

Using iRAP for route review

A National Highways Case Study

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Background

- Arup has committed to aligning our business with the Sustainable Development Goals (SDGs).
- A focus on delivering broader outcomes and benefits from investment.
- Arup are working in partnership with National Highways to develop their schemes and programmes for future investment periods.





Route Optimisation

Overview

- Route Optimisation (Study Group 4 - SG4) is focused on delivering the National Highways 'Home Safe and Well Strategy'.
- The overall star rating aim set by NH is for a majority of travel on the SRN to be on 3+ star rated roads, for vehicle occupants.
- SG4 focuses on developing work packages that directly address safety concerns, both realised or predicted. The interventions are linked to improving iRAP star rating.
- Route corridors are typically older, single (and/or) dual carriageway sections of the SRN (predominantly 1 and 2 star rated).



Route Optimisation

Process

- Route Optimisation follows a 4-step process aligned to other NH processes (PCF Stage 0 model).
- The process has been designed to be proportionate to the scope and scale of the proposed measures.

Step 1: Define the problem and assess need for intervention - SNNA

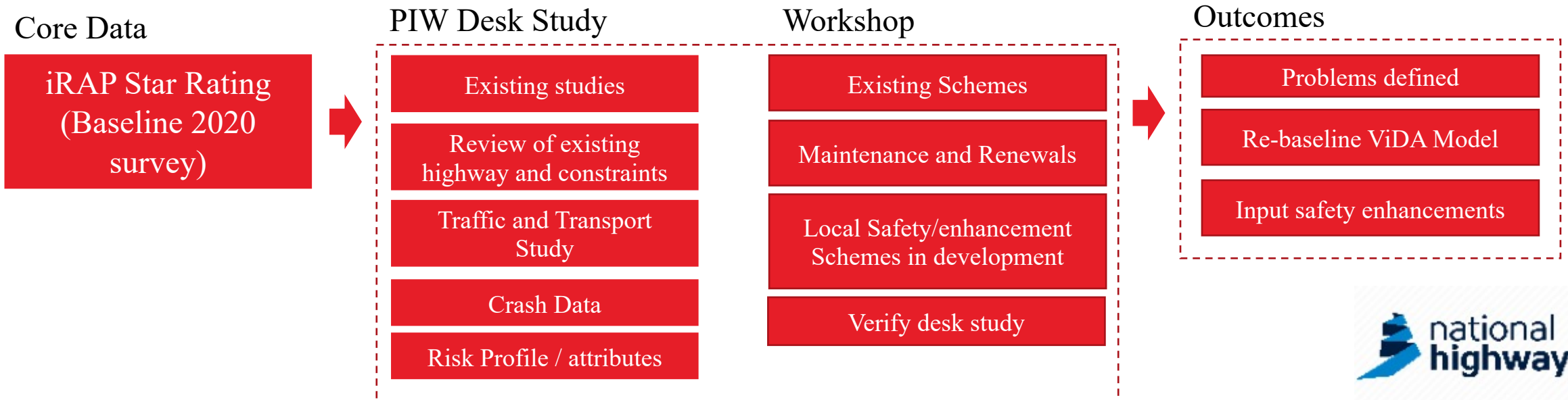
Step 2: identify solution concepts to address problems – PCF0a

