Road Asset Management (RAM)

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Session: Developing Service Levels for All Asset Types

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Level of Service is Key to Asset Management

Design and Construction
- Functional requirements
- Capital budgeting
- Design requirements
- Environmental impact assessment

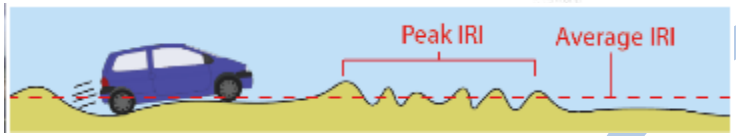
Operations & Safety
- Network management
- Traffic management systems (ITS)
- Worksite safety and traffic management
- Road safety monitoring
- Road safety management and law enforcement
- Overweight control

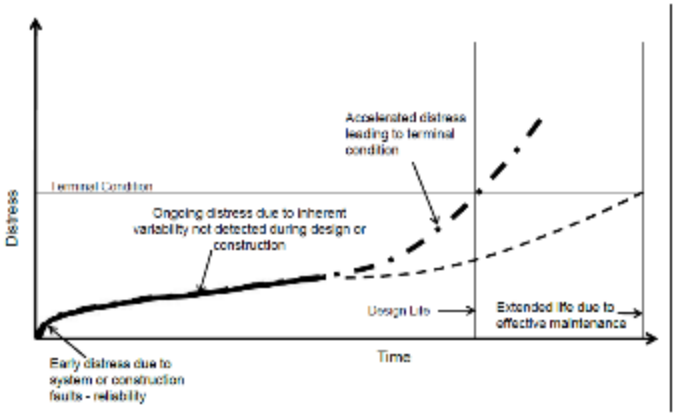
Maintenance & Monitoring
- Maintenance inspection
- Regular/ preventive maintenance planning
- Maintenance execution
- Contract and workflow management

Resilience, Renew & Expand
- Investment decision making
- Reconditioning & refurbishment
- Expanding and capacity improvements
- Route criticality / lifelines
- Exposure/network risk
- Asset resilience improvements
- Coastal protection

Transport Planning
- Demand and capacity management
- Network expansion
- Other modes of transport
- Utilities requirements

Level of Service Dimensions

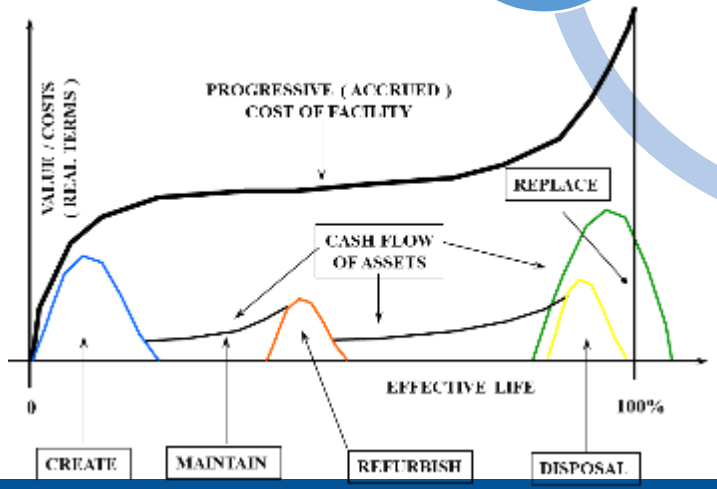




Source SANRAL, 2016

Level of Service

- Functional
- Safety
- Economic
- User Level of Service

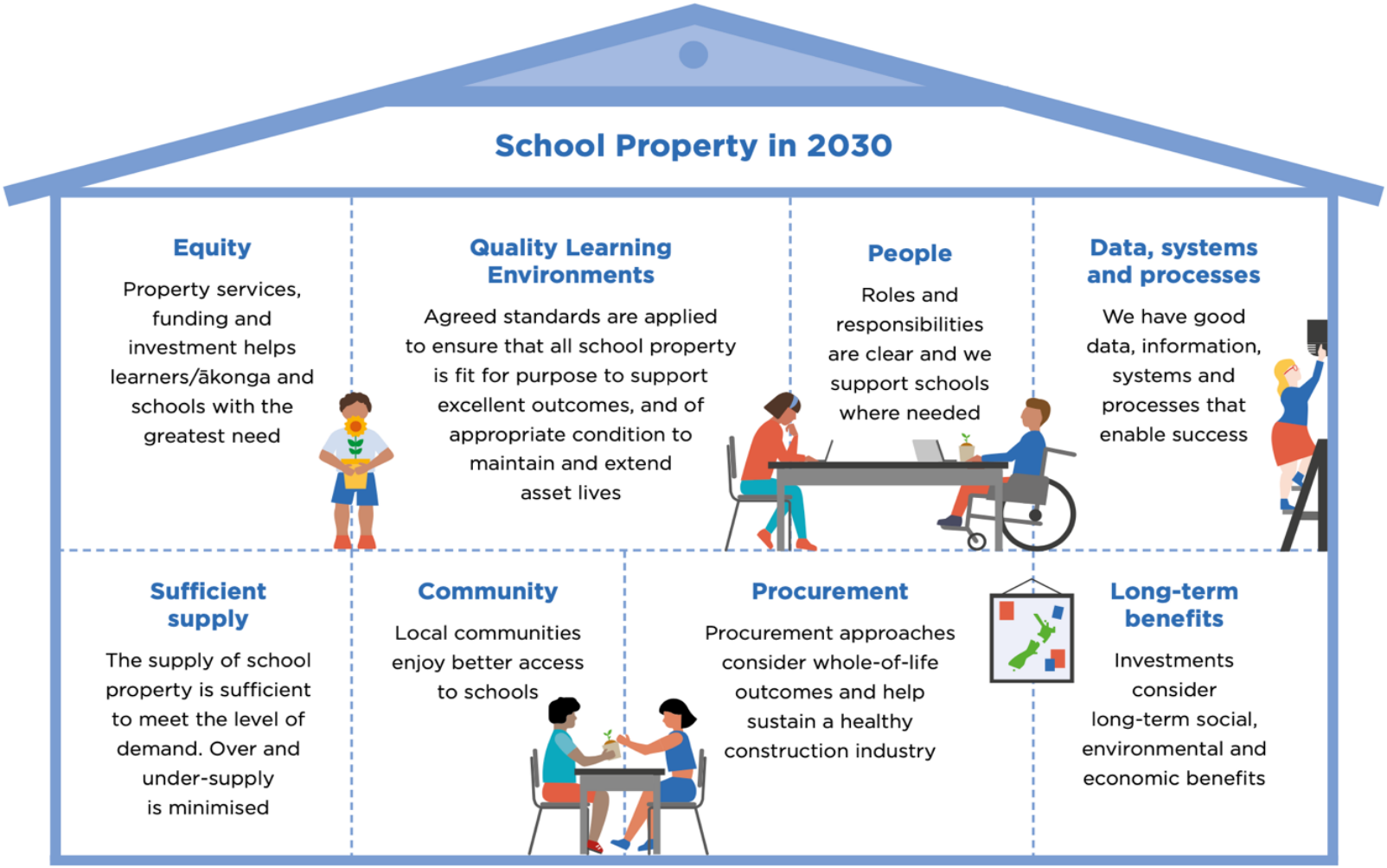


Level of Service "Knowing which roads to invest in when and when to do it”:

