CAREC
Central Asia Regional Economic Cooperation Program

Highways Workshop

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Семинар по автомобильным дорогам

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Monitoring of Road Asset Management in the CAREC Region

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CURRENT KEY PERFORMANCE INDICATORS

Appendix 3: Outcome Level Indicators for CAREC Transport Sector

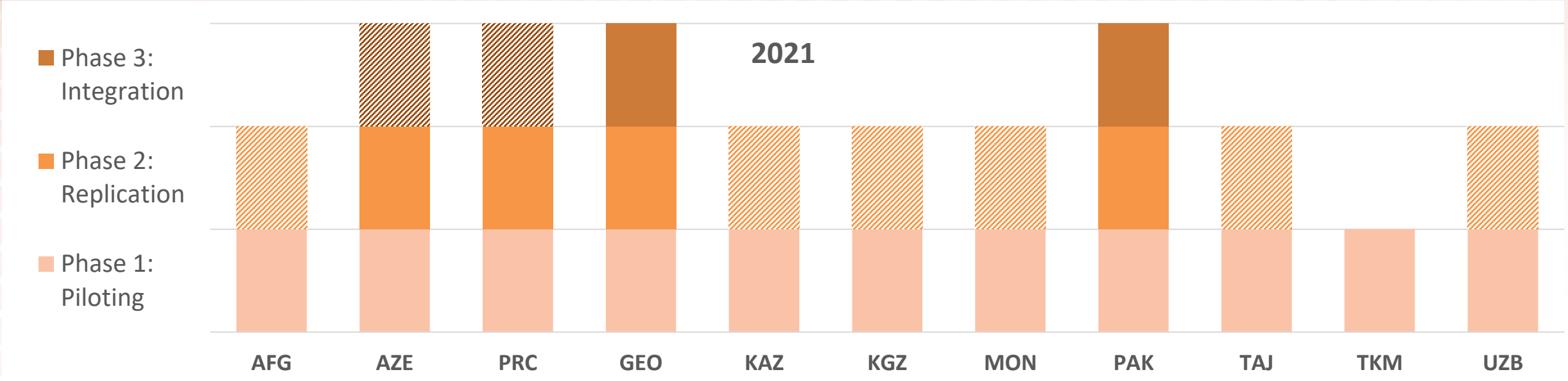
Pillar	Title	Outcomes	Indicators (Sources or Reports)
1	**Transport and Logistics Facilitation**	Efficiency improvements in border crossing points (BCPs), customs clearance, immigration procedures and cross-border logistics.	• Average speed by corridors, speed with delay (SWD) • Time and cost to clear a border crossing point, by corridor, country and BCP • Logistics Perception Index (LPI)
2	**Roads and Road Asset Management**	Improvement on the CAREC Road Asset Management (RAM) maturity model*	• 2019 (provisional): All countries at level 1 except Pakistan at level 3, for National Highway network (CAREC Transport Sector Progress Report) • Average speed of traffic without delay (SWOD), by corridors (CAREC CPMM) • Perception of highway quality improved (World Economic Forum Global Competitiveness Index) for selected countries
3	**Road Safety**	Reduction in the number of road crash fatalities on CAREC international road corridors	• By 2030: 50% reduction from 2010 figure (82,000 fatalities).
4	**Railways**	Improved service level and operation efficiency of railways	• CPMM average commercial speed, by CAREC corridor, SWD and SWOD • Perception of railway quality improved (World Economic Forum Global Competitiveness Index for railways) for selected countries
5	**Aviation**	Creation of a more open aviation market that catalyzes enhanced exchange and trade outcomes	• Number of CAREC country pairs achieving unrestricted third- and fourth-freedom rights • Number of CAREC countries adopting paperless e-freight systems for aviation • Number of countries with e-visa systems

