Wayfinding the New Cycleways

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ABSTRACT

Cycling in Hamilton is on the rise. Many people are jumping on their bikes to explore their neighbourhood and city for the first time in many years. This trend has been supported by a Biking Plan, the increase of connected cycleways, improved cycling facilities and the education and promotional programmes that Hamilton City Council are actively doing.

One crucial component that can tie the cycling infrastructure together in Hamilton is wayfinding, which is concerned with connecting people to the infrastructure and destination. Without a cohesive wayfinding system, the work involved in building cycle infrastructure is undermined by potential users either not knowing where they are, or how the network is connected.

Austroads has recently given credence to the importance of cycle signage and wayfinding in detail, and Christchurch City Council subsequently produced one of the most comprehensive best-practice framework in Australasia. An emerging knowledge base can be found in the region, with the potential to build on this to create comprehensive frameworks for New Zealand's towns and cities.

The aspect that is often overlooked is the user-experience for the designers that are undertaking the planning or design work. The methodology for undertaking a wayfinding exercise varies, however by agreeing to milestone-based workflow, the designers have certainty in the design process, its review steps and its outcome. Improving the user-experience for designers means less time understanding what to do and use more time doing the design which ultimately benefits both the design team and the end-users.

AECOM's designers worked with transport planners from HCC to develop designer-friendly tools, with the aim to consolidate the knowledge of existing written frameworks and present them in a graphical manner that can be easily referred to. This paper will focus on the background and the process for developing the draft HCC Cycle Wayfinding Manual, which is currently at a draft stage. The paper will discuss the used of cross-disciplinary thought processes for problem solving and how this formed the basis for a package of work that complement the traditional written document, while increasing ease of use, clarity and efficiency in the wayfinding process and ultimately controlled the risk of undertaking a new task in a city.

BACKGROUND

Navigating through a journey is a complex task for people who are unfamiliar with their environment. This applies to those that visit new places, looking for specific locations or using a different transport mode through the city. Wayfinding underlines the ability for people to navigate throughout a journey.

A good wayfinding system takes visual, spatial and experiential elements into the user-experience of the journey. The wayfinding context of this study is specifically aimed at cycling journeys. This poses a range of considerations for the wayfinding system that is different to motor-vehicle travel and pedestrian trips. However fundamentally, the function of the wayfinding system needs to guide the people that cycle to places where they would like to go.

Wayfinding is a holistic approach to showing people where to go in a given environment. The concept is broader than street signage and road markings to also include other visual, spatial and experiential elements into someone's journey.

The wayfinding component is an integral part of Hamilton City Council (HCC)'s vision to create a 'Bike Friendly City'. It is identified as an action in the "Biking Plan 2015-2045". However a brief analysis of the available resources for aiding cycling wayfinding showed minimal guidance for this component.

This lead our team to conduct a study to position cycling wayfinding into the context of a cycling project, understand the local regulatory requirements, and to design a range of processes, tools and procedures based on best-practice to aid the wayfinding implementation in Hamilton for cycling.

An overview of the TCD and MOTSAM documents contextualised the cycling signage within the New Zealand regulations. However, both NZ Manuals do not have enough considerations on cycle wayfinding signage and therefore both discretion and reference to supplementary guidelines is recommended. For example the City of Christchurch Bicycle Network Sign Design Manual and Austroads reference documents are required in order to standardise wayfinding signage.

PROJECT METHOD

The ultimate goal of this project is to put up cycle signage on the streets of Hamilton, and the starting point is a goal in the "Bike Plan" and an outdated Walking and Cycling Signage Manual. This scope to achieve the end goal is broad and contains many unforeseeable risks to the project if the tasks are not planned appropriately. This paper is focusing on the processes of formulating the design guidance; therefore the reference to "project" captures the formation of the design guidance.

The project structure was underlined in a mixture of iterative design processes, scalable prototyping and modular agile sprints.

The combination of these project management styles formulated a methodology that broke the tasks down into small portions with the aim to achieve specific outcomes. The iterative design features were guided by a series of agile sprints, a style of project management popularised in the tech industries. These sprints are set up as time-based tasks where the project team had a set amount of time to solve the problem. However the outcomes of these sprints are not designed to be a comprehensive answer, but a prototype to showcase the

principles of a solution. Through the time-constraint sprint process, designers are forces to make and record assumptions while actively seeking and testing the pathway to something that works. Modules of these sprints were conducted where the design team would produce the prototype, reflect on the results and then build on the previous revision to form a more comprehensive answer to the design problem.

The departure from the traditional method is the time constraint. A standard approach would be to provide an answer with a level of accuracy over a period of weeks, the modular agile sprints produced a series of prototypes over the course of a week each more comprehensive than the last. This process accelerates the iterative design process by focusing on the outcomes and outputs and therefore provide a series of could-be answers before emerging with a comprehensive answer.

