CAMBRIDGE PATHWAY PROJECT

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ABSTRACT

In response to the growing need for resilient, future-ready transport infrastructure, Waipā District Council has undertaken the Cambridge Pathway project—an ambitious initiative to enhance active mode connectivity and urban mobility in Cambridge. Supported by NZ Transport Agency Waka Kotahi through the Climate Emergency Relief Fund - Transport Choices initiative, the project delivered a 2.5km network of protected cycleways and upgraded footpaths, linking key destinations including schools, the Central Business District, and the Te Awa River Ride.

This paper presents the design philosophy and strategic planning underpinning the project, which integrates CROW-based design standards, Safe System principles, and catchment-based demand modelling. The infrastructure is tailored to support aspirational mode share targets of 10% walking and 20% cycling, with bi-directional cycleways designed to accommodate peak volumes of up to 450 cyclists per hour.

Key design features include kerb-separated cycleways, raised safety platform pedestrian crossings, cyclist priority on road crossings, tree root protection, a 130m long boardwalk over an embankment, and a focus on user comfort and safety. The project also addressed challenges such as constrained road corridors, community concerns over parking loss, and the need for inclusive access. Extensive stakeholder engagement and political support were critical to navigating these complexities.

Catchment studies informed facility sizing, demonstrating that a 3m wide bi-directional cycleway is appropriate for current and projected demand. The project exemplifies how targeted investment, evidence-based design, and community collaboration can deliver high-quality infrastructure within a resource-constrained environment.

The Cambridge Pathway project has resulted in demonstrable increases in active transport, in particular, with students cycling to school and elderly gaining improved mobility. Therefore, it offers a replicable model for improving urban mobility through integrated planning and resilient design to enable sustainable growth. It highlights the importance of proactive, inclusive, and technically robust approaches to future-proofing our transport networks.

INTRODUCTION

Cambridge, located within the Waipā District, is forecast to experience substantial residential expansion, with an estimated 13,456 additional households required by 2050. This growth is shaped by Cambridge's distinctive locality that is characterised by a semi-rural setting, proximity to key transport corridors, and gently rolling topography which presents both opportunities and constraints for infrastructure and transport planning.

Current development areas such as Cambridge Park, St Kilda, and Cambridge North are nearing capacity, prompting the need to activate future growth areas on the west and north-west of Cambridge, specifically the C2 and C3 growth cells (Figure 1).

Structure Plans for these growth cells provide a high-level framework to guide land use and infrastructure provision. They aim to avoid fragmented development and instead promote a cohesive, multimodal transport system from early development stages to influence long-term travel-mode behaviour as population growth increases travel demand. Therefore, high-quality connected cycleways and paths are critical transport infrastructure to support sustainable development and travel for these growth cells.

Figure 1 illustrates the critical active mode paths connecting the western growth cells to Cambridge Central Business District (CBD). The paths have been developed in stages as funding enabled. The Cambridge Pathway project (shown by yellow lines) is the longest section and one of the most challenging and is the subject of this paper.

The Cambridge Pathway project is not only instrumental in connecting the western growth cells to Cambridge CBD, but it also provides a high-quality continuous active mode connection between key destinations. This means residents now have access to 2.5km of safe and legible active mode paths, to encourage mode shift to active travel in Cambridge and make it a normal part of life.

