Applying the Green Roads Toolkit for Tajikistan

Why we need to move to Green Roads?

Major force – should be for good

- **29 million km of roads in Asia and the Pacific region, with a forecast for 8 million km of new roads added from 2020-2030!**
- **1.8 Billion people in Asia who lack adequate road access**
- **Transport infrastructure investments required to develop, maintain and repair inland transport infrastructure in Asia and the Pacific region, from 2020 to 2030 estimated at 14.5 trillion USD.**

Why we need to move to Green Roads?

Major footprint

- **Road sector contributing 18% of global CO2 emissions. Emissions in Asia growing a twice the global average**
- **Circularity: road sector using 20-30% of all construction material, including scarce resources.**
- **Roads cause 12-40% of sedimentation in basin – and major affect on hydrology**
- **Particulate matter emissions from roads increase 5-10% this decade**
- **In Asia 10 million healthy live years lost because traffic noise**
- **Major impact on biodiversity (dissected habitats and road kills)**

Why we need to move to Green Roads?

Yet we can:

- **mitigate and compensate the negative impacts**
- **even turn roads into nature-positive for example in water management, local climate and biodiversity, public health and quality of life**

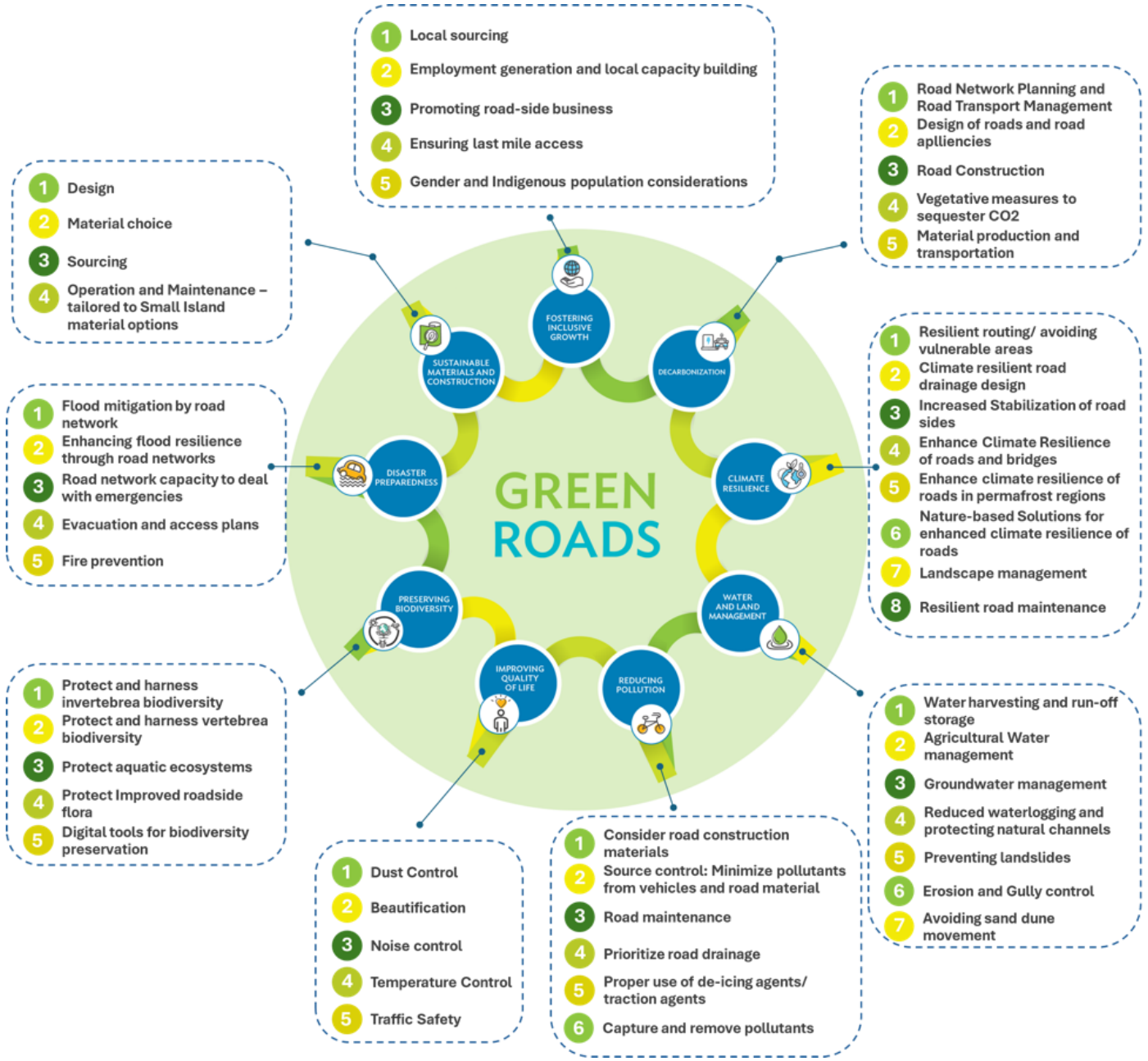
We need to apply best Green Road practices in:

