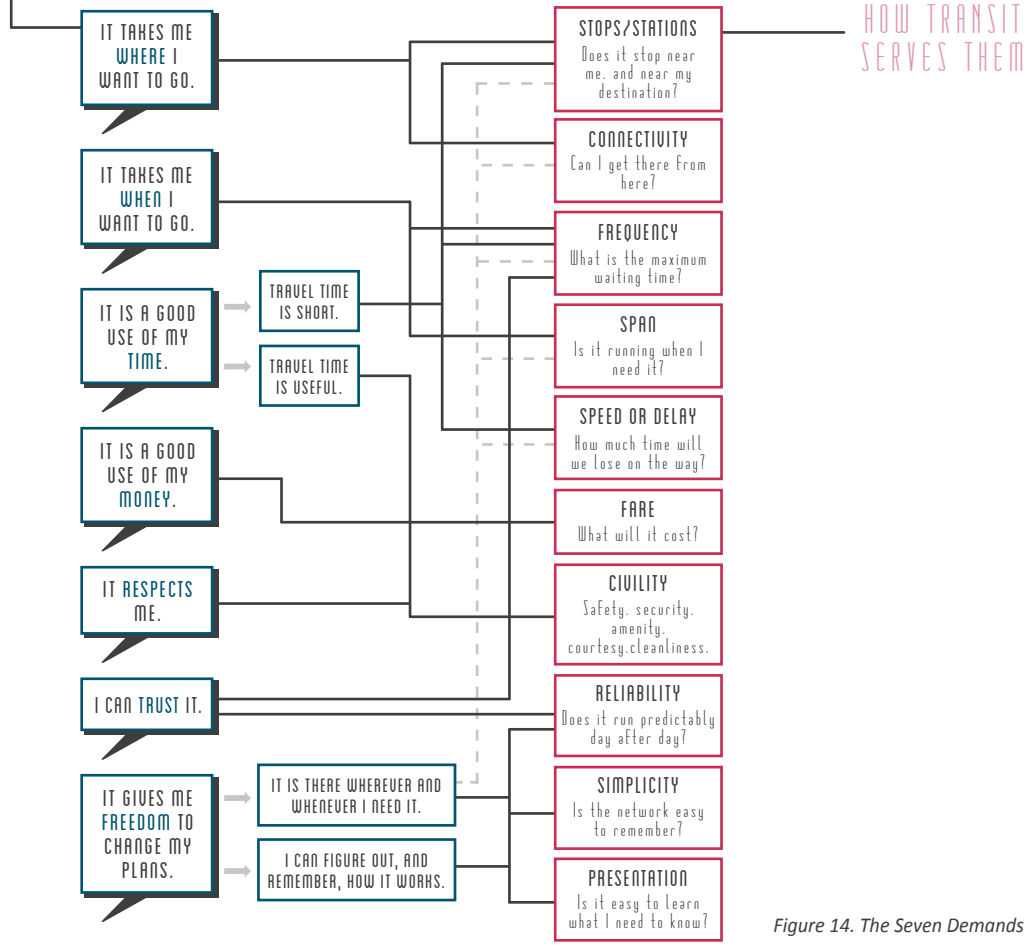


Figure 14. The Seven Demands of Useful Service, 2012.

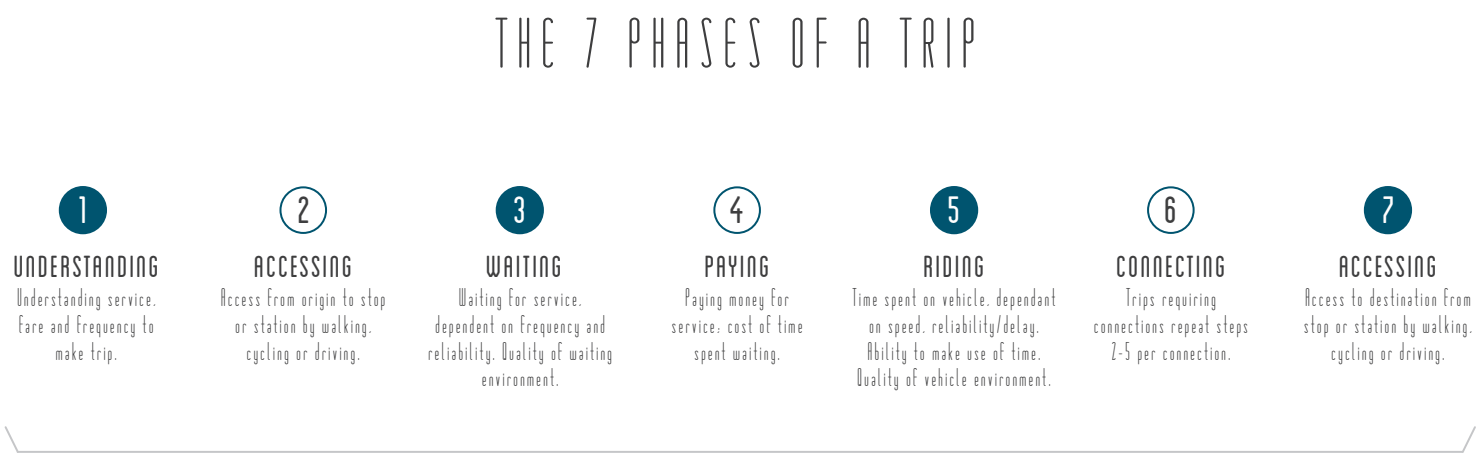


Figure 15. The Seven Phases of a Trip, 2012.

USABILITY CONSIDERATIONS

In the book, 'Human Transit', author Jarrett Walker explains the seven demands of useful service, as viewed by the user, and how public transport meets these demands [Figure 14]. Furthermore, he explains the seven phases of any given trip using public transport [Figure 15]. Although these diagrams represent the basic demands of a user, and the process in which they go through using public transport, I felt they were largely usability considerations and didn't reflect the real needs and experiences of public transport users in actual use.

I drew a comparison between the seven phases of a trip identified by Walker, and the customer journey or customer experience map typically associated with service design processes and practice. Unlike Walker's 'seven phases of a trip', which identify a sequence of events and associated user considerations, the customer experience map reveals, at a much deeper level, both the physical and emotional complexities associated with each action, process or interaction the user has throughout the entire journey. Through the utilisation of qualitative research methods like observation and role-play, I sought to identify the deeper physical and emotional complexities and considerations for public transport users.

USER GROUPS

One potential way to narrow the scope of my enquiry was to focus on a particular user group or user type. Given that I was situated within the university context, there was an opportunity to focus on the user experience of public transport specifically for students. However, having learnt that the new network aimed to provide public transport to a much broader reach and range of people, I felt that focusing on one specific user group/type would contradict the purpose of the network redesign.

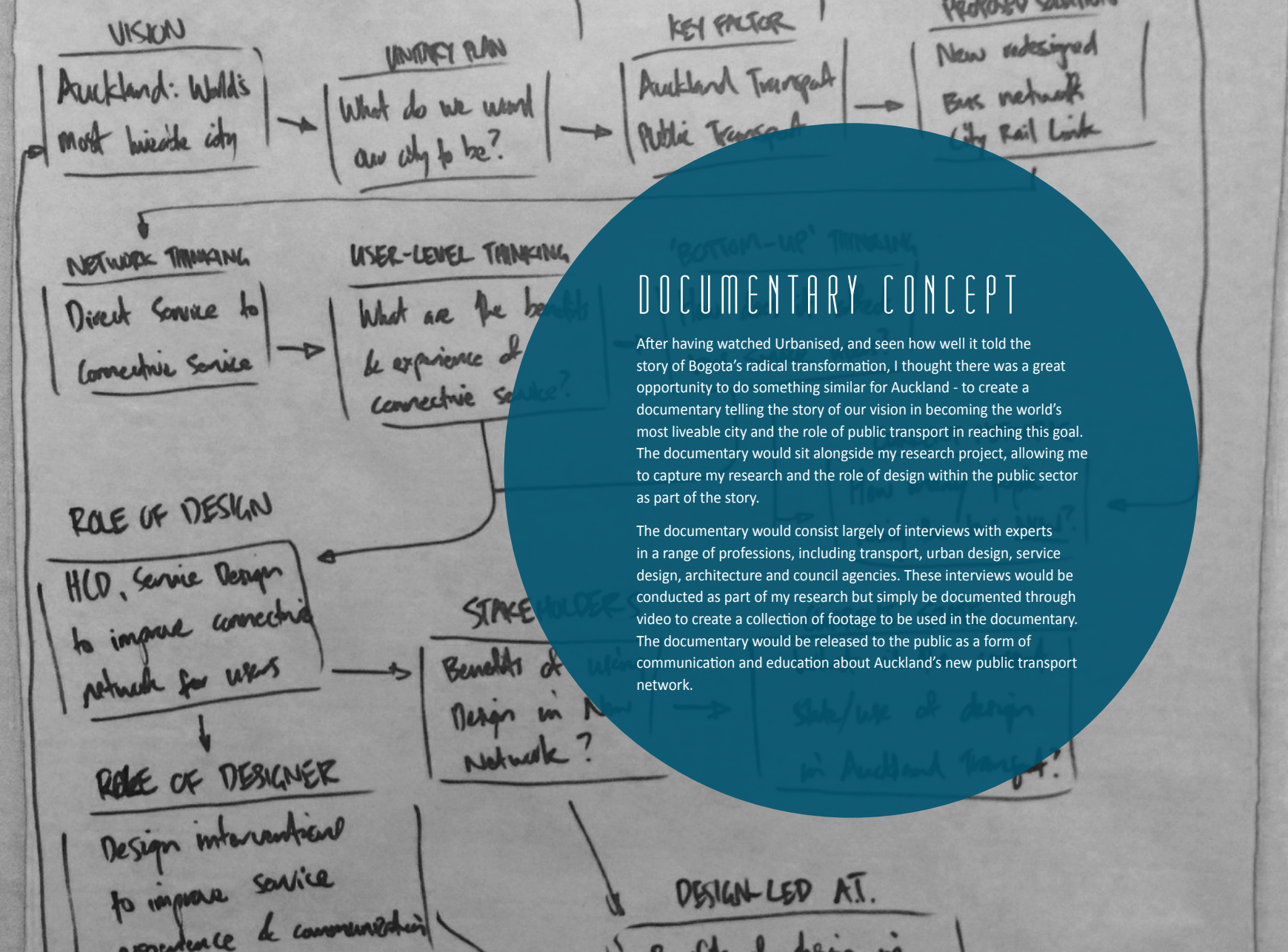
Alternatively, I decided to focus the project towards a particular task/action that forms part of the public transport service experience for all users e.g. ticket purchasing, journey planning or making connections/transfers. When considering the significance of interconnectivity in the design of the new network, it became apparent that opportunities to improve the user experience of public transport were situated around the action of making connections/transfers.

CONNECTIVE ROLE-PLAY

In order to more deeply understand the experience of a connective public transport network, I needed to role-play making connections on Auckland's current network. Given my proximity to the Northern Busway, which serves as a transport hub for a number of different bus services, this seemed the ideal location to role-play a connective service experience. For the sake of these exercises, I treated direct services as connective services by making forced transfers at Northern Busway stations.

One of many role-playing exercises was an evening journey from university (midtown) to home (Mairangi Bay). Usually, in this instance, I would catch the 86X service (which passes through Constellation Station) direct from outside campus to the street adjacent to my house. However, on this occasion I began with a 1.3km walk down to Britomart, where I caught a Northern Express service to Constellation Station. Here I waited for my connecting service (86X), which was scheduled to arrive in 8 minutes at 1903. However, according to the real-time board, the 86X was due to arrive in 21 minutes. With this in mind, I decided to pass the additional wait time inside the interchange station. A short 5-10 minutes later, the 86X came swooping past the interchange and continued without stopping, as I was no longer at the correct platform to signal the driver. As this was the last 86X service, I had to phone a family member to collect me from the Park and Ride station.

During this role-playing exercise (and subsequent role-play exercises) it was important to remain aware that the current network did not yet function as a connective network, and thus was likely to behave less optimally or predictably than under the new network. However, conducting these connective service role-play experiments on the current network allowed me to identify and reveal several barriers and complexities for users that would need to be addressed under the new network in order to create positive connective service experiences.



DOCUMENTARY CONCEPT

After having watched Urbanised, and seen how well it told the story of Bogota's radical transformation, I thought there was a great opportunity to do something similar for Auckland - to create a documentary telling the story of our vision in becoming the world's most liveable city and the role of public transport in reaching this goal. The documentary would sit alongside my research project, allowing me to capture my research and the role of design within the public sector as part of the story.

The documentary would consist largely of interviews with experts in a range of professions, including transport, urban design, service design, architecture and council agencies. These interviews would be conducted as part of my research but simply be documented through video to create a collection of footage to be used in the documentary. The documentary would be released to the public as a form of communication and education about Auckland's new public transport network.

Shortly after developing the documentary concept I came across a video released by Los Angeles Metro promoting the success of recent design-led campaigns to attract more users to public transport in a highly automobile-dominated city. The video demonstrates the success of a branding campaign that portrays the automobile as an evil character and public transport as the hero character. Considering the similar level of automobile dependence in Auckland, the video provoked thought around how design-led initiatives could form part of the documentary, demonstrating the influence design has in changing perceptions of public transport, and the role of public transport in shaping an automobile dominated city.

Figure 16. L.A. Metro: Promoting Mass Transit, 2010.

As a form of photographic observation, I created a timelapse sequence from a location on the North Shore where I could capture the Northern Busway and Northern motorway during the peak afternoon traffic. The timelapse begins by focusing closely on the Northern Busway, then pans across to reveal the congested motorway. When compared to the number of cars heading north, it appears as though the number of buses travelling along the busway is rather poor. However, considering more people travel between the North Shore and Auckland CBD during peak hours by bus than by car (Lowrie, 2013), the sequence reveals something far more insightful - the sheer efficiency of the Bus Rapid Transit system.

HERE'S AN IDEA

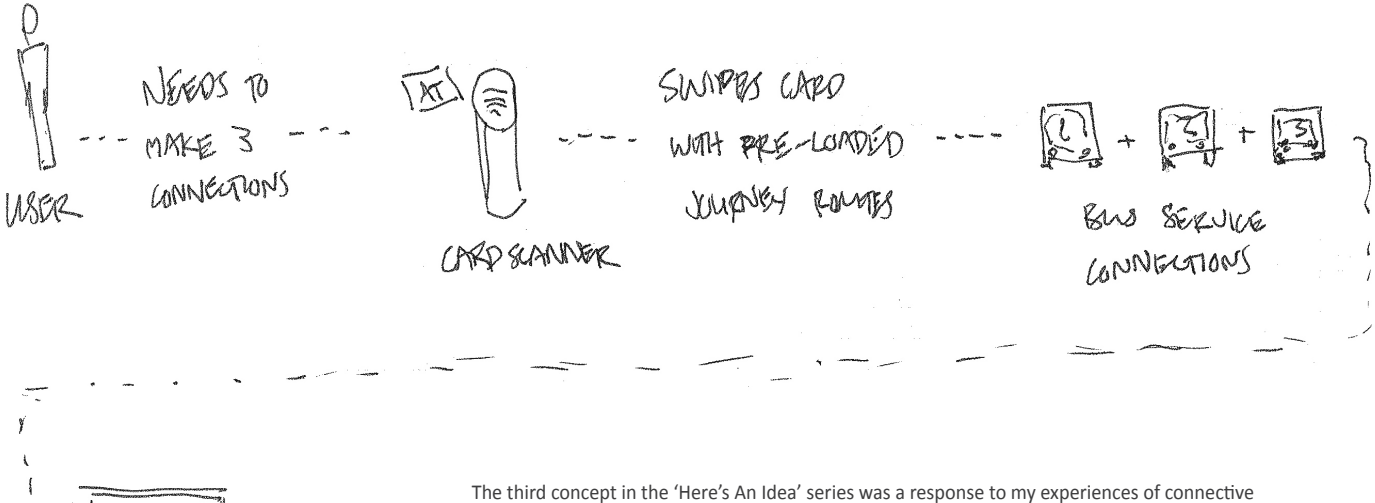
The second idea in the 'Here's An Idea' series was again, a play on an existing concept which I adopted into the context of public transport. The well established 'Like' button commonly seen on social networking platforms such as Facebook and YouTube is a simple way of showing an appreciation for something, be it genuine or trivial.

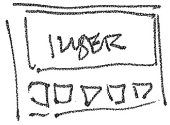
From my own personal experiences and observations, there is a tendency for public transport users to express, or share with others, their bad experiences using public transport but very rarely do they speak of the good public transport experiences they have. If we were to show our appreciation for good service experiences more often, what effect would this have on people's perception of public transport and how could it improve service experiences more broadly?

Similar to smart card readers on buses, 'Like' or 'thumbs up' buttons could be installed on buses so that passengers can show their appreciation for the service as they exit the vehicle. It could be the friendly driver, the abundance of seats, the speed of the service, the accuracy of arrival/departure times, the friendly passenger who offers up their seat - all these and many other qualitative measures shrunk down into a single quantitative 'like'. The number of 'likes' per service could be publicly displayed to show users which services are most favoured. Or the total number of 'likes' could be captured as a beautiful visual infographic and displayed publicly to show non-public transport users just how enjoyable public transport can be.

Figure 17. Facebook 'Like' Thumbs Up Button, 2013.

HERE'S AN IDEA





DRIVER INTERFACE DISPLAYS # OF USERS REQUIRING CONNECTION

The third concept in the 'Here's An Idea' series was a response to my experiences of connective service through role-playing techniques, and my observations of other people's experiences during the initial phases of research. The problem I had both experienced and observed was the experience of missing a connecting service for several reasons: the driver is unaware there are people requiring a connection, the driver does not see your signal to stop, or you are at the wrong stop for the connecting service. In response to this, the concept generated was a bus booking system that would allow users to scan their Hop card at stops or stations to 'book' their connecting service. Similar to pushing the 'stop' button on-board to alert the driver that you wish to exit, this system would alert the driver that you wish to board the connecting service. Whether or not it would be practical, a system like this would create a sense of reassurance for users making connections, as well as make drivers more aware of users requiring connections.

Two months after the reframing of the project, I met with several industry partners from Auckland Transport to discuss the development of my project. Still without a clear focus or direction, I had hoped the meeting would reveal opportunities where my research could integrate with an existing problem or project that Auckland Transport had already established. Despite discussing several problems that required attention, no decisive conclusion could be made about the alignment of these problems and my research, partly due to a lack of clarity around the project's intent. There was potential for the documentary concept to be developed in line with the work Auckland Transport was doing in promoting the new network but at this stage I was unsure whether that would be the output of this research project.

REFLECTIONS

Following three cycles of action research, I had still not yet managed to define the focus or direction of the project. Through cycles two and three, I had developed a more comprehensive understanding of the new network design, as well as some of the issues for users associated with a connective network. I had developed a hypothesis that was driving the user-centred investigation into the new network but I needed to develop a much deeper understanding of the complexities, both physically and emotionally, for users of a connective service network through further role-play, observations and expert interviews.

FINDING A FOCUS

MAY

EXPERT INTERVIEW

To build on the knowledge I had developed about Auckland's new network through the review of literature and attending seminars/ presentations, I began conducting interviews with experts who played a significant role in the new network design. The process of setting up these interviews was a challenging task given the busy schedules of each of the experts I wanted to interview.

The first interview I managed to secure was with the Network Planning Manager of Auckland Transport. This interview was very time constrained and therefore, I was unable to film it as part of the documentary. The nature of this interview was highly structured to ensure I received as much information about the topics of focus in the given time.

PUBLIC TRANSPORT NETWORK PLANNING MANAGER, AUCKLAND TRANSPORT

Q. Where does connective service currently exist? Where are the main transport hubs where connections occur?

A. Examples of where connective service currently exists are at major interchanges such as the New Lynn Interchange, and the Northern Busway.

Q. How will the new network work in detail? What is the process a user would go through - journey planning, paying, transferring etc?

A. At the moment barriers are that the current timetable is very complicated, too many services at random times. We want to replicate the trains with buses as it's too hard to make sense of bus network at present; we want to make the network more simple so with that we want to make the information a lot simpler too.

When a user gets on the bus, they tag on with their HOP card, travel then tag off and get charged for their fare journey without hidden costs.

Q. How will it be communicated, both the new network and the user process? (HOP system for example has been communicated quite well but many problems exist for actual users due to lack of communication of the service process).

A. For seniors, they feel that they are being alienated because they still need to get a HOP card as well as a Gold card but that hasn't been communicated at their level, which is a problem.

Q. How quickly will the new network be rolled out?

A. We plan to roll out the new network over the next three years, starting in South Auckland towards the end of this year and early 2014.

A world class transport system requires world class communications.

A consistent customer brand is an essential link across all modes.

Figure 18. Auckland Transport Branding Mission, 2013.

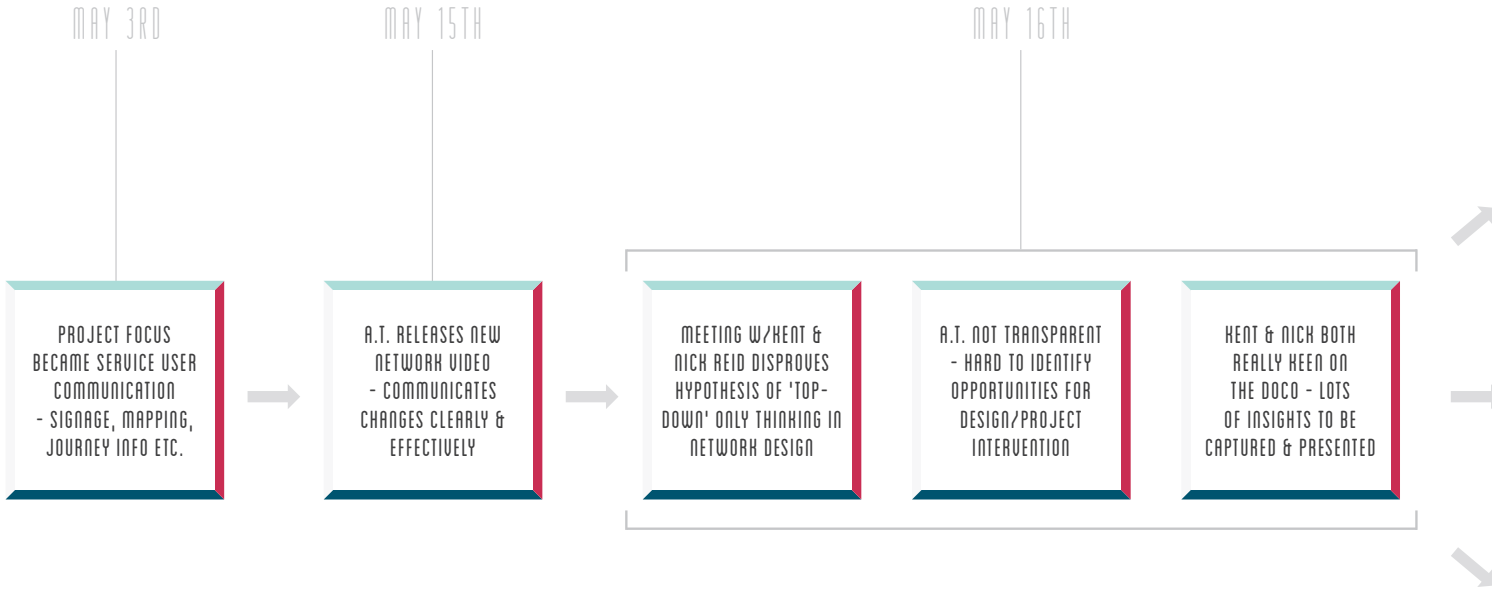
Upon reflection of this initial interview, I felt the amount insights or new information revealed was substantially low. However, the interview was beneficial to the research by confirming what I had already learnt through earlier stages of research. Furthermore, the interview revealed an insight around the complexity of current signage, timetables, and service information.

Shortly after conducting this interview, I came across a new document released by Auckland Transport entitled, 'Graphic Design Studio, Brand Identity & Customer Experience'. The last page [Figure 18] stressed the importance of creating consistency in branding and communications for customers across all transport modes. Although the document mostly referred to branding identity, the overarching notion was of simplicity and transparency across all forms of customer orientated communication. In combination with the insights revealed through expert interview, it was at this point that I narrowed the project to focus on signage and service communication.

SIGNAGE & SERVICE COMMUNICATION

Shortly after determining the focus of the project (signage/communication), Auckland Transport released a public video promoting the new network. The video was a well-constructed form of communication that clearly explained not only the changes being made to Auckland's public transport network but also the reasons the changes were being made. The video combined in-context footage with clear and easily understandable animations showing how the new network would operate. Although it did a great job of communicating the simplicity of the new network, I felt certain aspects were somewhat oversimplified. In order for the notion of 'turn up and go' to work in practice, I felt Auckland Transport would first have to better understand the needs of its customers through user empathy.

Figure 19. Auckland's New Public Transport Network, 2013.


MAY 3RD
MAY 15TH
MAY 16TH
PROJECT FOCUS BECAME SERVICE USER COMMUNICATION - SIGNAGE, MAPPING, JOURNEY INFO ETC.
A.T. RELEASES NEW NETWORK VIDEO - COMMUNICATES CHANGES CLEARLY & EFFECTIVELY
MEETING W/KENT & NICK REID DISPROVES HYPOTHESIS OF 'TOP-DOWN' ONLY THINKING IN NETWORK DESIGN
A.T. NOT TRANSPARENT - HARD TO IDENTIFY OPPORTUNITIES FOR DESIGN/PROJECT INTERVENTION
KENT & NICK BOTH REALLY KEEN ON THE DOCO - LOTS OF INSIGHTS TO BE CAPTURED & PRESENTED

AWAITING RESPONSE FROM CUSTOMER EXPERIENCE TEAM - NEED TO GET IN WITH THEM!

CONTINUE PROJECT DIRECTION 1

?

DOCO PRESENTING ITSELF AS STRONGEST IDEA - WANTING TO KEEP SEPARATE FROM DESIGN PROJECT

PERSONAL CONFLICT AROUND WHETHER PROJECT SHOULD BE DOCO OR SEPARATE DESIGN INTERVENTION

DOCO COULD REPRESENT 2 DIFFERENT AGENDAS:

A.T.

ME

KENT & NICK LIKING THE 'HERE'S AN IDEA' IDEAS & INTERVENTIONS - SIMILAR IDEAS FROM TRANSPORT BLOGGERS

PROJECT DIRECTION 2

PROJECT COULD BECOME DOCO ABOUT PERSONAL JOURNEY TRYING TO ESTABLISH WORKING RELATIONSHIP WITH A.T.

- ROLE OF STUDENT DESIGNERS IN 'BIG PICTURE' PROBLEMS

- CREATING SERIES OF SMALL INTERVENTIONS TO TEST AND EVALUATE OPPORTUNITIES FOR INNOVATION WITHIN TRANSPORT SECTOR.

AKL PUBLIC TRANSPORT • INNOVATION • HUB

USABILITY VS. EMPATHY

MAY

USABILITY VS. EMPATHY

Midway through the project, a series of events unfolded during the fourth action research cycle (documented in the above map), which created a great deal of personal uncertainty in the direction and purpose of the project.