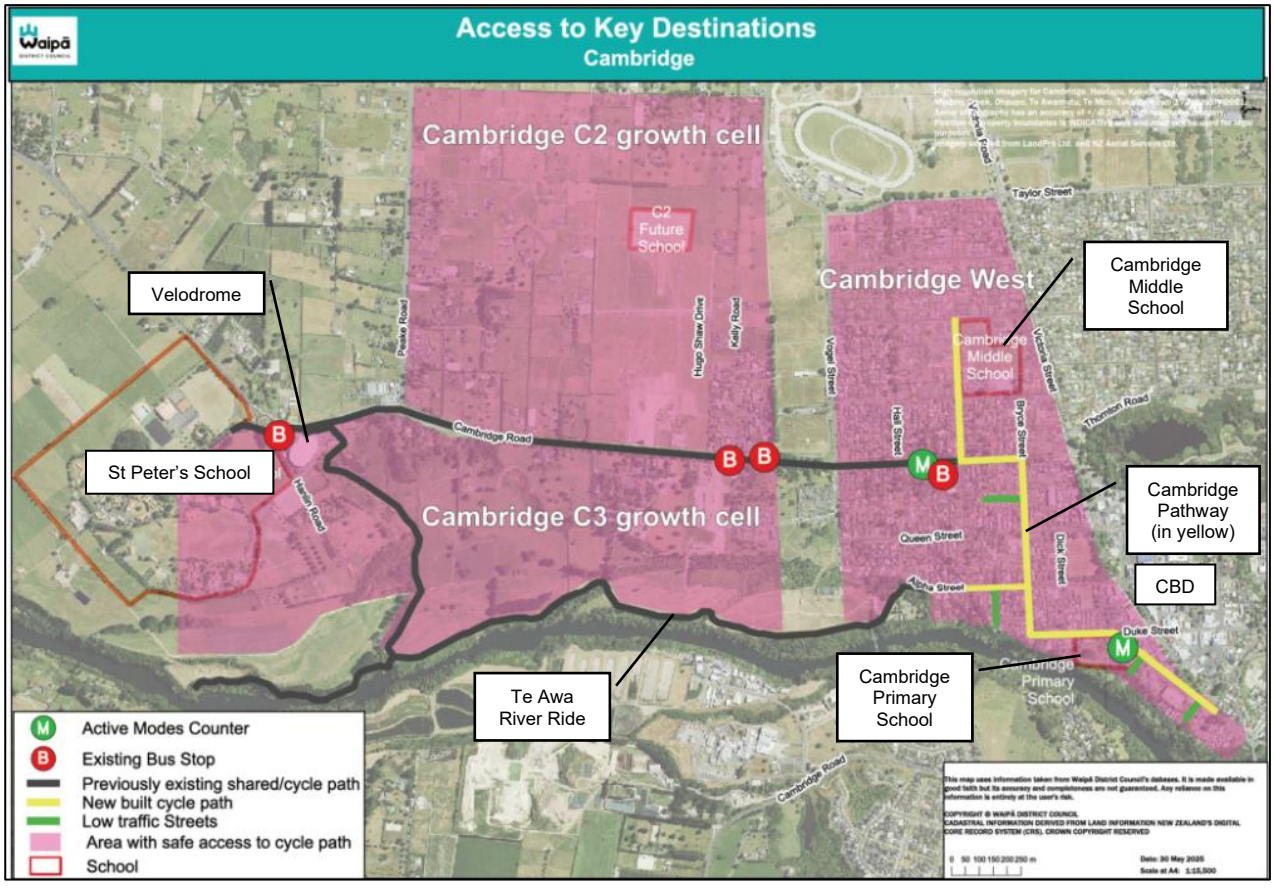

Figure 1: Cambridge Pathway Locality

NZ Transport Agency Transport Choices Programme

The Transport Choices Programme (TCP) was established under the Climate Emergency Response Fund (CERF) to support New Zealand's transition to a low-emissions and climate-resilient future. Its overarching goal is to reduce transport emissions by 41% by 2035 and focuses on enabling people to move around towns and cities in ways that are better for the climate.

The programme provided funding to 20 councils to deliver 31 packages of work that make streets safer and more accessible, encourage active travel, and reduce reliance on cars. Waipā District Council received $10.4 million funding from NZ Transport Agency through the TCP of which approximately $7.2 million was allocated to Cambridge Pathway project. The remaining amount was allocated to Te Ara Rimu – Kihikihi Pathway project.

