

# Road Asset Management (RAM)

Georgia

12-15<sup>th</sup> September 2022

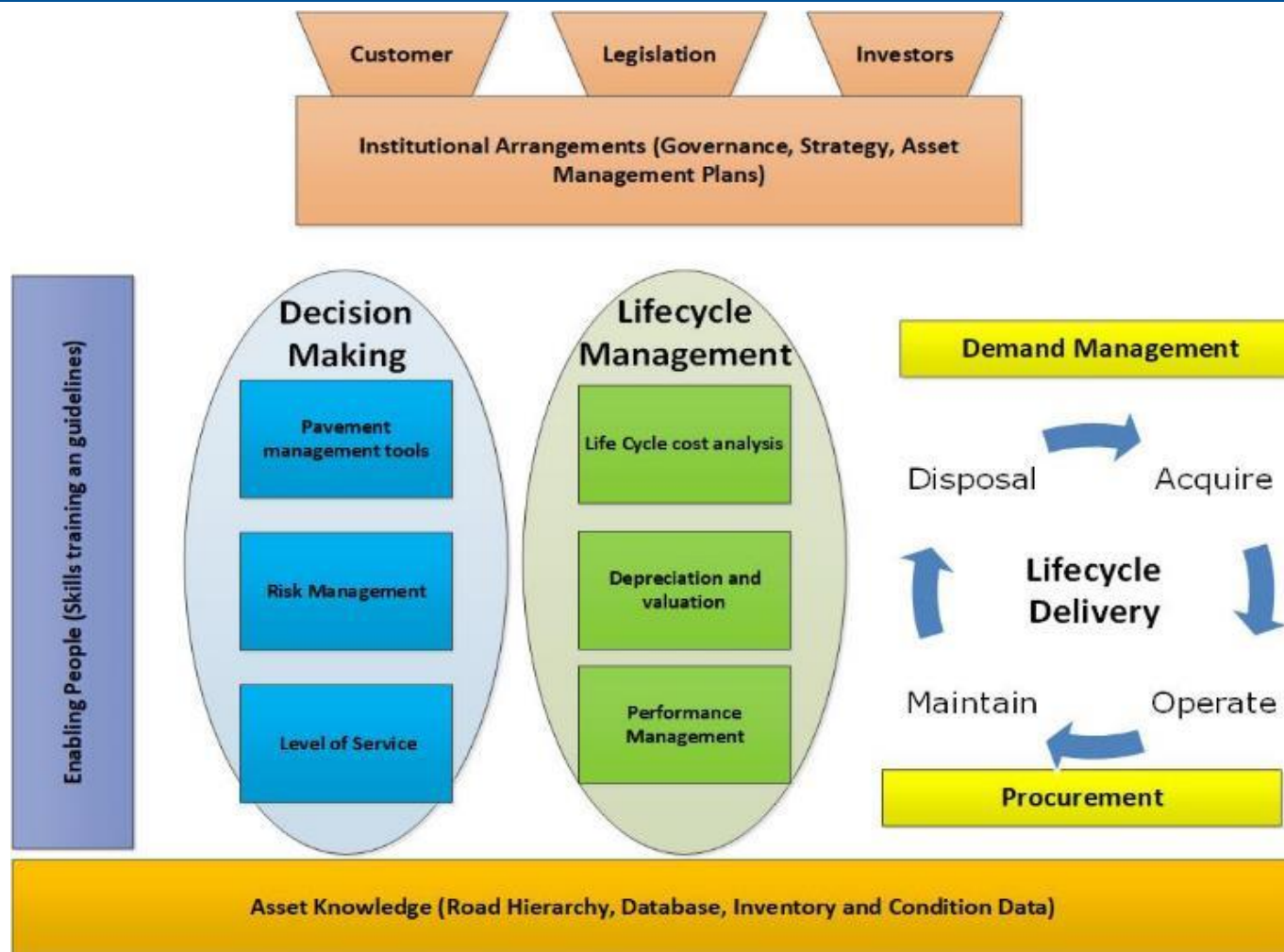
## Session: Developing Service Levels for All Asset Types

Dr Theuns Henning

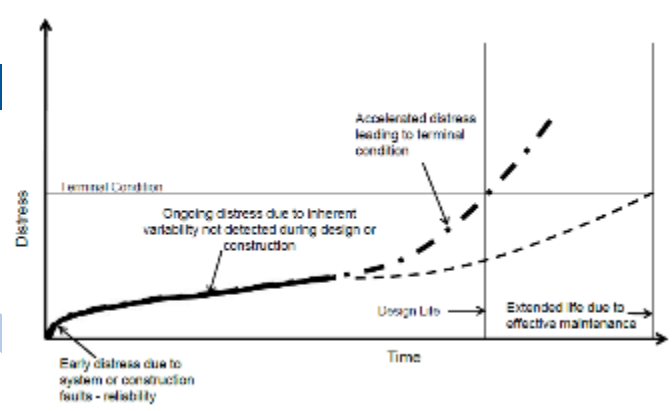
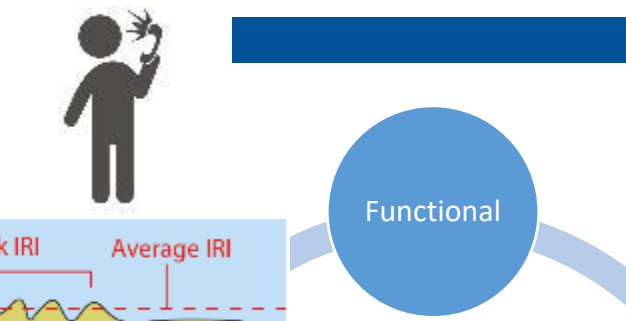
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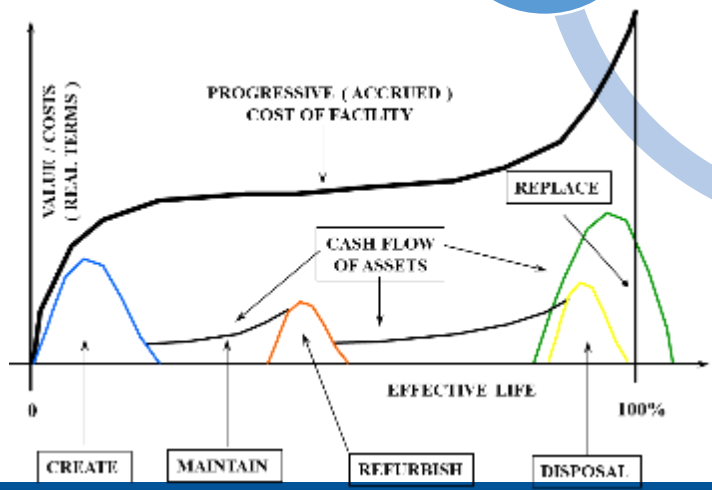
# Level of Service is Key to Asset Management