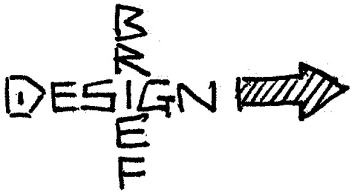
Shortly after the initial expert interview, and the release of the new network video by Auckland Transport, I met with two industry experts from MRCagney - the transport and planning consultancy instrumental in the design of Auckland's new public transport network. The purpose of this meeting was to identify opportunities where my project could add to the work currently being done around the new network. During the course of this meeting, I described the nature of the project and the hypothesis that I had developed. In response, the experts detailed the amount of user consideration that occurred during the process of the network redesign, and the lengths taken to ensure changes at a high level would work for users on the ground.

It was at this point of the project that I began to feel my initial hypothesis could in fact have been wrong, and that the design of the new network had been considered at both a high level and from the perspective of users. However, as I reflected further on this meeting, I began to realise the disconnect or miscommunication between usability and user empathy. The hypothesis and research question I had developed were underpinned by a notion of understanding the deeply held, unmet needs of users, beyond simple or typical usability considerations.

To help differentiate between usability considerations and user empathy, my studio peers and I began mapping out emotional anxieties, concerns and frustrations in relation to public transport. The responses produced related to different aspects of using public transport including understanding the service, the paying experience, the waiting experience and the riding experience. Each of the participants involved had experienced public transport either on a daily basis or a semi-regular basis and collectively, the experiences covered a range of locations and transport modes.

THE 7 PHASES OF A TRIP

Following this exercise, we translated and categorized each of the produced responses into specific emotion types such as confusion and uncertainty. Using Jarrett Walker's 'Seven Phases of a Trip' as a framework, we then listed each emotion type under the relevant phases. The outcome of this collaborative exercise was a clearer, more holistic understanding of the emotional complexities users experience at different stages throughout the service. It also revealed where the best opportunities for design intervention to address these emotional complexities existed.



Having developed a deeper understanding of both the physical and emotional complexities that users face throughout various stages of the public transport experience, I collated all the research findings and insights I had gathered up to this point of the project. From here, I began developing the project's first design brief. A notion I had developed along the course of the research was the idea of creating full service transparency at the first point of interaction. Under this notion, all aspects of the service (and journey) would be presented to the user at the first touchpoint, allowing them to understand the entire service before committing to the journey.

- SERVICE COMMUNICATION AT MAJOR INTERCHANGES
- CLEAR, SIMPLE VISUAL COMMUNICATION OF:
  - BUS SERVICES
  - SERVICE FREQUENCY
  - SERVICE SPAN
  - CONNECTION / INTERCHANGE POINTS
  - SERVICE LINES AND MAP
  - SERVICE FARES & PRICING

  FULL TRANSPARENCY AT 1ST POINT OF INTERACTION
- OFF-BOARD PAYMENTS
- GRAPHIC / INTERACTIVE / PRODUCT DESIGN
- TRAVEL ITINERARY (PRINTED OR MOBILE)
- TESTABLE AT NORTHERN BUSWAY AND/OR BOTANY
- IMPLEMENTABLE

REFOCUSING

JUNE

EXPERT INTERVIEW

CUSTOMER EXPERIENCE DEVELOPMENT CONSULTANT, AUCKLAND TRANSPORT

Q. How do you differentiate usability or utilitarian needs from emotional or empathic needs?

A. That's something we're getting into with the Customer Experience Development project - looking at the whole end-to-end experience that a customer has (bus, ferry, train). We're trying to understand the various types of users, from daily commuters to weekend users etc. as well as understand the tangible and intangible aspects of the entire experience.

Q. What sort of processes will that exercise involve?

A. We're going to be engaging an outside organisation to help us develop that, which will be a very collaborative process. We have a whole lot of desires and expectations, historical and inherited, and we're almost at the exploratory phase now so need to discover for ourselves what it is that defines us in terms of customer experience.

Q. How important is the overall customer experience in the success of the new network?

A. That's crucial and that's what's pushing us to do this now. We have new bus and rail services coming out, we're completely ripping apart the network infrastructure and building a whole lot of new things, which is what's driving us to say 'we don't really have a good understanding of customer experience and we need to do it now' rather than implement these services and then go back and look at it.

We know there's a lot of latent expectation we have to meet, and what's really driving us is that for the first time, all these services will be interconnected and not just the physical, but the integrated ticketing and integrated fares - we really have to be doing this right now before any of these services get to full launch.

Q. In what way, if at all, were customer experiences "designed" as part of the new network?

A. This is what we're planning to do. The outcome of this exercise over the next five months is a series of service blueprints that we can take and say 'this is what we'll use as the basis for developing a service for buses as the new network rolls out in South Auckland at the end of 2014, and then again in central Auckland, the North Shore and out West.'

We'll have a series of customer service blueprints that we'll adhere to, which covers everything from the user level down to how the operators perform their service.

From a customer perspective, they don't care who's doing it, so long as their expectations from beginning to journey end are met.

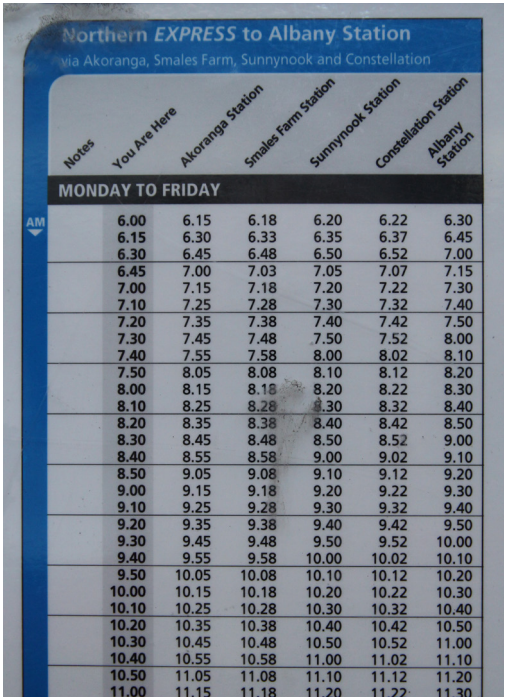
Service blueprints are going to help us align, coordinate and give consistency to the services that we within Auckland Transport are responsible for delivering, and the others that are delivered from our outsourced partners.

EXISTING SIGNAGE STUDY

I conducted a photographic study of the existing public transport signage landscape to gauge a better understanding of the current state of signage. I surveyed the Auckland CBD area along Queen St, Britomart vicinity and several Northern Busway interchange stations. The study revealed just how complex the signage, timetable and service information currently is - the result of a direct service, peak-only prioritised network.

In most cases at least half the space on information boards is dedicated to timetable information, with the remainder space being occupied by stop-specific maps overlaid with complicated stop numbering conventions. As pictured right, there is a form of connection information from stations along the Northern Busway, however it gives no detail as to how to make these connections or by which services.

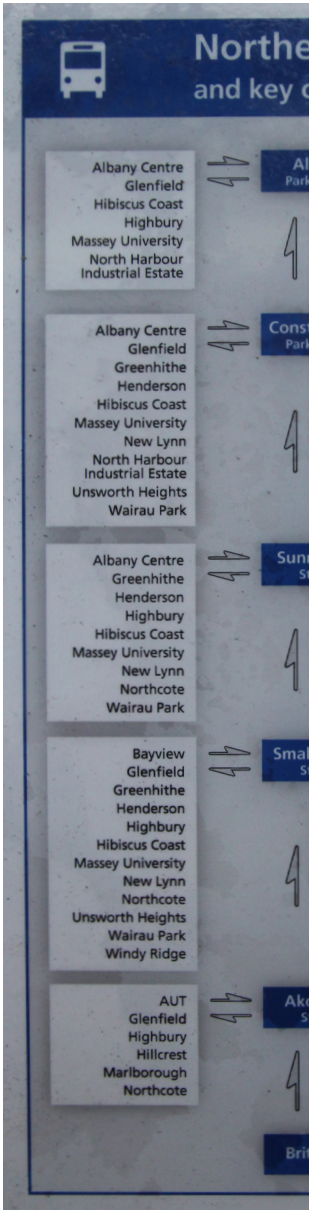
Pictured far right, the newly installed HOP ticketing machines are bulky, oversized systems clad with a plethora of information, situated around the peripheral of a considerably small, interactive screen.

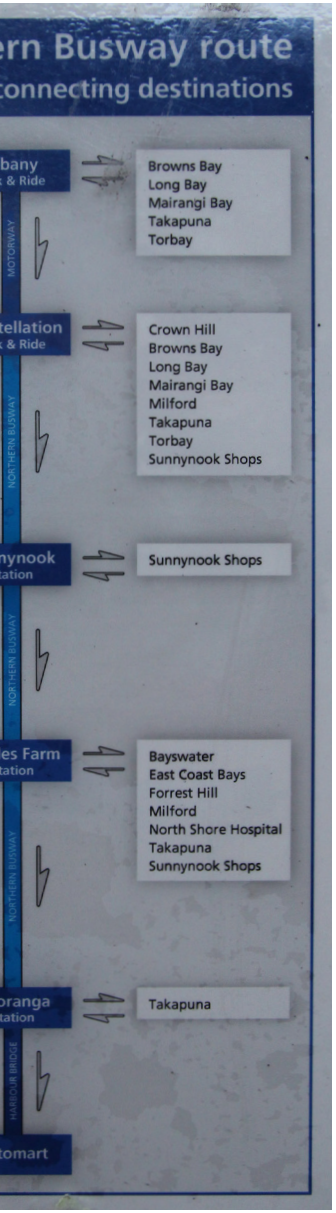


Northern *EXPRESS* to Albany Station

via Akoranga, Smales Farm, Sunnynook and Constellation

Notes	You Are Here	Akoranga Station	Smales Farm Station	Sunnynook Station	Constellation Station	Albany Station
MONDAY TO FRIDAY						
AM	6.00	6.15	6.18	6.20	6.22	6.30
	6.15	6.30	6.33	6.35	6.37	6.45
	6.30	6.45	6.48	6.50	6.52	7.00
	6.45	7.00	7.03	7.05	7.07	7.15
	7.00	7.15	7.18	7.20	7.22	7.30
	7.10	7.25	7.28	7.30	7.32	7.40
	7.20	7.35	7.38	7.40	7.42	7.50
	7.30	7.45	7.48	7.50	7.52	8.00
	7.40	7.55	7.58	8.00	8.02	8.10
	7.50	8.05	8.08	8.10	8.12	8.20
	8.00	8.15	8.18	8.20	8.22	8.30
	8.10	8.25	8.28	8.30	8.32	8.40
	8.20	8.35	8.38	8.40	8.42	8.50
	8.30	8.45	8.48	8.50	8.52	9.00
	8.40	8.55	8.58	9.00	9.02	9.10
	8.50	9.05	9.08	9.10	9.12	9.20
	9.00	9.15	9.18	9.20	9.22	9.30
	9.10	9.25	9.28	9.30	9.32	9.40
	9.20	9.35	9.38	9.40	9.42	9.50
	9.30	9.45	9.48	9.50	9.52	10.00
	9.40	9.55	9.58	10.00	10.02	10.10
	9.50	10.05	10.08	10.10	10.12	10.20
	10.00	10.15	10.18	10.20	10.22	10.30
	10.10	10.25	10.28	10.30	10.32	10.40
	10.20	10.35	10.38	10.40	10.42	10.50
	10.30	10.45	10.48	10.50	10.52	11.00
	10.40	10.55	10.58	11.00	11.02	11.10
	10.50	11.05	11.08	11.10	11.12	11.20
	11.00	11.15	11.18	11.20	11.22	11.30




ern Busway route
connecting destinations
bany
& Ride
Browns Bay
Long Bay
Mairangi Bay
Takapuna
Torbay
tellation
& Ride
Crown Hill
Browns Bay
Long Bay
Mairangi Bay
Milford
Takapuna
Torbay
Sunnynook Shops
nynook
tation
Sunnynook Shops
es Farm
tation
Bayswater
East Coast Bays
Forrest Hill
Milford
North Shore Hospital
Takapuna
Sunnynook Shops
oranga
tation
Takapuna
tomart


Stop
7045
Northern Express


BUS STOP 7055
Civic Theatre - C2
Maxx
Route
Destination
Sched
Due
X = Express
C = Cancelled
* = Arrival due/departing


WWW.LGOABOVE.CO
Your bus stop number
7051


Constellation
Top up & Monthly Passes
AT HOP Card
Notes
Cards
Coins
Receipt
Need Help?
Collect Change
Top up & Monthly Passes
Eftpos and
Credit Cards only
AT HOP Card
Receipt
Need Help?
If this machine is not working:
Top up or load your Monthly Pass at another
Top-Up machine where available.

A signage system that I found to be an example of signage done well was for the Airbus Express service. The first thing that was apparent was the clarity and simplicity in how the information was displayed. Rather than using complex timetables that are difficult to read, the Airbus Express signage simply states the frequency of service as 'EVERY 10 MINUTES' on weekdays and 'EVERY 15 MINUTES' on weekends. The standard cost of a one-way journey is clearly displayed and directions to the departure terminal are clear and consistently presented.

Perhaps the most beneficial or useful aspect of this signage is its continuation onto the buses themselves. At a glance, a user can identify the Airbus express service, understand its frequency, as well as the fare value.

Britomart Transport Centre had an interesting mix of signage for both buses and trains. Of the two, the information displayed for train services was a lot clearer and simpler, likely due to the few number of train services operating. The departure boards were much clearer and understandable than typical bus service real-time departure boards.

Located towards the front entrance of the station was the city centre departure points board. Given the sheer amount of information presented, the readability and usability of this information board was substantially poor.

Sitting alongside this was some sort of interactive information kiosk. However, as pictured above, the area for the screen was covered by a black MDF sheet with 'Upgrading service watch this space' spray painted onto it. This was probably the worst example of a signage or information system, as it was entirely redundant.

A second timelapse sequence was created to observe and reveal the patterns of pedestrian, bus and vehicle traffic flow around the Britomart Transport Centre during the evening peak. Much like the first timelapse sequence, what's interesting is the sheer number of cars travelling through the intersection compared to the number of buses. Also worth noting is the number of pedestrians travelling to and from the ferry terminal located directly behind this location. According to Auckland Transport (2013), patronage for ferry services in the month of March this year was 555, 143.

CONNECTIVE EXPERIENCES

By this point in the research I had a much clearer and deeper understanding of the issues associated with Auckland's current network, particularly those related to bus services. I had conducted several role-playing exercises in an attempt to better understand the complexities a connective network poses for its users. However, up to this point, these exercises had only been between different bus services, which were not yet operating as a connective network. To further my current understanding, I needed to conduct connective role-playing exercises between different public transport modes. Over a two-day period, I made several journeys connecting between bus, train and ferry services.

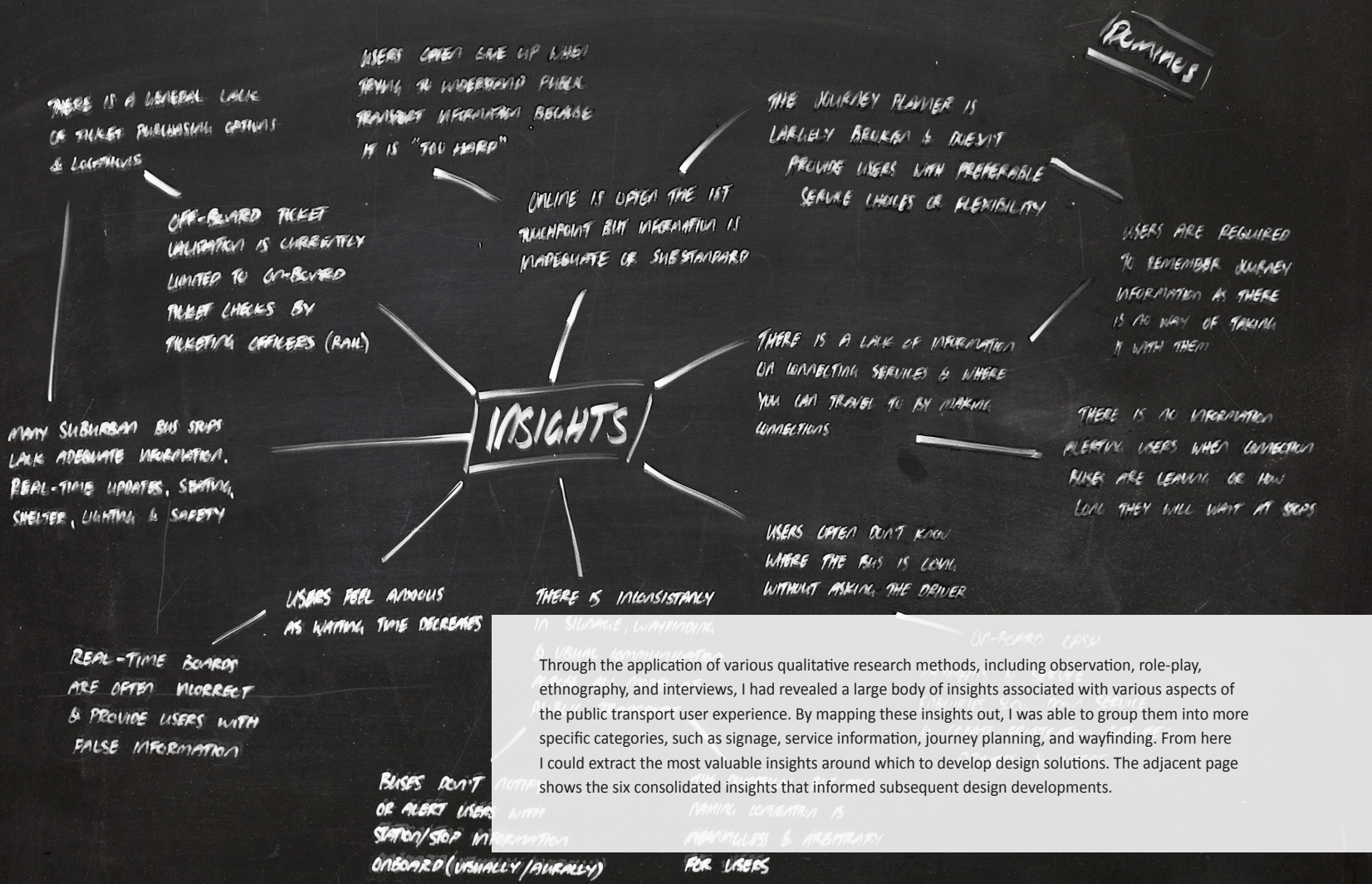
The first journey was from home to Henderson, taking both bus and train services. Before leaving home, I used the Auckland Transport online journey planner as well as Google Maps to work out the process of making the journey, both of which presented me with varying results. Instead of relying on these results, I decided to begin the journey with my regular trip along the Northern Busway to Britomart, where I could then find further information about the rest of the journey.

Once at Britomart, the departure board displayed a Western Line train heading to Henderson and due in 20 minutes. In this time I decided that I would purchase a HOP card, as the system had been rolled out on trains and ferries. The process of purchasing the card was rather convoluted, as it required visiting three different service desks to purchase, register and validate the card for tertiary discount. The entire process took just under 20 minutes, leaving me only a few minutes to board my connecting train. After reaching the platform, I 'tagged on' at the gates with my HOP card and boarded the train.

The overall journey experience was rather pleasant, and much smoother than bus travel. Although I was unfamiliar with this part of Auckland, I was constantly aware of my approximate location via the on-board announcements. In addition to this, the route line map was printed alongside the interior of the carriage, so I could easily keep track of upcoming stations. These two features created a sense of confidence and reassurance in knowing where and when to exit/transfer. Once the train arrived at Henderson Station, I exited the carriage and 'tagged off' with my HOP and was charged my total fare.

The following day I made a similar journey, except this time I made a connection at the ferry terminal to head to Devonport. Because I had already gone through the process of purchasing a HOP card, I could simply 'tag on' at the terminal gates and board the vessel. The riding experience on-board the ferry was the most unique of all three modes; the interior of the vessel was far more spacious (even at peak), with large seats and tables at which you could work, eat or converse, creating a much more socially engaging experience.

After departing the vessel, I was unable to find the location of the tag post to 'tag off'. After minutes of searching, I found a single tag post located significantly far from the ferry, inside the terminal building. There were no signs or signals to direct passengers towards the tag post, and the fact that there was only one meant you had to wait in line simply to be charged your total fare.



Through the application of various qualitative research methods, including observation, role-play, ethnography, and interviews, I had revealed a large body of insights associated with various aspects of the public transport user experience. By mapping these insights out, I was able to group them into more specific categories, such as signage, service information, journey planning, and wayfinding. From here I could extract the most valuable insights around which to develop design solutions. The adjacent page shows the six consolidated insights that informed subsequent design developments.

THERE IS A LACK OF INFORMATION ON CONNECTING SERVICES AND WHERE YOU CAN TRAVEL TO BY MAKING CONNECTIONS

THERE IS INCONSISTANCY IN SIGNAGE, WAYFINDING AND VISUAL COMMUNICATION ACROSS ALL MODES OF PUBLIC TRANSPORT

USERS OFTEN DON'T KNOW WHERE THE BUS IS GOING WITHOUT ASKING THE DRIVER

THERE IS NO INFORMATION ALERTING USERS WHEN CONNECTION BUSES ARE LEAVING OR HOW LONG THEY WILL WAIT FOR AT STOPS/STATIONS

BUSES DON'T NOTIFY OR ALERT USERS WITH STATION/STOP INFORMATION ONBOARD (VISUALLY/AURALLY)

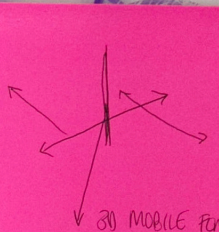
MANY SUBURBAN BUS STOPS LACK ADEQUATE INFORMATION, REAL-TIME UPDATES, SEATING, SHELTER, LIGHTING AND SAFETY

After gathering a range of actionable insights, a group ideation session was conducted with studio peers. Using brainstorming techniques, the purpose was to generate quick ideas and concepts in response to insights, categorized into three sections: Wayfinding, Signage, and Pre-paid.

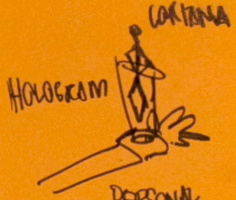
SIGNAGE

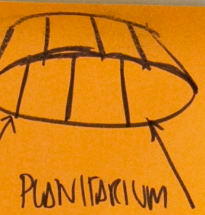
- route
- time till bus
- when is the next one

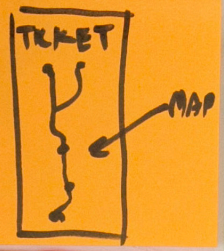
led trail



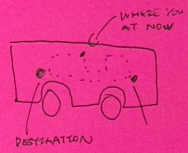
WAYFINDING

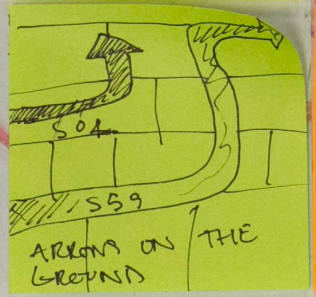


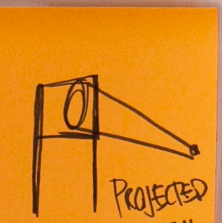


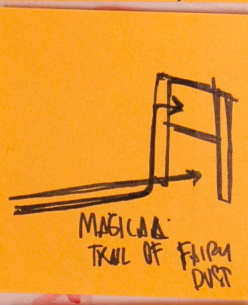


Route information on side of bus.
- where its going
- times?
Large font

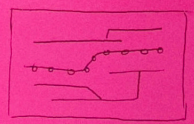




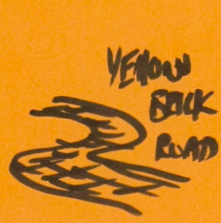


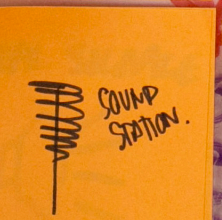


HUD style displays on windows... would look cool

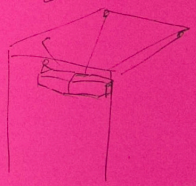


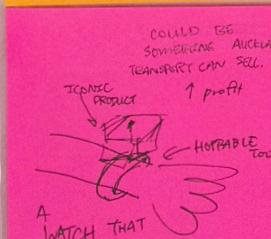
Hot spot boards. where to go and why. "Whats on"

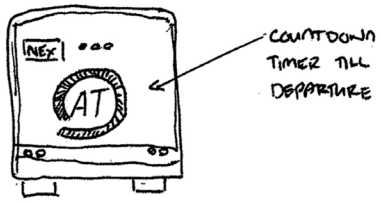


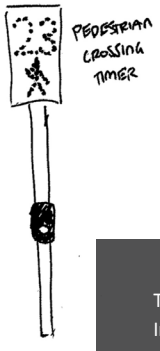


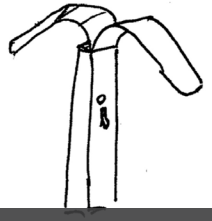
Push data to cell/smart phones

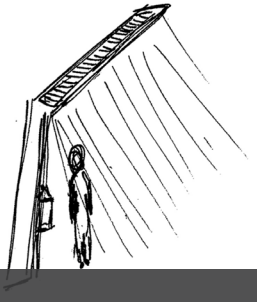


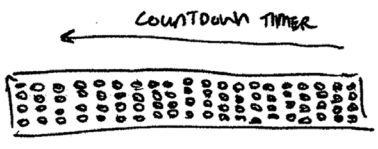




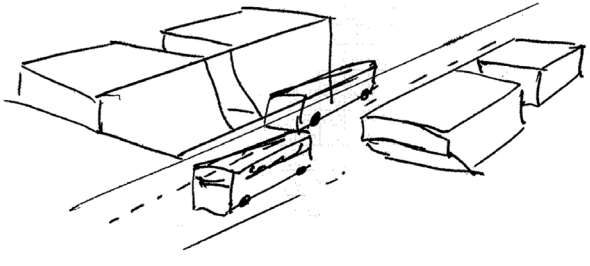


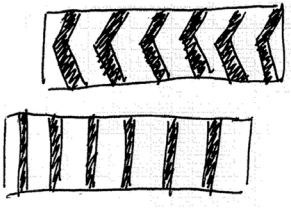


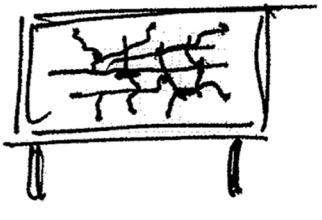


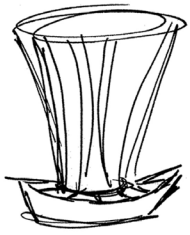


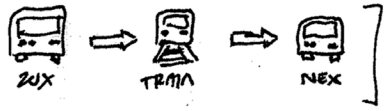
The ideas generated were then further explored through sketches and quick illustrations. In response to these ideas, additional ideas and concepts were generated throughout the process, which was highly iterative. Through these illustrations, I explored how signage and wayfinding systems could perform multiple functions such as display service information, or act as seating, shelter and lighting. I also expanded on the kiosk, ticketing, and bus booking system concepts I had explored during earlier stages of the research.