- 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

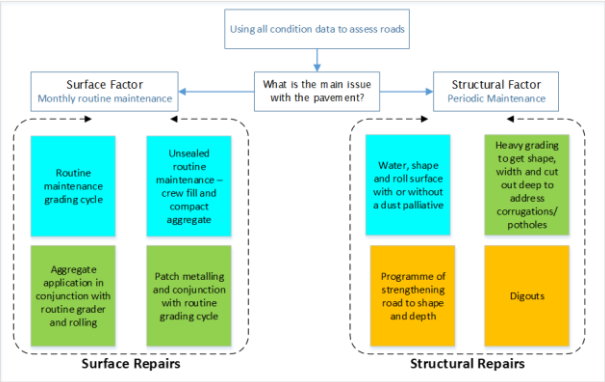
Levels of Service Examples NZ Education Property



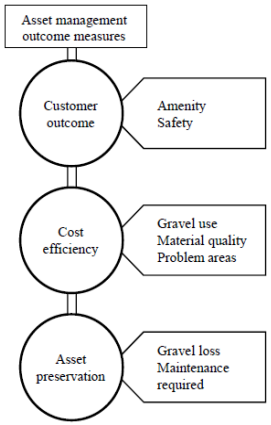
Data Collection Should be Focused on its Purpose

What do we use the data for?

