

Differential Levels of Service

Guidance document

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Purpose

To provide guidance for developing appropriate and relevant Differential Levels of Service to the transport sector. This will inform Activity Management Plans, Long Term Plans and the National Land Transport Programme.

What are Levels of Service?

Levels of Service (LoS) are fundamental to delivering good asset management practice. The definition of asset management in the International Infrastructure Management Manual (IIMM) mentions LoS in the first line: 'Asset management is providing the required Level of Service in a cost-effective manner for present and future customers.'

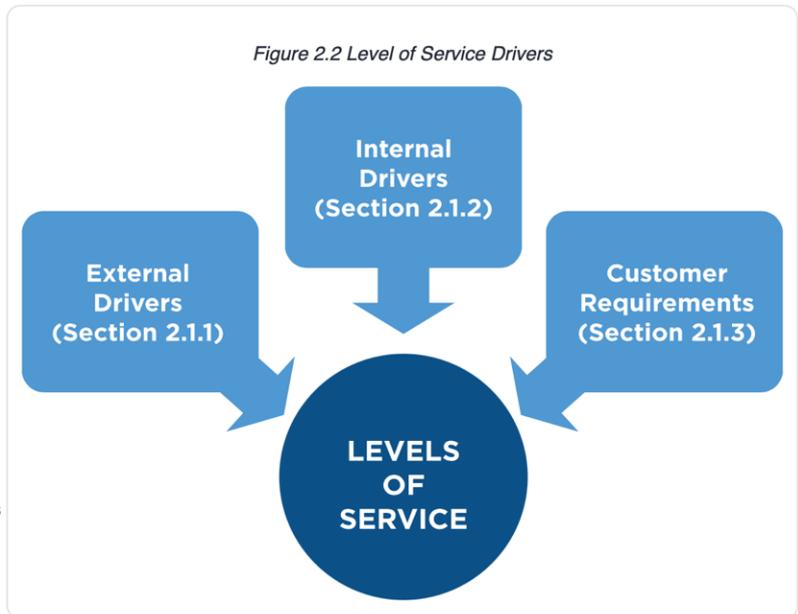
The IIMM defines the drivers of LoS as per figure 2.2 as external, internal and customer requirements.

LoS is simply a measure of the quality or service the public can expect around the provision of an element of infrastructure, for example, the quality of an unsealed road or the frequency of flooding. LoS can be described as the mechanism we use to balance the Service, Cost and Risk relationships - high LoS usually reduce risk but cost more.

There are many infrastructure elements that lend themselves to setting LoS. Te Ringa Maimoa has compiled these elements into a Framework to ensure everyone in the sector is using the same language around LoS. Not every Council will need every LoS in this Framework, only those that are relevant and important to their infrastructure needs.

LoS help an asset manager communicate to the community, senior management and politicians what performance they can expect from their infrastructure. LoS also help asset managers design, monitor and maintain the network to everyone's expectations. This means they are often used to translate work done on the ground to what the customers can expect when using the transport network.

Enabling effective LoS decision making locally within a national framework will lead to greater value for the transport sector. The preferred LoS is the one that the community is comfortable with, there is enough funding for, and the level of risk is acceptable.



What do we mean by Differential Levels of Service?

Differential Levels of Service (DLoS) may sound complicated, but it is simply taking a risk-based approach to managing assets within constrained budgets. Asset managers identify where higher or lower levels of service are appropriate across a portfolio of assets. This is often done on a risk basis but can also be driven by legislative or customer requirements.

The DLoS are those relevant LoS for a particular element of infrastructure that change depending on factors such as risk. Road and transport mode classification systems can be used for differentiating LoS as they are often based on the level of activity and therefore risk. Te Ringa Maimoa has embraced the One Network Framework (ONF) as a classification system to be used for differentiating LoS. Higher ONF classification levels with higher use and risk can require higher LoS, while low ONF classification levels can sometimes need lower LoS.

