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WG D.1.3: Allocation of Resources Across Asset Classes

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D.1.3 Terms of Reference

Strategies

- Review the different approaches taken by countries in allocating resources based upon asset management.
- Consider the prioritisation process used in a range of countries for investing in maintaining the different assets (pavements, bridges, geotechnical structures, etc).

Outputs

- Produce evidence based upon the case studies to illustrate the different approaches and report on the key conclusions of the studies.
- Identify the benefits and dis-benefits of the prioritisation processes used to allocate resources, noting the differences across asset classes.

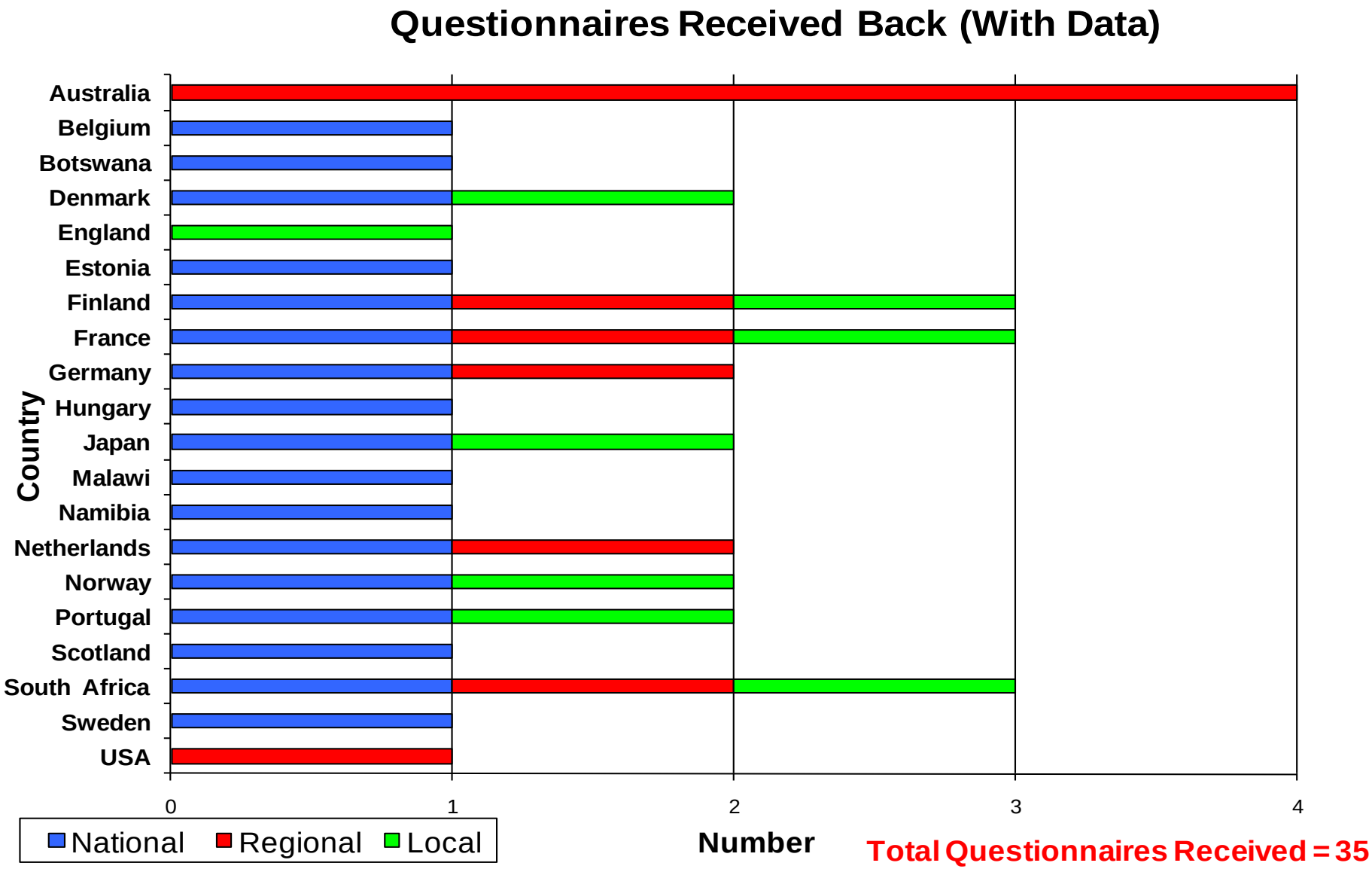
Methodology Followed

1. Structured Questionnaire

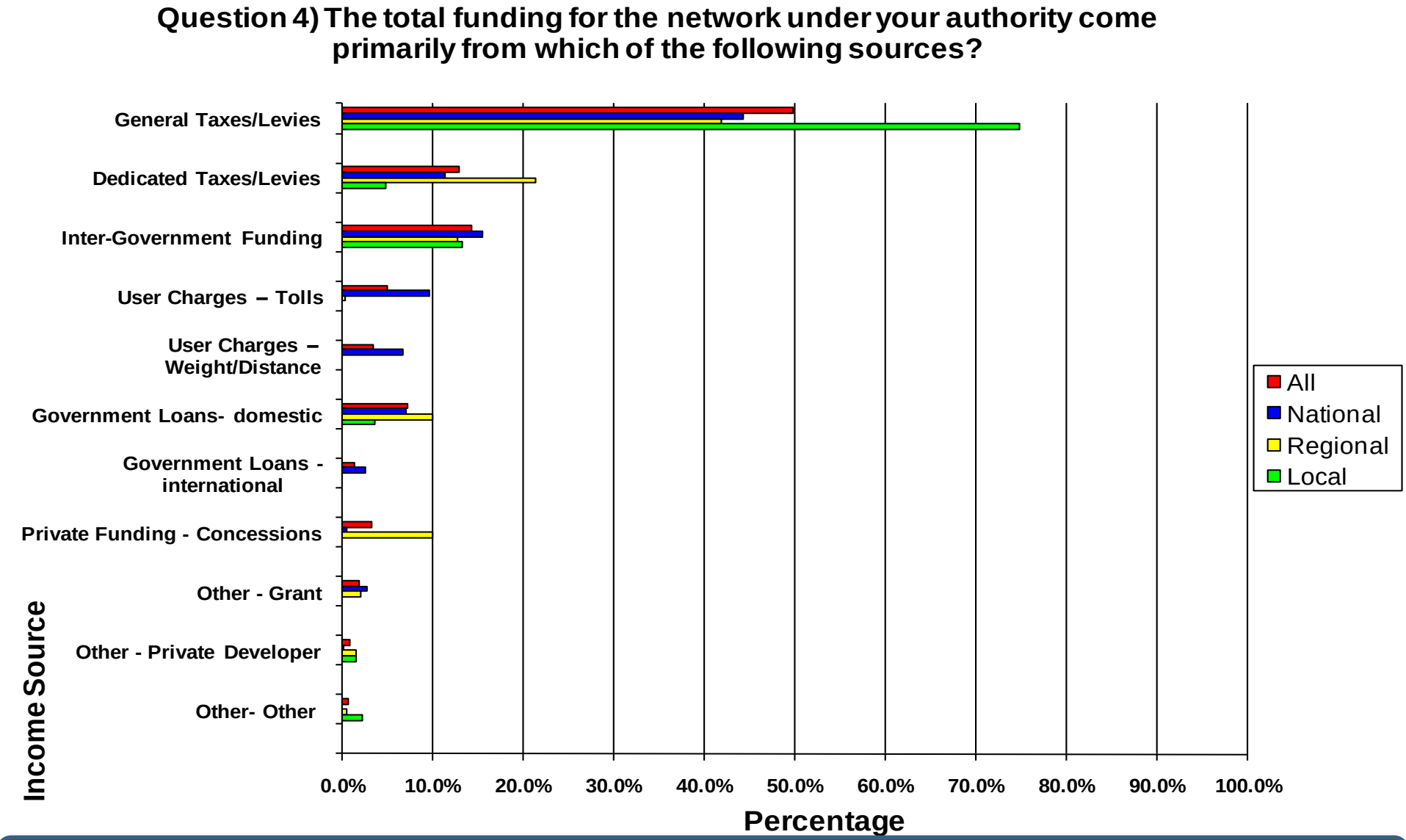
- Question 1: General Information
- Question 2: Country Network Extent
- Question 3: Authority Network Extent
- Question 4: Funding Sources
- Question 5: Determining Budget Requirements
- Question 6: Budget Allocation to Authority
- Question 7: Budget Allocation to Network
- Question 8: Use of Asset Management Systems
- Question 9: Budget Prioritization Methods Used
- Question 10: Budget Allocation between Asset Classes