Cambridge Pathway Project Objectives

- **Connect key destinations**: Link the Te Awa River Ride path with the Hamilton Road cycleway and the Victoria Street high-level bridge.
- **Improve access**: To two schools and the Cambridge CBD.
- **Safety:** Enhance safety through a separated bi-directional cycleway with traffic calming measures and cycle priority at road crossing points.
- **Promote mode shift:** By making cycling and walking more viable and appealing options.

The Cambridge Pathway project involved the design and construction of approximately 2.5km of separated bi-directional cycleway and footpath retrofitted into existing road corridors, including a 130m long by 5m wide timber boardwalk across the steep embankment supporting Duke Street.

The Cambridge Pathway project is a strong case study of how targeted, cost-effective, and community-focused infrastructure can contribute to a resilient, future-ready transport network. It embodies the conference theme by:

Conference Theme	Cambridge Pathway
Resilience & Futureproofing	By promoting active transport, the project reduces reliance on cars, contributing to climate resilience and sustainable urban mobility. It also supports safe school travel, ensuring long-term community benefits.
Efficient Use of Resources	Reallocation of road space to accommodate high-quality active mode infrastructure.
Addressing Infrastructure Deficits	The project filled a critical connectivity gap in Cambridge's active mode network and linking several key destinations.

Table 1: Cambridge Pathway Alignment with Conference Theme

METHODOLOGY

Design Guidance

There are several design guidance documents that offer applicable design treatments based upon user type, posted and operating traffic speed, traffic volumes, interaction with motor vehicles, cyclist volume, intersection priority and network function. This project has generally adopted the guidance provided in CROW-Fietsberaad (2016).

CROW-Fietsberaad (2016) was preferred for designing high-quality, separated cycling infrastructure as it provides detailed and internationally recognised best-practice design guidance tailored to environments with or wanting to achieve strong cycling demand. The guidance offers comprehensive geometric standards, proven intersection priority treatments, and the five core design principles—cohesion, directness, safety, comfort, and attractiveness which are specifically developed for contexts where high user experience is essential.

Although the technical guidance in CROW-Fietsberaad (2016) was adopted for this project, the NZ Transport Agency Cycling Network Guidance was referred to for alignment and compliance with Traffic Control Devices Manual.

Cycle Catchment Studies

Cycle catchment studies were undertaken prior to the Cambridge Pathway project to assess the potential cycle demand along:

- Cambridge Road and Hamilton Road (Bloxam Burnett & Olliver Ltd (2020)); and
- Grey Street to Wilson Street transport corridor (Bloxam Burnett & Olliver Ltd (2022)).

To determine appropriate infrastructure needs, residential catchment areas along the route, as shown in Figure 2 were identified. The number of dwellings in these areas was used to estimate total daily trips using a standard trip generation rate. Then, a range of cycling mode share values was applied to estimate the potential number of future cycling trips that could be generated by the catchment areas accessing the proposed cycling facility.

The studies concluded that a bi-directional cycleway is the most suitable option to achieve Waipā District Council's aspirational cycling mode share target of 20% in alignment with Waipā District Council (2022) Business Case. The Bloxam Burnett & Olliver Ltd (2022) study recommended a 4m wide bi-directional cycleway along Cambridge Pathway, aligning with CROW-Fietsberaad (2016) guidelines, and reflecting an estimated demand of approximately 280 to 300 cyclists per peak hour.

