

ROADS PAVEMENT FORUM

SANRAL



BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

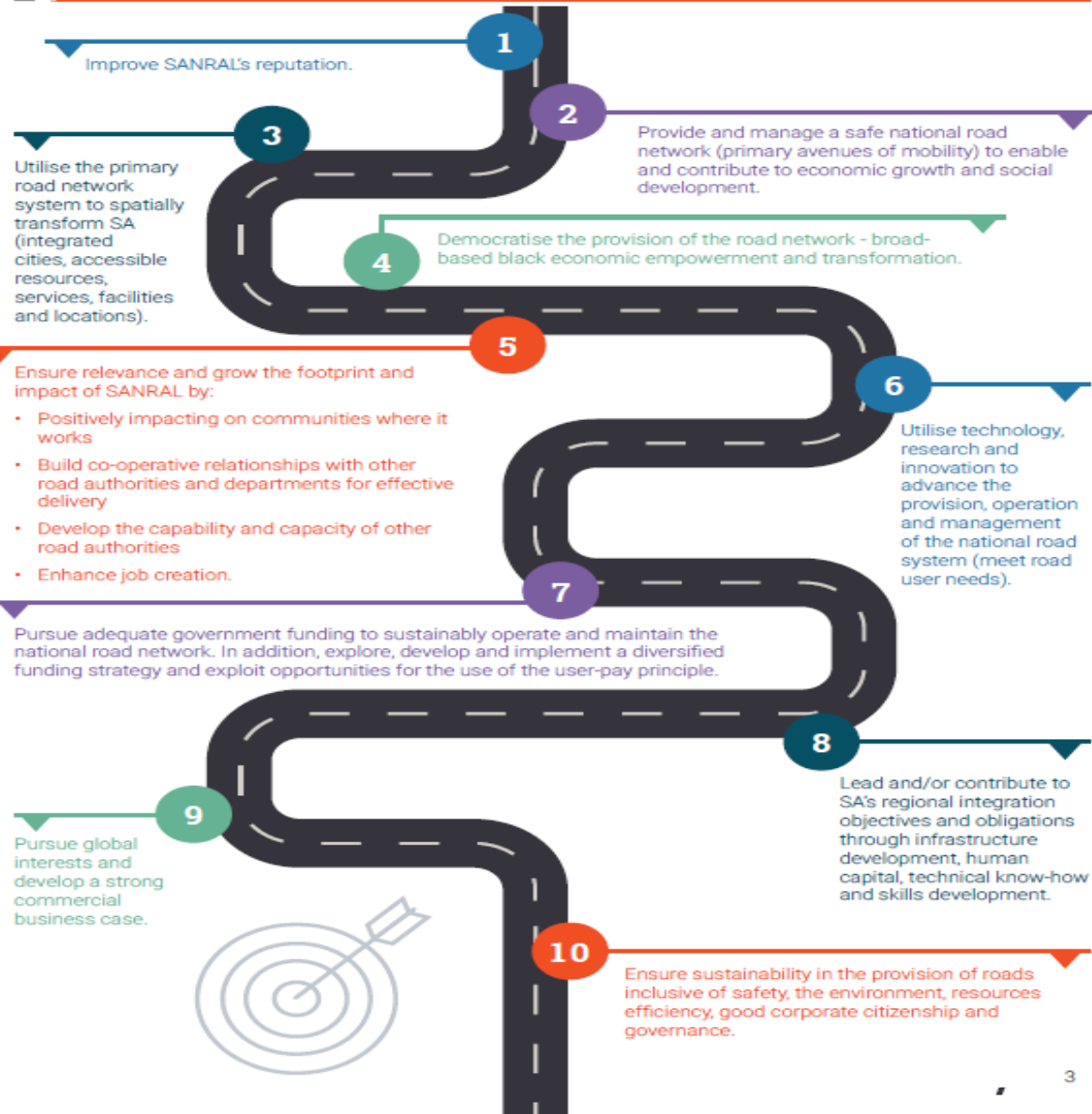


NEED FOR RESEARCH & PROGRESS TO DATE

SANRAL strategy - Horizon 2030

- NDP – importance of infrastructure for economic development
- SANRAL 10 strategic objectives include: -
 - #6 Utilise technology, research and innovation to advance the provision, operation and management of the national road system (meet road user needs)