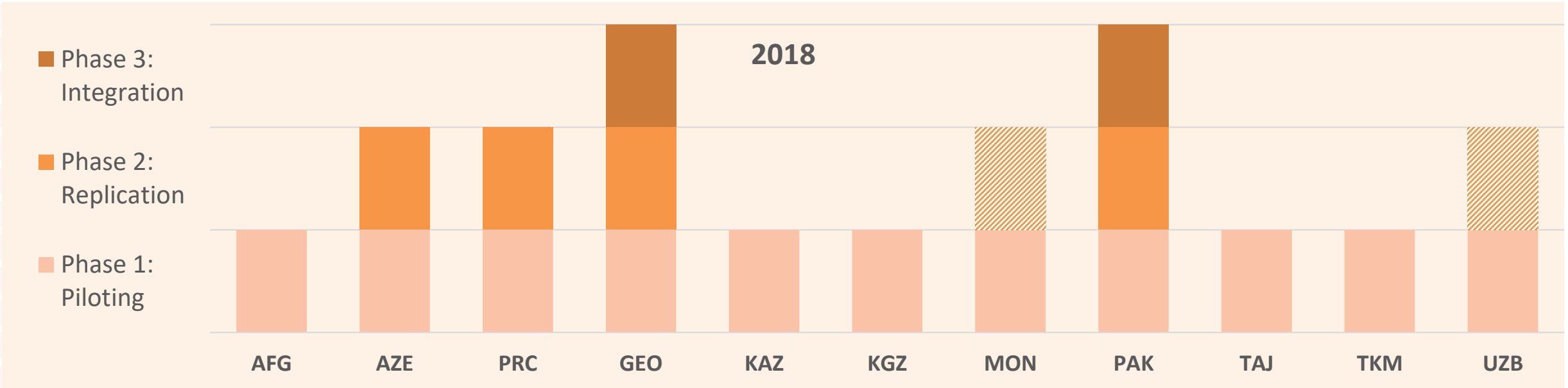
* RAMS maturity model (Phase 1 – RAMS at construction; Phase 2 – RAMS provides full inventory assessment, albeit it can be at the fixed time, not regularly updated, not used in full for decision making and financial planning; Phase 3 – continuous (periodic) monitoring of the road asset inventory, good cost models, cost/management accounting and planning, decisions and financial planning based on all well-known factors and clear performance targets).

CAREC = Central Asia Regional Economic Cooperation, CPMM = Corridor Performance Measurement and Monitoring.

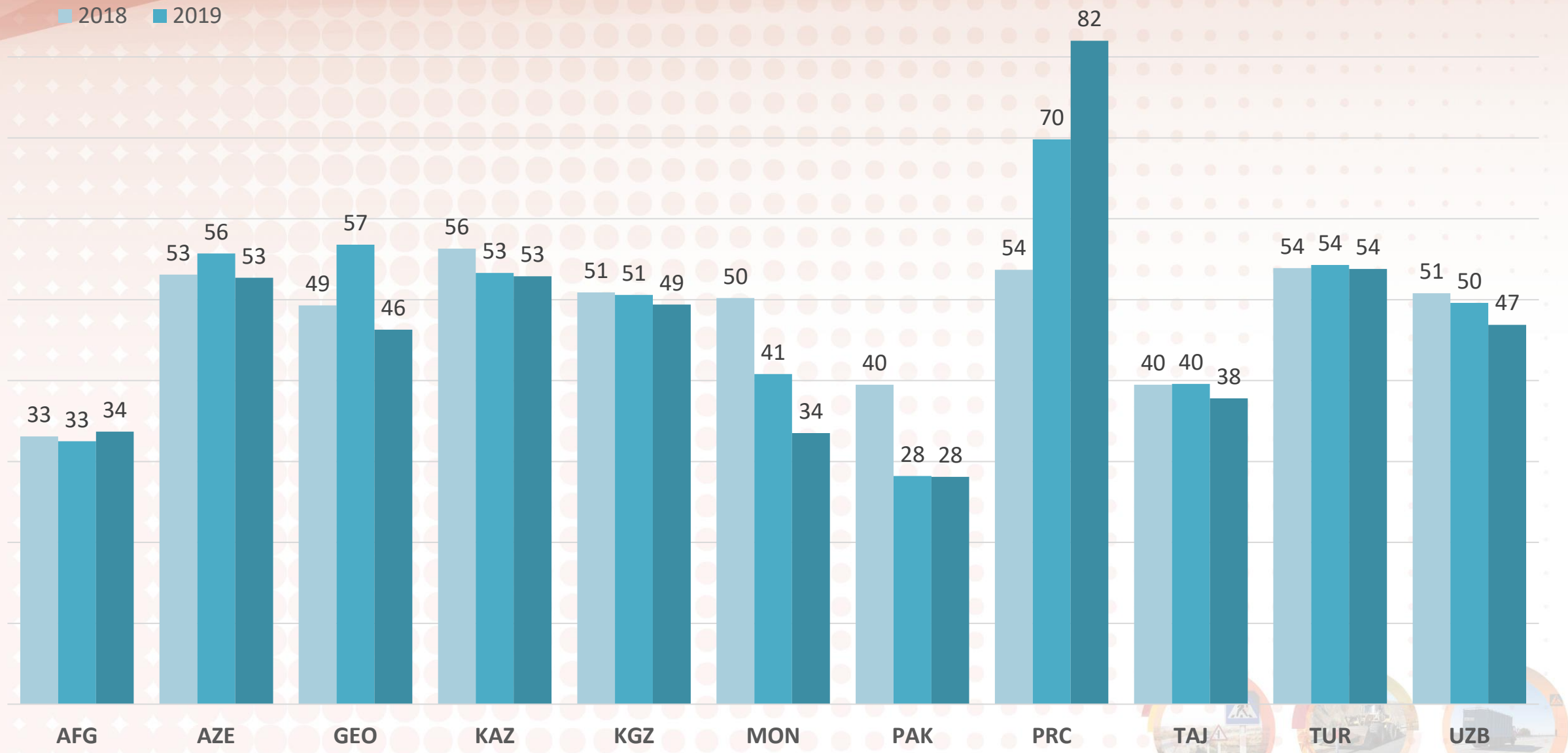
Source: CAREC Secretariat.