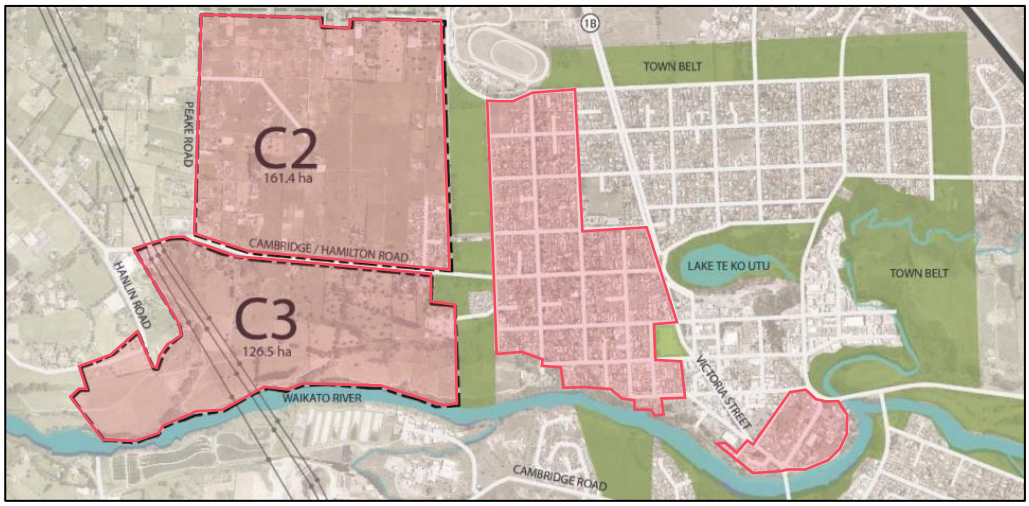

Figure 2: Cycle Catchment Study Areas

One-way path		Bidirectional path	
rush hour volume (one-way) (bicycles/hour)	width (b)	rush hour volume (bidirectional) (bicycles/ hour)	width (b)
0-150	2.00 m	0-50	2.50 m[1)]
150-750	2.50-3.00 m	50-150	2.50-3.00 m
> 750	3.50-4.00 m	150-350	3.50-4.00 m
		> 350	4.50 m

Figure 3: CROW-Fietsberaad (2016) Cycleway Width Guidelines

Preferred Route

A preferred route(Figure 1– yellow lines) was selected for the Cambridge Pathway project, which received strong support from NZ Transport Agency, the Cambridge Community Board, the Governance Group, and formal endorsement from the Waipā District Council's Service Delivery Committee.

The rationale for the preferred route was based on several factors. Using Bryce Street was favoured because it would reduce vehicle speed along the street which benefits the retirement village that gains access off Bryce Street. It also provided the most direct connection between Hamilton Road, Te Awa River Ride, the High-level Bridge, and the CBD.

Duke Street and Wilson Street were also preferred for the route as these streets were previously trialled as part of the Streets for People initiative and performed exceptionally well for pathway users.

Core Design Principles

This project generally adopted the design guidance provided in CROW-Fietsberaad (2016).

- **Cohesion**: The project forms a continuous route linking all identified origins and destinations.
- **Directness:** The project offers the cyclist a route with minimal detours and delay at intersections.
- **Safety:** The project ensures the road safety of all road users.
- **Comfort:** The project offers smooth and safe surfaces allowing cyclists to ride without frequent conflicts.
- **Attractiveness:** The project is designed such that it makes routes appealing, well-lit, and perceived as safe.

Design Features

The following are some design features that were adopted across this project / route to satisfy the core design principles of this project.

- The design adopted a 3m wide bi-directional cycleway throughout the route. This was consistent with the previously constructed Hamilton Road cycleway as well as the Cambridge Road urbanisation project. Although, the width was not aligned with the guidance from CROW-Fietsberaad (2016), it is consistent with the NZ Transport Agency Cycling Network Guidance which identifies a 3m wide bi-directional cycleway as a tolerable minimum width to accommodate two cyclists side by side. Cyclists travelling side by side require a minimum space of 0.875m to 1m each plus 0.25m to 0.5m separation between them as shown in Figure 4. Therefore, the cycleway design width of 3m was still considered to enable high quality human interaction and helps to establish cycling as a preferred mode of transport for short trips. High quality human interaction describes a situation where two cyclists can comfortably ride side by side, socially engaging and immersed in conversation while maintaining a safe separation distance from each other.

