Auckland Transport
An Auckland Council Organisation

Technical note

Investigation stage business case Framework

in support of the Cycling and Micromobility Programme Business Case

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Contents

1 Introduction

The purpose of this Framework document is to guide investigation phase business cases that follow the Auckland Cycling and Micromobility Programme Business Case (CAM-PBC) in a way that responds to lessons learnt. The Framework aims to:

- Speed up business cases - Provide guidance on scope to speed up the business case process e.g. guide on level of investigation and design required;
- Provide consistency - Make sure business cases are somewhat consistent to enable comparison at Programme Business Case (PBC) level;
- Manage costs and risks - Indicate governance / hold points that are required to ensure the business cases align with the CAM-PBC e.g. seeking governance approval to proceed with a business case if complexity or costs change from those identified at PBC level;
- Improve efficiency - Support the bundling of business cases / projects to promote further delivery efficiencies.

This Framework is a live document that will be updated as lessons are learnt through investigation stage business cases.

1.1 Connections for investment

The CAM-PBC sets out the philosophy for cycling and micromobility investment in Auckland for the next 10-year period. Investment in cycling and micromobility (referred to as *cycling* or *people on bikes*) in Auckland is based on the four connection types, as per the below figures, and that were developed with feedback from the project working group and reference groups to address the lessons learnt and ensure benefits for people on bikes and micromobility are maximised:

The CAM-PBC connections are regional routes (these include 'Regional' routes in the Cycle and Micromobility Strategic Network in Future Connect and the 'Major' routes that link into these), rapid transit network (RTN) access (i.e. rail, bus, and ferry stations), school access, and metropolitan centres and satellite towns. Further detail on these connection types can be found in Appendix F of the CAM-PBC (the Shortlist technical note).

With safe cycle being the number one deterrent to people biking for more of their trip, safer journeys will be provided through separated cycleways, and low traffic neighbourhoods and low speed neighbourhoods (termed local area networks or LANs).

1.2 Prioritisation for investment

The CAM-PBC prioritises all connections based on safety, connectivity to other safe facilities, the number of connection types a connection or focus area intersects with ('Regional' routes, RTN stations, schools, and metropolitan centres), and cost of delivery. Professional judgement was also applied. The following diagram further explains the prioritisation criteria with the CAM-PBC Appendix I including the Prioritisation Matrix.

Safety - recognising that safety and the perception of safety are the biggest barriers to people using bikes and micromobility and that there is an opportunity to add value and cost share with safety works programme.

Connectivity - recognising that building off existing and committed cycle facilities to create a connected network has proven to be more successful than isolated cycle facilities, by enabling the 'network effect'.

Multiple connection types - recognising that layering connection types will attract the most people to cycling and micromobility and that we want equitable distribution of investment particularly for transport disadvantaged.

Deliverability, based on cost - recognising the urgency of climate action, the value of reallocating road space, using existing investigations, and considering tactical urbanism and semi-permanent infrastructure to speed up benefits.

Value for money and completion of critical missing links are also used as prioritisation checks.

The connections identified in the CAM-PBC were prioritised (with a total of 180 connections exceeding $3.5 billion in estimated cost) so that the best value ones can proceed earlier in the programme to next stage business cases.

The type of next stage business cases are set out in the following table.

Table 1-1: Type of business case

Indicative Business Case (IBC), followed by a Detailed Business Case (DBC)	This is not expected to be used for business cases that progress from the CAM-PBC but may be required in more complex networks or larger assessment areas, such as the scale of the Henderson SSBC
Single Stage Business Case lite (SSBC lite)	For projects less than $15 million (total cost and risk) that are unlikely to affect other strategic networks
Single Stage Business Case (SSBC)	All other projects and focus areas that are too complex or too costly to be undertaken with an SSBC lite

Where appropriate business cases will be procured in a bundle to seek out further efficiencies. The following diagram provides further guidance on whether an SSBC lite is an option for the business case. The $15 million cost must include all whole of life costs.

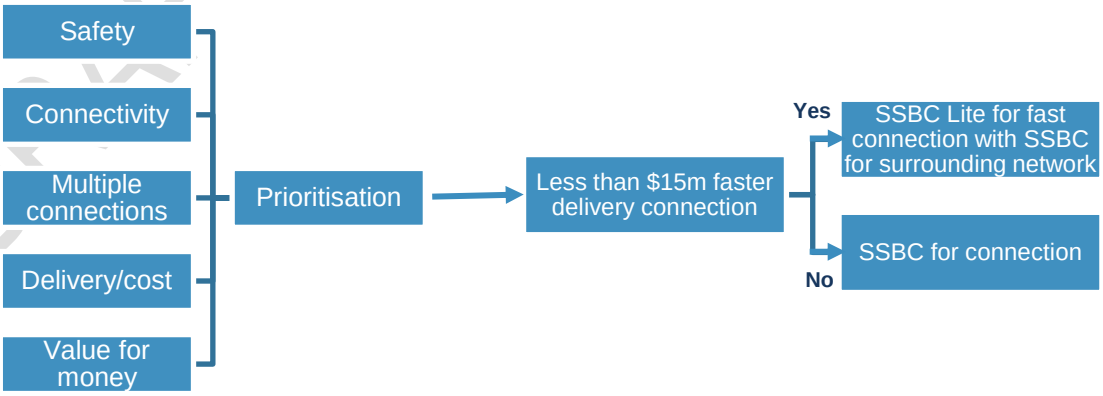

Figure 1-1 Guidance on SSBC lites.

