In Confidence

Office of the Minister of Finance

Office of the Minister of Transport

Cabinet Priorities Committee

Auckland Light Rail - decision to progress

Proposal

1 This paper seeks Cabinet's agreement to a preferred way forward for the delivery of the Auckland Light Rail (ALR) project. This is in response to the recommendations that project sponsors have received from the Establishment Unit.

2 It seeks agreement to an integrated programme of work that develops a preferred option through technical project design and development, policy implementation and decision-making, delivered as broader approach to urban transformation along the City Centre to Māngere (CC2M) corridor (the Corridor).

3 We are proposing that the project is taken forward by a partnership between the Crown, Auckland Council and mana whenua. The proposed governance arrangements will provide for appropriate Crown oversight and will incorporate the necessary skills within the project to set it up for success. This partnership is also an appropriate expression of the Te Tiriti o Waitangi principle of partnership.

Relation to government priorities

4 Cabinet has prioritised progressing light rail from the city centre to the airport in the next decade as the first spine of a wider rapid transit network for Auckland [DEV-18-MIN-0059 refers]. This reflects the commitments the Government has made through the Auckland Transport Alignment Project (ATAP). The 2020 Labour Party Election Manifesto committed to building a light rail connection from the City Centre to Māngere and the airport.

5 The Climate Change Response (Zero Carbon) Amendment Act 2019 set a target to reach net zero emissions by 2050. The transport priorities being consulted on in the Emissions Reduction Plan emphasise the significance of public transport investments such as these in reducing carbon emissions by changing the way New Zealanders travel and supporting denser urban form which avoids significant emissions over the long-term.

Executive summary

6 ALR will be New Zealand's largest and most complex infrastructure project. Our response to climate change is changing the way we prioritise our investment, meaning that we need to shift the focus of some of our investment and to consider large-scale 'trunk' transport infrastructure in our larger urban centres.

7 ALR has the potential to transform Auckland's transport network, bringing far-reaching benefits to communities and increasing access across the region. Delivering this requires the Government and its partners to make bold decisions and enduring commitments.

8 This involves making key choices on the scope of the project and how it can be delivered in a way that brings its anticipated benefits to fruition and ensures value for money.

9 To inform decision making, Cabinet agreed in March this year to set up an Establishment Unit [CBC-21-MIN-0036 refers]. The Establishment Unit was given a mandate to recommend a preferred way forward on mode and route, improve social licence through community and stakeholder engagement, and consider how the project could be funded and delivered.

10 Collaboration has been at the heart of the Establishment Unit's set up. We have worked as project sponsors, alongside the Mayor and Deputy Mayor of Auckland, and with input from the Minster of Housing. The Establishment Unit itself has been governed by an inclusive board made up of representatives from the Crown, Auckland local government and mana whenua.

11 The principal output of the Establishment Unit has been an indicative business case (IBC) which has clarified the strategic case for investment and presents a short-list of options for mode and route. The IBC has now been provided to project sponsors, alongside the Chairperson's report.

12 We are seeking Cabinet's agreement to a pathway for the delivery of the project. We propose the project moves into a detailed planning phase that includes further business case assessment alongside a policy work programme that provides strategic and policy direction to the shape of the project.

13 An IBC is an early opportunity to inform decision-makers of whether or not a project is viable. Consistent with the current stage of the project, we can expect costs and benefits to change as more detailed work is undertaken. While more work is needed to determine the exact details of the investment, we are confident that we can make decisions now on how to proceed that will set this project up for success.

14 The IBC demonstrates that ALR will increase access to jobs and opportunities by making more of Auckland accessible, including for disadvantaged communities. Delivered as part of a wider rapid transit network, ALR will support a change in how Aucklanders travel. It will provide an alternative to the private car, help reduce congestion and emissions, and bring a series of economic benefits that support agglomeration and boost productivity. A significant portion of the project benefits are linked to the high levels of urban development that are enabled. All of the options support tens of thousands of additional houses to be built along the corridor, over and above the status quo.

15 Beyond these core transport and economic benefits, investment in ALR has the potential to catalyse urban transformation along the Corridor, providing for a significant number of additional homes and jobs.

16 The Establishment Unit considered three investment options in detail. These are[1]:

16.1 Surface Light Rail, along Dominion Road (P50 - $9 billion, P95 - $13.7 billion)

16.2 Light Metro, along Sandringham Road (P50 -$16.3 billion, P95 - $26.4 billion)

[1]. P50 and P95 estimates respectively represent a 50 per cent or 5 per cent chance that costs will exceed this amount

16.3 Tunnelled Light Rail, along Sandringham Road (P50 - $14.6 billion, P95 $23.1 billion)

17 The Establishment Unit has recommended Tunnelled Light Rail as its preferred mode option, although has concluded that any option would achieve the investment objectives.

18 Informed by the recommendations from the Establishment Unit, advice from Officials and following recent engagement with Auckland local government, we are recommending that Cabinet agrees that tunnelled light rail, following an alignment along Sandringham Road, is this Government's preferred option.

19 The Establishment Unit's work demonstrates the value that tunnelling could bring, particularly ensuring sufficient capacity of the transport network to increase patronage and drive mode shift, thereby supporting higher levels of growth than surface running light rail. Tunnelling also keeps the option of a tunnelled connection of an additional Waitematā harbour crossing, and helps reduce disruption to businesses and residents during construction.

20 In progressing this preferred option, the parameters of the detailed planning phase must reflect a greater focus on the integration of transport and urban development outcomes. This is needed to inform decisions by both Crown and Council on how to leverage investment in ALR in a way that increases density and boosts the supply of affordable housing and employment opportunities.

21 Only by moving forward in this way can we increase certainty that the benefits of investment can be realised and that value for money is achieved. We expect this will significantly affect the benefit-cost ratio of investment, which at this stage, without the consideration of the urban benefits, is marginal.

22 Ministers will need to make choices on how the arrangements for delivering the project, including the form and function for the ultimate delivery entity, can best ensure that urban and transport outcomes are realised. This needs to be informed by further work and more detailed planning undertaken in the next phase.

23 To continue to ensure that there is alignment on the outcomes for the Corridor, we are proposing that the project is taken forward through a partnership between the Crown, Auckland Council and mana whenua. This partnership will be at the heart of an enduring approach to delivery and enable partners to align our aspirations for the shape of Auckland's growth along the Corridor and work together to deliver ALR.

24 An ALR Unit will be set up to advance the project through the next detailed planning phase, including the development of further business case work, technical assessments and detailed design, masterplanning, and further community and stakeholder engagement.

25 In line with the recommendations of the Establishment Unit, we do not recommend making decisions at this stage regarding the nature and form of the ultimate entity to deliver the project. We nevertheless expect many aspects of governance, skills and capability and developed stakeholder relationships within the next phase to endure as the project progresses into delivery.

26 The ALR Unit will be guided by a competency-based board that brings the skills needed to further develop our preferred solution as an integral part of a broader programme of urban transformation along the Corridor.

27 It will require many partners with different priorities and constraints to work collaboratively, making commitments over a long period of time, which endure through multiple political and investment cycles.

28 We expect the project to gain momentum and certainty over the next 15-18 months. During this timeframe, we expect that a number of milestones will show this Government's commitment to the project, including decisions on establishing the delivery entity, aspects of consenting, possible early land acquisitions, early works and market engagement.

29 A report back in April 2022 will provide further details of the timings of the transition to the legal entity to deliver the light rail project, provide necessary updates on progress being made on project development and a policy work programme, and seek Cabinet's agreement to enter into a formal Sponsors Agreement with Auckland Council and mana whenua.

There is a strong strategic case for investment in rapid transit in the Corridor

Rapid transit is a core component of our strategy for New Zealand's cities

30 Despite increased demand for public transport and active modes, we need to do things differently to support the growth of New Zealand's largest urban areas in a way that shifts the dial on accessibility, emissions reduction and equity. Bringing about the mode shift that is needed to reduce vehicle kilometres and better connect communities by walking, cycling and public transport requires bold investments and long-term, network-wide commitments.

31 Rapid transit is a critical part of this shift, especially in our largest and fastest growing cities including Auckland, Wellington and Christchurch. In cutting emissions from transport, better connecting communities and supporting future development, rapid transit will play an increasing role in how our cities grow and how we connect communities.

32 Rapid transit lies at the heart of our commitments to create vibrant and compact urban neighbourhoods, resulting in fewer emissions from how people live and travel, and giving people real travel choices and better access.

33 When integrated with land use planning, investment in rapid transit is central to our strategy to optimise the use of land, boost housing supply and improve affordability. While the costs of brownfield compared with greenfield development are highly dependent on location, supporting patterns of growth that reduce pressure on greenfield areas to accommodate growth is likely to be less expensive per unit[2], given the opportunities to make more efficient use of land and infrastructure capacity.

ALR needs to form part of an enduring part of Auckland's wider rapid transit network

34 Auckland's population continues to grow significantly, having nearly doubled in the last 30 years, creating pressures across the transport, housing and infrastructure systems. This growth is forecast to continue, growing by another 720,000 people over the next 30 years, roughly twice the population of Christchurch today.

[2] Trubka et al, 2009; Hamilton and Kellet, 2016; The CIE and Arup, 2015; Litman, 2015; SGS, 2016.

35 Representing a key component of Auckland's wider Rapid Transit Network (RTN), investment in ALR along the CC2M Corridor will be a vital part of supporting growth and shaping Auckland's urban form. When integrated with land use to enable quality compact urban form, projects such as ALR offer the opportunity to support higher levels of intensification, helping unlock housing supply and providing an environment that will support different housing typologies.

36 The underlying conditions and characteristics of the Corridor support the case for investment in rapid transit. It connects two significant employment hubs (the City Centre and the airport) via a number of established suburbs as well as two of Auckland's major tertiary institutions. The Corridor follows major arterial roads through the central isthmus before following the direction of State Highway 20 through Onehunga and Māngere onto the airport.

37 The Corridor is forecast to grow significantly in line with the wider Auckland region, and already accommodates a significant amount of developable land. This includes land within Kāinga Ora's Auckland Housing Programme, which will see up to 20,000 new homes built in Māngere and Mt Roskill.

38 Providing the Corridor's communities with better access to jobs and education will support the realisation of equity benefits, including in areas such as Māngere which suffers from poor access by public transport.

39 The ability of the Corridor to reach its full potential and accommodate the approximately 40 per cent increase in population (by 2051) will be limited by existing bus service capacity.

40 Without delivery of rapid transit in the Corridor, additional capacity for the 140 buses forecast to be terminating in the City Centre's Downtown per hour would be required as early as 2028, almost double the current figure and requiring significant investment to improve infrastructure.

41 While cost estimates for this infrastructure are not known, recent forecasts have shown that it would cost approximately $350m to cater for 100 buses (15 more than current) just in the City Centre's Downtown area alone, 40 less than without rapid transit in the Corridor. Even with additional investment, high bus volumes would negatively impact reliable operation and customer experience due to constrained street space.

42 It is clear that the existing public transport network cannot be relied upon to accommodate future growth and support the Corridor to reach its full potential. Without investment, congestion in the Corridor will continue to increase and the opportunity to realise compact urban form and all its associated benefits will be missed. This will result in increasing pressure for housing in low density and/or greenfield areas outside the primary employment centres.

An Establishment Unit was set up in March 2021 to inform decisions on investment

43 In ending the previous parallel process [CAB-20-MIN-0300 refers], Cabinet agreed that the project should be taken forward through a public service delivery approach. This followed a number of iterations of the project over many years, with its 'stop start' nature serving to reduce social licence and result in a poor understanding of the need for investment and the benefits it could bring.

44 Recognising the opportunity that investment could bring to delivering a range of outcomes for Auckland, an outcomes framework was agreed by ATAP partners in 2019. Partners have previously agreed that this outcomes framework should endure:

44.1 **Access and integration** – improved access to opportunities through enhancing Auckland's Rapid Transit Network and integration with the current and future transport network

44.2 **Environment** – optimised environmental quality and embedded sustainable practice

44.3 **Experience** – a high-quality service that is attractive to users and highly patronised

44.4 **Urban and community** – enabling of quality integrated urban

44.5 **Value for money** – investment should reflect the priorities of the Government and its partners.

45 In March 2021, Cabinet agreed that in order to deliver against these outcomes, a number of strategic choices and trade-offs needed to be made by the Government and its partners before decisions could be made around the scope and delivery of the project [CBC-21-MIN-0036 refers].

46 These choices reflect critical questions in relation to the city shaping role that the project should play, how it can best be integrated with the broader rapid transit network for Auckland, and the level of complexity that the Government and stakeholders were prepared for in delivering the project.