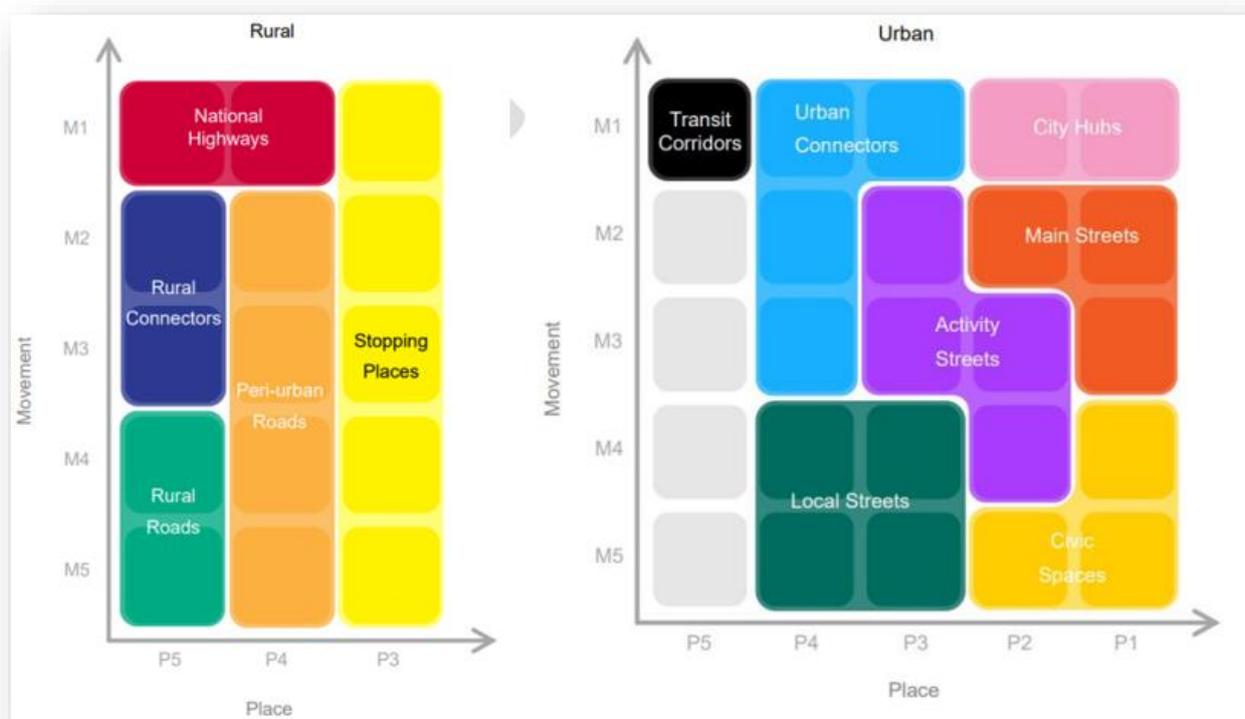
One of the four major recommendations from the Road Maintenance Task Force (Oct 2012) was 'improved prioritisation and optimisation through level of service differentiation' to ensure road maintenance efficiency.

Current application:

- The One Network Road Classification (ONRC) provided a relatively coarse way of differentiating LoS across networks but did provide a level of consistency across the country.

Using the DLoS Framework:

- ONF provides a more flexible, nuanced way to contemplate LoS differentiation across movement, place and time.



Why do we need a nationally consistent Differential Levels of Service Framework?

The transport sector has had LoS in place for some time; many LoS were updated to take into account the One Network Road Classification. Selection of the appropriate LoS was left up to individual road controlling authorities which has led to many different LoS being specified across the country.

