

To: Project Sponsors
 From: Auckland Light Rail Group
 Date: 5 November 2021
 Re: The use of P50 as an indicator of project cost at IBC stage

Purpose

The purpose of this paper is to provide context for why it is appropriate to use the P50 as the best indicator of cost for projects at this early stage in their development and to demonstrate that the sponsors can have confidence in the CC2M P50 cost.

Recommendation

It is recommended that the Sponsors note the contents of this paper.

Context for the use of P50

As specified in the Waka Kotahi Cost Estimation Manual (SM014), which is based on international best practice, the P50 cost has been used as the central cost estimate for the Indicative Business Case (IBC), as it is the best indicator of project outturn cost and the anticipated final cost (AFC) at this stage of the Project’s development. If estimating methodology is appropriately carried out, which we feel it has been in this case, then the level of contingency provided within the P50 cost will be sufficient to cover off the significant scope development that occurs over the life of the project.

The Project has carried out this estimate in line with the above Waka Kotahi estimating standard.

The Final Investment Decision (FID) is not expected to be made until April-June 2024 (at the earliest). By then, as is indicated in Figure 1 below, the range of outturn costs will have reduced considerably from where it is today based on an increased level of design information, estimating accuracy, escalation accuracy and value engineering.

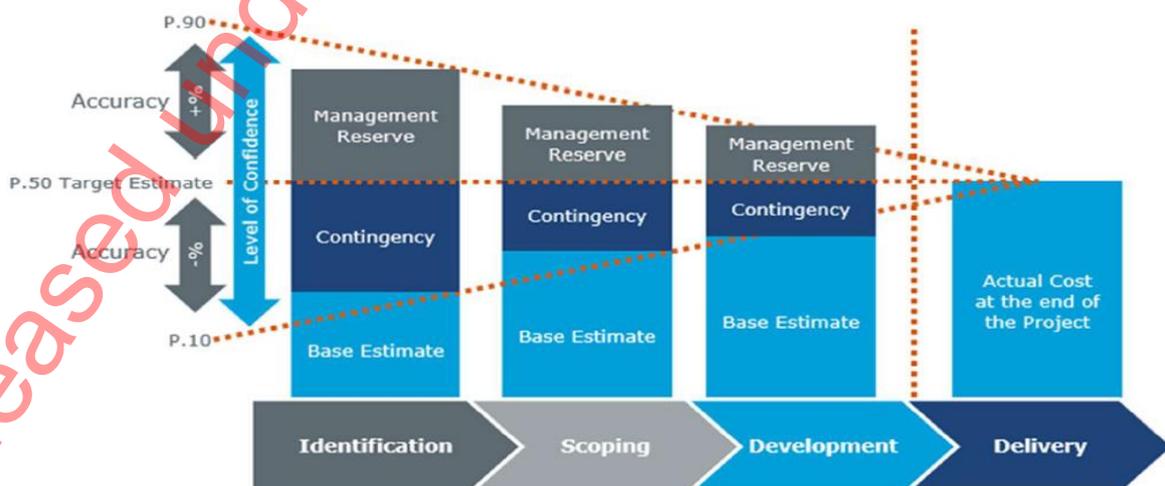


Figure 1: Increasing certainty as design and estimating accuracy increases



Project and Design Maturity

Recently, a number of projects in New Zealand have reached close to the P95 assessment. However, this is related to their P95 being estimated at the point of the FID which represents a far narrower range between the base cost, P50 and P95 than is currently provided in the Project estimate. The narrower range is due to a more developed scope/design and a more accurate understanding of the risks involved (see Figure 1 above) at the FID.

Investment decisions are generally not made until there is more substantive and advanced designs on which to base costs, narrowing the range of potential outcomes significantly, and ensuring funders are not over-exposed to the risk of substantial overspend.

If costs were to creep above the agreed P50 at these early stages in the Project, there may be opportunities for decisions around scope, scale, and staging. This flexibility reduces as the Project progresses through the phases (and as the P95 reduces). The P95 becomes much more important at the FID gate.

Track record of Waka Kotahi major projects

As stated above, the CC2M estimate has been undertaken following Waka Kotahi estimating standard.

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Development of the current estimate - Confidence in the P50 for CC2M

Many recent New Zealand infrastructure procurements have used affordability thresholds. Constraints like affordability thresholds or indications of 'acceptable' levels of funding, can exacerbate the risk of an optimistic estimate – this Project has not had this constraint.

This Project's approach has not been influenced by any external factors that could either drive the perceived cost down or impact on the level of scope promised within a funding bracket, such as a competitive process or adherence to a perceived funding limit, arguably making the Project estimate more accurate.

This reduces the likelihood of being exposed to the risk associated with any value engineered solutions that cannot work in practice, to overestimate the capability of the industry in order to ensure a project passes to the next stage or securing funding at an unrealistic level.

The estimating methodology and approach for this Project has incorporated learnings from previous comparable New Zealand projects. With the City Rail Link (CRL) Project as an example, as demonstrated in Table 2, the CC2M Project has applied a significantly higher P50 than CRL did at a similar stage in its development.



Project/Stage	P50 as % Uplift on identified Costs (Excluding Escalation)
CC2M (IBC)	34%
CRL (approx. IBC)	17%
CRL (approx. DBC)	15%
CRL (FID)	13%

Table 2: P50 as a % uplift at different stages and key decision gates

Current CRL Experience

Our estimating team (Turner & Townsend) has brought its experience from recent work on the CRL Project. This includes ensuring the rates used in the base estimate are accurate for the local context, increasing accuracy in the assumed rates at P50 level. The costs of setting up a major tunnelling operation and the costs around deep level stations in New Zealand have been realistically estimated based on this experience. There are minor assumed efficiencies based on the length of this Project in comparison to CRL.

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Peer Review

To provide further confidence in the robustness of the estimating work, as per Waka Kotahi guidelines, the Project cost estimates have been subject to a detailed peer review undertaken by an independent estimator – WT Partners. This review was within 5% of Turner & Townsend’s original base estimate and adjustments were made to the original estimates accordingly.

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Conclusion

In order to ensure application of best practice in the New Zealand infrastructure environment, the Project has followed the guidelines set out by Waka Kotahi in their Estimating Manual. This recommends the use of P50 as the appropriate indicator for key decisions at this stage in the Project’s lifecycle. The Project’s cost estimation approach has



not been influenced by external factors that can sometimes lead to an optimistic assessment, such as affordability thresholds, indications of a favoured funding envelope, or competitive processes that can lead to overpromising.

The Project has applied two processes to ensure the robustness of the estimate, namely a peer review assessment, and international benchmarking. This benchmarking shows the CC2M P50 sits alongside the upper range of analogous project outturn costs.

Based on the above evidence, the Project P50 cost is the appropriate number to be used to inform the decision at this stage. Particularly as it provides greater contingency than previous comparative projects in New Zealand.

As the Project definition develops in the lead up to the FID, a significant amount of further design and assessment will have been undertaken. This further work will increase the accuracy of costs and increase the understanding of risk to a level that is appropriate to inform any investment decision. At that point in time, the P95 figure will become more relevant as an indicator of cost estimation risk.

ENDS

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