47 To support the Government in making these choices, Cabinet agreed to set up an Establishment Unit to inform firm decisions by Ministers on matters such as scope, delivery entity and funding and finance. Cabinet agreed that the Establishment Unit should:

47.1 complete business case work to inform future advice to Cabinet

47.2 undertake initial iwi, stakeholder and community engagement

47.3 prepare advice on the form and governance arrangements for the delivery entity for the project

47.4 prepare advice on the options to take the project forward, including mode, alignment and decision gateways

47.5 support and inform, as required, policy work undertaken by policy agencies.

48 Collaboration has been at the heart of the Establishment Unit's set up. We have worked together as project sponsors, alongside the Mayor and Deputy Mayor of Auckland and with input from the Minister of Housing, to set direction for the project and ensure alignment between the Crown and Auckland Council.

49 The Establishment Unit itself has been governed by an inclusive board made up of representatives from the Crown, local government and mana whenua, and has been chaired by an independent chairperson, Mr Leigh Auton. It was set up swiftly and has successfully brought together relevant knowledge and expertise from across multiple agencies.

50 We commend the efforts of the Establishment Unit Board and the team supporting them. We acknowledge the commitment and resourcing given by multiple partner agencies to deliver against Cabinet's direction within ambitious timeframes.

51 The Establishment Unit has now delivered its recommendations to project sponsors, based on the findings of an indicative business case (IBC) that has been provided to Ministers alongside this paper. The subsequent sections of this paper summarise the recommendations made and seek Cabinet's support for our preferred way forward.

Building social licence for investment

52 We have placed a strong emphasis on the need to build social licence for ALR. The Establishment Unit ran a programme of engagement and consultation activities to increase awareness and understanding of the need for investment. In total, two thousand and seven hundred pieces of feedback have been received by the Establishment Unit.

53 Although this engagement did not consult on specific investment options, it nevertheless showed that there is general support for light rail, with 66 per cent of the feedback demonstrating support investment. People recognised the role ALR could place in supporting higher density housing, improving access to affordable homes, reducing car dependency, and providing better access to jobs, education and recreation.

54 Feedback from those who were neutral (14 per cent) or not supportive of the project (20 per cent) expressed concerns that the costs of fares could be a barrier to some people, or that the project delivery would cause disruption and may take longer and cost more than expected. Some people thought congestion could be addressed by improving the roading system or that the benefits of investment would be limited.

55 We have learned an important lesson from the City Rail Link (CRL) that a clear and principled approach to managing the disruption experienced by businesses during construction of large urban transport infrastructure project is a vital aspect of building and preserving social licence for such investments.

56 We are recommending that a package of financial support for serious disruption is developed during the next phase of the project and delivered from the beginning of construction. This should compensate for lost revenue or relocation, with details to be consulted on during detailed design.

The Establishment Unit examined three shortlisted options for rapid transit

57 The IBC has been prepared in response to the specific challenges and opportunities that exist in the Corridor, the agreed project outcomes, and a series of investment objectives. These objectives have been used throughout the assessment process, including the appraisal of a long-list prior to the assessment of a shortlist of options.

58 The investment objectives are:

58.1 **Objective one:** To implement a rapid transit service that is attractive, reliable, frequent, safe and equitable, is integrated with the current and future active and public transport network, and that improves access to employment, education and other opportunities.

58.2 **Objective two:** A transport intervention that embeds sustainable practice and reduces Auckland's carbon footprint.

58.3 **Objective three:** To unlock significant urban development potential supporting a quality compact urban form and enabling integrated and healthy communities.

59 Guided by these objectives, over 50 options were considered, at which point options including heavy rail, bus rapid transit and trackless trams were ruled out. These did not meet the investment objectives as they did not achieve the necessary capacity to meet demand and support urban development, as were investment options with route alignments via SH16 and Mount Eden Road.

60 A shortlist of three investment options was developed and appraised in greater detail. These are described below, alongside their costs. Given the early stages of the project's development and design, costs are indicative only and are expressed as both P50 and P95 estimates (respectively representing a 50 per cent or 5 per cent chance that costs will exceed this amount).

Option 1: Surface-running light rail via Dominion Road (P50 - $9 billion, P95 - $13.7 billion)

61 This option involves modern trams running on tracks at surface level, but separated from traffic. This would largely follow the alignment of existing roads and motorways, and all stops would be on the surface.

62 An initial shortlist considered the merits of an alternative alignment along Sandringham Road, although this was subsequently ruled out based on a need to relocate a Vector power cable to Dominion Road, requiring two years of works, leading to additional disruption and cost.

Option 2: Light Metro via Sandringham Road (P50 -$16.3 billion, P95 - $26.4 billion)

63 Light Metro provides for higher capacity than surface-running light rail, and would be tunnelled through densely populated urban areas (Wynyard Quarter to Mount Roskill) and run at surface level through non-urban areas, generally following the motorway corridor.

64 The initial shortlist considered the merits of an alternative Light Metro alignment via Dominion Road. This was assessed as providing poorer value for money than a Sandringham Road alignment, largely due to lower patronage and urban development potential. While surface level light rail follows road corridors, the tunnelled options have more route flexibility, so if a tunnelled option proceeds, we expect that further investigation at the next stage would confirm the exact route to optimise project benefits.

Option 3: Tunnelled Light Rail (P50 - $14.6 billion, P95 $23.1 billion)

65 The Establishment Unit developed a 'hybrid' option, utilising light rail vehicles via a tunnel running from Wynyard Quarter to Mount Roskill, and segregated running for the majority of the remaining route to the airport, with two short street running sections in Māngere.

The key differentiators between options

66 The Establishment Unit found that all three options perform well against the investment objectives and represented value for money. However, in order to agree a preferred way forward, a number of trade-offs were considered.

67 There is significant variation in some key aspects, as set out in further detail in Appendix 1. In summary, the principal differentiators between the options relate to:

67.1 **Costs** – both Light Metro and Tunnelled Light Rail have P50 costs upwards of $14bn, with Light Rail being more affordable, at $9bn.

67.2 **Climate change** – all options significantly reduce carbon emissions over their lifetime. Light rail is forecast to achieve net reductions earliest, in 2041, with Light Metro and Tunnelled Light Rail following in 2055 and 2051 respectively. This is partially due to the embodied carbon in different options, which is lower in Light Rail than the two tunnelled options. Recent developments in concrete technology that lower the embedded carbon component may further improve these outcomes, especially for tunnelled options.

67.3 **Urban intensification** – Light Rail achieves high levels of urban intensification with a net increase of 4,100 to 20,000 dwellings, albeit lower than the circa 5,000 to 35,000 for Light Metro and Tunnelled Light Rail. The majority of this additional growth depends on a number of urban interventions being made alongside investment.

67.4 **Disruption** – Light Rail is expected to create the most disruption, with partial or full road closures along sections of the route for a number of years. Light Metro would cause the least disruption due to the tunnelled nature of the project.

67.5 **RTN integration** – tunnelled options (Light Metro and Tunnelled Light Rail) may connect better with future RTN, with the most recent Additional Waitemata Harbour Crossing (AWHC) work indicated the better option may be to tunnel. Tunnelling in the city centre would allow for faster and more frequent services across a future RTN, providing for higher capacity across the network.

67.6 **Transport capacity** – all options would carry significant numbers of passengers, with Light Rail carrying 20 million per year, Light Metro 35 million and Tunnelled Light Rail 31 million. If integrated into the AWHC, Light rail is expected to run out of capacity by 2051.

68 The Establishment Unit has recommended the Tunnelled Light Rail option as the preferred way forward due to its ability to unlock the same high levels of urban development and intensification as Light Metro, but at roughly 10 per cent lower cost.

We are satisfied that the business case and its recommendations provide a clear pathway forward

69 In determining our preferred way forward, we have had regard to a number of important considerations relating to the conditions within which the Establishment Unit undertook its work.

70 Firstly, the short timeframes and compressed deadlines that were necessary to produce recommendations in time for this report back inevitably meant that a number areas within the Establishment Unit's programme of work were run in parallel. This provided limited opportunities for a sequential and iterative consideration of outputs from individual workstreams.

71 Secondly, we acknowledge that the intent of an IBC is to provide an early opportunity for decision makers to determine if there is a viable project to proceed with, before further funding is committed to detailed planning. An IBC is not prepared around detailed design and costings, meaning that, at this stage, there is a high degree of uncertainty in the estimates of costs and benefits, which will need to be refined in the next phase.

72 Acknowledging these challenges, we welcome the approach to assurance that has been undertaken by the Establishment Unit, including independent advice to the board with overseas experts providing rapid transit and light rail experience. We have also received 'second opinion' advice from the Ministry of Transport and the Treasury.

73 A Gateway review has also been completed by independent experts, overall assessing the project as amber on the 5-point scale, noting the high quality of the transport component (which was rated as green-amber) and recommending several areas of improvement, including:

- the next phase being progressed as an integrated urban development and transport business case
- a comprehensive partnering strategy is developed that ensures appropriate contractual and collaborative working arrangements between partners.

74 Overall, while there are limitations to the IBC, no issues have been identified that would materially impact our decision on how best to proceed. We are satisfied that a robust process has been followed and that the IBC provides the basis on which to proceed to detailed planning.

We are recommending that tunnelled light rail along Sandringham Road is progressed as the preferred option

75 In moving into a detailed planning phase, we are recommending that tunnelled light rail along Sandringham Road is further developed as the preferred option, with a strong focus integrating this with urban development along the Corridor.

76 Balancing the clear benefits of a tunnel with the higher costs of construction (relative to surface level construction) is a priority for the next phase of work. As mentioned in 62, the need to relocate a Vector power cable does add to these costs and constrains the ability to shorten the tunnel down the proposed Sandringham Road alignment.

77 In making this recommendation we have considered a number of trade-offs including:

77.1 the additional capacity of the transport network, given the increased speeds and frequency of tunnelled light rail services

77.2 enabling a potential future connection to an AWHC, noting that this could require a tunnelled connection in the City Centre

77.3 the larger catchment and accessibility enabled by a tunnel in the city centre, for example to serve the universities

77.4 reducing disruption to businesses and residents during construction

77.5 the certainty that a firm decision to tunnel the scheme provides to planning of the wider rapid transit network, as well as to landowners, developers, businesses and other stakeholders

78 This option has been selected on the basis of the IBC. Whilst we acknowledge that the precise details of this option may change as we work through the detailed planning and consider opportunities to optimise the design, it is our intent through this decision to provide the certainty needed to progress towards delivery.

Progressing ALR will signal a shift in how we plan, fund and deliver rapid transit in New Zealand

79 Rapid transit initiatives such as ALR are only successful when they are delivered as part of broader networks that transform access and shape long-term growth across cities and regions. Failing to plan, fund and deliver investments such as ALR in an integrated and consistent manner across New Zealand will put at risk our ability to leverage the benefits of investment, including the combined role that rapid transit investments need to play in meeting our emissions reductions targets.

80 In an Auckland context, ATAP frames light rail as part of a connected and integrated rapid transit network including the CC2M, Northern and North-western Corridors. ALR must be planned in a way that supports the delivery of future investments alongside rapid transit corridors with this wider network in mind.

81 We recognise that the choice of mode and route along the CC2M Corridor will have a material impact on future decisions on rapid transit in other corridors. Misalignment of planning could result in higher costs to integrate the network, or foregone benefits.

82 Of particular relevance is the AWHC project, which will enter an indicative business case phase at the same time as we progress with ALR. Previous work has indicated that a rail-based rapid transit connection for the North Shore, including across the Waitematā Harbour to the city centre, could be needed.

83 The Tunnelled Light Rail option would enable a tunnelled connection that the AWHC project could require. We intend to progress both projects together given they will need to connect to each other, dependent on business cases being able to be aligned.

84 Dependent on Cabinet decisions, we have asked agencies to prepare to align the projects so they can benefit from coherent integration and the efficiencies of progressing both projects at once.

85 This is a nationally significant corridor, providing access within the North Shore, from the North Shore and across the Waitematā Harbour to the Auckland isthmus, and

acting as the most direct link between Northland, Auckland and the rest of New Zealand. The corridor is already under pressure and faces some resilience challenges. These pressures and challenges are forecast to increase further as population and employment continues to grow.

86 Integrating both the ALR and AWHC projects would allow us to address the growth pressures and resilience issues of the North Shore while improving urban development and creating transport opportunities for those on the Isthmus and South Auckland. It would also ensure a more linked-up rapid transit network that would potentially better enable mode shift as well as create efficiencies during construction.

