Future Funding
Scoping approaches to set an investment band for land transport
November 2014
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The Future Funding project is one of three Strategic Projects that the Ministry of Transport undertook in 2014. The other two projects are Future Demand and Economic Development and Transport. These projects consider the changing world and how our transport systems, including funding, can be 'future proofed' while adapting to known and uncertain economic, environmental and social changes.

Future Funding addresses land transport funding. The project aims to promote informed and critical thinking among Ministry staff and external stakeholders regarding how much we should invest in the land transport system and how we should raise that money.

The key questions considered in this project are set out in the quadrants of the circle in the diagram below with the key reports produced for each question outlined in the adjacent boxes. This report outlines approaches to set ranges for how much to invest in transport in response to question one.

This paper is presented not as policy, but with a view to inform and stimulate wider debate.
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1 Purpose: Enable informed discussion on setting an overall investment band for land transport

1. This paper identifies a number of different ways of identifying a funding band for land transport at the Government Policy Statement (GPS) level. The paper complements the development of an overall framework for information identification and collection.

2. This paper follows a regulatory impact statement-like structure. It sets out the problem, objectives and assessment criteria before examining a range of different approaches that could be used to identify a funding band.
2 Context: The Ministry must provide advice on national funding levels as part of GPS reviews

3. The Minister of Transport issues the GPS, which sets out the overall amount of funding to be invested in land transport over at least 10 years. The scope of the GPS covers funding allocated from the National Land Transport Fund (NLTF), the associated local share, and any other Crown appropriations to land transport, for example metro rail investment. The GPS also allocates NLTF funding to activity classes within upper and lower ranges.

4. The key structural elements of the land transport funding framework established by the Land Transport Management Act are set out in Figures 2 and 3. Decision-making within this framework must ‘contribute to an effective, efficient and safe land transport system in the public interest’.

Figure 2: Land Transport funding flows
Figure 3: Land Transport planning documents

5. The Ministry of Transport needs to be in a position to advise the Minister on the appropriate overall level of land transport funding in the course of GPS reviews. The next GPS review will occur by mid-2018.

6. In the course of the GPS 2015 review, Cabinet made it clear that it is looking to the Ministry to provide impartial advice on land transport system funding levels and performance.
3 Problem: Better methodologies are needed for advising ministers on appropriate land transport funding levels

7. Currently there is no formal methodological approach for advising ministers on the appropriate level of land transport funding at the national level. Advice draws on a disparate set of data sources and is provided on a three yearly cycle with the drafting of the GPS. Funding decisions outside the GPS, such as Crown contributions to metro rail or Auckland and regional roads, are considered individually outside of this cycle and the wider picture.

8. The recent GPS 2015 advice on overall funding levels drew on analysis of nominal GDP, a comparative analysis of OECD funding levels, reported benefit-cost ratios on current investment, existing forward commitments and provider expenditure proposals. While this approach has merits, there are ongoing concerns on how to address issues such as increasing maintenance costs, regional equity and concentration of demand in growing urban areas.

9. The Ministry needs a clear methodological framework to enable it to deliver consistent high quality advice to the Minister and Cabinet over time.
4 Objectives: Improved decision-making on investment levels

10. The overarching outcome sought is to have a system of land transport investment that achieves an effective, efficient and safe land transport system in the public interest.

11. The key objectives relevant to setting investment levels are the need for investment and the affordability of that investment. Need relates to the anticipated demand for access to economic and social opportunities, while affordability relates to the net benefits to system uses compared to other forms of investment. Both of these factors vary nationally, regionally, between individuals, and over time.

12. Good quality data are needed to provide a basis for well informed decision making. This should involve an analytical process that generates data that:
   - is based on key variables that generate a range for land transport investment (relevant)
   - uses accurate information (reliable)
   - adjusts to changing economic circumstances (responsive)
   - can be reviewed quickly at reasonable cost (timely)
   - enables assessment of the proportion of wealth being spent on transport nationally, regionally, individually, and over time (affordable).

