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HDM-4

HIGHWAY DEVELOPMENT & MANAGEMENT

WORLD ROAD ASSOCIATION MONDIALE DE LA ROUTE

Overview of HDM-4 and main improvements in Version 2

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Background & Overview

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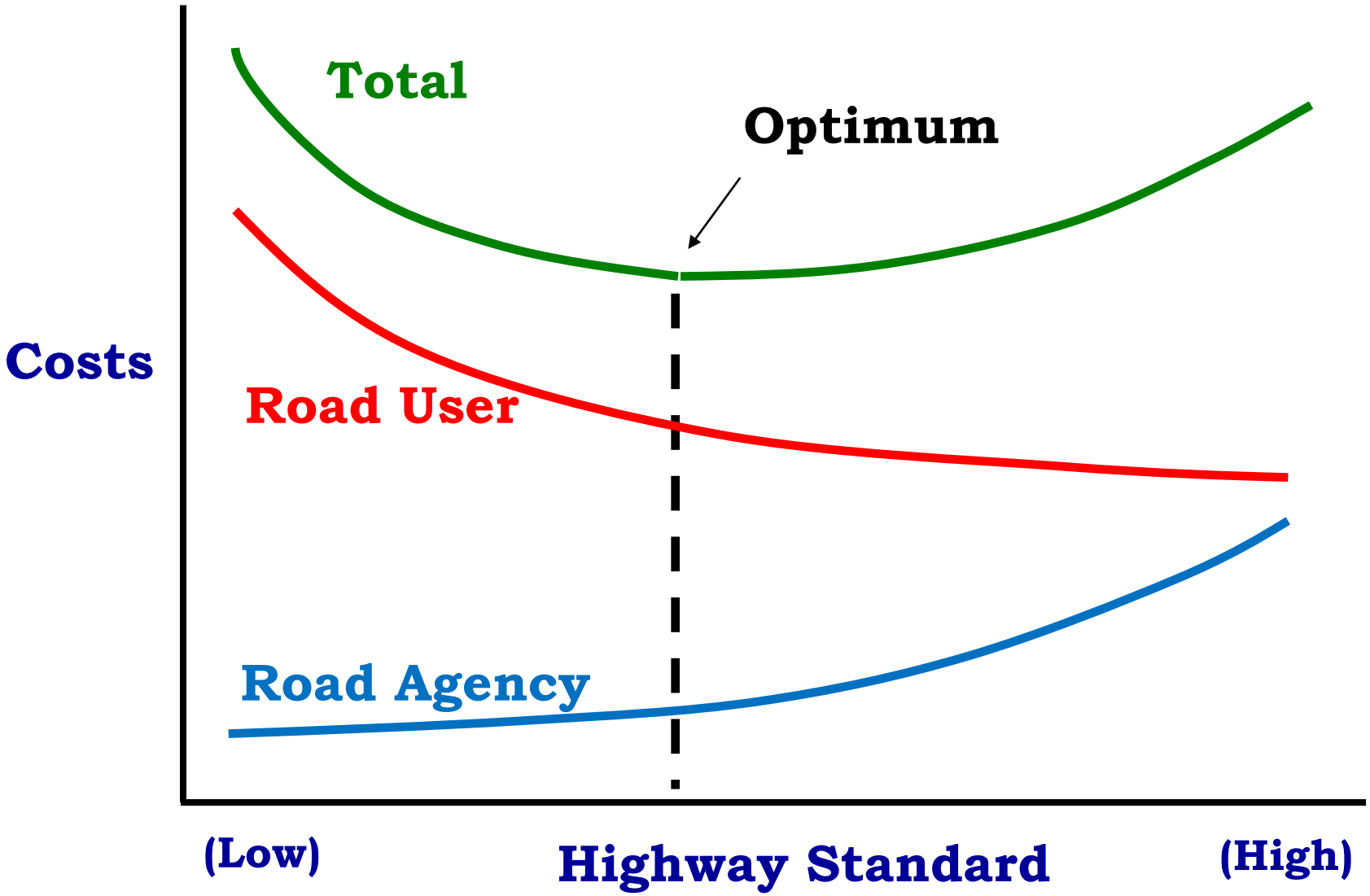
What is Highway Management ?