TEN STRATEGIC OBJECTIVES



SANRAL Identified research focus areas

- Future Transportation

Not awarded: -

- Technical innovation

- Transport planning

Electrical & Mechanical
Legal, Communications

- Economy

- Public administration

- Pavements

- Asset management

- Traffic

- Road safety

- Geo-technical

- Structures

- Drainage and hydraulics

- Environment



WORKSHOPS – APRIL-MAY 2019 –SANRAL, RESEARCHERS & INDUSTRY

- Future Transportation
 - Technical innovation

 - Transport planning
 - Economy
 - Public administration

 - Pavements
 - Asset management

 - Traffic
 - Road safety

 - Geo-technical
 - Structures
 - Drainage and hydraulics
 - Environment
- Workshop 1

 - Workshop 2

 - Workshop 3

 - Workshop 4

 - Workshop 5

 - Workshop 6

 - Workshop 7

Research focus area steering committees

- Future Transportation RFASC 1
- Technical innovation

- Transport planning RFASC 2
- Economy
- Public Admin & Management

- Pavements RFASC 3

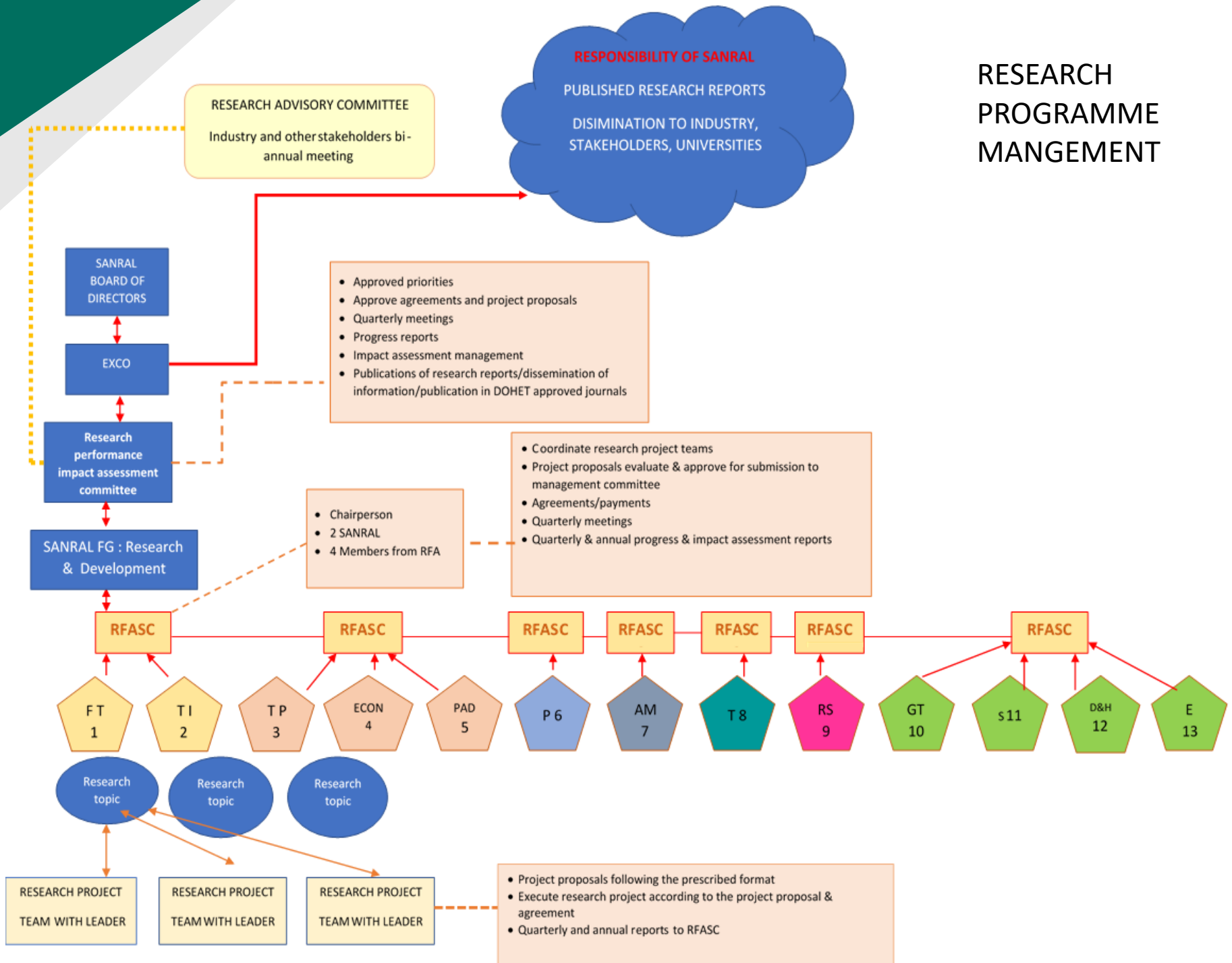
- Asset management RFASC 4

- Traffic RFASC 5

- Road safety RFASC 6

- Geo-technical RFASC 7
- Structures
- Drainage and hydraulics
- Environment

RESEARCH PROGRAMME MANGEMENT





PERFORMANCE IMPACT ASSESSMENT & MANAGEMENT

2016 © JAKE FULLER
CAYMAN COMPASS
OPINION IN A PINCH

NEEDS
ASSESSMENT
UNIT

GOOD GRIEF!
LOOK AT ALL
THESE PEOPLE...