87 To enhance the combined impacts of investments across Auckland's rapid transit network, we expect all projects to be developed in a way that have regard to one another, ensuring that the costs and benefits of integration are quantified and incorporated into decision-making.

88 For ALR, we expect the governance and partnership arrangements to ensure that decisions made during the detailed planning phase are integrated with decision-making across other rapid transit initiatives, working closely with Waka Kotahi, Auckland Transport and others.

An enduring framework for rapid transit is needed across New Zealand

89 From a national perspective, it is not sustainable for investments such as ALR to continue to be developed on a project-by-project basis. To effectively plan and deliver rapid transit in a way that supports long-term growth in cities and delivers against our emissions reduction targets, we need to work towards a clearer, nationwide approach to the planning, funding and delivery of rapid transit. This will be particularly important to frame the development and delivery of future projects in Auckland, Wellington and Christchurch. Preferred options for rapid transit projects in Wellington and Christchurch are likely come before Cabinet in 2022.

90 The framework we are developing through work on the Strategic Planning Act will be a significant step forward in the integration of planning for transport and land use. This will provide a platform for a shared understanding for how regions such as Auckland will grow. It will help provide a more consistent approach to identifying and protecting transit corridors and creating certainty for the Government, its partners and the market regarding the timing and prioritisation of investments.

91 In response to this new planning regime, and our climate commitments, a nationally consistent strategy for the planning, funding, ownership, operation and delivery of rapid transit in New Zealand is needed. The Minister of Transport intends to set out a high level direction on these issues in an amendment to the GPS on Transport in early 2022. As part of the policy work programme needed to take ALR forward, the Ministry of Transport will lead ongoing work, working the Treasury, Waka Kotahi and others.

92 The approach should clarify the definitions and role of rapid transit in wider transport and planning frameworks, including the wider range of interventions that will be needed to reduce emissions in our cities. This will form the basis of advice to ministers on the roles and responsibilities for the delivery and operation of rapid transit within the transport system.

93 Sufficient progress will need to be made on the development of the national approach to rapid transit to inform policy decisions on funding and delivery entity choices for ALR. The Minister of Transport will return to Cabinet with details of this national approach as part of advice to Cabinet on the delivery entity for ALR.

The project should be progressed as an integrated urban development and transport initiative

94 While the tunnelled light rail solution is key to supporting the desired intensification and compact urban form, the assurance process demonstrates that none of the investment solutions in isolation will provide the conditions for the delivery of the enabled urban development capacity.

95 Beyond investment, unlocking the scale of urban development and housing uplift will also depend on a number of interventions, including:

95.1 investment by both the public and private sector in housebuilding, urban development and placemaking

95.2 supporting infrastructure investment (e.g. three waters, supporting transport interventions, placemaking)

95.3 planning policy changes, including zoning and masterplanning

95.4 engaging with communities and stakeholders.

96 The work of the Establishment Unit provides an indication on the level of urban development potential associated with different options, although we need to build on this initial analysis to develop a more comprehensive understanding of the programme and costs associated with the urban interventions needed to enable the scale of opportunity envisaged.

97 The next stage of work should focus on developing more certainty over how and when these wider benefits would be delivered, by whom and where funding for this could be sourced.

98 Many of the interventions needed to deliver this urban uplift potential, such as planning and zoning changes, land assembly and complementary investment in water, energy, transport and placemaking, are not within the Crown's direct sphere of influence. Much of this sits with Auckland local government.

99 We expect that developing an understanding of the urban opportunity and costs to be a core focus of the next, detailed planning phase of work

100 In recognition of the need to focus on the urban development opportunities and costs in the next phase, the parameters of the scheme's design, development and appraisal must more clearly reflect the nature of the project as an integrated transport and urban development initiative. Progressing the project in such a way is likely to include:

100.1 collaborative working by partner agencies and mana whenua to clearly articulate the end benefits being sought, adopting an infrastructure and policy neutral approach to developing the project scope and appraising options.

100.2 refreshing the strategic case to outline the urban development factors as well as transport, to help establish realistic and feasible benefits

100.3 revisiting land use scenarios, including methodologies, modelling and feasibility assessment of scenarios

100.4 identifying the interventions required to facilitate market development benefits, particularly increased housing capacity. These interventions would be focused on infrastructure and land use initiatives and include zoning changes (including impact of new medium density residential standards/intensification rules), land acquisition and aggregation, as well as masterplanning and the 'packaging' of development opportunities

100.5 analysis of the viability of the development sites that make up the enabled housing capacity, providing an indication of the phasing of development sites

100.6 analysis of likely effectiveness and feasibility of urban interventions, including analysis of the effectiveness of different packages of interventions at different locations along the Corridor

100.7 engaging with the market to enable, promote and incentivise urban development to achieve desired density and scale

100.8 developing our understanding of the costings for the urban interventions, including enabling infrastructure and other amenities required to support development (for example water infrastructure, urban parks, schools, other utilities). Investigation and analysis of options of these interventions is generally the responsibility of partners, namely Auckland Council and Kāinga Ora. Engagement and commitment from these partners will be required to support this work

100.9 confirming the requirements, constraints and dependencies of Auckland Council and Kāinga Ora's adjacent schemes and land holdings is critical, of note are the Kāinga Ora Large Scale housing projects in Mt Roskill and Māngere

100.10 analysis of social, well-being, economic costs and benefits of different interventions (or packages of interventions)

100.11 working with partners to develop a recommended implementation plan focused on infrastructure and land use initiatives and other urban interventions to facilitate market development.

The project should also consider how broader benefits for the workforce are realised

101 In addition to a full exploration of options and value through transport and urban development lens, we are also committed to ensuring that the options and value in the way in which work is undertaken are also fully explored to ensure it is safe, fair and productive.

102 Our expectation is that large amounts of value are created through the work through the training and development of workers, especially those from the local communities.

103 The project should from the outset adopt a 'zero harm and thriving infrastructure approach' that embeds a focus on caring for the wellbeing of people at every level, including governance and procurement. We expect the project to realise efficiencies and productivity gains as a result of the above.

The next phase of detailed planning will include work to inform final investment decisions

104 We are recommending that the project progresses on the basis of our recommended option, into a detailed planning phase.

105 Realising the full potential of the corridor will involve a concerted effort by multiple partners. The next operating unit must consider all the desired outcomes for the Corridor in refining the nature of the light rail solution, having full regard to the opportunity for urban transformation, growth and intensification.

106 It is expected that delivery of tunnelled light rail and the wider benefits realisation over the longer term would occur across multiple partners. The detailed planning phase must provide the evidence base that shows how tunnelled light rail and its benefits can be delivered as part of an integrated programme.

107 Framed as an integrated transport and urban development initiative as described above, the detailed planning phase will inform final investment decisions and will involve work by multiple partners to:

107.1 scope and progress a business case, undertaking necessary analysis to build on the IBC and ensure a robust evidence base for future decision making, including final investment decisions

107.2 examine and optimise the preferred proposal to consider whether there are cost savings that can be made, acknowledging that international comparisons cost considerably less. This should consider the extent of land acquisition and corridor widening required in the context of moving towards a low emissions transport system with reduced vehicle kilometres travelled

107.3 refine the solution to ensure it is integrated with wider planning for growth and transport investment across the region, including the AWHC, the Auckland Rapid Transit Plan and Kāinga Ora Large Scale Projects

107.4 develop procurement and land acquisition strategies, considering the potential for early strategic land acquisition

107.5 develop a consenting strategy, begin route protection and the preparation of associated applications for consenting. This must involve working with the Ministry of Housing and Urban Development to consider the application of the Urban Development Act 2020

107.6 undertake further community, Māori and stakeholder engagement, especially through masterplanning activities, ensuring that local interests are presented in plans and to build an understanding of the implications of this project for urban form along the Corridor

107.7 determine the approaches to minimising disruption to businesses and business compensation

107.8 further investigate opportunities to reduce embodied emissions across the integrated transport and urban development programme

107.9 agree the governance arrangements for the project in the delivery phase, including the roles, responsibilities and accountabilities of agencies

107.10 agree the preferred delivery entity, the powers and form of it, ownership and operations of the transport asset

107.11 determine the preferred funding and finance arrangements for the delivery of the project

107.12 develop an approach to minimise disruption to businesses and target assistance available for businesses affected by the project

107.13 develop options to stage the route, and project as a whole (both transport and urban interventions)

107.14 develop an approach to the design, delivery and operation of the project in a way that has zero tolerance for harm, and supports workers to thrive. The approach should minimise health and safety issues with a target of zero fatalities during the construction of the project, reflecting approaches taken in other jurisdictions such as the 2012 London Olympics.

108 Based on current assumptions, Officials have advised that the above represents a work programme lasting approximately two years, and that this will be necessary to ensure that future funding and investment decisions can be made with confidence, based on sufficient information.

109 In advance of more detailed scoping of the next phase, Officials have advised against making investment decisions in any shorter timeframe. International examples of similar projects being developed demonstrate the significant risks of cost overruns and the need to revisit decisions when they are made early and on insufficient information, and based on. We intend to carefully work these timeframes through with Officials to ensure that we have a considered process, while retaining project momentum.

110 At the end of the planning phase, we expect to be able to progress a Crown investment decision for the project. Depending on the final advice regarding the funding package, other agencies, in particular Auckland local government, will also need to make investment decisions to implement the programme of initiatives required to deliver light rail and the benefits it enables. These investment decisions may be subject to negotiation following the business case adoption.

111 We expect the project to gain momentum and certainty over the next 15-18 months. During this timeframe, we expect that a number of milestones will show this Government's commitment to the project, including decisions on establishing the delivery entity, aspects of consenting, possible early land acquisitions, early works and market engagement.

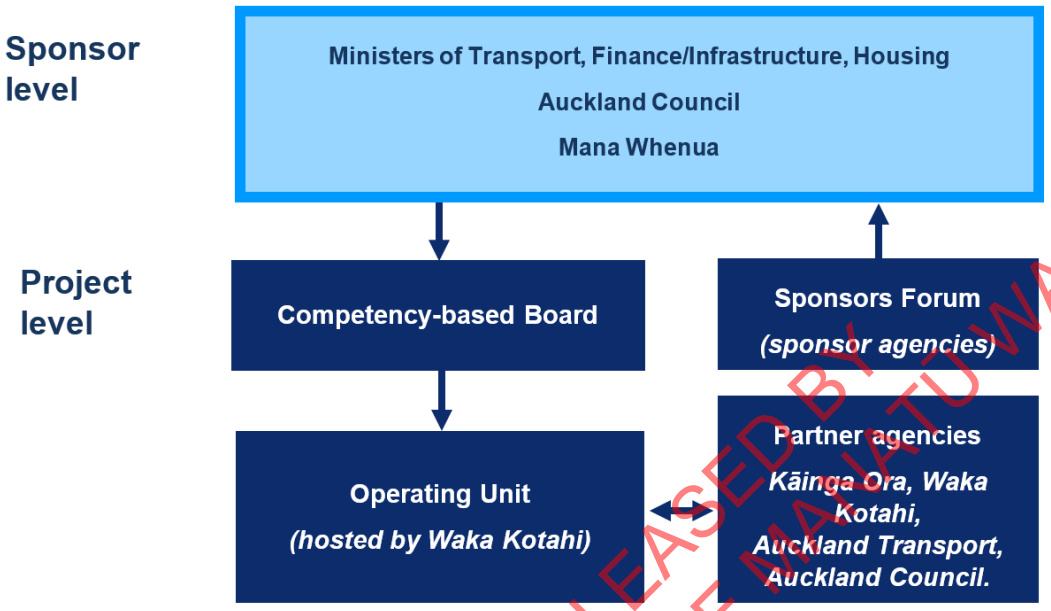
112 The above mandate represents a mixed programme of policy and project work across multiple portfolios. An indicative sequencing of Crown decisions based on a two-year programme is identified at Appendix 2.

113 We are seeking a mandate from Cabinet for ourselves and the Minister of Housing, in consultation with Auckland Council and mana whenua, to clarify the specific deliverables of the next operating unit within this programme, who we expect to work closely with policy agencies.

114 A policy work programme will be run in conjunction with the work of the next operating unit, details of which is set out later in this paper.

Appropriate governance and oversight arrangements are needed going forward

115 Good governance is imperative to the success of this integrated programme of work. The following diagram sets out our proposed approach to governance for the detailed planning phase.



116 Our proposal includes two layers of governance; at sponsor and project level. In evolving the existing arrangements, we are proposing that the project sponsors consist of the Ministers of Transport, Finance and Housing, representatives from Auckland Council and mana whenua. This partnership is critical to the success of the project and will be formalised in a Sponsors Agreement.

