

An aerial photograph showing a two-lane asphalt road that curves through a vast, dense forest. The trees are a mix of green and yellowish-green, suggesting a temperate climate. The road has white lane markings and a small blue car is visible in the lower curve. The overall scene is lush and green.

Green Roads Toolkit

Why is the Green Roads Toolkit essential?

- **29 million km** of roads in Asia and the Pacific region, with a forecast for **8 million km** of new roads by 2030!
- **0.4 Billion people** in Asia lack adequate road access.
- **\$520 billion annual** cost of transportation infrastructure
- **36 Billion Tons of CO2** emitted into the atmosphere annually, with the road sector contributing **18% of global CO2 emissions** !

Enormous footprint of roads:

The unified MDB commitment to Paris align operations requires the move from roads to green roads regular

We need 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,
- ✓ Fostering inclusive growth.



What is the Green Roads toolkit?

- **A tool for maximizing benefits** : Focuses on making road projects better while reducing any harm.
- **A Collection of Best Practices** : Includes 150 different 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
- **Customizable Use** : Designed to support the creation of tailored road programs that promote sustainability

Each Practice documentation

includes:

- Description
- Details of the practice
- Examples/illustrations/photos
- **Enabling factors**
- Costs and benefits
- References

How each practice was documented:

- Generated from project experiences worldwide
- Informed by expert judgment
- Collected through open calls for good practices
- Supported by the Community of Practice

Calling for Good Green Road Practices

Key Points

- Roads play a pivotal role in our daily lives, connecting people, goods, and services.
- However, roads and the vehicles that use them also have significant environmental and social impacts, such as contributing to CO2 emissions and affecting landscapes, water resources, habitats, and micro-climates.
- We need to reimagine roads as sustainable and eco-friendly elements of our landscape.

Project information

MetaMeta Research and the International Road Federation have been assigned by the Asian Development Bank to develop a Green Roads Toolkit, which will be used for planning and preparing future road project investments. The Green Roads toolkit will go beyond the current hallmark of conventional roads, where connectivity, safety, and affordability are the main dimensions to incorporate green road elements and ensure roads are in compliance with different conventions, such as the Paris Agreement, Biodiversity Convention, and the Sustainable Development Goals (SDGs) among others.

Contribute to transforming roads into sustainable, climate-resilient, and eco-positive 'Green Roads'

How to participate

Step 1
Read the call carefully at www.greenroadsforwater.org/...

Step 2
Submit your application by completing the form at www.greenroadsforwater.org/...

Step 3
Win a signed copy of a newly published book on Road Ecology and support from the project team.

Logos: ADB, META META, IRE GLOBAL

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 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	<table border="1"> <tr> <th>Geography and Climate</th> <th>Mountainous</th> <th>Flat</th> <th>Arid</th> <th>Tropical</th> <th>Pacific Islands</th> </tr> <tr> <td></td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> </tr> </table>	Geography and Climate	Mountainous	Flat	Arid	Tropical	Pacific Islands		x	x	x	x	x												
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<table border="1"> <tr> <th>Road project stage</th> <th>Planning</th> <th>Design</th> <th>Construction/Implementation</th> <th>Maintenance</th> </tr> <tr> <td></td> <td>x</td> <td></td> <td></td> <td>x</td> </tr> </table>	Road project stage	Planning	Design	Construction/Implementation	Maintenance		x			x															
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Details of the good practice, incl. examples	<p>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.</p> <p>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.</p> <p>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.</p> <p>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!!</p>																								

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

Douglas, R. 2015. Low-Volume Road Engineering: Design, Construction, and Maintenance. CRC Press, Taylor & Francis Group. ISBN: 978-1-4822-1263-1. 326 p.