- ✓ Decarbonization
- ✓ Climate resilience/ adaptation
- ✓ Water and land management,
- ✓ Reducing pollution,
- ✓ Improving quality of life,
- ✓ Preserving biodiversity,
- ✓ Disaster preparedness,
- ✓ Sustainably sourcing materials,/ circularity
- ✓ Fostering inclusive growth.

What is the Green Roads toolkit?

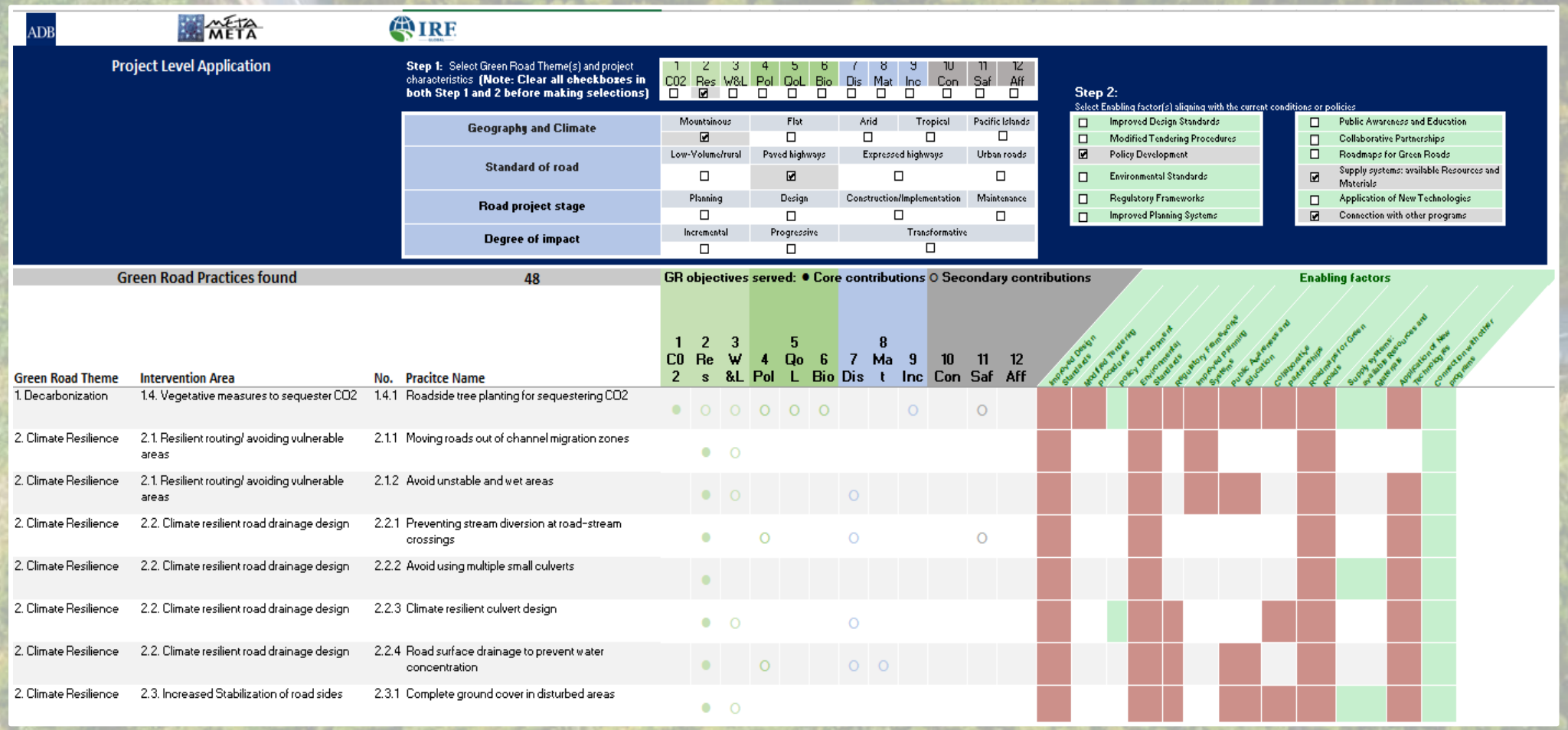
- **A tool for maximizing benefits: Focuses on making road projects better while reducing any harm – used in preparation and implementation of ADB Transport Programs**
- **A Large and Growing Collection of Best Practices: Green Roads practices that can be applied to road management, planning, design, construction, and asset management**
- **Easy to Search: Organized into nine green themes and can be filtered by different categories.**
- **Includes additional helpful tools: Comes with checklists and other tools, including assessment of enabling framework**