When using HDM-4 what do we understand by 'Highway Development and Management"

- **Purpose:**
  - To optimise the overall performance of the network over time in accordance with POLICY OBJECTIVES and within budgetary constraints
- **Typical objectives:**
  - Minimise transport costs
  - Preserve asset value
  - Provide and maintain accessibility
  - Provide safe and environmentally friendly transport

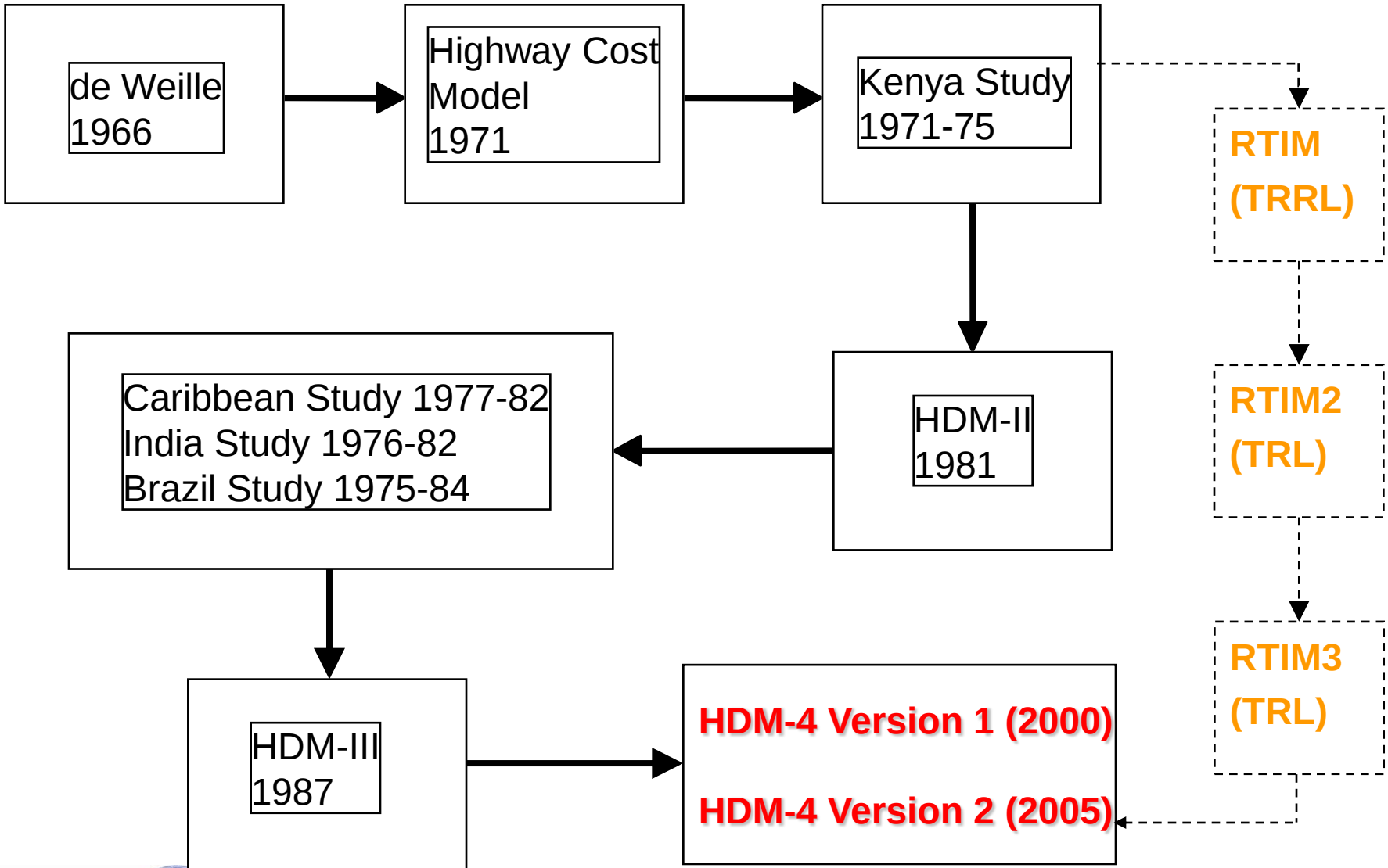
Optimising Total Transport Costs



Highway Management Functions

- **Planning**
  - Setting standards and policies
  - Long term estimates of expenditure
- **Programming**
  - Medium term work programmes
- **Preparation**
  - Detailed project design and work packaging