Outcome KPI-1: Maturity of Road Asset Management Systems (RAMS)





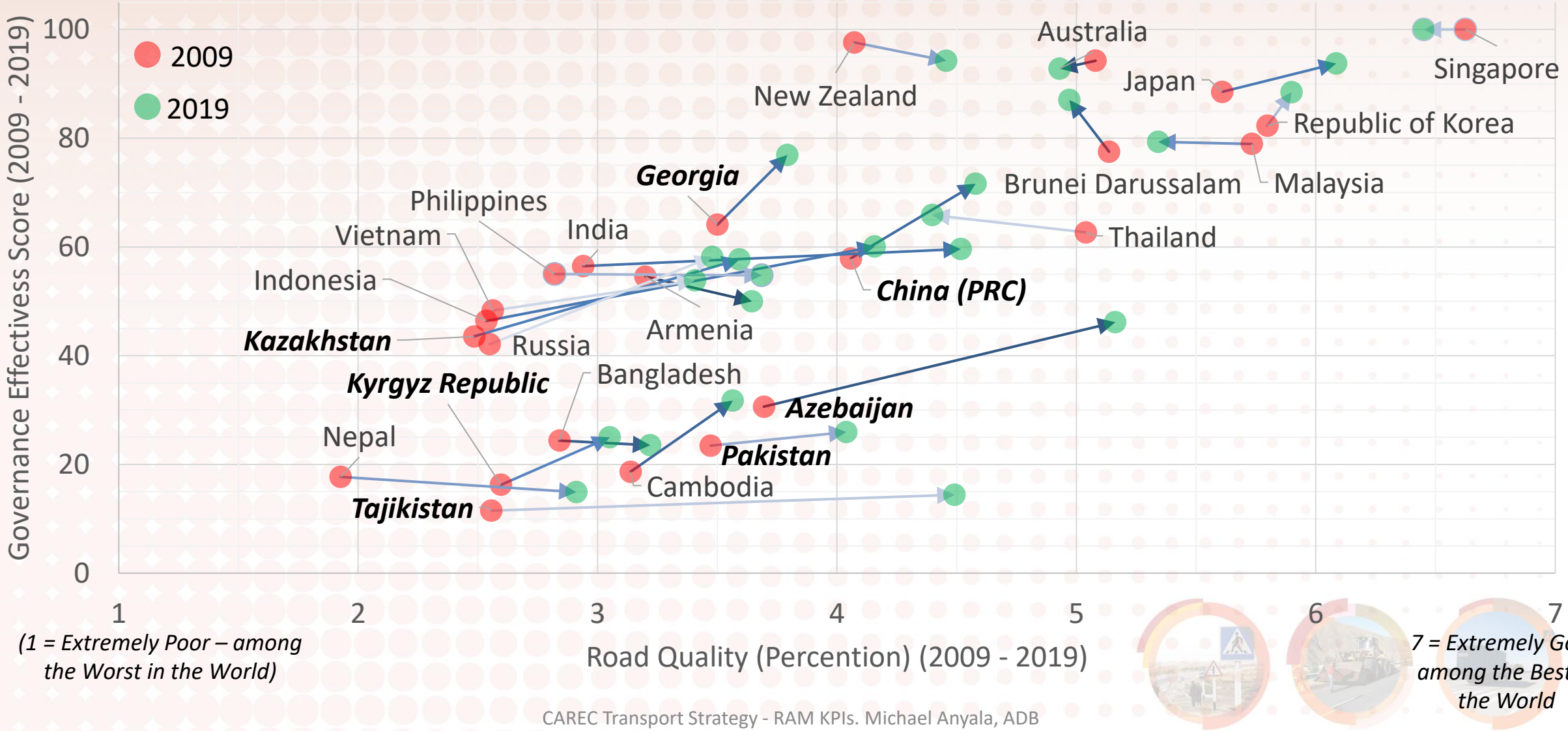
Outcome KPI-2: Average Speed of Traffic Without Delay



