# ROAD INVESTMENT FOR SUSTAINABILITY OF NETWORK AND DOMESTIC CONTRACTORS

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# Introduction

- *Many countries have recently created Roads Funds and Roads Agencies to improve road management.*
- *Often investment strategies have not been optimal for the sustainability of the network and development of domestic contractors.*
- *Consideration is given to current investment strategies in Suriname, Tanzania and Zambia*

# Key Message

Giving priority to road maintenance at local level will enhance development of both national total road asset and the local construction industry

# Paper in 2 parts:

- Strategic model for road investment
- Ways of developing local contractors

# Investment Tool

# Key Data Input

- Road Asset Value
- Backlog Value
- Deferred maintenance cost factor
- Maintenance requirement as a % of asset value
- Annual increase in budget

# 1. Suriname Example

# Get Vehicle Data From RUC & VOC Model

| Vehicle Type and Payload (tons) | Number of Vehicles (veh) | Kilometers Driven per year (km/yr) | Vehicle Utilization Veh-km/yr (million) | VOC Good IRI=2m/km | VOC Poor IRI=10m/km | Good $m | Poor $m |
|---|---|---|---|---|---|---|---|
| Car | 65,000 | 20,000 | 1,300 | 0.170 | 0.235 | 221 | 305 |
| Light Truck (2.0) | 2,000 | 40,000 | 80 | 0.156 | 0.208 | 12 | 17 |
| Medium Truck (5.0) | 20,500 | 40,000 | 820 | 0.455 | 0.611 | 373 | 501 |
| Articulated Truck (25.0 | 2,500 | 40,000 | 100 | 0.799 | 1.122 | 80 | 112 |
| Bus | 2,500 | 40,000 | 100 | 0.176 | 0.235 | 18 | 24 |
| Total | 92,500 | | 2,400 | | Total | 704 | 958 |

| | |
|---|---|
| Normal traffic benefit | 254 |
| Generated traffic benefit | 46 |
| Total | 300 |

# Do nothing option

| | |
|---|---|
| Deferred maintenance cost factor | 2.5 |
| Maintenance cost as % of asset | 3.0 |
| % annual Increase in budget | 1.0 |

| | |
|---|---|
| VOC Saving for primary Network from Poor to Good | 299.8 |
| Ann. Traffic Growth % | 2 |

**Strategy 0 - Do Nothing**

| **Year** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **Totals** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Asset Value | 312 | 293 | 273 | 251 | 227 | 202 | 175 | 147 | 117 | 85 | 51 | |
| Maintenance backlog | 63 | 77 | 92 | 107 | 122 | 138 | 155 | 172 | 189 | 206 | 225 | |
| Maintenance requirement | 9 | 9 | 8 | 8 | 7 | 6 | 5 | 4 | 4 | 3 | 2 | 64 |
| Annual cost of backlog | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 13 | 14 | 15 | 17 | 116 |
| Capital expenditure | - | - | - | - | - | - | - | - | - | - | - | - |
| Rehabilitation expenditure | - | - | - | - | - | - | - | - | - | - | - | - |
| Maintenance expenditure | - | - | - | - | - | - | - | - | - | - | - | - |
| VOC Benefit | | (15) | (17) | (19) | (22) | (26) | (32) | (40) | (52) | (74) | (128) | (425) |
| **Total Net Benefit** | | **(34)** | **(37)** | **(41)** | **(46)** | **(51)** | **(58)** | **(68)** | **(82)** | **(106)** | **(162)** | **(685)** |