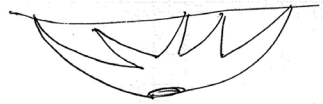


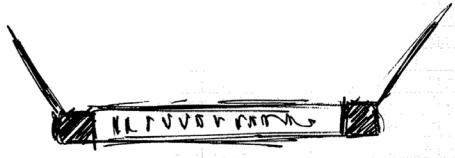


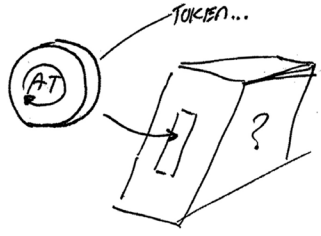


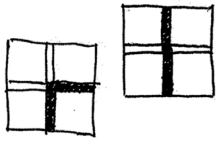


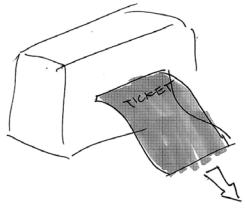


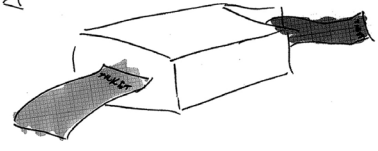




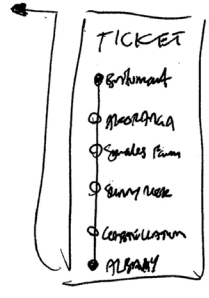


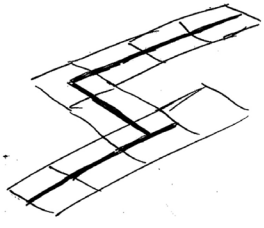


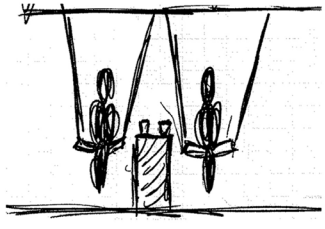


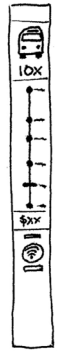


-TICKET-

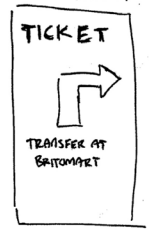


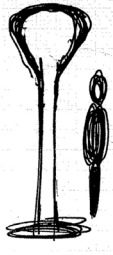


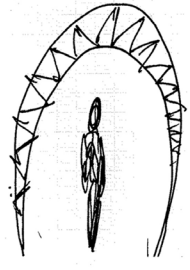




E-INK PAPER DISPLAY

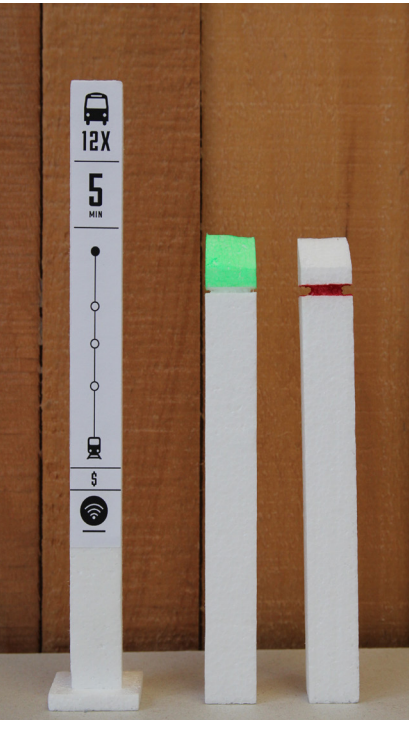


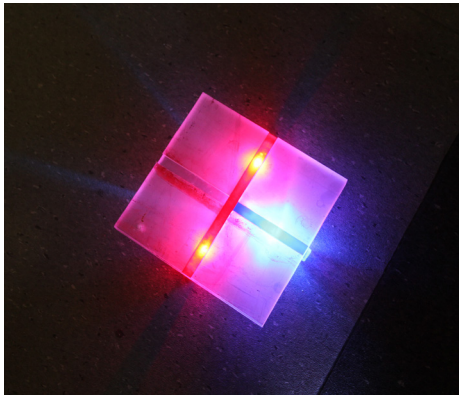


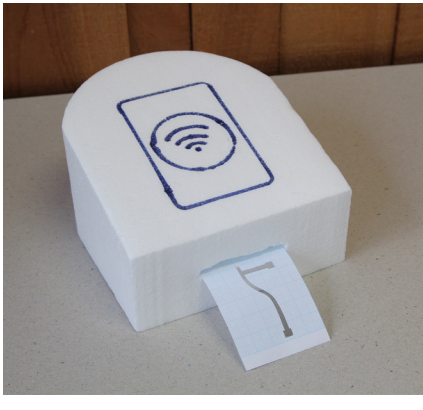


PROTOTYPING

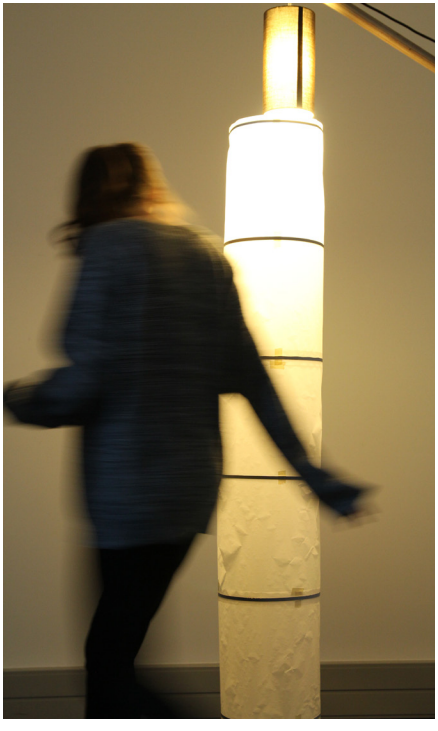
JULY





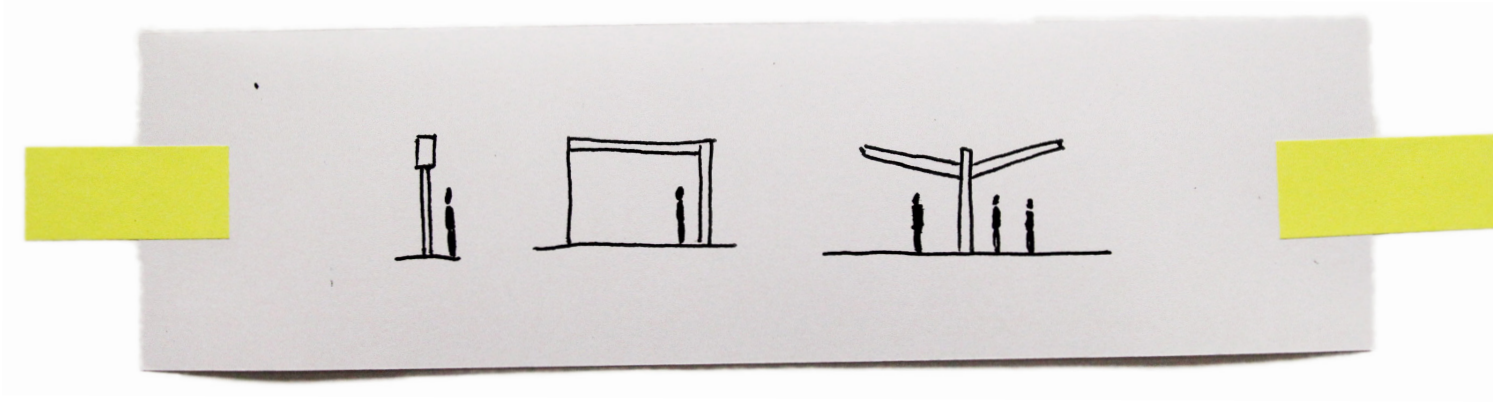


From here I began making models and small scale prototypes to explore how these ideas might look and function physically, as well as how users might interact with them. Pictured above are prototypes exploring signage, wayfinding and ticketing concepts.


Expanding on the ideas and concepts I had been exploring through small-scale prototypes, I began developing concepts at full scale to better understand the ways in which users could interact or engage with them. Most of these concepts centralised around some form of kiosk or information stand, but I was also exploring how they could perform multiple functions, such as provide lighting for safety at night, or create a more engaging and enjoyable waiting experience.

HOLISTIC SOLUTIONS



FIRST TIME USER — REGULAR USER

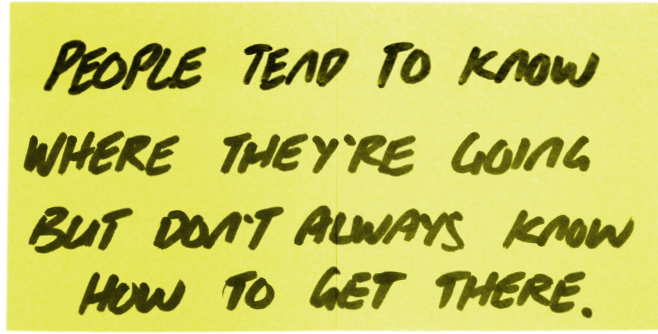
The insights I had generated were the result of observations and experiences documented from a broad range of environments and situations. I had identified the issues and complexities faced by users throughout various stages of the public transport experience, and at various touchpoints within this experience. In response, I wanted to design a solution to these complexities that was holistic and transferable across different stop/station types, and catered to users with varying experience using public transport, from first time users to regular users. By aiming to create a holistic and transferable solution, the overall experience of using public transport would be more consistent and coherent for all users.

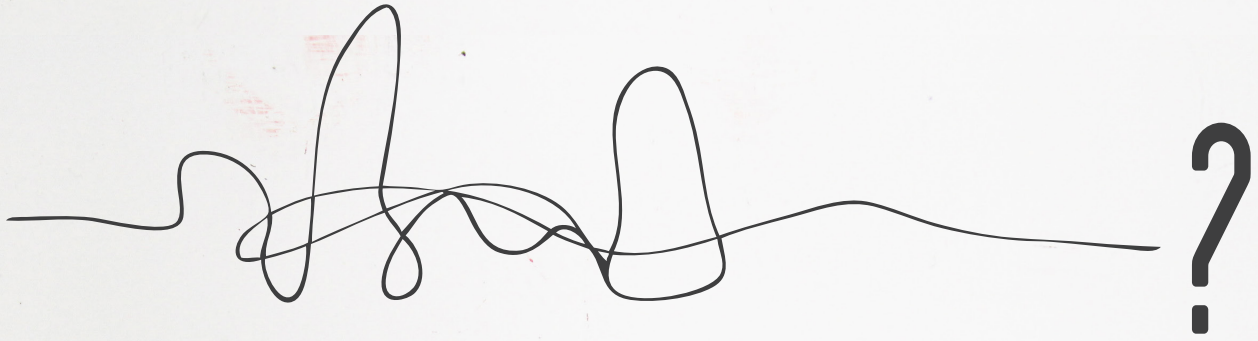
REFLECTIONS

Although I had generated a significant number of insights through the initial phases of research, I struggled to translate these insights into meaningful design solutions. My exploration of various ideas through ideation, sketching, model making and prototyping had failed to produce an outcome that responded to the physical and emotional complexities faced by users of a connective network in a meaningful and engaging way. After seven action research cycles, the focus of the project was still relatively ill-defined and it was unclear as to what the final design outcome would be. It was during this phase of uncertainty that I revealed a very simple but powerful insight.

Whilst waiting for my bus one late morning at a Northern Busway station, I observed a couple who appeared rather perplexed by the abundance of information around them. I watched as they travelled back and forth between all the various sources of information, none of which could seem to provide them with the information they needed to know to get to where they were going. It was during this observation that I was struck with the insight: people tend to know where they're going, but they don't always know how to get there. This couple clearly had a destination they needed to get to but the complexity of the information was such that it simply could not deciphered.

It was at this point in the project that I knew my design outcome had to be a solution to this problem; a type of journey planning or wayfinding system that would provide users with exactly the information they needed, when and where they needed it, to get to where they know they're going.





PEOPLE TEND TO KNOW
WHERE THEY'RE GOING
BUT DON'T ALWAYS KNOW
HOW TO GET THERE.

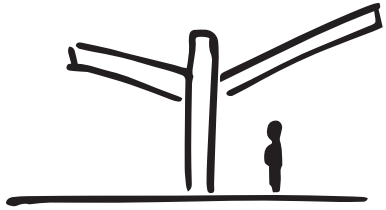
DESIGNING A SYSTEM

JULY / AUGUST

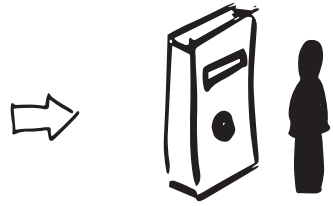
After having identified the key insight that gave the project new momentum, I wanted to create a short film that captured the complexity of navigating the highly complex informational landscape of Auckland's public transport network.

The short film '*Struggle*' depicts a young woman's journey from an Auckland suburb into the CBD and beyond via public transport. Although it evokes concerns of safety and security, '*Struggle*' aims to capture the emotional anxieties associated with making an unfamiliar journey using public transport. Timelapse sequences of dense motorway traffic weave throughout the film, presenting dark themes around Auckland's dependence on the automobile.

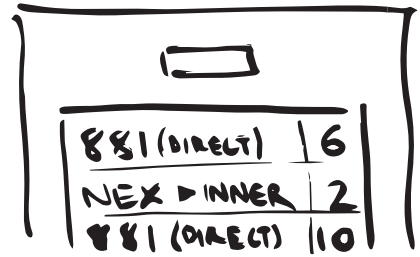
SYSTEM CONCEPT DESIGN



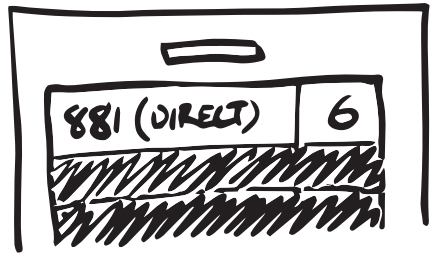
USER ARRIVES AT STATION/INTERCHANGE



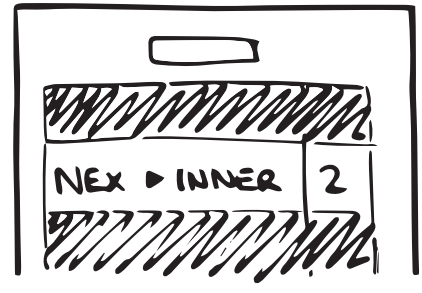
USER APPROACHES KIOSK AND INPUTS DESIRED DESTINATION



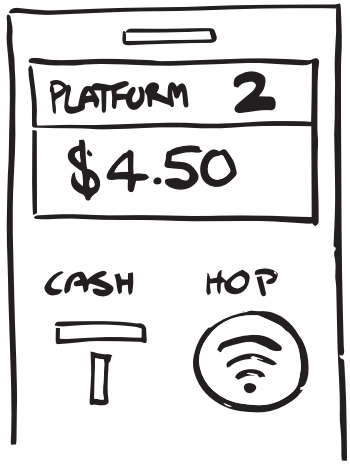
KIOSK DISPLAYS TRANSIT OPTIONS AND FREQUENCIES TO USER, SHOWING BOTH DIRECT AND CONNECTIVE SERVICES.



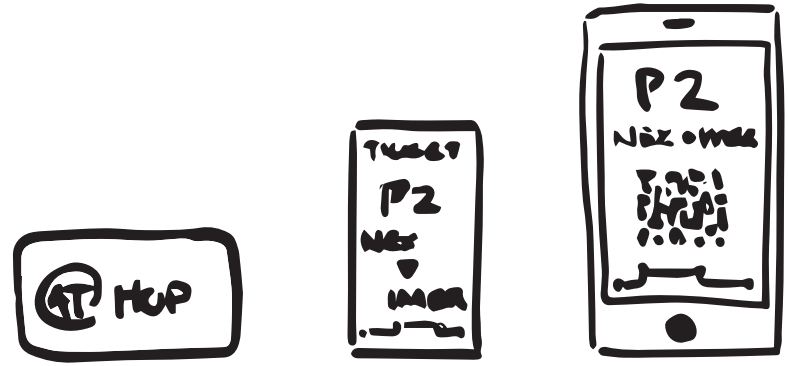
USER SELECTS DIRECT SERVICE, DUE IN 6 MINUTES, OVER CONNECTIVE SERVICE TO REDUCE COMPLEXITY.



USER IS CONSCIOUS OF TIME SO SELECTS THE CONNECTIVE SERVICE, DUE IN 2 MINUTES.

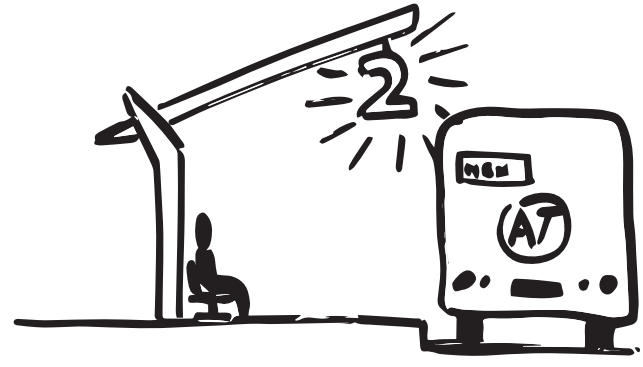


KIOSK DISPLAYS JOURNEY INFO, BOARDING PLATFORM AND COST, ALLOWING THE USER TO PAY BEFORE BOARDING.



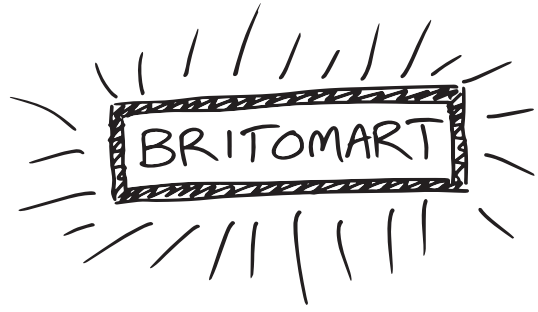
THE USER CAN LOAD THEIR JOURNEY INFO ONTO THEIR HOP CARD, SMARTPHONE, OR CHOOSE TO PRINT AN RFID PAPER TICKET WITH INFORMATION STORED TO IT. THIS WAY THE USER CAN TAKE THE INFORMATION WITH THEM ALONG THE JOURNEY.

THE USER WAITS AT PLATFORM 2. THE PLATFORM SIGN LIGHTS UP TO ALERT THE BUS DRIVER THAT SOMEONE IS WAITING.



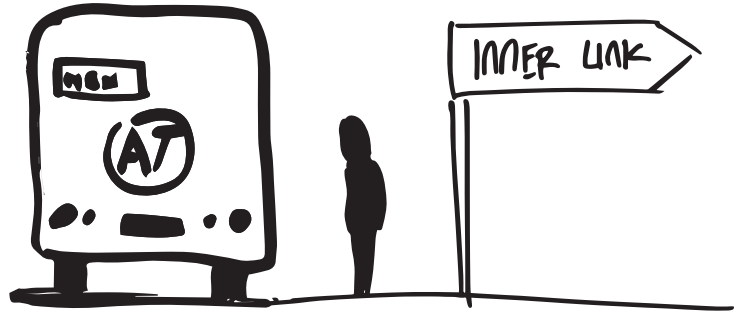
THE PLATFORM SIGN BEGINS FLASHING, ALERTING THE USER THAT THEIR BUS IS ARRIVING/HAS ARRIVED.

THE USER BOARDS THE BUS AND TAGS ON WITH THEIR HOP CARD, SMARTPHONE OR RFID PAPER TICKET. THE USER FINDS A SEAT AND THE BUS DEPARTS.



THE BUS ALERTS THE USER OF THE STOP AND TRANSFER INFORMATION, VISUALLY AND AURALLY.

THE USER TAGS THEIR HOP CARD, SMARTPHONE OR RFID PAPER TICKET SO INITIATE THEIR TRANSFER.

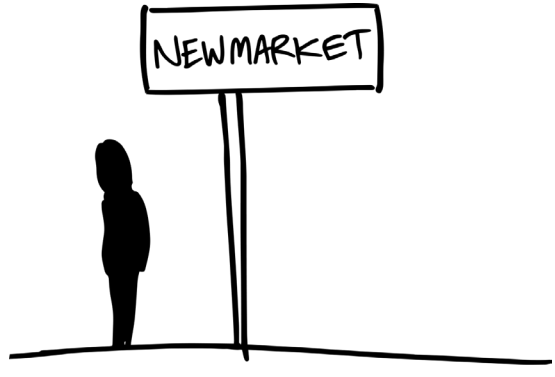


THE USER EXITS THE BUS AND IS DIRECTED TO THE BOARDING TERMINAL/PLATFORM OF THEIR CONNECTING SERVICE.

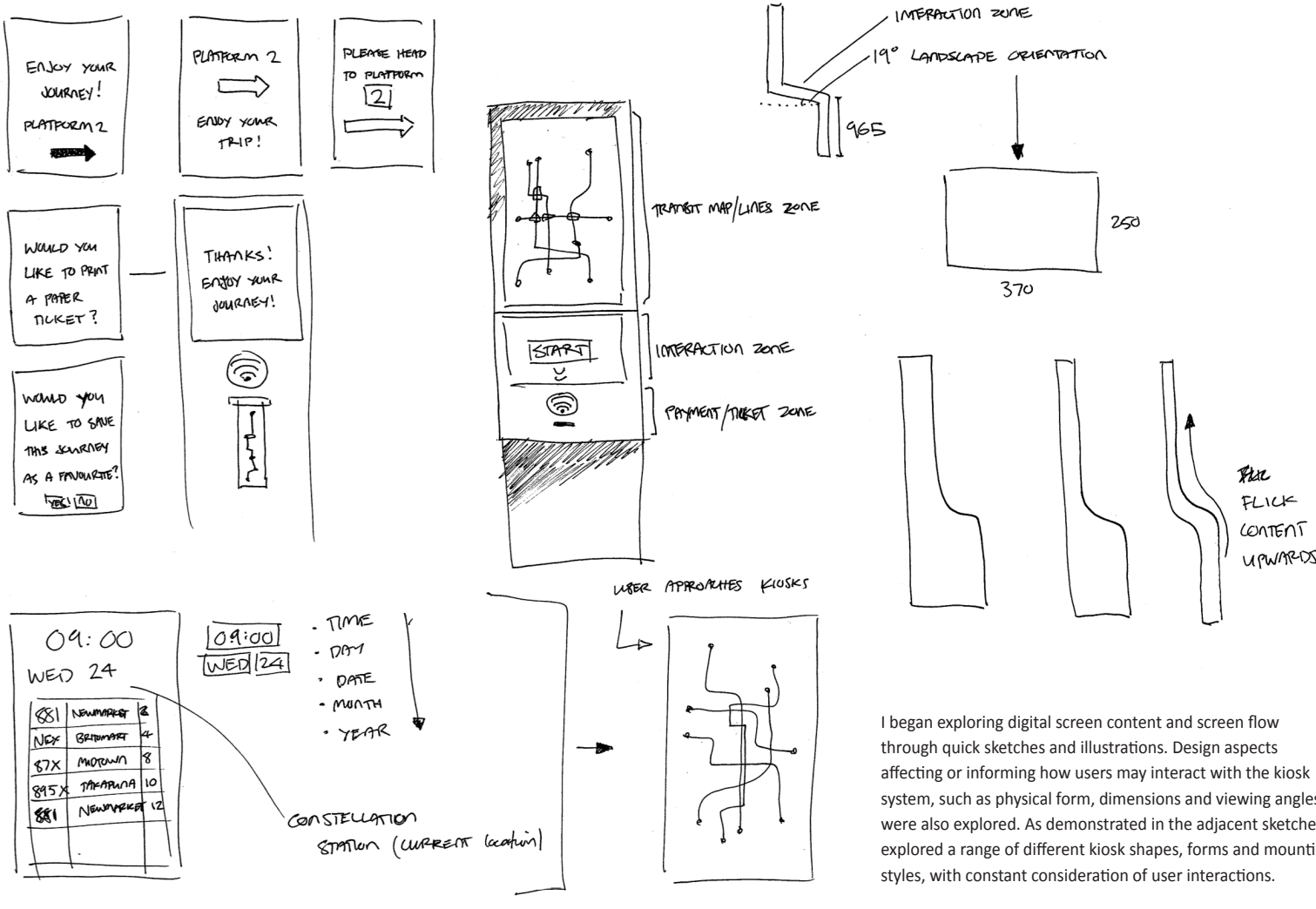
WHILE WAITING BETWEEN TRANSFERS, THE USER GRABS A COFFEE. WHEN THE CONNECTING SERVICE ARRIVES, THE USER TAGS ON AND FINDS A SEAT.

THE BUS ALERTS THE USER OF THEIR STOP, VISUALLY AND AURALLY. IN ADDITION TO THIS, THE USER IS ALERTED OF THEIR STOP VIA THEIR SMARTPHONE.

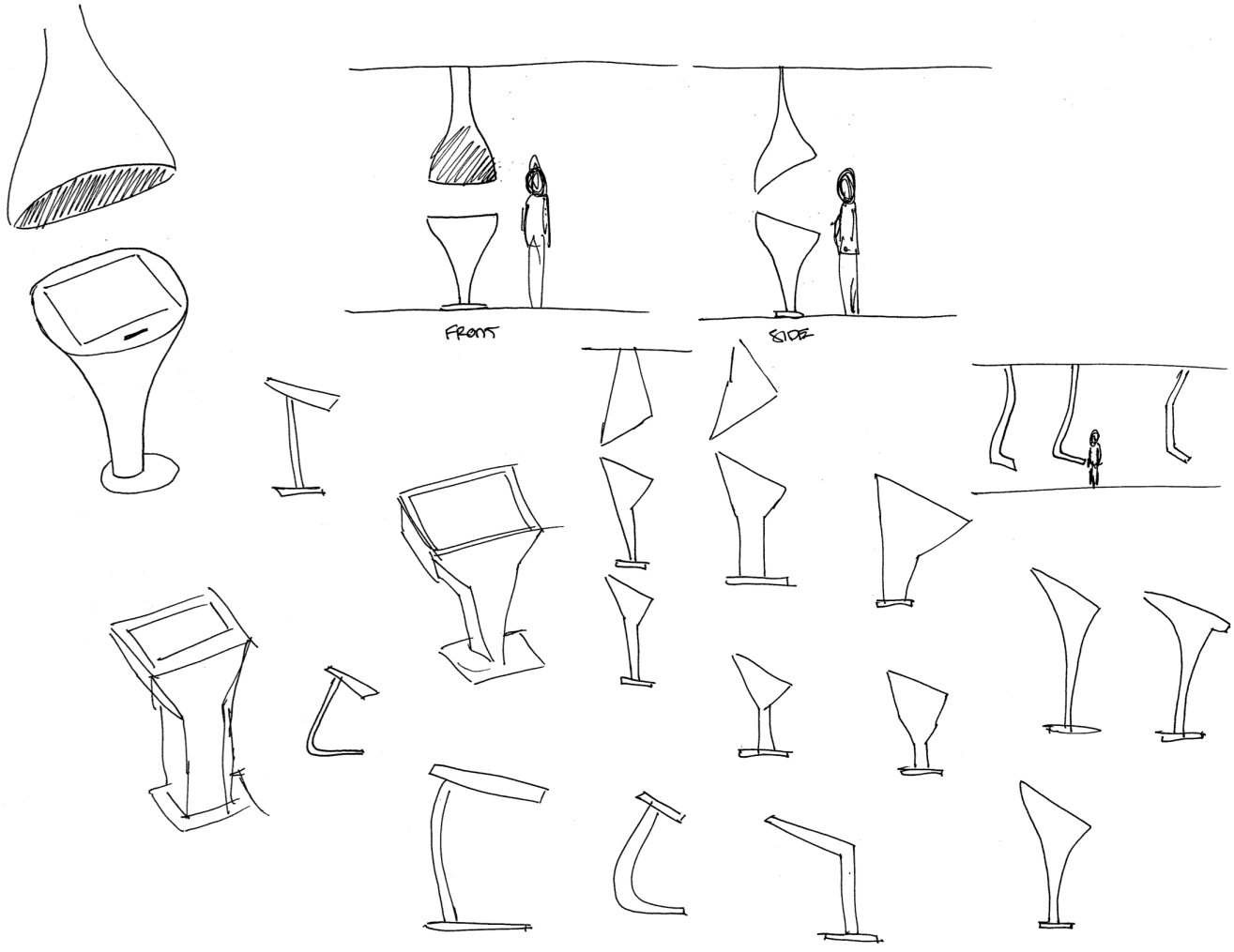
THE USER TAGS OFF WITH THEIR HOP CARD, SMARTPHONE OR RFID PAPER TICKET AND IS CHARGED THEIR TOTAL FARE.