1.3 Lessons Learnt

The lessons learnt technical note is Appendix C of the CAM-PBC. In summary the key lessons learnt were:

- Investigation stage business cases development are taking longer than anticipated in 2017.
- Investigation stage business cases are not comparable (i.e. have differing Investment Logic Maps and assessment criteria), which makes comparison and prioritisation at PBC level more difficult.
- Delivery of infrastructure for people using bikes and micromobility is costing more to deliver than expected in 2017 because:
    - Kerbs are being moved more often than expected in 2017.
    - Additional works such as streetscape and stormwater are included in the project scope (largely due to the movement of kerbs).

The CAM-PBC prioritisation process and governance changes partially address these lessons learnt. This Framework responds to these lessons by providing guidance for investigation stage business cases with a focus on: speed, efficiency, managing costs, and consistency.

2 Speed up business cases

This section sets out where efficiencies in the business case process can be achieved for each of the following types of business case:

- SSBC lite for road space reallocation connection
- SSBC for focus area
- SSBC for complex strategic connection

2.1 SSBC lite

Ultimately the project / programme governance, as set out in Part C of the CAM-PBC, and together with the Waka Kotahi Point of Entry discussion, will determine what type of business case is used for the investigation stage. However, a SSBC lite would likely be used for connections prioritised by the CAM-PBC as faster delivery routes. This is because, in accordance with Waka Kotahi requirements for an SSBC Lite, they:

- Cost less than $15 million to plan, design and implement (including risk and contingency),
- Are low risk and complexity, notably:
    - Require little or no kerb moving (i.e. are road space reallocation projects). It is recognised that some kerb moving may be required at pinch points.
    - Have little or no adverse effect on other strategic networks (e.g. freight and public transport).

SSBC lites will be undertaken in accordance with the Waka Kotahi SSBC lite template, unless superseded by an AT SSBC Lite template.

The SSBC lite will be combined with detailed design (pre implementation) to speed up delivery. Therefore, the preferred option will likely proceed from concept design (for shortlist) straight to detailed design. No alternatives assessment or longlist is included as there should be a small number

of options to be assessed and therefore all options can go straight to a shortlist assessment. The CAM-PBC assessed alternatives that can be referenced in SSBC lites.

