global Transport Knowledge Partnership

ADB Transport Forum 2010
Pathways to Sustainable Transport

Low Cost Surfacing and Pavements South East Asia

Dr Jasper Cook
OtB Engineering LLP

jcook@otbeng.com

This presentation is based on the outcomes of Low Volume Rural Road (LVRR) practical research in Vietnam, Lao and Cambodia since 2001.

Over 200km of trial pavements (140km in Vietnam) with 150 monitored sections (100-200m)

This work funded by DfID, World Bank and ADB is continuing in Vietnam under the World Bank RTP3 programme.

Strategic Outcomes

In the highly variable road environments of S E Asia unsealed gravel surfacing is not sustainable either in engineering or in economic terms

There are now proven regional alternatives to unsealed gravel surfacing that that are sustainable in engineering and economic terms

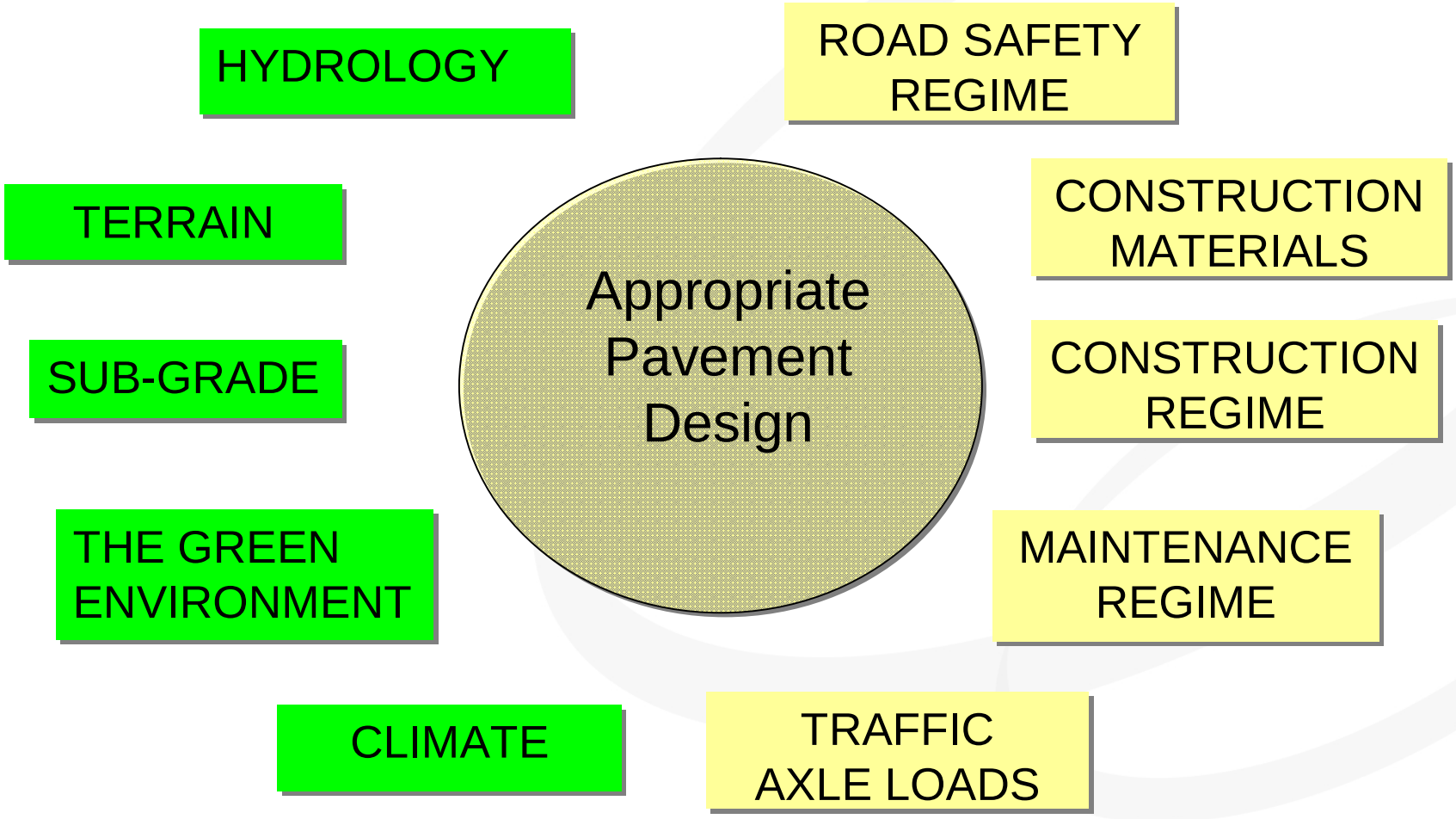
LVRR Sustainability Issues

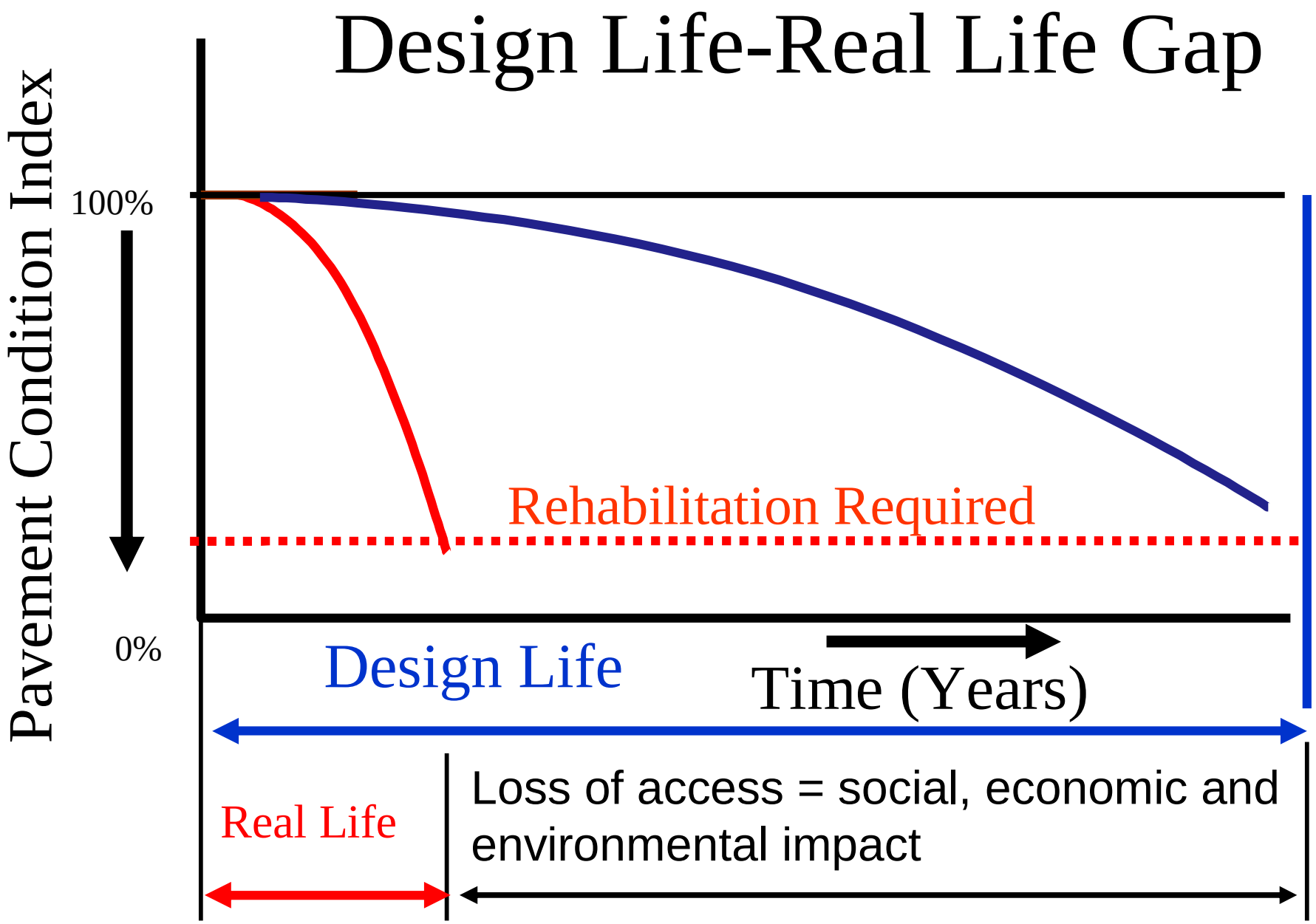
Task based – that they suit the road function and its traffic (people as well as the vehicles)

Local resource based and compatible with the engineers who design the roads, the contractors who construct them, the communities that maintain them and the available construction materials.

Economically sustainable – they must not exhaust the provincial and district budgets or place excessive maintenance burdens on local communities.