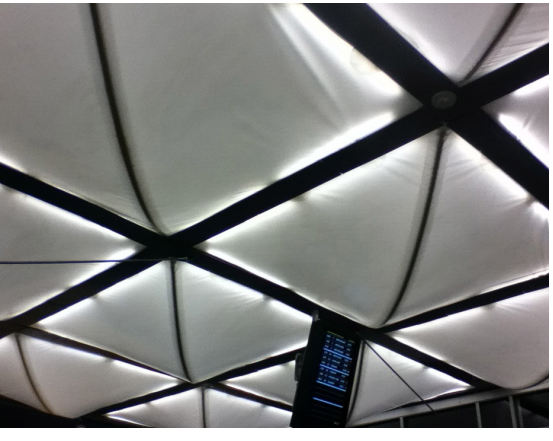


THE USER EXITS THE BUS AND HAS SUCCESSFULLY ARRIVED AT THEIR FINAL DESTINATION.



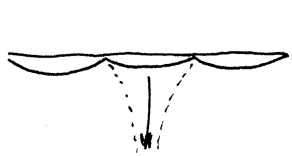
I began exploring digital screen content and screen flow through quick sketches and illustrations. Design aspects affecting or informing how users may interact with the kiosk system, such as physical form, dimensions and viewing angles, were also explored. As demonstrated in the adjacent sketches, I explored a range of different kiosk shapes, forms and mounting styles, with constant consideration of user interactions.

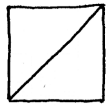

FRONT
SIDE



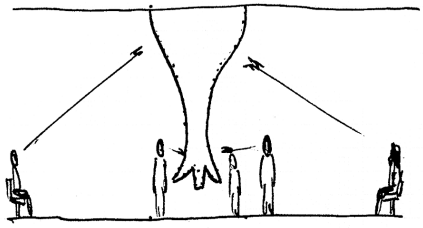
Inspired by the tensile structures featured in the ceilings of Northern Busway interchange stations, I explored the concept of extending the central structure down to ground level, creating an elongated canvas on which to display information and house the kiosks. The extended cylindrical form of the canvas would enable information to be viewed from almost any angle within the interchange station, replacing the need for real time boards in their current positions. Furthermore, the increasing size of the structure as it reaches the ceiling creates a natural visual division between areas of publicly displayed information (such as real-time departures) and user specific information displayed on interactive kiosks housed in the lower half of the structure. The exploration of these ideas can be seen in the adjacent sketches and illustrations.

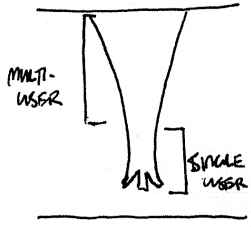
DIRECTIONAL SIGNAGE





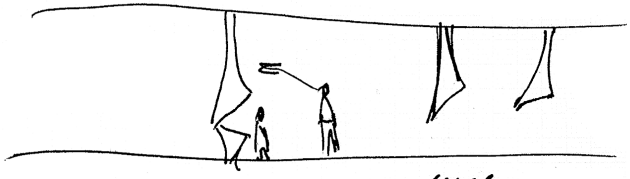
~2m²





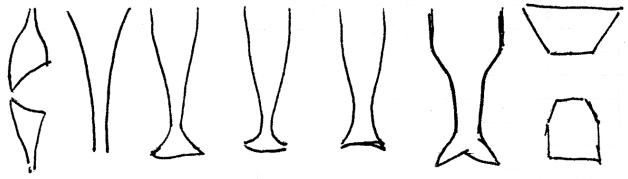
MULTI-USER

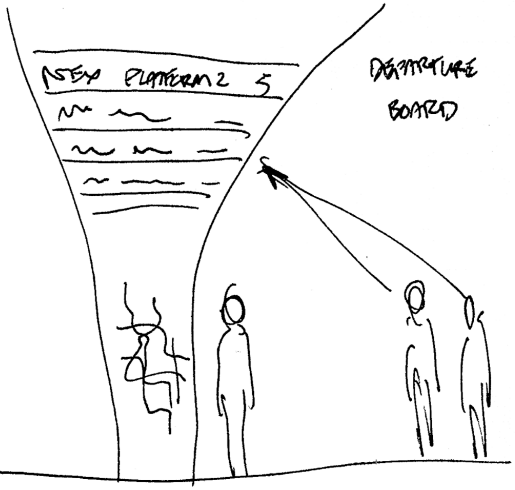
SINGLE USER



KIOSK

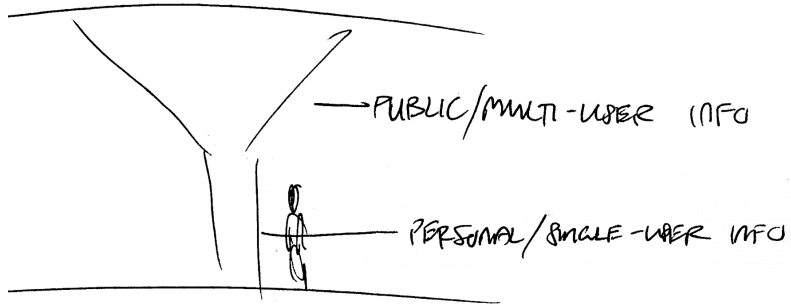
SIGNS





PLATFORM 2 5

DEPARTURE BOARD

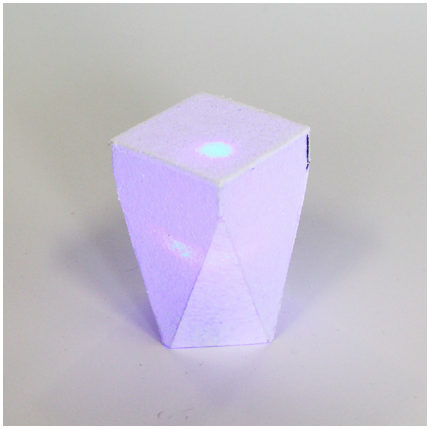


PUBLIC/MULTI-USER INFO

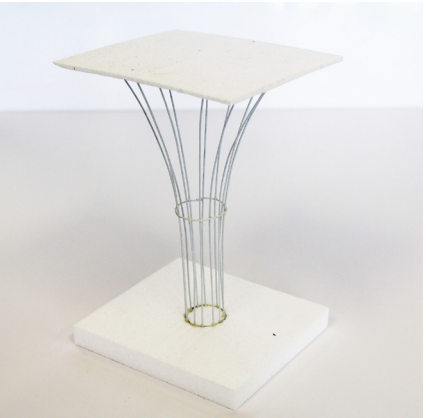
PERSONAL/SINGLE-USER INFO

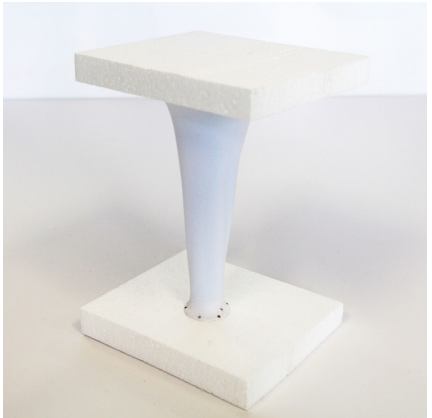


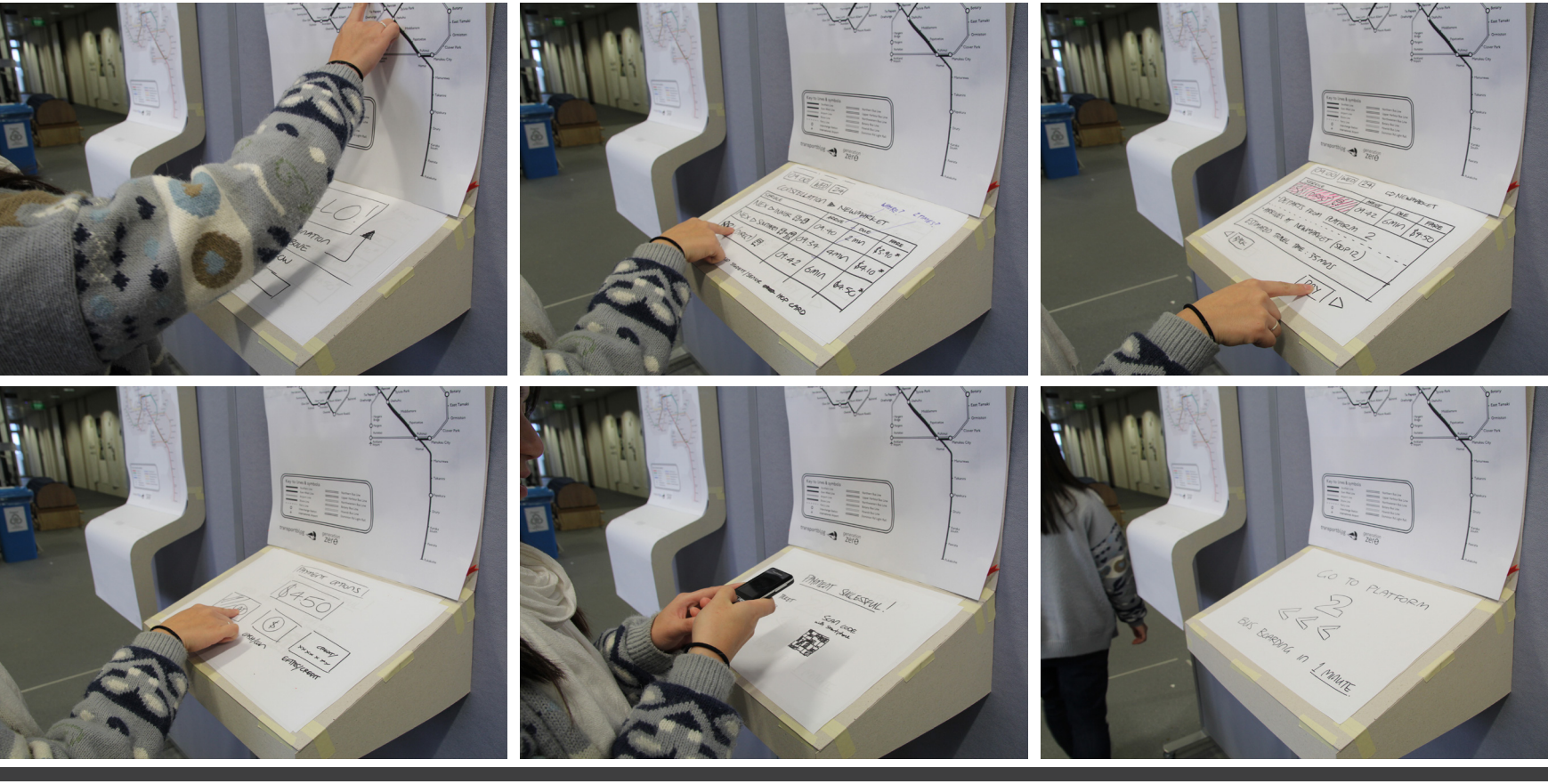


Further studies of the structure's potential form were explored through model making and prototyping with a range of various materials.





Alongside explorations of the physical form of the kiosk, I began developing iterations of the digital content to be displayed on-screen. I constructed a full-size, physical mock-up of a kiosk form and used it as a canvas to display the various screen mock-ups. Using the service prototyping method - paper prototyping - studio peers role-played the start-to-end experience of using the kiosk. Each sheet of paper represented a different screen, and would be progressively removed to reveal subsequent screens based on the user's selection. During this process, I documented the interactions between the user and the kiosk through note-taking and photographic observation. This allowed me to identify when users encountered problems during the service experience, and revealed aspects of the design that needed significant further development and improvement.

PRESENTATION TO A.T.

Having established and developed a strong project direction in the eighth action research cycle of the project, I wanted to get feedback on the direction of the project and validation of the design concept from my industry contacts at Auckland Transport and MRCagney. I managed to arrange a meeting with four of these industry contacts to present my work to.

I began the presentation by showing '*Struggle*' - the short film I had produced in the previous action research cycle - to help establish the problem I sought to address through my design outcome. After running through my methodology, process, explorations and insights, I presented the design concept - an interactive journey planning system that provides users with a transparent and holistic journey experience across all touchpoints. Once I had demonstrated the basic user interactions of the system, I went on to demonstrate the development of the digital content and the physical form through paper prototypes and full size mock-ups. Given that my recent design explorations had focused largely on the physical form of the kiosk, and how it integrates into the existing architecture of Northern Busway interchange stations, I focused on this aspect of the design in my demonstration.

The various physical models and iterations I showed represented my 'thinking through doing' process and my method of developing the concept. However, when taken out of that individual context and put in front of the group, the representation and communication of these ideas was lost; the models simply became arbitrary foam and card forms.

Naturally, they wanted me to explain these tacit explorations, and in doing so revealed the weaknesses, or lack of detail, in the overall concept. Furthermore, by focusing largely on physical design developments rather than digital content developments, it became difficult for the group to understand what value the concept would bring to users.

The direction I had taken with these explorations was centred around Northern Busway interchange stations, and inspired by a form that existed within that context. By focusing largely on the physical form rather than the digital content, I had limited the transferability and usefulness to a specific site. If my solution was to be a holistic and consistent experience for users, it needed to be widely applicable and transferable.

Following the constructive criticism around the concept presented, we began discussing some of the other concepts I had briefly presented with my process work. It was clear that the group saw value in the simpler ideas, some of which were part of the 'Here's An Idea' series, and that any of them could become the focus of the project. However, I explained that each idea addressed a specific, individual problem and that the intention of the system concept was to address multiple problems through one intervention. In response, they suggested focusing the attention of the design to the digital content and front-end, user-facing information rather than physical design aspects; they identified this as an inherent weakness of current user-interactive systems.

DEFINING THE DELIVERABLES

AUGUST

DESIGN BRIEF

• 3 DELIVERABLES •

Following the presentation to industry, I spent significant time reflecting on the feedback and comments I had received. Although the response to the concept I had presented was not overly positive, there was a great deal of constructive criticism, which I could turn into actionable outcomes. I developed a revised brief in response to the outcomes of the presentation. The final project outcome would consist of three deliverables: the first would be a detailed map of the current user journey/experience of public transport; the second would be a booklet that captured the various ideas and concepts I had generated throughout the research; the third would be to develop the system/application user interface in detail.

1. JOURNEY MAP

- A detailed map documenting the current service experience for P.T. users. capturing all touchpoints across multiple channels.
- Visually beautiful
- Tells a compelling story
- Acts as the blueprint for future service development.

2. CONCEPT BOOKLET

- A collection of ≤10 ideas/ concepts that respond to a certain aspect of the user experience of public transport.
- Documented in a 'low-fi' quirky manner so as to provoke thought and discussion of idea development.
- Visually beautiful
- Mini exegesis packaged-up with brief summary of context, research etc.
- 'X' Principles of Good P.T. SERVICE.

3. PAPER TICKET / APP

- Paper ticket is printed with all relevant info for user to make journey easily & effectively.
  - Platforms/service lines
  - Departure/arrival times
  - Connection/stop info
  - Service(s) time map
- Mobile app: all aspects of paper ticket with addition of dynamic info.
  - tracks user's movement along service & alerts user of stops/connections
- Possible inclusion of journey planner?
- Beyond utilitarian functions?

FINDING MY FIELD

At the point of determining the final outcomes/deliverables of the project, there was only three months until the end-of-year exhibition. The decision to design three artefacts, one in considerable detail, in the given time frame was a significant undertaking. However, it is worth noting that my decision to pursue such a task was not solely based on the suggestions of industry experts.

In my honours year of study, I designed a mobile application to aid the navigation and negotiation of university environments for blind and visually impaired students. During this time, I learnt about designing user interfaces and mobile interactions, as well as developed skills in digital, graphic, and visual design. Following the completion of my honours year, I interned at Orion Health - a medical software company - where I further developed these skills in an industry environment.

With this in mind, I was fairly confident in undertaking a body of work that contained such a large digital/graphic design component. Furthermore, the decision to pursue this type of design work supported my interest and passion in pursuing a career in the field of user experience (UX) design, and would help to develop and strengthen my skills in this area of design during the process.

AT Public Transport

By Auckland Transport

Open iTunes to buy and download apps.

View In iTunes

Free

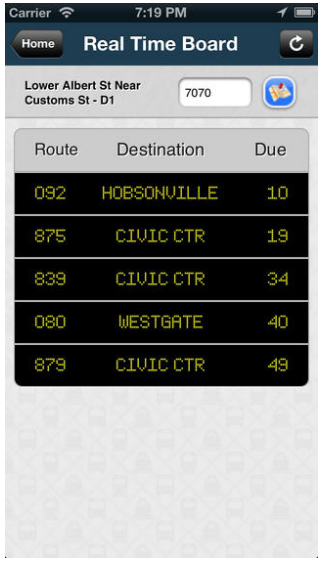
Description

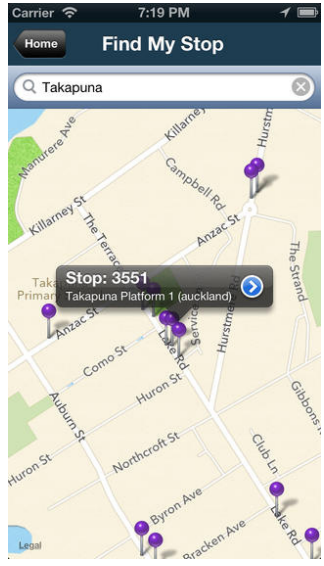
AT Public Transport information on your iPhone.

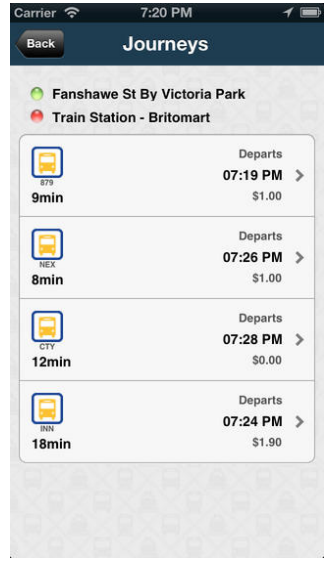
Auckland Transport brings to you the AT Public Transport Mobile App for your iPhone featuring Journey Planner, Real Time Board for buses in the Auckland region, and 'Find My Stop' functionality, making it easy for you to locate your stop from your iPhone.

- Plan journeys using map-based search
- See LIVE departure information for any Auckland bus stop.
- Intuitive maps that show you the way to your nearest stop
- Simple, easy to use interface

Note: AT Public Transport replaces the MAXX app







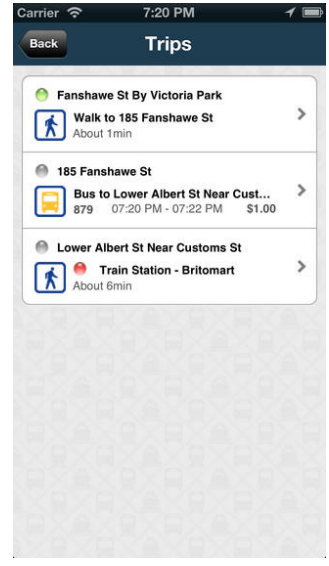


Figure 20. AT Public Transport App, 2013.

App Store Ratings and Reviews

Current Version | All Versions

AVERAGE RATING

★★☆☆☆

Based on 42 Ratings

2	★★★★★
3	★★★★
6	★★★
7	★★
24	★

CLICK TO RATE ☆☆☆☆☆

The first public transport mobile application I sought to examine and critique was the official Auckland Transport mobile application, available for both iOS and Android smartphones. As evidenced by the ratings and reviews on the iTunes App Store, Auckland Transport's current mobile solution was nothing short of poor. After downloading and using the application personally, I could validate claims made by numerous public transport users of the application's substandard operation, functionality and general usability. The journey planning function was clunky and rarely produced results that were useful. The real-time board served little purpose beyond displaying an endless cycle of services irrelevant to your journey. Moreover, there was no option to save favourite routes, destinations or search terms for quick and easy access at a later time. And from a visual design perspective, the interface was dull and unanimated.

CUSTOMER REVIEWS

Write a Review | App Support

36 Customer Reviews Most Helpful

Real time board no longer real ★☆☆☆☆
by Mickcsmith – Dec 5, 2012

The Real Time board used to be extremely accurate making it easy to plan ahead. Since the last update the boards have changed and now read the same as the unreliable live boards at the bus stops making this app absolutely pointless for planning ahead. Auckland Public Transport, please change it back for Aucklanders. I'll then be able to give your app 5 stars instead of the 1 it now deserves.

1 out of 1 customers found this review helpful. Was this review helpful? Yes | No | Report a Concern

Rubbish ★☆☆☆☆
by AT User – Dec 10, 2012

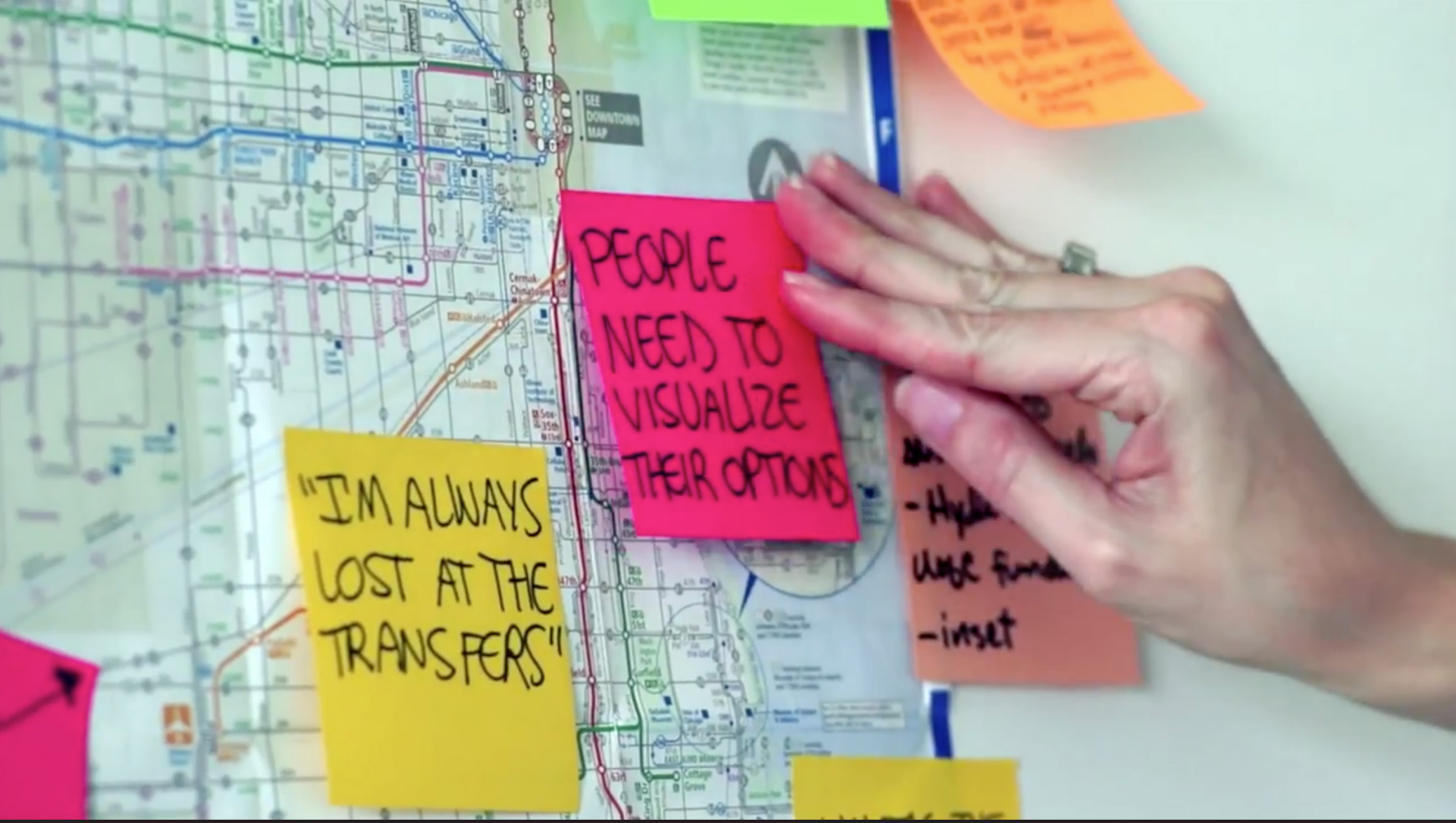
A great timetable app. Unfortunately it bears no resemblance to the real world. Why would I want to know about a bus that's already left? Absolute rubbish.

1 out of 1 customers found this review helpful. Was this review helpful? Yes | No | Report a Concern

Pointless ★☆☆☆☆
by Mcrtt – Dec 16, 2012

Never correct. Just adds to the already stressful experience of using poor public transport in Auckland city.

1 out of 1 customers found this review helpful. Was this review helpful? Yes | No | Report a Concern



I discovered a project by a Chicago based company, Greater Good Studio, who adopt and apply design methods to solve social problems (Greater Good, 2013). The project 'Designing Chicago', was an initiative to design a transit application for Chicago with the participation and collaboration of the public. The project addressed the issues that many public transport users faced when trying to navigate and negotiate the city. Given that the project was still under development, the outcome or success of the user-centred, collaborative approach could not be measured or tested. However, the discovery of this project helped in supporting the user-centred approach I was bringing to the design of a public transport application/system in the Auckland context.

Figure 21. Greater Good Studio: Designing Chicago, 2013.

The second user-centred transit application I discovered was the 'Moovit' application. What was unique about this application was its use of crowd-sourcing to improve the user experience of public transport. Users can update information about particular bus or train services in real-time, alerting other users of delays, breakdowns, or the number of seats remaining etc. The application is available on both iOS and Android but is not yet available in New Zealand, so I was unable to download the application for use, test, and critique. This application provided another example of applying a user-centred approach to public transport to improve and enhance the overall user experience.