Green Roads Toolkit



META

Green Roads Toolkit: Generating overview of relevant best practices



ADB META IRF

Project Level Application

Step 1: Select Green Road Theme(s) and project characteristics **(Note: Clear all checkboxes in both Step 1 and 2 before making selections)**

1 CO2	2 Res	3 W&L	4 Pol	5 QoL	6 Bio	7 Dis	8 Mat	9 Inc	10 Con	11 Saf	12 Aff
☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Geography and Climate	Mountainous ☑	Flat ☐	Arid ☐	Tropical ☐	Pacific Islands ☐
Standard of road	Low-Volume/rural ☐	Paved highways ☑	Expressed highways ☐	Urban roads ☐	
Road project stage	Planning ☐	Design ☐	Construction/Implementation ☐	Maintenance ☐	
Degree of impact	Incremental ☐	Progressive ☐	Transformative ☐		

Step 2:
Select Enabling factor(s) aligning with the current conditions or policies

☐ Improved Design Standards	☐ Public Awareness and Education
☐ Modified Tendering Procedures	☐ Collaborative Partnerships
☑ Policy Development	☐ Roadmaps for Green Roads
☐ Environmental Standards	☑ Supply systems: available Resources and Materials
☐ Regulatory Frameworks	☐ Application of New Technologies
☐ Improved Planning Systems	☑ Connection with other programs

Green Road Practices found 48

GR objectives served: ● Core contributions ○ Secondary contributions

Green Road Theme	Intervention Area	No.	Pracitce Name	1 CO2	2 Res	3 W&L	4 Pol	5 QoL	6 Bio	7 Dis	8 Mat	9 Inc	10 Con	11 Saf	12 Aff
1. Decarbonization	1.4. Vegetative measures to sequester CO2	1.4.1	Roadside tree planting for sequestering CO2	●	○	○	○	○	○			○		○	
2. Climate Resilience	2.1. Resilient routing/ avoiding vulnerable areas	2.1.1	Moving roads out of channel migration zones		●	○									
2. Climate Resilience	2.1. Resilient routing/ avoiding vulnerable areas	2.1.2	Avoid unstable and wet areas		●	○				○					
2. Climate Resilience	2.2. Climate resilient road drainage design	2.2.1	Preventing stream diversion at road-stream crossings		●		○			○				○	
2. Climate Resilience	2.2. Climate resilient road drainage design	2.2.2	Avoid using multiple small culverts		●										
2. Climate Resilience	2.2. Climate resilient road drainage design	2.2.3	Climate resilient culvert design		●	○				○					
2. Climate Resilience	2.2. Climate resilient road drainage design	2.2.4	Road surface drainage to prevent water concentration		●		○			○	○				
2. Climate Resilience	2.3. Increased Stabilization of road sides	2.3.1	Complete ground cover in disturbed areas		●	○									

