

WAIPĀ AT A CROSSROADS

A Staged and Adaptive Infrastructure Strategy for Cambridge Connections

(Optionality, Metropolitan Growth and Designing for Change)

1. Purpose

Cambridge Connections was established to address increasingly evident transport pressures in Cambridge and to develop an integrated approach to how the town's transport system should function over the next 30 years (to 2055). Since that process commenced, however, the wider policy environment within which Cambridge sits has changed substantially.

Local government reform and amalgamation are now live issues. The Planning Bill and Natural Environment Bill have returned to Parliament following Select Committee consideration. The Government has established the Ministry for Cities, Environment, Regions and Transport (MCERT). Future Proof and NZTA increasingly recognise the metropolitan character of Hamilton and its surrounding growth area. Infrastructure funding models are changing. New mobility technologies are developing rapidly.

At the same time, the Cambridge Connections process itself has appropriately begun to broaden from consideration of individual transport projects towards spatial themes and a 30-year network perspective.

This paper therefore does not propose replacing Cambridge Connections or selecting a particular bridge solution. It proposes that:

Waipā District Council adopt an adaptive infrastructure strategy for Cambridge Connections that preserves optionality through staged investment, enabling infrastructure and emerging technologies.

The objective should be to make useful short-term improvements now while ensuring that decisions taken today do not unnecessarily constrain the choices available to Cambridge, Waipā or any successor authority over the next 30 years.

2. The Strategic Environment Has Changed

The pace of change since Cambridge Connections originally commenced and even following the re-set is important. The emerging national framework increasingly brings together:

- land-use planning;
- housing and growth;
- transport;

- infrastructure;
- environmental limits;
- regional development; and
- local government structure.

The creation of MCERT is particularly significant. Functions previously divided between transport, housing and urban development, environment and local government are increasingly being considered within one institutional framework. The Planning Bill and Natural Environment Bill reinforce that direction, but recent Select Committee consideration also highlights an important unresolved issue.

The Parliamentary Commissioner for the Environment recently has questioned whether separating regional spatial planning and development decisions from the environmental planning process could result in decisions being taken without sufficiently integrated consideration of environmental constraints. That concern has particular relevance for Cambridge. The appropriate response is not to stop planning for growth or infrastructure. It is to ensure that **spatial planning, environmental constraints and infrastructure planning proceed from a common evidence base, likely in parallel, and are capable of adjustment as that evidence develops.**

That is especially important while matters such as Highly Productive Land mapping remain unresolved. The strategic lesson for Cambridge Connections is therefore straightforward - **The greater the uncertainty surrounding future planning, environmental and governance arrangements, the greater the value of preserving infrastructure optionality.**

3. Cambridge Is No Longer Sensibly Viewed in Isolation

Cambridge retains a strong and distinctive identity. That does not prevent it increasingly functioning as part of a wider metropolitan system centred upon Hamilton and extending through the surrounding Waipā and Waikato growth areas. Employment, education, freight, housing and daily travel increasingly cross local authority boundaries.

Hautapu is particularly important in this respect. The Cambridge–Hautapu relationship increasingly combines residential growth, industrial employment, State Highway connectivity and regional movement. Completion of Cambridge–Piarere will further change travel behaviour and accessibility. Cambridge Connections should therefore increasingly be understood within the wider Hamilton metropolitan and Future Proof transport spine, rather than solely as a response to congestion within Cambridge.

Local government reform makes this even more important. Whatever governance structure ultimately emerges, infrastructure constructed today will substantially outlive the existing institutional arrangements. A bridge may last 80–100 years. The council structure responsible

for it may change considerably sooner. Infrastructure decisions should therefore be robust across different future governance arrangements.

4. Thirty Years Requires a Different Approach

A 30-year strategy should not attempt to predict precisely what Cambridge will require in 2055.

It should instead establish:

1. where growth can appropriately occur;
2. which corridors should be protected;
3. which existing assets should be optimised;
4. what enabling infrastructure should be constructed;
5. what decisions can safely be deferred; and
6. what future options should deliberately be preserved.