Decision Process

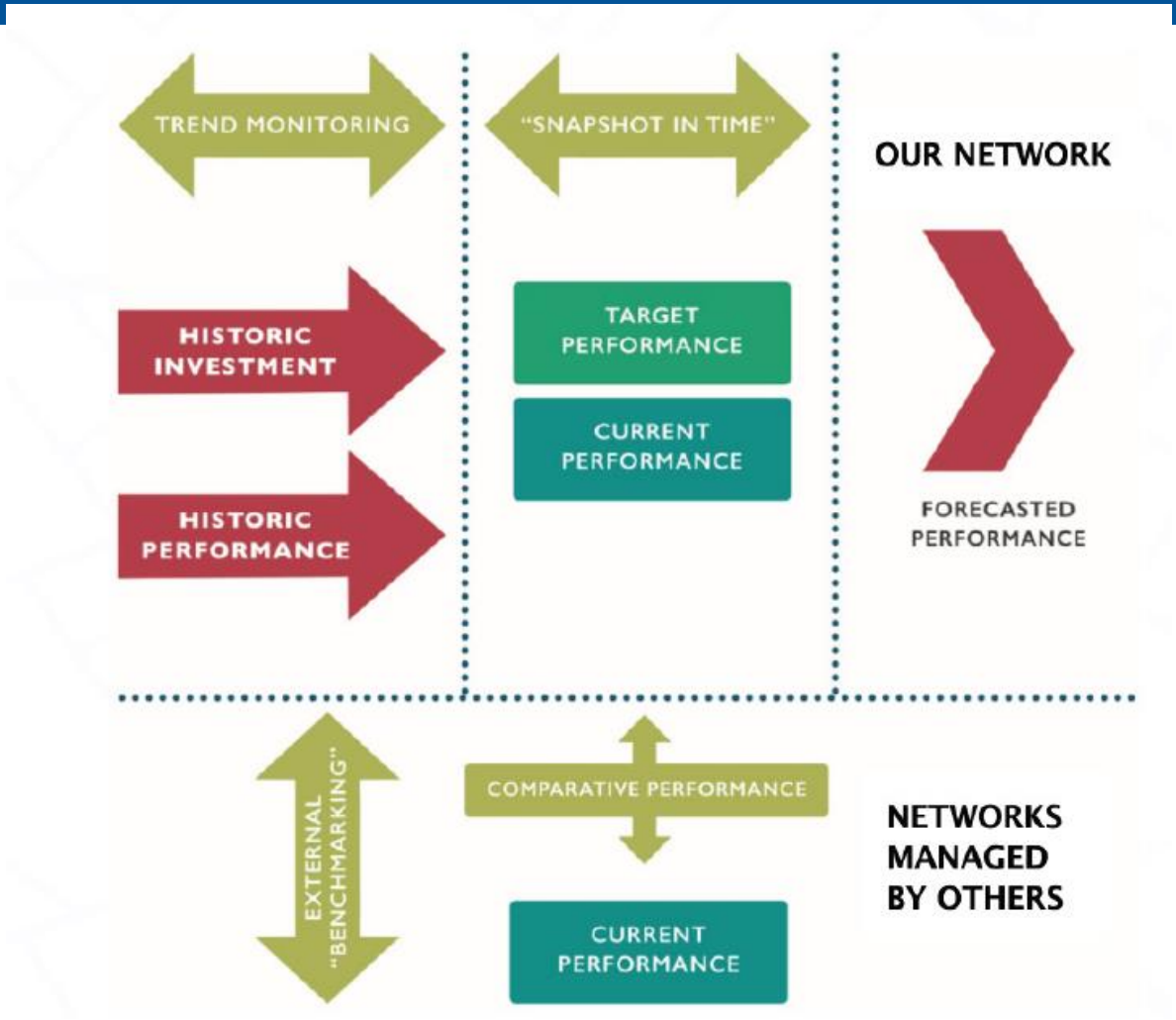


Performance Monitoring

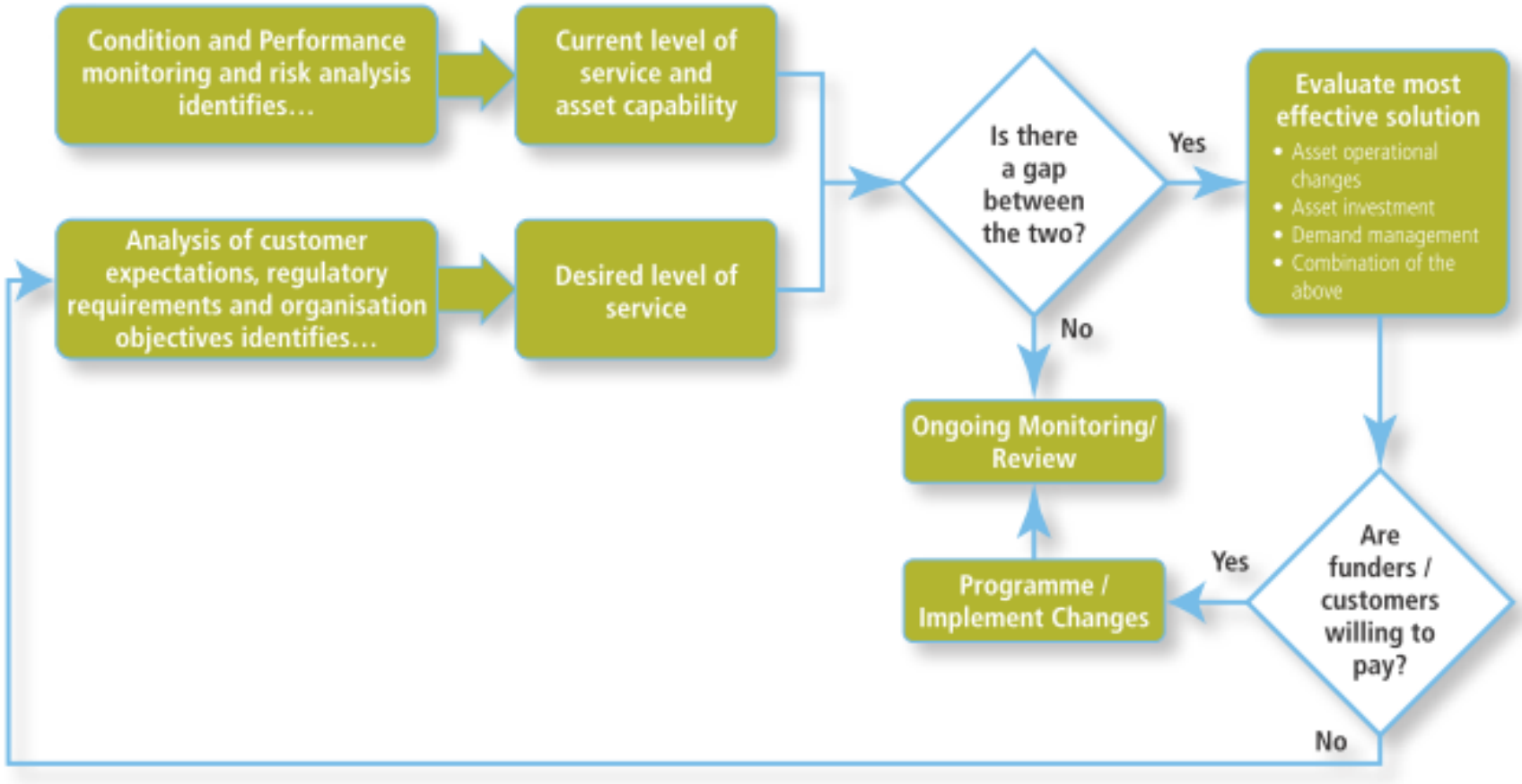


Data Framework

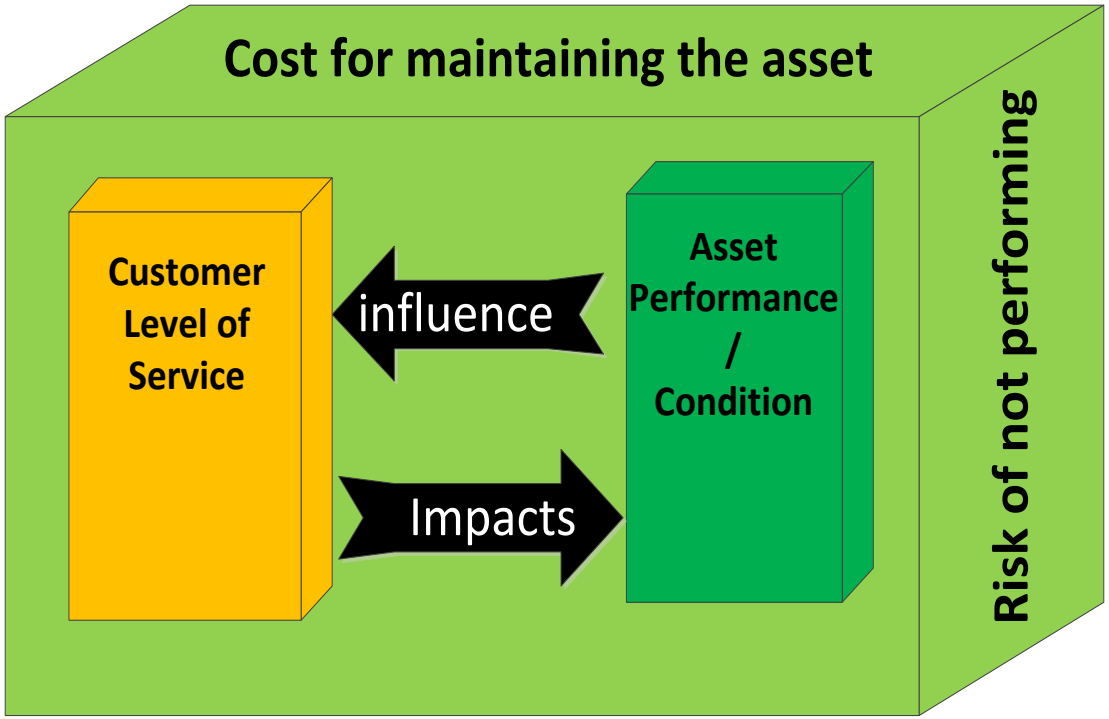
Time-series performance management framework?