2. Case Studies

Questionnaire Results



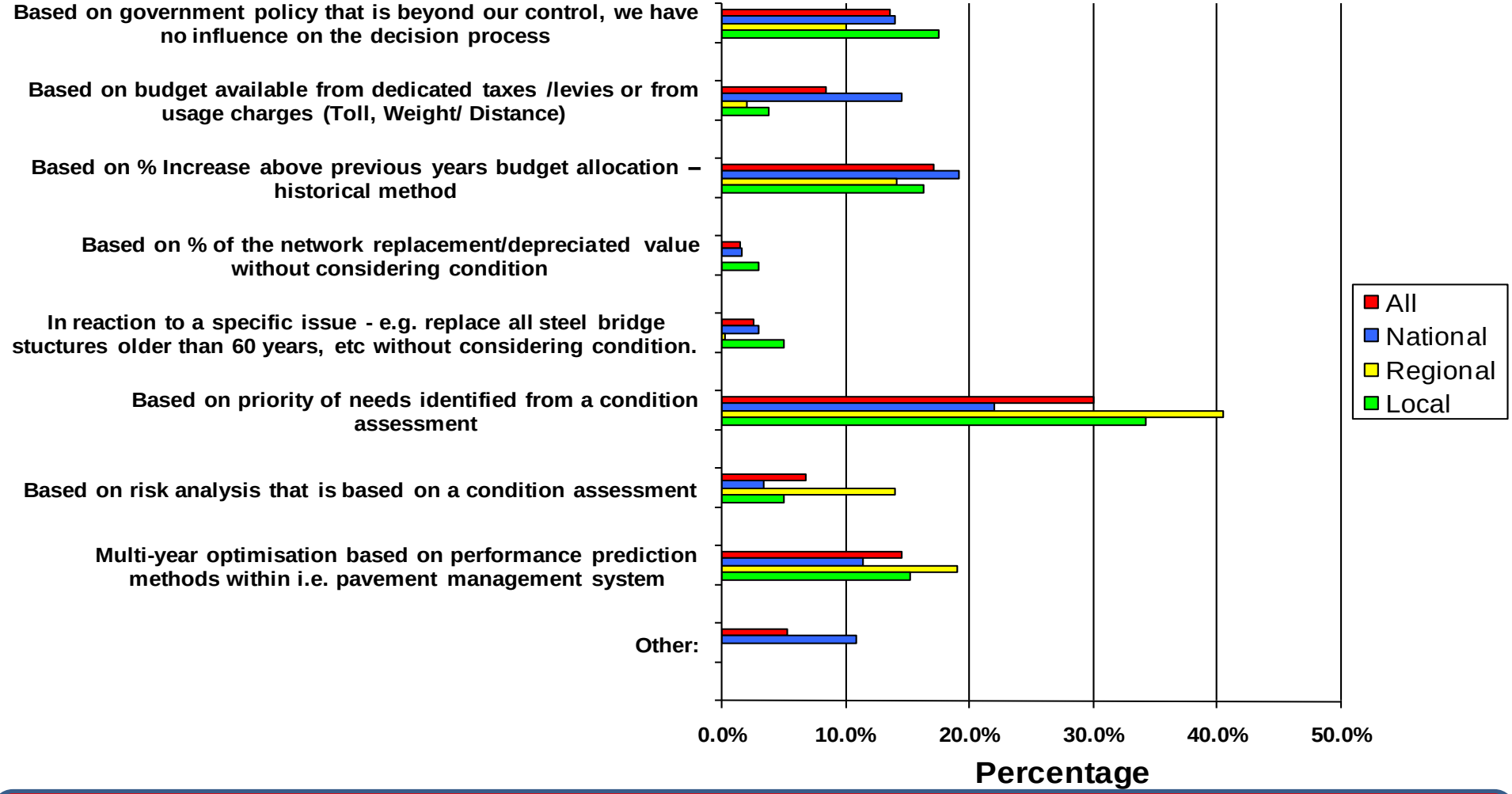
Questionnaire Results



Most respondent's primary source of funding still remains general taxes/levies, with 49.9 % of all respondents' income generated through this source

Questionnaire Results

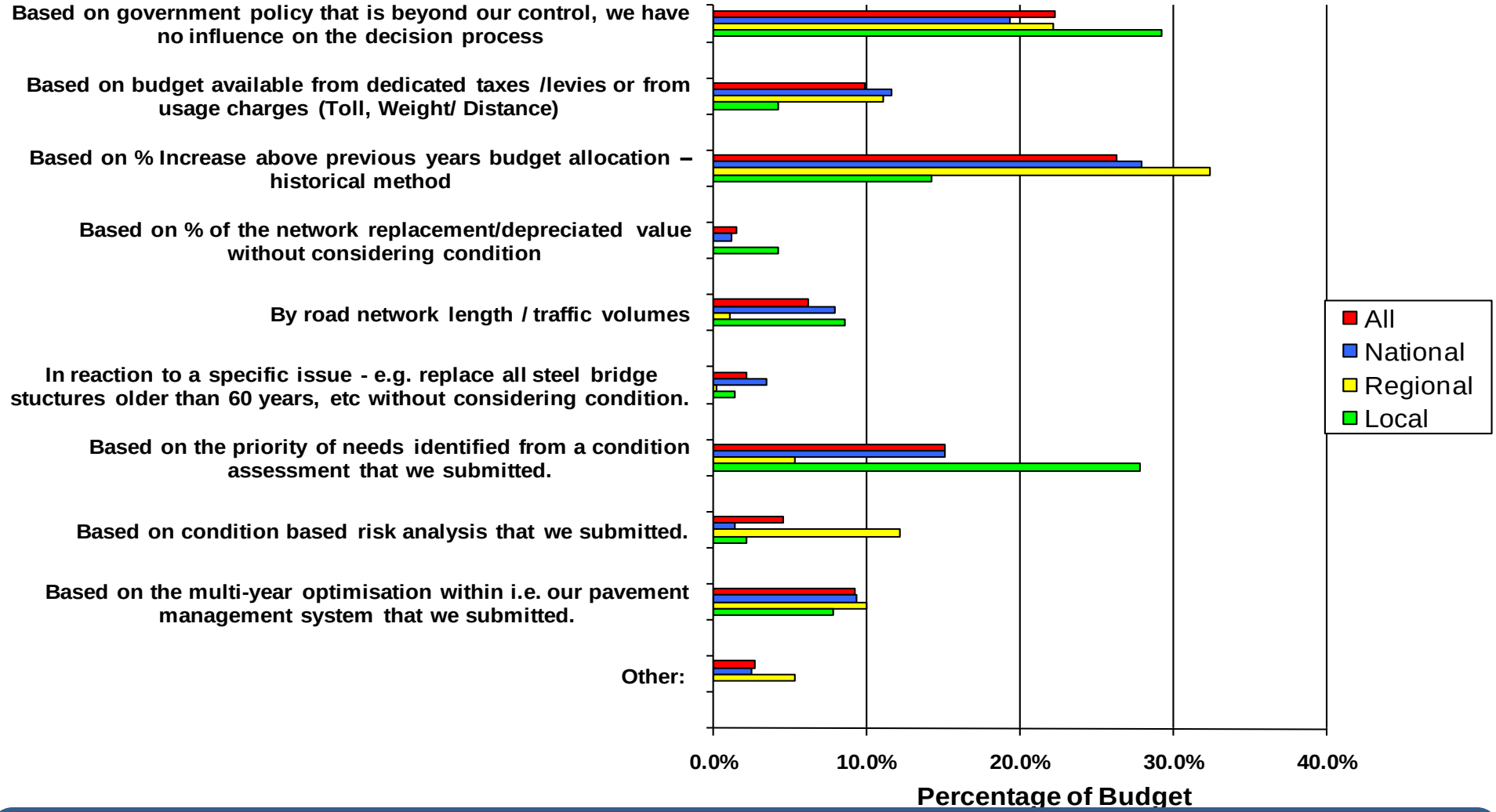
Question 5) As the Authority, we determine the budget requirement for our existing network as follows?



Most respondent's primary method of determining budget requirements is a priority of needs identified through a condition assessment, with 30.1 % of all respondents.