History of HDM



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HDM-4 Use

HDM-4 is a decision-support tool for Planning and Management of roads:

- **Programming road works**
- **Estimating funding requirements**
- **Budget Allocations**
- **Predicting road network performance**
- **Project appraisal**
- **Policy impact studies**

HDM-4 Applications

- **HDM-4 has four main applications**
  - **Strategic Planning**
  - **Roadwork Programming**
  - **Project Analysis**
  - **Research and Policy Studies**

How Does HDM-4 Contribute ?

- **HDM-4 is a decision support system, to assist in determining impacts of potential road investments**

Management Function	HDM-4 Application
Planning	Strategy Analysis
Programming	Programme Analysis
Preparation	Project Analysis

Strategy Analysis

Strategy analysis is concerned with the analysis of entire road networks to:

- forecast pavement performance and road user costs
- determine medium/long term funding needs
- predict future performance under budget constraints

Programme Analysis

Concerned with the preparation of single or multi-year road works and expenditure programmes often under specified budget constraints

- Calculate economic benefits and expenditure requirements of each option
- Schedule of optimum road maintenance projects obtained to ensure limited budgets spent consistently and equitably

Project Analysis

Evaluation of the economic or engineering viability of one or more road projects or investment options

- Annual prediction of pavement performance
- Pavement maintenance and improvement effects
- Road user costs and benefits
- Estimates of environmental effects
- Standard economic indicators such as NPV / IRR for decision making

Using HDM-4 for Research and Policy Studies

HDM-4 can be used to conduct road sector policy studies, examples include:

- Funding policies for competing needs, e.g. feeder versus main roads
- Impact of road transport policy changes on energy consumption
- Impact of axle load limits
- Pavement maintenance and rehabilitation standards

Applying HDM-4 Worldwide

HDM-4 has been used throughout the world through configuration and calibration:

Configuration: customising default data to reflect local circumstances, for example, vehicles, climate, road classes, traffic flow etc

Calibration: models adapted and calibrated so that the outputs are representative of the local conditions

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What is new in HDM-4 Version 2.0

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HDM-4 Version 2 – Responding to users needs

HDM-4 used

- in many countries
- diverse range of projects

Users provided feedback on

- usability
- functionality

User survey and feedback analysed to

- determine users needs
- focus development of **HDM-4 Version 2**

New Analysis Tools (1)

New analysis tools:

- **Multi Criteria Analysis (MCA)**
  means of comparing projects/schemes using non-monetisable criteria

- **Sensitivity Analysis**
  investigate the impact of small variations in key parameters on analysis outcomes

New Analysis Tools (2)

New analysis tools (continued):

- **Budget Scenario Analysis**

  investigate the impact of alternative budget levels and funding periods on network-level / strategic studies

- **Asset Valuation**

  estimate the financial and economic value of road assets as a function of the level of investment

Technical Models

- **Review of Technical Models:**

  updated to reflect new knowledge

  improved calibration of RD models

  Improved work effects

Usability, Data Handling & Configuration

- **Usability & Data Handling**

  Improvements to the user-interface

  Structure of the data changed to reduce data entry and reflect data availability

- **Configuration**

  Improvements to aid the task of adapting HDM-4 to suit local conditions

Connectivity

- **Connectivity of HDM-4 to external systems/data**
  - Data exchange format updated to aid connectivity to external systems
  - Imported data validated
  - Results of analysis available in format easily used by external systems

Reporting

- **Wider range of default reports available**
- **Improved management of reports to aid usability**

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More Information

www.hdmglobal.com

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