Source: CPMM Annual Report

Outcome KPI-3: Perception of Highway Quality Improved 2009 - 2019

(World Economic Forum Global Competitiveness Index)



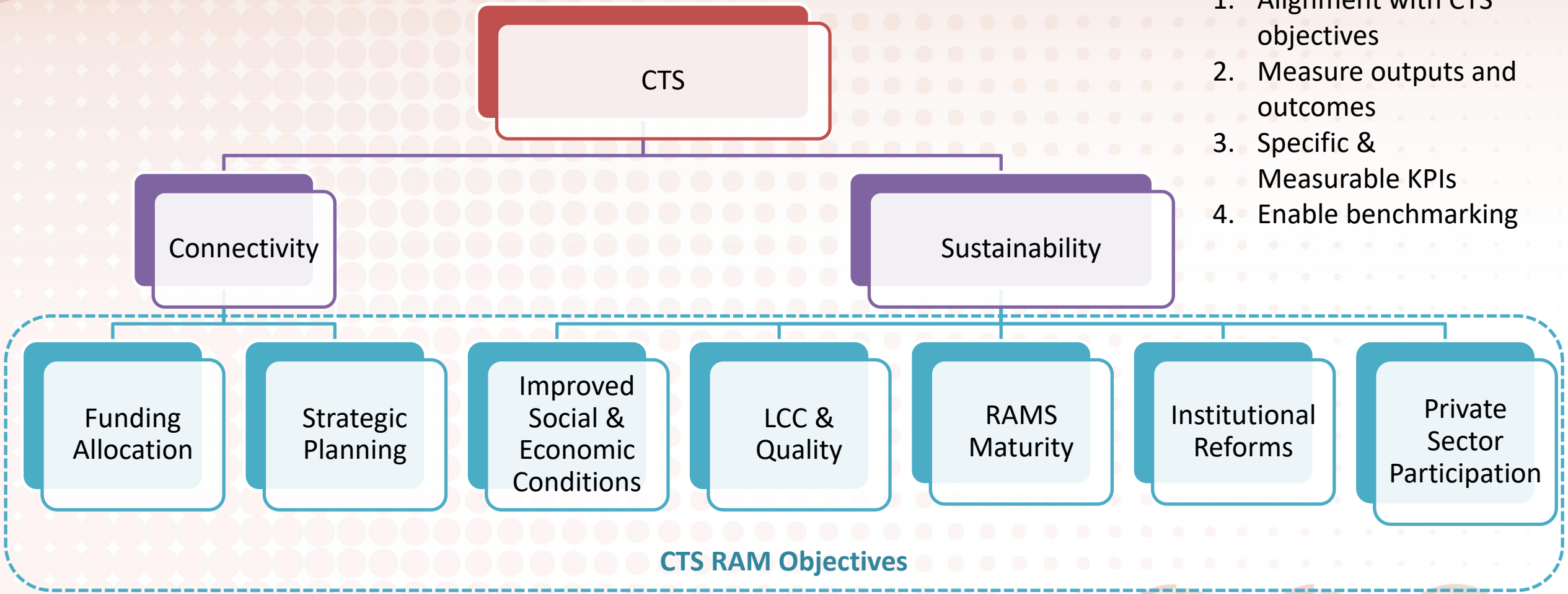
(1 = Extremely Poor – among the Worst in the World)