There will undoubtedly be relatively minor works that can and should proceed in the short term - Intersection improvements, traffic management, school travel initiatives, active-mode connections, public transport improvements and parking management should not be delayed merely because longer-term questions remain unresolved.

But these should form **the first stage of a programme**, rather than becoming substitutes for a long-term strategy. The objective should be **improve now, enable next, expand when justified**.

5. Staging Is Not Deferral

Recent infrastructure programmes reported provide useful practical examples.

- A. The Government's Auckland rail level-crossing programme is being delivered progressively. The new \$12.2 million Glen Innes pedestrian bridge is a relatively modest intervention whose strategic purpose is to remove a constraint and help unlock the benefits of the much larger City Rail Link investment.
- B. The Christchurch Men's Prison redevelopment similarly provides an explicit staged model. Phase One is being constructed now, while later phases will be assessed according to future capacity and funding requirements. Equally and similar is the Waikeria expansion
- C. The Cook Strait ferry programme separates vessel operation, port infrastructure, ownership, commercial charges and long-term investment between different institutions rather than treating the programme as one indivisible project.
- D. Auckland's Central Interceptor has expressly been described as a "backbone" upon which subsequent investment, resilience and growth can build.

The common principle is:

establish the long-term system, deliver the presently justified component, and preserve the ability to add later stages.

We consider that approach should inform Cambridge Connections.

6. A Staged Cambridge Connections Programme

A possible framework is:

Stage One — Optimise and Prepare

Immediate and relatively affordable interventions should improve the performance of the existing network. These may include:

- (i) intersection and traffic-management improvements;
- (ii) school travel initiatives;
- (iii) improved walking and cycling connections;
- (iv) public transport improvements;
- (v) park-and-ride development;
- (vi) parking management;
- (vii) intelligent network management; and
- (viii) protection of future corridors.

Importantly, these investments should be tested against the long-term spatial strategy so that short-term expenditure does not frustrate later stages.

Stage Two — Create Enabling Capacity

This is where the concept previously described as the "pipe bridge" should be reconsidered. That terminology has become too narrow. The strategic concept is better understood as an **Enabling Crossing**. The proposition is not to construct a cheaper substitute for a conventional road bridge. It is to investigate whether a proportionate lightweight crossing could:

- a) bridge the Waikato River at materially lower cost than a conventional road crossing;
- b) provide an additional resilient connection;
- c) accommodate changing uses during its life;
- d) remove particular short trips from existing bridges;
- e) support future infrastructure requirements; and
- f) preserve rather than consume the option of constructing a full road bridge later.

The appropriate structural solution should follow the function and site conditions rather than being predetermined. Suspension, cable-supported or other lightweight long-span structures should therefore be investigated rather than assuming conventional road-bridge construction.

7. The Cost of Bridging the Divide

Recent New Zealand examples demonstrate why the cost of the crossing itself should be separated from the cost of whatever facilities ultimately use it. The new Hooker Valley suspension bridge at Aoraki/Mount Cook spans approximately **189 metres** and has been delivered for approximately **\$4.85 million**. It is plainly not directly comparable with a Cambridge crossing. It is narrower, carries pedestrians rather than vehicles and has different site and loading requirements. But it establishes an important contemporary fact:

a substantial physical divide can be crossed in New Zealand using a lightweight long-span structure for a single-digit-million-dollar cost.

At the other end of the spectrum, the new Glen Innes pedestrian bridge cost approximately **\$12.2 million**, but operates within a live electrified metropolitan railway and station environment.

Those two recent examples demonstrate why generic "bridge costs" are misleading. We consider the correct question for Cambridge is:

What would it cost to construct the primary crossing structure and foundations appropriate to this particular divide?

The cost of pathways, utility installation, autonomous mobility equipment or other subsequent uses should not be conflated with the cost of establishing the crossing. A limited concept engineering exercise could establish realistic order-of-magnitude costs without committing Council to a particular solution.