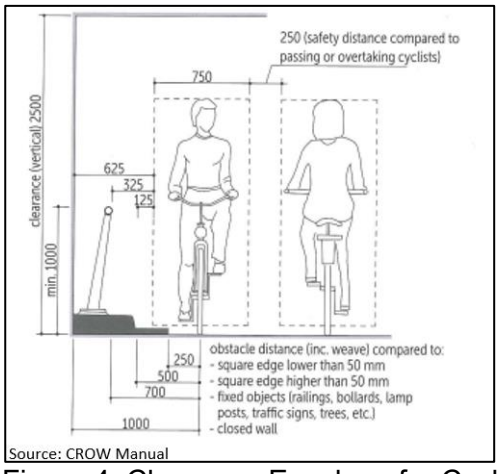

Figure 4: Clearance Envelope for Cyclists

- Existing crossroads intersections (i.e. Bryce Street / Queen Street and Bryce Street / Alpha Street) upgraded to mini mountable roundabouts. The roundabouts provide clarity to drivers regarding rules when navigating a crossroads intersection and they reduce vehicle speeds in all directions. Cyclists and pedestrians are accommodated by providing them protected space, both around the roundabout and on all approaches and exits. Large vehicles (larger than 8 m medium rigid trucks) that rarely use the roundabouts are expected to track over the central island.
- Dual priority crossings were provided on raised safety platforms at intersections. The dual priority creates a continuous path across intersections, prioritising people walking and cycling over motor vehicles. The raised safety platforms slow the speed of turning vehicles, increase visibility to both cyclists and pedestrians, and increase “give-way” behaviour of motorists.
- Intersection corner radii were decreased to reduce the crossing distance for cyclists and pedestrians and manage the speed of turning vehicles.
- Pedestrian and cycle crossings were designed as ‘bent-out’ crossings at intersections, where they are set back from the main carriageway by at least a car length (5m) which enables a car to stop if a cyclist or pedestrian is crossing. Design guidance from CROW-Fietsberaad (2016) was adopted for this element for the following reasons:
    - The guidance is based on the expectation that cyclists have priorities across side roads by default.
    - Bent-out crossings are part of a coherent continuation of the cycleway, often with continuous surface materials, visual narrowing of the side road and tight corner radii.
    - With limited road space available, set back distance will have to be managed. CROW-Fietsberaad (2016) recommends relatively shorter set back distances but still ensuring cyclists can be seen early and positioned where drivers are naturally checking for conflicts.
- Bends along the main cycleway thoroughfare had a minimum radius of 10m which attribute to a design speed of 20 km/h. However, at intersections the minimum radius along the cycleway was reduced to 5m (in accordance with CROW-Fietsberaad (2016)) to create a design speed below 12 km/h to increase reaction time and reduce conflict risk.

Figure 5: Bryce St / Alpha St Intersection

- Physical separation (either kerb with berm buffer or median separator) between new cycleway and adjacent traffic lane / parking. Separation was at least 0.8m wide to allow wheelie bins (refer to Figure 8) and rubbish bags to be placed. This type of buffer element provided physical separation that is safe, attractive and with little long-term maintenance required.

Figure 6: Berm Buffer on Bryce St (Left) and Concrete Median Separators on Alpha St (Right)

- Pedestrian zebra crossings were installed on the cycleway to ensure cyclists gave way to crossing pedestrians.

Figure 7: Cyclists Yielding to Pedestrians on Wilson St by Cambridge Primary School

- New footpaths or any upgrades to existing footpaths had a minimum width of 1.5m which allows a wheelchair and a pram to pass in accordance with NZS 4121:2001 Design for Access and Mobility – Buildings and Associated Facilities.
- Pockets of recessed parallel parking bays were provided where width allows, but parking along road shoulders were generally removed.