# Level of Service Dimensions



Source SANRAL, 2016



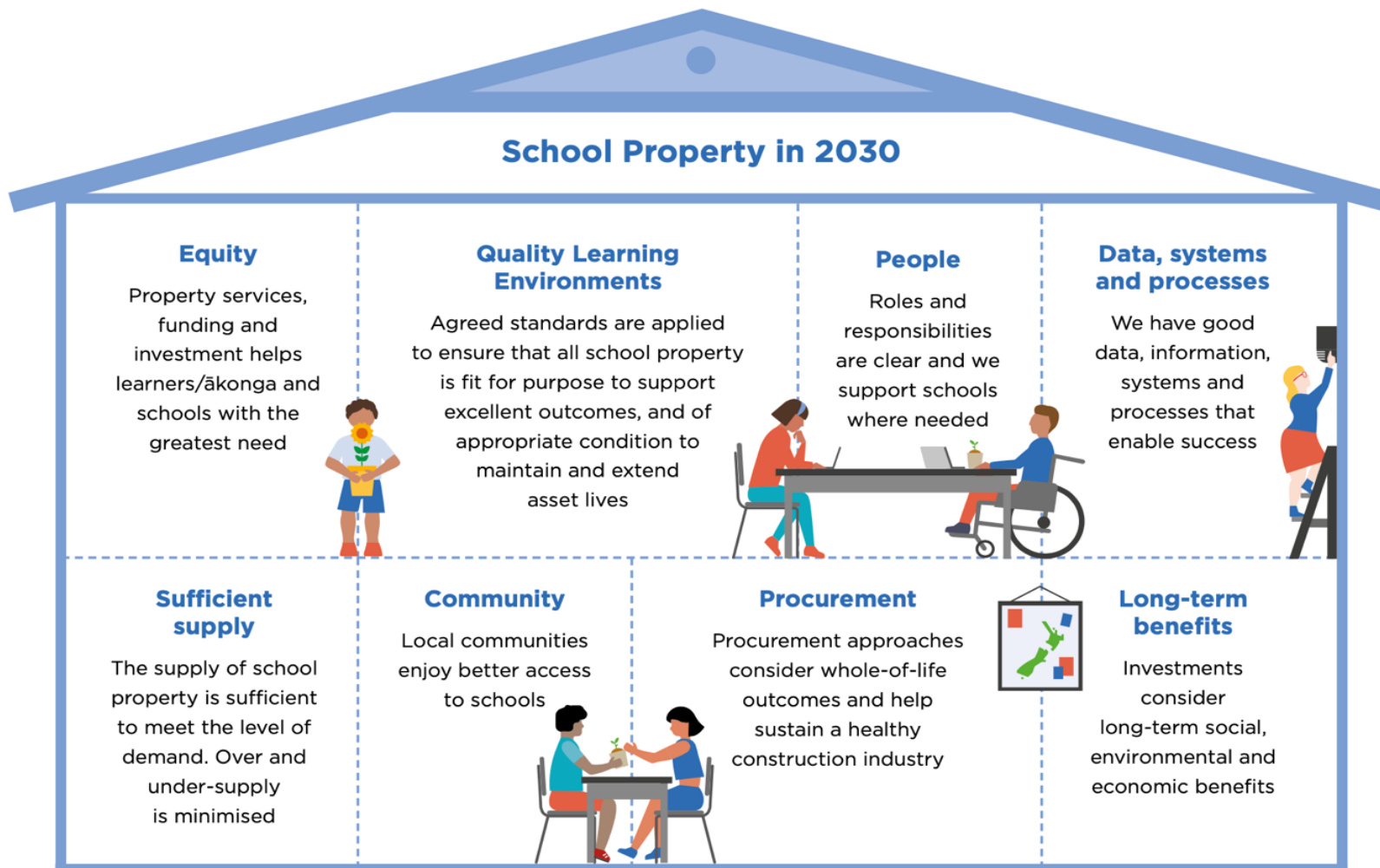
# Level of Service "Knowing which roads to invest in when and when to do it":

- A focus on what matters most
  - Our ongoing work programmes (operations, maintenance and renewals)
  - Our Capital works programmes (improvements)
- A framework for prioritising our actions
- A framework for consistency across provinces and road classes
- A framework for organising our data and information



**FRAMEWORK**

# Levels of Service Examples NZ Education Property

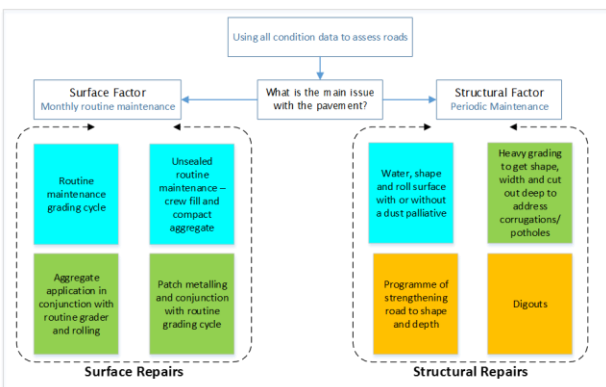


# Data Collection Should be Focused on its Purpose

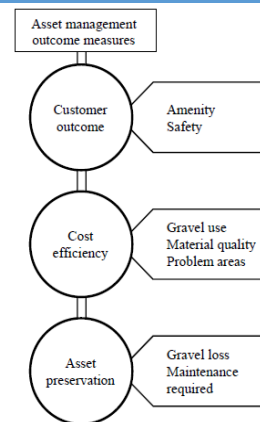
What do we use the data for?

Decision Process

Performance Monitoring



Data Framework



# Where do levels of service fit in the performance management framework?

## ASSET MANAGEMENT LEVEL

STRATEGIC

TACTICAL

OPERATIONAL

## PERFORMANCE MANAGEMENT QUESTIONS

### INVESTMENT BUSINESS CASE

- How does the actual performance compare to target levels?
- Is the investment targeting the right outcomes?
- Ensuring sustainable investment levels?
- Are the risks appropriately managed?

### PROGRAMME PLANNING

- Ensure sustainable investment levels
- Timing and type of renewal and maintenance
- Linking technical inputs to performance outcomes

## Knowing where you come from

Past investment  
Past performance  
Historical failures

## Understanding the GAP

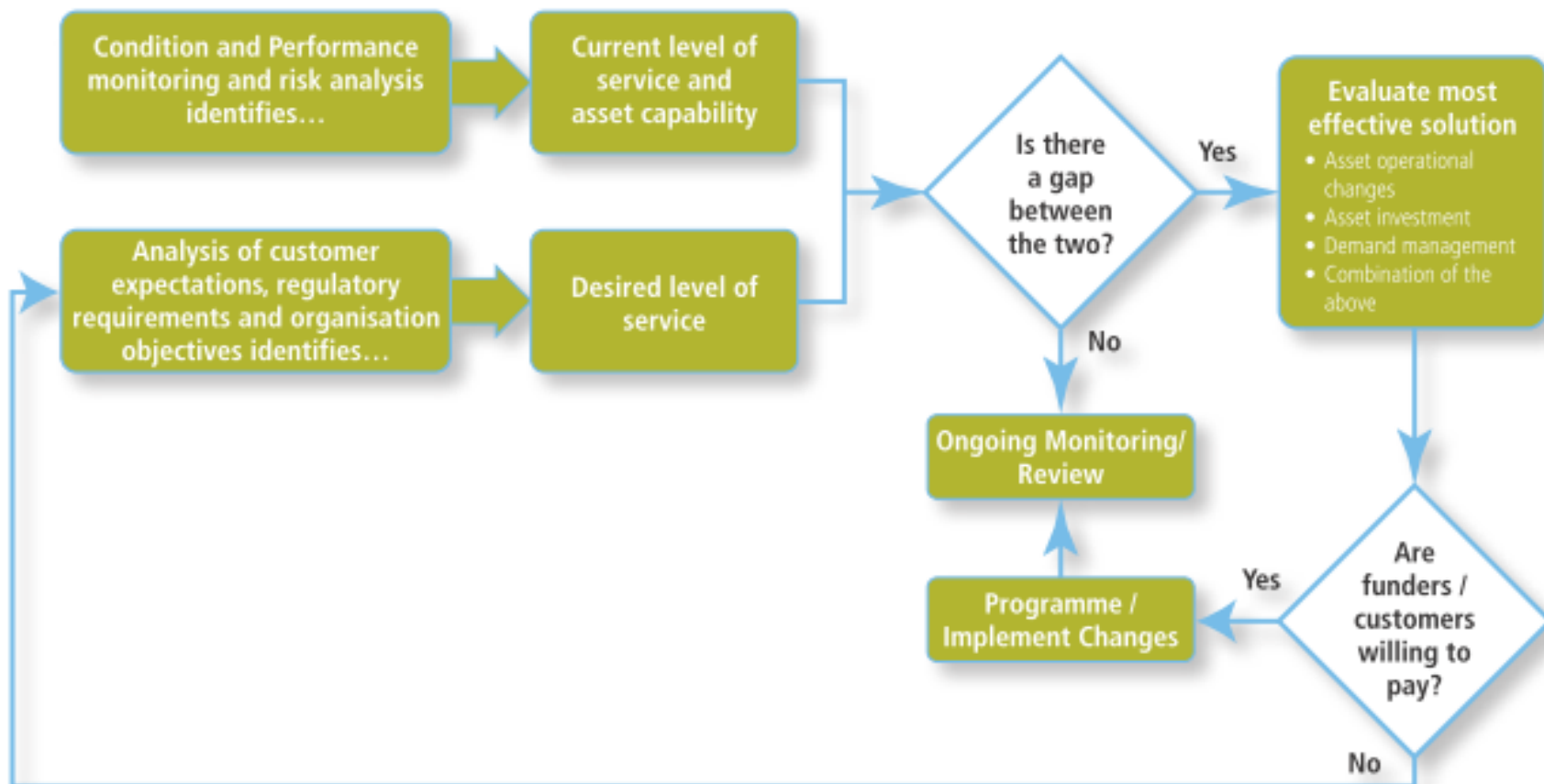
What is my current performance in term of by desired Level of Service (LoS)