13. These objectives are used as criteria to assess the different approaches for setting an investment band. Table 1 outlines further information on the criteria.
<table>
<thead>
<tr>
<th>Criterion</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevant</td>
<td>An approach should be a useful way of getting to a range for optimal funding using variables or indicators that relate to transport. It should identify either a proportion of wealth to be spent on transport or what is needed to reach a desired state. This criterion focuses on using the right indicators (not whether the indicators have robust data underpinning them).</td>
</tr>
<tr>
<td>Reliable</td>
<td>An approach needs to be based on data that are accurate and use an understandable and robust methodology. This criterion focuses on whether the data are accurate (not whether the variables are relevant).</td>
</tr>
<tr>
<td>Responsive</td>
<td>An approach should be able to adapt to a changing world and remain usable in different scenarios. This criterion focuses on the ability to change (rather than the speed of change).</td>
</tr>
<tr>
<td>Timely</td>
<td>Although the GPS is set 3-yearly, an approach should still be able to be applied in a reasonable timeframe if required, to deal with ad-hoc funding decisions. This criterion assesses whether an approach can be used quickly and cost effectively.</td>
</tr>
<tr>
<td>Affordable</td>
<td>Investment is needed in a good transport system to support the economy, while avoiding costs that would undermine our competitiveness. An approach should provide an indication of the proportion of wealth that is being spent on transport, either per capita or total. This criterion focuses on that ability to give an assessment (not whether it is the right amount or based on the right indicators).</td>
</tr>
</tbody>
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5 Approaches: Setting a target investment band

5.1 Approaches

14. Nine different approaches to identifying a target investment band have been identified. A number of these approaches are used in the status quo, as described in paragraph 8 above. All approaches make use of multiple data sources to inform decision making and draw on different methodologies. These methods include those that compile data that can be built up to understand the whole system, or those that use broad economy wide information to understand the system.

15. Given the use of varying methods, each approach provides information on different aspects of the question of ‘how much to invest’ and therefore some combination is likely to be required. Approaches one, two and six relate to affordability for the economy and economic return from existing investment, approaches three, four and five relate to understanding the system and building a value based on proposed future investment, and approaches seven and eight relate to developing a system wide performance goal.

16. A combination of approaches is likely to be required to understand how much to invest; however, each of the following approaches focuses on a specific component in order to examine the merits of an approach that places emphasis on the selected approach. This method enables the benefits and weaknesses of each approach to be individually examined.

Affordability focussed
- Approach 1: GDP led
- Approach 2: OECD led
- Approach 3: Benefit –Cost Analysis (BCA) hurdle led
- Approach 4: Capital value led
- Approach 5: Price led

Need focussed
- Approach 6: Expenditure led
- Approach 7: Stated preference led
- Approach 8: Indictor led
- Approach 9: Outcome led

17. The approaches developed as part of this work provide a number of ways to set an investment band or understand the system needs. Another aspect of setting optimal spend however, is understanding whether the proposed bands are affordable in terms of resources. The approaches are assessed on their ability to provide an affordability measure.
18. Figure 4 provides some information on how New Zealand’s current spend on roads per person and as a proportion of GDP compares to a small sub-set of OECD countries. Overall, New Zealand spends more on roads per capita than any country in the sample apart from Australia. But at the same time, New Zealand has the lowest GDP per capita. This means NZ’s spend on roads is a higher proportion of its GDP than most other countries, apart from Australia. The high Australian and NZ spend might be attributed to the relative newness of the nation and population growth. Also, given the context of the low NZ population, a high number of road kilometres per person with relatively low traffic volumes, low population density and the available GDP per person, this position may be perfectly appropriate.

19. Nevertheless, the strength of the Australian economy enables them to spend twice as much per person while using only a slightly higher proportion of their national wealth.

Figure 4: Proportion of GDP spent on roads and the spend on roads per capita compared to GDP per capita

5.1.1 Approach 1: GDP led

Description

20. This methodology focuses on the relative change in expenditure compared to anticipated growth in nominal GDP. It takes the existing level of expenditure as a given, but uses historical growth rates to help inform investment decision making (e.g. historical change in GDP, productivity and the construction price index).

21. GPS 2015 largely used this approach. Investment bands would be expressed in terms of movement compared to the anticipated growth in nominal GDP (e.g. 25%, 50% or 100% more or less than GDP inflation). Anticipated nominal GDP growth is adopted from Treasury forecasts.
Strengths

22. This methodology is responsive to changing economic conditions within the economy and can be applied at any time as it uses current economic data and is not dependent on provider supplied analysis. The approach could also use regional GDP to examine regional equity in terms of transport spend as a proportion of regional GDP.

23. Data on expenditure aspirations (Approach 3) or anticipated returns at an activity class level (Approach 4) are desirable but not essential.