Figure 8: Recessed Parking Bays on Bryce St (20 m wide Road Reserve)

- New stormwater infrastructure such as catchpits, soak pits and culvert extensions to be provided to facilitate kerb and channel relocation and accommodate raised safety platforms / intersections.
- Existing trees remained as much as possible. Pruning of trees were carried out to maintain the required lateral and vertical clearances to the paths.
- New cycleway and footpaths were constructed using fibreglass reinforced mesh grating (FRP panels) on wooden bearers direct on ground at localised areas to protect existing tree roots.

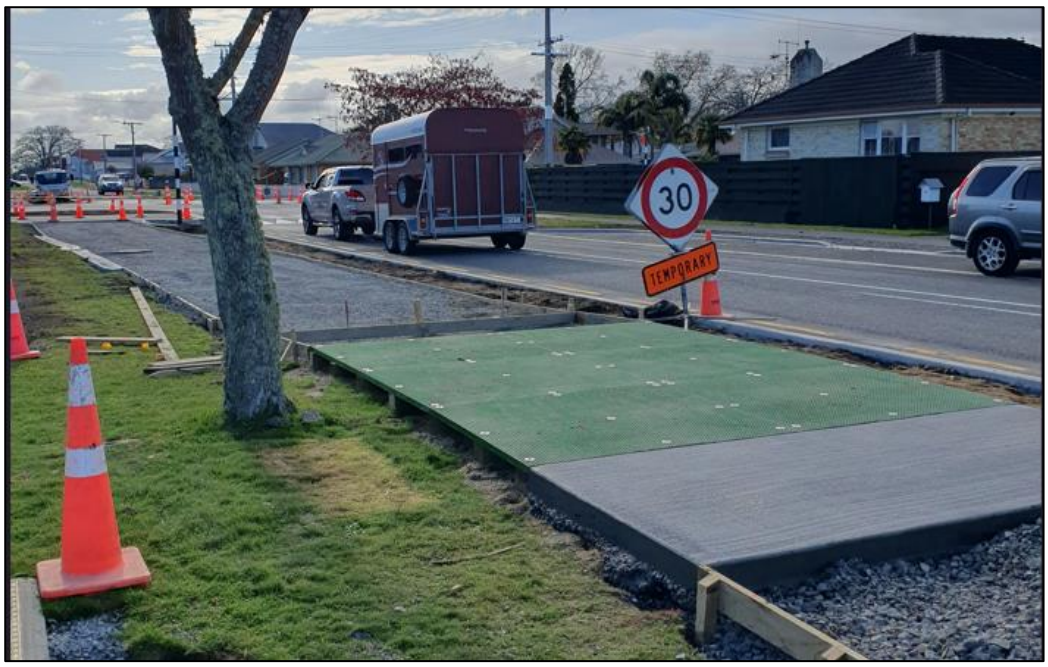

Figure 9: Installation of FRP Panels

- High-use commercial driveways on Wilson Street to the Kindergarten, Council office and library and The Warehouse, incorporated a raised safety platform type treatment raising the level of the footpath and cycleway at the vehicle crossing and providing ramps to reduce vehicle speeds. This improves awareness of cyclists and minimise the risk of cyclists versus vehicle conflicts. The presence of the cycleway and footpath were highlighted using the different coloured surfaces.
- A walking and cycling boardwalk was constructed on the southern side of Duke Street between Bryce Street and Lower Duke Street. This boardwalk was required to provide sufficient space for

a bi-directional cycleway and maintain access for two-way traffic. The boardwalk consisted of a 3m wide bi-directional cycleway and a 1.5m wide footpath protected from the traffic lanes. Cycle rails were installed between the new kerb and channel and boardwalk to prevent any motor vehicles from getting onto the boardwalk and to be forgiving to cyclists. Existing vegetation on embankment were removed, and new planting was provided post-construction.

Figure 10: Constructed Boardwalk (Western End – Left, Eastern End – Right)

Community and Engagement

Extensive consultation and engagement with Cambridge community was undertaken over a three-month period, February to April 2023. The engagement ensured that the Cambridge community and key stakeholders understood the importance of the project, had opportunities to provide feedback, and supported Council's preferred route. Schools and emergency services were consulted and feedback sought throughout the design process.