## Road map to get there

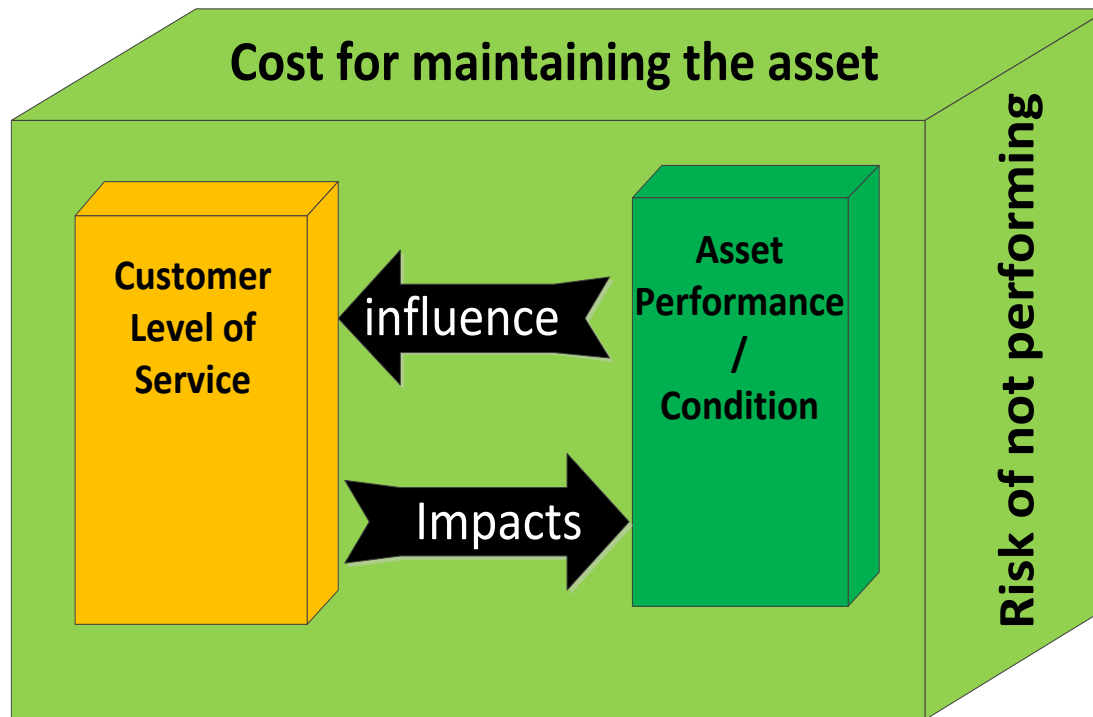
Forecasted investment and LoS delivery plan



# How does the levels of service review fit with asset management processes?

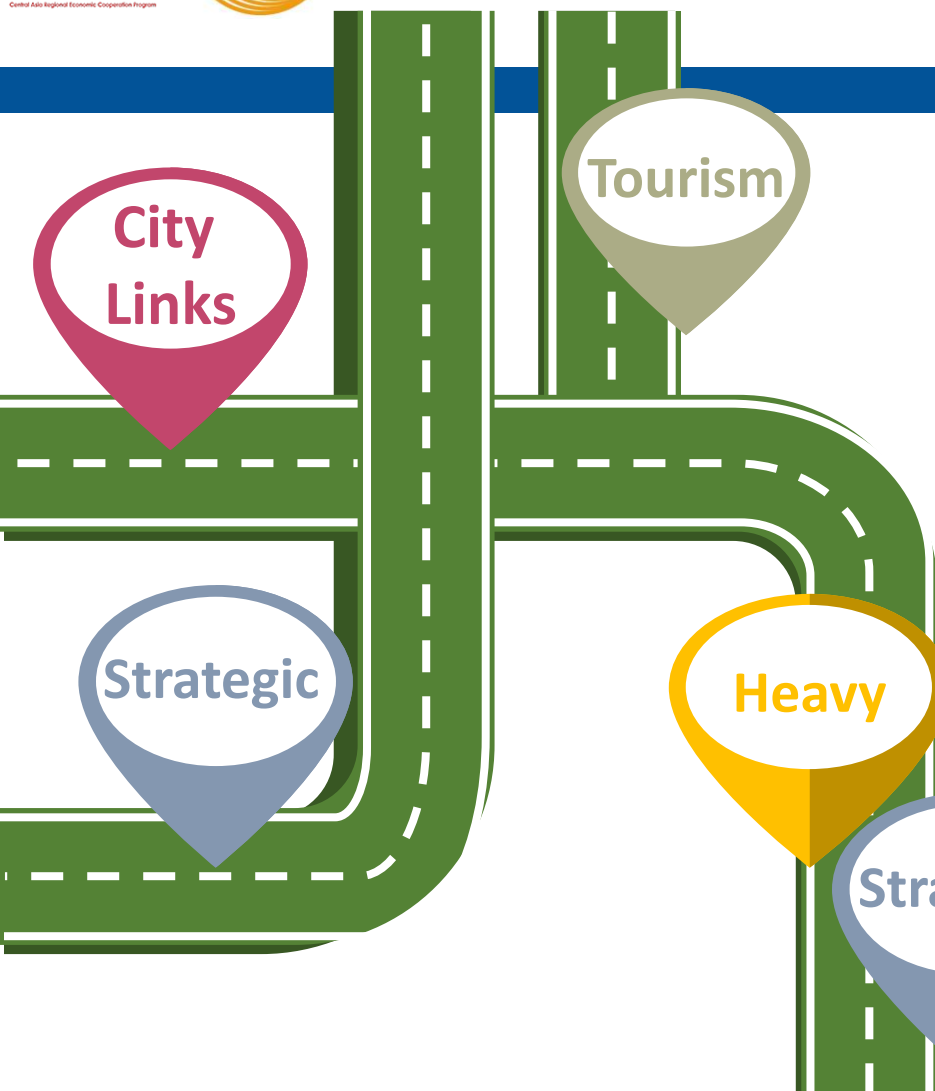


# The Business Case for Road Investment



# Road Classification System

# Road Function



Strategic Routes - Military  
- Emergency

Heavy Traffic - Economic Links

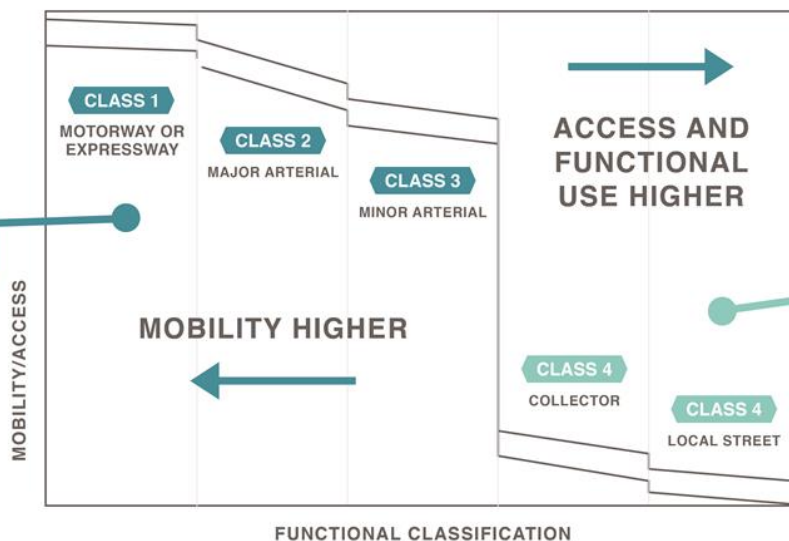
City Links - City to City  
- Within Cities

Tourism

*A road may perform more than one function*

# Road Classification Underpins LoS

- High order roads (motorway/expressway) – high speed, safety, no ad-grade access
- Low-order roads – low speed, free access, mixed use (children playing and vehicles)