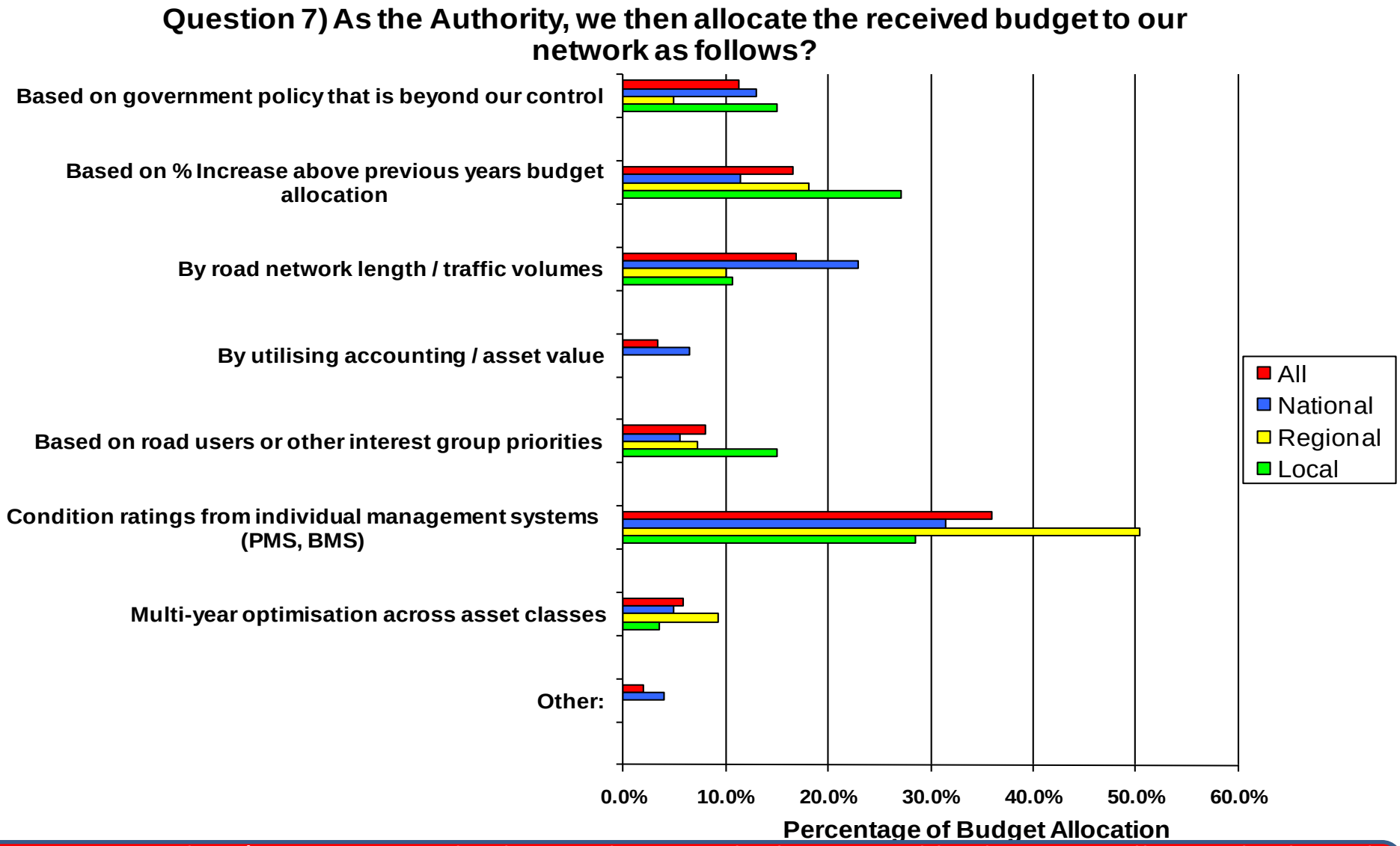
Questionnaire Results

Question 6) The budget for our network is allocated to the Authority as follows?



Most respondent's primary method according to which budgets are allocated to them is based on a percentage adjustment from the previous year's budget allocation, with 26.3 % of all respondents' budget allocated through this method