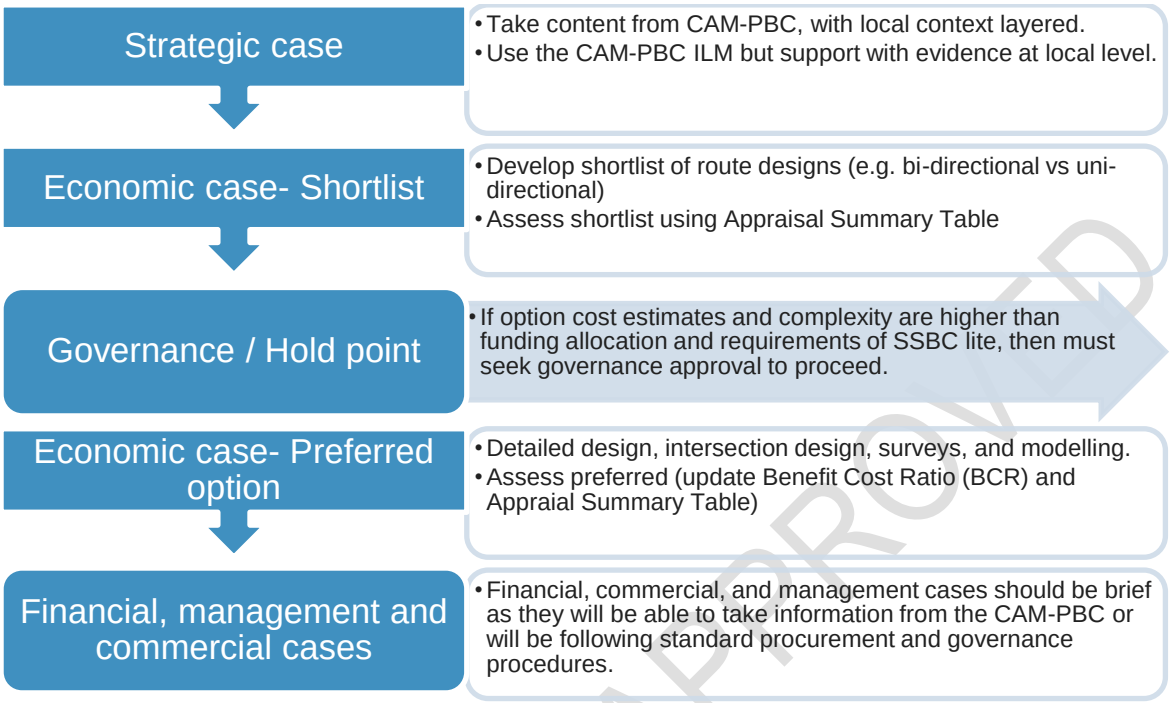

Figure 2-1 SSBC Lite process

2.2 SSBC for a complex connection

A complex connection will follow a more business as usual approach for SSBCs. However, there will be some efficiencies gained by utilising the CAM-PBC strategic case, Investment Logic Map (ILM), and alternatives assessment.

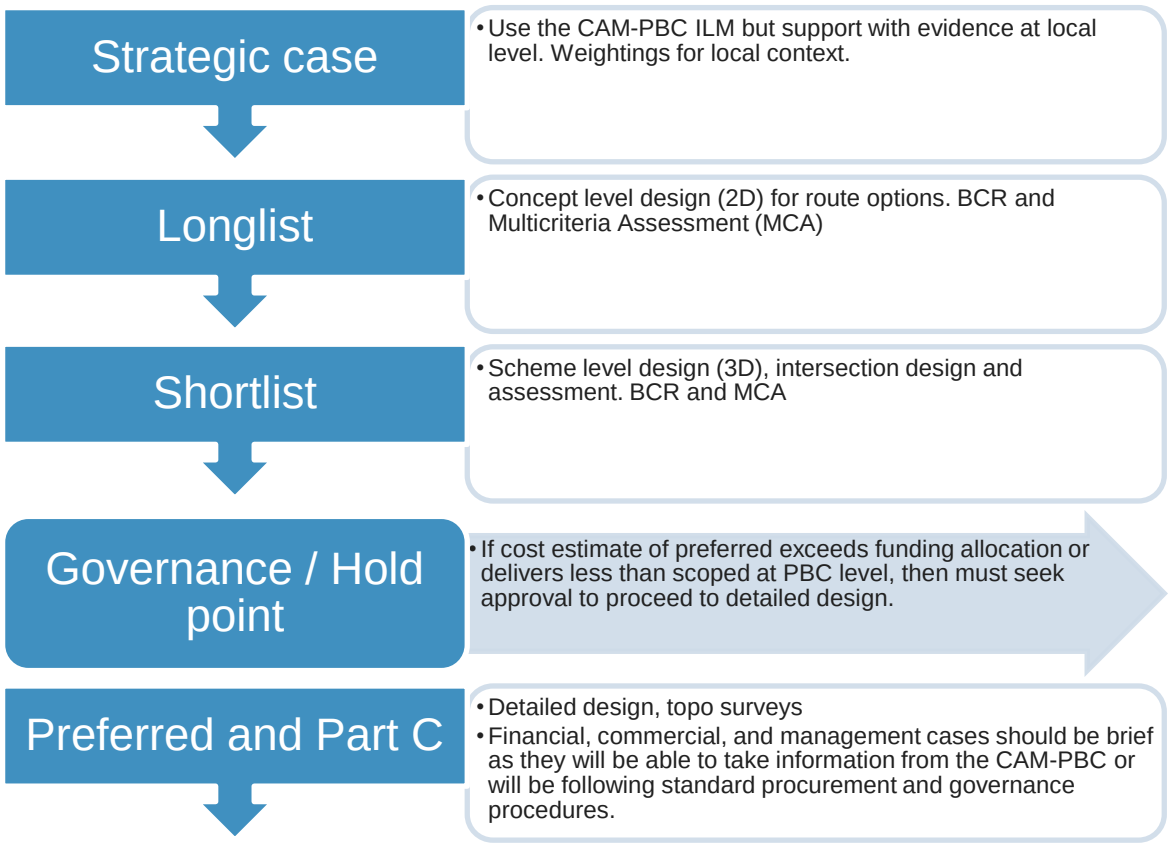

Figure 2-2 Complex connection SSBC process

2.3 SSBC for a focus area

The process diagram below shows the steps taken to produce a focus area SSBC using this Framework. An SSBC might contain a single connection, in which case the steps below could be simplified as there would not be a need to prioritise connections.

Where a focus area is considered too complex for an SSBC, an IBC and DBC process could be used instead of an SSBC. However, a focus area of that scale is unlikely to progress from the CAM-PBC because it would be unlikely to speed up the business case process.