Enabling factors: Improved Design Standards; Modified Tendering Procedures; Policy Development; Environmental Standards; Regulatory Frameworks; Improved Planning Systems; Public Awareness and Education; Collaborative Partnerships; Roadmaps for Green Roads; Supply systems: available Resources and Materials; Application of New Technologies; Connection with other programs

GREEN ROADS TOOLKIT

Download the Green Roads Toolkit

SCAN ME

Example of practice documentation

2.4.1.	Staying Current on Road Maintenance
Description	Many roadway drainage problems occur because of lack of maintenance, where ruts form or a road is flat, concentrating water, and leading to erosion and formation of gullies. Culverts that are not cleaned lead to plugging and then damage to re roadway from local flooding. Raveling of a road surface can be a safety problem, as well as dust problems and loss of valuable roadway materials

Area of applicability

Geography and Climate	Mountainous	Flat	Arid	Tropical	Pacific Islands
	x	x	x	x	x

Standard of road	Low-Volume/rural	Paved highways		Expressed highways	Urban roads
	x	x		x	x

Road project stage	Planning	Design	Construction/Implementation	Maintenance
	x			x

Degree of impact	Incremental	Progressive	Transformative
	x		

Green Road objectives served

1 C02	2 Res	3 W&L	4 Pol	5 QoL	6 Bio	7 Dis	8 Mtl	9 Inc	10 Con	11 Saf	12 Aff
	●	○					○				

Details of the good practice, incl. examples

Road maintenance is a fundamental part of road management so planned ongoing and recurrent maintenance is a must. Additionally, some maintenance items are occasional and may be in the category of deferred maintenance. A road maintenance plan needs to be developed and executed.

Road maintenance typically includes grading and reshaping the road surface, cleaning ditches, clearing brush for sight distance, cleaning culverts, filling potholes, painting or replacing signs, replacing riprap armoring, and periodically surface treatments such as seal coats.

Environmentally Sensitive Maintenance is a concept used today to accomplish needed timely maintenance but also to not create environmental problems by excessive grading, removal of too much vegetation, or conducting maintenance at a time harmful to wildlife.

Maintenance can be accomplished in a variety of ways, including contracts, Performance based contracts, force account teams, micro-enterprises, or community-based maintenance. All have advantages and disadvantages, but the key is that some maintenance scheme is set up for every road network. Ideally a maintenance group will consist of some mechanized equipment, (such as a grader, compactor, water, and dump trucks, backhoe), and hand laborers to do brushing, pothole filling, culvert cleaning, etc. A road should not be built unless a guaranteed maintenance plan is in place!!

Photos/Graphics

LACK OF MAINTENANCE ON ROADS AND CULVERTS

HAND AND MACHINE MAINTENANCE WORK ALONG A ROAD

Enabling factors

Improved Design Standards	x	Public Awareness and Education:	
Modified Tendering Procedures	x	Collaborative Partnerships	x
Policy Development		Roadmaps for Green Roads	x
Environmental Standards	x	Supply systems: available Resources and Materials	x
Regulatory Frameworks		Application of New Technologies	x
Improved Planning Systems	x	Connection with other programs	x

Costs/Benefits

Maintenance costs will vary widely, depending on how the work is done, geographic location, and work needed. Whatever the cost, the initial investment in a road will be lost if the road is not maintained. Deterioration curves on asphalt roads show the significant benefits of early and periodic maintenance.