Figure 22. Moovit Public Transportation App, 2013.

Auckland
Frequent Service Network
2016 (proposed)

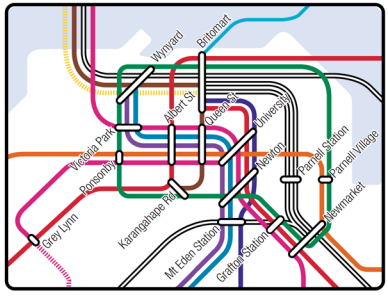
Proposed network of high frequency all-day bus, train and ferry services.
(Note: lower frequency bus, ferry and train routes are not shown on this map)

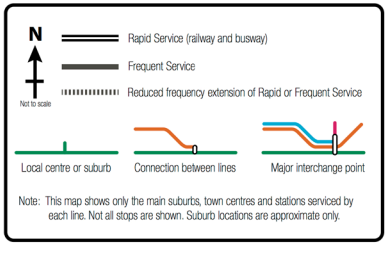
Each line represents a service that will operate *at least* once every fifteen minutes from 7am until 7pm, seven days a week. Many lines will operate at much higher frequencies across the day and evening, especially during the morning and evening peak hours.

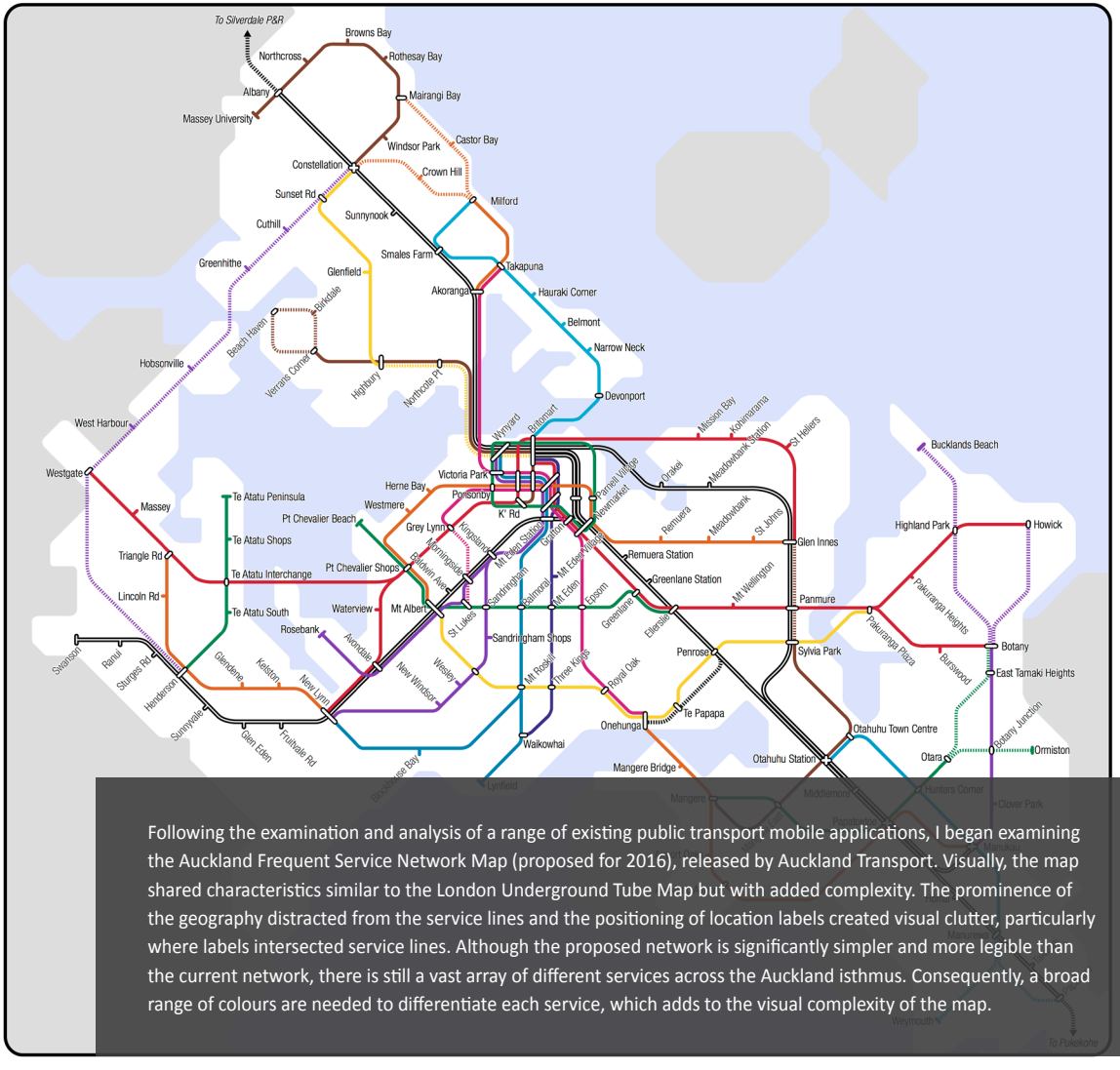
Lines will still operate before 7am and after 7pm at lesser minimum frequencies. Some lines with run additional late night service on Friday and Saturday nights to supplement or replace Night Rider services.

The network is service based and not mode dependent: lines will be operated by bus, train and ferry using a range of vehicle types and infrastructure.

The network has been designed to operate using Auckland's existing public transport resources by utilising the efficiencies of an integrated connective network model. This network can be achieved with broadly the same number of service-kilometres that are operated under the current non-integrated network.

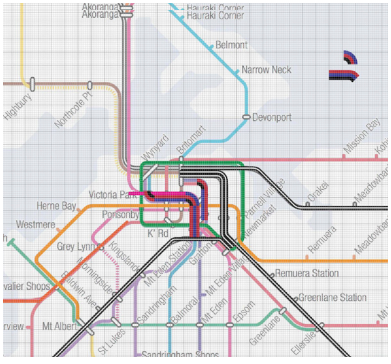


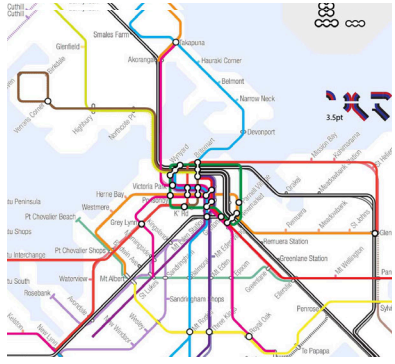


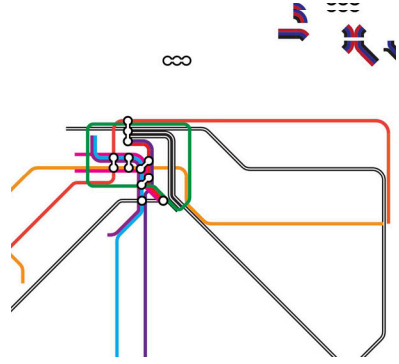


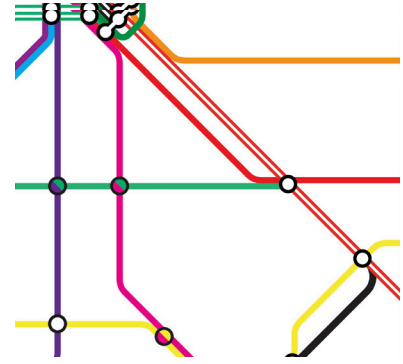
Following the examination and analysis of a range of existing public transport mobile applications, I began examining the Auckland Frequent Service Network Map (proposed for 2016), released by Auckland Transport. Visually, the map shared characteristics similar to the London Underground Tube Map but with added complexity. The prominence of the geography distracted from the service lines and the positioning of location labels created visual clutter, particularly where labels intersected service lines. Although the proposed network is significantly simpler and more legible than the current network, there is still a vast array of different services across the Auckland isthmus. Consequently, a broad range of colours are needed to differentiate each service, which adds to the visual complexity of the map.

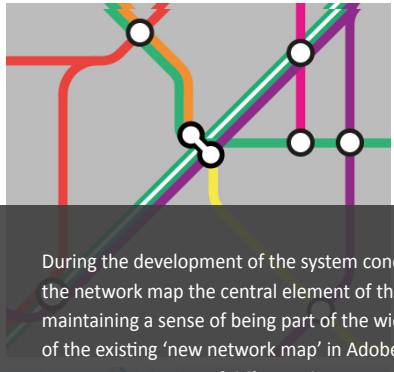
Figure 23. Auckland Frequent Service Network Map (Proposed 2016) , 2013.

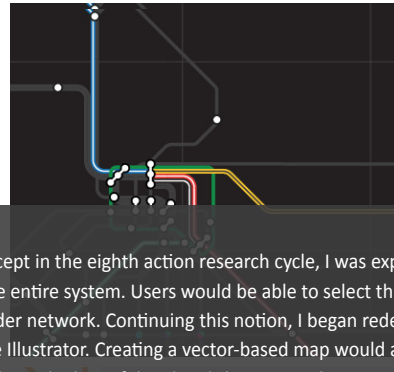




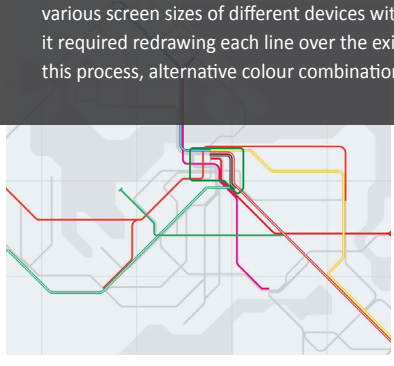


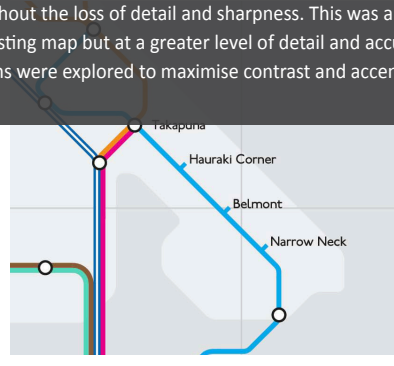


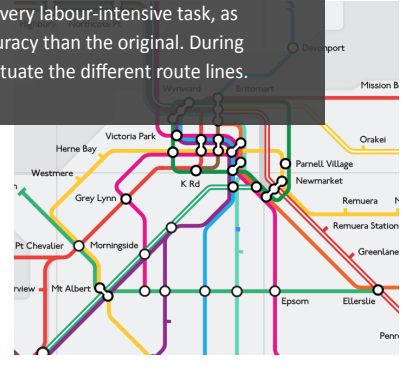


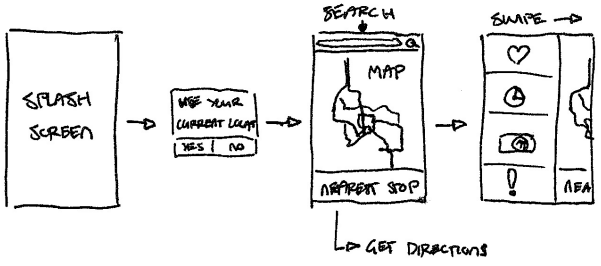


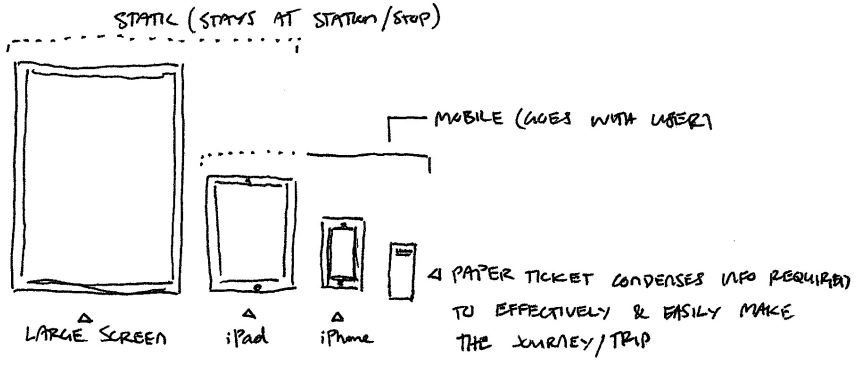
During the development of the system concept in the eighth action research cycle, I was exploring the idea of making the network map the central element of the entire system. Users would be able to select their desired destination whilst maintaining a sense of being part of the wider network. Continuing this notion, I began redesigning a vector-based version of the existing 'new network map' in Adobe Illustrator. Creating a vector-based map would allow me to scale the map to fit various screen sizes of different devices without the loss of detail and sharpness. This was a very labour-intensive task, as it required redrawing each line over the existing map but at a greater level of detail and accuracy than the original. During this process, alternative colour combinations were explored to maximise contrast and accentuate the different route lines.











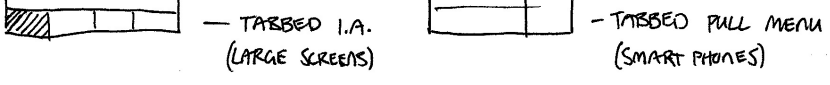
INTERFACE FUNCTIONS / SCREENS

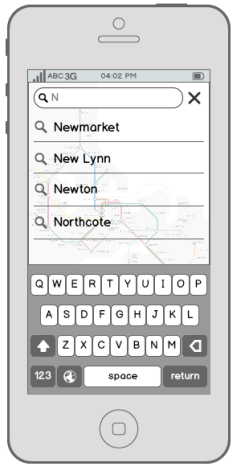
- NETWORK MAP - CORE
- JOURNEY PLANNER - SEARCH DESTINATION
- REAL-TIME BOARD - LOCATION AWARE
- NETWORK/SERVICE UPDATES - REPORT PROBLEM
- MY HOP - LOGIN, DISPLAY FAVS ETC.

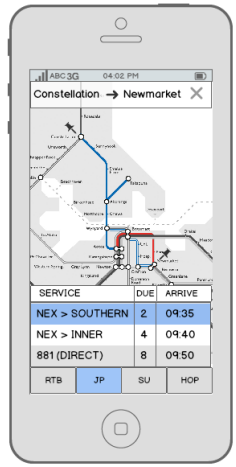
DRAFT PRINCIPLES OF 'BOTTOM-UP' / PRINCIPLES OF...

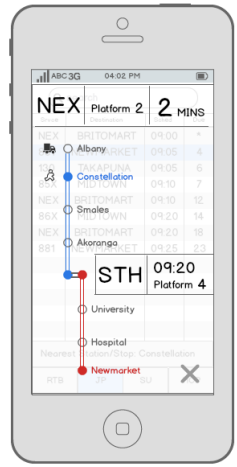
- TRANSPARENCY
- CONSISTENCY
- CERTAINTY
- RELIABILITY

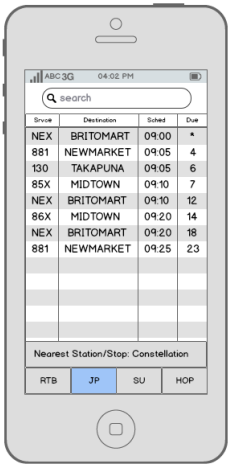
Having established the network map as the central element of the design, I began exploring the broader concept of the application and system through sketching and drawing. Given that the system was to work across different platforms and devices, I needed to establish how each device would display information and what functionality would be built into each. The smaller, more portable devices, such as smartphones and tablets, would display more personalised transit information and allow users to save favourite destinations, journeys and routes, as well as access their HOP account directly within the application. For larger devices like the kiosk, the default information would be more publicly orientated, displaying real-time departure information etc., but still allow users to log into their HOP account to top-up their balance or purchase tickets.

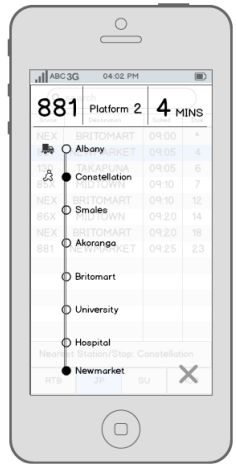


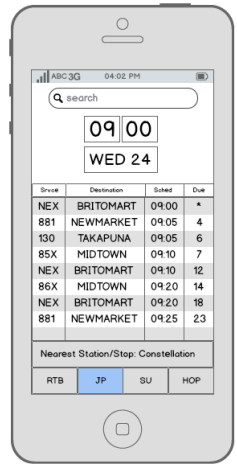












Following explorations through sketching and drawing methods, I began developing the application concept in Balsamiq Mockups. This prototyping software provided me with a set of standard mobile user interface components, which could be rearranged and scaled to quickly develop ideas and concepts. This proved to be a valuable tool in developing the user interface of the application through quick, low-fi iterations. Using Balsamiq Mockups, I was able to import iterations of the network map and begin layering interface elements on top to build up the various screens of the application. This allowed me to develop a better understanding of how each function and interaction would operate across the different screens.

REFLECTIONS

After developing the initial application and system concept through various low-fi prototyping methods, I felt as though the outcome of this process was simply a redesigned and enhanced version of the existing Auckland Transport mobile application. Although my concept was structured around the new network map, I had chosen to include many of the features of the existing application, such as the real-time board and service updates. Through the analysis of the existing application, I had identified that most users find the information on the real-time board unusable and unrelated to their specific needs.

After considering this at a deeper level, I decided to focus the concept of the application around personalised journey planning. Under this notion, the application would provide the user with the specific information they needed to make a particular journey, whilst removing information that was irrelevant to that journey, thus reducing the overall complexity for the user.

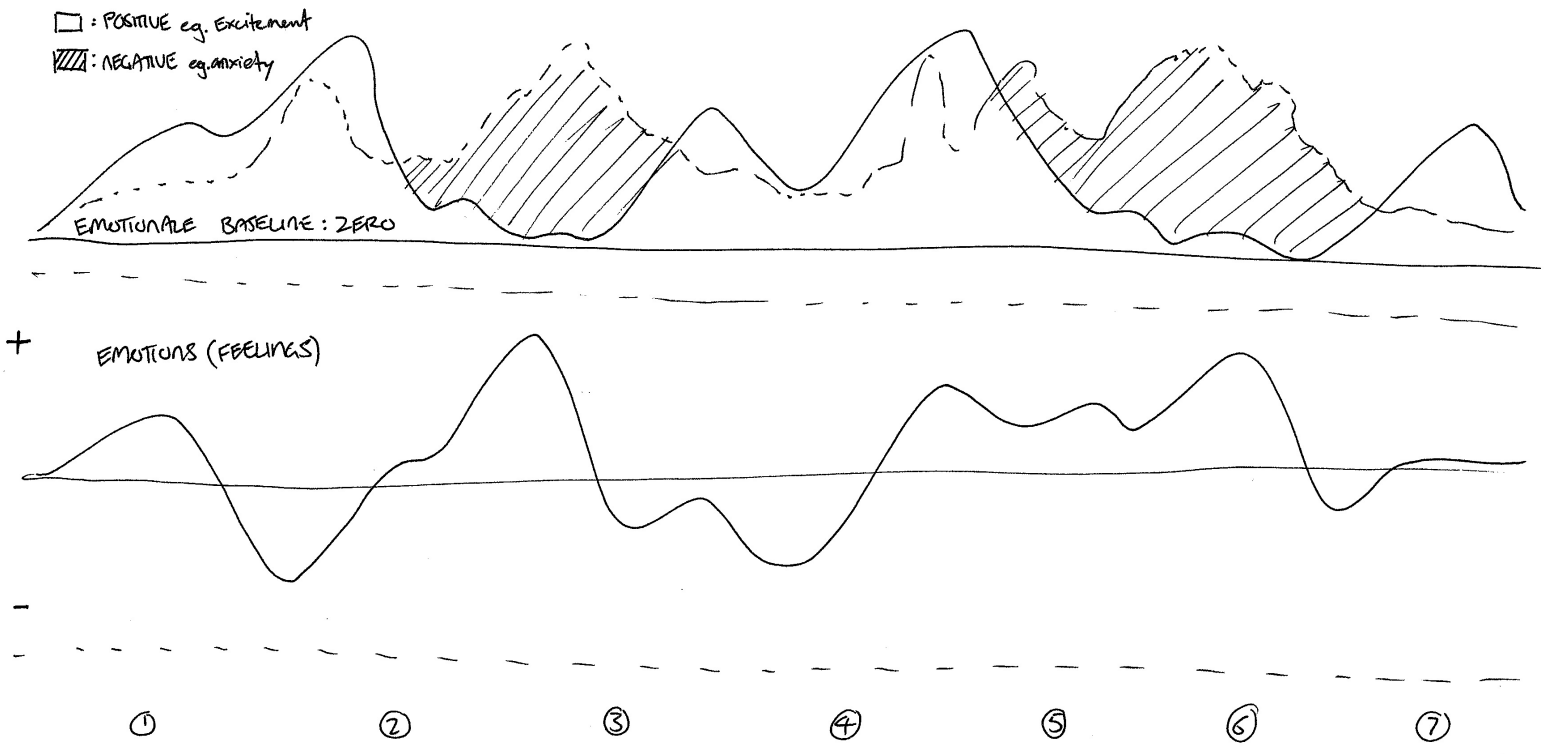
Considering the speed at which the semester was moving, I made the decision to confine the development of the application to smartphone only, which allowed me to focus developing the design of the application for a single device to a much higher level of detail and resolution.

DESIGNING THE DELIVERABLES

SEPTEMBER

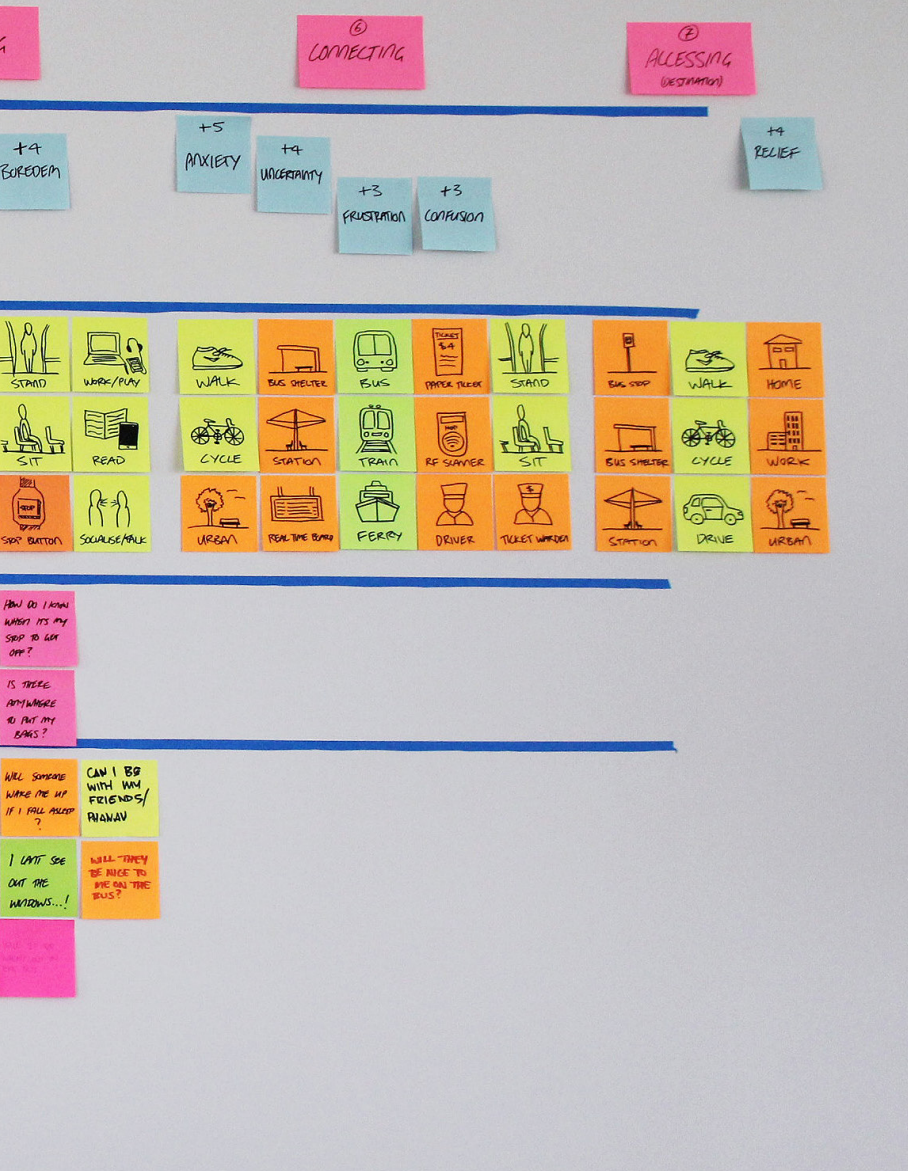
EXPERIENCE MAPPING

Reviewing literature of the process of developing customer journey maps/ experience maps, in combination with developing the structure and content of the public transport user experience map.



I wanted to create a user experience map that highlighted the emotional aspects throughout the entire journey.
Here I was exploring how the various emotions could be plotted or graphed along each of the seven phases of the journey to visually demonstrate different positive and negative emotions associated with experience of using public transport. In the above illustrations, positive and negative emotions could be differentiated by the peaks and troughs, above and below an 'emotional baseline', whereby the user's emotional experience of the journey is relatively neutral. Alternatively, the difference in emotions could be graphed as different colours or textures, with peaks representing the intensity of each emotion, be they positive or negative.

