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FA6: Roads and the Environment

Sustainability of roads: survey results critically analysed

Context

- PIARC TC D.2 Pavements 2016-2019, WG1: Green Paving Solutions and Sustainable Pavement Materials
- (...) encourage the use of methods and materials that minimize the use of natural resources, reduce energy consumption and emissions during the lifetime of pavements
- survey to map existing GPTs among (member) countries
- PIARC TC WG 2012-2015: carbon footprint of pavements

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Questionnaire

- PART 1 Identification of GPTs: inventory of potentially successful GPT
- PART 2 Sustainability drivers GPTs
 - materials depletion,
 - using by-products (from other industries),
 - recycling/reuse,
 - energy consumption,
 - CO2 emissions,
 - health & safety,
 - noise & comfort for road user,
 - responsible sourcing,
 - user delays/ traffic congestion /level of service,
 - life cycle costs,
 - direct costs.

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Questionnaire

- PART 3 Constraints, barriers or incentives for GPTs
 - initial investments for implementation (incl. technology development, skilled staff, process)
 - legal issues & concerns
 - no innovative procurement contracts available, restricted specifications
 - missing proof of evidence of sustainability and/or lack of objective measures to quantify the sustainability
 - missing proof of equal performance to conventional pavement
 - direct financial costs
 - policy
 - risk assessment
 - resistance to change
- implementation level: under investigation > pilot > available technique > standard practice
- current status of Green Public Procurement

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41 respondents
19 countries



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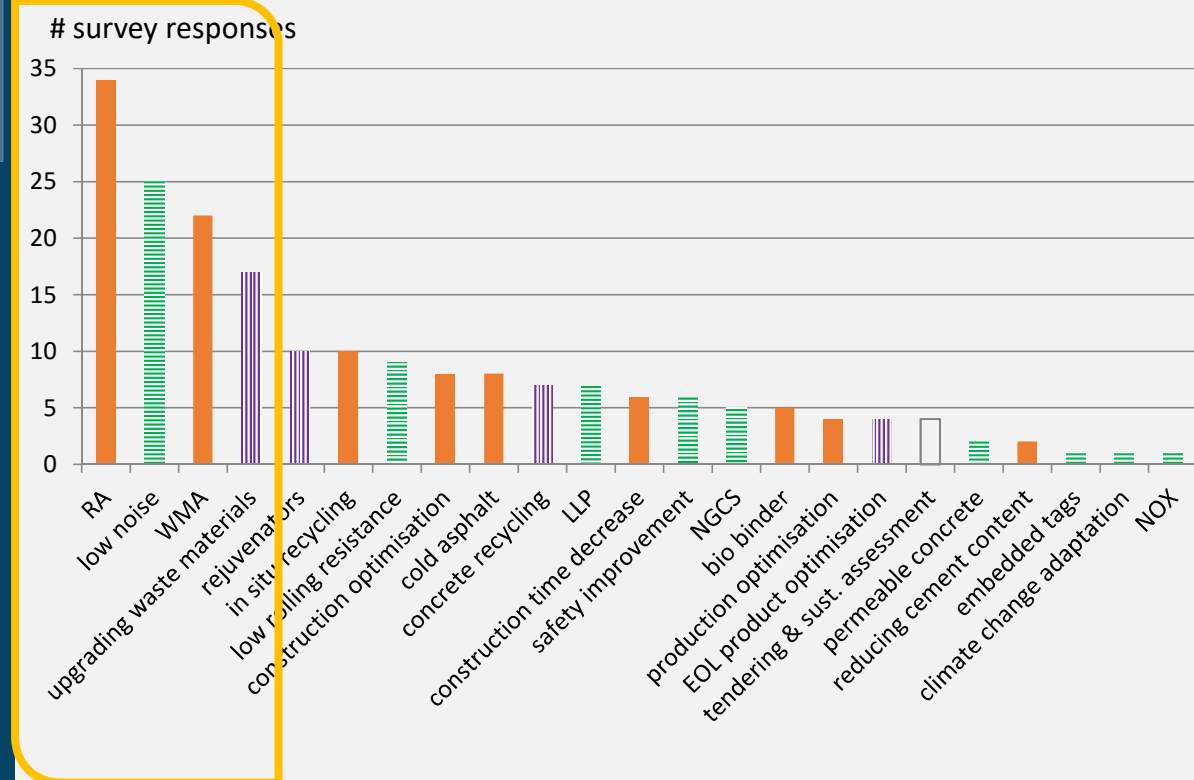
198 GPTs
23 classes