Step 3: assess viability of solution concept – PCF0a

Step 4: Assess the case for investing for handover to OD – PCF0b

Step 1 – Define the problem and need for intervention

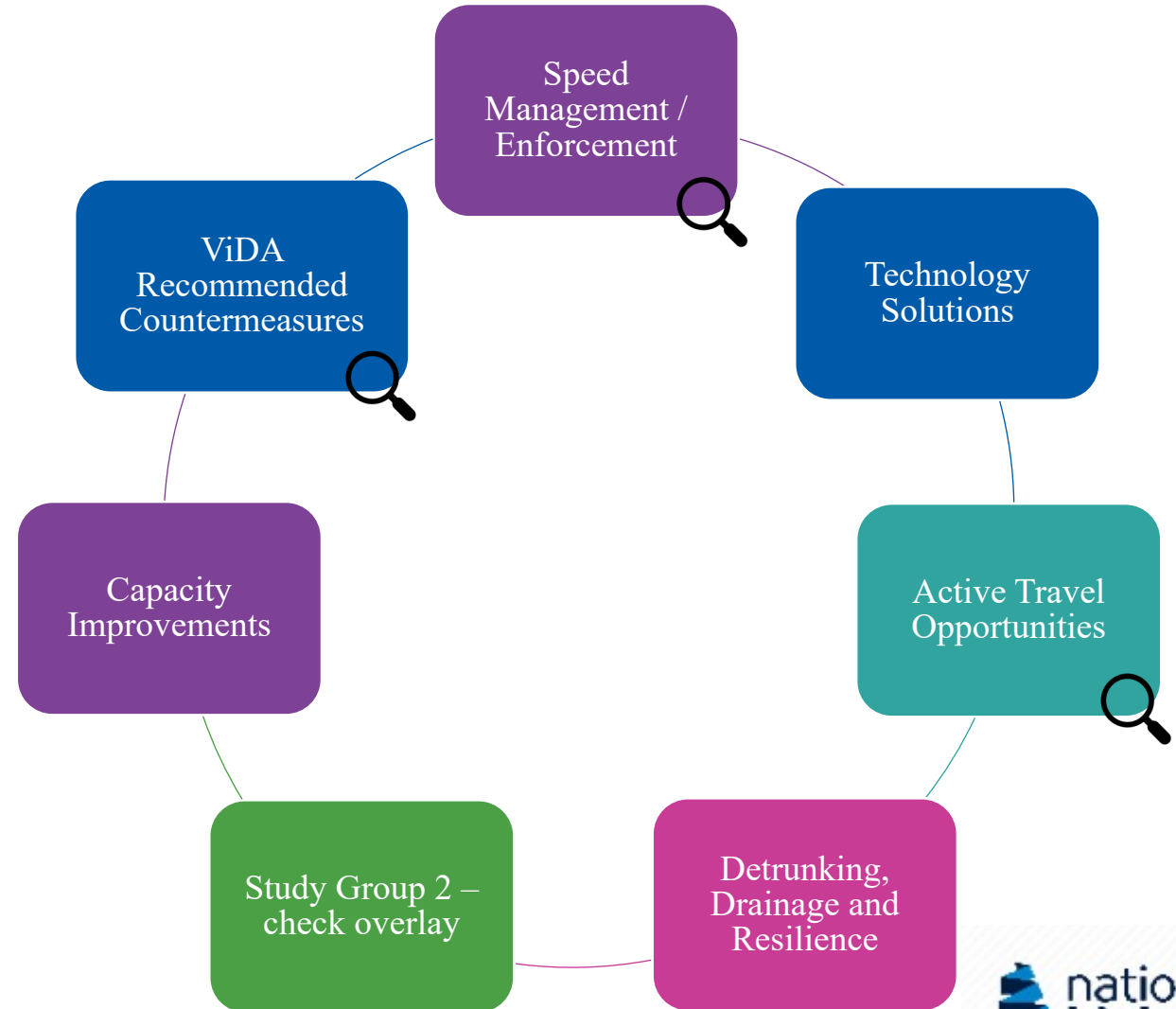
- A Problem Identification Workshop (PIW) in collaboration with the regional Operations Team
- The PIW plays back intelligence from previous studies and desktop assessment (safety, environment, alternative modes)
- Used to verify our understanding of the problems along the route and identifies route enhancements
- It is the catalyst for updating the ViDA baseline with any proposals to March 2030



Step 2 – Identifying Concept Solutions

7 strand approach

- The design team use ViDA to identify suggested interventions (‘countermeasures’) along the corridor, which are then reviewed using engineering judgement for suitability/compliance with standards/codes.
- ViDA analysis performed to calculate reduction in Fatal and Serious Injuries (FSIs)
- Enhance intervention package with opportunities identified by desktop assessment, Ops or other sources