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

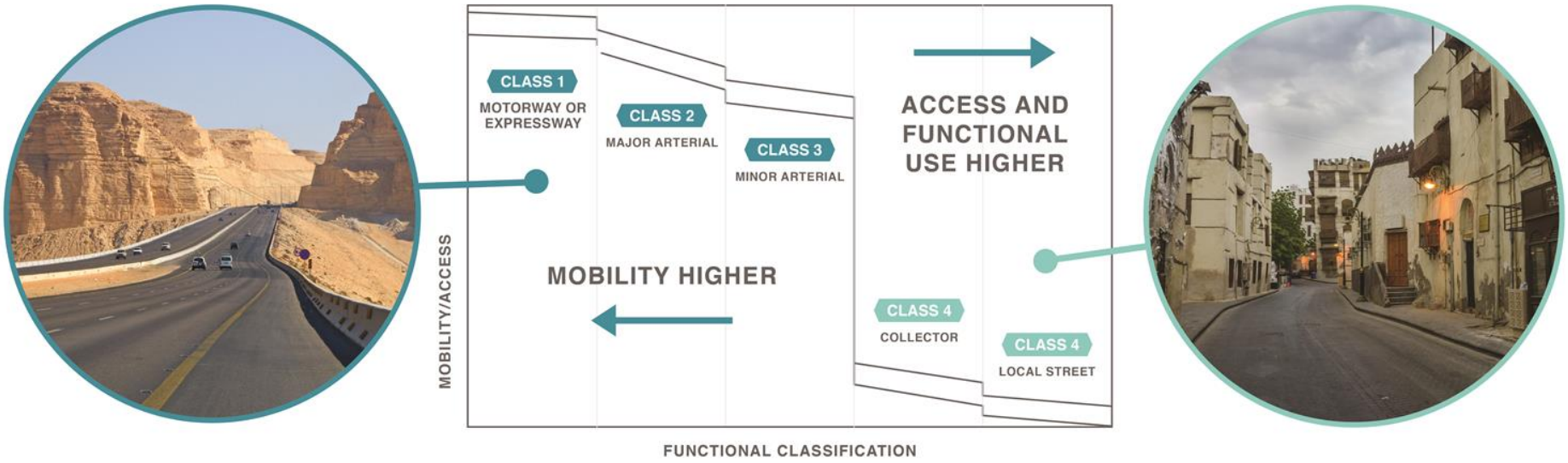
City Links - City to City
- Within Cities

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)

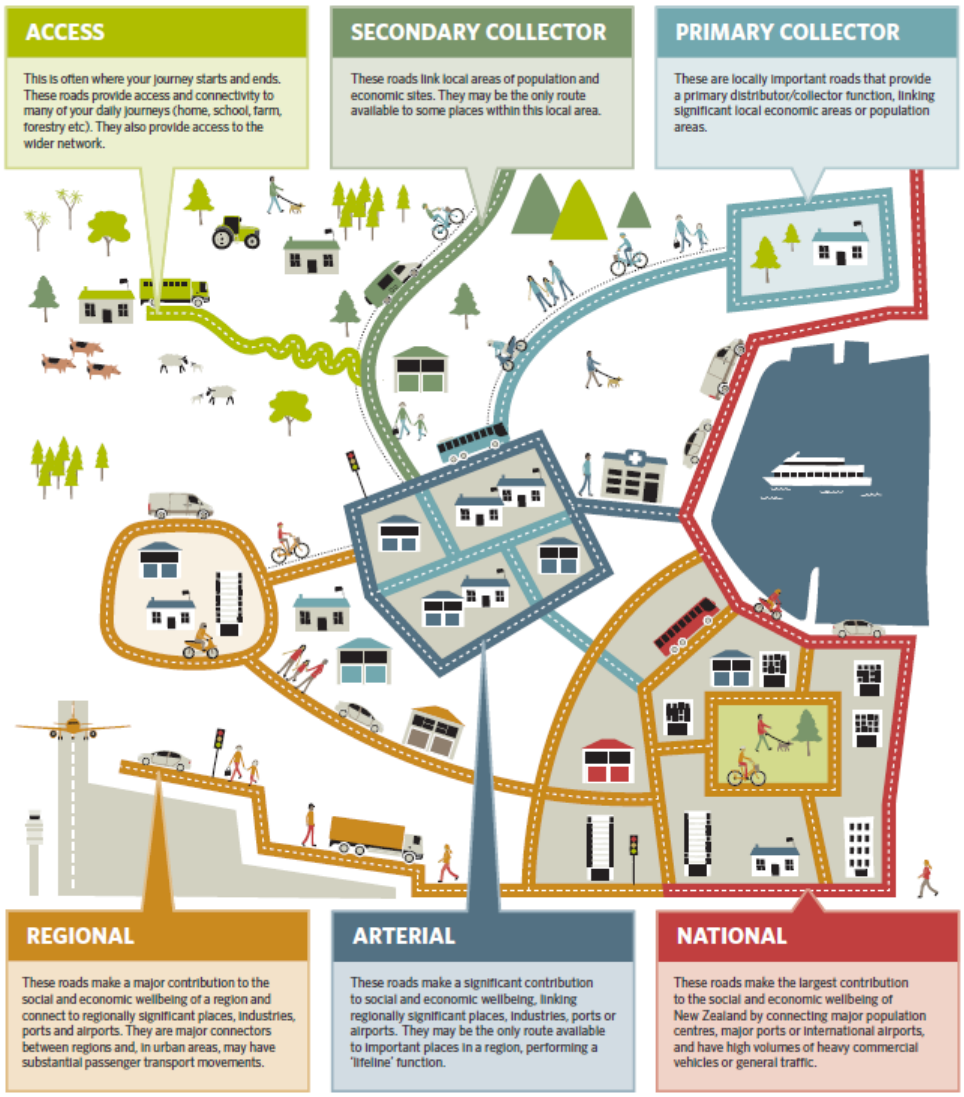


Example Classification System

Functional Classification	Sub-Function	Functional Description of Road/ Trip	Typical Trip Characteristics
Primary (Rural)*	Primary Route Regional	Connects Countries - Relatively high volumes of passengers and freight between regions	500 to 1000 km or +more, large 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, large freight content
Secondary Arterials Split for Rural & Urban		Connect Districts - Infrastructure primarily connects district centres, towns, villages and tourist or agricultural areas.	Less than 300 km, low to medium volumes
Feeder (Collector) Split for Urban & Rural)		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
Access Roads Split for Urban & Rural)		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	Amenity
Customer Outcome Measure	The smoothness of my journey is as I would expect when I take into account the importance of the road.
Description	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)
Reference No.	Amenity - OM1
	Amenity - OM2
What is the means of reporting?	Reporting automatically from Asset Register (RAMM)
	Reporting automatically from Asset Register (RAMM)
Quantitative or Qualitative?	Quantitative
	Quantitative
Status of Measure?	Current
	Current

HOW? How do we deliver the outcome?