Remarks/Further reading or viewing/References

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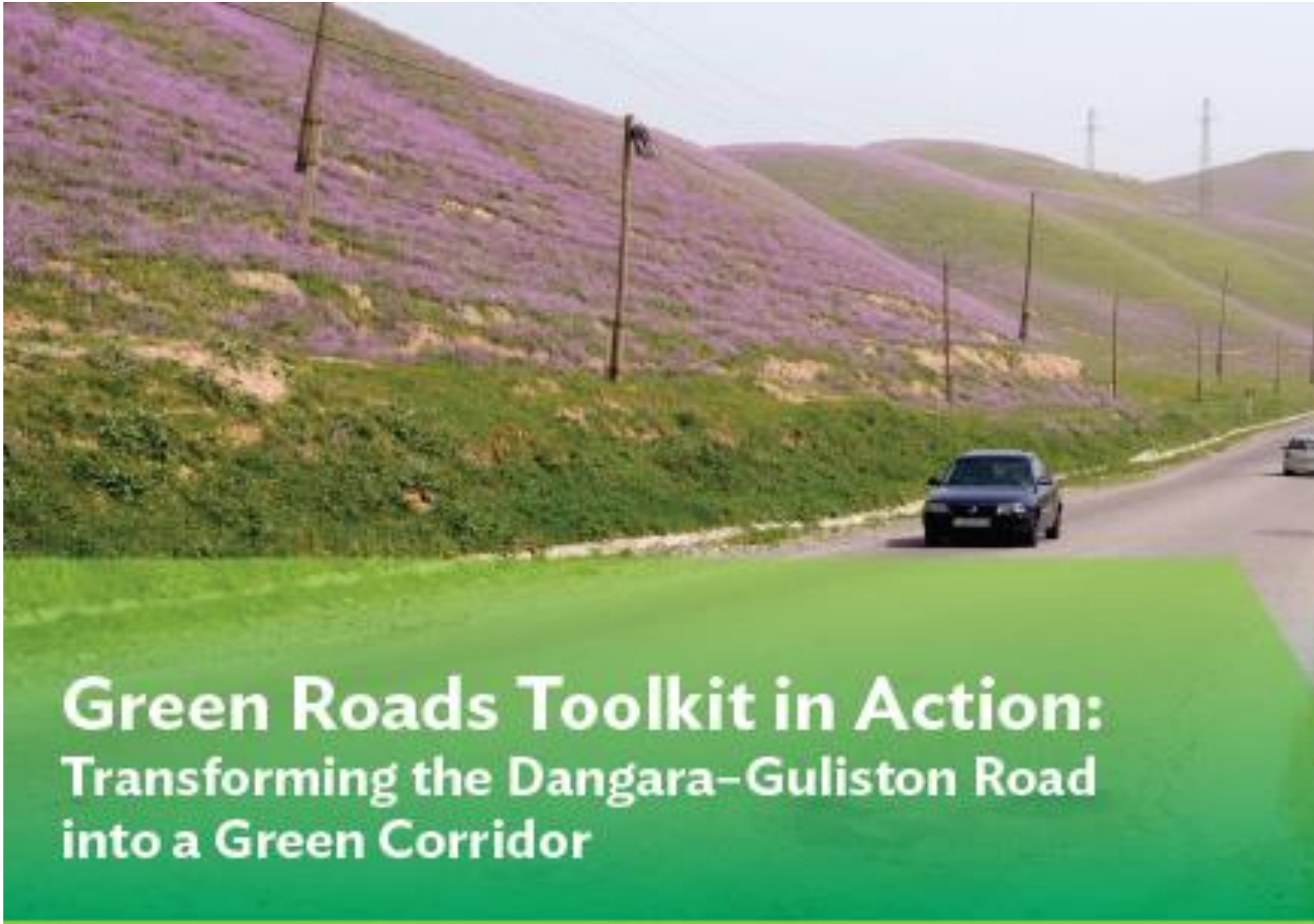
World Bank 2010. Highway Development and Management Model-HDM-4, The World Bank Washington, DC. (Available at: http://www.worldbank.org/transport/roads/rd_tools/hdm4.htm)



Green Roads Toolkit in Action:

Transforming the Dangara–Guliston Road into a Green Corridor