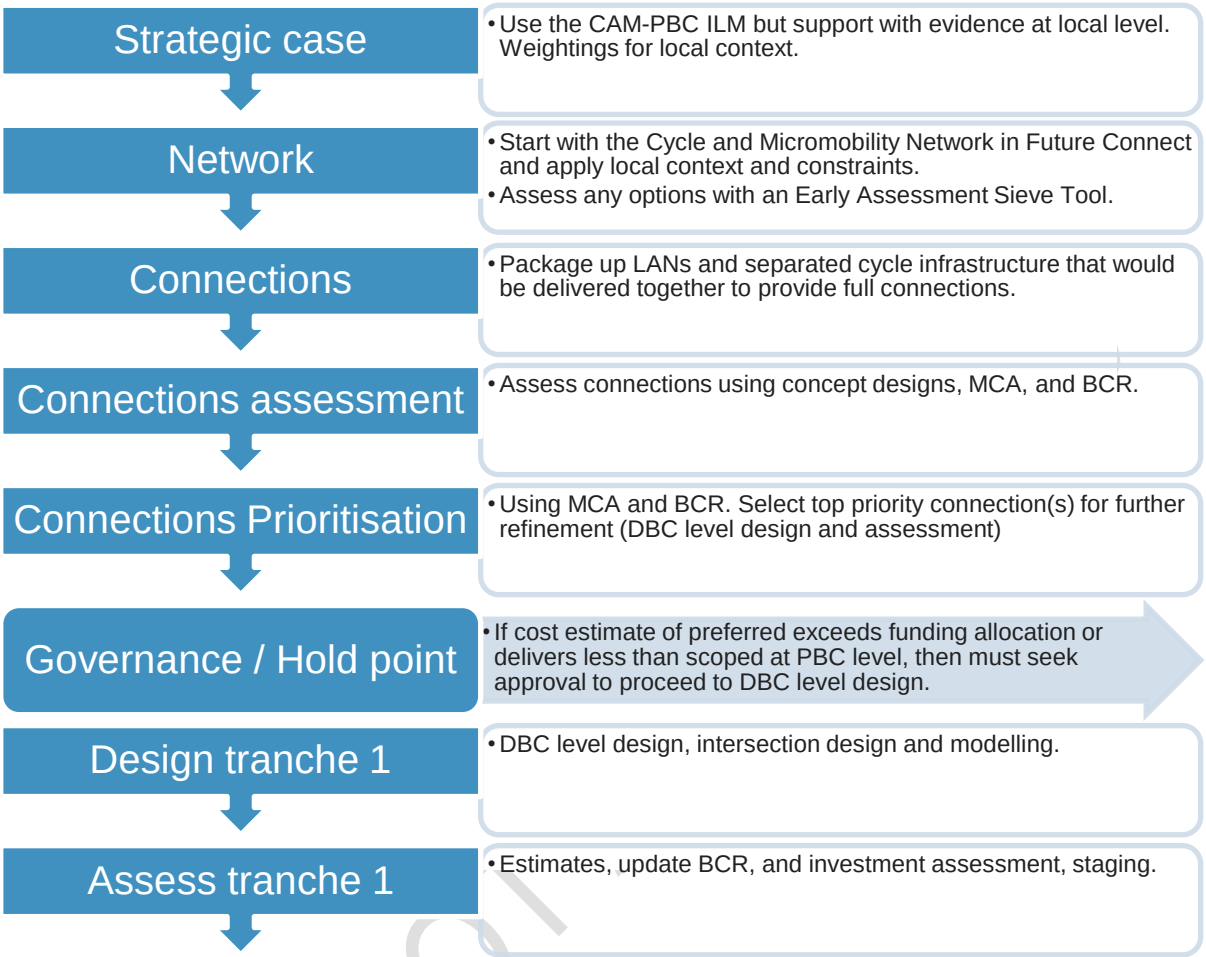

Figure 2-3 Focus area SSBC process

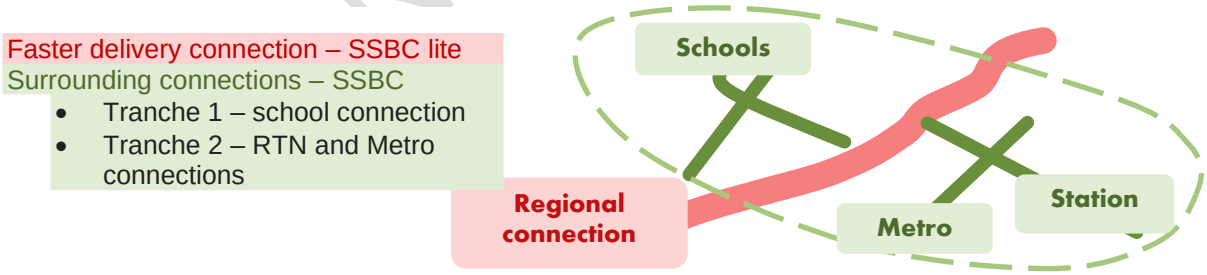

Figure 2-4 Example of SSBC with connections that could be divided into Tranches of work