24. It provides information that can inform an assessment of whether the spend is affordable by considering the proportion of wealth, or GDP, that is being spent on transport.

Weaknesses

25. It does not identify whether there is over or under investment in the current system. Therefore, it would be preferable to use this approach as an ‘affordability check’ in conjunction with an approach that explores the need in the system. In addition, arguably the level of transport investment that is warranted does not necessarily vary with changes in economic conditions.

26. It adopts a cost-plus approach that may not incentivise efficiencies in current baseline spend or question whether the return on investment of previous transport projects actually achieved predicted returns.

27. It is dependent on a further process to make priority allocations between activity classes based on expenditure aspirations (Approach 6) or anticipated returns at an activity class level (Approach 4).

Further development

28. Further development of this approach would involve improving NZ’s ability to analyse GDP data at a sub-national level that considers GDP per person and regional GDP. Analysis of imported and domestic cost drivers would also be helpful. Further development of key international comparators would also be desirable.

5.1.2 Approach 2: OECD led

Description

29. This methodology looks to OECD comparators to help set an investment band. The relevant variables for both NZ and OECD countries include total road expenditure as a proportion of GDP and road expenditure per person.
30. It would examine how much NZ would need to spend as a proportion of its GDP to equal an OECD comparator country’s spend on road transport per person. At its simplest, this methodology would set investment bands at upper, lower and median country comparators.

31. This approach would need to assume that investment will be at least as efficient as achieved by the average OECD country.

**Strengths**

32. This methodology provides an external comparison that is independent of the performance of New Zealand providers and the historical levels of investment in the network.

33. The methodology sheds some light on historical over or under investment.

**Weaknesses**

34. OECD data are not very reliable as accounting practices across the OECD vary widely. New Zealand’s own reporting to the OECD has systematically under-stated investment levels. The scope of the OECD data is also limited and it is difficult to collect local government levels of investment data. Comparable data are available only for roads, and then only back to 2002. Data before that date require substantial manipulation.

35. Other countries’ decision making processes are not necessarily robust. For example, the US has the problem of a depleted highways fund due to falling real fuel tax rates, and some countries are said to simply aim for 1% of GDP.

36. Spending more of NZ’s GDP than others is not necessarily unwise given NZ’s limited GDP per capita, geography and demography. If NZ wants a transport system comparable with the OECD average it may have to spend more of its wealth on that system. As a long narrow country with relatively low population densities, NZ has many more kilometres of road per capita than most OECD countries.

37. The approach does not tell us whether we are undertaking all the economically worthwhile projects, overspending (doing some projects that are not worthwhile) or under spending (not doing some worthwhile projects).

38. As with Approach 1, this approach is dependent on a further process to make priority allocations between activity classes based on expenditure aspirations (Approach 3) or anticipated returns at an activity class level (Approach 4).

**Further development**

39. Further development of this approach would involve improving NZ’s ability to secure up to date and comparable OECD data.
5.1.3 **Approach 3: BCA hurdle led**

**Description**

40. This methodology uses the BCA investment cut-offs (hurdles) within activity classes to inform maximum and minimum investment bands. It incorporates both tangible and intangible returns, expressed as monetary values (e.g. BCA rather than just BCR).

41. This approach was used by the Ministry from at least the early 1990s through to 2008. Before 2003 returns were legally required to be similar across the entire programme (i.e. programme efficiency) although, in practice, this was unlikely to have been the case. From 2003, returns were able to vary by activity class (i.e. activity class efficiency).

42. Investment was maintained somewhere between a minimum return of 3 and 4 dollars per dollar invested (i.e. BCAs of 3:1 to 4:1).

43. The discount rate is also a significant feature of BCA approach as it can impact:
   - project selection (e.g. low-risk early returns compared to high-risk later returns); and
   - project execution (e.g. high construction cost and low maintenance cost compared to low construction cost and high maintenance cost).

44. This approach, and related matters, is also discussed in a companion paper on optimal funding.

**Strengths**

45. This methodology transparently sets out the measurable and assumed value attributed to the programme, activity classes and individual investments. It provides a relatively simple way for Ministers to decide on overall funding levels because those levels directly determine the effective hurdle rate for investment, i.e. an increasing effective hurdle rate suggests a developing shortfall in overall funding or vice versa. It is also very transparent about the assumptions being made and anticipated returns in economic welfare terms.