117 A Sponsors Forum will be comprised of senior representatives from agencies represented at the Sponsor's level. This will give effect to the Sponsors Agreement and allow for a second stream of advice to the Crown, taking a system-wide and stewardship view.

118 At the project level, governance will comprise a competency-based board, which we see as necessary to bring the specific skills and knowledge required to advance this complex project. A series of partnership agreements between the operating unit and agencies including Waka Kotahi, Auckland Council, Auckland Transport and Kāinga Ora. These will set out what is expected of each agency to deliver as part of the detailed planning phase.

119 The partner agreements will be informed by the Sponsors Agreement and any other accountability mechanisms used to support and clarify the governance arrangements.

120 In finalising the governance arrangements, we expect the following principles to be applied and reflected as necessary in governance structures and all necessary agreements:

120.1 **Direct line of sight and influence by the Crown.** The detailed planning phase requires a number of significant policy and strategy decisions to be made, which are the reserve of the Crown. This includes final ownership and operation of the transport asset, the scope of the urban development opportunities and how these are realised, and the preferred funding and governance arrangements.

120.2 **A Sponsors partnership between Crown, Auckland Council and mana whenua,** described below.

120.3 **Embedding the integrated urban development and transport focus** with the inclusion of the Minister of Housing as a Sponsor, the Ministry of Housing and Urban Development in the Sponsors Forum, and urban development expertise on the competency-based board.

120.4 **Mana whenua will be embedded** in the governance and entity arrangements as the project progresses. These roles, responsibilities and representatives will be worked through with mana whenua as these arrangements are finalised. Mana whenua representation is intended to take account of broader Māori interests.

120.5 **Accountabilities** will be set up so that there is certainty for Sponsors that their agreed outcomes are being delivered. This will ensure that the trade-offs that need to be made during the development of the investment can have regard to Sponsor's outcomes.

120.6 **Clarity of the roles, responsibilities and accountabilities of the many partners** involved in this complex project.

121 The governance arrangements will evolve over the phases of the project, with a lesser degree of ministerial oversight being required over time. As strategic and policy decisions are made, the operating environment (including our understanding of risk) will become more stable.

122 This will allow increasing levels of operational responsibility and decision-making to be made available to existing agencies as well as the ultimate light rail delivery entity.

Establishing an enduring partnership of sponsors to guide the project over the long-term

123 Delivering ALR as part of an integrated programme of urban transformation requires close coordination between the Crown and its partners, Auckland Council and mana whenua. Auckland Council in particular will have significant responsibilities, including:

123.1 working within a wider partnership to develop a shared vision

123.2 planning and investment to enable the required scale of urban transformation

123.3 statutory planning functions

123.4 masterplanning throughout the Corridor

123.5 working with Auckland Transport to confirm long-term ownership and operation of the transport asset, including opex

123.6 supporting the development and implementation of value capture mechanisms

123.7 community and stakeholder engagement.

124 Recent experience has shown that the Crown and Auckland Council can have different aspirations for how Auckland grows. For this project to succeed we will need to align our aspirations for the Corridor and work together to realise the full suite of outcomes that will be unlocked, recognising that this will require bold decision making. Given the scale of this investment, Auckland Council will need to commit to this project beyond its normal business as usual planning cycles and approaches.

125 Through our initial engagement with Auckland Council it has indicated an appreciation of its role, and the significance of working in partnership with the Crown to progress the project.

126 To support this relationship in guiding the project we are proposing to establish a formal partnership between the Crown, Auckland Council and mana whenua. This will set out those responsibilities we each bring to the project and a commitment to resource and working together in the interests of delivering ALR.

127 It is proposed that the partnership will respect the individual decision-making rights of each of the partners, but recognise that final investment decision-making on light rail will sit with ministers, given the significant financial contribution being made by the Crown. It will enable the coordination of activities, including the various investment and policy tools available to the Crown and Auckland Council.

128 We are working with Auckland Council and mana whenua to agree the nature of this partnership. We expect to report back to Cabinet in April 2022 to seek agreement to enter into a Sponsors Agreement that will give effect to the partnership.

129 We are seeking a delegation from Cabinet to, in consultation with Auckland Council and mana whenua, finalise the other governance arrangements. The Ministry of Transport, the Treasury and the Ministry of Housing and Urban Development will lead this work, in close collaboration with relevant agencies and the ALR Unit.

Building on the success of the Establishment Unit to take the next phase forward

130 The Establishment Unit has demonstrated its success in building relationships with partners and bringing them together to provide advice on a way forward. We want to build on that success and maintain momentum.

131 We are proposing that the detailed planning phase be taken forward by a specific ALR Unit, which will be hosted by Waka Kotahi but overseen by its own dedicated competency-based board (the ALR Board). This will replace the current Establishment Unit Board, be accountable to Sponsors and will bring the skills, knowledge and experience necessary to deliver a mega-infrastructure project in a public sector context.

132 One of the successes of the Establishment Unit has been its ability to bring together a number of agencies to work collaboratively on a project with broad interests. We want this to continue in the ALR Unit, drawing in the established expertise and knowledge from across the sectors through partnerships with Waka Kotahi, Auckland Council, Auckland Transport and Kāinga Ora.

133 In setting up the next phase in such a way, the ALR Unit can access corporate services from Waka Kotahi while providing a direct line of accountability and influence to and from the Crown. This creates a level-playing field for partners to participate in the project, ensuring both urban and transport considerations, as well as national and Auckland interests, are all taken into account.

134 We expect the role of the Waka Kotahi Board to be limited to its hosting responsibilities. To best support this, and in a change from the existing arrangements, we are seeking funding for the ALR Unit through Budget 22. This is different to the current arrangements where the National Land Transport Fund is used, for which the Waka Kotahi Board is accountable.

135 Work by Officials is underway to provide clarity on accountabilities, responsibilities and liabilities within the system through our preferred governance arrangements, including providing the necessary clarifications regarding the role of the Waka Kotahi Board and the appointment of a designated Senior Responsible Officer.

136 We are seeking delegated authority, alongside the Minister of Housing and in consultation with Auckland Council and mana whenua, to take decisions as required to finalise the governance arrangements, assurance framework and the accountability mechanisms for the next phase.

There must be continuity of governance and skills across the project's phases

137 We expect aspects of governance, skills and capability and developed stakeholder relationships within the next phase to endure as the project progresses through further planning and into delivery. This is important to maintain momentum, demonstrate the credibility of the project, attract and retain critical expertise in staff and board members and facilitate an enduring social licence and strong stakeholder relationships.

138 It will be critical that the partnership between the Crown, Auckland Council and mana whenua endures to allow for the long-term alignment and commitment by Sponsors to the project's outcomes.

139 With a focus on urban and transport outcomes, further refinement of project scope is needed before a decision on the delivery entity can be made. Outputs of the detailed planning phase and policy work programme will inform this decision, including on which entity/s will be responsible for delivering the various aspects of the project and its broader outcomes. This will include where responsibility sits for property development alongside the core transport project, to realise the urban development benefits. This is consistent with the Establishment Unit's advice.

140 Determining the appropriate powers and institutional settings needed for the delivery of the agreed scope of ALR must also be considered in the context of this Government's prioritisation of rapid transit and the need for consistent and enduring frameworks to support this.

141 We are clear that the transition from the ALR Unit to the final delivery entity will be designed to ensure a high-degree of continuity in the membership of the ALR Board and in the skills and capabilities that are embedded into the unit itself. This will be critical as we move away from the stop-start history of the project.

142 We expect work to determine the nature and form of the delivery entity to be undertaken as a priority in the next phase. The transition to this formal legal entity will take place before the detailed planning phase has been completed, to ensure the commitment of the Board to important part of the project and support processes such as consenting and land acquisition.

143 This transition should be planned to occur in the second half of 2022 as this is likely to be necessary in advance of consenting and land acquisition processes. More information on the timing of this will be included in our report back in April 2022.

144 We are seeking a delegation from Cabinet for ourselves and the Minister of Housing, in consultation with Auckland Council and mana whenua, to determine the parameters of responsibility of the ALR Unit. The Ministry of Transport and the Treasury will work in close collaboration with sponsor and partner agencies, Te Waihanga, and the Establishment Unit to set these out.

145 We expect the new governance and organisation arrangements will be established no later than April 2022. The appointment of the chair of the ALR Board will be a priority. Until these arrangements are finalised the existing arrangements will continue.

Assurance approach going forward

146 Assurance and monitoring is a common component of megaproject delivery and is a key risk management mechanism used to protect the interests of various parties and increase confidence that the project will deliver effectively.

147 As complexity increases, the risk to benefits, cost and schedule can increase exponentially due to the significant interactions and dependencies within and outside the project. Managing risk across the ALR project will be critical for successful delivery.

148 Assurance and monitoring arrangements will be finalised alongside project scope and governance. This will be multi-faceted, with activities being undertaken by the Crown, the Senior Reporting Officer and the ALR Unit.

149 Implementation of monitoring and assurance will involve multiple agencies in the project direct. The Ministry of Transport will work with the Ministry of Housing and Urban Development, the Treasury and Auckland Council to develop a monitoring and assurance framework and the accountability mechanisms for the next phase.

150 The governance structure itself has built-in assurance mechanisms through system and stewardship advice from the Sponsors Forum to Sponsors, and the independent advice of policy agencies to Sponsoring Ministers.

Funding and value capture

Moving to a nationally consistent approach to funding rapid transit in a transport system with less reliance on cars

151 We are entering a period in which the government is having to consider investment in rapid transit systems in our main urban centres after decades of limited investment in this mode.

152 There is currently no consistent approach to this investment as there is with motorways for example, which have been one hundred per cent funded by Waka Kotahi or the Crown in recent years. Examples of current rapid transit systems that are being built or contemplated and the Crown contributions for each are as follows:

- City Rail Link – 50% Crown contribution
- Eastern Busway – 80% Waka Kotahi contribution
- Let's Get Wellington Moving – Indicative 60% Crown contribution
- Christchurch rapid transit – Early stage of planning, funding contribution not yet under discussion
- AWHC - Early stage of planning, funding contribution not yet under discussion
- Interim North-West busway – 100% Crown contribution.

153 Our view is that there should be a more coherent approach to rapid transit investment that provides a stable platform for discussion with local government partners, and ensures a level of equity across regions.

154 The Minister of Transport is considering these issues as part of an amendment to the Government Policy Statement on Land Transport (GPS) 2021 and intends to report back to Cabinet in the first half of 2022. We believe that final investment decisions about ALR should then be considered within this broader context.

155 The Ministry of Transport is considering what the future state of the transport revenue system could look like over the long term, to ensure it is fit for purpose and can meet future requirements. The current reliance on charges for vehicle use is not necessarily sustainable given the desire to reduce vehicle kilometres travelled to reduce carbon emissions, while also expecting greater levels of investment into public transport and active modes. The end goal of the future of the revenue system work is to design a new, or renewed, revenue system that effectively services transport needs over the following 30 to 50 years.

156 To address the short- and medium-term pressures on the NLTF Officials from the Ministry of Transport, the Treasury and Waka Kotahi are also undertaking a Review of Land Transport Revenue. This will include considering how land transport projects of scale can be funded and financed, with the major emphasis being what the NLTF should and should not be expected to pay for. This review will inform Officials' advice on the preferred funding package for the ALR project, as well as potential future MRT projects.

157 The Ministry of Transport plans to consider what further direction can be provided through the GPS 2024. The national rapid transit strategy and the Revenue Review are among work programmes that could inform rapid transit funding and investment implementation in GPS 2024.

A range of funding tools will form the funding package needed to deliver the light rail solution

158 It is clear that a significant proportion of the capital costs associated with the project will be paid for by the Crown. To support this, it is important that a broad range of funding sources, including value capture, is utilised as part of a fair and equitable funding solution. The Establishment Unit's work indicates that $2-3 billion could be recovered through value capture mechanisms.

159 The development of the final funding package will require an ambitious approach that reflects the scale, breadth and nature of benefits that investment will bring, based on the 'beneficiary pays' principle.

160 The Establishment Unit considered the merits of a range of funding sources.

160.1 Infrastructure Funding and Finance (IFF) levy.

160.2 General rates (to recognise regional benefits to regional landowners).

160.3 Business rate supplement across Auckland (with local and regional price differentials).

160.4 Development contributions, which will recoup growth-related elements of Auckland Council's contribution from developers.

160.5 Strategic land acquisition and intervention has the ability to generate funding for the project, and will need to be considered in more detail in the next phase business case.