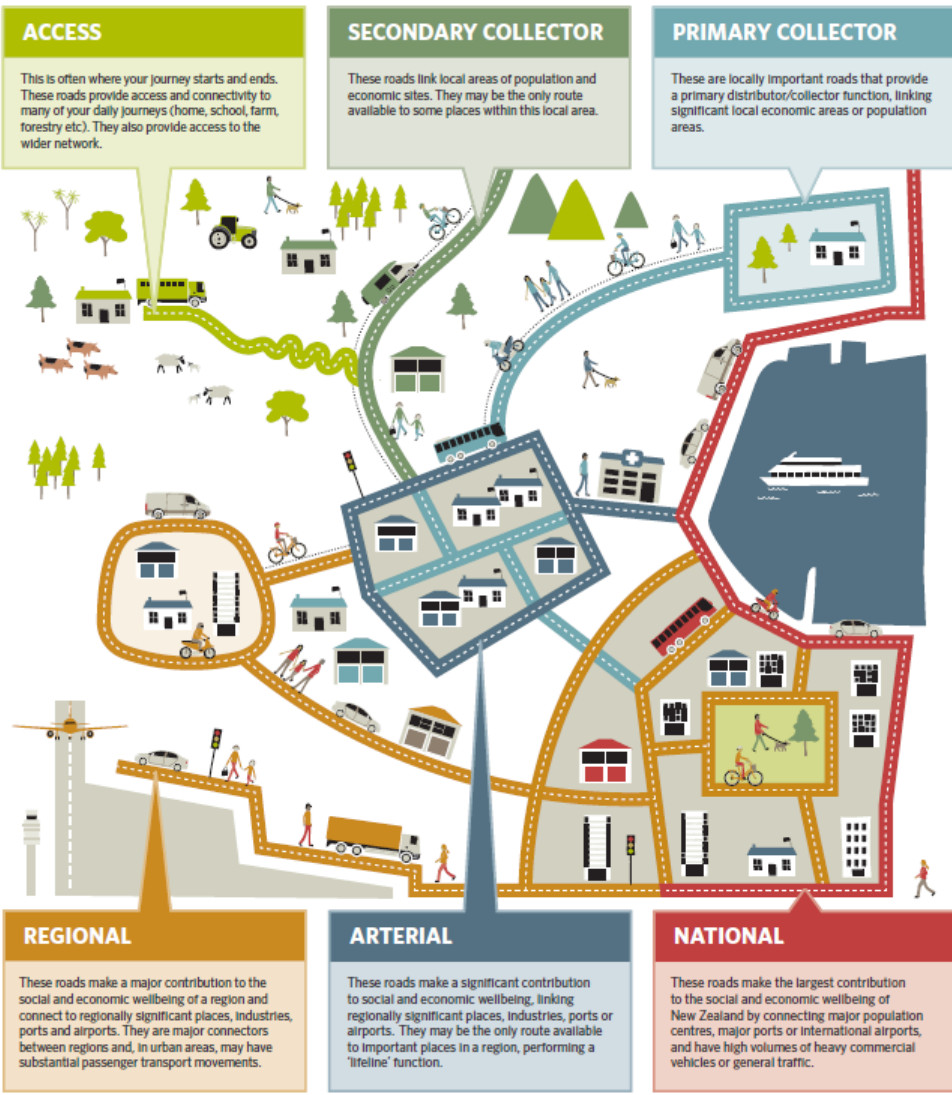


# Example Classification System

Functional Classification	Sub-Function	Functional Description of Road/ Trip	Typical Trip Characteristics
<b>Primary (Rural)*</b>	Primary Route Regional	Connects Countries - Relatively high volumes of passengers and freight between regions	500 to 1000 km or +more, <u>large</u> freight content
	Primary Route National	Connects Provinces/Regions - Relatively high volumes of passengers and freight between the capital and provincial and district centres,	Less than 500 km, <u>large</u> freight content
<b>Secondary Arterials Split for Rural &amp; Urban</b>		Connect Districts - Infrastructure primarily connects district centres, towns, villages and tourist or agricultural areas.	Less than 300 km, low to medium volumes
<b>Feeder (Collector) Split for Urban &amp; Rural)</b>		Connects Chiefdoms- Feeder routes with relatively low volumes of passengers and freight over short distances between villages and higher mobility paths,	Less than 50 km, medium to low volumes
<b>Access Roads Split for Urban &amp; Rural)</b>		Connects Neighbours - Provides access from individual farms and properties to villages and Feeder routes.	Less than 30 km, low volumes and other active transport modes (e.g. pedestrians and bicycles)

\***Note:** Two classes of the primary route are only needed in a situation that warrant such a distinction

# Example Performance Reporting



Customer Outcome
Customer Outcome Measure
Description
Reference No.



What is the means of reporting?
Quantitative or Qualitative?
Status of Measure?

Road Classification
National (High Volume)
National
Regional
Arterial
Primary collector
Secondary collector
Access
Access (Low Volume)

<b>Amenity</b>	
The smoothness of my journey is as I would expect when I take into account the importance of the road.	
Smooth Travel Exposure (STE) Index for sealed roads. (DIA Non-Fin Perf Meas)	Average Roughness - The average ride comfort level of the sealed road network meets specified levels (Local Gov Maintenance Guidelines)
Amenity - OM1	Amenity - OM2

Reporting automatically from Asset Register (RAMM)	Reporting automatically from Asset Register (RAMM)
Quantitative	Quantitative
Current	Current

NB: For Roughness, RCAs are required to report	
% by classification	Report No. Provisional service level is: Urban <= 90 NAASRA Rural <= 90 NAASRA
% by classification	Report No. Provisional service level is: Urban <= 90 NAASRA Rural <= 90 NAASRA
% by classification	Report No. Provisional service level is: Urban <= 90 NAASRA Rural <= 90 NAASRA
% by classification	Report No. Provisional service level is: Urban <= 100 NAASRA Rural <= 100 NAASRA
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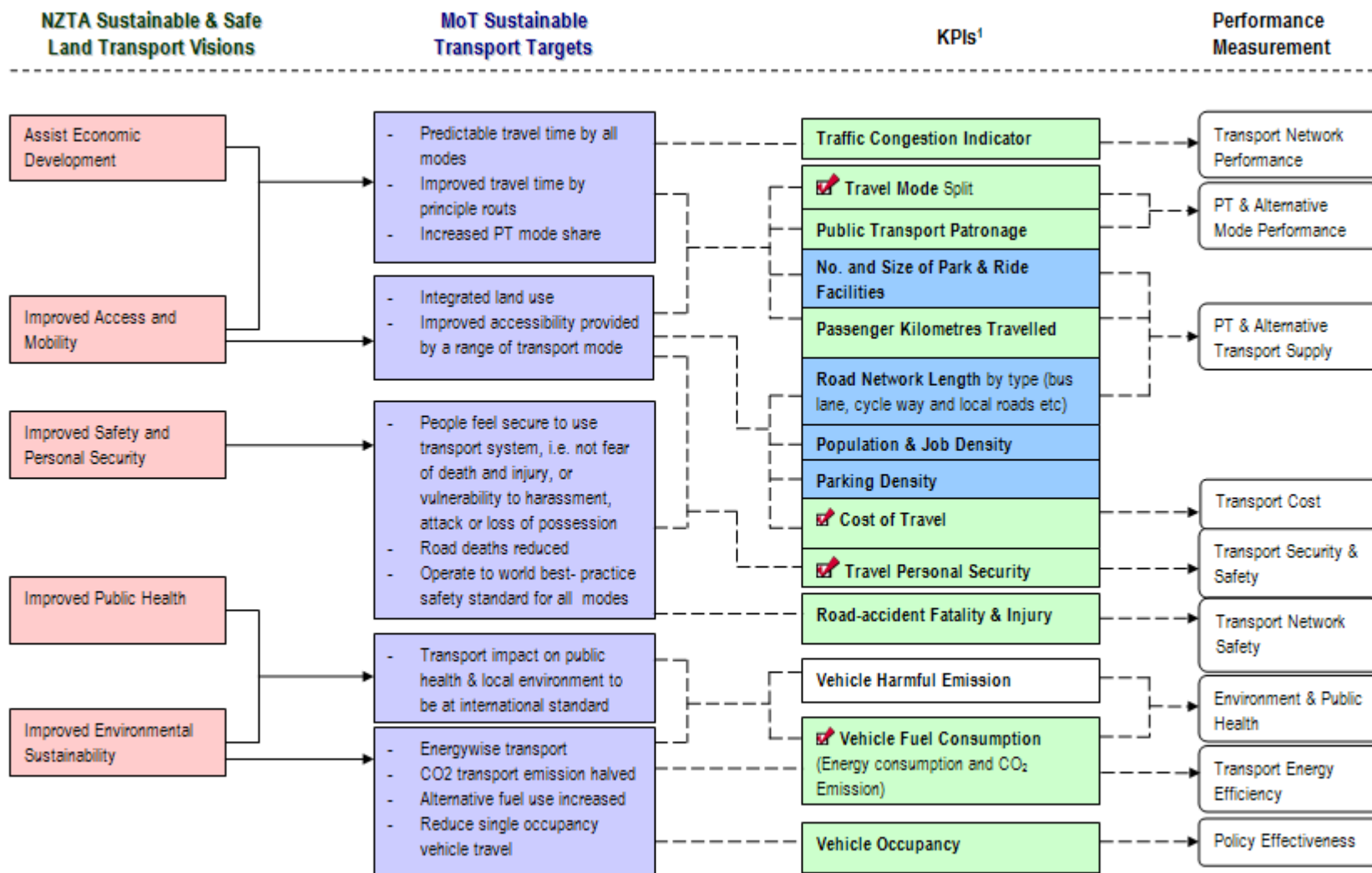
# Level of Service Framework