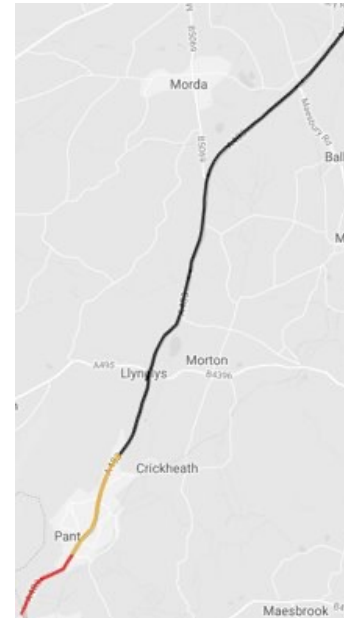


Focus Areas for SG4

Step 3 – Assessing viability of proposed solutions

Viability Assessment and Scenario Testing

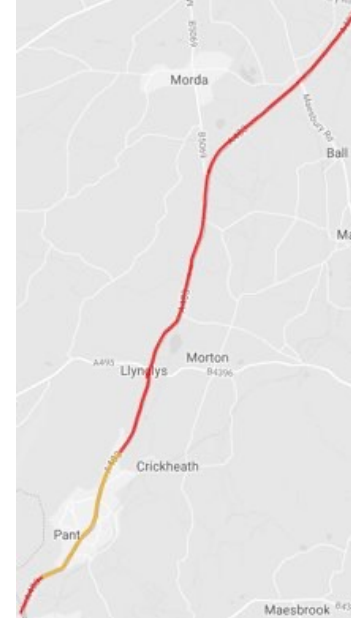
- Review ViDA countermeasures and other scheme enhancements impact on FSI reduction.
- The countermeasures require engineering judgement to assess suitability.
- Scenarios are used to develop an optimum package of interventions.
- Undertake impact assessments on;
 - Environment
 - Traffic
 - Other benefits
- Develop costing information
- Constraints on some corridors can lead to challenges in improving iRAP rating without speed management



A483 Scenario 1



A483 Scenario 4
(with barriers)

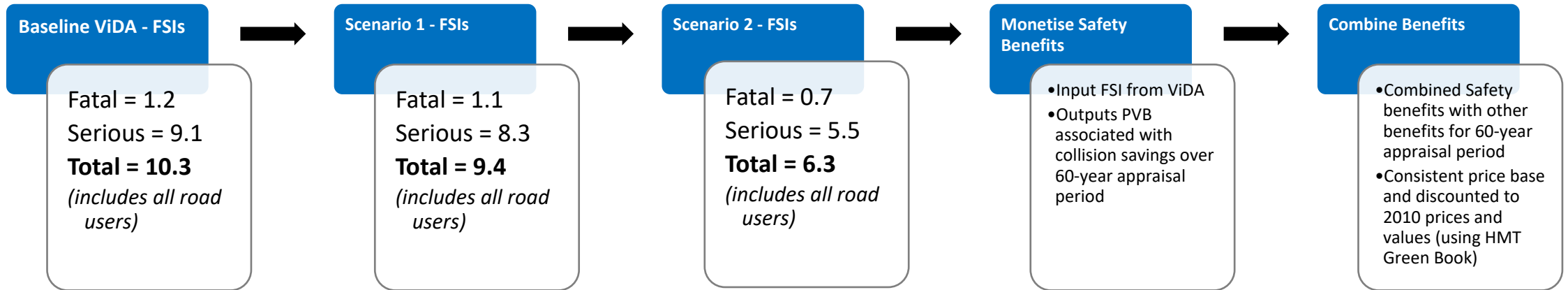


A483 Scenario 5
(tree clearance)

Maps indicate smoothed
star rating



Step 4 – Assessing case for investment



- Underpinning road safety benefits is the reduction in risk of fatal and serious injuries as a result of the proposed interventions along the route (FSI savings).
- Reduction in FSI is calculated by the ViDA model based on proposed changes to road attributes and road user/traffic flows.
- Other Benefits (where appropriate are calculated for the Route such as; incident, non-motorised user and journey time benefits).

Programme Summary

- 9 schemes (229km) complete with a further 8 schemes (200km) currently being assessed.
- Average FSI Reduction of 11% across 9 schemes
- Typically, high value for money and high deliverability, relatively low-cost schemes (compared to major projects).
- There are challenges and not expected that all routes will perform in same way due to characteristics and constraints.
- It can be difficult to achieve 3-star rating within constrained existing cross-section without speed management interventions.



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