7 = Extremely Good among the Best in the World

PROPOSED KEY PERFOMANCE INDICATORS (DRAFT)

Structure of Proposed KPI's

1. Alignment with CTS objectives
2. Measure outputs and outcomes
3. Specific & Measurable KPIs
4. Enable benchmarking



LCC = Lifecycle Costing

Connectivity - Funding

No.	CTS RAM Objectives	Outcome/ Input	No.	Indicator	Measure	Essential or Desirable	Remarks
1.1	Sufficient allocation of funds for construction, rehabilitation, and maintenance of roads	Output	1.1.1	Adequacy of budget allocation for road construction	3-year rolling average total of annual budget allocated for construction of roads per km of road	Desirable	Trend is more interesting than the absolute value in any given year.
		Output	1.1.2	Adequacy of budget allocation for road rehabilitation	3-year rolling average total of annual budget allocated for rehabilitation of roads per km of road	Essential	
		Output	1.1.3	Adequacy of budget allocation for road maintenance	3-year rolling average total of annual budget allocated for the maintenance of roads per km of road	Essential	
		Output	1.1.4	Funds allocated for road construction as a proportion of GDP	Total annual funds allocated for road construction as a proportion of GDP	Desirable	
		Output	1.1.5	Funds allocated for road rehabilitation as a proportion of GDP	3-year rolling average total of annual budget allocated for rehabilitation as a proportion of GDP	Essential	
		Output	1.1.6	Funds allocated for road maintenance as a proportion of GDP	3-year rolling average total of annual budget allocated for the maintenance as a proportion of GDP	Essential	
		Outcome	1.1.7	Utilization of allocated funds	Proportion of allocated funds (for previous year) for construction, rehabilitation and maintenance of national and regional expended	Essential	

Connectivity - Strategy

No.	CTS RAM Objectives	Outcome / Input	No.	Indicator	Measure	Essential or Desirable	Remarks
1.2	Strategic long-term planning for development of the regional and national transport networks to meet growing social, economic, and trade connectivity needs	Output	1.2.1	Strategy for regional and national road network	Age of most recent strategy for development of regional and national road networks (if none then report as 20years)	Essential	The strategy includes documents such as a Road Master Plans, and should have a minimum future outlook of 20 years for the overall network development and at least a 10 year projection of network condition. There should be clear indication of support for the strategy by senior leadership.

Sustainability – Economic & Social (1)

No.	CTS RAM Objectives	Outcome/ Input	No.	Indicator	Measure	Essential or Desirable	Remarks
2.1	Improved economic and social conditions through better connectivity	Outcome	2.1.1	Length of network with paved road surface	Length (km) of road network with paved roads	Essential	Includes bitumen, asphalt, concrete, cobblestones etc.
		Outcome	2.1.2	Length of network with unpaved road surface	Length (km) of road network with unpaved roads	Essential	Includes gravel and earth roads.
		Outcome	2.1.2	Roughness of the paved road network – Good	Percent of paved network length with roughness below 4 IRI (m/km)	Essential	Only include data that is less than 2 years old
		Outcome	2.1.3	Roughness of the paved road network – Fair	Percent of paved network length with roughness below 4-6 IRI (m/km)	Essential	Only include data that is less than 2 years old
		Outcome	2.1.4	Roughness of the paved road network – Poor	Percent of paved network length with roughness below > 6 IRI (m/km)	Essential	Only include data that is less than 2 years old
		Outcome	2.1.5	Roughness of the paved road network – Unknown	Percent of paved network length with no roughness survey data	Desirable	Includes roads with no data and those where the most recent data is more than 2 years old.