The consultation phase focused on draft plans before finalizing the route. Feedback was sought through questions such as "What do you think of our proposed plans?", "Have we missed anything?", and "Have you got any other ideas?". The process also helped educate the public on the benefits of urban mobility projects and the bigger picture of creating safer pathways for all.

Engagement was carried out through face-to-face and digital methods. A drop-in session was held on 7 March 2023 at the Cambridge Council office, featuring interactive maps and hard copy surveys. Digital engagement included an online survey that ran from 27 February to 24 March 2023, a webinar on 8 March, and updates through social media, the Council website, and e-newsletters.

Communication tactics included letter drops and direct emails to Tier 1 stakeholders, newspaper adverts in Cambridge News, social media posts, Antenno alerts, signs on Bryce Street showing proposed plans, and media engagement. Regular updates were provided to the Governance Group and Community Board. Consultation and engagement outcomes were reported to the public and Service Delivery Committee in June 2023.

For instance, face-to-face engagement was undertaken with residents on Lower Duke Street who will be directly impacted by the construction of the timber boardwalk. The matured trees that existed pre-construction provided privacy screening from path users into the dwellings on Lower Duke Street. An illustration (Figure 11) prepared by the Project Team helped these residents visualise the final structure and resolved their privacy concerns.

Figure 11: Landscape Architect Illustration of Duke St Boardwalk

KEY CHALLENGES

Existing Specimen Trees

Various mature trees were considered an important part of the local streetscape and environmental character. However, the alignment of the new pathways meant that construction would intersect with the root zones of these trees, creating a risk of damage and long-term decline. To address this, porous FRP panels were installed where the paths crossed over the maple tree roots. This reduced excavation depth, allowed water and air to penetrate the soil maintaining root health while providing a stable surface for the pathway. Refer to Figure 9.

Duke Street Boardwalk

A major design challenge for this project was the section on Duke Street, where continuity of the new cycleway was constrained by a narrow two-lane road flanked by a steep, vegetated embankment on the southern side of the road. Maintaining two traffic lanes was a strong public expectation, leaving inadequate space to provide a separated cycleway. To resolve this, a 5m wide by 136m long timber piled boardwalk was constructed over the embankment. This allowed the existing traffic lanes to remain while creating a safe and continuous path without compromising the dedicated cycleway width.

Figure 12: Duke St Before (Left) and After (Right)

Loss of On-street Parking

The design team carefully optimized the layout to retain as much on-street parking as practicable without compromising the pathway widths. This involved constructing pockets of recessed parking bays, refer to Figure 8.

Public Perception

The Cambridge Pathway project faced several community-related challenges during its delivery. Some residents expressed negativity towards the duration of the construction phase and the inconvenience to adjacent properties. Additionally, traffic delays caused frustration among the public. To address these issues, the project team implemented a proactive communication and engagement strategy throughout the project.

Some residents were not convinced that the pathway infrastructure was necessary and that cyclist should bike on the road. The project team demonstrated that dedicated infrastructure was required and would be well used due to the planned housing growth, and desire for residents to cycle in Cambridge.

PROJECT OUTCOMES

Daily Active Mode Counts of New Facility

Site	Cyclists	Pedestrians
Hamilton Rd	125	109
Wilson St	158	325

Table 2: Daily Average Active Mode Counts – October 2025 (Waipā District Council Data)

No counts were collected pre-construction, therefore, there is no direct comparison to understand the increase in active mode users. However, anecdotally there is an obvious increase in the type of users (i.e. families, elderly, mobility impaired and students).

A mode share study that was undertaken in 2019-20 indicated that approximately 5.8% of users were travelling by active transport modes in Cambridge. Similar studies on a regular basis are expected to be undertaken by Waipā District Council to measure the increase in active mode uptake.