I THINK I'M
GONNA NEED
ASSISTANCE,
TOO!

NOW
SERVING

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Impact assessment

- Principles:
 - Plan for impact upfront
 - Research effectiveness: input/ output/ outcome/ impact
 - Cost Benefit Analysis is one element
 - Must be related to strategic objectives
 - Trend analysis rather than accuracy
 - Balance in indicators over full innovation value chain
 - Impact is almost impossible to measure directly, use proxy indicators
 - Quality of life: reduction in fatalities/ 100,000: skid resistance
 - Equality: Job creation: labour-intensive methods or small business development
 - How do indicators build up towards potential impact



Potential indicators



- **Input indicators:** -
 - Number of researchers active in SANRAL research programme
 - Number of SA black researchers active in SANRAL research programme
 - Number of SA black research project leaders
 - Number of SA female researchers active in the SANRAL research programme
 - Number of active researchers with a PhD
 - Frascati distribution of research funding (basic, applied, experimental development, piloting and implementation)
 - The amount of funding employed for research infrastructure
 - The amount of research funding spent, and
 - the number and size of collaborative partnerships

Potential indicators



- Output indicators: -
 - Number of publication equivalents (DoHET formula)
 - Number of new technology/ knowledge packages
 - Number of SANRAL endorsed national research reports
 - Number of new or updated national guidelines
 - Number of new Masters' degrees completed
 - Number of new PhDs completed
 - Quality assessment of publications (e.g. journal impact factors)