8. Designing Infrastructure That Can Change

The Queen Elizabeth Park swing bridge in Masterton provides a simple but instructive example. Constructed in 1938–39, the bridge has remained useful for almost 90 years. Its decking was replaced in 2021 and the crossing was adapted to accommodate mobility scooters — a form of personal mobility that its original designers could not possibly have anticipated. Its current refurbishment includes inspection of its anchorages and suspension system, replacement of components and reduction of deck weight.

The lesson is:

Good long-life infrastructure is not infrastructure that never changes. It is infrastructure capable of changing.

We consider that this should be a design principle for any Cambridge enabling crossing. The primary structure (foundations) should have a long life. Its uses should be capable of evolving.

9. Emerging Mobility, Autonomous Vehicles and Geofencing — Designing for Change

Autonomous mobility has developed sufficiently rapidly that it cannot sensibly be excluded from a 30-year transport strategy. Equally, Cambridge Connections should not be designed on the assumption that autonomous vehicles will arrive on any particular timetable. The appropriate position lies between those extremes.

International developments demonstrate both the opportunity and the uncertainty. Robotaxi services are already operating commercially in several jurisdictions. China has recently demonstrated the regulatory cycle particularly clearly: substantial deployment was followed by a significant system failure in Wuhan, regulatory intervention and safety review, followed within months by progressive resumption of approvals. That experience reinforces rather than weakens the case for considering automation. It demonstrates that:

technology, regulation and operating models can change remarkably quickly.

New Zealand's Ministry of Transport and land-transport regulatory agencies have themselves been considering the regulatory implications of increasingly automated vehicles. For Cambridge the most relevant possibility is unlikely initially to be unrestricted autonomous private vehicles. It may instead be:

low-speed, geofenced and remotely supervised mobility operating within defined corridors.

Potential applications include:

- (a) school transport;
- (b) connections between residential areas and the CBD;
- (c) Leamington connections;
- (d) park-and-ride feeders;
- (e) Hautapu employment connections;
- (f) mobility for older residents; and
- (g) connections with regional public transport.

The infrastructure principle should therefore be:

Do not construct infrastructure around an uncertain technology, but do not unnecessarily construct infrastructure that excludes it.

That is optionality in practice.

10. School Travel and Short Trips

School travel deserves particular attention because it is one of the most predictable components of Cambridge's peak-period transport demand. A significant proportion of these journeys are relatively short. The objective should not necessarily be to eliminate car travel. It should be to provide credible alternatives for those journeys that do not inherently require a private vehicle to cross the river or travel through central Cambridge.

Walking, cycling, public transport and ultimately geofenced shared mobility should therefore be considered as parts of one system. This also reinforces the potential value of an enabling crossing. Even relatively modest diversion of short journeys from the existing road bridges may increase their effective capacity and/or extend their useful life and/or improve resilience; and defer the point at which a major additional road crossing becomes unavoidable.

11. Park-and-Ride and the Metropolitan Edge

Park-and-ride should be treated as a strategic element rather than merely a parking facility. A degree of informal park-and-ride behaviour is already evident around major destinations such as the Velodrome. Future facilities should be located deliberately in relation to:

- regional bus routes;
- Hautapu;
- Hamilton travel;
- Cambridge–Piarere;
- schools and employment;
- future autonomous feeder services.

This becomes particularly important if Cambridge increasingly functions as a metropolitan-edge settlement. The objective should be to intercept appropriate trips before they enter the most constrained parts of the Cambridge network.

12. Growth, Housing and Infrastructure Must Be Considered Together

The current Planning Bill debate reinforces the importance of connecting growth decisions with infrastructure capacity. See also the Infrastructure Commissions report and Government response.

Recent international examples make the same point.

- A. Australia's federally established High Speed Rail Authority is developing Sydney–Newcastle high-speed rail not simply as a transport project but as an intervention intended to reshape housing, employment and metropolitan accessibility.
- B. Closer to home, major growth investments such as Drury increasingly demonstrate the relationship between housing, transport, health and other social infrastructure.

Cambridge should therefore avoid considering transport demand independently from:

- a. residential development;
- b. Hautapu employment;
- c. school capacity;
- d. healthcare;
- e. commercial development; and
- f. regional accessibility.