Road Classification	NB: For Roughness, RCAs are required to rep
National (High Volume)	% by classification
National	% by classification
Regional	% by classification
Arterial	% by classification
Primary collector	% by classification
Secondary collector	% by classification
Access	% by classification
Access (Low Volume)	% by classification

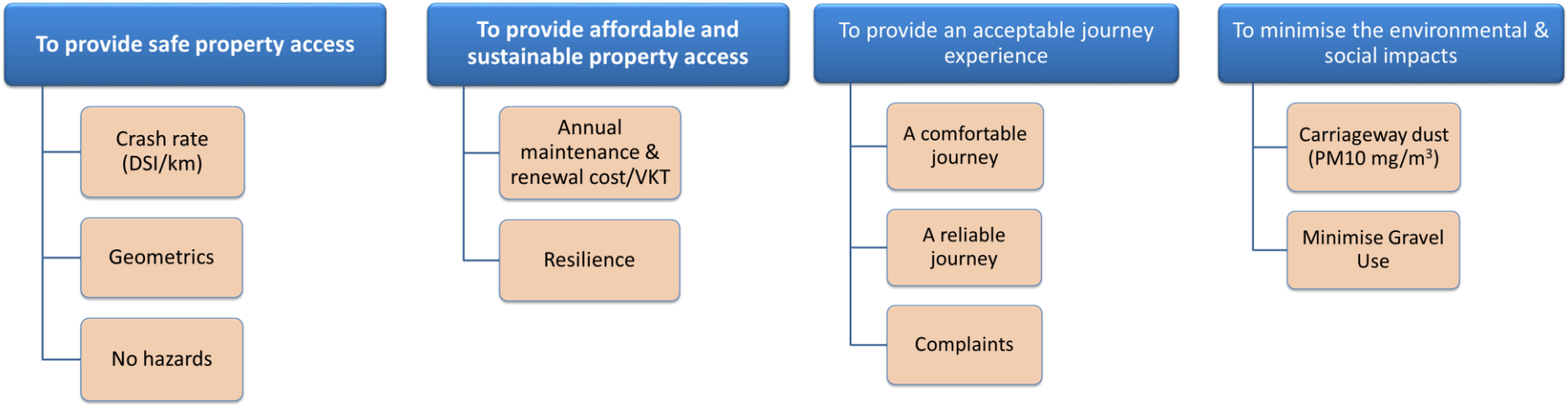
Report No. Provisional service level is:
Urban <= 90 NAASRA Rural < = 90 NAASRA
Urban <= 90 NAASRA Rural < = 90 NAASRA
Urban <= 90 NAASRA Rural < = 90 NAASRA
Urban <= 100 NAASRA Rural < = 100 NAASRA
Urban <= 110 NAASRA Rural < = 100 NAASRA
Urban <= 110 NAASRA Rural < = 110 NAASRA
Urban <= 120 NAASRA Rural < = 120 NAASRA
Urban <= 140 NAASRA Rural < = 140 NAASRA

Level of Service Framework

Key Drivers – Level of Service, Demand, Risk

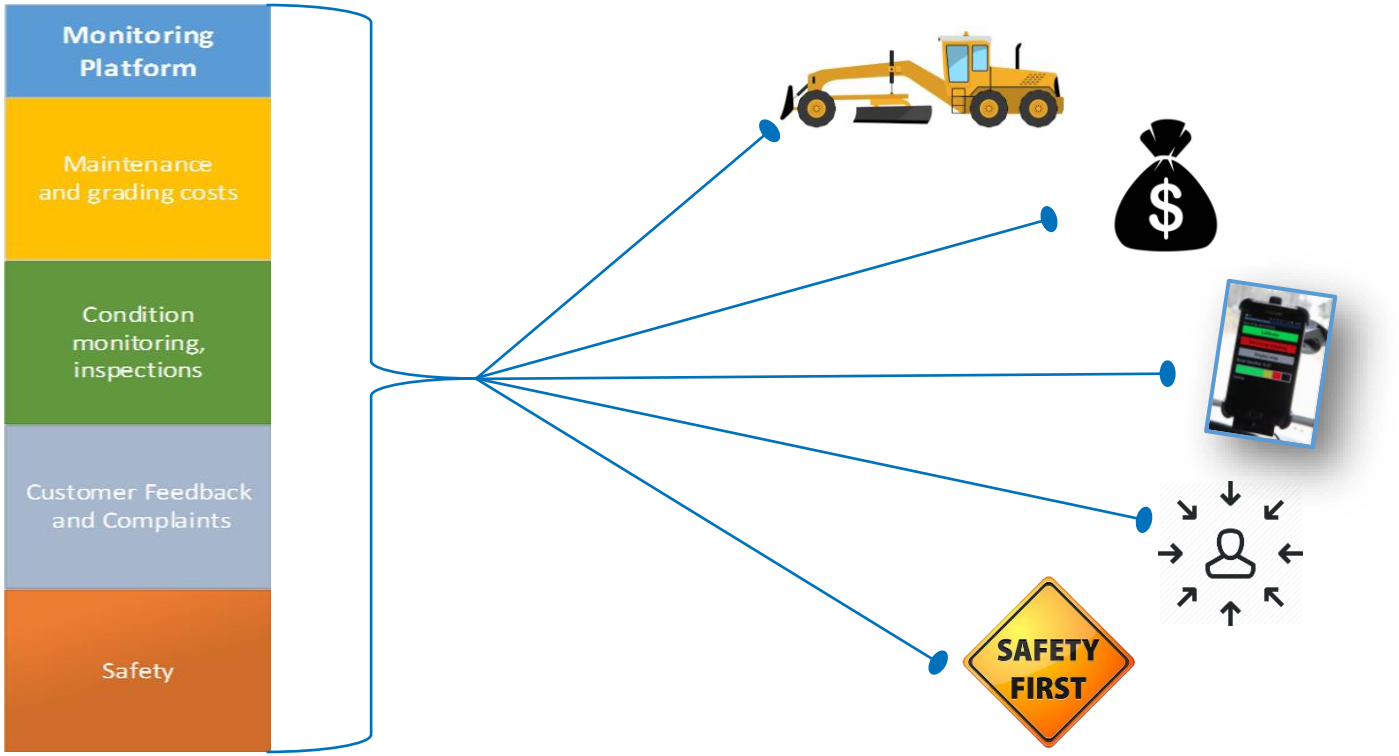
- Levels of Service
  - Key service levels changing
  - Addressing service level gaps
- Future Demand
  - High population growth expected through to 2050
  - Continuing urbanization expected – shifts in population patterns
  - Growth changes resulting from natural hazard and climate risk adaptation
-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