Taking Account of the Road Environment is Essential

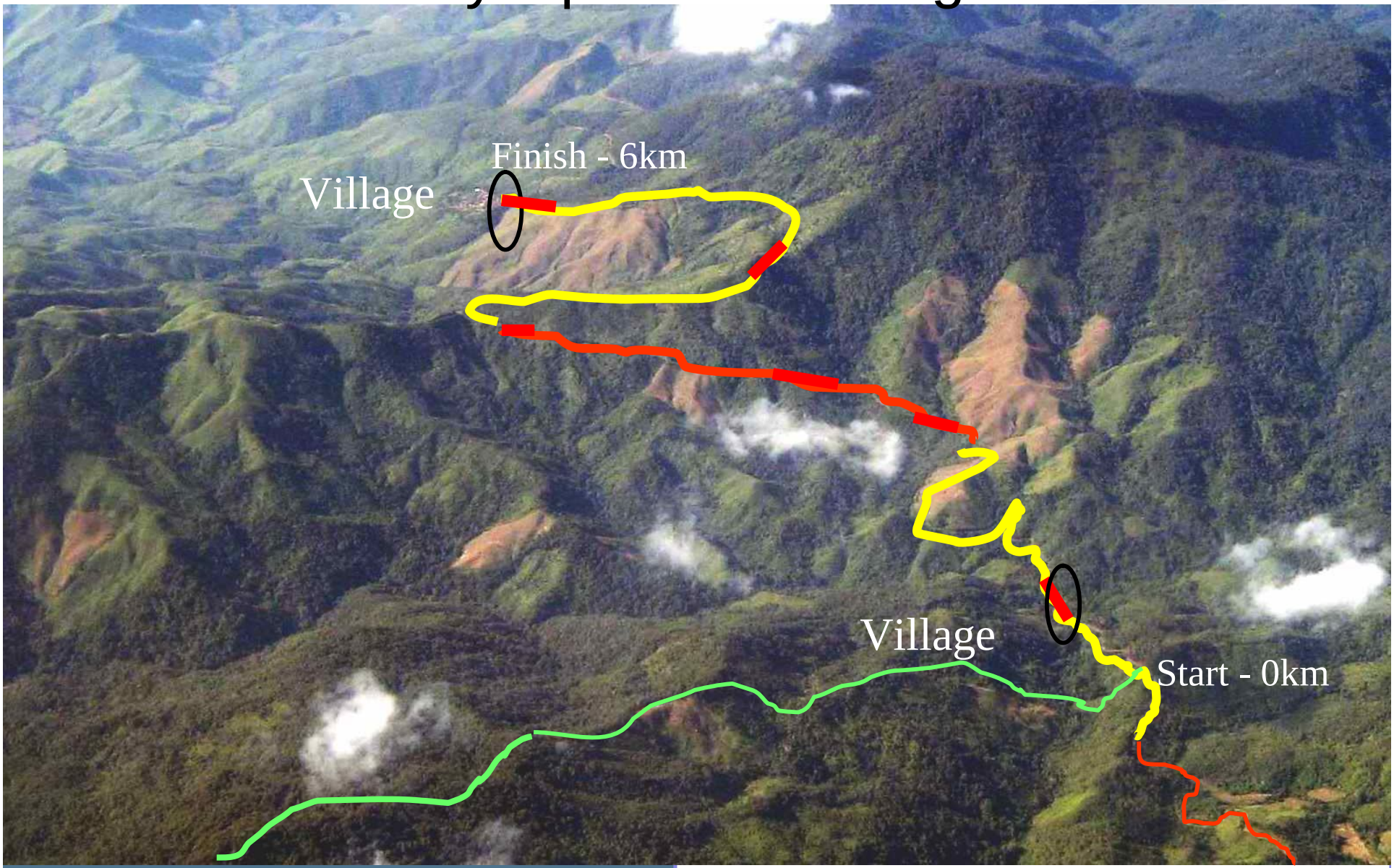



Design Life-Real Life Gap
Pavement Condition Index
100%
0%
Rehabilitation Required
Design Life
Time (Years)
Real Life
Loss of access = social, economic and environmental impact

Whole-life Asset Costing

Class	A1	Region	North region
Axle Load:	6T	Gradient condition:	4-6%
Subgrade	7% CBR	Annual rainfall:	>2000mm
Terrain	High Hill	Flood condition:	Annual but small
Option			WLC: NPV
		Construction	Total cost
		Cost	(Yrs 1-10)
Sealed Armoured Gravel		3.1xG	4.5xG
Unsealed Gravel		G	6xG
Sealed Dry Bound Macadam		4xG	4.4xG
Sealed Gravel		2xG	5xG

Environmentally Optimised Design: EOD



Knowledge Gap at the “Front Line” of LVRR Engineering

Recent work has confirmed that there is a critical shortfall in the application of recent LVRR research at provincial level and below.