This may become increasingly important for future growth proposals of the character of Rider Park/Plan Change 37. Infrastructure planning should inform those decisions rather than simply respond to them afterwards.

13. Environmental Planning Is Part of Infrastructure Planning

The recent Parliamentary Commissioner for the Environment analysis deserves particular attention. The concern that development-focused spatial planning and environmental planning could become institutionally separated reinforces the need for integrated evidence at the regional level.

For Cambridge and its environs that includes:

- the Waikato River;
- highly productive land;
- flooding and resilience;
- ecological constraints;
- cultural values;
- water infrastructure;
- growth areas; and
- transport corridors.

These matters should not be sequentially considered as obstacles after a preferred transport solution has been selected. They should help determine the spatial strategy itself as well as supporting staged investment. Where future environmental or land-use settings remain

uncertain, protecting options may be considerably more prudent than prematurely constructing the ultimate solution. There are also the timing and compensation issues

14. Governance Reform Makes Optionality More Important

Local government reorganisation is underway. Whatever structure emerges, Cambridge's transport system will increasingly need to operate within a wider metropolitan and regional framework. That does not diminish Waipā's present responsibility. It makes decisions taken during the transition period more important. Waipā should seek to ensure that the infrastructure options handed to any future governance structure are **better rather than narrower** than those available today.

That means:

- protecting corridors;
- maintaining alternative crossing options;
- avoiding premature engineering lock-in;
- establishing credible cost information;
- integrating Cambridge with metropolitan planning; and
- preserving the ability to use future technology.

15. Funding Should Follow the Stages

The emerging infrastructure environment also suggests that there need not be one funding source for an entire 30-year programme. Different stages may have different beneficiaries and therefore different funding mechanisms.

Central and local government co-funding, NZTA investment, growth-related funding, development contributions, targeted funding arrangements and ultimately user charging may each have roles at different stages. Recent cross-party movement towards tolling and congestion charging is relevant because user charging can perform two functions simultaneously - **fund infrastructure and influence travel behaviour**.

The funding question should therefore follow the strategic question rather than determine it prematurely. First determine - **what long-term system should be preserved?**

Then determine - **which stage is required, who benefits from it and how that stage should appropriately be funded?**

16. Recommended Approach

In our view the next phase of Cambridge Connections should therefore:

1. retain and progress sensible short-term network improvements;
2. treat those improvements explicitly as the first stage of a longer programme;
3. embed Cambridge Connections within the emerging Hamilton/Waikato metropolitan spatial framework;
4. protect credible future transport corridors before development removes them;
5. investigate an **Enabling Crossing** as a distinct lightweight infrastructure option;
6. commission limited concept engineering sufficient to establish realistic structural and foundation costs;
7. separate the cost of establishing the crossing from the cost of future facilities or uses;
8. incorporate autonomous mobility and geofencing explicitly into the 30-year technology assessment;
9. give greater strategic emphasis to school travel, short trips and park-and-ride;
10. integrate infrastructure planning with growth, HPL, environmental and resilience considerations;
11. reassess demand and staging as actual growth data develops rather than relying upon a static 30-year forecast; and
12. ensure each investment preserves rather than unnecessarily forecloses subsequent options.

17. Conclusion — Optionality Is an Infrastructure Asset

Cambridge Connections began in one planning, governance and technological environment. It is now operating in another. That should not be regarded as a failure of the process. A genuine 30-year strategy must be capable of responding when circumstances change.

The challenge is therefore not to identify today the single transport solution that Cambridge will require in 2055. It is to establish a framework that allows **Waipā to make good decisions progressively**.

That means:

- A) improving what can sensibly be improved now
- B) protecting corridors
- C) constructing enabling infrastructure where justified
- D) testing proportionate alternatives before committing to the most expensive solution.
- E) recognising that technology will change
- F) integrating transport with growth and environmental planning.

And above all it means preserving choices.

The value of optionality is greatest when the future is uncertain.

For a 30-year infrastructure programme being developed during simultaneous reform of planning legislation, local government, transport technology and infrastructure funding, optionality should therefore not be regarded as indecision.

It should be regarded as a deliberate infrastructure strategy.

CCCP group

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