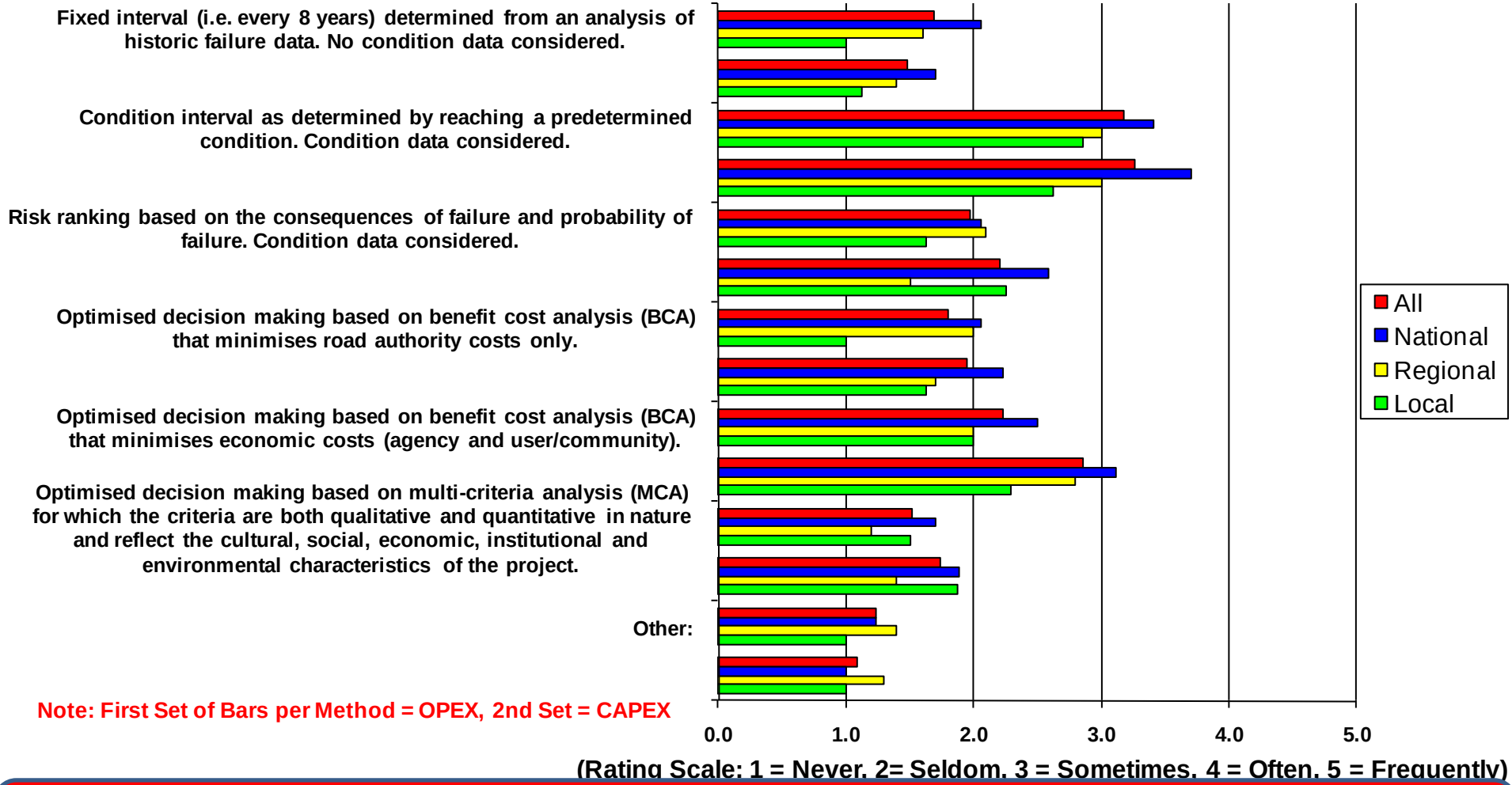
Questionnaire Results



Most respondent's primary method according to which received budgets are allocated is based on condition ratings from individual management systems (PMS, BMS), with 36.0 % of all respondents' received budget allocated through this method.

Questionnaire Results

Question 9) The Authority uses the asset management sub systems to prioritise budgets as follows - Pavements

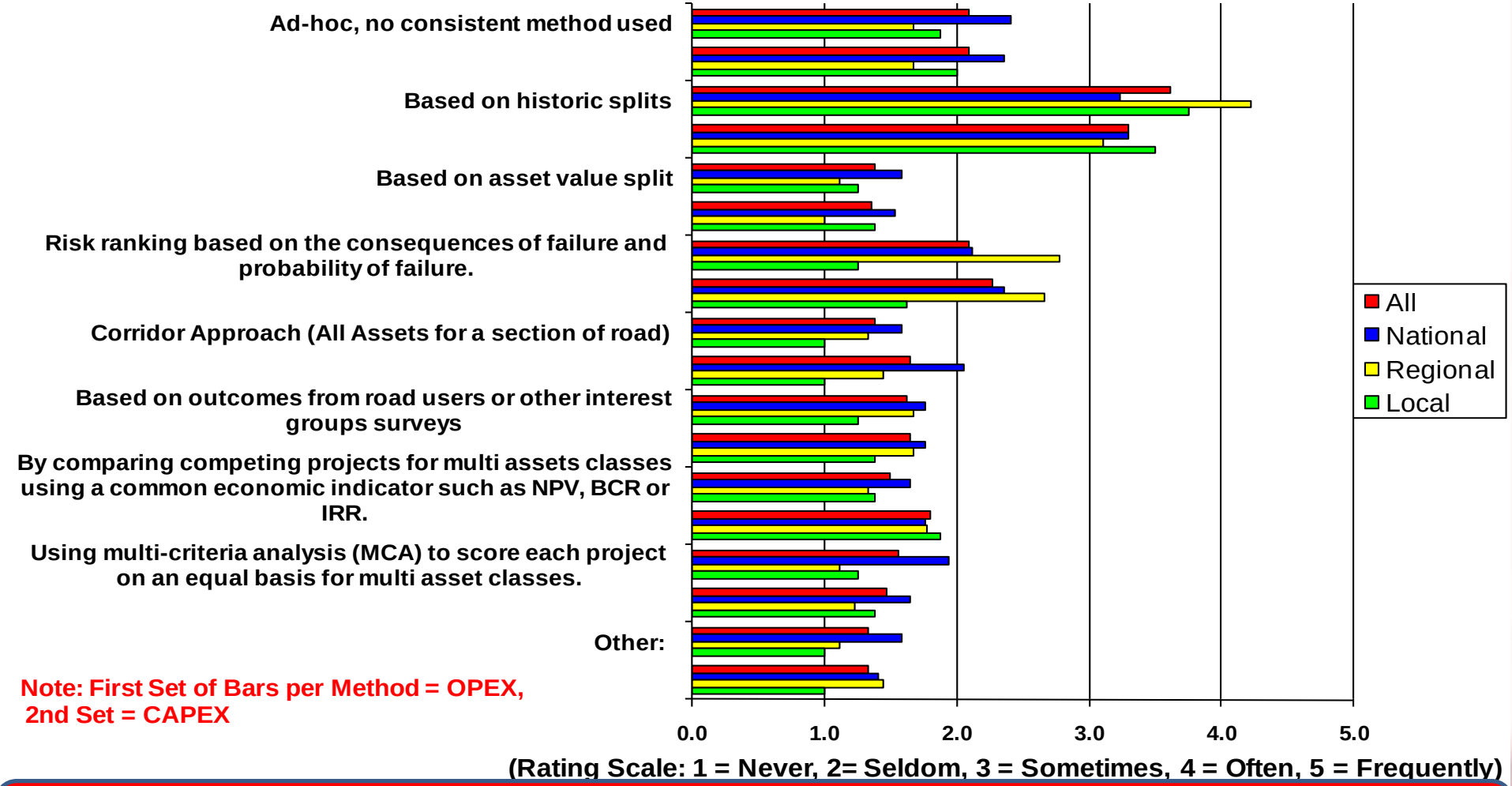


Note: First Set of Bars per Method = OPEX, 2nd Set = CAPEX

The budget prioritisation method used **sometimes** in pavement management systems is Condition Interval that is triggered by reaching a pre-defined condition level