3 Efficient Design

In this section, there are three design levels discussed:

- Concept design (2D, with indicative intersection forms and no intersection modelling), typical of indicative business cases or longlist phase of an SSBC
- Scheme design (3D using lidar and intersection modelling to refine intersection design), typical of detailed business cases or shortlist and preferred option phase of an SSBC
- Detailed design (3D using topographic survey data), typically undertaken after business case phase during pre-implementation

Design can be undertaken more efficiently by:

- Only undertaking enough design to inform decision making and not progressing to scheme level design on tranches of work that are not likely to progress to implementation in the short-medium term.
- Fast tracking preferred options to detailed design by bundling up procurement of business case and detailed design (subject to the preferred option cost being within funding thresholds).

3.1 Network design

SSBCs for a focus area or for a complex connection that has multiple route choices will need to develop a network plan to concept level design.

The Cycle and Micromobility Network in Future Connect should be used as the starting point for any network development, with any local constraints and context used to develop and refine the concept network to provide for connections.

The purpose of the local concept network is to ensure connectivity of Regional routes, Rapid Transit Access, Schools, and Metropolitan centres and Satellite Towns (and other high-growth areas that require increased cycling uptake to realise growth).

Typically concept design (2D only) should be produced for the network, with scheme design work only required for the first tranche of the network to be implemented, which will be determined through a prioritisation process as described in Section 4.1.2. Slope and other 3D risks and constraints should be considered if they are likely to affect costs and/or route choice in enough detail to inform prioritisation of tranches of work. The concept designs are used to develop high-level cost estimates for the connections to enable comparison and prioritisation.

Concept designs would typically be 2D plans of the network and cross sections used to understand whether kerb moving will be likely or not. Generally, it is expected no CAD design is needed for intersections or local area network (LAN) infrastructure for this concept design but an indication of likely number of traffic calming devices or modal filters and level of intervention required at intersections will be needed to estimate costs. There may be exceptions to this, such as critical intersection that may have significant cost variability depending on level of intervention.

The Transport Design Manual (TDM) should be used to inform concept design but it is recognised that departures from the TDM are likely in most road space reallocation type scenarios. **The SSBC should seek to achieve TDM standard only as much as practical while staying within kerbs**.

Designs should aim to limit kerb moving, while ensuring designs do not adversely affect operation of the strategic public transport network and strategic freight network. Should concept designs adversely affect other strategic networks, consultation with relevant subject matter experts (SMEs) will be

required and governance approval of the concept may be required if there is disagreement from relevant SMEs as to road space reallocation. The project team should not assume road space reallocation cannot take place as this will be for the governance group to decide.

There may be a need to assess multiple concept design options for a route, in which case a mini-MCA could be used to determine the preferred concept design. However, the concept design is only used for indicative costs of the routes so this step should only be undertaken if its likely to result in a significant cost difference for the route (e.g., kerb moving option vs no kerb moving). This is especially the case if the route in question is unlikely to be progressed in the short-term, because there is very little value in optioneering the concept design as context may change in the years till implementation.

GOVERANCE: Any departures from TDM will need to be communicated with the TDM team and agreed in principle. Where operation of other strategic networks (e.g. public transport) are adversely affected, consultation and agreement with relevant SMEs will be required. Any disagreement may need to be resolved at governance level.

3.2 Connection design

If there is a longlist of options for a connection, the longlist should be developed to concept design level only. Scheme level design including traffic modelling will generally only be required at shortlist assessment stage.

In the case of an SSBC lite for a road space reallocation connection, it is expected that there will be a small enough number of options that they can proceed straight to shortlist (i.e., no longlist assessment is required). The shortlist assessment could be undertaken using concept level design if this will be detailed enough to inform preferred option selection.

3.3 Preferred option design

The preferred option for an SSBC lite will proceed from the shortlist assessment to detailed design, provided the cost is within funding thresholds.

The preferred option for a SSBC will have been developed to scheme level design as part of the shortlist assessment and no further design detail is required for submission of the SSBC; however, in may be prudent to consider fast tracking elements of detailed design during the business case phase if implementation funding is likely to be available (e.g., undertaking topographic surveys and design during the business case phase to minimise detailed design work during pre-implementation).

4 Speed up Assessment

Assessment will be sped up in the following ways:

- Through SSBC lites, which will only need shortlist assessment assessed using an Appraisal Summary Table.
- Through focus area SSBCs but prioritising the network into tranches or work, so that only higher priority tranches are assessed in detail.

Complex connection SSBCs are likely to follow a more business as usual approach to assessment with use of EAST for longlist and MCA for shortlist but will be more efficient by utilising information from the CAM-PBC including cost estimate information (see section 6).

4.1 Network assessment

Where there are multiple options to provide a connection, an EAST may be required to select the appropriate option e.g., there may be two roads that could provide a connection between a regional route and an RTN, one in Future Connect and the other an alternative route. These options could be assessed in an EAST to determine the most appropriate route, which may differ from the Future Connect route.