Potential indicators

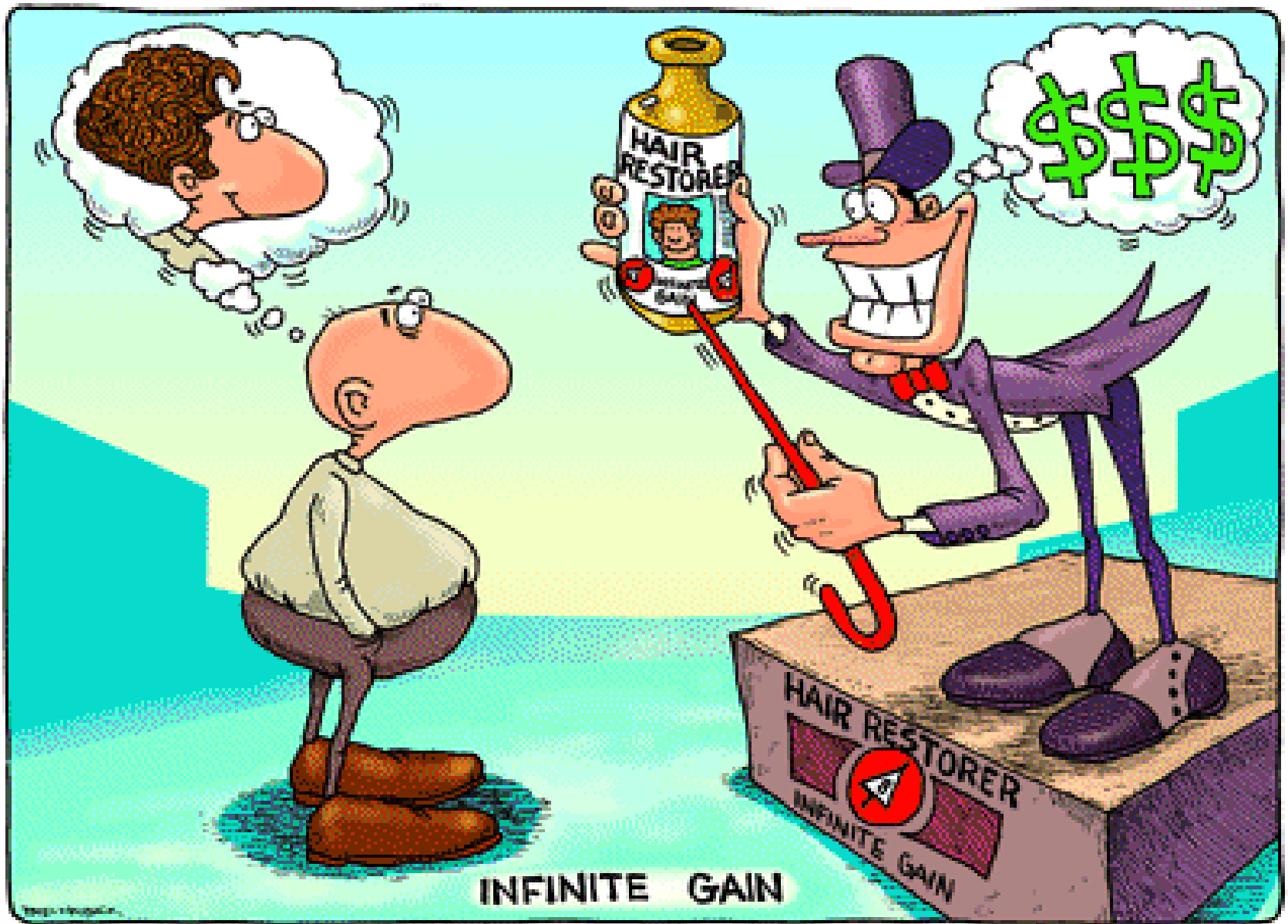


- **Outcomes indicators (uptake):** -
 - Number of technology demonstration projects where new knowledge/ technology was implemented
 - Rand value of demonstration projects
 - Number and size of social impact
 - Number of projects where positive environmental impact is made
 - Number of practitioners trained in use of new technology or knowledge package
 - Cumulative cost/benefit ratio
 - Public perceptions of interventions
 - Effective communication measures
 - Number of small contractors involved in projects emanating from research programme
 - Life stories and success stories of new technologies implemented

Potential indicators



- Impact proxy indicators: -
 - Number of retrospective studies to determine current impact resulting from past R&D
 - Fatalities/ 100,000 trips on roads where new solutions have been implemented
 - Normalised crash rates
 - Rand value of indirect economic impact
 - Behavioural change in road users
 - Network benefits on interventions
 - Traffic through flow rate at crucial bottlenecks
 - CO2 levels near roads
 - Energy footprint of operations
 - Road safety index
 - Number of job opportunities created
 - Road conditions index
 - Facility performance index
 - User satisfaction index
 - Number and nature of community involvement projects
 - Cumulative Rand value of SANRAL involvement in communities
 - Freight flow rates on road where new technology has been implemented (Netsafe statistics)



INFINITE GAIN

EPSON
EXCEED YOUR VISION

Source: Computer
Searching all sources...

CSIR

CSIR

EXIT











VIRTUAL REALITY (VR)

Virtual reality (VR), which can be referred to as immersive multimedia or **computer-simulated reality**, replicates an environment that simulates a physical presence in places in the real world or an imagined world, allowing the user to interact in that world.



SANRAL

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CSIR Convention Centre

CSIR Convention Centre



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Water



Research topics summary

Pavements

Topic	Research idea	Times listed	Ranking (1-10)	Time frame (2,5, >5)
Self-Healing Asphalt	Self-healing asphalt: Addition of “components” to asphalt mixes that activate with time to enhance properties of binder and mixes when distresses occur.	1	1	Short
	Self-healing of micro-cracks triggered by engineered materials and technology - to be implemented as a non-invasive maintenance technique.	1	1	Short to Medium
	Relation of stress relaxation properties of binders and self-healing characteristics of asphalt.	1	1	Short to Medium

Research topics summary

Pavements

Topic	Research idea	Times listed	Ranking (1-10)	Time frame (2,5, >5)
Cemented Material Technology	Effect of different binders on different material types. Need for a guide to provide guidance to avoid large scale testing per project	1	3	Short
Materials Quality assurance	Statistical analysis of test data take outliers into account. Application of probability density functions for QA	1	1	Medium
Construction Quality Assurance	Application of smart technologies to enhance QA in Pavement construction. Assess available tools to continuously monitor and record batching details/info. Incorporation into COTO standard spec as part of	1	2	Short

Research topics summary

Pavements

Topic	Research idea	Times listed	Ranking (1-10)	Time frame (2,5, >5)
Numerical Modelling	Non-linear FEM on cracking of concrete.	1	1	Long
	Virtual environment to simulate performance of new material/ stabilisation technologies (decision support tool). Link INDUSTRY 4.0	1	1	Long
	Development of FEA for static and dynamic load analysis of pavement structures including APT.	1	1	Short to Medium