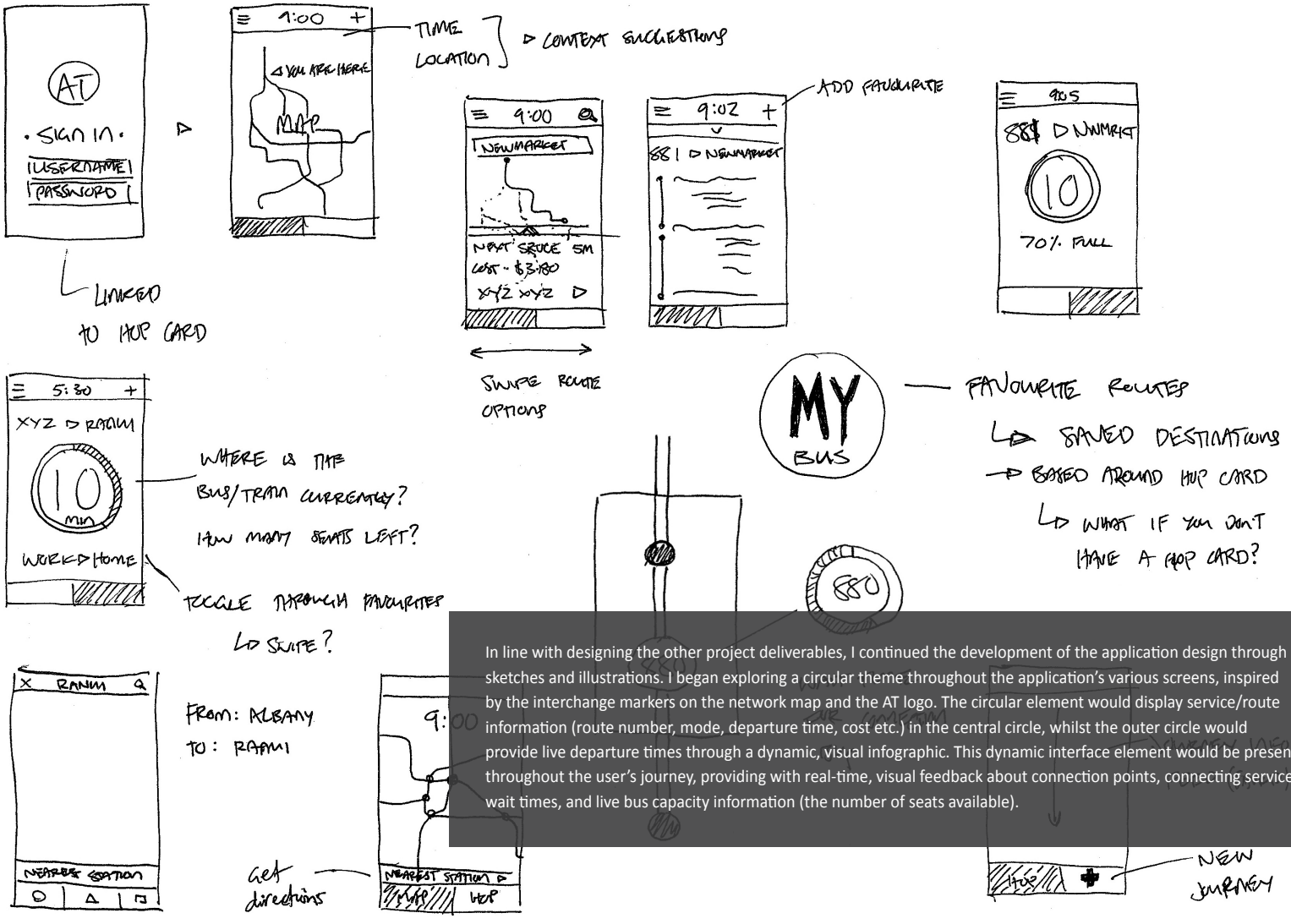

1 UNDERSTANDING (RESEARCH)
2 ACCESSING (ORIGIN)
3 WAITING
4 PAYING
EMOTIONS (FEELING)
+2 STRESS
+3 FRUSTRATION
+5 CONFUSION
+3 UNCERTAINTY
+3 FRUSTRATION
+3 VULNERABILITY
+4 DISCOMFORT
+5 ANXIETY
+2 BELITTLEMENT
+3 UNCERTAINTY
ACTIONS (DOING)
CHANNELS (MEDIUM)
TOUCHPOINTS (POINT)
WEB
MOBILE
PHONE
RESEARCHING
P2P
PRINT
HOME
WORK
URBAN
WALK
CYCLE
DRIVE
BUS STOP
BUS SHELTER
STATION
BUS STOP
TIMETABLES
STAND
EAT/DRINK
BUS SHELTER
REAL TIME BOARD
SIT
SOCIALISE/TALK
STATION
AUDIO ANNOUNCEMENTS
WORK/PLAY
READ
CASH
PAPER TICKET
DRIVER
CREDIT CARD
KIOSK
RF SCANNER
PRE-PAID CARD
TICKET OFFICE
BUS
DRIVER
TRAIN
TICKET WARDEN
FERRY
ONBOARD ANNOUNCEMENTS
THOUGHTS (THINKING)
I NEED TO GET SOMEWHERE... HOW DO I GET THERE?
CAN I WALK OR CYCLE INSTEAD?
HOW LONG WILL IT TAKE ME? HOW MUCH WILL IT COST ME?
WHERE DO I CATCH IT FROM?
THIS ALL SEEMS VERY CONFUSING ... MAYBE ITS EASIER TO DRIVE...
WHY IS THE NEAREST BUS STOP SO FAR AWAY?
IS THERE SOMEWHERE TO SAFELY STORE MY BIKE? CAN I PARK MY CAR?
THERE'S NOWHERE TO SIT DOWN... ITS RAINING & THERE'S NO SHELTER
THESE TIMETABLES ARE SO CONFUSING!
NO FREE WI-FI? CAN I GET A COFFEE HERE?
MY BUS SHOULD HAVE ARRIVED... ITS LATE BUT IT DOESN'T SAY WHY...
MY PAPER TICKET LOOKS LIKE A RECEIPT...
ITS COLD ON HERE... ITS VERY NOISY
DO I HAVE TO STAND THE WHOLE WAY?
What DO I NEED
WHO IS IN CHARGE? OF THE BUS? OF THE SIGNS?
Who can I ask for help?
WHO ELSE TAKES THE BUS?
AM I TOO FAT?
DO I HAVE EVERYTHING I NEED
CAN I USE THIS AS A NON ENGLISH SPEAKER.
Can I take my kids?
Will this bus stop get me to where I want to go?
Where is the nearest dairy?
If I miss this bus, when is the next one?
WHICH PLATFORM DO I CATCH MY BUS FROM?
DO I HAVE TIME TO GRAB FOOD OR COFFEE?
IS THERE SOMEWHERE TO SIT?
ARE THERE NEWSPAPERS TO READ?
IS THERE SHELTER FROM THE ELEMENTS?
A bus pulled up ... how will I know its the bus I need to take?
WILL I BE SAFE
Can I lock my luggage somewhere while I get a drink?
free wifi?
Can I pay before I get on the bus?
Can I pay with cash
Can I get an all day pass?
Where/who/How do I pay?
When will my gold card work?
IF I DON'T HAVE A TICKET CAN I USE THE BUS
Is there a max fear?
How much will it cost?
Can I store my luggage on the bus?
CAN I TALK TO THE DRIVER TO OTHER PATRONS?
WHERE ARE THE BUZZERS TO PUSH?
CAN I EAT OR DRINK ON THE BUS? COFFEE ON BUS?



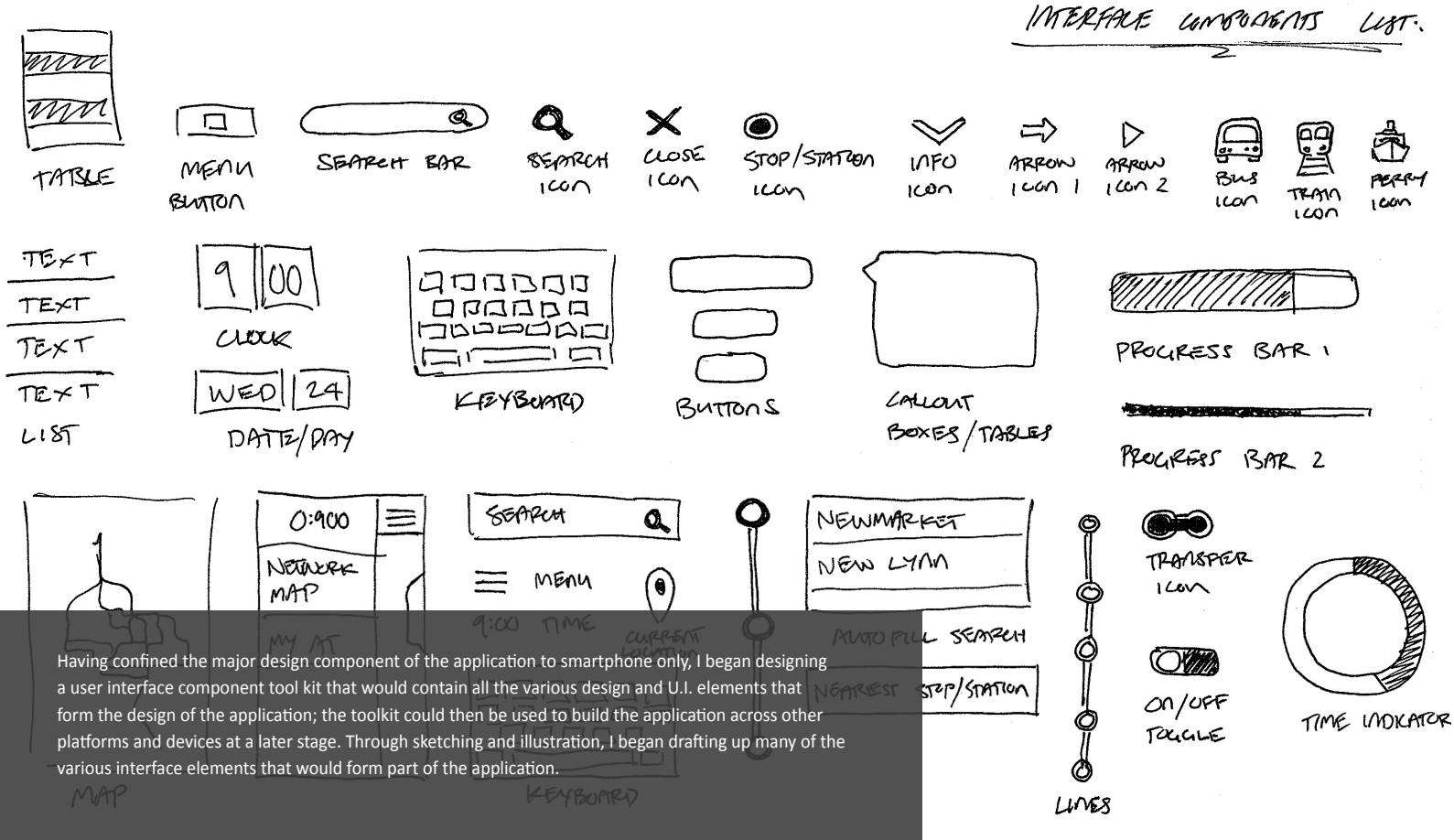
EXPERIENCE MAP

Creating the experience map was a lengthy process, as it demanded the consideration of all possible actions, thoughts, feelings and interactions at different touchpoints for each part of the journey. During this process, I realised that a single experience map could not properly capture the vast potential of experiences for different users of the service. To properly understand the experiences for each different user type, an experience map would need to be created for each. It was at this point that I made the decision to not include the experience map as one of the project deliverables due to the time demanded of each map. Ideally, this entire task would be a collaborative, group process, whereby the collective understanding of different user experiences would streamline the process of creating the each necessary map.

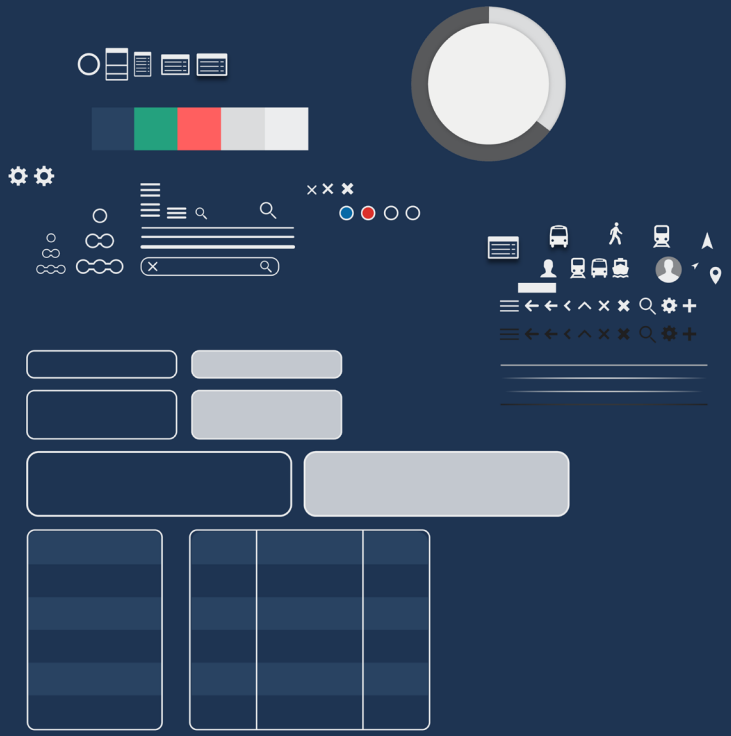
Although I had decided to end the task at this point, the development of the experience map to this level of detail was a beneficial exercise for my own personal understanding of the broad range of interactions and emotions associated with each stage of the journey. It also allowed me to locate the points at which the concepts and solutions I had developed would address certain barriers or complexities faced by the user throughout the journey to improve the overall experience.



In line with designing the other project deliverables, I continued the development of the application design through sketches and illustrations. I began exploring a circular theme throughout the application's various screens, inspired by the interchange markers on the network map and the AT logo. The circular element would display service/route information (route number, mode, departure time, cost etc.) in the central circle, whilst the outer circle would provide live departure times through a dynamic, visual infographic. This dynamic interface element would be present throughout the user's journey, providing with real-time, visual feedback about connection points, connecting service wait times, and live bus capacity information (the number of seats available).



Having confined the major design component of the application to smartphone only, I began designing a user interface component tool kit that would contain all the various design and U.I. elements that form the design of the application; the toolkit could then be used to build the application across other platforms and devices at a later stage. Through sketching and illustration, I began drafting up many of the various interface elements that would form part of the application.



1234567890
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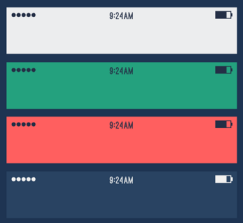
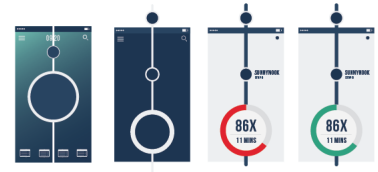
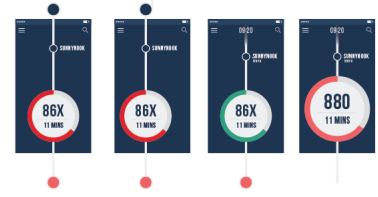


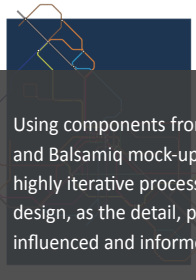
ABCDEFGHIJ
ABCDEFGHIJKLM
ABCDEFGIJKLMN
ABCDEFGHI
ABCDEFGHIJKLMNOP
ABCDEFGHIJKLMNO
ABCDEFGHIJKLO
ABCDEFGHIJ
abcdefghijkl
Sunnynook
HOME
Home
1234567890

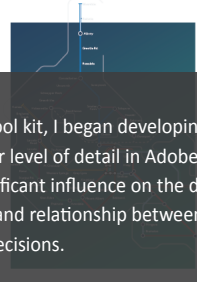
Interface component sketches were then developed at a higher level of detail using Adobe Illustrator to create vector-based components. By using vector-based graphics, components and interface elements could easily be scaled in size or modified according to different device screen sizes or aspect ratios. In an attempt to make the design of the application as easily implementable by Auckland Transport as possible, I created a colour palette close to that of the Auckland Transport branding colours. However, to give the application a more lively and modern aesthetic, the colours chosen were more pastel and subtly vibrant.

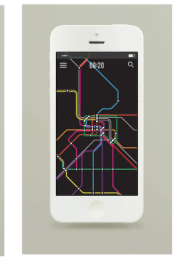




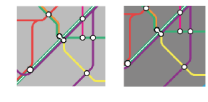
NEX 880 880
NEX 880 880
86X NEX NEX
86X

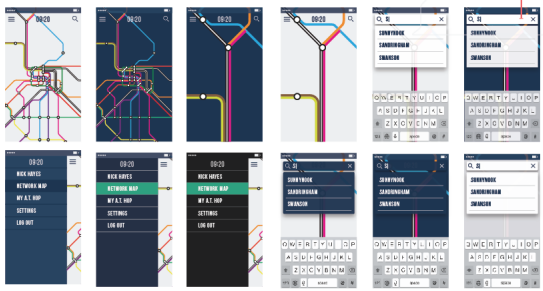


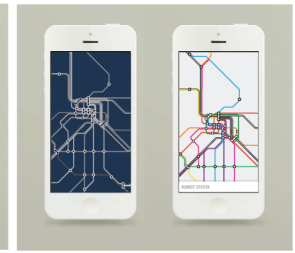


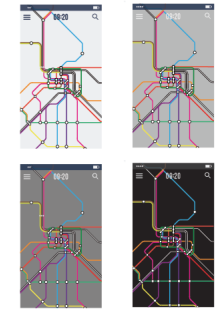


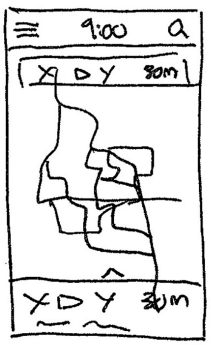
Using components from the U.I. tool kit, I began developing the low-fi sketch and Balsamiq mock-ups at a higher level of detail in Adobe Illustrator. This highly iterative process had a significant influence on the development of the design, as the detail, proportions and relationship between different elements influenced and informed design decisions.

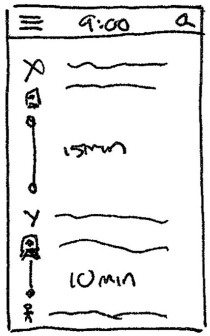


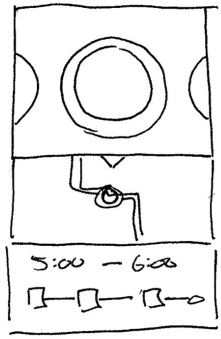










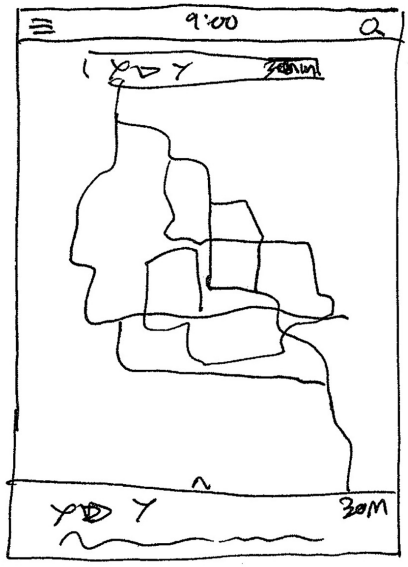


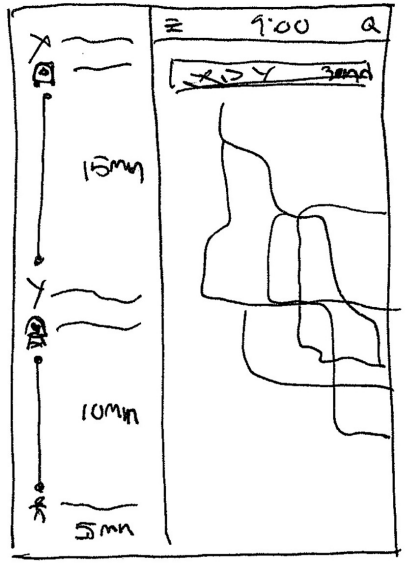
MAP

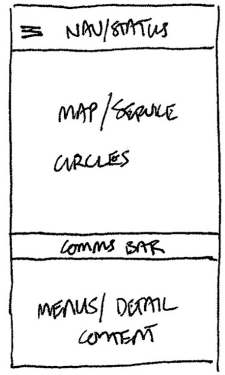
- BRAINWAVE!

IT CAN BE ITS OWN PRODUCT

- DOESN'T HAVE TO BE ASSOCIATED WITH A.T.
- CAN BECOME THE 'SOMEONE' YOU RELY ON, BECOMES A VERB eg. "I'll Google it"
- ALLOWS YOU THE FREEDOM TO DESIGN IT HOW YOU THINK IT SHOULD BE & HOW THE RESEARCH BACKS IT SHOULD BE



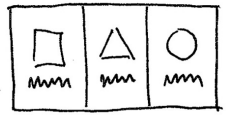


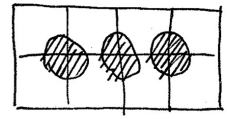


← Dynamic, horizontal scroll - translucent

← Dynamic updates

← Dynamic, horizontal scroll





MY PLACES – MY SERVICES – MY ACCOUNT

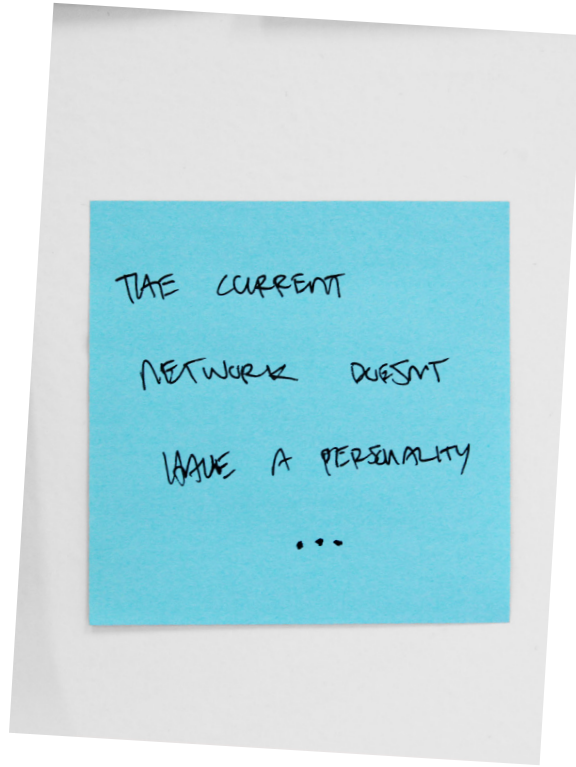
REFLECTIONS

Having developed the concept and visual identity of the application and system through numerous iterations, using both low-fi and high-fi prototyping methods, I took a step back from the development process to critique and assess the design in its current state. I felt the overarching concept of the application and system was strong but that it was lacking personality and vibrancy due to the colour palette originally chosen.

It was at this point that I embraced an insight revealed during my interview of the Customer Experience Development consultant at Auckland Transport. The insight was that there is currently a lack of personality to the network, and that the new network needs to be recognisable and memorable for its users.

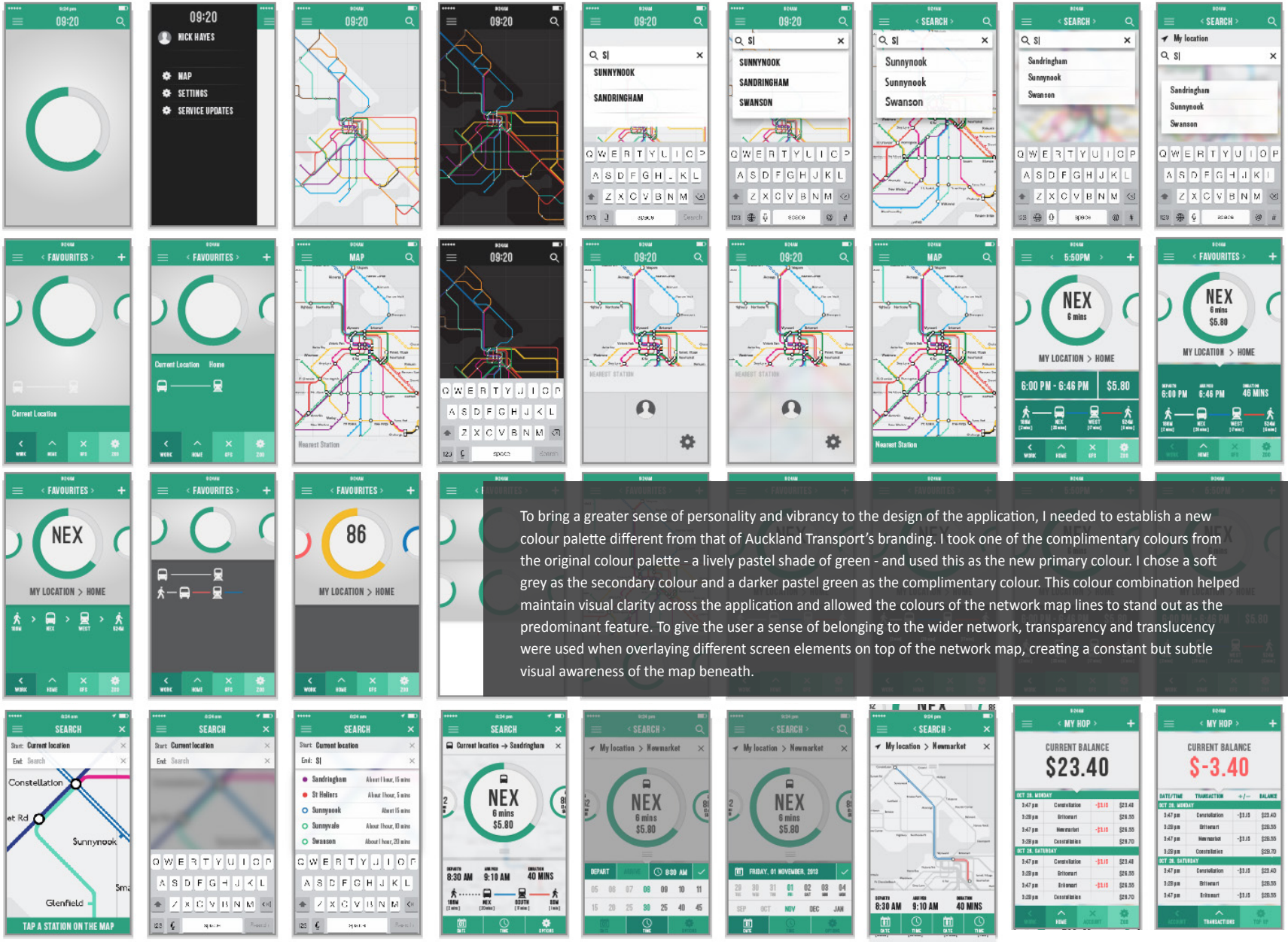
With this in mind, I developed a concept of personifying the application and system, based on the experience of visiting a friend of family member in a foreign city and not knowing how to get around. Typically in this situation, the friend or family member would know the city well, and provide all the necessary information needed to get around the city. More importantly, they would communicate the information in very simple, human terms, reducing the complexity of understanding and navigating the city based on the information provided.

It was this notion that I wanted to capture in the design of the application and system; the application would be your personal travel companion, helping you get around Auckland using public transport.