161 Whilst this has provided an indication of the potential funding tools that could be used, further analysis is needed to better understand the affordability and viability of different mechanisms, and the contributions these could make. We are proposing that this takes place during the detailed planning phase, led by the Ministry of Transport and the Treasury with input from the ALR Unit.

162 The Establishment Unit has considered IFF as a proxy for value capture, although we note that this mechanism is generally intended to recover costs rather than capture value. This future work should explicitly explore how value capture could be pursued as a core component of any funding solution, recognising that the developers and landowners who benefit from investment should make a contribution to its costs.

163 Whilst the use of both targeted rates and/or the IFF levy could be an appropriate part of any funding package, we are recommending that future work develops the policy approach and a pathway to implement a specific value capture tool that could be used for this project and possibly others. Given the impact on landowners along the Corridor, any announcements the Government makes about the project should indicate the possible funding sources to be used.

164 The National Land Transport Fund (NLTF) alone will not have the capacity to fund the capital costs of this project, or all of the operating costs. The NLTF funding model is well-suited to meet maintenance costs and gradual network improvements but too inflexible to meet the capital cost profile and the many objectives we want from projects such as ALR.

165 Under the Auckland Transport Alignment Project (ATAP) 2021-31 funding totalling $1.8 billion has been allocated for CC2M and Northwest corridors in this decade. Whilst the Government Policy Statement on Land Transport 2021 includes a commitment to ATAP, this does not direct or guarantee funding for specific projects such as CC2M. Funding for individual projects through the NLTF must be approved by the Waka Kotahi Board having regard to a range of priorities for spending.

Policy work programme going forward

166 A significant policy work programme is needed to consider the legislative, regulatory and institutional frameworks that are needed to move the project to delivery and ensure it gives effect to wider government priorities. This will include consideration given to the development of nationally consistent and enduring frameworks to support this Government's focus on shifting to a transport system with increasing levels of rapid transit.

167 The policy work will be integrated into the project work programme. This is necessary to enable Crown decisions on policy to inform the project's scope and direction.

168 The policy work to be undertaken includes:

168.1 supporting future decisions on project scope, confirming the outcomes and deliverables that are being purchased as part of this project, especially in relation to the delivery of transport infrastructure and urban development

168.2 identifying, influencing and implementing further policy interventions that are needed to leverage the investment and deliver broader outcomes, for example, influencing Kāinga Ora's large-scale projects

168.3 determining the optimal governance and organisational arrangements for delivering the project. This should consider the responsibilities of a delivery entity for ALR and beyond, how this fits with the wider framework for rapid transit, and responsibilities between central and local government

168.4 shaping and confirming the consenting requirements and processes. This should consider the implication of the Government proposed replacement of the Resource Management Act 1991, the potential merits of the Urban Development Act 2020 and the extent of legislative change that may be needed in order to deliver the benefits of the project

168.5 confirming the ultimate owner(s) and operator(s) of the transport assets

168.6 confirming how the project will be funded and financed, confirming the role of existing funding mechanisms such as the NLTF, recommending a funding package including the use of value capture tools, with a view to creating consistency to how all rapid transit projects are funded in the future

168.7 ensuring that Māori and the Crown receive the necessary assurance that the Crown's Treaty obligations are being met

168.8 supporting the Crown-Auckland Council and Crown-mana whenua sponsor relationships

168.9 developing and confirming the approach to land acquisition

168.10 identifying the approach to managing and compensating for business disruption

168.11 ensuring existing rail regulations and standards support construction and operating of the mode being built and operated

168.12 determining the need for legislative or regulatory change.

169 The Ministry of Transport will coordinate this policy work, working closely with a number of agencies including the Ministry of Housing and Urban Development, the Treasury, Public Services Commission, Land Information New Zealand and the Ministry for the Environment. The Sponsors Forum will guide this programme and inform advice to the Crown.

170 This work will inform (and be informed by) work led by the Ministry of Transport to develop an enduring approach to the way that rapid transit is planned, funded and delivered across New Zealand.

171 We will update Cabinet by April 2022 on the progress of the policy work programme.

Financial Implications

172 The latest National Land Transport Programme commits sufficient funding from the NLTF for the Establishment Unit to continue until June 2022. Whilst a further $39 million is signalled for subsequent phases, this will be insufficient to cover the costs associated with the next, more detailed phase of work. Ongoing funding from the NLTF does also not reflect the appropriate level of accountability back to the Crown.

173 Progressing ALR beyond this period, as outlined in this paper and with the appropriate oversight by Ministers, is therefore considered to be contingent on further Crown funding being made available through Budget 2022.

174 Crown funding provides a strong lever of accountability back to the Crown, which is considered necessary in the next phase, during which a high degree of oversight will be required by Ministers. Given that Crown funding will establish a strong link of accountability between the new ALR Unit and the Crown, we are recommending that funding for the next phase is progressed as a Budget 2022 bid.

175 The Minister of Finance has invited a bid of this nature, which will need to be considered alongside other government spending priorities prior to Budget announcements. For a period of two years the bid is seeking $260 million for professional services and policy work, and $131 million for early strategic land acquisitions.

Legislative Implications

176 There are no legislative or regulatory implications from this paper, however through the policy work undertaken in the next phase consideration will be given to the most appropriate legislative and regulatory pathway for delivering the project. This will cover:

176.1 the approach to consenting, including fast track considerations and use of the Urban Development Act

176.2 the legislative and policy changes required to implement the chosen funding tools, for example implementing value capture options

176.3 fitness for purpose of legislative and regulatory framework for building and operating the selected mode. For example modes not currently operating in New Zealand, such as driverless trains; health and safety, building standards.

Climate Implications of Policy Assessment

177 The Climate Implications of Policy Assessment (CIPA) team has been consulted and confirms that the CIPA requirements apply to this proposal as it will have a significant emissions impact.

178 The CIPA team has undertaken a high-level assessment of the modelling process and considers the estimates to be reasonable and to follow good practice for a project at this early stage.

179 There is a high level of uncertainty in estimates as key decisions are yet to be taken and many aspects of the project are not fully defined. However, modelling for different options provides a reasonable order of magnitude estimate.

180 Each option will initially increase emissions due to construction, before emissions begin to reduce as users move to more sustainable modes. Tunnelling creates higher levels of embodied emissions in the short term, but due to higher capacity and ridership, the tunnelled options will reduce emissions at a faster rate once in operation. Due to the extent of tunnelling, Tunnelled Light Rail and Light Metro take a longer time to achieve net zero emissions (break even).

181 For the Surface Light Rail option a net emissions reduction is realised in 2041 while the Light Metro and Tunnelled Light Rail options (Options 2 and 3) are realised by the early 2050's (between 2053 and 2055). Over the longer term and past the CIPA analysis period ending 2050, Light Metro and Tunnelled Light Rail will produce larger net reductions in carbon than surface light rail.

182 All three options will result in a significant emissions reduction over the life of the project through significant mode-shift, increased urban development, densification and a shift towards a compact urban form along the Corridor, which can be expected to result in further overall emissions reductions across Auckland's transport network.

183 The estimated range (+/- 40 per cent) of cumulative change to emissions between 2022 - 2050 from construction, transport mode-shift and land use intensification (including estimated increase in emissions from operational electricity use) for each of the three options is.

183.1 Option 1 Light Rail Dominion road: a net decrease of 139,900 to 59,900 tonnes of CO2e.

183.2 Option 2 Light Metro Sandringham road: a net increase of 164,500 to 70,500 tonnes of CO2.

183.3 Option 3 Hybrid Sandringham road: a net increase of 70,600 to 30,200 tonnes of CO2.

184 As further decisions are made and the next business case is developed, the emissions impact estimates will be improved and provide results with a higher level of certainty. The CIPA team will work with the Ministry of Transport as proposals are advanced to disclose emissions impacts to Ministers, as appropriate.

185 For further information see Appendix 3.

Response to CIPA

186 It's important to note that ALR will be a piece of infrastructure that will stand for far longer than the timeframe modelled in the CIPA.

187 The Establishment Unit's modelling out to 2081 shows each option results in a net decrease in carbon emissions of 860,000 tonnes to 980,000 depending on the option chosen.

188 We also note that advances in concrete technology may allow for emissions reductions over and above these estimates across all options, in particular tunnelled options.

189 The expected emissions reduction of Cabinet's preferred option will be refined in the DBC.

Treaty of Waitangi and recognition for mana whenua

190 The Establishment Unit was tasked with pro-actively engaging with mana whenua and Māori to increase visibility and awareness and develop social licence and explore partnering opportunities as envisaged under Te Tiriti o Waitangi.

191 There are 19 mana whenua tribes in Tāmaki Makaurau, and 15 mana whenua have interests in the project area. Relationships were built and information shared with these mana whenua, as well as mana whenua leadership. Engagement was on a kanohi ki te kanohi basis (face-to-face, except during COVID-19 restrictions) between the Chair of the Establishment Unit Board and mana whenua leadership rangatira-to-rangatira (chief-to-chief). Engagement as also undertaken with mataawaka, though this was constrained as a result of the COVID-19 restrictions.

192 Mana whenua expressed interest in development and decision-making in governance and management of the project. Citing key areas of interest as:

192.1 growing the Māori economy through employment and procurement

192.2 the environment, the expression of kaitiakitanga and the health and wellbeing of the Manukau harbour of high significance

192.3 a design framework that reflects Te Ao Māori.

193 Embedding mana whenua across the governance and entity arrangements is a key principle for taking the project forward, discussed further in the governance section. Mana whenua have also been represented in the governance arrangements of the current phase of the project. The governance arrangements for the next phase will enable mana whenua to participate in decision-making.

194 These approaches respect the Te Tirit o Waitangi principles of partnership and protection. Partnership in the project will be undertaken reasonably, honourably and in good faith. Positive steps to ensure that Māori rights, roles and responsibilities are protected will be taken.

Consultation

195 The Ministry of Transport worked closely with the Establishment Unit, the Treasury, the Ministry of Housing and Urban Design and Waka Kotahi in the development of this paper. The Ministry for the Environment, Land Information NZ, Kāinga Ora, Te Kawa Mataaho Public Service Commission, Te Arawhiti and Te Waihanga Infrastructure Commission were all consulted on this proposal.

196 The decisions in this paper have been informed by discussions with Auckland Council and mana whenua.

Communications

197 The ALR project continues to attract a high degree of public interest, and the announcements of Cabinet's decisions are likely to influence commercial decisions and activity in the infrastructure markets.

198 Announcements about the project will be made following consultation with all project sponsors. Before any public announcements, it is important that we first brief members of the Establishment Unit Board and KiwiRail (as the only ATAP partner not included on the Establishment Unit Board).

199 A communications approach will be agreed with the Office of the Prime Minister.

Proactive Release

200 It is our intention to proactively release this Cabinet paper, alongside our announcements on the project.

Recommendations

The Minister of Finance and the Minister for Transport recommend that the Committee:

1 **note** the Establishment Unit has now delivered its advice, following the work it undertook in line with Cabinet's mandate in March 2021

2 **note** that while the project has been through a Treasury Gateway review, this was completed after the IBC was finalised, meaning that the feedback from the Review has not been reflected in the business case

3 **agree** to progress the project on the basis of the indicative business case, noting that this focused on the transport intervention and did not contain detailed analysis or options to realise the urban development benefits

4 **agree** that a tunnelled light rail solution is this Government's preferred way forward, with further detailed work to follow to refine the Establishment Unit's recommended Sandringham Rd corridor.