# Current Strategy

**Strategy 1 - Current - Opcenten SRD 0.03 only on petrol**

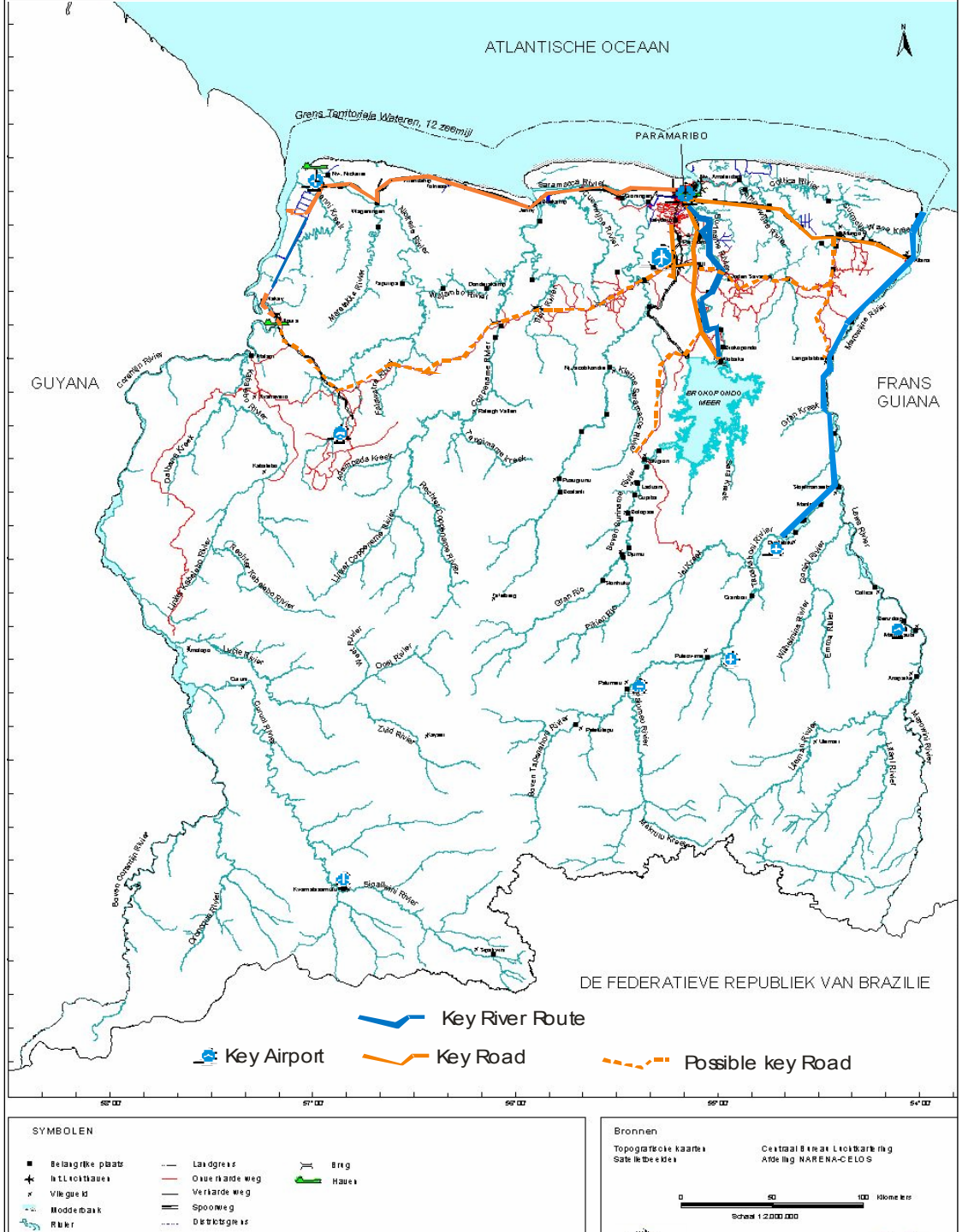
| **Year** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **Totals** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Asset Value | 312 | 323 | 334 | 344 | 353 | 361 | 368 | 375 | 380 | 384 | 387 | |
| Maintenance backlog | 63 | 67 | 72 | 77 | 83 | 89 | 96 | 104 | 112 | 121 | 131 | |
| Maintenance requirement | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 118 |
| Annual cost of backlog | 5 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 10 | 76 |
| Capital expenditure | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 231 |
| Rehabilitation expenditure | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 93 |
| Maintenance expenditure | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 23 |
| VOC Benefit | | (4) | (4) | (5) | (5) | (6) | (6) | (7) | (8) | (8) | (9) | (63) |
| **Total Net Benefit** | | **11** | **13** | **15** | **18** | **22** | **28** | **35** | **47** | **69** | **123** | **381** |

# Strategy 2

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Asset Value | 312 | 321 | 331 | 341 | 352 | 364 | 376 | 389 | 403 | 417 | 432 | |
| Maintenance backlog | 63 | 59 | 55 | 51 | 46 | 41 | 37 | 31 | 26 | 21 | 15 | |
| Maintenance requirement | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 12 | 12 | 13 | 13 | 121 |
| Cost of backlog | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 33 |
| Capital expenditure | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 116 |
| Rehabilitation expenditure | 12 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 139 |
| Maintenance expenditure | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 69 |
| VOC Benefit | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 43 |
| **Total Net Benefit** | | **18** | **22** | **27** | **32** | **38** | **45** | **55** | **70** | **95** | **150** | **552** |