It all starts with Levels of Service, and performance monitoring



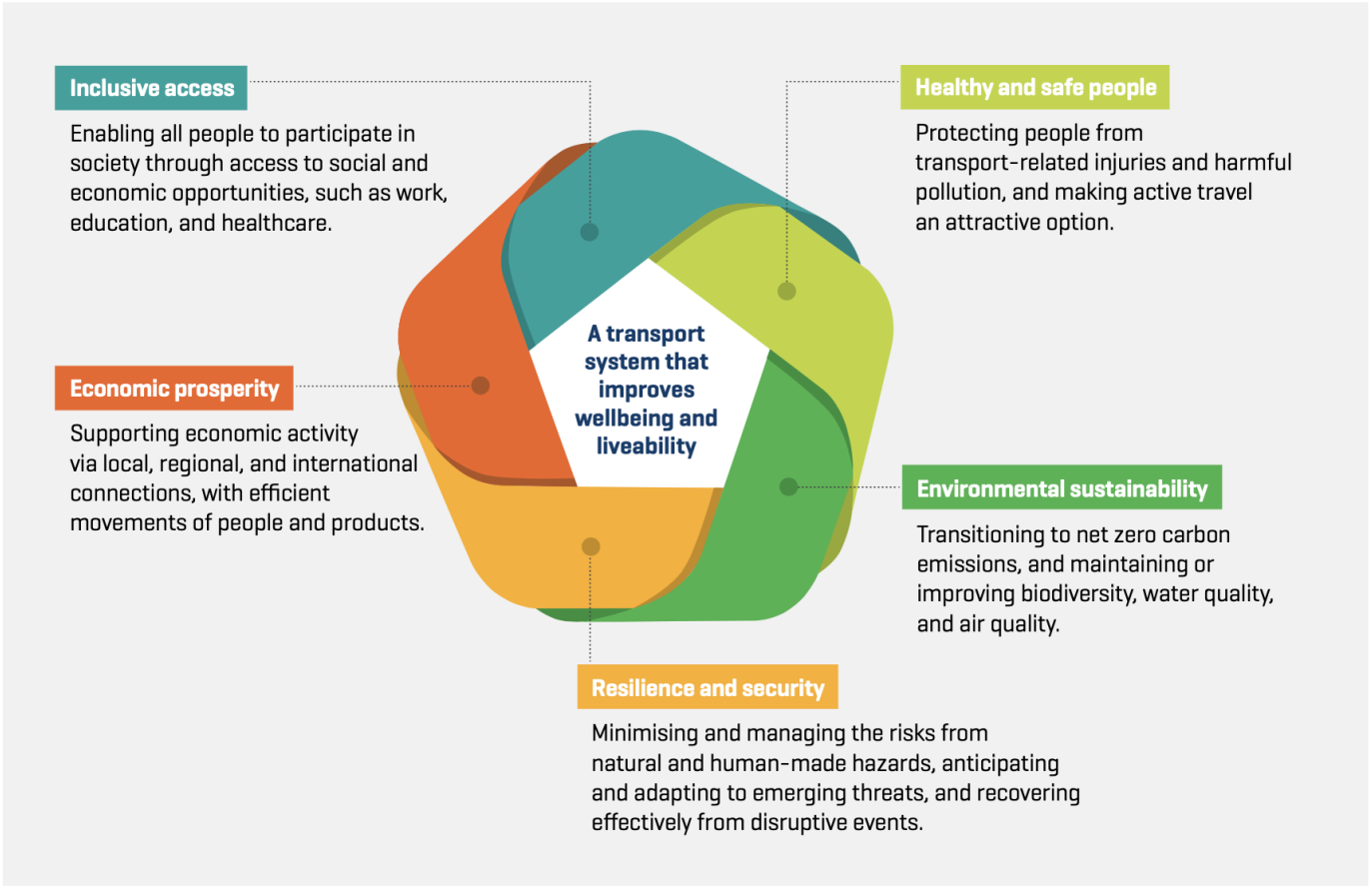
Source NZTA Research Report 652

Operational Performance Monitoring



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

Road Safety

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

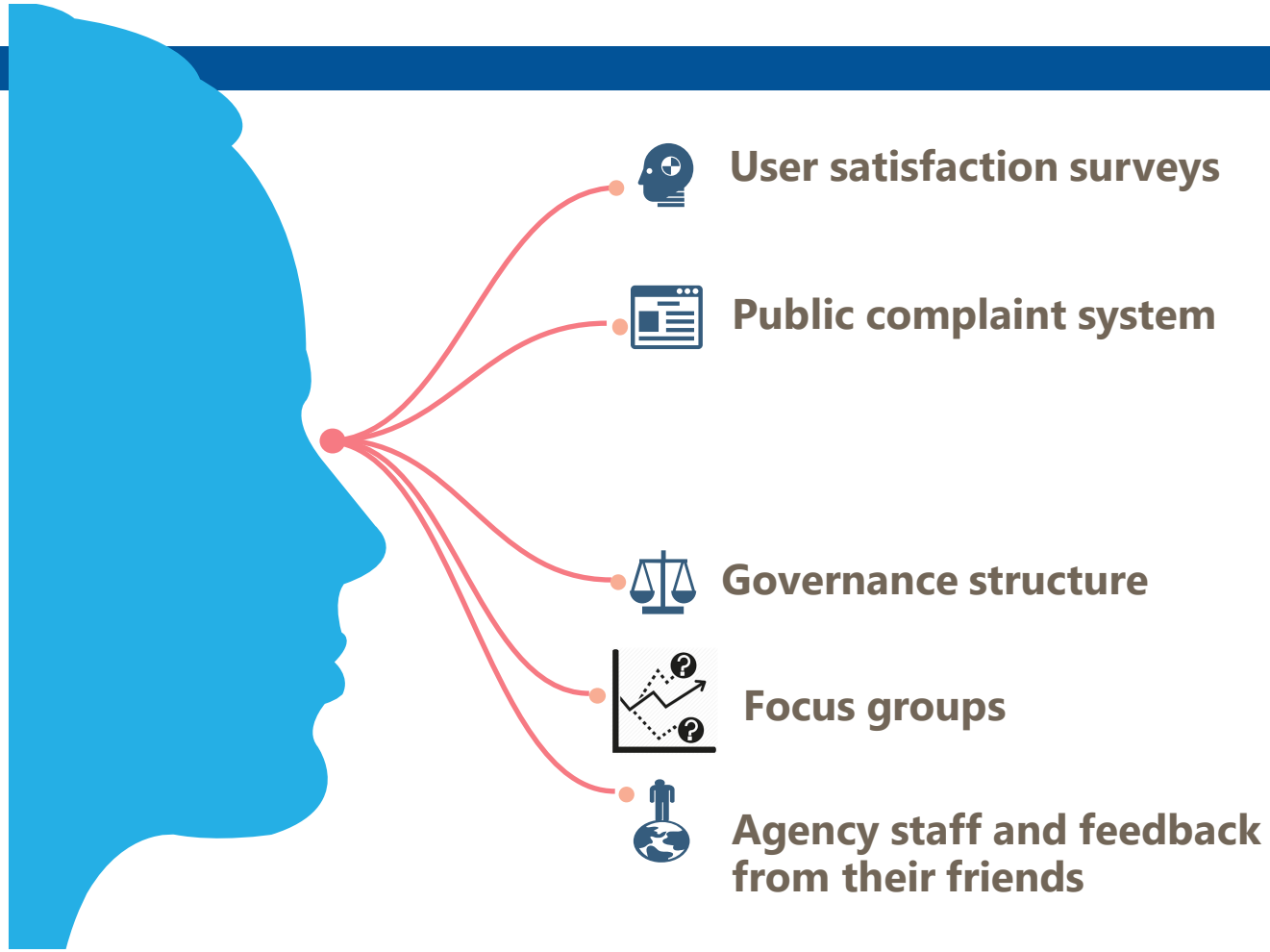
Category	Measure	Description
Asset Preservation	75th Percentile Rutting	75th rutting value (measured by High-speed data collection)
	Pavement Condition Index (PCI)	Overall (composite) index showing the health of the road pavements
	Bridge Condition Rating (BCR)	Bridge Condition Rating
Cost Efficiency	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 50th 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