GOVERNANCE: Any changes from the Cycle and Micromobility Network in Future Connect will be communicated.

4.1.1 Splitting network into tranches of work

Splitting the network into tranches of work will enable only higher priority tranches of work that are likely to be implemented in the short-medium term to proceed to scheme level design.

The network should be packaged up into tranches of work in accordance with how they would need to be delivered to form full connections (e.g., a separated cycling path and surrounding LANs that serve to connect a school catchment could be one tranche of work, with a second tranche being a group of separated cycling paths and LANs that provide access to an RTN station as shown in **Error! Reference source not found.**).

This step may not be required if the SSBC area is small enough. For example, if an SSBC area only has one key connection that all routes and LANs lead to it could be treated as a single tranche of work.

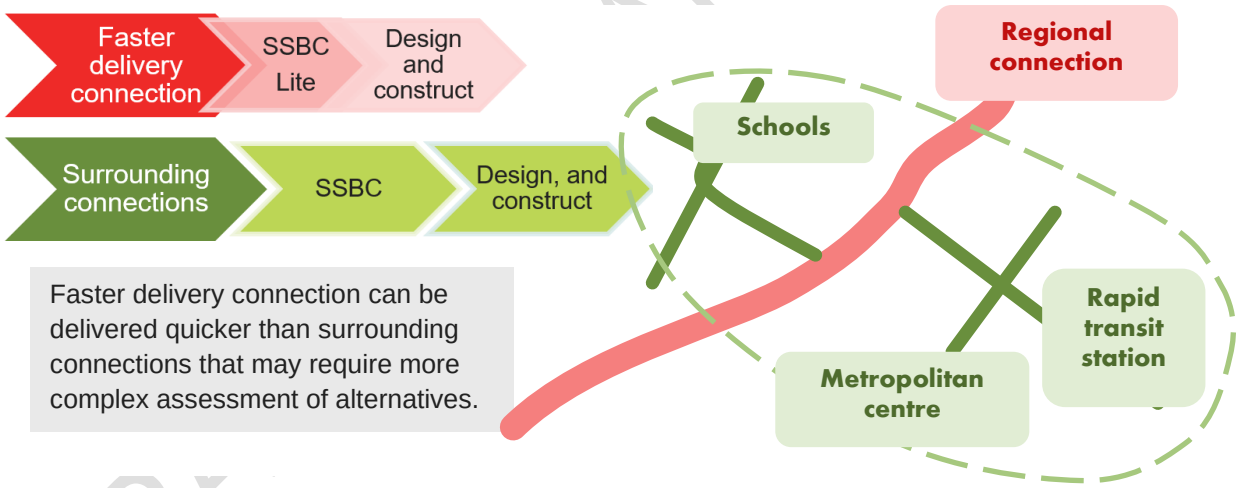

Figure 4-1 Example of grouping network into connections

4.1.2 Network Prioritisation

Prioritisation is undertaken using an MCA approach combined with BCR. This prioritisation step is not required if there is only one connection (tranche of work).

The recommended criteria for prioritisation are:

- Investment objectives - the CAM-PBC objectives 1-3 adjusted for local context.
- Monetised benefits – BCR.
- Critical success factors - as per the Waka Kotahi MCA.
- Other impacts - as per the Waka Kotahi MCA.

- Co-delivery and funding opportunities / dig once opportunities – i.e., ability to work with other projects / programmes to dig once and reduce costs and disruption. This will need to be considered alongside speeding up delivery of cycling infrastructure (i.e., co-funding or co-delivery may not be appropriate if it is going to unduly delay delivery of cycling infrastructure).
- Partners and stakeholders – preferences of local stakeholders e.g., Mana whenua, Eke Panuku, local boards. For example, Panuku may have preference for a particular connection to be delivered because it aligns with revitalisation plan they have.

Weighting of the criteria should be determined based on local context and sensitivity tested. However, the CAM-PBC philosophies of achieving a **safe**, **connected** network for **many people** that has **fast and affordable delivery** opportunities, should be considered when prioritising within the SSBC.

5 Speed up delivery

There may be multiple staging options. Staging should consider a balanced approach to deliverability and benefits i.e., seek easier delivery separated cycling infrastructure and LANs (with minimal kerb moving), while ensuring full connections are provided.

Tactical urbanism should be considered to speed up benefits realisation but not as a means of lowering the cost of delivery, because a path to permanence needs to be part of the plan if tactical urbanism is proposed (i.e., the cost of making the project permanent needs to be included in the costs of the project and designed and planned for).

6 Consistent data

6.1 Strategic case

The CAM-PBC strategic case and ILM should be used as a starting point. The weightings of the problem statements and investment objectives should be updated to match the local context.