Gesford, A; Anderson, J. 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. PA-2006-001-CP-83043501-0, Pennsylvania State Center for Dirt and Gravel Roads Studies, in cooperation with Commonwealth of Pennsylvania, Pennsylvania DOT, & EPA. Harrisburg, PA.
<http://www.epa.gov/owow/nps/sensitive/sensitive.html>

Giummarra, G., Editor. 2009. Unsealed Roads Manual: Guidelines to Good Practice, Third Edition. Australian Roads Research Board (ARRB Group Ltd.). Vermont South, Victoria, Australia. A useful manual for gravel road design and maintenance, particularly in semi-arid regions.
<http://www.arrb.com.au/admin/file/content13/c6/LocalRoadsNews69.pdf>

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)

Toolkit's Application in Tajikistan

Recommendations:

- **Decarbonization Initiatives:** Reuse existing materials, implement energy -efficient lighting, and develop international climate financing application for a re -forestation project along the national road corridors
- **Climate Resilience Measures:** bio -engineering and improved drainage systems to enhance the road's ability to withstand climate -related impacts
- **Water Management Improvements :** mudflow control and exploration of water harvesting/reuse options to optimize resource management
- **Pollution Control and Biodiversity Protection:** Safe decommissioning of petrol stations and introduction of underpasses to facilitate cattle and wildlife movements



Green Roads Webinar Series



DISABILITY-INCLUSIVE AND GENDER-RESPONSIVE TRANSPORT

ADB's Transport Sector Office, together with the Gender Equality Division and the Human and Social Development Sector Office, will host a webinar on Gender Responsive and Disability Inclusive Transport this 5 December to mark the International Day for People with Disabilities.

The webinar will explore the barriers people with disabilities face in accessing transport systems and examine how to identify address those barriers through including women and people with disabilities in the design, implementation and monitoring of transport systems projects.



ANTONI TSAPUTRA
Consultant
Disability Inclusion Expert, ADB



JOANNA ROGERS
Consultant
Disability Inclusion Expert, ADB



PRABHJOT REHAN KHAN
Senior Social Development Specialist
Gender Equality Division, ADB



CLAIRE CHARAMNAC
Social Development Specialist
Gender Equality Division, ADB

Join via Zoom
bit.ly/4fT9DL7

Thursday, 5 December 2024 | 2:00-3:00 p.m. Manila time (GMT+8)

Green Roads Webinar Series



GREENING ROAD CONSTRUCTION USING LOW-CARBON CONCRETE AND 3D PRINTING

There is still room to reduce the emission of carbon dioxide and the workload throughout road life, even during construction works. Researchers are working on innovative approaches possibly applicable at steps during construction works, such as civil works material production and construction techniques.

This webinar will showcase the Taisei Corporation's recent development of low-carbon concrete using byproducts and 3D printing methods being used for concrete structures. The company has just started to use the technologies at actual project sites in Japan, exploring the applications to other countries. The speakers will present how those methods were produced and are being applied at worksites as well as the impacts of GHG emissions and workload reductions, and discuss their potential uses in future road development projects in the world.



Shigeyoshi MIYAHARA
Taisei Corporation, Advanced Center of Technology



Koji KINOMURA
Taisei Corporation, Advanced Center of Technology

Join via Zoom
bit.ly/4g4ScaT

Thursday, 12 December 2024 | 2:00-3:00 p.m. Manila time (GMT+8)

Knowledge Sharing

GREEN ROADS TOOLKIT

Download the Green Roads Toolkit



SCAN ME



Join the Green Roads Community of Practice

The Asian Development Bank (ADB) has initiated a green roads initiative by partnering with MetaMeta and the International Roads Federation (IRF Global) to create a Green Roads Toolkit. This comprehensive resource is designed to guide sustainable road development and operations, covering nine key dimensions: decarbonization, climate resilience, water and land management, pollution control, enhancing quality of life, biodiversity conservation, disaster preparedness, sustainable material sourcing, and fostering inclusive economic growth. Accessible via the ADB website, this toolkit serves as a vital resource for stakeholders in the road sector. The Community of Practice offers a platform for professionals and practitioners to exchange insights, successful strategies, and expertise on green roads.

Webinar Recordings in YouTube



Green Roads Series



An aerial photograph of a winding asphalt road cutting through a dense, lush green forest. The road curves from the top left towards the bottom right. A small car is visible on the road. The entire image is overlaid with a semi-transparent blue filter. The text "Thank you" is centered in the middle of the image in a light green, sans-serif font.

Thank you