Steps were taken to actively produce graphical elements to support the writing. The design team focused on portraying the knowledge base of existing manuals and guidance documents through flow charts, charts, tables and diagrams. This step was aimed to facilitate a different way for people to consume knowledge. The value of written knowledge can never be undermined; however the graphical work compliments the written work. The graphical work provides the first-time users overviews of the knowledge before focusing on explaining the knowledge in detail. This provides users a point-of-reference for undertaking the tasks, clarifies the processes, identifies the milestones and also shows the cross-relationships between different aspects of knowledge.

DESIGN OUTPUT

The project intention is to develop the design guidance that can support the cycle signage rollout. This means an understanding of current knowledge base, identifying the key process logic and the gaps in knowledge for the local context. A Workflow chart was developed; a draft scheme design procedure was set up and a series of signs were designed. It was then applied to the wayfinding design of the route. The findings are used as improvement indicators for the next iteration of the development before finalising the guide.

The project established the key project-lifecycle milestones within a cycling wayfinding project. This led to the process of the wayfinding task being considered from project-inception to sign manufacturing, installation and maintenance. The findings were presented visually in a flowchart for ease of use. More importantly, the chart shows the relationships between major milestones within the project and provides guidance on the progress forward.

The wayfinding framework was mapped into a flowchart based on the current understanding of cycling wayfinding implementation. The aim was to identify a range of key milestones in the wayfinding process. These milestones are based on local requirements and also what was suggested in other similar guidance documents.

Six sequential milestones have been identified:

1. Project Inception

2. Data Collection

3. Design Phase

4. Review

5. Stakeholder Engagement

6. Implementation

This Workflow provides the basis for the development of the framework. The draft showed a range of knowledge and process gaps within the current cycling wayfinding lifecycle, such as existing assessment criteria, design tools or the engagement process. For confidentiality reasons a draft is not able to be included in this paper; however a printed copy will be available at the conference. A procedure to aid schematic design was developed. This procedure forms a crucial part of design development for signage along a given route. Steps were developed to assist with data capture and route analyses, these were summarised in a Cycling Signage Scheme Design Procedure document.

DESIGN TESTING

The workflow and the procedure hypothesised in the prototyping phase requires a level of validation for it to be fit-for-purpose. This can be done through a reference to best practice review or, for real impact, test it with a real project as a case study.

A route was picked in Hamilton. This route requires cycle wayfinding as a part of the Bike Plan and it was the chosen candidate to become the case study for the design team to apply the design workflow and the procedure to.

Desktop case studies were conducted on the chosen route, with the primary purpose of simulating live cycling wayfinding projects. This used the hands-on experience to gauge the merits and deficiencies of the workflow chart and schematic design procedure proposed in this study. These case studies also revealed a range of knowledge gaps within the current processes, and recommendations were made to address these if holistic cycling wayfinding is to be achieved.

Draft guidance tools were produced in this this stage, although further iterations are required to address the current deficiencies identified in case study. The iterative-design process of this study does show however, that the proposed process logic for developing cycling wayfinding is effective in principle. For example, both case studies showed that the processes in its current iteration were able to guide two different route designs through high-level planning work and yield signage schedules based on a desktop study.

A key innovative component within this process that added value to the design output was the integration and assimilation of graphic-design principles. Displaying information visually through use of tables, figures and diagrams was prioritised over the written words at this early development stage. Case studies into different routes showed an improved experience for designers to quickly understand and utilise the information.

Below, figure 1, is an example of a table created to outline and explain the different signage classifications and abbreviations used within the document.

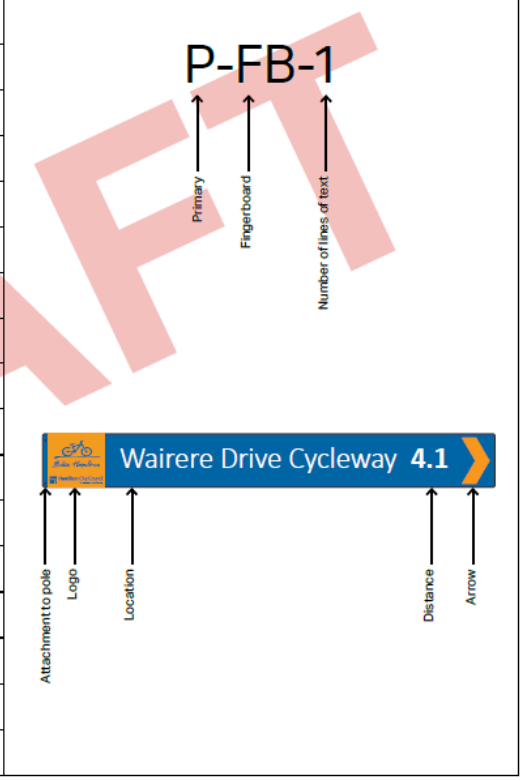
Signage Classification	Abbreviation	Meaning	Description	Example
	P	Primary	Primary cycle route	
	S	Secondary	Secondary cycle route	
	T	Tourist	Tourist/recreational cycle route	
	M	Markings	Shared path markings on path	
	R	Regulatory	Regulatory signs	
	FB	Fingerboard	Fingerboard signs	
	AD	Advanced	Advanced direction signs to be used before intersections or at junctions	
	RD	Reassurance	Reassurance signs to be used as confirmation on long linear stretches of path	
	LP	Location plate	Location plates that confirm the identify of the current location	
	ES	Entrance sign	Mark the start/end of the route	
	M	Medium	Medium sized sign	
	L	Large	Large sized sign	
	H	Horizontal	Horizontal orientation of sign	
	V	Vertical	Vertical orientation of sign	
	PN	Path name	Name of the shared path or cycleway	
	C	Circle	Shape of the sign	
	SP	Shared path	Path type	

Figure 1

Tables were also created to show the different signs used throughout the route and their classifications. These pages could then be used to refer directly to plans and gain a clear understanding of sign types used along the route, example shown below, figure 2.

