

UNCERTAINTY LOG

Ref #	Uncertainty name	Uncertainty type	Description	Case where identified	Likelihood	Impact	Timeframe	Uncertainty treatment / management
U#	Name of uncertainty	For example demand; supply; productivity; economic	Brief description of the uncertainty, eg potential land-use change, uncertainty relating to demographic or other growth projection, climate change trends or system shocks, technology etc	Case (from the five-case model) where the uncertainty is identified/ described	See 'Likelihood and impact categories' sheet	See 'Likelihood and impact categories' sheet	The most likely timeframe for the uncertainty to be realised	Describe the proposed approach to manage the uncertainty, eg scenarios considered, assumptions taken, sensitivity testing, real options analysis
U1	Urbanisation and population growth	Demand	The scale and spatial distribution of future urban development in Auckland is not certain. The degree to which intensification occurs along the rail corridor will have an impact on rail patronage, which could impact the scale, scope, and prioritisation of investments in Auckland. Of particular relevance to the PBC is the degree to which growth in existing urban areas is prioritised over growth in greenfield and peripheral developments.	Economic Case	Probable	Medium	Medium to Long term	i11.6 land use scenario has been adopted, however a demand sensitivity of lower growth in the south (40%) reduction, to reflect recent proposed land use changes
U2	Port and supply chain	Demand	Rail freight operates in a competitive market, where location of demand is largely driven by competition between ports and the wider global supply chains, outside of the control of freight operators, including rail. The distribution of traffic on the network can change significantly under different port futures, which could lead to increased or reduced priority for recommended investments.	Economic Case	Probable	High	Medium term	Demand scenarios have considered a variety of possible port futures, and the PBC has been developed to be robust against these.
U3	Inter Regional Rail	Demand	The current Hamilton to Auckland (Te Huia) service is operating under trial and there is uncertainty around whether the service will continue beyond this period. Equally, a recent inquiry into regional rail has recommended further study of various new inter regional services that would operate within the Auckland network and there is considerable grass roots support for re-introduction of inter regional services in NZ. The reduction or increase in inter regional rail demand could impact the scope and scale of investment in the PBC.	Economic Case	Potential	Medium	Medium to Long term	The four tracking solution alleviates capacity issues on the southern corridor, but also provides excess capacity (75% utilisation or better) for future traffic including inter regional services.
U4	Infrastructure Financing Gap	Financial	Ageing infrastructure combined with the need for more robust structure to handle densification and climate change, could result in more funding required for maintaining state of good repair, compromising the ability of cities to expand or enhance the existing system. Investment in good asset management systems mitigates the impact of this in the long run. Implementation of government policy shifts to a build last approach, with emphasis on getting more from existing infrastructure.	Financial	Potential	Medium	Medium to Long term	The recommended programme has taken into account likely funding constraints (leading to an investment programme that lags demand, but is practical to implement)
U5	Reduced need for travel (due to MoT policy, ageing workforce, prevalence of WFH, etc.)	Demand	MOT Avoid-Shift-Improve policy reduces the need to travel, causes shifts to rail and other competing/ complementary modes and increases rail efficiency. Digital communications like virtual and augmented reality reduce/ change demand for physical communications significantly. Local 3D printing substantially reduce/ change freight movements.	Economic Case	Potential	Medium	Short to Medium term	Modelling assumes demand contraction experienced during the COVID-19 pandemic to be a short-term impact that will be recovered from, without permanent changes to travel behaviours. This is recorded as a risk to the programme. (Risk #9a)
U6	Uptake of electric road vehicles (EVs)	Environmental	The MSM embeds assumptions from the MoT Vehicle Fleet Emissions which predicts high growth in the proportion of EVs on the premise that this is, and will further be, incentivised through policy. This could lead other modes like mass transit to suffer as a result and weaken the case for investment in mass transit as a means of reducing emissions. On the other hand, if these assumptions don't come to pass, then the need for capacity improvements to mass transit to meet climate change commitments could increase.	Economic Case	Potential	High	Short to Medium term	Modelling incorporates currently accepted rates of EV update (according to TCQM)
U7	Climate change impacts	Infrastructure	Even if New Zealand does well on meeting its climate commitments, climate nonetheless has a chance to fundamentally impact infrastructure through a higher frequency and intensity of extreme weather events. This may lead to the cost of building resilience into infrastructure increases, making more projects marginal. Even with improved design outages because of frequent	Management Case	Probable	High	Medium to Long term	The Asset strategy for Track and Corridor to include high level principals and guidance on future mitigations to climate change effects Budget has been provisioned for further studies into ensuring resiliency of rail network

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			and impactful climate related events increase with resilient design always playing catch-up.					
U8	Climate change policy	Demand	Current emission reductions targets imply a much higher degree of mode shift to public transport than is forecast using the base MSM. Achieving these targets would require application of strong policies - assuming this would be feasible, demand for metro rail could increase significantly	Economic Case	Probable	High	Short to Medium term	Scenarios have been tested in which ERP targets are achieved with estimated impacts on rail patronage. The PBC strategy has been developed to be robust against this future scenario.