46. BCAs have the capacity to provide rigorous comparisons between widely differing types of investment. They have value in comparisons between activity classes as well as between projects. This strength is dependent on maintenance of a methodology that is broadly consistent across the programme.

47. A further strength is that they make the trade-offs inherent in a rationing system transparent, including the impact of the political economy on net welfare benefits. BCA also supports robust post-project review and provides a consistent basis for holding providers accountable for network performance.
Weaknesses

48. Comparisons between transport and other forms of public investment is hard as the BCA information about other ways of investing public funds is thin.

49. Arguably, narrowly done BCAs that are not complemented by supplementary analysis, risk overlooking qualitative (non monetised) benefits, and wider corridor, network benefits and/or agglomeration benefits. Some would argue that they are unresponsive to changes in the political economy, including a disconnect between strategic project selection and BCA, although others would see that as a strength.

50. Maintenance should be purely BCA driven. Given the number of maintenance tasks, guidelines and standard values can be more practical than case-by-case analyses. It is hard to adjust network maintenance levels to reflect changes in BCAs as dynamically as improvement levels (for example, there are long-term maintenance contracts that are hard to change quickly). Therefore, maintenance BCAs are difficult to keep in alignment with project BCAs and most revenue variability tends to be absorbed in improvements. This risks over or under investment in maintenance compared to the return from improvements.

Further development

51. Further development of this approach would involve improving the reliability and consistency of BCA data across all investment classes, and always considering feasible alternatives as part of the BCA.

5.1.4 Approach 4: Capital value led

Description

52. If a business is in a “steady state” it will generate a return on capital, part of which is paid in dividends and part retained as reinvestment. This methodology would establish upper and lower limits to this investment band based on a rate of return from the capital value of the network.

53. Investment bands would be expressed as the dollar value of a market return from capital. For a $60 billion asset, a conservative 5 percent annual return is $3 billion, while a more ambitious rate of return of 7 percent is $4.2 billion.

54. A decision is then required about the level of re-investment compared to payment of a dividend to the shareholder. This decision could usefully be informed by expenditure planning (Approach 6), BCA analysis (Approach 3) or outcome targets (Approach 9).
**Strengths**

55. This methodology would directly link the level of investment in the existing system to the future level of investment, which can be appropriate if past investments were generally sound and if the external environment is reasonably stable.

56. It is a business-like, returns on investment, approach that would reduce the risk of over or under investment relative to current asset value.

**Weaknesses**

57. There are many circumstances in which investment made so far is not a good guide to what should be invested in the future (e.g. suboptimal past decisions, or changing demand). This methodology is, relatively unresponsive to market demand and in transport would be used within a governance and ownership structure that is not ‘business like’.

58. Ideally this would be based on a value that considers the current cost of replacing fit-for-purpose parts of the system while excluding stranded assets (i.e. optimum deprival value, which is optimised depreciated replacement cost with an adjustment for stranded assets). Current valuations fall well short of this ideal.

59. The methodology depends heavily on capital values that are nominal at best. The values are also relatively unresponsive to changes in economic conditions or service levels.

60. As with other approaches, it relies on other tools to reveal the actual value being delivered by investment.

**Further development**

61. Further development of this approach would involve a more detailed examination of how land transport network valuations are established. Work may also need to examine ways of valuing the network that are more responsive to changing economic conditions than land value.

5.1.5 **Approach 5: Price led**

**Description**

62. This methodology uses the willingness of users to pay a price, which would set the revenue bands for the system. The price would need to be differentiated by the distance travelled, by type of vehicle (weight), the location of travel (main or secondary road), and the time of day (peak or off-peak).
63. For pricing to work on a road network, which is a public monopoly, those setting the price need to be exposed to the consequences of poor pricing and investment decisions. This is likely to involve more business-like decision making frameworks than currently in place.

64. The current system incorporates some aspects of pricing within the Road User Charges system, which captures vehicle type and distance. A limited subset of vehicles subject to Road User Charges are also reporting time and location data under a permitting system that allows post rather than pre payment of the charge.

**Strengths**

65. Pricing creates a strong link between revenue and expenditure. It captures individuals willingness to pay for services at a specific time and location on the network. It gives them an incentive to avoid congested times and locations where prices are high, by altering their road travel or by changing mode. It gives providers strong incentives to identify and provide services that people will use. It also opens the prospect of reducing investment costs because of reduced peak pressure, and spreading them over time where improvements will deliver a positive revenue stream over time. Pricing should lead to better decision making by users and providers.