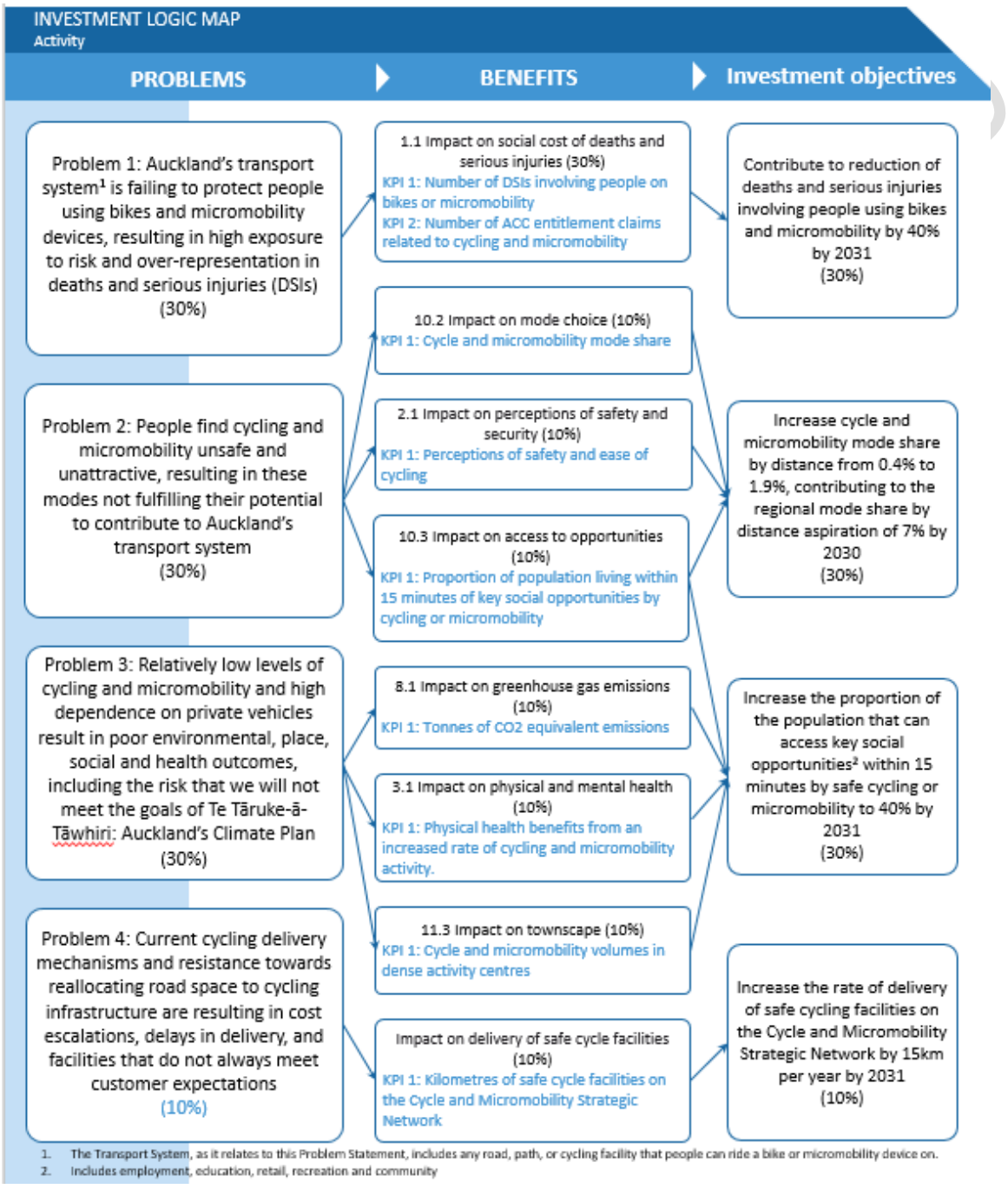

Figure 6-1 - CAM-PBC ILM

Problem statement 4 and investment objective 4 are only relevant for CAM-PBC level and not required to be assessed at SSBC level. Programme context information and problem evidence at a local level can be sourced from the following:

Table 6-1 Problem evidence sources

Topic	Information/Evidence	Source
Programme context	• Land use - Unitary Plan zone	AC Open Data
	• Demographics – 2018 Census	Statistics NZ
	• Travel patterns – Commuter Waka, 2018 Census	Statistics NZ
	• Transport - Future Connect	AT
	• Transport – Existing cycle infrastructure	AT
	• Social - Socioeconomic deprivation profile 2018	Environmental Health Intelligence New Zealand
Problem 1: Safety	• Crash Analysis System data	Access via AT
	• Urban KiwiRAP Active Mode User Corridor Risk	Access via AT
	• Monthly crash statistics	AT
	• AT Transport Design Manual – guide to cycle facilities for traffic conditions	AT
Problems 2 and 3: Travel options and Access	• TRA for Auckland Transport. June 2021. Measuring and growing active modes of transport in Auckland	AT
	• Transport – Existing cycle infrastructure	AT
	• Monthly cycle counts (at selected sites)	AT
	• Travel patterns – Commuter Waka, 2018 Census	Statistics NZ

GOVERNANCE: IBC / SSBC teams should inform the governance group of any changes to the ILM. If only minor wording changes and weightings are changed, this step should just be to inform the governance group but if major changes are made e.g. a new problem statement added, the CAM-PBC governance group may need to approve the change to ensure the CAM-PBC can still compare options between different IBCs and SSBCs and ensure benefit reporting at PBC level is able to be undertaken.