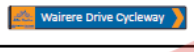
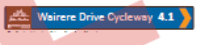
	Type	Abbreviation	Description	Example	CCC Cross Reference
Secondary	Fingerboard	S-FB-1	Secondary route, one line, arrow Fingerboard layout		FBL-1
		S-FBR-1	Secondary route, one line, route number, arrow Fingerboard layout		-
		S-FB-2	Secondary route, two lines, distance, arrows Fingerboard layout		FBL-2
Tourist	Fingerboard	T-FB-1	Tourist route, one line, arrow Finger board layout		FBT-1
		T-FB-2	Tourist route, two lines, distance, arrow Finger board layout		FBT-2
Markings	Path name	M-PN-C	Path name ground marking, custom text, arrows Path marking layout		-
Regulatory	Shared Path sign	R-SP	Legal signs Refer to MOTSAM + TCD		-

Figure 2

OUTCOMES

Several case studies were created to follow through the workflow and procedure outlined above to test the application of the step process on an existing cycle route. This included desktop assessment of existing route infrastructure, matching wayfinding types to intersections and producing an estimated schedule for sign types.

The outcomes of this scalable process meant that the conclusions and assumptions for each prototype phase were reflected on in a timely manner. These iterative reflections built the basis for improvements for the next step. The output discussed above went through around ten prototypes before emerging as the product written here. The improvements for the iterations were recorded and the testing was conducted with a real project therefore validating its application.

The seemingly minor graphical improvement to this project appeared to be underwhelming in discussion. However considering the knowledge-consumer nature of the planners and designers that will be undertaking the task, the minor improvements add up to a clearer and more straight-forward task direction. This improved user-experience for the designers, clarifies the task completion process, outlines the steps and milestones they will encounter along the way and finally provides them with a cross-referenced knowledge base for further information.

A key outcome for this project was the risk management. The broad task of setting up a design guidance to facilitate the planning and design of cycle signage implementation is daunting. One can spend considerable time and funding on developing a product outcome that may or may not be applicable to the task. The utilisation of aspects of agile project management thinking shaped the project to produce many incremental product outcomes within short periods of time. The product at each increment was checked with the project stakeholders to ensure the pros and cons were clearly documented before producing the next iteration. The process meant the stakeholder had clearer foresight into the final outcome of the guidance and tools for cycle wayfinding before the final product takes shape. This mitigates risks from ambiguity, outcome direction, financial and scope creep.

The overall outcome at the time of writing is a positive one. The stakeholders are a part of the journey for the guidance taking shape and they can see the body of knowledge grow with the passing design iterations. This was a positive outcome and working experience for all parties involved.

CONCLUSION

This paper has outlined thought process and practical steps for formulating a framework and design guidance for lifecycle implementation of cycle wayfinding signage within Hamilton's cycling network. The wayfinding component facilitates HCC's vision to create a 'Bike Friendly City' and complete a fully connected biking network within the next 30 years.

Wayfinding, when designed appropriately, will aid the development of the cycle network by improving the usability and legibility for existing and potential cycle users. It will therefore increase the participation for cycling in the city; however the role which the designers have

within the planning and implementation process is crucial. The project approach of developing tools to benefit the people that plan and design the wayfinding is grounded in the archival research into the regulations and literature review of the best practice. This ensures that the user-experience element of this project is met with the regulatory credibility that it deserves.

New Zealand signage requirements are outlined in the TCD and MOTSAM documents. However, both Manuals do not have enough considerations for cycle wayfinding signage and therefore both discretion and reference to supplementary guidelines is recommended. For example the City of Christchurch Bicycle Network Sign Design Manual or Austroads reference documents are required in order to standardise wayfinding signage.

The workflow, the processes and diagrams produced in this project are aimed at the designers who will be ultimately undertaking the wayfinding work.

The guidance tools produced in this project are drafts-only, as further iterations are required to address the current deficiencies. This paper does show however, that the proposed process logic for developing cycling wayfinding is effective in principle. The case studies showed that the processes in its current iteration were able to guide two different design studies to completed schematic designs and yield signage schedules based on a desktop study.

This paper also outlined the project management consideration for a project like this and risk mitigation can be developed through cross-disciplinary thinking. In conclusion, the content within this paper outlines the working processes and project considerations for the first few design iterations of the cycling wayfinding framework for Hamilton City Council.

REFERENCES

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