D.2.1 SURVEY RESULTS							NAME	stage	#
COUNTRY	NL	BE	DE	TR	NL	BE	RA	CON	34
CONTINENT	EU	EU	EU	EU	EU	EU	low noise	USE	25
TYPE	RE	RE	RE	RA	PR	PR	WMA	CON	22
ID	6	2	20	21	5	3	upgrading waste materials	EOL	17
Identification of green paving solutions, drivers, constraints							rejuvenators	EOL	10
potentially successful GPT	higher recycling % in premium asphalt surface layers like PA + limits of recycling percentages in base layers increasing standard recycling percentages from 50% to +/- 70%	increasing %RA in asphalt mixes + allowing RA in top layers	Use of high amounts of RAP in the same type of layer (e.g. RAP from a surface layer is used again in a surface layer).	Recycling	Partial recycling in asphalt (mainly hot mix), mainly in base layers (50-70%, some cases higher), in top layers 0-30%. Research ongoing to increase % in top layers	Recycling	in situ recycling	CON	10
with intention to specific at life stage (x)	CON	CON	Reduce material use	Reduce material use	CON	CON	low rolling resistance	USE	9
sustainability driver 1		CO2 emissions	Recycling/reuse	CO2 emissions	Direct costs	Direct costs	construction optimisation	CON	8
sustainability driver 2			Direct costs	Life Cycle Costs	Life Cycle Costs	Recycling/reuse	cold asphalt	CON	8
sustainability driver 3							concrete recycling	EOL	7
implementation level (x)	STA	LIM	STA	PIL	STA	STA	LLP	USE	7
constraint 1		Missing proof of equal performance to conventional pavement	Missing proof of equal performance to conventional pavement. Research projects to overcome the constraint.	Legal issues & concerns			construction time decrease	CON	6
constraint 2		Resistance to change	Technical regulations had to be changed.	No innovative procurement contracts available, restricted specifications			safety improvement	USE	6
constraint 3							NGCS	USE	5
incentive		financial bonus for higher %RA	Large stockpiles of RAP at the mixing plants				bio binder	CON	5
							production optimisation	CON	4
							EOL product optimisation	EOL	4
							tendering & sust. assessment	DSN	4
							permeable concrete	USE	2
							reducing cement content	CON	2
							embedded tags	USE	1
							climate change adaptation	USE	1
							NOX	USE	1
									198

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production & construction
use
EOL

50%
30%
20%

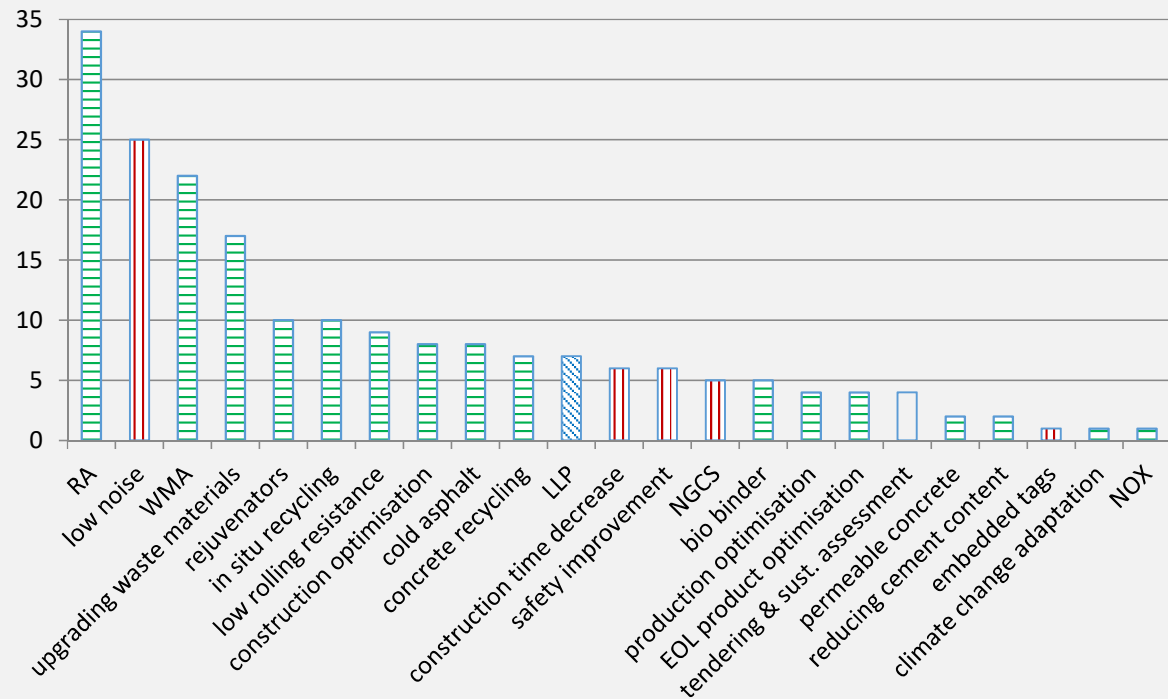


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eco
soc
fin

73%
22%
4%

survey responses



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Concluding ...

- GPTs gain interest
- 60% of cited GPTs related to asphalt
- most frequently cited : recycling asphalt, warm mix asphalt, low noise pavements
- construction stage vs use stage GPTs
- environmental vs societal & financial driver of GPTs

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Thanks to ...

- Interviewers
- Interviewed persons