6.2 Cycling demands

Cycling demands should be taken from the Auckland Cycle model (ACM) but school and rapid transport network (RTN) station access demands should be layered on top, as these are not captured within the ACM. High-level school and RTN demands have been produced in the CAM-PBC but will need to be checked and verified at SSBC level.

6.3 Cost estimation

Table 6-2 below outlines the cost assumptions used for the CAM-PBC, which are a starting point for concept design costs estimates. More detailed cost estimation is required at scheme design level. AT's Commercial Quantity Surveyors Manger can provide the latest cost rates for cycling infrastructure as required.

The cost estimates generally represent construction cost estimates only (rather than actuals), and do not include investigation and design costs, nor contingency.

Table 6-2 Construction cost estimates for strategic connections and local area networks

Route type	Description	Construction cost assumed	Data used
Pop-up protection	Concrete separators retrofitted to existing painted cycle lanes, without affecting kerbs (and without intersection treatments)	$0.5 millon / km	$0.5 million / km for AT's pop-up protection programme, 2021
AT network – reallocate road space	Protected cycle infrastructure on street, without shifting kerbs. Generally, on neighbourhood or collector type route where car parking and/or flush median can be removed. Does not include the cost of intersection upgrade	$2-3 million / km	$1.2 million / km – Mangere West cycle improvements, 2019 $1.3 million / km – Tamaki cycle loop concept, 2020 $3.5 million / km – Puhinui Road & Lambie Dr, 2019 $2.35/km – Project WAVE pilot
AT network - mid-range	Locations where a combination of road space reallocation and kerb movement is required	$5-6 million / km	Subject matter expert assumption
AT network – move kerbs	Protected cycle infrastructure, assuming kerbs shifted. Generally, on constrained arterial corridors where existing road space cannot easily be reallocated, or where there are major intersections to address	$8-10 million / km	$7 million / km – Link to Glen Innes, 2021 $9 million / km – Pt Chev & Meola Road, 2021
Waka Kotahi network – off-road facility	Significant off road shared path or cycleway within a rail or motorway corridor, with major structures	$20-25 million / km	$20 million / km – Akoranga to Constellation, 2020 $21 million / km – Seapath, 2018
Intersections upgrades	Retrofitting existing intersections to provide safe facilities for people on bikes	$1-2 million per intersection	
Local Area Networks	Physical investment in area-based programmes that aim to make neighbourhoods more accessible by bicycle. This may include investment in local area traffic calming, greenways, low traffic/low speed neighbourhoods and other 'lower tier' interventions	$2-4 million per km^2 $250,000 per modal filters/ traffic calming	

Investigation, design, and contingency costs at concept design level must be added as appropriate. The CAM-PBC used the following assumptions:

- Contingency is 30% of construction costs; and
- Investigation and design are 30% of construction costs.

The investigation, design and contingency costs are considered low by current delivery standards, however, these are expected to be reduced further than those assumed in the CAM-PBC through quicker business case and delivery processes, and reduced risks from road space reallocation projects (i.e. less risk of affecting utilities or requiring new structures).

GOVERANCE: Cost estimates that indicate the SSBC will exceed allocated funding thresholds, must be escalated to the PCG as a minimum to inform them of escalating costs, but also to make a decision on whether to proceed with the SSBC in full or part.

7 Manage risks and costs

Key governance hold-points to manage risk and costs, that are highlighted in the business case process above are:

- Any departures from TDM will need to be communicated with the TDM team and agreed in principle. Where operation of other strategic networks (e.g. public transport) are adversely affected, consultation and agreement with relevant SMEs will be required. Any disagreement may need to be resolved at governance level.
- Any changes from the Cycle and Micromobility Network in Future Connect will need to be communicated.
- SSBC teams will inform the governance group of any changes to the ILM. If only minor wording changes and weightings are changed, this step should just be to inform the governance group but if major changes are made e.g. a new problem statement added, the CAM-PBC governance group may need to approve the change to ensure the CAM-PBC can still compare options between different IBCs and SSBCs and ensure benefit reporting at PBC level is able to be undertaken.
- Cost estimates that indicate the SSBC / SSBC lite will exceed allocated funding thresholds will be escalated to the PCG as a minimum to inform them of escalating costs, but also to make a decision on whether to proceed with the SSBC in full or part.