Questionnaire Results

Question 10) The Authority allocates the budget between asset classes (roads, bridges, signs, etc) as follows - Current Practice

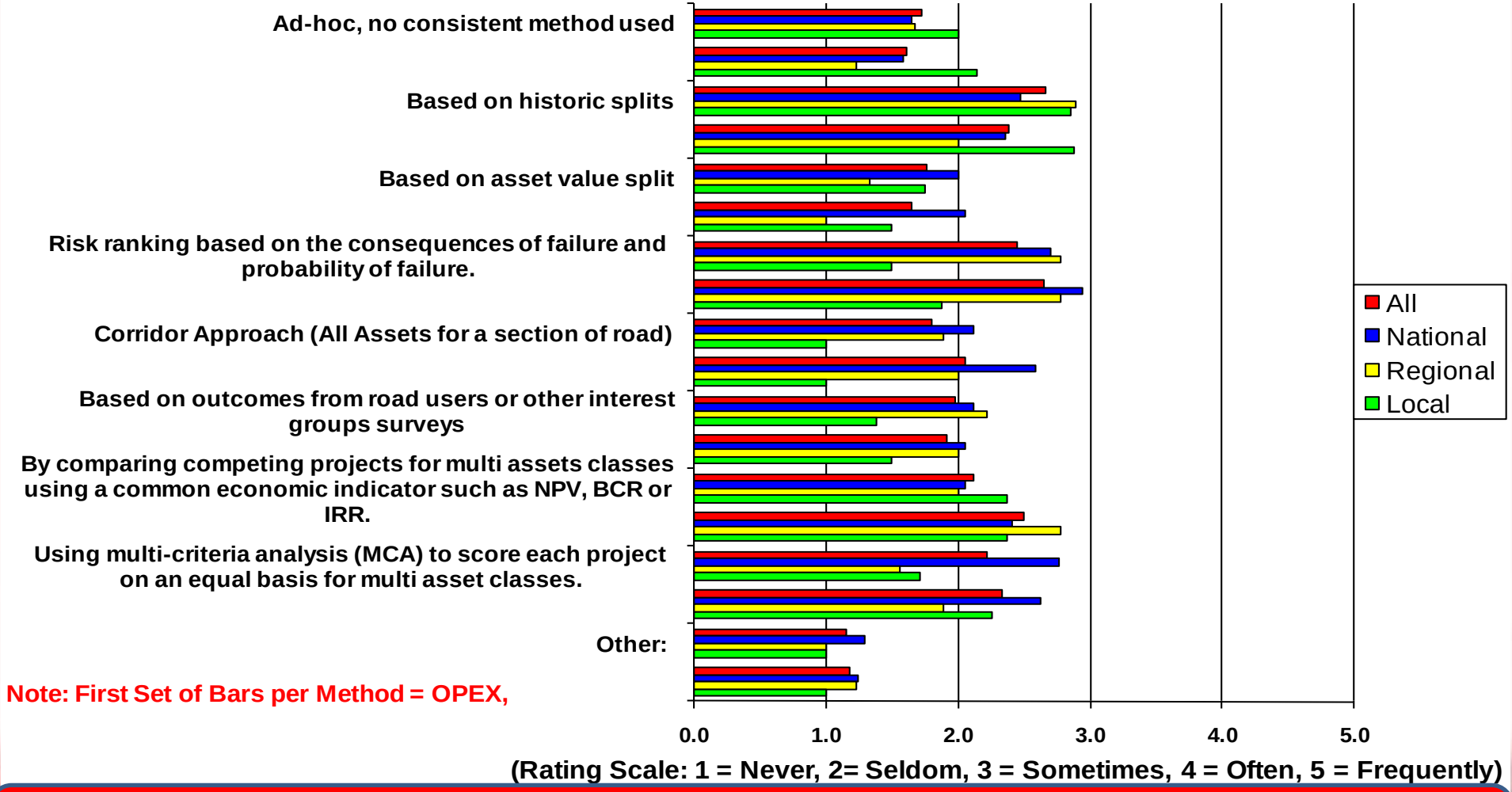


Note: First Set of Bars per Method = OPEX, 2nd Set = CAPEX

The only budget allocation method used **sometimes** to **often** by all authorities for both capital and operational budgets allocations is based on historical splits

Questionnaire Results

Question 10) The Authority allocates the budget between asset classes (roads, bridges, signs, etc) as follows - In 5 Years



Note: First Set of Bars per Method = OPEX,

No clear budget allocation method is favoured by respondents in future. The methods predicted to be used seldom to sometimes by all authorities is **historic splits, risk ranking, common economic indicator, multi-criteria analysis**

Questionnaire Results - Conclusions

1. Although the most common approach for determining budgets for pavements and bridges is a priority of needs identified through a condition assessment, most authorities budgets are still allocated to them based on a % adjustment on previous years allocation;
2. Approaches taken by countries in allocating resources based upon asset management are overall at a basic level, with pavements and bridges being most advanced in that they frequently use condition data to trigger budget allocations when a pre-defined condition level is reached. The use of advance methods such as optimised decision making based on benefit cost analysis (BCA) that minimises road authority costs or economic costs (agency and user/community) are limited, and if used mostly only applied for pavements;
3. The most common approach currently used for determining budget allocations between asset classes still remain a % split based on historic allocations. No clear future method could be identified, but the following methods are considered:
   - Risk ranking based on the consequences of failure and probability of failure;
   - By comparing competing projects for multi assets classes using a common economic indicator such as NPV, BCR or IRR, and
   - Using multi-criteria analysis (MCA) to score each project on an equal basis for multi asset classes.