5 **agree** that the project should be planned as an integrated transport and urban development programme with a strong focus on the infrastructure, land use, urban interventions and market enablement required to achieve the outcomes to be confirmed by Sponsors

6 **agree** the project will follow a 'zero harm and thriving infrastructure' approach, to be embedded at all levels of the project including governance and procurement

7 **agree** that the project should progress into a detailed planning phase and the mandate for this next phase will include work across a number of partners to:

7.1 undertake masterplanning across the Corridor and investigate the scale and costs of urban development and housing uplift possible and how this could be achieved

7.2 scope and progress a business case as required to inform a final investment decision including any necessary detailed business case and programme business case components

7.3 examine and optimise the preferred tunnelled light rail solution to consider whether cost savings can be made

7.4 Undertake further community, Māori, stakeholder and market engagement

7.5 Undertake the necessary analysis and planning to understand the package of urban interventions needed to deliver sponsors outcomes

7.6 Refine the proposed solution to ensure it is integrated with wider planning for growth and transport across the region, including the Additional Waitematā Harbour Crossing, Auckland Rapid Transit Plan and Kāinga Ora Large Scale Projects

7.7 Develop an approach to minimise business disruption, including the development of a package of support, including financial support, for serious business disruption for the project that will apply from the beginning of construction

7.8 Further investigate opportunities to reduce embodied emissions across the integrated transport and urban development programme

7.9 Agree a preferred entity to deliver the project and confirm the associated governance, roles and responsibilities and accountabilities

7.10 Determine the preferred funding and finance arrangements for the delivery of the project

7.11 Develop a consenting strategy, route protection and the preparation of associated applications for consenting, including consideration of use of the Urban Development Act 2020

7.12 Develop procurement and land acquisition strategies

7.13 Develop an approach to the design, delivery and operation of the project that takes a zero tolerance to health and safety associated harm approach, following best practice

7.14 Other required activities, which may include early works

8 **note** that Officials have advised that the work programme for the detailed planning phase could last approximately two years

9 **note** that at this stage it is not expected that the ultimate delivery entity will be responsible for the delivery of significant urban development beyond opportunities over and adjacent to stations

10 **note** the cost of tunnelled light rail is currently estimated to be $14.6 billion (P50) and $23.1 billion (P95) but that this excludes the costs of enabling urban development outcomes in the Corridor

11 **note** that the Establishment Unit concluded that a range of funding sources should contribute to fund the capital expenditure as recognition of the various beneficiaries, including

11.1 Infrastructure Funding and Finance levy

11.2 General rates

11.3 Business rate supplement across Auckland

11.4 Development contributions, which will recoup growth-related elements of Auckland Council's contribution from developers

11.5 Strategic land acquisition and intervention has the ability to generate funding for the Project, and will need to be considered in more detail in the next phase business case

12 **agree** that a mix of funding will be needed to cover the costs of the project which will be further investigated during the next phase, and that this is likely to include Crown, National Land Transport Fund funding, value capture and Auckland local government sources subject to future agreement

13 **agree** that in accordance with the beneficiaries pays principle, beneficiaries of the project, including landowners, will be expected to contribute to funding the project

14 **note** that, notwithstanding the need for a mix of funding sources, a significant Crown contribution will be required to fund the project

15 **note** that the Ministry of Transport, the Treasury and Waka Kotahi are jointly leading a Review of Land Transport Revenue which will develop guidance for funding and financing large scale land transport projects such as ALR and this will inform Officials advice on the funding package for ALR

16 **note** that the Minister of Transport is developing a more coherent and consistent national approach to Crown investment in rapid transit projects and intends to report back to Cabinet in the first half of 2022 with a view that the agreed approach should guide final Crown decisions about investment in Auckland Light Rail.

17 **direct** the Ministry of Transport, the Treasury and Waka Kotahi to work with the Ministry of Housing and Urban Development, Auckland Council and the ALR Unit to recommend a funding package that can be implemented for the project, including the consideration of an Infrastructure Funding and Finance levy and a specific value capture tool, including any required legislative changes

18 **agree** for the Government to signal its intent to use value capture as part of the funding package in any future announcements

19 **agree** that a partnership of the Crown, Auckland Council and mana whenua should be established as the foundational and enduring framework for overseeing the project, supported by agreed objectives, to be confirmed through a Sponsors Agreement

20 **agree** that the Minister of Transport, Minister of Finance and Minister of Housing act as the project sponsors alongside representation from Auckland Council and mana whenua

21 **direct** the Ministry of Transport, the Treasury and the Ministry of Housing and Urban Development to work with Auckland Council and mana whenua to prepare a Sponsors Agreement

22 **note** that taking the project forward and realising the benefits relies on commitments and investments by both the Crown and Auckland local government

23 **agree** the governance arrangements for the next phase will consist of project sponsors, a sponsors forum, a Crown established competency-based project board and a series of partner agreements

24 **note** that an ALR Unit will be established to progress the project through the next phase of detailed planning and will continue until decisions are made and implemented on the transition of this unit to the final delivery entity

25 **note** the transition from the ALR Unit to the final delivery entity:

25.1 will be designed to ensure a high-degree of continuity in board members and staff, to maintain momentum, knowledge and commitment to the project

25.2 will create a formal legal entity to see the project through the final stages of planning before it moves onto delivery

25.3 should be planned to occur in the second half of 2022 as this is likely to be necessary in advance of consenting and land acquisition processes. More information on the timing of this will be included in our report back in April 2022

26 **authorise** the Minister of Transport, Minister of Finance and Minister of Housing, in consultation with Auckland Council and mana whenua, to take decisions as required in relation to the setting up of to the governance arrangements, assurance framework, the accountability mechanisms and, ALR Unit for the next phase

27 **agree** that Cabinet will appoint the competency-based board for the next phase, and for the Minister of Transport, Minister of Finance and the Minister of Housing to prepare a paper for the Appointments and Honours Committee, expected to be lodged by April 2022

28 **note** that the Minister of Transport, Minister of Finance and the Minister of Housing are likely to seek an exception to the Cabinet Fees Framework for the competency-based board given the complexity and scale of the project

29 **direct** the Ministry of Transport, the Treasury and the Ministry of Housing and Urban Development to finalise the governance arrangements, assurance framework and the accountability mechanisms and set up the ALR Unit to take forward the next phase, working with Auckland Council, mana whenua, Auckland Transport, Kāinga Ora, Waka Kotahi, Te Waihanga Infrastructure Commission and the Establishment Unit

30 **note** the ALR Unit will be responsible for entering into any necessary partnership agreements to deliver against sponsors expectations

31 **direct** the Ministry of Transport, the Treasury and the Ministry of Housing & Urban Development to work with Auckland Council, mana whenua, Auckland Transport, , Kāinga Ora, Waka Kotahi and the Establishment Unit to scope and initiate the next phase including to confirm the mandate for the ALR Unit and the parameters of future business case work, and the project assurance mechanisms

32 **authorise** the Minister of Transport, Minister of Finance and Minister of Housing, in consultation with Auckland Council and mana whenua, to take decisions as required in relation to the detailed parameters of the next phase, the scope of the business case and the mandate to the new ALR Unit

33 **agree** that the Establishment Unit and the existing governance arrangements will continue until such a time that the ALR Unit has been set up, and that this is expected to be no later than April 2022

34 **note** that Kāinga Ora is preparing its business case for the Large Scale Projects in Auckland and these include the Mt Roskill and Māngere precincts within the City Centre to Māngere Corridor, which are due to go to Cabinet in March 2022

35 **note** the need for alignment between the ALR project and Kāinga Ora's Large Scale Projects in Mt Roskill and Māngere to identify dependencies and maximise benefits from Crown investment

36 **note** that Auckland Council will have significant responsibilities to enable the delivery of light rail as part of an integrated programme of urban transformation and will need to make commitments to enable the project, including:

36.1 working within a wider partnership to develop a shared vision

36.2 planning and investment to enable the required scale of urban transformation

36.3 statutory planning functions

36.4 masterplanning throughout the Corridor

36.5 working with Auckland Transport to confirm long-term ownership and operation, including opex

36.6 supporting the development and implementation of value capture mechanisms

36.7 community and stakeholder engagement

37 **invite** the Minister of Transport, the Minister of Finance and the Minister of Housing to report back to Cabinet in April 2022 to seek authorisation to enter into a Sponsors Agreement and provide updates on project progress, including on the approaches to land acquisition, value capture and establishing the final delivery entity

38 **note** that funding for the remainder of the financial year 2021-2022 is intended to be from the NLTF and that this is a matter for the Waka Kotahi Board to approve pursuant to the Land Transport Management Act 2003

39 **note** that the funding of the next phase of work from 1 July 2022 onwards will be subject to a bid as part of Budget 2022 which could fund the next operating unit's activities, including:

39.1 an allowance for strategic land acquisition

39.2 supporting policy work

39.3 the reimbursement of Waka Kotahi for costs incurred in setting up the ALR Unit and governance arrangements

40 **note** the Treasury will also be seeking additional funding to support its involvement in the next phase through Budget 2022

41 **note** that a nationally consistent strategy for the planning, funding, ownership, operation and delivery of rapid transit in New Zealand is needed

42 **note** the Minister of Transport and the Minister of Finance intend to progress the Additional Waitematā Harbour Crossing (AWHC) project alongside ALR

43 **direct** the Ministry of Transport to work with Waka Kotahi, Auckland Transport, the ALR Unit, the Treasury and others on aligning the projects

44 **invite** the Minister of Transport to report back to Cabinet in 2022 on progress on aligning the AWHC and ALR projects

45 **direct** the Ministry of Transport to develop a policy work programme in consultation with the Treasury, the Ministry of Housing and Urban Development, the Ministry for the Environment and other policy agencies

46 **invite** the relevant portfolio Ministers to work with the Minister of Transport to give direction to departments on their involvement in the policy work programme

47 **agree** that the Minister of Transport, in consultation with the Office of the Prime Minister and the Ministers of Finance and Housing, make future announcements for the project based on these Cabinet decisions