Sustainability – Economic & Social (2)

No.	CTS RAM Objectives	Outcome / Input	No.	Indicator	Measure	Essential or Desirable	Remarks
2.1	Improved economic and social conditions through better connectivity	Outcome	2.1.6	Roughness of the unpaved road network – Good	Percent of unpaved network length with roughness below 6 IRI (m/km)	Desirable	Only include data that is less than 2 years old
		Outcome	2.1.7	Roughness of the unpaved road network – Fair	Percent of unpaved network length with roughness below 6-8 IRI (m/km)	Desirable	Only include data that is less than 2 years old
		Outcome	2.1.8	Roughness of the unpaved road network – Poor	Percent of unpaved network length with roughness below > 8 IRI (m/km)	Desirable	Only include data that is less than 2 years old
		Outcome	2.1.9	Roughness of the unpaved road network – Unknown	Percent of unpaved network length with no roughness survey data	Desirable	Includes roads with no data and those where the most recent data is more than 2 years old.
		Outcome	2.1.10	Percentage of travel on roads with roughness not greater than 4 IRI (m/km)	Percentage of travel on paved roads with roughness not greater than 4 IRI (m/km)	Essential	Based on vehicle-km travelled (vkt). In the absence of AADT data for all road links, representative AADT data can be assigned based on a group or class of roads.
		Outcome	2.1.11	Average speed of traffic without delay (SWOD), by corridors (CAREC CPMM)		Essential	CPMM = Corridor Performance Measurement and Monitoring.
		Outcome	2.1.12	Perception of highway quality improved (World Economic Forum Global Competitiveness Index)		Essential	

Sustainability – Lifecycle Costing & Quality

No.	CTS RAM Objectives	Outcome / Input	No.	Indicator	Measure	Essential or Desirable	Remarks
2.2	Strong focus on life-cycle costing and quality for more sustainable infrastructure investments	Output	2.2.1	Percentage of asphalt resurfacing	Percentage of the asphalt road network resurfaced within the past year	Essential	Includes asphalt, bitumen, surface dressing, chipseal and similar. Would expect a well maintained network to be in the vicinity of 10% per year, depending on traffic and environmental conditions.
		Output	2.2.2	Percentage of concrete road replacement	Percentage of concrete roads rehabilitated within the past year	Desirable	Would expect this to be in the vicinity of 2-4%, although a recent increase in concrete construction would reduce this figure.
		Output	2.3.1	Percentage of financed works program based derived from RAMS	Percentage (by length) of financed resurfacing and rehabilitation program predicted via HDM-4 or similar predictive tools within the past year. Comparison is between the approved road resurfacing and rehabilitation sites, and that generic from HDM-4 or similar. If not use is made of a pavement prediction tool, then report as 0%.	Essential	Indicator of whether there is a full RAM cycle in place in terms of data collection, decision making etc. Ideally this would be circa 80% plus.

Sustainability – Road Asset Management System

No.	CTS RAM Objectives	Outcome/ Input	No.	Indicator	Measure	Essential or Desirable	Remarks
2.3	Financing allocation based on robust analytical and decision support tools, such as the Road Asset Management System (RAMS)	Outcome	2.3.2	Maturity of Road Asset Management System	Level of maturity of Road Asset Management System assessed using CAREC RAMS Maturity methodology [Note in this context RAMS broadly pertains to the presence of an information management system (database), data collection and a pavement prediction tool.]	Essential	Measures progress in the implementation and institutionalization of good Road Asset Management Systems Assessment to be by an independent expert at least every 3 years. Interim updates could be self-assessment.