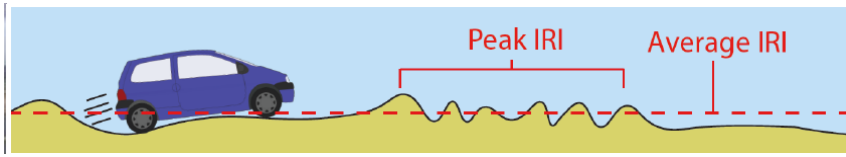
Understanding your customer

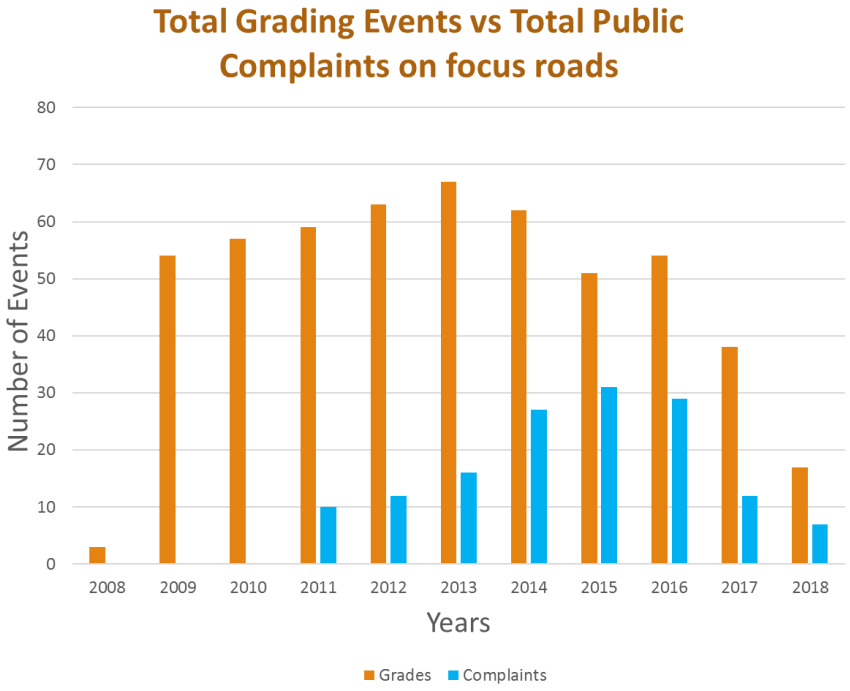
What does the customer want?

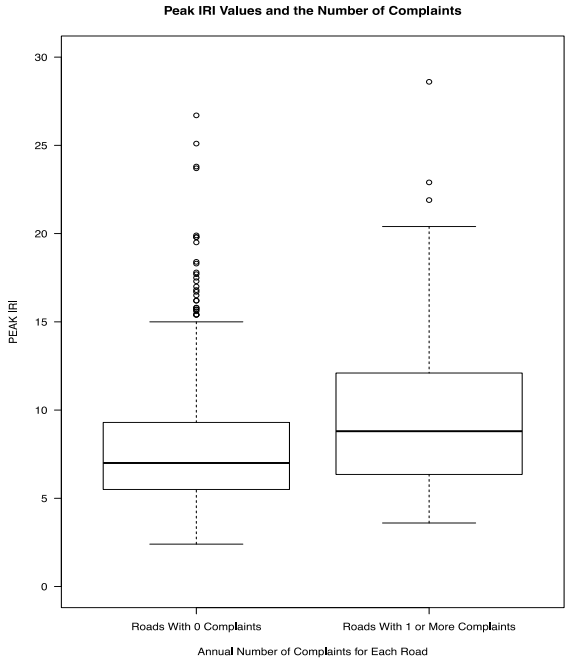


When do the drivers complain?