At the same time there is still a need to disseminate outside the Engineering Box at policy and strategic decision making levels

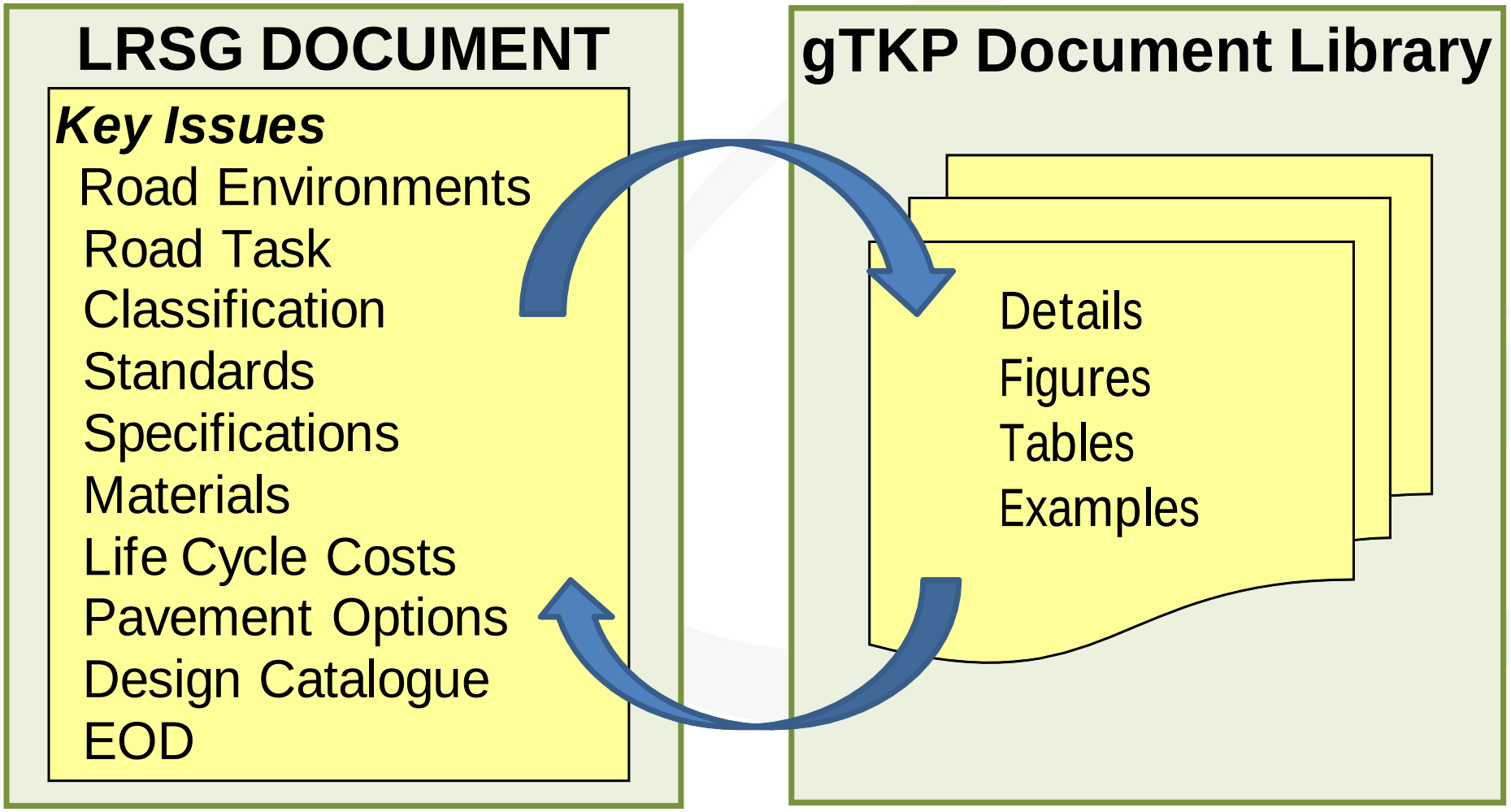
The Low-volume Road Surfacing Guideline – (LRSG)

A detailed global guide to best practice for LVRR pavements is not a practicable approach.