# Key Drivers – Level of Service, Demand, Risk

- Levels of Service
  - Key service levels changing
  - Addressing service level gaps
- Future Demand
  - High population growth expected through to 2050
  - Continuing urbanization expected – shifts in population patterns
  - Growth changes resulting from natural hazard and climate risk adaptation
- Risk
  - Natural Hazard Risk
  - Calamity Risk
  - Climate change and climate adaptation risk
  - Service failure risk

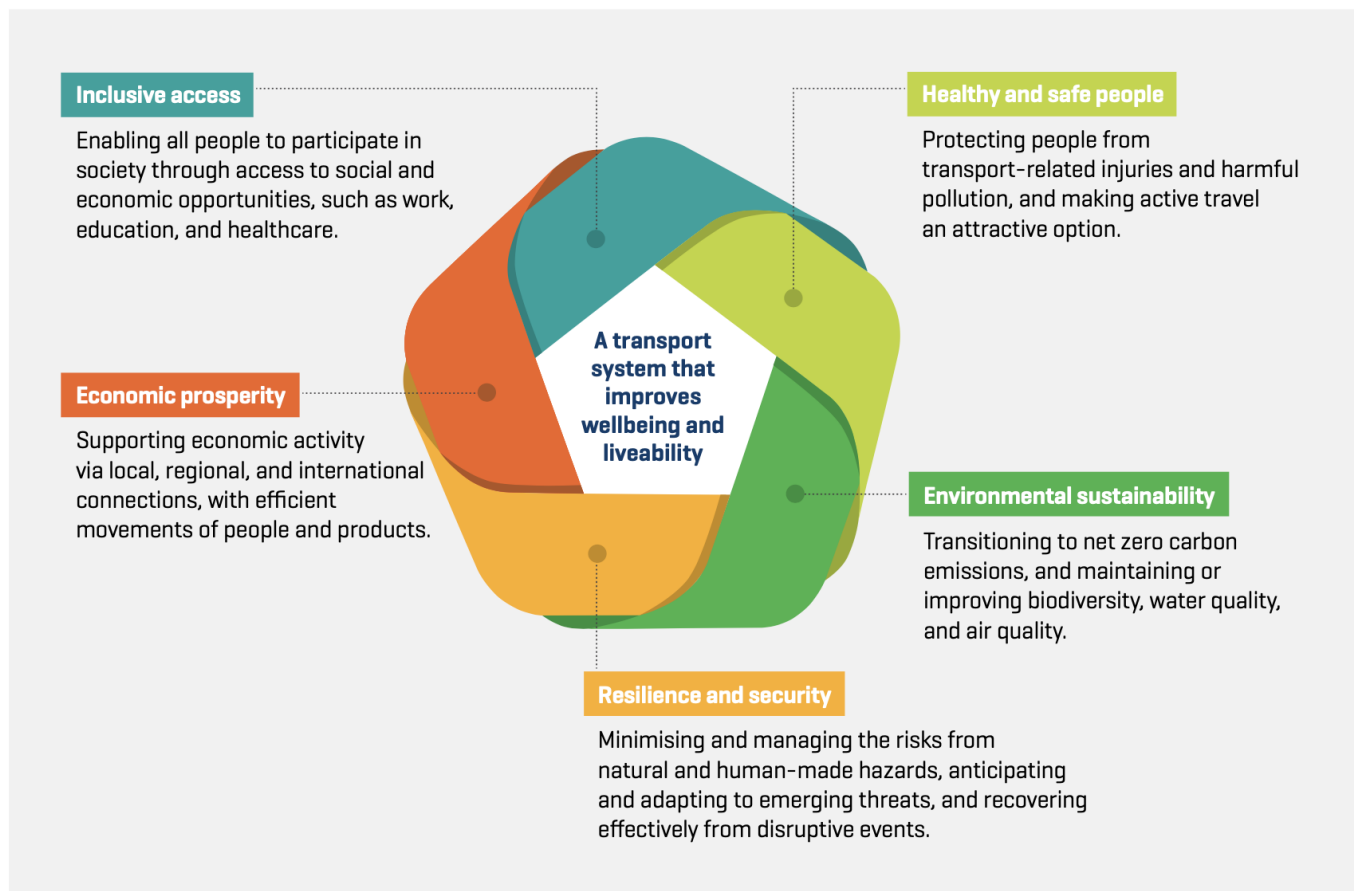
# Linking to Objective or Strategic Goals



Note <sup>1</sup> ✓ means KPI adopted for pilot study; □ denotes Must Have KPI; □ denotes contextual indicator.

# Levels of Service Examples NZ Transport Outcomes

## Transport Outcomes Framework



# Example Performance Framework for Roads



**ROAD SAFETY**

**Crash Statistics**  
**Road Safety Measures**



**TOTAL COST OF OWNERSHIP**

**Cost Efficiency**  
**Asset Preservation**  
**Road Condition**



**ROAD USER PRIORITY**

**Freight Access**  
**Travel Time Reliability**  
**Resilience to Unplanned Events**  
**Road Condition**



Category	Measure	Description
Safety Customer Outcome	Number of fatal and serious injuries	The total number of fatal and serious injuries /year (Total or normalised)
	Collective risk (fatal and serious injury) rate/km	Intensity measure – that highlights dangerous routes or parts of the network
	Personal risk (fatal and serious injury rate by traffic volume)	The total number of fatal and serious injuries by traffic volume/year
Safety Technical Output	Road Safety Rating	Reporting on the location and routes with high safety risk
	Black Spots	Reporting on the location and routes with high crash occurrence.

# Total Cost of Ownership



Category	Measure	Description
Asset Preservation	75 <sup>th</sup> Percentile Rutting	75 <sup>th</sup> rutting value (measured by High-speed data collection)
	Pavement Condition Index (PCI)	Overall (composite) index showing the health of the road pavements
	Bridge Condition Rating (BCR)	Bridge Condition Rating
Cost Efficiency	Pavement rehabilitation	Total quantity pavement rehabilitation Total cost of pavement rehabilitation
	Asphalt resurfacing	Total quantity of asphaltic sealed road resurfacing Total cost of asphaltic sealed road resurfacing
	Bridge Repairs	Total quantity of Bridge Repairs Total cost of Bridge Repairs
	Overall network cost, and cost by work category	The overall cost per km and per vkt of routine maintenance activities Cost by work category on each road
	Asset Valuation	Asset value and trend over time as per Treasury's methodology