Vehicle Speed Reduction

The following table demonstrates that vehicle speed has reduced throughout the project route due to narrowing of traffic lanes and vertical deflection at all crossing points and intersections. These lower speeds are important for the safety and attractiveness of active mode users, in particular at road crossing points.

Cambridge		
Pre-construction 2022	**Post-Construction 10.03-17.03.2025**	**% reduction**
Wilson St - $V_{85\%}$ =40.2kmh	$V_{85\%}$ =37.8kmh	6%
Duke St - $V_{85\%}$ =45.5kmh	$V_{85\%}$ =29.5kmh	54%
Alpha St - $V_{85\%}$ = NA	$V_{85\%}$ =45.4kmh	-
Bryce St - $V_{85\%}$ =47.8kmh	$V_{85\%}$ =45.4kmh	5%
Clare St - $V_{85\%}$ =45.4kmh	$V_{85\%}$ =40.0kmh	13.5%
Grey St - $V_{85\%}$ =46.4kmh	$V_{85\%}$ =41.0kmh	13%
Williams St - $V_{85\%}$ =49.3kmh	$V_{85\%}$ =49.7kmh	-

Table 3: Vehicle Speed Reduction (Waipā District Council (2025) Report)

Student Active Mode Travel

Cambridge Middle School, and Cambridge Primary School participated in bicycle skills training sessions as part of the TCP. The initiative aimed to enhance students' road safety awareness and practical cycling abilities with 24 students from Cambridge Middle School participating in in Grade 1 (basic skills) and Grade 2 (advanced skills/etiquette), while 180 students from Cambridge Primary School were recorded across two training levels. Cambridge Primary School has installed additional bike and scooter racks to accommodate the increase in active mode travel.

Figure 13: Students from Cambridge Middle School and Cambridge Primary School Participating in Bicycle Skills Training Sessions

LESSONS LEARNT

Rapid Decision Making and Streamline Approvals

The Cambridge Pathway project highlighted several important lessons for delivering fast-tracked infrastructure initiatives. The compressed timeline significantly altered traditional processes, requiring rapid decision-making and streamlined approvals. This was facilitated through strong political, organisational and funding support combined with a procurement approach that reduced approval steps and enabled early contractor mobilisation.

Community Buy-in

Community engagement emerged as a major challenge under time pressure. Limited consultation windows led to perceptions that feedback had minimal influence, underscoring the need for more adaptive and transparent engagement strategies in accelerated programmes. Early and clear communication about project benefits and timelines proved essential for maintaining public trust.

Don’t Underestimate Stakeholders’ Interests

- **Trees**: Stakeholders and the community strongly advocated for mature trees along the project route to remain, emphasizing their environmental and character value to the Cambridge community. Their input influenced design decisions, leading to innovative solutions such as the installation of FRP panels over tree routes and detailed alignment changes.
- **Active mode priority:** Community stakeholders (mobility impaired and local cycling advocacy groups) consistently pushed for active mode priority, highlighting the desire for legible crossing points (zebra crossings) and cycle route priority over vehicles at all intersections.
- **Schools**: Schools played a pivotal role by advocating for safe, green and healthy school travel. Their involvement ensured that the project incorporated features such as raised safety platforms,

safe crossing points, and clear separation between vehicles and active modes near school zones. In addition to these safety measures, schools pushed for good frontage along their boundaries and sufficient space for pick-up and drop-off areas.

CONCLUSION

The Cambridge Pathway project successfully demonstrated how targeted investment and accelerated delivery can transform urban mobility within a constrained timeframe. Through strategic planning, innovative design solutions, and proactive community engagement, the project delivered safer, more attractive, and accessible transport options that encourage walking and cycling. Despite challenges such as stakeholder concerns, technical constraints, and tight deadlines, the collaborative approach between Waipā District Council, NZTA, contractors, and the community ensured the project met its objectives.

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Erik Van der Wel - Development of ideas/thoughts and reviewed the paper.
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Siva Balachandran – Development of ideas/thoughts and prepared the paper.