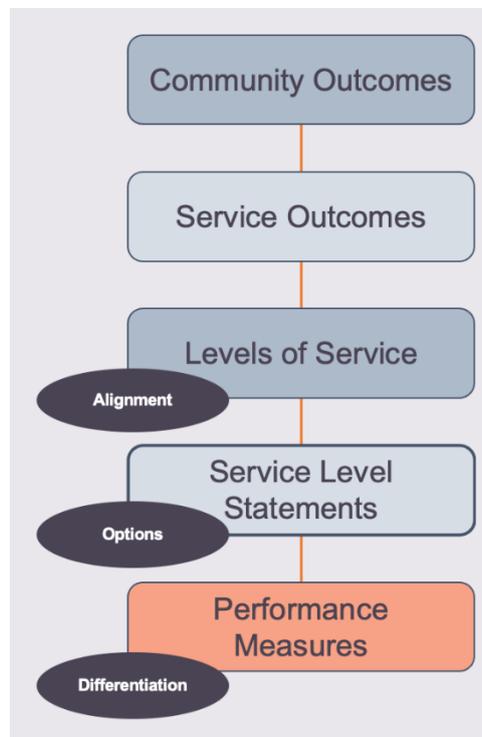
The DLoS Framework project aims to provide a consistent way to describe, select and set levels of service across the transport sector for local roads.

The DLoS Framework came about through trial and testing in the sector during the 2021 Long Term Plan development process.

The Framework aims to provide a measure of national consistency while allowing flexibility for local affordability to be managed. The core functions of the Framework are to provide alignment, LoS options and differentiation.

The sector needs alignment between work done on the ground through to community and transport outcomes to ensure that what we are doing is heading us in the right direction.

Asset managers also need a consistent way to describe LoS options considering risk, cost and emissions to make effective investment decisions and trade-offs. There is also a need for a common means of differentiation across the transport network when applying the ONF.



LoS Framework element	Definition
Community Outcomes	Outcomes sought by the community, Government or organisation.
Service Outcomes	The contribution to the community outcomes made by the service, activity or asset portfolio.
Levels of Service	Description of the service parameter the organisation has agreed to deliver from a customer point of view.
Service level Statement	The service level the organisation has agreed to deliver from a customer point of view for a given level of investment and risk.
Performance Measures	A qualitative or quantitative measure of a service or activity used to indicate how the organisation is doing in relation to delivering levels of service.

Benefits of a Differential Levels of Service Framework

The DLoS Framework helps ensure asset managers can meet customer expectations while also achieving value for money through carrying out the right treatment at the right time in the right place. This approach was conceived to provide a measure of consistency in how LoS are described, selected and set across the transport sector, starting with local roads through the Te Ringa Maimoa programme.

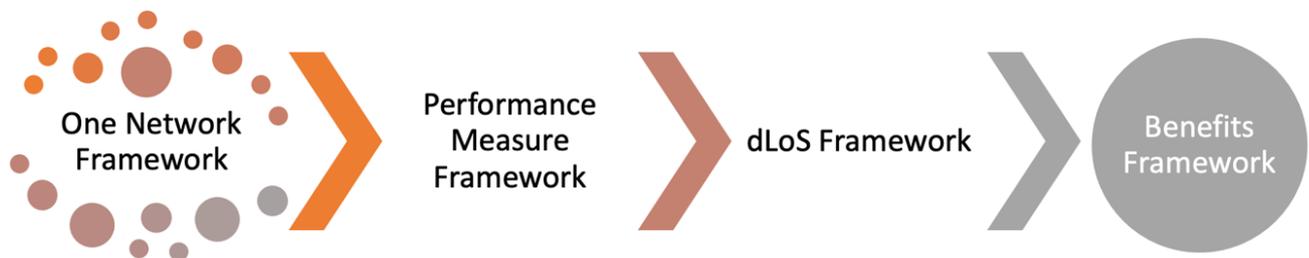
Using a common language and a consistent way of describing transport LoS across the sector will improve aggregation of benefits to regional and national programmes.

The benefits from taking a DLoS Framework perspective include:

- Alignment of community outcomes through to performance measures.
- Streamlined optioneering and consistent differentiation using ONF.
- Description in customer language of the benefits or consequences of investment.
- A robust connection between service, cost and risk that tells a better investment story.
- Better evidence for transport investment decision makers.