Case Studies

Classification	Local	Regional	National
Developed	London Tokyo	Louisiana New South Wales	Sweden Netherlands
In Transition			South Africa
Developing			

- The case study from Transport for London was the only to demonstrate an actual attempt at allocating resources across asset classes through their Value Management (VM) process.

Case Study – Transport for London

- *Common cross-asset metric* - risk of not delivering the service.
- risk was defined as *an event or hazard that has the potential to hinder the achievement of business objectives,* and is evaluated as a combination of the likelihood of the event/hazard occurring and the consequences given the event/hazard has occurred.

Case Study – Transport for London

- Risk Matrix

Likelihood	V Low	Low	Medium	High	V High
V High	40	60	80	100	100
High	40	40	60	80	100
Medium	20	40	40	60	80
Low	20	20	40	40	60
V Low	0	20	20	40	40

Consequence

Critical Priority –action must be taken

High Priority –action must be taken

Medium Priority –action should be taken

Low Priority –action may be taken

Case Study - Value Criteria

- *Safety* – the risk posed to the public
- *Functionality* – the risk to network performance; including but not restricted to, availability and reliability
- *Environment* – the risk posed to the environment

Risk Scoring

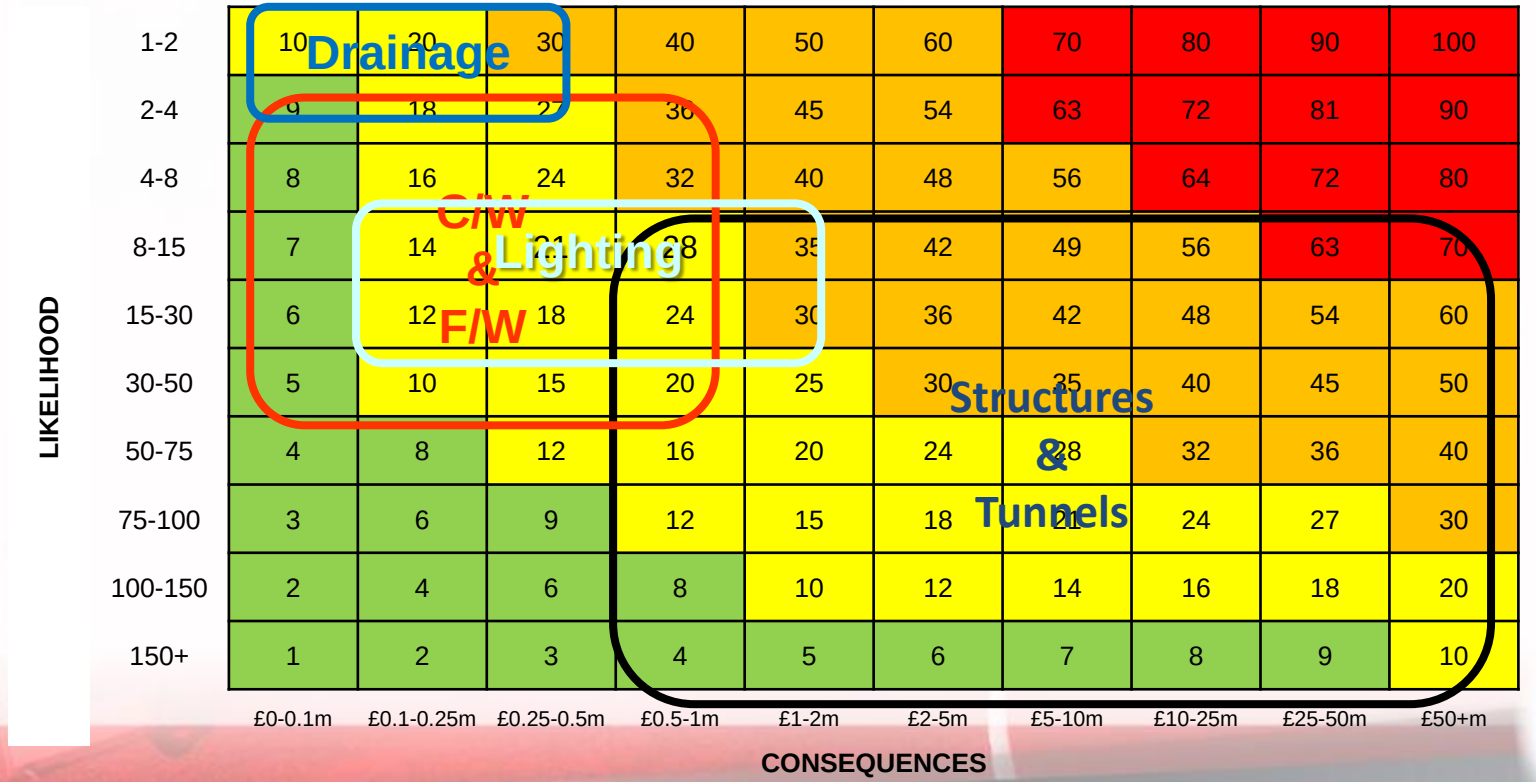
- *Financial* – providing WLC savings considering both direct costs to TfL and indirect costs to the economy

Financial Scoring

Project scores were obtained using value criteria for Safety, Functionality and Environment then combined and weighted for each event/hazard to determine a Risk Rating Benchmark for each scheme.