Authorised for lodgement

Hon Grant Robertson

Minister of Finance

Hon Michael Wood

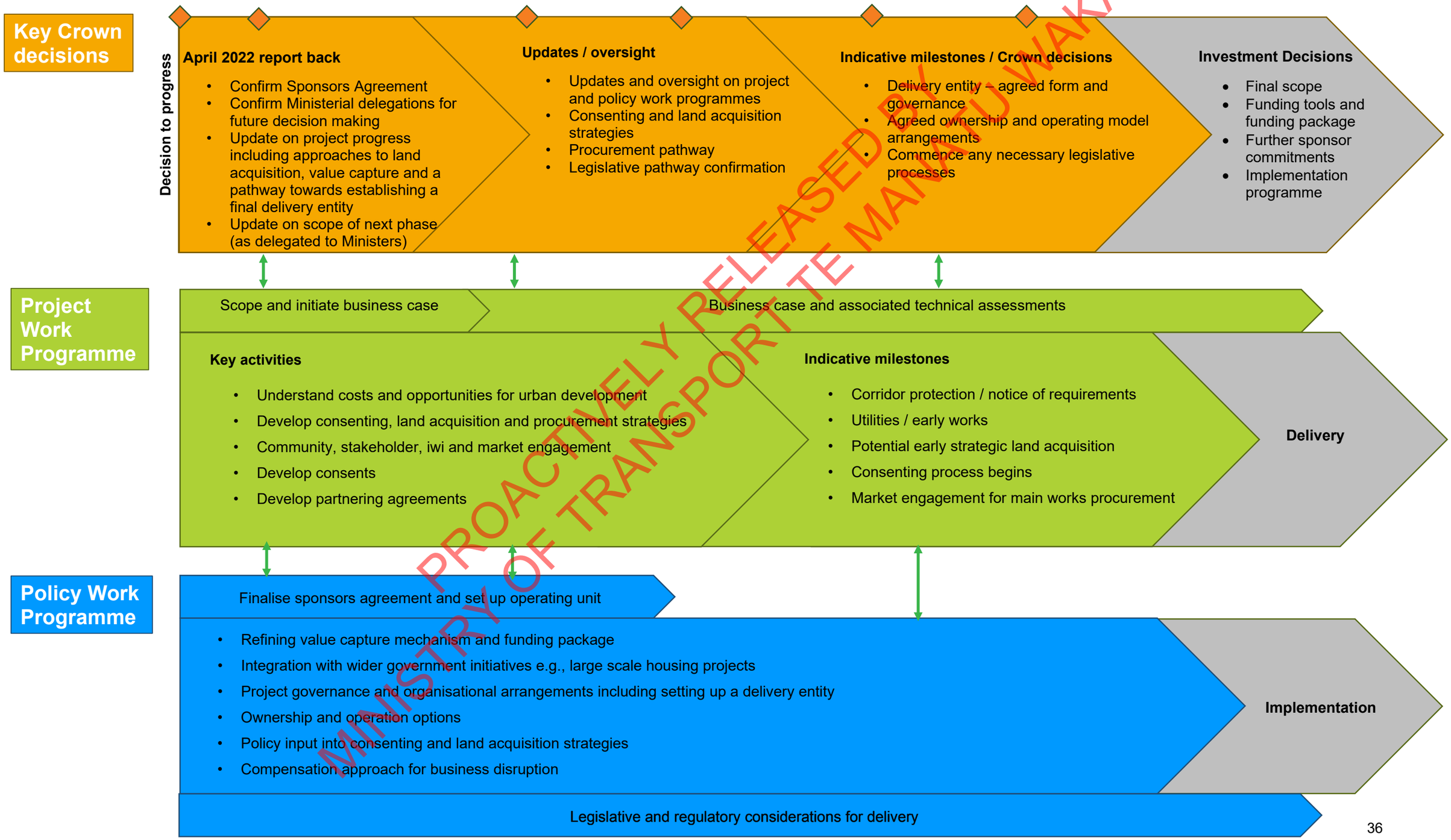
Minister for Transport

Appendix 1: Detailed Options Assessment

	Light rail via Dominion Road	Light metro via Sandringham	Tunnelled light rail via Sandringham
CAPEX P50[3]	$9bn	$16.3bn	$14.6bn
CAPEX P95	$13.7bn	$26.4bn	$23.1bn
Annual P50 OPEX	$104m	$104m	$119m
Benefits (NPV)	$8.1bn	$13.9bn	$11.7bn
Costs (NPV)[4]	$7.1bn	$11.2bn	$10.4bn
BCR without WEBs	0.6	0.6	0.6
BCR with WEBs	1.1	1.2	1.1
Project NPV with WEBs	$0.909bn	$2.745bn	$1.314bn
Project NPV without WEBs	-$3.079bn	-$4.242bn	-$4.446bn
Travel time: Full route	58 minutes	36 minutes	43 minutes
Travel time: Mangere to mid town	37 minutes	27 minutes	32 minutes
Travel time: Mt Roskill to mid town	17 minutes	12 minutes	12 minutes
Boarding's	20.3m	35m	31.2m
Access to City Centre and Airport employment	475,600 households within 45 minutes of central city and airport	569,600 households within 45 minutes of central city and airport	515,900 households within 45 minutes of central city and airport
Carbon tonnes saved by 2081	860,000	940,000	980,000
Auckland wide mode shift in 2051	1.34% reduction in daily car person trips relative to do-minimum.	1.64% reduction in daily car person trips relative to do-minimum	1.59% reduction in daily car person trips relative to do-minimum
Growth in the CC2M corridor[5]	4,100 – 20,000 increase in homes 3,700 – 12,000 increase in jobs	5,100 – 35,000 increase in homes 5,300 – 16,000 increase in jobs	5,000 – 35,000 increase in homes 5,300 – 16,000 increase in jobs
Deliverability	Disruption to traffic and business, with noise and dust issues along the route for 6.5 years with related consenting risks	Disruption limited to station locations due to tunnelling	Tunnelling reduces disruption and environmental impacts. The southern section creates similar disruption to Light Rail
Impacts on Te Ao Māori	An increase from 276,100 jobs accessible within 45 minutes of Onehunga and Māngere to 652,000. Requires acquisition of Māori land and disruptions to cultural sites such as the effects at Princess Street, Te Awa Te Wai o Horotiu along Queen Street and associated Pā.	An increase from 276,100 jobs accessible within 45 minutes of Onehunga and Māngere to 916,700. Potential impact on aquifers and lava caves when boring close to Māngere bridge or Puketāpapa.	An increase from 276,100 jobs accessible within 45 minutes of Onehunga and Māngere to 781,900. Potential impact on aquifers and lava caves when boring close to Māngere bridge or Puketāpapa.
Property acquisition	489 surface properties	168 surface property acquisitions and 437 subterranean properties	167 surface property acquisitions and 434 subterranean properties

[3] Capital costs shown are nominal. P50 and P95 costs respectively represent a 50 per cent and 5 per cent chance that costs will exceed this amount. Benefits are monetised and are calculated as Net Present Value (NPV), using a 4% discount rate.
[4] Escalated P50 capital and operating expenditures, discounted to NPV figures.
[5] the range presented reflects a lower impact transport only scenario, through to a higher impact transport plus wider non-transport urban interventions scenario, including elements such as land use change

Appendix 2: Indicative sequencing of decisions based on two-year programme



Appendix 3: An explanatory note on Zero harm and thriving infrastructure

Zero Harm

1 The 'Zero Harm' concept refers to a health and safety ethos and approach that ensures no individual (employee or not) is exposed to potential harm. What this means is that both the work itself, as well as the workplace, are specifically designed to ensure there is little to no risk involved in any and all activity.

2 A prominent example of zero harm in infrastructure is the London 2012 Olympics build, wherein a wealth of safety culture practice, including worker involvement, was deployed. The build spanned four years and 62 million person-hours, and for the first time in Olympic history all projects were completed without a fatality.

3 Among the many legacies of the 2012 Games was a more capable, reliable, innovative, healthier and safer sector, that has in turn been re-deployed on even more complex infrastructure programmes.

4 Embedding a zero harm approach in the design and build of Auckland Light Rail could see the project completed with similar outcomes to the 2012 Games, resulting in a more resilient construction sector.

Thriving infrastructure

5 Thriving infrastructure extends beyond the concept of 'zero harm' and refers to the realisation of broader benefits through the work. Such broader benefits include new and innovative ways of working, including the transfer of knowledge, enhanced worker well-being and capability development in the next generation of workers - and as a result the opening up of the wider efficiency and productivity opportunities and benefit inherent in the investment.

6 The central tenet to thriving infrastructure is 'care for people'. This means that worker well-being, proper supervision, and skills and capability development for a workforce engaged largely from local communities, become an explicit part of the design, planning, costing and, beyond that, monitoring and governance of the infrastructure investment.

7 If done well, 'care for people' can contribute materially to increasing human capability and social cohesion.

8 A people centred focus will improve productivity through, for example, improved worker engagement and alignment of incentives across the supply chain. A recent New Plymouth District Council project evidenced a cost reduction of 15% and improved labour productivity of 39% through increased innovation in understanding and adjusting the way work is done.

Appendix 4: Climate Implications of Policy Assessment (CIPA) disclosure

Introduction

1 This carbon emissions estimate for the Auckland Light Rail (ALR) CIPA and CIPA disclosure is based on the best information currently available. The ALR project is still early in the project lifecycle, following Cabinet's mandate to start a new process in March 2021. This mandate included setting up an Establishment Unit to produce an Indicative Business Case (IBC) within 6 months. As such carbon emissions estimates, as should be expected at this early stage, are indicative only due to the further work required to better understand wider outcomes, project scope and detailed construction impacts.

2 The decisions to be made in November are 'macro scope' decisions on route and mode, reflecting the indicative nature of the work to this point. Final investment decisions are not being made at this stage. Early stage carbon emissions assessment has helped to differentiate between route options and modes, by estimating the relative carbon impacts of each option.

3 As the project progresses, there will be a number of opportunities for Cabinet to be updated on the climate implications of this project, as well as further decision points/stage gates. These will be informed by ongoing analysis of the carbon emissions estimates for both ALR and the wider programme, alongside the next business case work to determine the scale and nature of costs and benefits.

4 ALR is one project within a programme of works planned through the Auckland Transport Alignment Project (ATAP) and is an integral part of Auckland's strategy to meet urban and transport challenges. The ATAP plan has been considered within the Climate Change Commission's findings. This represents a holistic and joined up approach to reducing the climate impact of transport within Auckland, which requires a step change through increasing public transport use.

5 To support development of the early stage carbon estimate, collaborative engagement has been undertaken with the Ministry for the Environment including weekly meetings early in the project, to guide development and provide early feedback and challenge on the approach.

6 As with the IBC itself, the CIPA has drawn on a wide range of subject matter experts to test key assumptions, undertake quantitative analysis and ultimately improve the validity of the forecast.

Approach / basis of estimate

7 The presented carbon estimate is a combination of bottom-up and parametric analyses, reflecting the differing development status of various aspects of the project. A broad range carbon estimate has been developed, reflecting a direct impact scenario that accounts for emissions from activities such as construction, operations emissions, transport system users and indirect emissions. This includes reduced carbon emissions due to changes in land use intensification and avoided construction.

8 In particular it should be noted that the construction related emissions at this stage of the project are top down estimates and are especially uncertain as they are not correlated to a refined construction design that includes detailed quantities of material.

9 Noting the significant uncertainty with the transport related components and difficulty in assessing the wider strategic impacts to land use, housing and travel patterns at this time, **we recommend that the CIPA estimates be provided as relative "order of magnitude" estimates of the options and associated narrative, rather than absolute estimates.**

10 International experience with similar strategically significant schemes indicates material impacts to land use and housing in the areas served by rapid transit. Given the wider strategic impacts of the project, Officials recommend that in addition to the direct transport emission impacts of ALR, these indirect land use and housing carbon impacts should also be accounted for, as an integrated transport and land use solution.

11 Further, additional opportunities exist to reduce the carbon emissions of construction as noted above via incentives to optimise construction impacts through design and to reduce operational impacts. Efforts to reduce emissions and improve the environment through investment in transport is reflected in the project's outcomes and investment objectives. As the project progresses, measures will be introduced to monitor the carbon impacts of design.

Next steps

12 During the next stages of the project a more detailed scope will be developed for both design and route, and this will support more accurate reporting of the climate change implications and better support decision making by Cabinet.

13 Cabinet updates and decisions are expected to be required prior to completion of the next business case, providing a number of opportunities to assess the climate implications before funding is committed.

14 A number of key climate related work programmes will be completed and guidance released. Noting that one of the objectives of the ALR project to improve the environment, it will be developed reflecting this guidance and work within these parameters to deliver against environmental outcomes.

Description of the Green House Gas (GHG) emission impacts & CIPA methodology

Direct impacts

15 CIPA requires reporting on the direct GHG emission impacts of a proposal; direct impacts of transport infrastructure projects are categorised as either embodied (construction) emissions or operational (enabled) emissions.

16 Construction carbon emissions are:

16.1 emissions embodied within the materials of construction, particularly steel, concrete and cement, asphalt, and glass and

16.2 emissions from fuel or electricity used during the construction, for example during earthworks, plant operation and transport of material and waste.

17 Construction carbon emissions can be estimated based on concept designs or derived from construction schedules of quantities. As CIPA is a high-level assessment, estimates focus on the most significant carbon emissions sources: the construction of stations, rail tracks, tunnels, and bridges. Estimates of carbon emissions from construction of new roads associated with the scheme, manufacture

of rolling stock and fuel used for the transportation of materials are not available at this early stage of scheme design.

18 Counterfactual / do-minimum construction emissions exclude emissions due to manufacturing activities, such as those relating to electric vehicle production. It has also been assumed that construction materials are sourced from NZ.

19 **Operational carbon** emissions are associated with the ongoing operational use of constructed infrastructure. For light rail, the most significant operational emissions are those from the electricity used to energise the rail systems and stations; for the transport network, the most significant operational emissions are the enabled emissions that arise from vehicles (cars, buses, trucks) using the roads. Enabled emissions are the largest contributor of carbon emissions across New Zealand's transport network - these are the very carbon emissions that New Zealand aims to reduce through the transport priorities being consulted on as part of the draft Emissions Reduction Plan.

20 The CIPA results present the change in embodied and enabled carbon emissions that is expected to occur as a result of the project (either an increase or a decrease in emissions), rather than the total emissions arising from transport demand on infrastructure. For CIPA, the preference is for change in enabled emissions to be reported out to 2050. At minimum a timeframe of 10 years (post construction), in 5-year intervals is required.

21 To inform this estimation, the predicted future traffic and public transport movements with the project in place (referred to as the "do-intervention" scenario) must be compared against the traffic and public transport movements that would be expected without the project in place (the counter-factual, also referred to as the "do-minimum" scenario).

22 For this transport proposal:

22.1 "Do-intervention" emissions will be those arising from the operational electricity usage of the transport system, the mode shift the project is expected to induce, and emissions derived from construction of the scheme.

22.2 The counter-factual ("do-minimum") emissions are those that are expected to arise without ALR as passengers continue to use existing public transport options and/or light vehicles.

23 As this project is intended to reduce light vehicle use and/or increase public transport throughput, enabled emissions are expected to reduce as a result of the project (often referred to as avoided emissions).

Indirect impacts

24 The CIPA disclosure may include an assessment of the indirect emission impacts that may occur over a longer timeframe as a result of the policy or project. Quantifying these impacts is inherently more uncertain, and it is not a mandatory requirement of the CIPA analysis, however for ALR these are significant and should be considered.

25 For the ALR proposal, indirect impacts are primarily those that arise from/associated with the land use intensification that the project would encourage. These include:

25.1 Proposed higher density housing to be constructed at stations

25.1.1 High density housing is more carbon-efficient from a construction and operational view (optimised and reduced floorplate sizes, more efficient use of building materials, insulated housing requiring less heating, energy efficient appliances and services etc.)

25.1.2 More high-density housing avoids the need for expansion of housing in greenfield areas, and results in reduced new infrastructure requirements to service these developments (e.g. carbon emissions savings from avoiding the construction of roads, water infrastructure, or the installation of utilities etc.). At this early stage only the carbon emissions savings from avoiding the construction of roads have been assessed due to lack of available data.