The strategy adopted for the LRSG is to draft a clear and practical web-based framework to be used by road practitioners for the development of best practice ***within their specific region of interest.***

The LRSG Framework

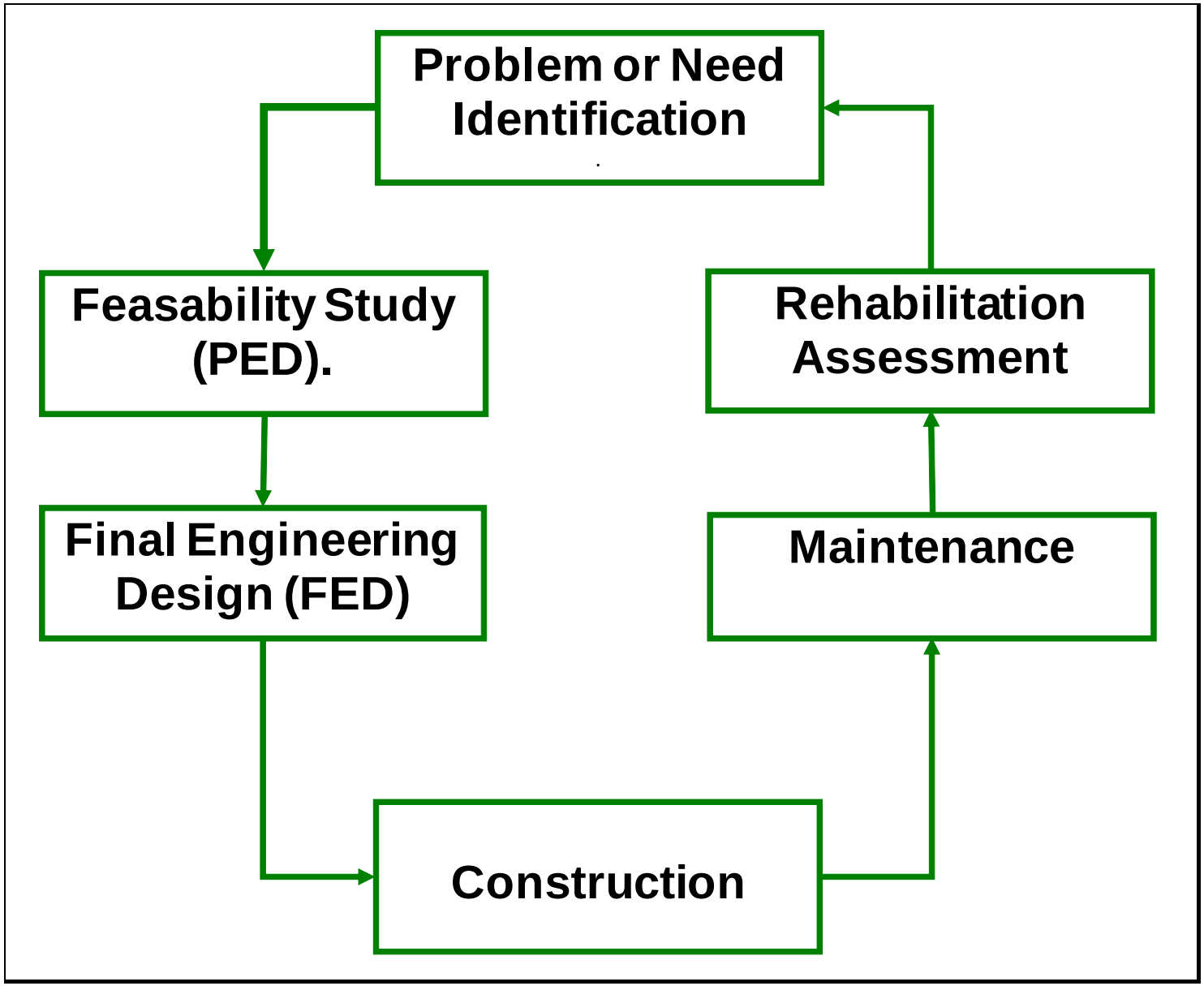
Guideline currently in preparation



The LRSG Knowledge Base

The guideline will encompass the lessons from the design, construction, supervision and monitoring of a range of surface and paving types trialled and investigated in the Cambodia, Laos and Vietnam SEACAP projects, together with the knowledge compiled in other relevant programmes outside S E Asia

The Whole Life Asset Cycle



Phased Approach to Pavement Selection and Design

Phase I
Selection of appropriate general pavement type or types

Phase II
Detailed design of selected option

But **Additional broad-based support is essential**

gTKP global Transport Knowledge Partnership

otb Outside the box solutions in civil engineering