# Road User Priority

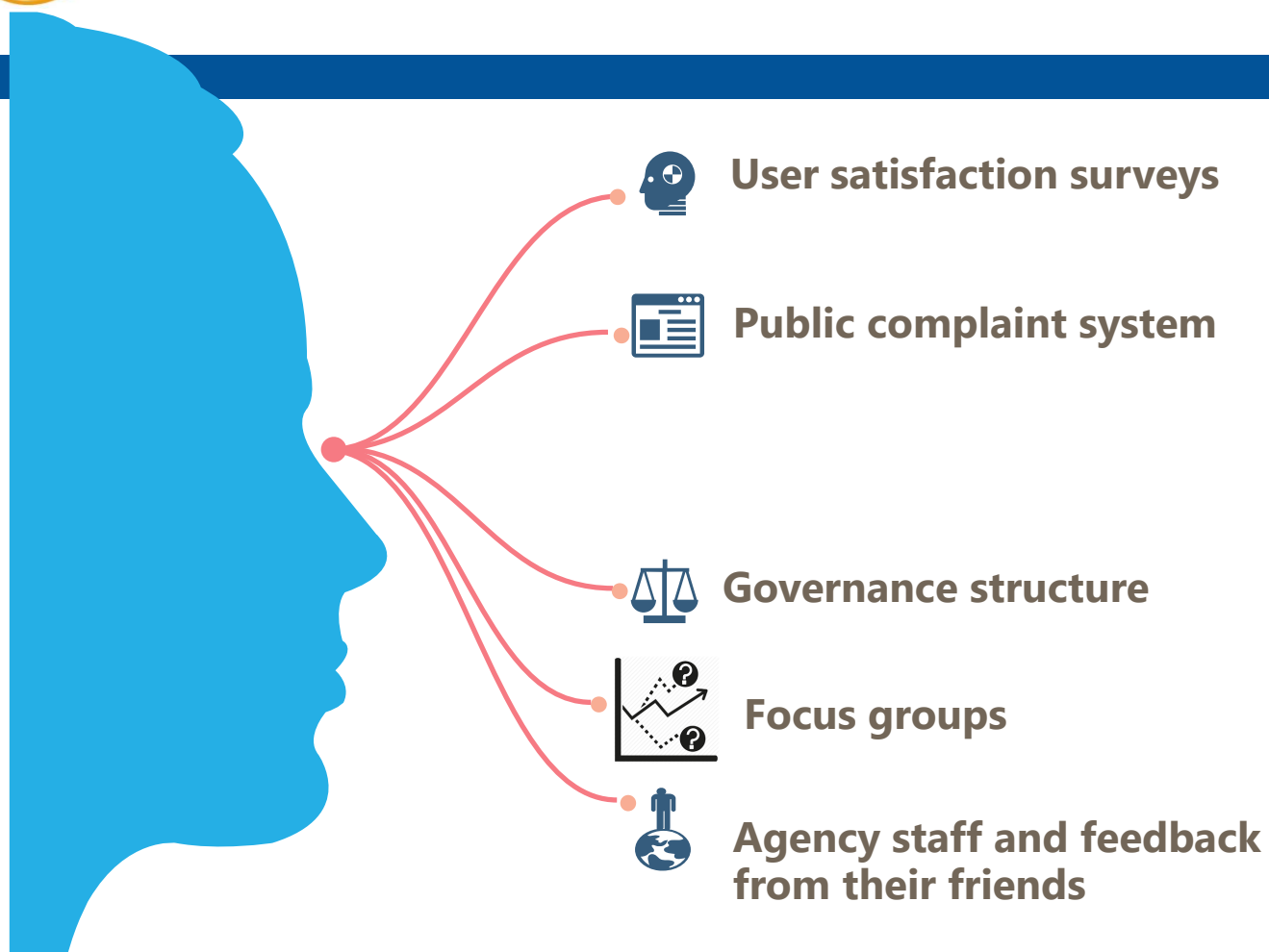


Category	Measure	Description
Road Condition	Peak roughness	The 85th percentile roughness of roads
	Median Roughness	The 50 <sup>th</sup> percentile roughness of roads
Freight Access	The proportion of network not available to trucks (bridge loading constraints)	The proportion of each road classification that is not accessible to high trucks loads
Travel Time Reliability Customer Outcome	Output at indicator information sites	The hourly traffic volume during the peak morning hour and peak afternoon/evening hour
Resilience Customer Outcome	Number of journeys impacted by unplanned events	The number of unplanned road closures and the number of vehicles affected by closures

# Understanding your customer



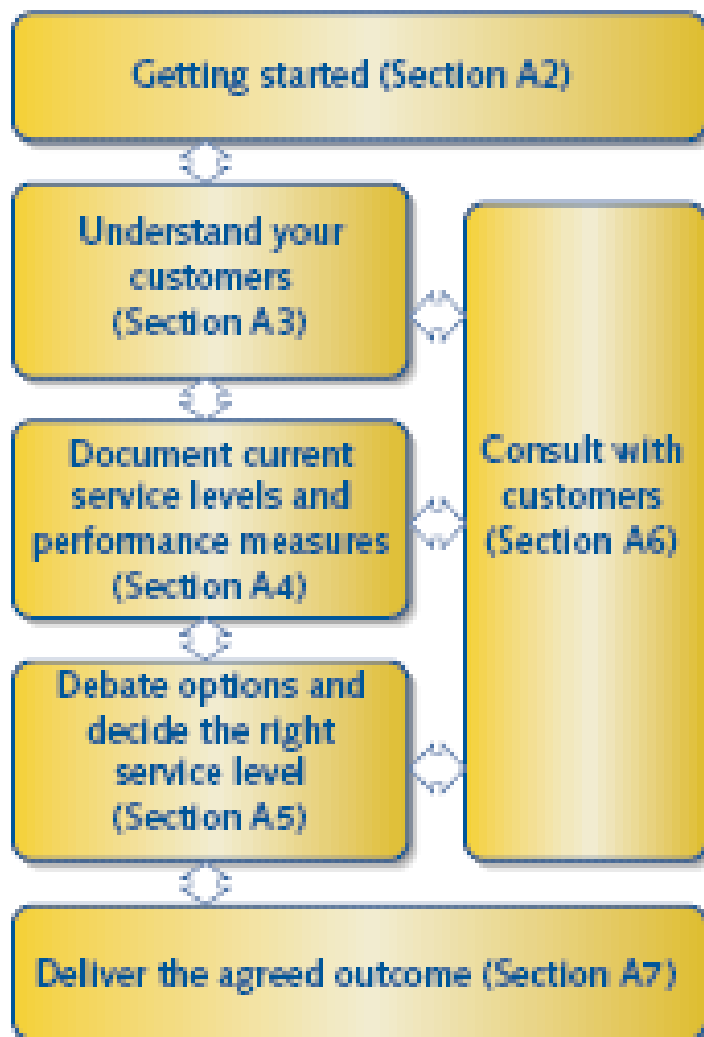
# What does the customer want?