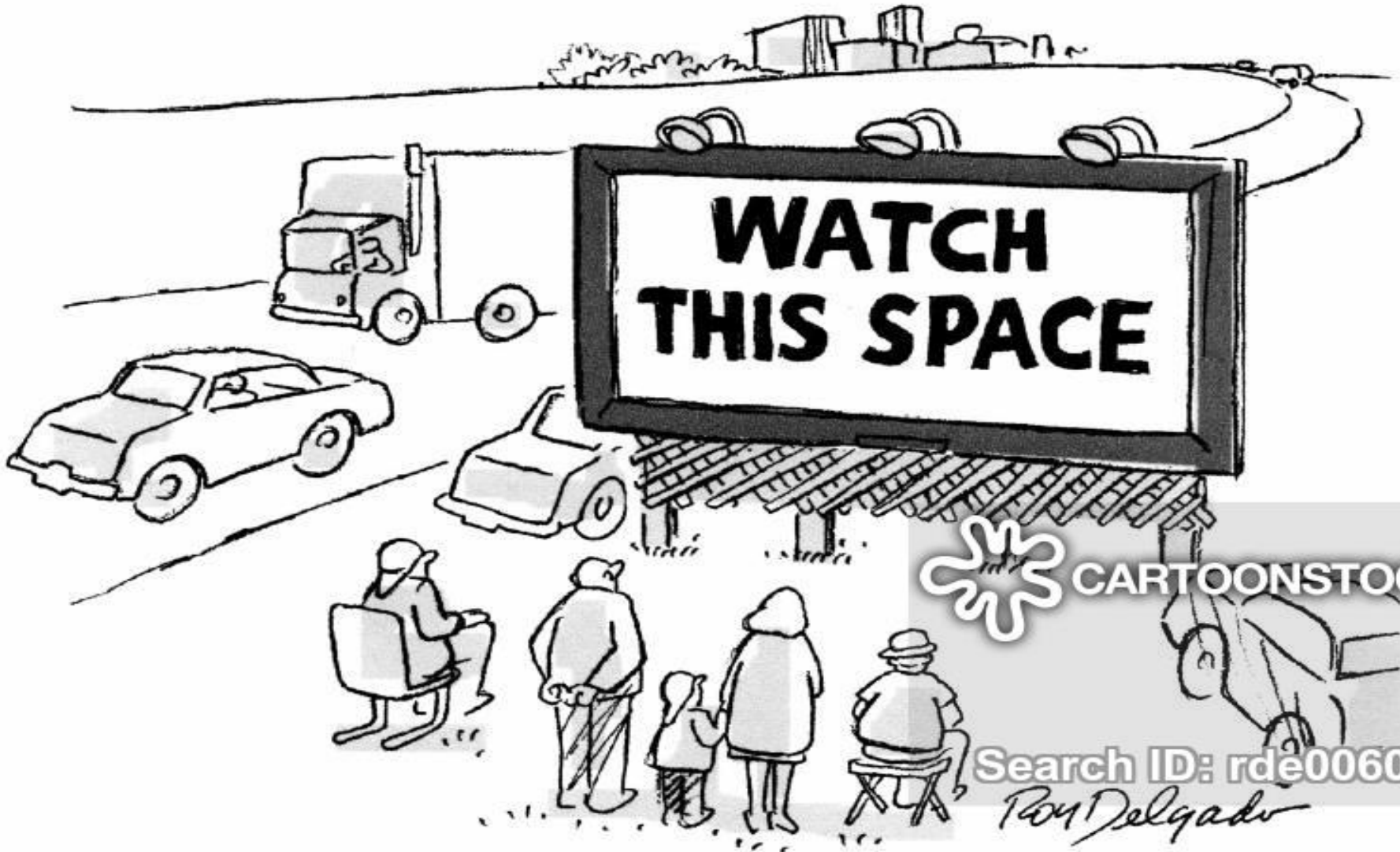
Research topics summary

Pavements

Topic	Research idea	Times listed	Ranking (1-10)	Time frame (2,5, >5)
Asphalt Fatigue	Refinement of fatigue testing with reasonable time limits.	1	2	Short to Medium
	Asphalt fatigue : understanding and development of fatigue models.	1	3	Medium
	Fatigue properties in relation to flexible and rut properties.	1	2	Short to Medium

Outcome of the research workshops

- 341 delegates attended the workshops
- 696 research ideas
- Post workshop activities – June to end of Aug 2019
 - Clean up of ideas listed by combining duplicates - 696
 - Sort ideas under the correct research focus area
 - Determine linkages between all ideas
 - Determine priorities taking into account needs, budget and capacity of the research panel members



**WATCH
THIS SPACE**

 **CARTOONSTOCK**

Search ID: rde0060
Ray Delgado



THANK YOU