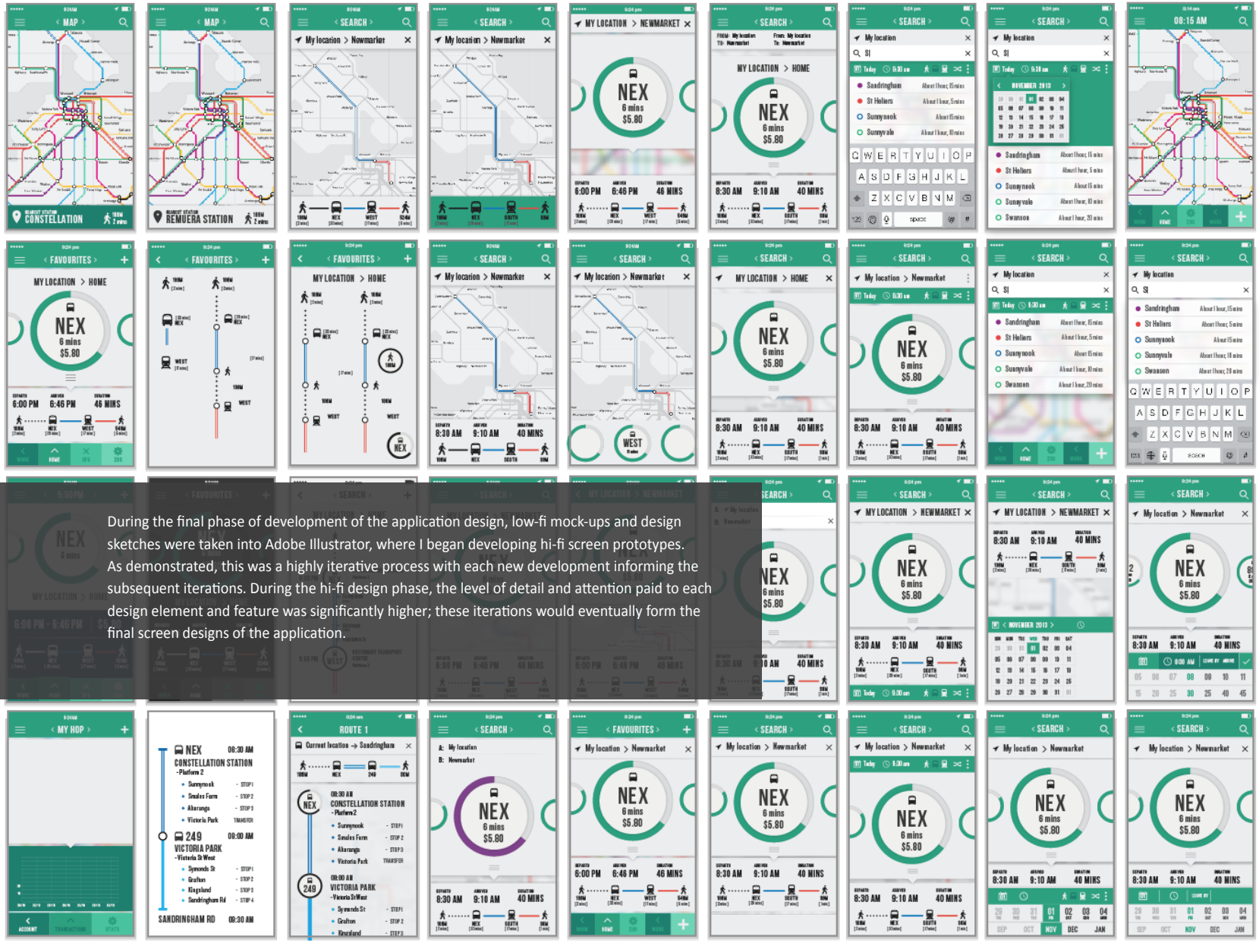


DESIGNING THE DELIVERABLES

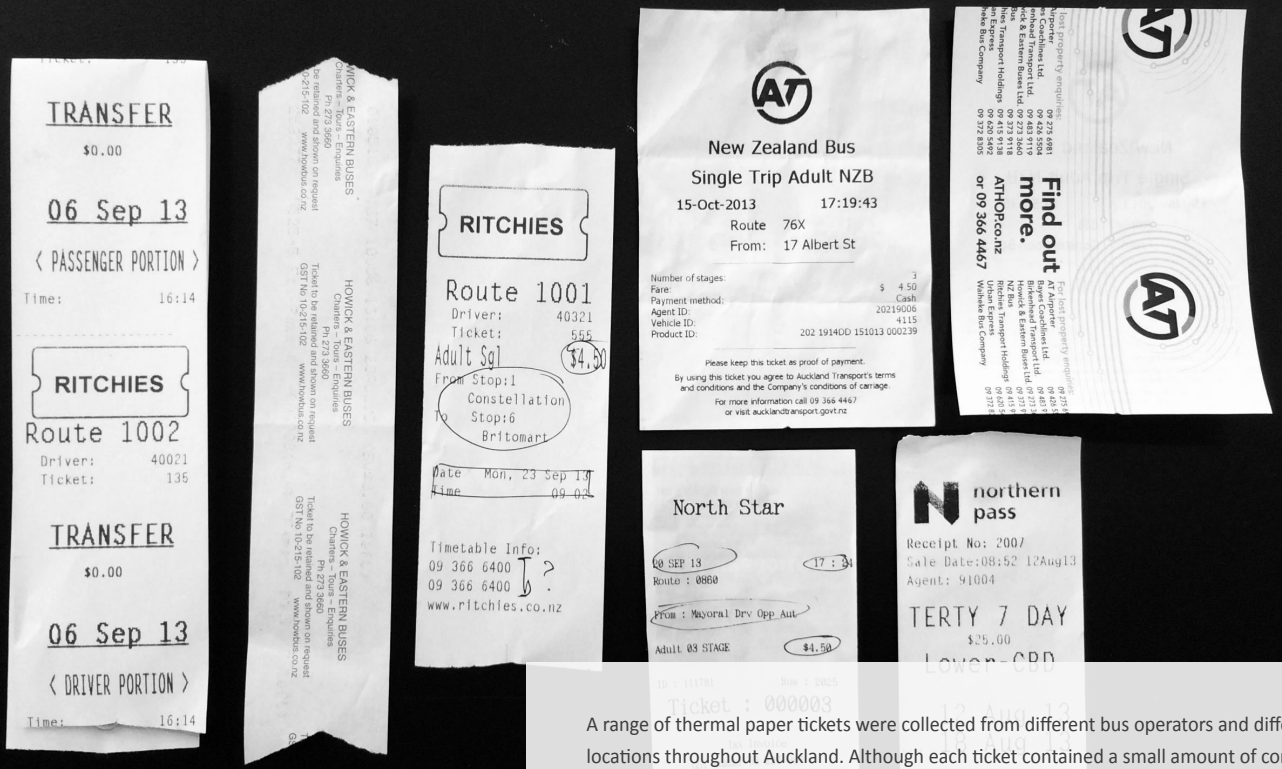
OCTOBER / NOVEMBER



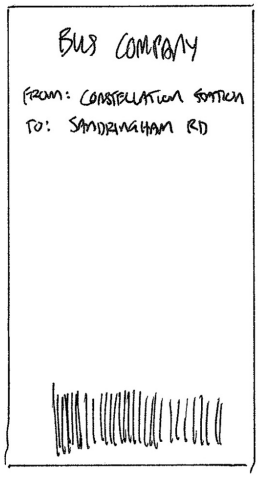
To bring a greater sense of personality and vibrancy to the design of the application, I needed to establish a new colour palette different from that of Auckland Transport's branding. I took one of the complimentary colours from the original colour palette - a lively pastel shade of green - and used this as the new primary colour. I chose a soft grey as the secondary colour and a darker pastel green as the complimentary colour. This colour combination helped maintain visual clarity across the application and allowed the colours of the network map lines to stand out as the predominant feature. To give the user a sense of belonging to the wider network, transparency and translucency were used when overlaying different screen elements on top of the network map, creating a constant but subtle visual awareness of the map beneath.

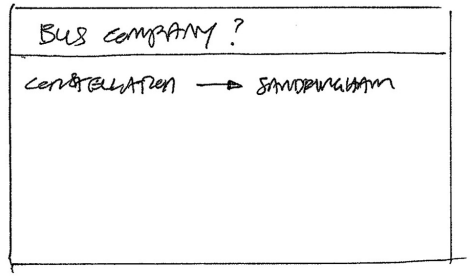


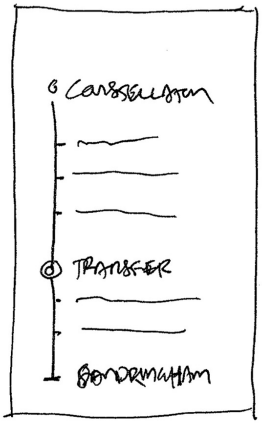
During the final phase of development of the application design, low-fi mock-ups and design sketches were taken into Adobe Illustrator, where I began developing hi-fi screen prototypes. As demonstrated, this was a highly iterative process with each new development informing the subsequent iterations. During the hi-fi design phase, the level of detail and attention paid to each design element and feature was significantly higher; these iterations would eventually form the final screen designs of the application.

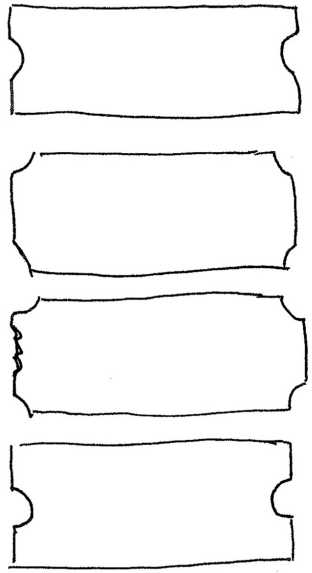


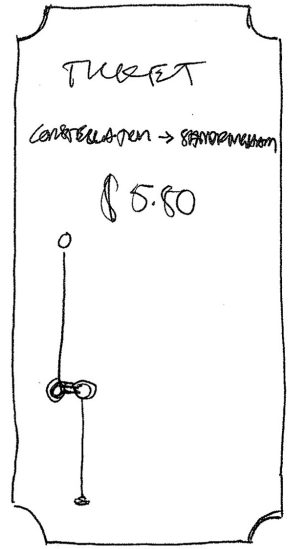
A range of thermal paper tickets were collected from different bus operators and different locations throughout Auckland. Although each ticket contained a small amount of context specific information such as time/date, point of origin and destination, the majority of the information presented was similar across each ticket. Furthermore, the information was far more driver/ operator specific and added no value for users. In most cases, the rear side of tickets were left blank or contained little information of use, such as branding or operator contact information.











- Currently various bus operators
  - North Star, RITCHIES, Howick & Eastern, Metrolink, LINK, URBAN EXPRESS, BIRKENHEAD, GO WEST, Wakapacific
- Necessary information:
  - $ PRICE
  - → DEPARTURE & ARRIVAL DESTINATIONS
  - → MODES & TRANSFERS
  - → TIME & DATE
- Removing all information that is not important to the user


When developing the paper ticket, I wanted the design to be as similar to the design of the application as possible to create consistency across the different modes of communicating information. The paper ticket was essentially a physical representation of the digital application, which allowed me to keep the same dimensions horizontally, and slightly extend the vertical dimensions to allow for the perforations. The design captured all the necessary information the user needed to make their journey, including line colours, service modes, transfer points, and stop/station numbers. The barcode at the bottom would allow for quick repeat purchases of the same journey at in-station kiosks, as well as potential promotional campaigns.

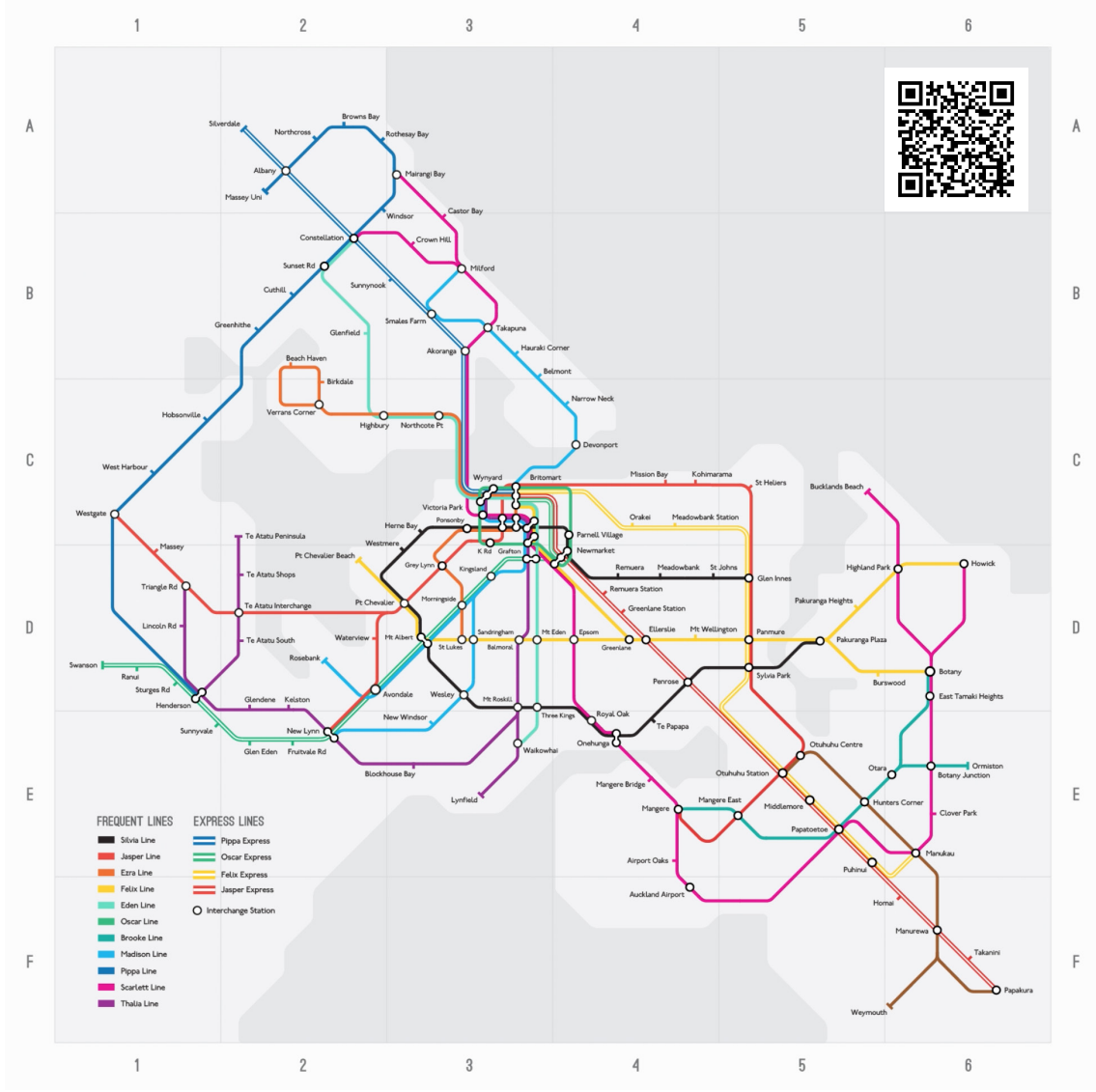
FINAL NETWORK MAP

Following the decision to remove the experience map from the final design deliverables, I decided to replace this component with a highly detailed design of the new network map.

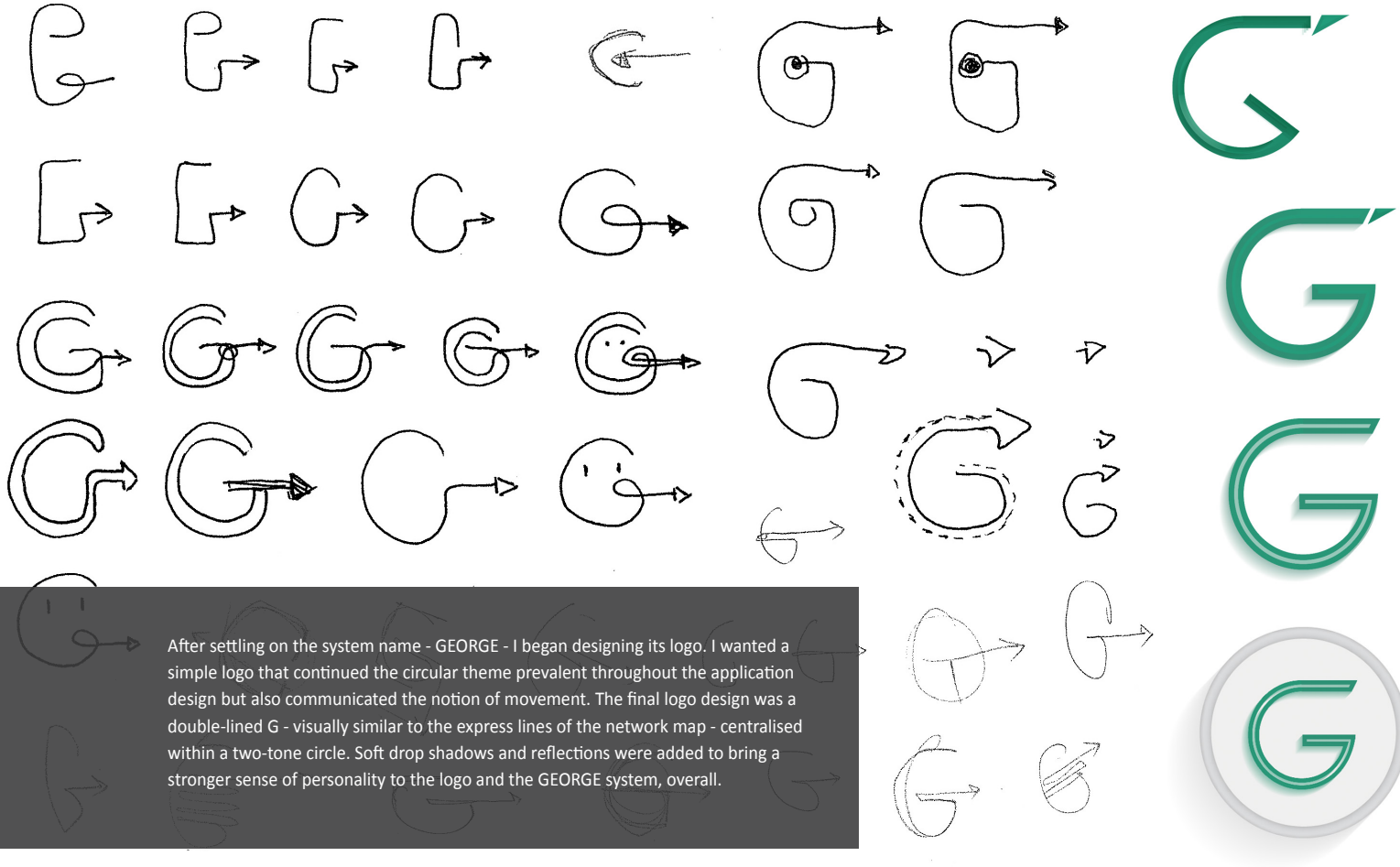
During the process of developing the vector-based map in Adobe Illustrator, I made a critical decision that allowed me to dramatically simplify the overall design. Rather than maintaining the vast array of different service/route lines, each of which had their own unique colour, I decided to join lines together where visual continuity was present. What this enabled was a reduction of the total number of lines and colours required to differentiate each line. The result of this was a network map that was much clearer, simpler and easier for the user to read and understand. The downside to achieving this simplicity was that users would have to be made aware that, in most cases, they would not be able to catch a single service along the entire route but instead would have to make forced transfers at predetermined locations. However, for the sake of reducing the overall complexity of the network map, this decision seemed valid and well justified.

Perhaps the most important feature of the new network map design was its ability to display information in a dynamic and interactive manner, which was made possible by the vector-based, digital construction. When a user makes a search query of a destination or location, the application dynamically adjusts the information presented on the map to show only the lines that are relevant to that journey, destination or location. This greatly reduces the complexity of navigating the network map and demonstrates a more user-centred approach to mapping public transport.

In continuing the notion of personifying the network, I needed to create a naming convention for the various service lines, as well as a name for the overall system. The placeholder of ‘George’ was given during the process of designing the network map and the application. However, after completing the application/system, I decided to keep the name George and assign individual names to the network map lines. Under this notion, George became the user’s personal travel companion, and the map line names represented George’s network of friends who together, would help you get around Auckland using public transport.


1
2
3
4
5
6
A
B
C
D
E
F
Silverdale
Northcross
Browns Bay
Rothesay Bay
Albany
Massey Uni
Mairangi Bay
Windsor
Castor Bay
Constellation
Crown Hill
Sunset Rd
Milford
Cuthill
Sunnynook
Greenhithe
Smales Farm
Takapuna
Glenfield
Akoranga
Hauraki Corner
Beach Haven
Belmont
Birkdale
Narrow Neck
Hobsonville
Verrans Corner
Highbury
Northcote Pt
Devonport
West Harbour
Wynyard
Britomart
Mission Bay
Kohimarama
St Heliers
Bucklands Beach
Westgate
Victoria Park
Orakei
Meadowbank Station
Herne Bay
Ponsonby
Parnell Village
Massey
Te Atatu Peninsula
Westmere
K Rd
Grafton
Newmarket
Pt Chevalier Beach
Grey Lynn
Kingsland
Remuera
Meadowbank
St Johns
Highland Park
Howick
Te Atatu Shops
Glen Innes
Triangle Rd
Remuera Station
Te Atatu Interchange
Pt Chevalier
Morningside
Greenlane Station
Pakuranga Heights
Lincoln Rd
Waterview
Mt Albert
Sandringham
Mt Eden
Epsom
Ellerslie
Mt Wellington
Panmure
Pakuranga Plaza
Te Atatu South
St Lukes
Balmoral
Greenlane
Rosebank
Sylvia Park
Botany
Swanson
Ranui
Avondale
Wesley
Penrose
Burswood
Sturges Rd
Mt Roskill
East Tamaki Heights
Henderson
Glendene
Kelston
Three Kings
Royal Oak
Te Papapa
Sunnyvale
New Lynn
New Windsor
Onehunga
Otuhuhu Centre
Glen Eden
Fruitvale Rd
Waikowhai
Otara
Ormiston
Blockhouse Bay
Otuhuhu Station
Botany Junction
Mangere Bridge
Lynfield
Mangere
Mangere East
Middlemore
Hunters Corner
Clover Park
Papatoetoe
Manukau
Airport Oaks
Puhinui
Auckland Airport
Homai
Manurewa
Takanini
Papakura
Weymouth
FREQUENT LINES
Silvia Line
Jasper Line
Ezra Line
Felix Line
Eden Line
Oscar Line
Brooke Line
Madison Line
Pippa Line
Scarlett Line
Thalia Line
EXPRESS LINES
Pippa Express
Oscar Express
Felix Express
Jasper Express
Interchange Station

- Akoranga B3
- Albany A2
- Auckland Airport E4
- Avondale D2
- Balmoral D3
- Beach Haven B2
- Belmont B3
- Birkdale C2
- Blockhouse Bay E3
- Botany D6
- Botany Junction E6
- Browns Bay A2
- Britomart C3
- Bucklands Beach C5
- Burswood D5
- Castor Bay E4
- Clover Park E6
- Constellation B2
- Crown Hill B3
- Cuthill B2
- Devonport C4
- East Tamaki Heights D6
- Ellerslie D4
- Epsom D4
- Fruitvale Rd E2
- Glendene D2
- Glenfield B2
- Glen Eden E2
- Glen Innes D5
- Grafton D3
- Greenhithe B2
- Greenlane D4
- Greenlane Station D4
- Grey Lynn D3
- Hauraki Corner B3
- Henderson D1
- Herne Bay C3
- Highbury C2
- Highland Park D6
- Hobsonville C1
- Homai F6
- Howick D6
- Hunters Corner E5
- K Rd (Karangahape Rd) C3
- Kelston D2
- Kingsland D3
- Kohimarama C4
- Lincoln Rd D1
- Lynfield E3
- Mairangi Bay A3
- Mangere E4
- Mangere Bridge E4
- Mangere East E5
- Manurewa F6
- Manukau E6
- Massey D1
- Massey Uni A2
- Meadowbank D4
- Meadowbank Station C4
- Middlemore E5
- Milford B3
- Mission Bay C4
- Morningside D3
- Mt Albert D3
- Mt Eden D3
- Mt Roskill D3
- Mt Wellington D4
- Narrow Neck C4
- New Lynn E2
- New Windsor E3
- Newmarket D4
- Northcross A2
- Northcote Pt C3
- Onehunga E4
- Orakei C4
- Otuhuhu Station E5
- Otuhuhu Centre E5
- Ormiston E6
- Otara E6
- Pakuranga Heights D5
- Pakuranga Plaza D5
- Panmure D5
- Papakura F6
- Papatoetoe E5
- Parnell Village C4
- Penrose D4
- Ponsonby C3
- Pt Chevalier D3
- Pt Chevalier Beach D2
- Puhinui E5
- Remuera D4
- Remuera Station D4
- Ranui D1
- Rosebank D2
- Rothesay Bay A2
- Royal Oak E4
- Sandringham D3
- Silverdale A2
- Smales Farm B3
- Sunnynook B3
- Sunnyvale E1
- Sunset Rd B2
- Sturges Rd D1
- St Heliers C5
- St Johns D4
- St Lukes D3
- Swanson D1
- Sylvia Park D5
- Takanini F6
- Takapuna B3
- Te Atatu Interchange D2
- Te Atatu Peninsula C2
- Te Atatu Shops D2
- Te Atatu South D2
- Te Papapa E4
- Three Kings D3
- Triangle Rd D1
- Verrans Corner C2
- Victoria Park C3
- Waikowhai E3
- Waterview D2
- Wesley D3
- Westgate C1
- Westmere D3
- West Harbour C1
- Weymouth F6
- Windsor A2
- Wynyard C3



After settling on the system name - GEORGE - I began designing its logo. I wanted a simple logo that continued the circular theme prevalent throughout the application design but also communicated the notion of movement. The final logo design was a double-lined G - visually similar to the express lines of the network map - centralised within a two-tone circle. Soft drop shadows and reflections were added to bring a stronger sense of personality to the logo and the GEORGE system, overall.

USER INTERFACE DESIGN TOOL KIT

U.I. DESIGN KIT

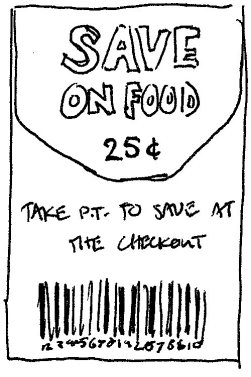
Finally, all the design elements were separated into individual components to form a user interface design toolkit. This toolkit would act as the platform in which the design of GEORGE for other devices and systems would be built from. This makes GEORGE easily transferable across multiple platforms such as mobile operating systems, web browsers, and eventually kiosks at stops and interchange stations. More importantly, it ensures a consistent visual language and user experience is maintained across all interactions with GEORGE.

•CONCEPT BOOKLET•

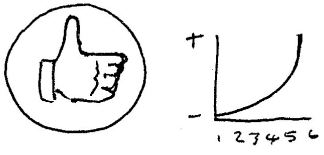
1. COUNTDOWN TIMER AT LOCO ON BUSES & TRAINS
2. PAPER TICKET WITH MAP/INFO ☆
3. SMART PHONE APP WITH TICKET INFO ☆
4. SERVICE SIGNAL LIGHTS: USER/DRIVER COMMUNICATION
5. SERVICE LINE COLOUR-CHANGING ROOF CEILING TILES/ LED DOTS
6. SELF-SERVICE KIOSKS AT INTERCHANGES/STOPS ☆
7. DYNAMIC, USER ACTIVATED WAYFINDING/SIGNAGE
8. NEW BUS STOP NAMING CONVENTION
9. "BUS FULL" ALERT/SIGNAL TO USERS
10. COLOUR-CHANGING TICKET FOR DIFFERENT LINES/SERVICE CONNECTIONS

BOOKLET OF IDEAS:

1. SUPERMARKET VOUCHER

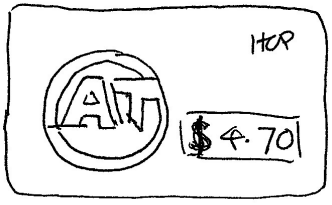


2. LIKE BUTTON FOR GOOD SERVICE



3. COUNTDOWN TIMER FOR BUSES/TRAINS

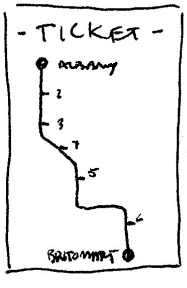
4. HOP CARD THAT DISPLAYS BALANCE



5. NEXT STOP & DYNAMIC LINES ONBOARD

The development of the booklet of ideas consisted largely of the ideas and concepts I had developed throughout the research process, therefore forming the bulk of the booklet's content. However, the process of actually producing the booklet was very involved and intricate. In order to engage and provoke thought from readers/public transport users, the style of the illustrations and supporting descriptions had to convey a sense of playfulness and low-fi aesthetic but at the same time, appear well considered and constructed. Each illustration and line of text was drawn with close attention to detail, then scanned into a computer and converted to a digital image. Text and illustrations were then arranged across the various pages of the document in the order they would read. Each page was then printed on 140gsm card stock, stitch bound and trimmed to pocket size notebook dimensions.