66. Data on actual network use (revealed preference) are essential. The revenue collection system needs to be configured in a way that allows actual travel to be monitored, even under an anonymous payment method.

67. Pricing has the potential to deliver on economic priorities by freeing up available network capacity for the most highly valued use, and environmental priorities by encouraging shorter trips and increased use of non-priced alternatives.

**Weaknesses**

68. Pricing is dependent on those setting prices experiencing the consequences if prices are set too high or too low. Changes in the decision making framework are likely to be needed as part of any move from tax setting to price setting.

69. Pricing only part of a network (e.g. motorway tolls), or only some vehicles on a network (e.g. RUC vehicles but not FED vehicles), is likely to distort travel patterns rather than improve them. This would take the form of traffic diversion and increased congestion and delays for those using the non-priced part of the network. Sound pricing internalises costs rather than transferring them to others.

70. The costs of collection associated with pricing are potentially high compared to FED, so the efficiency dividend needs to be significant to offset those costs. The costs of sufficiently reliable in-vehicle and back office charging and accounting technology is a significant factor.
71. Our knowledge about system condition and service levels needs to keep pace with the capacity to set a price.

72. Pricing is potentially regressive for low income families with little choice other than to use the system to get to work or services at peak times. It also potentially involves a refund system for FED that would add cost and complexity.

**Further development**

73. Further development of this approach would involve work to examine the series of opportunities and challenges presented by pricing. These include: the best technological platform for pricing; provision of a sound current state set of information about current network condition and service levels upon which prices could be based; the best method for setting prices that reflect those service levels; and the decision making framework needed to support pricing that may well involve a national system of collection and regionalised price setting and provision.

74. This work may ultimately lead to development of legislation enabling a progressive transition along a preferred transition pathway from tax setting to price setting.

5.1.6 **Approach 6: Expenditure led**

*Description*

75. This methodology uses provider assessments of what system users want and provider expenditure planning to inform investment levels. Political support for particular interventions is likely to be a significant factor. This approach features strongly in the NZ Transport Agency’s current approach to allocating resources and could be adapted to calculating the quantum based on provider recommendations.

76. Investment bands would be expressed as the maximum and minimum levels of revenue needed to deliver the expenditure anticipated by the provider to deliver the system users want.

*Strengths*

77. This methodology would be flexible in responding to changes in the political economy. It can be applied at any time based on providers’ current views.

78. It would deliver strong alignment between the Minister and providers on investment levels.

*Weaknesses*

79. This methodology has weak budgetary tension between funding and provision.

80. It would be relatively unresponsive to changing economic conditions and sheds little light on historical over or under investment. It is dependent on providers of a natural
monopoly to correctly discern user needs and willingness to pay in the absence of clear price signals. Any provider biases, such as a preference for demand management over capacity or visa-versa, would go untested.

81. As with previous approaches, this approach is dependent on a further process to make priority allocations between activity classes based on anticipated returns at an activity class level (Approach 4). There is a significant risk of over investment.

Further development

82. Further development of this approach would involve broadening the range of views about expenditure plans to incorporate a stronger local government perspective to complement a State highway perspective.

5.1.7 Approach 7: Stated preference led

Description

83. This approach would seek to establish users’ willingness to pay by undertaking comprehensive market research. The results of that research could be used to supplement demand forecasting and benefit-cost analysis approaches.

84. A statistically significant sample of system users would be interviewed to secure their informed view about the value they place on different aspects of the service they receive. From this information, a level of investment would be derived.

Strengths

85. Focuses on the users of the system. It would partially address the poor signals to network users due to application of average prices and provide better information to decision makers about user preferences.

86. The approach would also require development of approaches clearly setting out what would be delivered to different types of network users by different investment packages. That information would have to be presented in a form that makes the service levels and trade-offs involved transparent to those being sampled.

Weaknesses

87. Stated and revealed preferences tend to diverge significantly. It is difficult to introduce budget constraints in stated preference surveys. Users of the land transport system have limited information to base their responses. It is only when they are faced with real world choices that their actual preferences are revealed. Reliability is therefore an issue. There is also a risk of double counting in any methodology that also uses BCA analysis, which includes willingness to pay in the form of values of time and life.

88. Securing a representative sample would be challenging and presenting choices in a robust way would be difficult given the patchy information about returns from current
investment. This approach would be expensive and time consuming to implement given the diversity of the user base and quality of information currently available.