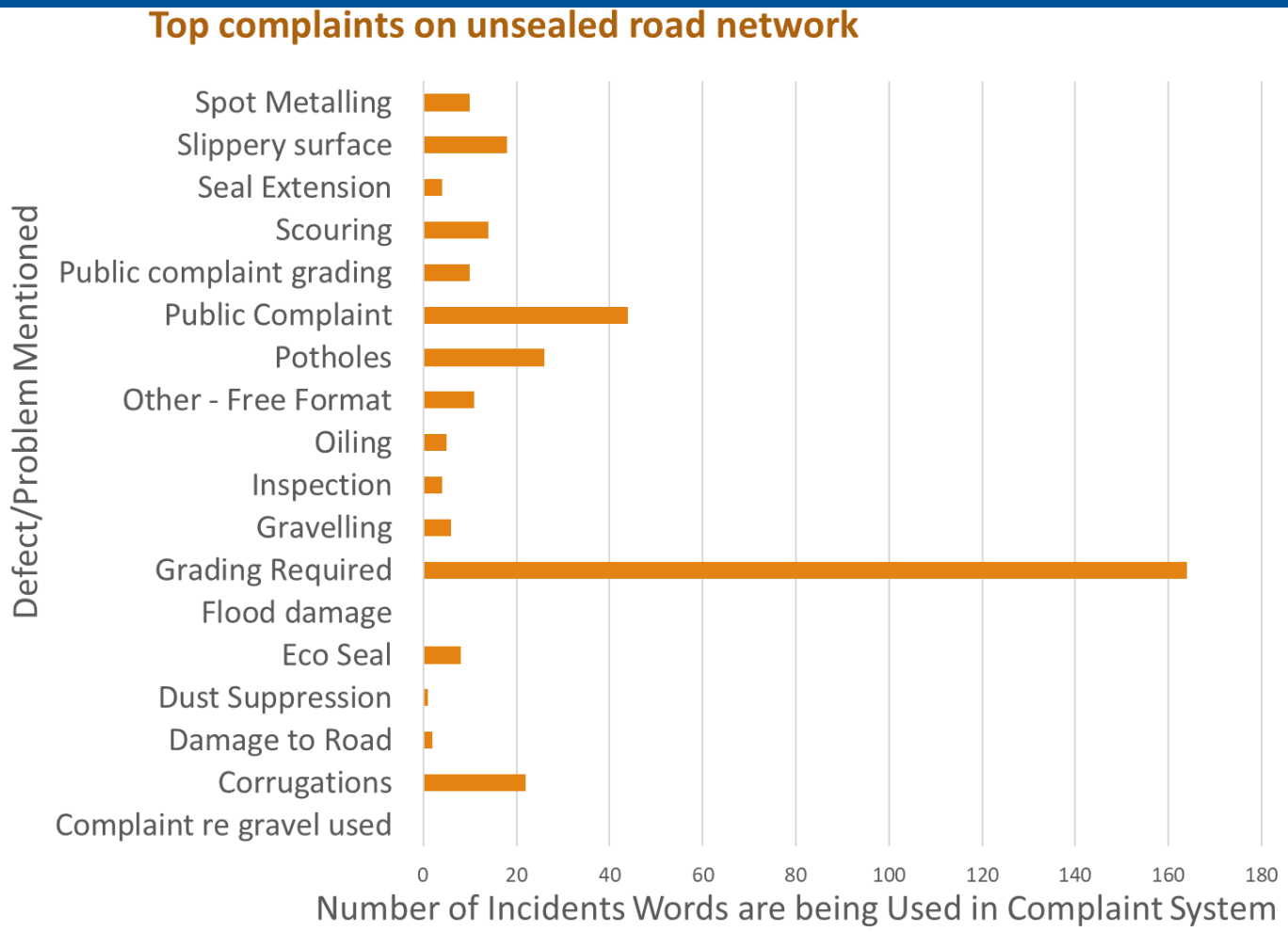
- Customers tell us when things changes
- They often complain about outliers





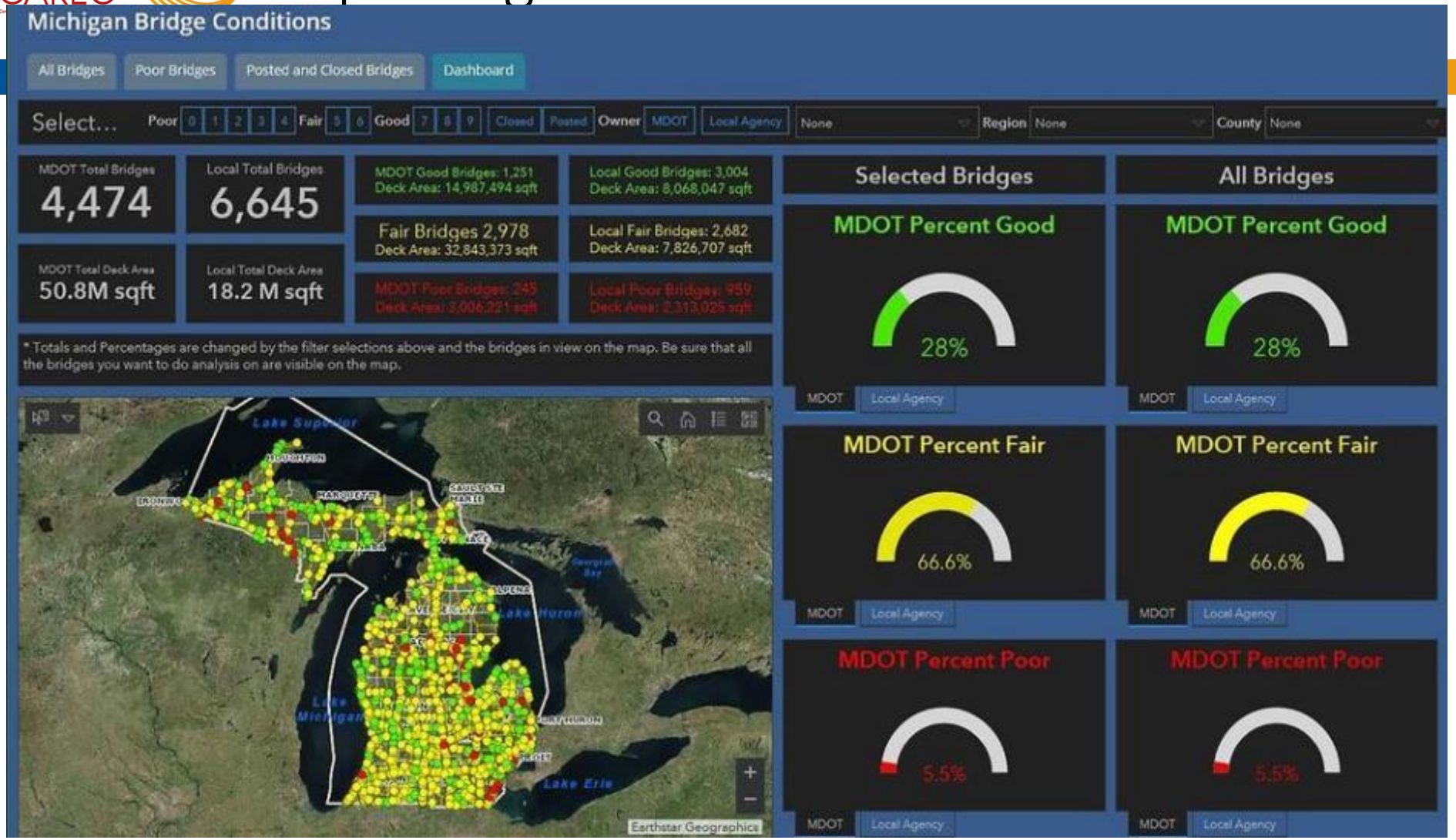


Reporting on Complaints



Communicating Performance

Reporting on Performance



Questions

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