Local road funding has a co-investment approach with two approval processes to go through - Local Council and Waka Kotahi NZ Transport Agency. These funding conversations happen concurrently and can mean that changes need to be made multiple times to reach the final agreed programme of work and funding allocations. Having LoS options developed ahead of these conversations means the consequences of these funding decisions can be communicated, rather than having to be recalculated as changes are made to funding levels.

The DLoS Framework allows the One Network Framework and Service Outcomes and Performance Measure Framework to be connected to the Waka Kotahi Benefits Framework.



Levels of Service options

Once asset managers have worked out relevant and important Service Outcomes and LoS necessary for delivering community outcomes as per the DLoS Framework, they are ready to find the optimised balance of cost, service and risk for each LoS.

This should be done as LoS Options, considering the Cost, Service and Risk for each option, for each LoS. The relationship between service (sometimes called performance), cost and risk is a fundamental principal of asset management.

This creates a little more work in the planning phase but has the benefit of contemplating what more or less might look like from multiple perspectives:

- Work programme options and the cost to deliver them.
- What the work programme will deliver in benefits and consequences.
- The metric and target used to track delivery.
- The residual risk for each option.

Putting LoS options forward assists decision makers by clearly demonstrating the:

- Impact of investment decisions on the level of service that can be provided.
- Benefits that could be gained from investing.
- Consequences of reduced or non-investment.
- Residual risks.

Understanding the relationships between doing more work and the results of that work are crucial to developing useful LoS options.

Options are also commonly contemplated by:

- More, Same, Less.
- Do Nothing, Do Minimum, Do Something.

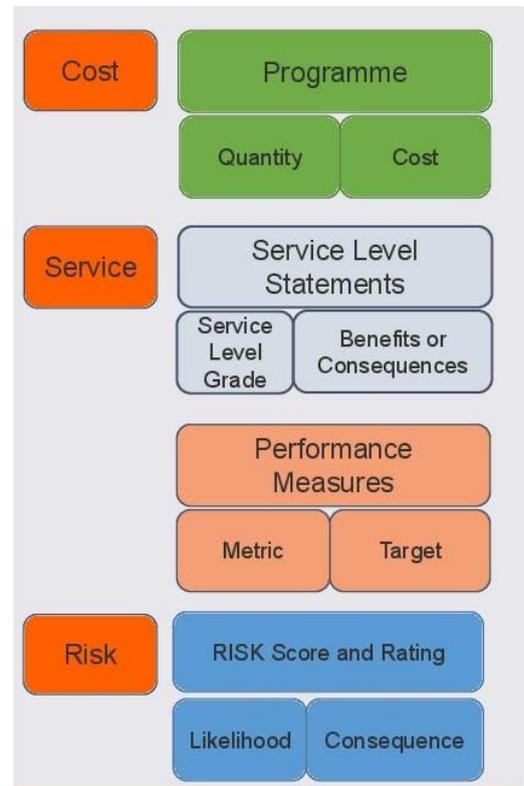
Work generates benefits that are described in words as well as in numbers through performance measures.

Risk is a crucial aspect of this balancing act and one that needs to be expanded on to make real the consequences of reduced investment levels.

LoS options are a critical decision making support tool. Asset managers often produce options in quite a granular, technical way to describe the planning processes to build programmes of work.

The LoS option Framework is based on the core asset management principle of balancing cost, service and risk. Emissions have been added as an aspirational set of information for reporting in the future.

The format for these options is indicated in the table, considering three options across the four parameters of Cost, Service, Risk and Emissions.



Option	Cost	Service	Risk	Emissions
A				
B				
C				

Differentiation

The One Network Framework (ONF) is the road network hierarchy that determines a road's category by considering both movement of multiple modes of traffic, and the place function of the road space. It also looks to the future to consider what that road may need to provide as land use changes.

The ONF can be used to differentiate the LoS across the transport network in terms of movement, place and time.

- Urban vs Rural
- 12 road categories
- 40 combinations of movement and place input factors.
- The five modes of transport.
- The Current vs Future network.