**Further development**

89. Further development of this approach would involve trialling a comprehensive stated preference survey methodology and programme.

### 5.1.8 Approach 8: Indicator led

**Description**

90. This methodology would link the level of investment to a measurable aspect of demand (or supply).

91. Investment bands would be calculated based on a combination of demand related variables, such as the number of vehicles, and supply related variables like lane kilometres or lane kilometres at a particular standard. The investment band would adjust to reflect changes in the variables.

92. A value would have to be attributed to each variable that reflects its value to society.

**Strengths**

93. This methodology would link the size of the transport task through the indicators to the level of funding made available. Inclusion of use related parameters would provide some degree of responsiveness to changing economic conditions.

94. The methodology could be applied reasonably quick with available data at any time.

**Weaknesses**

95. Identifying a cost per unit of demand would be challenging.

96. Information about the leading variables is currently poor and the reliability of data would be an issue. The welfare benefits delivered by a unit of demand also vary widely. In these circumstances, an average value per unit of demand would be a very crude proxy.

97. Standards (agreed levels of service) are a big issue. Possibly NZ needs lower levels of service on some parts of the road network than elsewhere because we have many kilometres of roads to maintain and limited wealth.

98. The approach would tend to focus on inputs (e.g. number of vehicles) or outputs (e.g. kilometres travelled) rather than outcomes (e.g. short travel times). There is accordingly a risk of perverse incentives on providers, such as encouraging maximisation of vehicle numbers or public transport boardings, over outcomes for users.
Further development
99. Further development of this approach would centre on identification of key inputs that can be measured and have costs identified.

5.1.9 Approach 9: Outcome led

Description
100. This methodology would identify outcomes for the system expressed as measurable results (e.g. increase the markets that can be reached per hour of travel time). The ability to generate good outcomes and associated results is critical to this approach.

101. It would then seek to identify levels of investment required to deliver those results through bids by providers. The approach would need to be supported with BCA and affordability assessments. Further analytical cycles would align final outcomes, revenue and expenditure levels in view of the anticipated results at a project level.

Strengths
102. This methodology has the potential to achieve strong integration between strategic outcomes and delivery as the outcomes sought would need to be more clearly framed than at present, provided that the information and timing challenges inherent in the approach can be addressed and the focus is maintained on results rather than inputs.

103. This methodology would be outcome focused, and based around results that are meaningful from a New Zealand Inc perspective.

Weaknesses
104. The information currently available about outcomes is poor. The outcomes identified would also be averaged over the system, when problems may be localised. There is a significant risk of perverse outcomes due to averaging of results.

105. This methodology is highly dependent on very good information about the network and completion of several iterative review cycles to ensure that the results and interventions are aligned. This would take considerable time to complete and a level of involvement by national government and policy makers in project selection that is not currently permitted under the legislative framework.

106. It would also be challenging to set outcomes that are largely in the control of system providers (e.g. congestion levels are a product of demand as well as supply).

Further development
107. Further development of this approach would centre on identification of key outcomes that can be measured and have costs identified.
5.2 **Assessment of approaches**

108. The purpose of this paper is to have a conversation about possible methods of setting an investment band for land transport. This section assesses the approaches outlined above with the aim to identify which approaches would be worth further investigation. It does not intend to compare approaches to the status quo or identify the most optimal approach (or package of approaches), but does look at some of the pros and cons of approaches in relation to each other.

**Affordability focussed**

109. Approach 1 (GDP led) is limited as it provides little insight into the relative value of current investment. However, it does provide a systematic way to test transport expenditure against wider changes in NZ’s wealth and capacity to fund different levels of transport expenditure. It is also reasonably easy to understand, measure and can be applied quickly whenever a review is needed.

110. Approach 2 (OECD led) is handicapped by the unreliable nature of OECD data. It provides a useful perspective, particularly on affordability, but is more useful in complementing other tools rather than deriving the investment bands.

111. Approach 3 (BCA led) is capable of delivering investment bands that reflect current investment performance and economic conditions. However, this requires the necessary skill base to be secured, and the system to be well implemented, including transparent reporting of intangible benefits. Even if we had access to get great BCA data, its value in setting overall investment bands would be limited by the lack of comparable data for other forms of public investment. Dispassionate BCA based analysis can be challenging for governments that see value in interventions that are intangible and difficult to measure.