- Workshops
- Public meetings
- Stakeholder meetings
- Focus groups

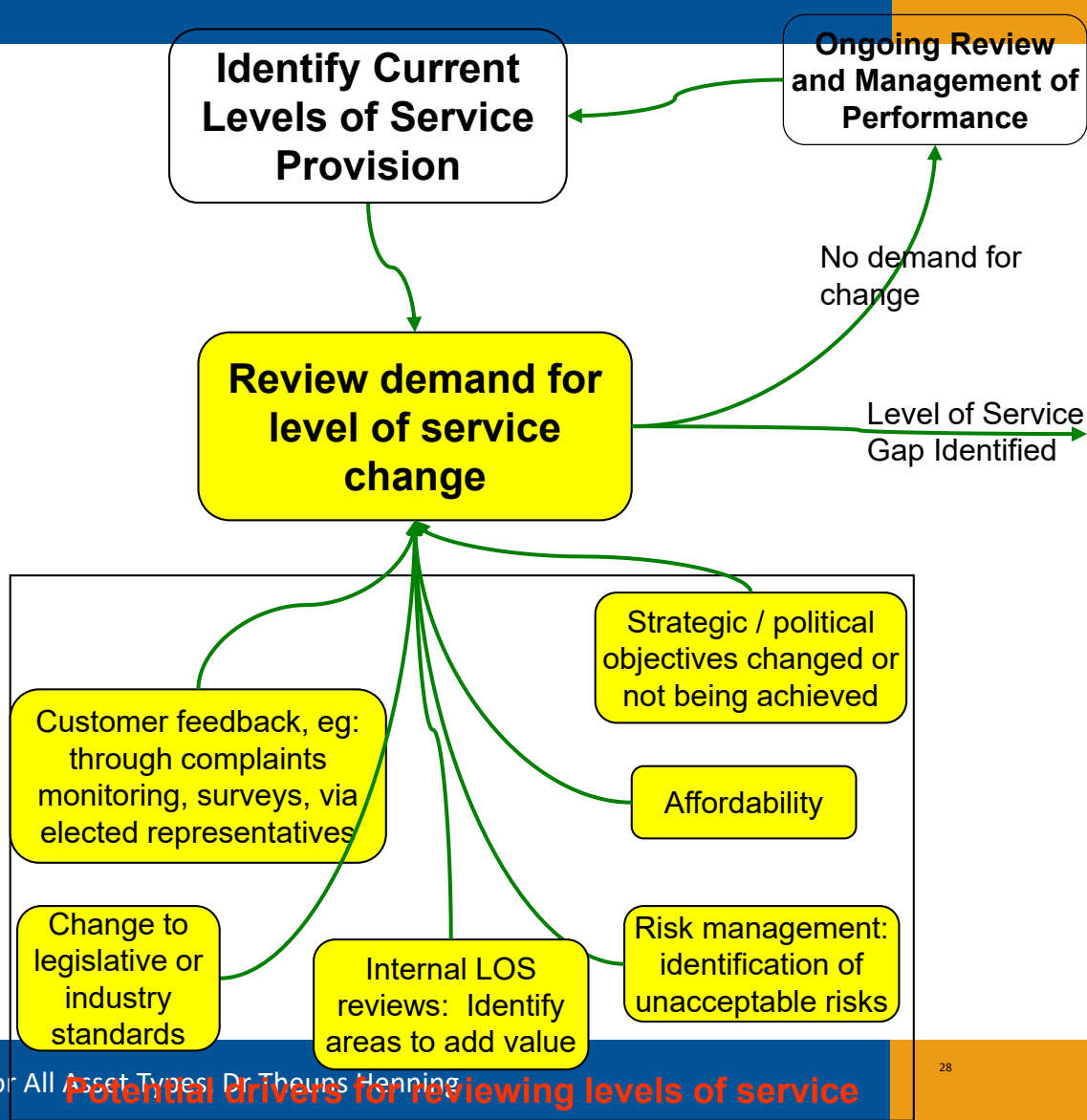


# The LOS review starts, continues and ends with the customer



# Selecting levels of service for review

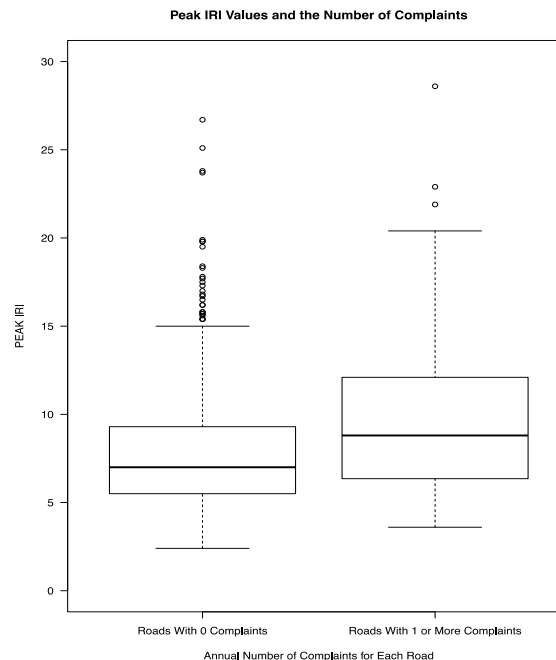
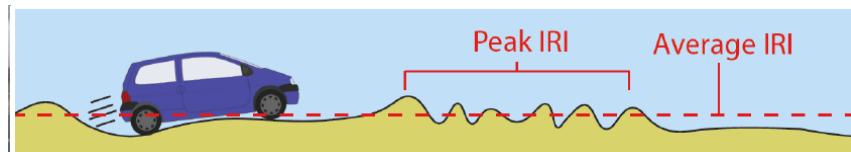
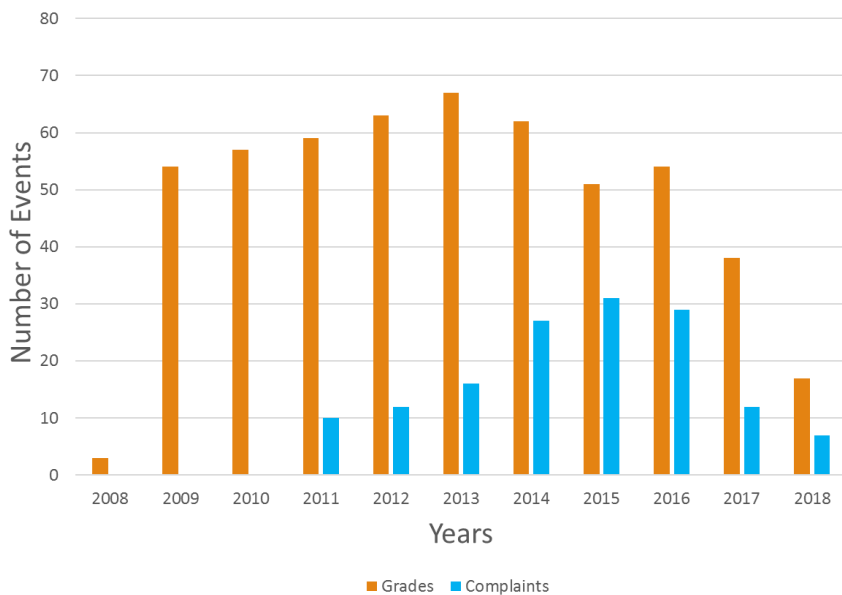
- Do the existing levels of service and performance measured align with outcomes?
- Is it likely that the community desire changes to the level of service provision?
- Is there political will or pressure to change the level of service provision?
- Is it an area of high public interest?



# When do the drivers complain?

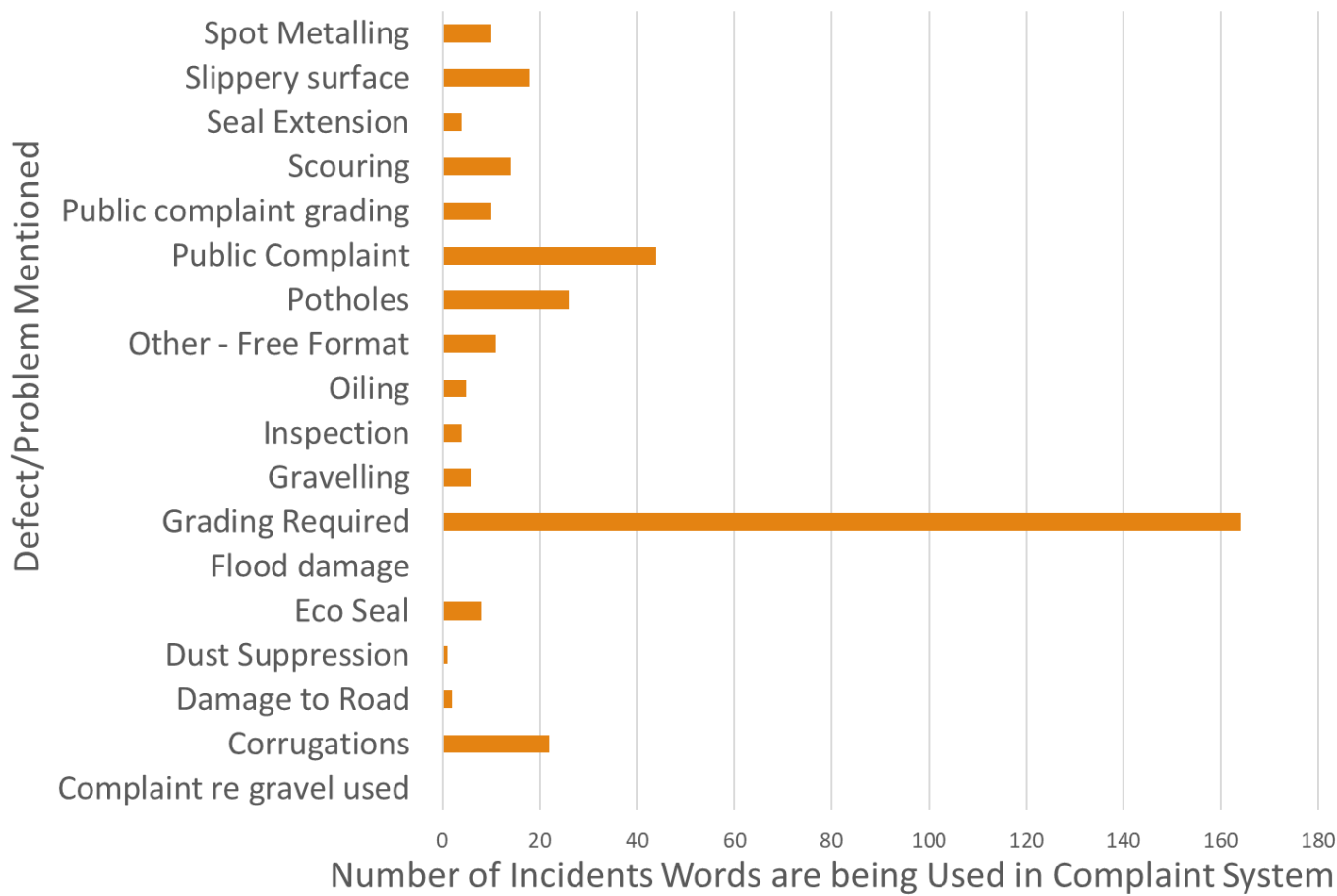
- Customers tell us when things changes
- They often complain about outliers