Case Study – Risk Reduction

The programme was then optimised by trading-off the risk reduction/mitigation offered by a scheme and its cost, which identified a programme of schemes that maximise risk reduction within the budget.

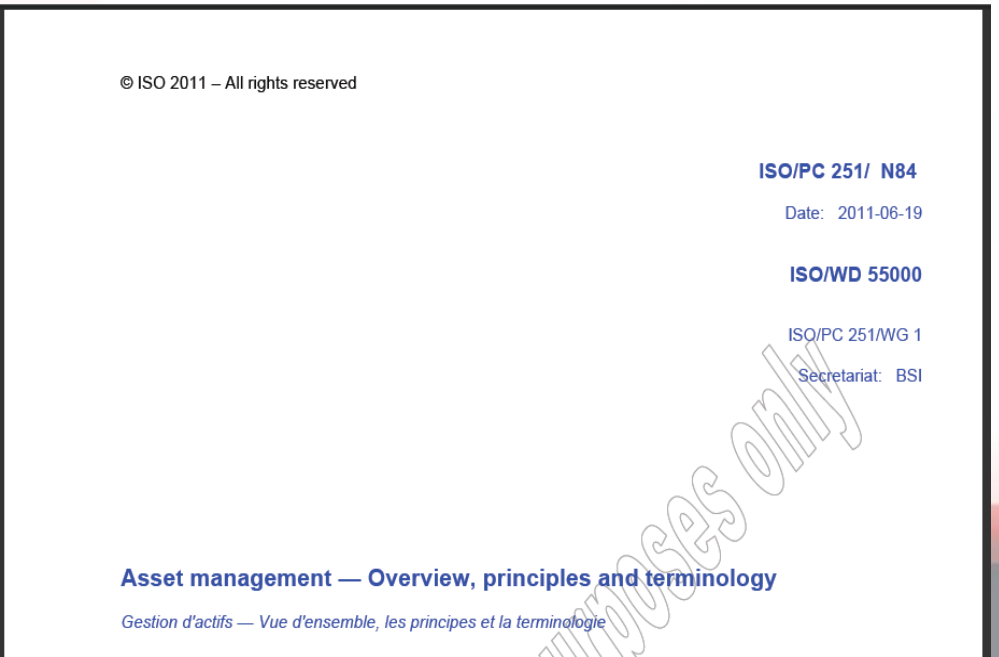


Case Study - Challenges

- Set appropriate matrix with correct banding
  - consequences should not be a problem
  - likelihood can be challenge
- Convert monetary value into point system scoring
- Potentially developed something with pre-empted output

Future Developments

- Take cognisance of ISO Technical Committee ISO/PC 251 – Asset Management, which is currently preparing following International Standards:
  - ISO 55000 Asset Management – Overview, principles and terminology
  - ISO 55001 Asset Management – Management Systems - Requirements
  - ISO 55002 Asset Management – Management Systems – Guidelines on application of ISO 55001



ISO/PC 251/ N84

Date: 2011-06-19

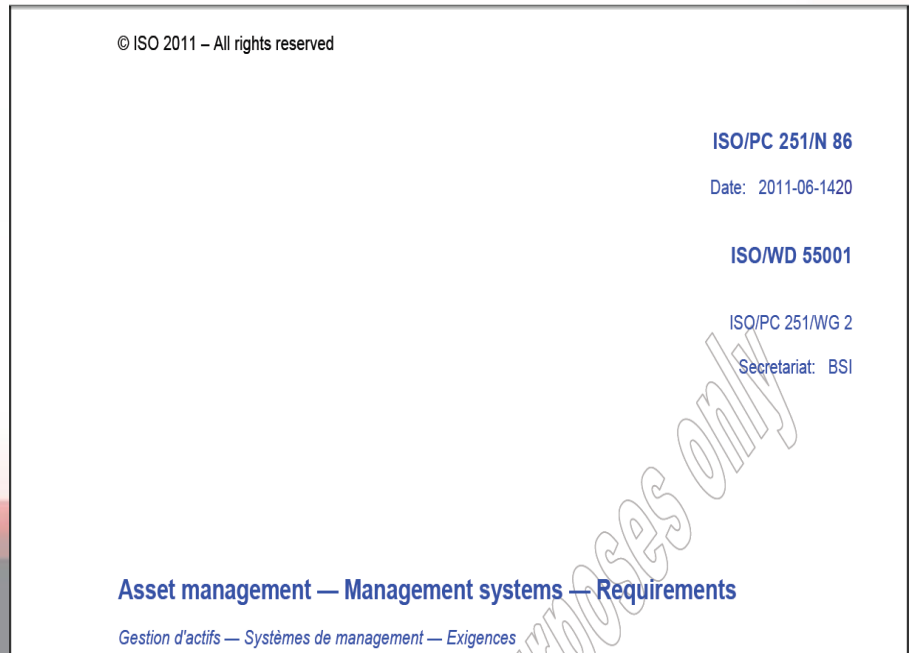
ISO/WD 55000

ISO/PC 251/WG 1

Secretariat: BSI

Asset management — Overview, principles and terminology

Gestion d'actifs — Vue d'ensemble, les principes et la terminologie



ISO/PC 251/N 86

Date: 2011-06-1420

ISO/WD 55001

ISO/PC 251/WG 2

Secretariat: BSI

Asset management — Management systems — Requirements

Gestion d'actifs — Systèmes de management — Exigences

Thank You

The Future ...

A Balancing Act