Sustainability – Asset Management Reforms

No.	CTS RAM Objectives	Outcome / Input	No.	Indicator	Measure	Essential or Desirable	Remarks
2.4	Institutional and procedural reforms for improved national road asset management	Outcome	2.4.1	Overall Road Asset Management Maturity	Road Asset Management Maturity assessed using ADB Road Asset Management Maturity framework. [Note: this assessment includes the full scope of RAM activities]	Essential	Maturity assessment across the full scope of RAM activities (not just RAMS IT component)
		Outcome	2.4.2	RAM Maturity Deficiency	Number of components in the maturity assessment where the current maturity is more than 1 below target maturity.	Essential	Based on the RAM Maturity assessment
		Outcome	2.4.3	RAM Improvement Plan	Percentage of target improvement actions completed on time within the past year. [note if there is no improvement plan, then report as 0%]	Essential	Improvement plan to be available for review.

Sustainability - Private Sector Participation

No.	CTS RAM Objectives	Outcome/ Input	No.	Indicator	Measure	Essential or Desirable	Remarks
2.5	Increased private sector participation in road operation and maintenance	Output	2.5.1	Percentage of network maintained by the private sector	Percentage of road length whereby the operation and maintenance is contracted to the private sector for delivery. [Note: this excludes public-private-partnerships and similar where long term concessions are in place]	Essential	
		Output	2.5.2	Percentage of overall budget going to the private sector	Includes construction, rehabilitation and maintenance activities.	Essential	
		Output	2.5.3	Number of performance-based road maintenance contracts	Length of road maintained under performance based contracts by the private sector	Essential	

Data Needs

- Accept not every country will be able to report every KPI initially
- Need to test the availability of the data and calculation methods in a number of CAREC countries prior to finalization.

Indicator	Budget				GDP	Road Length				Road Roughness	Traffic (AADT)	Speed Without Delay	Perception of highway quality	Resurfacing Program		Road Strategy
	Construction	Rehabilitation	Maintenance	Expended		Paved	Unpaved	Asphalt/Concrete	Total					Plan	Actual	
Adequacy of budget allocation for road construction	X								X							
Adequacy of budget allocation for road rehabilitation		X							X							
Adequacy of budget allocation for road maintenance			X						X							
Funds allocated for road construction as a proportion of GDP	X				X											
Funds allocated for road rehabilitation as a proportion of GDP		X			X											
Funds allocated for road maintenance as a proportion of GDP			X		X											
Utilization of allocated funds	X	X	X	X												
Strategy for regional and national road network																X
Length of network with paved road surface						X										
Length of network with unpaved road surface							X									
Roughness of the paved road network – Good						X				X						
Roughness of the paved road network – Fair						X				X						
Roughness of the paved road network – Poor						X				X						
Roughness of the paved road network – Unknown						X				X						
Roughness of the unpaved road network – Good							X			X						
Roughness of the unpaved road network – Fair							X			X						
Roughness of the unpaved road network – Poor							X			X						
Roughness of the unpaved road network – Unknown							X			X						
Percentage of travel on roads with roughness not greater than 4 IRI (m/km)						X				X	X					

Indicator	Road Length				Road Roughness	Traffic (AADT)	Speed Without Delay	Perception of highway quality	Resurfacing Program		Road Strategy	Maturity Assessments			Private Sector		
	Paved	Unpaved	Asphalt/Concrete	Total					Plan	Actual		RAMS	RAM	Improvement Plan	Road length	Value	PBCs
Average speed of traffic without delay (SWOD), by corridors (CAREC CPMM)							X										
Perception of highway quality improved (World Economic Forum Global Competitiveness Index)								X									
Percentage of asphalt resurfacing			X							X							
Percentage of concrete road replacement			X							X							
Percentage of financed works program based derived from RAMS									X	X							
Maturity of Road Asset Management System												X					
Overall Road Asset Management Maturity													X				
RAM Maturity Deficiency													X				
RAM Improvement Plan													X	X			
Percentage of network maintained by the private sector															X		
Percentage of overall budget going to the private sector																X	
Number of performance-based road maintenance contracts																	X

Summary and Next Steps

Summary
1. Transport Strategy has a lot of stated aims and objectives
2. A broad range of KPIs is appropriate to cover to measure achievement and enable benchmarking
3. Accept not every country will be able to report all measures initially

Next Steps
1. Consultation and pilot testing in selected countries
2. Finalize definition and details of KPIs
3. Prepare baseline report for the proposed KPIs

Thank You

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