**Total Grading Events vs Total Public Complaints on focus roads**

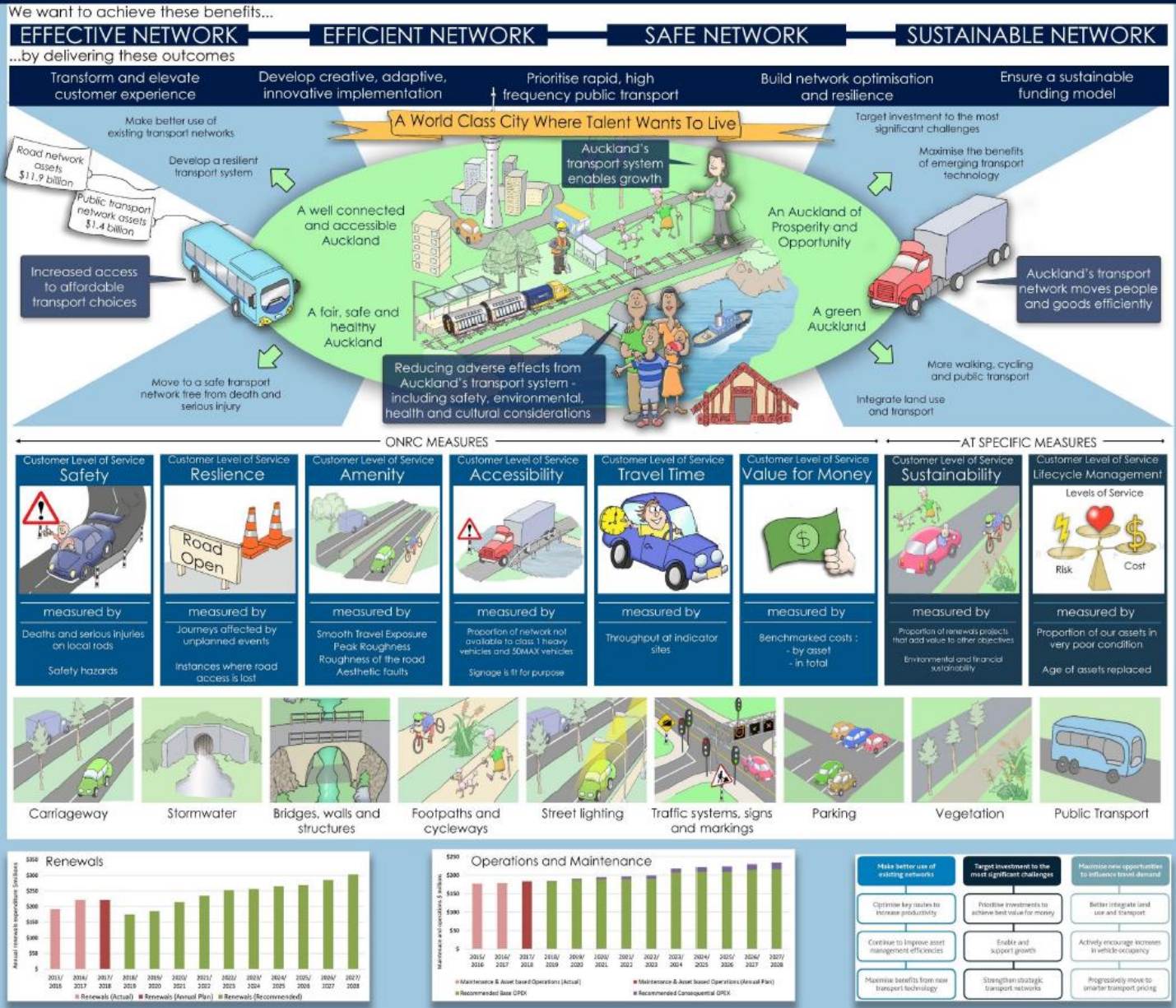


# Reporting on Complaints

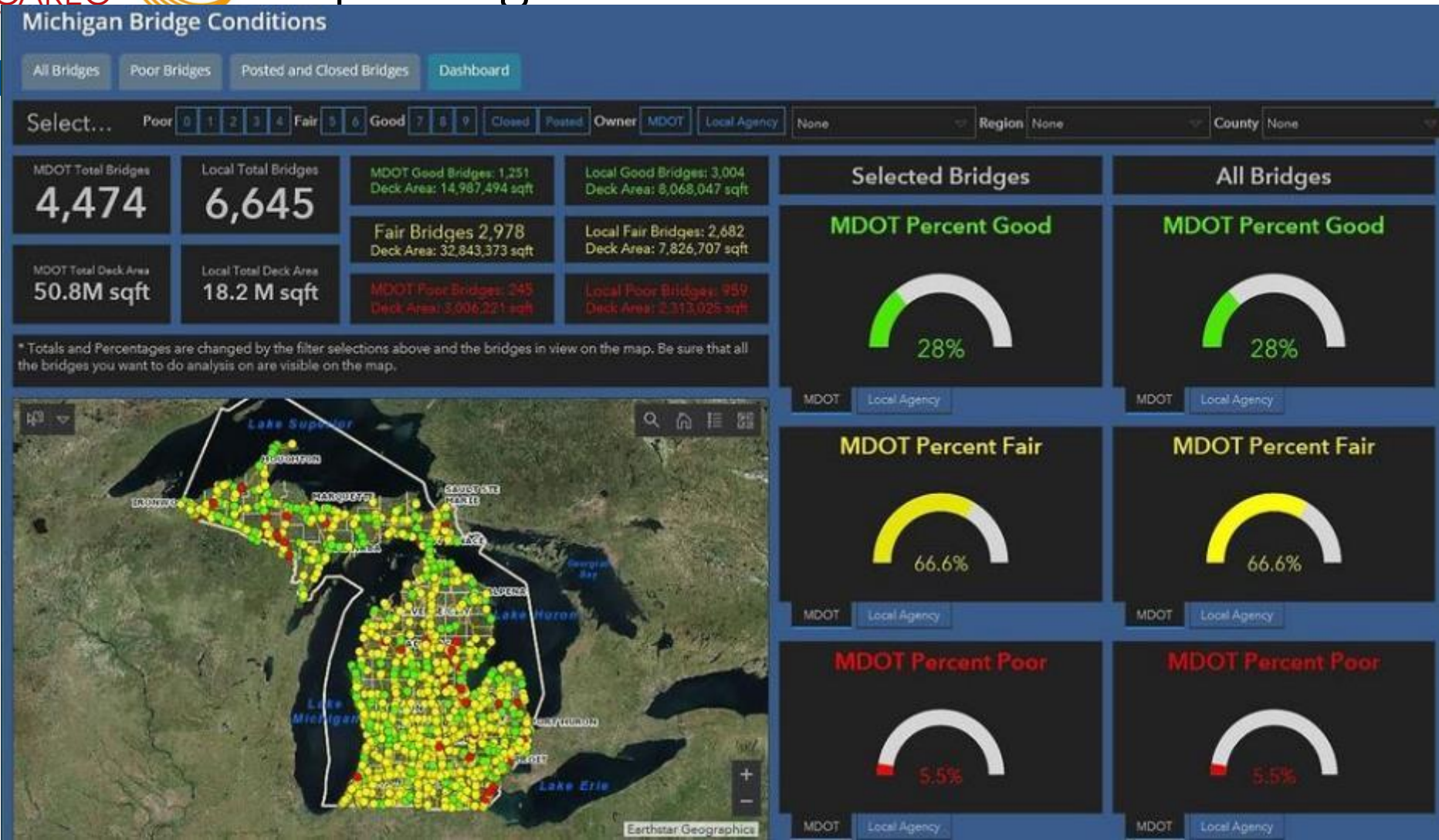
## Top complaints on unsealed road network



# Communicating Performance



# Reporting on Performance





# Questions



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