112. Approach 4 (Capital value led) relies on capital valuations that are very crude proxies for the value of the transport system and would not be sufficiently responsive to changing economic conditions.

113. Approach 5 (Price led) is likely to involve a significant transition period in moving from tax setting to price setting. This approach has been under investigation for more than 20 years. Progress has been modest due to the challenging technical and political issues raised. Uptake of pricing at a level that would be sufficient to substantively replace other approaches to setting revenue and expenditure levels is both sensitive socially and technically challenging. As a consequence, it is likely that a long time would be needed to implement from commencement of substantive policy work.

**Need focussed**

114. Approach 6 (Expenditure led) carries a serious risk of over investment and provides weak incentives to secure efficiency gains from existing resources.
115. Approach 7 (Stated preference led) is theoretically robust from an economics perspective but there are significant practical difficulties with the reliability of stated preference sampling and the level of resourcing required to provide the data that are required. While user preferences are clearly a useful supplement to revealed preference analysis, using them as a leading determinant of an investment band would be problematic.

116. Approach 8 (Indicator led) has potential to provide a richer picture of the transport task, but securing reliable information is problematic. Arguably it would provide a rather static view based on current demand.

117. Approach 9 (Outcomes led) appears to have potential to deliver the most integrated results, but a number of building blocks would need to be put in place before it could be implemented. This would include improvements in NZ’s understanding of asset performance and changes to the governance structure to allow for the iterative approach to decide quantum and packages of investment. The development of an inter-modal National Transport Model would also be useful in comparing needs across modes and regions.

118. A combination of the approaches is likely to be required to provide different perspectives on a range of factors to set the optimal funding bands. Approach 5 (Price led) looks like the strongest long term prospect, but would take some time to implement as it is dependent on securing some quite fundamental changes to the current funding framework. Approach 9 (Outcome led) looks like the best medium term prospect, but depends on significantly improving our knowledge about network use and performance. Approach 1 (GDP led) looks like the strongest short term approach pending implementation of the changes needed to implement Approach 5 and Approach 9.

119. A focus group from the project team assessed each approach individually against the criteria on a scale from 1 (strongly negative) to 5 (strongly positive). The assessment was based on the current practice rather than the theoretically capability of an approach in order to reveal where further work is required. The indicative rankings are shown in Table 2.
Table 2: Preliminary assessment of approaches

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<th>Approach</th>
<th>Relevant</th>
<th>Reliable</th>
<th>Responsive</th>
<th>Timely</th>
<th>Affordable</th>
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<td>Approach 1: GDP led</td>
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1 = strongly negative; 3 = neutral; 5 = strongly positive;
6 Summary

120. The purpose of this paper is to support an informed discussion of different approaches to setting an overall investment band for land transport. The purpose of setting bands is to identify a range in which there is a good return on investment. An upper band would indicate the maximum return on spending and above which additional investment has marginal benefit and economic drag. A lower limit would indicate the minimum spend needed to ensure a good return. It is highly unlikely that only one approach will serve the varied needs of the Ministry.

121. The Ministry needs to be in a position to advise the Minister on the appropriate overall level of land transport funding in the course of GPS reviews. However, the current approach to identifying an overall investment band assumes as a starting point future levels will follow current spend and CPI. It then seeks to test that assumption, however, there is no established approach to do this.

122. The objective is improved decision making on investment levels. A methodology needs to use relevant variables that can produce reliable information that is responsive to changing economic conditions, on time and at reasonable cost.

123. The nine approaches examined have a mixture of strengths and weaknesses. Data reliability is an issue with the majority of approaches which needs to be addressed as a priority, but most could be implemented in a timely way at reasonable cost. Some approaches are relatively unresponsive to changing economic conditions, and therefore offer limited insights into the value delivered to society at different funding levels.

124. While an increased focus on outcomes appears strongest in theory and may be best in the longer-term, information limitations suggest a more pragmatic approach that puts most weight on GDP comparisons may be best in the shorter-term, done in conjunction with detailed analysis.

125. Overall, a number of approaches could be taken forward for further investigation, such as approaches 1, 2, 3, 5, 8 and 9. Further work should include how to develop a package to provide a combined view on investment bands for land transport. Additional work is also needed on the level of affordability these bands might represent for New Zealand. Further work should also occur in conjunction with work underway or under consideration by the Ministry for the GPS and wider work on funding issues.