Many delivery contracts or maintenance specifications will already have some form of differentiation across transport networks. These could be:

- Frequency of operational practices such as grass mowing.
- Response times to maintenance defects or faults.
- Treatment intervention levels – when to trigger a renewal.
- Carrying capacity for road or bridges.

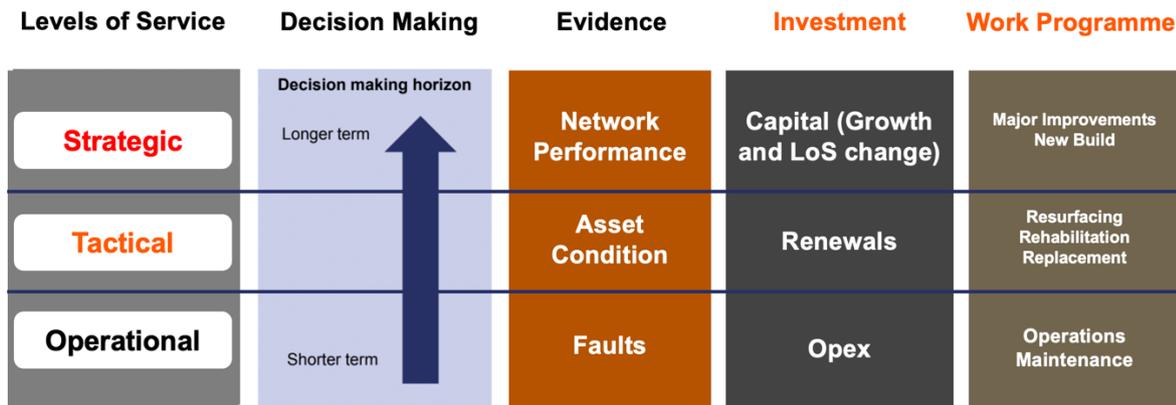
How to apply the Differential LoS Framework to networks

To help RCAs apply the DLoS Framework to their networks Te Ringa Maimoa has developed the following Cost Service Risk Model.

A critical part of asset management planning is to consider different options for investment. Te Ringa Maimoa has built upon good practice found in the sector and have refined the LoS options process through collaborative development of a Decision Support Tool.

By grouping LoS into Strategic, Tactical and Operational sets, Te Ringa Maimoa were able to have sensible conversations about each of the different work programmes and budgets that went with these levels of

service and isolate some of the decision making around operational issues which tended to dominate the conversation.



Decision Support Tool

To help RCAs use this Cost Service Risk Model on their networks, Te Ringa Maimoa has developed a Decision Support Tool. It assists asset managers to:

- select which LoS are the most appropriate for each transport network.
- create options for each LoS that consider Cost, Service, Risk, and Emissions in a consistent way.
- develop strategies to combine individual LoS into scenarios considering trade-offs and combinations of work categories.
- describe the impact of investment scenarios on the LoS, cost and risk.

The Tool also assists in developing options for each of the selected LoS by considering:

- different programmes of work.
- the cost to deliver that work.
- benefits or consequences.
- the target for the selected LoS metric.
- the risk outcome.

The Tool then calculates and summarises the options for the LoS and compares them for inclusion into decision making processes.

This relatively simple tool provides a way to aggregate all the good planning and thinking that goes into long term plans into a set of options for each LoS, bringing the sector to a common way of describing LoS options.

The Tool has been refined and tested through the Learning and Development workshops in 2022.

There is a place to add emissions calculations if available, so they can become part of the decision making conversation.

Incorporating Levels of Service into Activity Management Plans

Te Ringa Maimoa has aligned the LoS Framework components to fit with the line of sight diagram to ensure the LoS work is included in the business case approach.

Community Outcomes and Service Outcomes fit within the Strategic Case and LoS Options and Performance Measures will reside in the Programme Case.

The pieces of the DLoS puzzle fit into the build process for the business case Activity Management Plans.



Asset managers will follow the steps outlined in the graphic as the business case is developed within the AMPs.

More information

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Te Ringa Maimoa

Transport Excellence Partnership

**Working in partnership to
support the sector since 2012**