6. PAPER TICKET WITH JOURNEY MAP



HERE'S AN IDEA

10 WAYS TO IMPROVE THE PUBLIC TRANSPORT USER EXPERIENCE

BY NICK HAYES

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10 WAYS TO IMPROVE THE PUBLIC TRANSPORT USER EXPERIENCE

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WHAT IS THIS?

THIS IS A BOOKLET OF THOUGHT-PROVOKING IDEAS EXPLORING VARIOUS WAYS IN WHICH THE EXPERIENCE OF USING PUBLIC TRANSPORT COULD BE IMPROVED. SCRIBBLE IN YOUR OWN IDEAS ON THE BLANK PAGES AT THE BACK TO KEEP THE CONVERSATION GOING.

5 PRINCIPLES FOR DELIVERING BETTER SERVICE EXPERIENCES

01 RELIABILITY
SERVICE THAT IS RELIABLE AND TRUSTWORTHY

02 CERTAINTY
INFORMATION THAT BUILDS USERS' CONFIDENCE

03 CONSISTENCY
CONSISTENT EXPERIENCES ACROSS ALL MODES

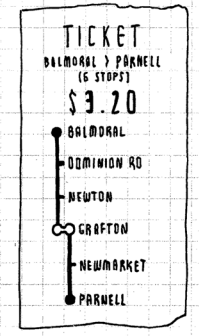
04 TRANSPARENCY
OPENESS AROUND SERVICE OPERATION/DELIVERY

05 EMPATHY
UNDERSTANDING USERS' NEEDS AND DESIRES

01

ROUTE LINES ON TICKETS

CAN'T REMEMBER YOUR STOP NAME OR WHERE TO TRANSFER? TAKE THE STRESS OUT OF THE JOURNEY BY TAKING YOUR JOURNEY INFORMATION WITH YOU ON YOUR TICKET.



02

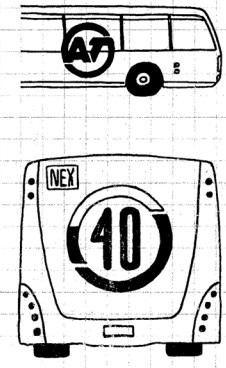
HOP CARD BALANCE DISPLAYS

UNSURE OF YOUR HOP CARD BALANCE BEFORE BOARDING? OR SIMPLY WANT TO CHECK IT ON THE GO? SEE IT AT A GLANCE WITH YOUR HOP CARD ELECTRONIC DISPLAY.

03

A.T. LOGO COUNTDOWN TIMERS

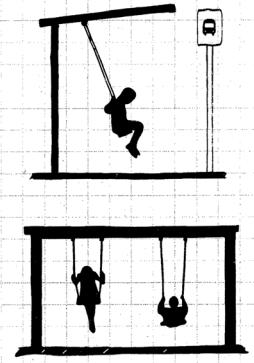
BUS EVER PULL AWAY JUST BEFORE YOU REACH IT? SEE HOW LONG YOU'VE GOT NEXT TIME BEFORE MAKING A MAD DASH BETWEEN TRANSFERS OR ACROSS BUSY STREETS.



04

SWINGING BUS STOP SEATS

BORED OF SITTING AROUND WAITING FOR THE NEXT BUS? WHY NOT HAVE SOME FUN WHILE YOU'RE AT IT AND EVOKE THOSE CHILDHOOD MEMORIES.



05

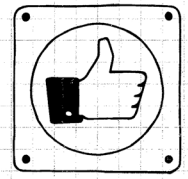
GROCERY DISCOUNT VOUCHERS

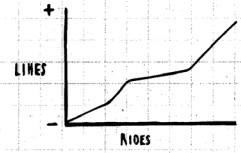
YOU SHOULD BE REWARDED FOR NOT DRIVING, NOT ENCOURAGED TO DRIVE MORE. USE YOUR TICKETS AS GROCERY VOUCHERS. THE MORE YOU RIDE, THE MORE YOU SAVE!

06

"THANKS DRIVER" LIKE BUTTON

SHOW YOUR APPRECIATION FOR GOOD DRIVING AND HIT THAT 'LIKE' BUTTON. A LITTLE BIT OF FRIENDLY DRIVER COMPETITION MEANS SMOOTHER RIDES FOR EVERYONE!

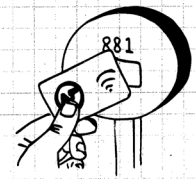




07

HOP CARD SIGNAL SYSTEM

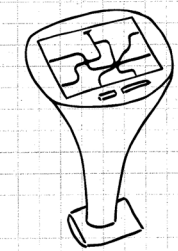
BUS DRIVER MISS YOUR SIGNAL AND FLY PAST YOUR STOP? SWIPE YOUR HOP CARD AT THE BUS STOP NEXT TIME TO AUTOMATICALLY ALERT THE DRIVER THAT YOU'RE WAITING.



08

JOURNEY PLANNING KIOSKS

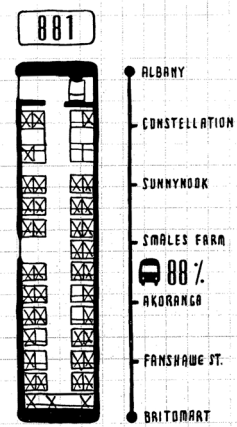
WANT TO MAKE A SPONTANEOUS JOURNEY TO SOMEWHERE NEW OR UNFAMILIAR? EASILY PLAN YOUR JOURNEY FROM ANYWHERE TO EVERYWHERE WITH SELF-SERVICE KIOSKS.



09

LIVE BUS CAPACITY INDICATORS

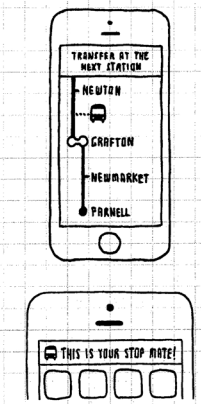
WAITING FOR YOUR BUS ONLY TO FIND IT'S FULL WHEN IT ARRIVES? FIND OUT IN ADVANCE NEXT TIME TO AVOID UNNECESSARY FRUSTRATION.



10

SMART JOURNEY NOTIFICATIONS

FALL ASLEEP AND MISS YOUR STOP? OR SIMPLY TOO ENGROSSED IN YOUR NEW BOOK OR GAME? GET SMART PHONE NOTIFICATIONS FOR YOUR TRANSFERS AND STOPS.

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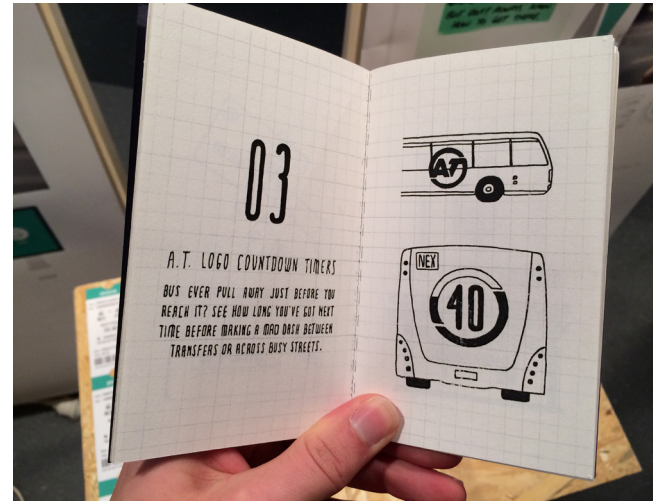
03
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NEX
40


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SAVE ON FOOD
25c OFF
FOR EVERY 3-STAGE TRIP ON PUBLIC TRANSPORT

DASHBOARD SCREEN

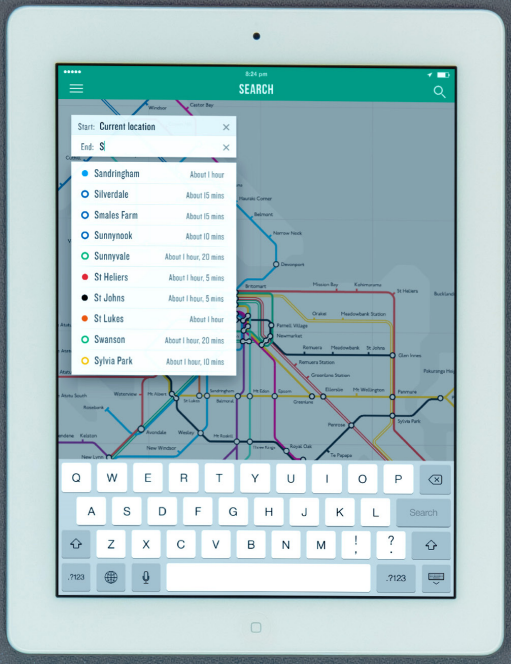
SEARCH SCREEN

ROUTE OPTIONS SCREEN

ROUTE INFO SCREEN

ACCOUNT SCREEN


GEORGE
Username
Password
Sign In


SEARCH
Start: Current location
End: S
Sandringham About 1 hour
Silverdale About 15 mins
Smales Farm About 15 mins
Sunnynook About 10 mins
Sunnyvale About 1 hour, 20 mins
St Heliers About 1 hour, 5 mins
St Johns About 1 hour, 5 mins
St Lukes About 1 hour
Swanson About 1 hour, 20 mins
Sylvia Park About 1 hour, 10 mins


OPERATOR
Start: CONSTELLATION STATION
End: SANDRINGHAM RD
NEX
249
Adult 4 Stage
$5.40
REMEMBER TO TAG ON/OFF PER SERVICE
Date: FRIDAY 01 NOV
Time: 08:30
Scan barcode at kiosk for repeat purchase


GEORGE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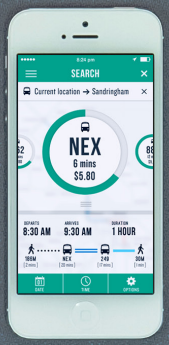
10 WAYS TO IMPROVE THE PUBLIC TRANSPORT USER EXPERIENCE
BY NICK HAYES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MODE ICONS
MAP SCREEN
MAP SCREEN (GAUSSIAN BLUR)
FREQUENT LINES
Sílvia Line
Jasper Line
Ezra Line
Felix Line
Eden Line
Oscar Line
Brooke Line
Madison Line
Pippa Line
Scarlett Line
Thalia Line
EXPRESS LINES
Pippa Express
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HEADER TEXT
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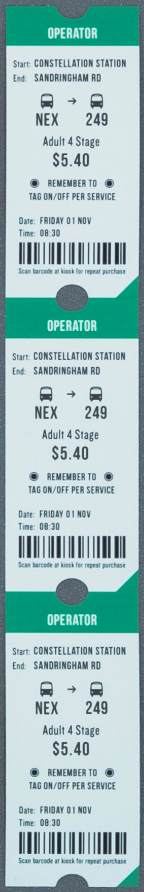
NAVIGATION ICONS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TICKET MOBILE DESKTOP / WEB KIOSK

GEORGE

DISCUSSION

05

EVALUATION & VALIDATION

NOVEMBER

DESIGN VALIDATION

Following the completion of the practical component of this research project, I sought to obtain validation and evaluation of the design outcome in the twelfth, and final, action research cycle. During this time there were several opportunities to present my work to experts within the field of public transport. The first opportunity was at the end-of year exhibition, where I invited the industry experts I had been in contact with over the course of the project. Shortly after this, I attended a 2-day interactive course in network planning, hosted by U.S. transit consultant Jarrett Walker. Following the completion of the 2-day workshop, I had the opportunity to present my final body of work to Jarrett and a number of his colleagues from MRCagney. The general response from both groups (Auckland Transport and MRCagney) was overwhelmingly positive with significant support shown for the overall concept. Having worked on the design of Auckland's new network from a high 'altitude' or network level of thinking, they liked that I had taken the opposite approach and had chosen to focus on the psychological/emotion aspects of using public transport.

Positive feedback was given around the concept of personalising transit information whilst maintaining the sense of being part of the larger network. In response to the driving insight of the project - 'people tend to know where they're going but don't always know how to get there' - they responded with an equally as powerful and revealing insight - 'people tend to know where they're going but don't always know where they *can* go'. This was a key objective in the design of both the network map and the GEORGE system - to show users their freedom of movement within Auckland under the new network - which was well received by both groups of industry experts.

NETWORK MAP

An aspect of the design they found particularly valuable was the digital network map, with its ability to respond dynamically to show specific information based on the user's journey plans. Regarding the rationale of the network map simplification, it was suggested that the merging of several lines was in fact not necessary, as users rarely look at an entire map when considering a specific destination point. The merging of lines could also create a false sense of simplicity, given that users may assume they can catch a single service for the entire length of a line. Because of the dynamic and interactive nature of the map, it was suggested a better option would be keep the line colours closer to the original map, then remove unnecessary complexity once the user had entered their destination into the search engine.

Where they saw potential for the map to be enhanced was the ability to overlay the network map schematic and geographic imaging (such as that of Google Maps), allowing users to toggle between the two when they require more specific geographic information or detail, such as the location of a particular bus stop, for example.

GEORGE SYSTEM

Positive feedback was given around the clarity and detail in which user-facing information was displayed across the entire GEORGE system. They felt GEORGE was a highly approachable and engaging system - something that their current customer-facing services were not.

In response to the naming of the system (which was placeholder), one industry expert suggested renaming it 'ROBBIE', after Sir Dove Myer Robinson - Auckland's longest-serving mayor, and visionary leader behind the 1972 Rapid Rail Transit Plan (ref).

A point that was collectively agreed upon was that in order for a system like GEORGE to work, the network would first have to operate at a high level of accuracy and provide reliable service - this was the first of the '5 principles to delivering better service experiences' I had identified in the opening pages of the 'Here's An Idea' booklet. Comments were made regarding the potential of a system like GEORGE in a much wider, international context in cities with well-established public transport networks such as London, Hong Kong and Tokyo.

Perhaps the best form of validation and feedback was not that of industry experts but by the general public at the end-of-year exhibition. Many of the people at the exhibition were regular public transport users and expressed both their frustrations with current solutions, as well as strong enthusiasm and support for a solution like GEORGE.

BOOKLET OF IDEAS

The response to the booklet of ideas was very positive, with many of the ideas featured referred to as highly useful, practical and achievable from an implementation perspective. From my observations, many of the ideas in the booklet resonated with industry experts, creating a very obvious sense of enjoyment in response to not only the ideas but also the style in which they were illustrated. This demonstrated the success of the illustration style in engaging the user/reader, which would likely increase the chances of the users responding with their own ideas in the rear, blank pages.

PAPER TICKET

The consistency of the design carried across from the digital solutions to the physical paper ticket was well praised. A particular aspect praised was the opportunity I had taken to utilise the back of the ticket to display the user's journey/route information. Collectively, we agreed there was latent potential for the reverse side of paper tickets to better utilised, and that the display of journey and context specific information was a strong idea. However, from a technical perspective, it was noted that current ticketing machines capable of dispensing disposable RFID paper tickets were not able to print information onto tickets in-situ; technological developments over the next 2-3 years would allow for this.

REFLECTIONS

INDUSTRY ENGAGEMENT

One of the most challenging aspects of this research project was the engagement (of lack thereof) with outside industry. Although I was successful in establishing an on-going communication with industry experts from Auckland Transport and MRCagney, the irregularity or infrequency of these communications and engagements impacted the speed at which I was able to move the project forward. Further to this point, the number of expert interviews conducted was much less than originally intended or planned. Had I secured more interviews earlier in the research, from a broader range of experts, my understanding of the research context at a deep level would have developed at a much steadier pace.

Of the few engagements I was able to successfully establish with industry experts, the outcomes of these engagements were often dissatisfying or underwhelming due to a lack of criticality to the work presented. The difficulty in receiving constructive, critical feedback often lead to stagnant periods in the project's development, as a result of my personal uncertainty in the project's development or overall direction.

Upon reflection of these engagements, much of the unresponsiveness to the work presented can be attributed to the lack of purpose or agenda I assigned to each of these meetings. In most cases, the purpose of each meeting was to gain support or validation of the project's direction or development, however this intent was not always clearly demonstrated through the presentation or communication of the work.

In comparison, I received a much greater response and level of criticality towards the end of the project when presenting and communicating the resolved collection of work in a clear and concise manner.

As a personal reflection on industry engagement, the pace at which the project developed was largely due to the enormous complexity of the topic, combined with my lack of confidence in pursuing a project direction without first gaining validation or support from industry experts; it was this indecisiveness and indecision that was perhaps the most critical aspect impeding the project's development.

REFLECTION ON METHODOLOGY

The success of this practice-based research project can be largely attributed to the effectiveness and appropriateness of the methodology applied. The overarching research methodology informing this project was action research, supported by human-centred design and service design frameworks. Action research has shown to be an effective research methodology where the final outcome of a design project is undefined or unknown (O'Brien, 2001). The nature of this project was highly explorative and experimental, and a significant amount of the year was spent narrowing the focus of the project into a manageable and well-defined set of outcomes. The iterative and reflective nature of action research allowed me to critically assess the outcomes of each cycle and reframe or refocus the project through the actions of subsequent cycles.

Given the highly iterative nature of human-centred design and service design, these critical frameworks aligned well with the overarching methodology of action research. The methods employed by these frameworks ensured the constant development of research insights and design responses, which enabled the project to maintain constant forward momentum.

Despite the typically linear pattern followed by human-centred and service design frameworks, where the process of ideation and creation follows the process of exploration and understanding (IDEO, 2011), in practice I found these processes coincided and informed one another throughout the entire research and design process.

"HOW CAN A BOTTOM-UP, USER-CENTRED APPROACH TO AUCKLAND'S NEW PUBLIC TRANSPORT NETWORK CREATE EMPATHIC SERVICE EXPERIENCES FOR ITS USERS?"

DISCUSSION

The nature of this practice-based design research project has been highly explorative and experimental. Beginning with a well-defined and manageable product orientated project, the scope of the enquiry quickly expanded to encompass a much broader and complex topic. Particular attention should be drawn to the multifaceted complexity of the topic of public transport, and the challenges presented to the researcher when navigating and engaging within such a diverse field. This masters research project has produced a broad range of learning outcomes, including academic, practical and personal, through the application of an empathic, user-centred approach to the research context.

The outcome of this practice-based research project is multi-faceted; at the very least, the research and practical body of work presents a thought-provoking enquiry into the topic of public transport through the lens of empathy. Beyond this, the project presents a convincing, engaging and well resolved public transport journey planning and placemaking solution through the design of the GEORGE system. The validity and value of this outcome has been supported by multiple sources of critical feedback and evaluation. Although conceptual in its present form, the potential for further development of the GEORGE system is significant, and it is the intention that development of this project will continue beyond the completion of this masters research degree.

Following the completion of this practice-based research project, a conclusion can be made in response to the research question. The initial hypothesis developed early in the research was that Auckland's new public transport network had been designed from a 'top-down', system/network level of thinking, without first deeply understanding the needs of its users. By applying an inverse, 'bottom-up', user-centred approach to the research context, I sought to understand the issues and complexities associated with a connective service network by developing a deep level of empathy for its users.

The final design outcome and body of work presented represents the manifestation of a user-centred, design-led approach to the topic of public transport within the Auckland context. In developing a response to the research question, it is perhaps of greater importance to consider not only the evaluation and validation of industry experts, but that of the general public - the real world users of Auckland's public transport network. The enthusiasm shown towards the project's final outcome reveals the importance of developing an understanding for users at a much deeper level in order to deliver product or service experiences that are truly empathic to its users.

The conversation of public transport is an ongoing and ever increasingly important discussion to be engaging in, particularly in the Auckland context. Through this thesis, I have demonstrated the importance of considering the deeply held needs and desires of public transport users in creating service experiences that are empathic to users and put people at the centre of the experience.

FINAL EXHIBITION

REFERENCES

Adaptive Path. (2013). *Adaptive Path's Guide to Experience Mapping.* Retrieved from http://www.adaptivepath.com/ideas/our-guide-to-experience-mapping/

Auckland Council. (2012). *The Auckland Plan.* Retrieved from http://theplan.theaucklandplan.govt.nz/

Auckland Council. (2012). *Chapter 13: Auckland's Transport.* Retrieved from http://theplan.theaucklandplan.govt.nz/aucklands-transport/?resetfont=yes

Auckland Council. (2012). *Strategic Bus Overview.* Auckland: Auckland Council.

Auckland Transport. (2013). *Auckland's New Network for Public Transport.* (Southern Network). Auckland: Auckland Transport.

Auckland Transport. (2010). *The Northern Busway.* Retrieved from http://www.aucklandtransport.govt.nz/improving-transport/completed-projects/RapidTransit/Pages/TheNorthernBusway.aspx

Auckland Transport. (2013). *A big boost for ferry patronage.* Retrieved from http://www.aucklandtransport.govt.nz/about-us/News/LatestNews/Pages/A-big-boost-for-ferry-patronage.aspx

Auckland Transport. (2013). *Northern Express Bus Timetable.* Retrieved from http://www.maxx.co.nz/media/5939/northern%20express_may%202011%20web.pdf

AUTEC. (2012). *Ethics Knowledge Base.* Retrieved from http://www.aut.ac.nz/research/research-ethics/ethics

Britomart. (2013). *About Britomart.* Retrieved from http://www.britomart.org/about-britomart

Collins, H. (2010). *Creative Research: The Theory and Practice of Research for the Creative Industries.* Switzerland: AVA Publishing.

Compton, H. (2011). *Product Analysis and Evaluation.* Retrieved from http://ebookbrowse.com/product-analysis-and-evaluation-pdf-d109411711

Creswell, J. W. (2006). *Designing and Conducting Mixed Methods Research* (2nd ed.). California: Sage Publications.

De Leuw, Cather & Company. (1965). *De Leuw Cather Report.* Retrieved from http://transportblog.co.nz/2011/12/02/an-auckland-that-could-have-been-the-1972-auckland-rapid-rail-transit-plan/

Dearnaley, M. (2013). *Fewer stops the price of untangled bus network.* Retrieved from http://www.nzherald.co.nz/aucklander/news/article.cfm?c_id=1503378&objectid=11094150

Designing With People. (2012). *Methods.* Retrieved from http://designingwithpeople.rca.ac.uk/methods

Geraci, J. (2011). *Microtransportation is the Future of Getting Around Cities.* Retrieved from http://johngeraci.com/blog/2011/01/microtransportation-is-the-future-of-getting-around-in-cities/

Gray, D. E. (2009). *Doing research in the real world.* London: Sage Publication.

Greater Good. (2013). *Approach.* Retrieved from http://greatergoodtest.com/approach/

Groundwater-Smith, S. (2009). Action Research. Educational Action Research (17:3). 479-481. DOI10.1080/09650790903088037

Hustwit, G. (Producer & Director). (2011). *Urbanized* [Documentary Film] London: Swiss Dots.

IDEO. (2011). *Human-Centered Design Toolkit.* Retrieved from http://www.ideo.com/work/human- centered-design-toolkit/

Institute of Design at Stanford. (2011). *Design Methods - Brainstorming.* Retrieved from http://e145.stanford.edu/upload/handouts/brainstorming.pdf

Jacobs, J. (1961). *The Death and Life of Great American Cities.* New York: Random House.

Kenworthy, A. (2013, March 25). Plan A: Creating the World's Best City. *Element Mazagine NZ, 3,* 16-24.

Lowrie, M. (2013). *Happy 10th Birthday Britomart.* Retrieved from http://transportblog.co.nz/2013/07/07/happy-10th-birthday-britomart/

Lowrie, M. (2013). *Northern Busway Success.* Retrieved from http://transportblog.co.nz/2013/09/23/24344/

Matthews, L., Imran, M. (2010). *Discursive Barriers to Sustainable Urban Transport in Auckland.* Retrieved from http://www.planning.org.nz/Folder?Action=View%20File&Folder_id=185&File=Matthews_Imran.pdf

Mees, P., Dodson, J. (2001). *The American Heresy: Half a Century of Transport Planning in Auckland.* Paper presented at the NZ Geographical Society/ Australian Institute of Geographers conference, Dunedin, New Zealand.

O'Brien, R. (2001). *An Overview of the Methodological Approach of Action Research.* Retrieved from http://www.web.ca/robrien/papers/arfinal.html

Oxford Dictionaries. (2013). *Definition of Liveable in English.* Retrieved from http://www.oxforddictionaries.com/definition/english/liveable?q=liveable

Polaine, A., Lovlie, L., Reason, B. (2013). *Service Design: From Insight to Implementation.* Brooklyn, NY: Rosenfeld Media.

Popova, M. (2010). *Bill Moggridge, Designer of the First Laptop, on Human-Centered Design.* Retrieved from http://www.brainpickings.org/index.php/2013/06/25/bill-moggridge-debbie-millman-brand-thinking/

Reid, N. (2011). *An Auckland that could have been: the 1972 Auckland Rapid Rail Transit Plan.* Retrieved from http://transportblog.co.nz/2011/12/02/an-auckland-that-could-have-been-the-1972-auckland-rapid-rail-transit-plan/

Samalionis, F. (2010). *Can Designers Help Deliver Better Services?* Retrieved from http://www.ideo.com/images/uploads/news/pdfs/Can_Designers_Help_Deliver_Better_Services.pdf

Scoop. (2003). *World class travel for Britomart Users.* Retrieved from http://www.scoop.co.nz/stories/AK0307/S00040.htm

Service Design Network. (2013). *What is service design.* Retrieved from http://www.service-design-network.org/intro/

Somekh, B., Noffke, S. (2003). *Action Research* (pp. 89–96). Retrieved from http://www.sagepub.com/upm-data/9738_035889ch10.pdf

Stickdorn, M., Schneider, J. (2010). *This Is Service Design Thinking.* Amsterdam, The Netherlands: BIS Publishers.

Swann, C. (2002). Action Research and the Practice of Design. *Design Issues, 18*(1), 49-61. Retrieved from http://www.jstor.org/stable/1512029

The New Zealand Herald. (2013). *Editorial: Britomart top example of getting things right*. Retrieved from http://www.nzherald.co.nz/opinion/news/article.cfm?c_id=466&objectid=10895099

United Nations. (2011). *Urbanization.* Retrieved from http://www.un.org/en/development/desa/population/theme/urbanization/index.shtml

Walker, J. (2013). Abundant Access: *Auckland's Network Plan and the CBD.* Auckland: Jarrett Walker, MRCagney.

Walker, J. (2012). *Auckland: how network redesign can transform a city's possbilities.* http://www.humantransit.org/2012/10/auckland-how-network-redesign-can-transform-a-citys-possibilities.html

Walker, J. (2012). *Human Transit: How Clearer Thinking about Public Transit Can Enrich Our Communities and Our Lives.* Washington: Island Press.