25.2 Economies of agglomeration can be defined as agglomeration benefits which measure the productivity gains that arise when increased spatial concentration results in higher efficiency

25.3 Reduced peak travel demand

25.3.1 Light rail reduces the number of cars on roads and subsequently reduces peak travel demand (this avoids the need to construct new roads and car parks).

26 The counter-factual case emissions are based on the Auckland plan, with housing density that is lower than would be allowed with ALR (due to land, development and transport constraints). A lower number of people living in a compact urban form configuration would generally mean higher emissions per capita.

Results of the CIPA assessment

Direct impacts

Construction emissions

27 Indicative construction emissions for a light rail system along Dominion Road are in the range of 3,300 to 7,700 tCO2e/km (tonnes of carbon dioxide equivalent or "carbon emissions" per kilometre).

28 By comparison, indicative construction emissions for a light metro system are in the range of 11,400 to 33,900 tCO2e/km. Construction carbon emissions for light metro systems are much higher because of the high level of embodied carbon emissions produced from the construction of large underground tunnels and stations (predominantly tunnelling, spoil removal, concrete and steel).

29 Gaps in this early stage analysis have been accounted for through the application of a factor of uncertainty of +/- 40%. This is presented in the ranges below. The uncertainty factor is due to the early stage of the project and uncertainty based on the resolved level of detail available at this stage of the project. There are other variables that are yet to be assessed in the next business case that will also contribute toward reducing the uncertainty level.

30 Carbon analysis of shortlisted options provides a range as follows:

30.1 Option 1b Light Rail Dominion Road: 24 km and 22 stations which results in an indicative carbon range of 79,000 to 185,000 tCO2e

30.2 Option 2a Light Metro Sandringham Road: 24 km and 17 stations which results in an indicative carbon range of 349,000 to 814,000 tCO2e

30.3 Option 3 Tunnelled Light Rail Sandringham Road: 24.5 km and 18 stations which results in an indicative carbon range of 280,000 to 653,000 tCO2e

31 Any option with tunnelling and large underground stations will have a significantly larger carbon footprint, due to the large amount of steel and concrete required to construct underground tunnels and stations combined with increased fuel use associated with excavating, tunnelling and transporting both excavated materials from site and construction materials to site.

32 The construction of bridges along the alignment are acknowledged as another large source of embodied carbon emissions due to the concrete and steel use. However, as there is little difference in the length and type of bridges proposed for each of the options, these not seen as a relative differentiator between route options.

33 Assumptions:

33.1 The construction of new roads, manufacture of rolling stock, and fuel associated with the transportation of construction/excavated material have been excluded from these early stage carbon emissions estimates, due to lack of available data at this time. This has been accounted for in the applied factor of uncertainty of +/- 40%. This uncertainty factor is due to the early stage of the project and uncertainty based on resolved level of detail available in design at this stage of the project. Other variables to be further assessed in the next business case (e.g. construction bill of quantities, construction method and programme, rolling stock specifications etc) will refine the carbon estimation and reduce this uncertainty level.

33.2 Where data and knowledge gaps have existed, early-stage multipliers and estimates for steel and concrete material use have been derived from relevant project case studies.

33.3 Embodied emissions from the construction of tunnels and underground stations have been derived from previous studies and other similar projects of a similar scale.

33.4 Construction is assumed to commence in 2024 and finish by 2031.

Operational emissions from electricity use

34 “Do-intervention” emissions associated with the use of electricity required to energise the light rail system:

34.1 Light rail systems typically consume 0.08 kWh/seat-km, whereas light metro systems typically consume 0.07 kWh/seat-km.

35 Gaps in this early stage analysis have been accounted for through the application of a factor of uncertainty of +/- 40%. This is presented in the ranges below. The uncertainty factor is due to the early stage of the project and uncertainty based on the resolved level of detail available at this stage of the project. There are other variables that are yet to be assessed in the next business case that will also contribute toward reducing the uncertainty level.

36 Indicative total operational emissions (per year) are therefore in the range of:

36.1 For Option 1b Light Rail Dominion Road: 1,100 to 2,700 tCO2e/year

36.2 For Option 2a Light Metro Sandringham road: 1,300 to 3,000 tCO2e/year

36.3 For Option 3 Tunnelled Light Rail Sandringham road: 1,000 to 2,400 tCO2e/year

37 Similarly, there is significant carbon reduction potential through the application of regenerative braking technologies to light rail system rolling stock, in order to optimise operational energy use and reduce energy demand.

38 Over a project lifecycle the carbon savings can be significant. This will be further investigated as rolling stock specifications are further refined. Gaps in early stage analysis have been accounted for through the application of a factor of uncertainty of +/- 40%. The uncertainty factor is due to the early stage of the project and uncertainty based on the level of resolved design detail available at this stage of the project. There are other variables that are yet to be assessed in the next business case that will also contribute toward reducing the uncertainty level.

39 Electricity emission factors from 2018 were used and applied for all years of operation (the latest emission factors published by the Ministry for the Environment). Note that as the New Zealand electricity grid continues to decarbonise toward net zero by 2050, this will contribute further toward the carbon reduction benefit of this project.

40 These estimates do not take into account the impact of slope/gradient on operational energy usage, nor does it factor in operational emissions from stations or depots. Further design resolution during the next business case will provide opportunity to estimate these carbon impacts.

Operational emissions from transport system users

41 The counter-factual ("do-minimum") emissions are those that would arise if those passengers used existing public transport options and/or light vehicles.

41.1 Indicative total emissions for Auckland's transport network are estimated at 3,552,000 tCO2e in 2031 and 1,706,000 tCO2e in 2051.

42 Light rail is expected encourage mode shift and increase urban development and densification along the corridor which can be expected to result in reduced overall carbon emissions across Auckland's transport network

42.1 Mode shift of passengers shifting from private vehicle to more sustainable travel modes (active and public transport) is in the order of 5% to 6.5% (by 2051) across the whole of Auckland's transport network during the morning peak. This informs the emission savings from in the transport system due to use of larger capacity of vehicles compared to private cars.

42.2 The options are expected to induce an increase in the residential population along the City Centre to Mangere corridor by approximately 46,500 to 81,500 people by 2051. Higher density housing can support emission savings when compared to low density greenfield housing.

43 Gaps in this early stage analysis have been accounted for through the application of a factor of uncertainty of +/- 40%. This is presented in the ranges below. The uncertainty factor is due to the early stage of the project and uncertainty based on the resolved level of detail available at this stage of the project. There are other variables that are yet to be assessed in the next business case that will also contribute toward reducing the uncertainty level.

44 Based on this, the change in operational emissions (in 2031) is expected to be in the order of:

44.1 For Option 1b Light Rail Dominion road: – 4,900 to – 11,300 tCO2e

44.2 For Option 2a Light Metro Sandringham road: – 10,100 to – 23,500 tCO2e

44.3 For Option 3 Tunnelled Light Rail Sandringham road: – 8,400 to – 19,600 tCO2e

45 Based on this, the change in operational emissions (in 2051) is expected to be in the range of:

45.1 For Option 1b Light Rail Dominion road: – 13,400 to – 31,200 tCO2e

45.2 For Option 2a Light Metro Sandringham road: – 17,600 to – 41,200 tCO2e

45.3 For Option 3 Tunnelled Light Rail Sandringham road: – 16,800 to – 39,200 tCO2e

Indirect impacts

Avoided construction of new roads

46 Emissions savings are expected to result from avoiding the need to accommodate increased peak travel demand through the construction of new roads and car parks (in a scenario where light rail is not constructed).

47 Initial estimates show that all options reduce peak travel demand by approximately 8,900 to 9,800 vehicles by 2051.

48 Gaps in this early-stage carbon analysis have been accounted for through the application of a factor of uncertainty of +/- 40%. This is presented in the ranges below. The uncertainty factor is due to the early stage of the project and uncertainty based on the resolved level detail available at this stage of the project. There are other variables that are yet to be assessed in the next business case that will also contribute toward reducing the uncertainty level.

48.1 This results in total carbon emissions savings in the range of:

48.1.1 For Option 1b Light Rail Dominion road: –17,500 to – 40,700 tCO2e

48.1.2 For Option 2a Light Metro Sandringham road: – 18,400 to – 43,000 tCO2e

48.1.3 For Option 3 Tunnelled Light Rail Sandringham road: – 18,200 to – 42,600 tCO2e

48.2 It has been assumed that traffic lane capacity is approximately 1000 vehicles/hour and 2 daily trips per vehicle (during the morning and evening peak).

Land use intensification

49 Housing developments in brownfield and greenfield areas produce different carbon emission profiles. Greenfield developments are typically characterised by single detached dwellings on individual allotments, whereas brownfield developments typically comprise of higher density multi-unit apartments and townhouses with shared communal spaces.

49.1 It is estimated that the generally lower density housing (relative to an ALR enabled corridor) forecast to be delivered across Auckland areas will result in carbon emissions of approximately 685 kgCO2e per year per person, whereas building higher density residential in inner urban brownfield redevelopment areas will result in carbon emissions of approximately 600 kgCO2e per year per person.

50 Light rail is expected to encourage a greater number of higher density developments along the transit alignment, and particularly adjacent to and surrounding stations and transit hubs. Residential population along the corridor is expected to increase by approximately 46,500 to 81,500 people by 2051 as a result of the scheme.

51 Gaps in this early stage carbon analysis have been accounted for through the application of a factor of uncertainty of +/- 40%. This is presented in the ranges below. The uncertainty factor is due to the early stage of the project and uncertainty based on the resolved level of detail available at this stage of the project. There are other variables that are yet to be assessed in the next business case that will also contribute toward reducing the uncertainty level.

51.1 This is estimated to result in total carbon emissions savings (per year) in the range of:

51.1.1 For Option 1b Light Rail Dominion road: – 2,400 to – 5,600 tCO2e

51.1.2 For Option 2a Light Metro Sandringham road: – 4,100 to – 9,700 tCO2e

51.1.3 For Option 3 Tunnelled Light Rail Sandringham road: – 4,100 to – 9,700 tCO2e

51.2 This assessment only considers the whole of life carbon emissions profile of houses, apartments, and townhouses, and doesn't consider the headworks and enabling infrastructure required to support these developments, due to lack of available data. This will be estimated as scheme design is further resolved during the next business case.

Summary sheet: Total change in emissions for short listed options

Auckland Light Rail - Changes in GHG emissions

Summary sheet on total change in emissions for short listed options

Construction is assumed to begin in 2024 and by the end of 2030 for all options

All emissions sources have a uncertainty factor of +/- 40%

An increase in carbon emissions is represented by a positive number

Short listed options		Emissions changes (tonnes of CO2e), by emissions budget period						Total carbon emissions by 2050 (tonnes of CO2e)		
	Scenario	2020-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	Total carbon emissions	Total carbon emissions with +40% uncertainty factor	Total carbon emissions with -40% uncertainty factor
Auckland Light Rail										
Option 1b: Light Rail Dominion Road (Total)		37,800	94,300	-58,000	-58,000	-58,000	-58,000	**-99,900**	**-59,900**	**-139,900**
Embodied (Construction)	Central estimate	37,800	94,300					132,100		
Operational	Central estimate			9,600	9,600	9,600	9,600	38,400		
Transport User	Central estimate			-40,400	-40,400	-40,400	-40,400	-161,600		
Avoided infrastructure	Central estimate			-7,300	-7,300	-7,300	-7,300	-29,200		
Avoided greenfield development	Central estimate			-19,900	-19,900	-19,900	-19,900	-79,600		
Option 2a: Light Metro Sandringham Road (Total)		166,200	415,300	-116,000	-116,000	-116,000	-116,000	**117,500**	**164,500**	**70,500**
Embodied (Construction)	Central estimate	166,200	415,300					581,500		
Operational	Central estimate			10,700	10,700	10,700	10,700	42,800		
Transport User	Central estimate			-84,200	-84,200	-84,200	-84,200	-336,800		
Avoided infrastructure	Central estimate			-7,700	-7,700	-7,700	-7,700	-30,800		
Avoided greenfield development	Central estimate			-34,800	-34,800	-34,800	-34,800	-139,200		
Option 3: Tunnelled Light Rail Sandringham Road (Total)		133,300	333,100	-104,000	-104,000	-104,000	-104,000	**50,400**	**70,600**	**30,200**
Embodied (Construction)	Central estimate	133,300	333,100					466,400		
Operational	Central estimate			8,500	8,500	8,500	8,500	34,000		
Transport User	Central estimate			-70,100	-70,100	-70,100	-70,100	-280,400		
Avoided infrastructure	Central estimate			-7,600	-7,600	-7,600	-7,600	-30,400		
Avoided greenfield development	Central estimate			-34,800	-34,800	-34,800	-34,800	-139,200		