# Case Study Countries

- Suriname
- Malawi
- Tanzania

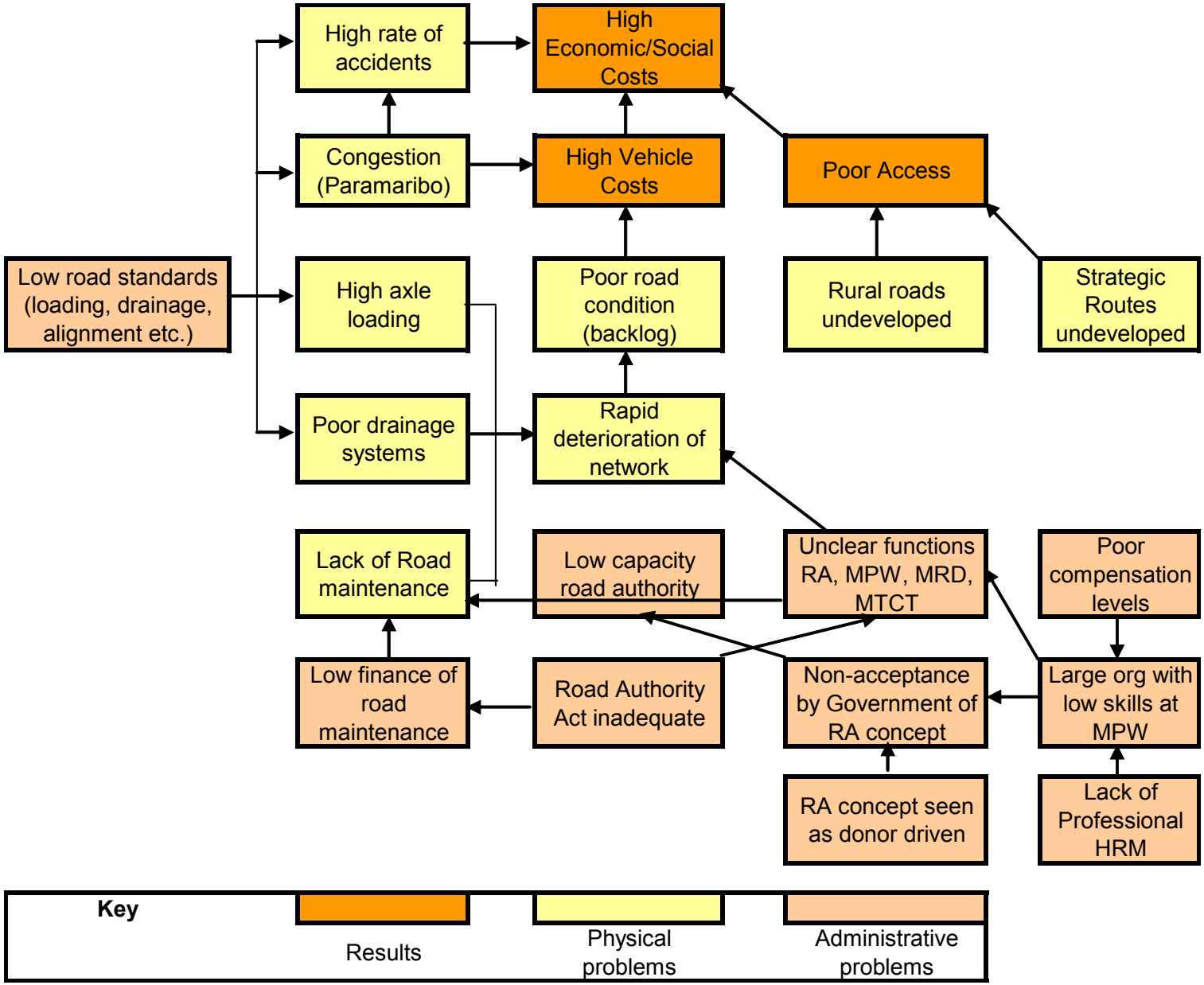

ATLANTISCHE OCEAAN
Grens Territoriale Wateren, 12 zeemijl
PARAMARIBO
GUYANA
FRANS GUIANA
BROKOPONDO MEER
DE FEDERATIEVE REPUBLIEK VAN BRAZILIE
Key River Route
Key Airport
Key Road
Possible key Road
SYMBOLEN
Bronnen
Topografische kaarten
Satellietbeelden
Centraal Bureau Luchtkartering
Afdeling NARENA-CELOS
Schaal 1:2.000.000

# Suriname

# Basic Statistics

- GDP $1.1b
- Population 440,000
- GDP per capita $2,500
- 4,750km

# Problem Tree



# Main Problems

- Maintenance Expenditure ~15% of requirements
- Local contracting industry undeveloped
- Roads damaged by overloaded trucks, particularly loggers

# Tanzania


TRUNK ROAD NETWORK
Bukoba
Musoma
RWANDA
KENYA
Mwanza
Shinyanga
Arusha
Moshi
Kigoma
Tabora
Singida
Tanga
Dodoma
Morogoro
Dar es Salaam
Mbeya
Iringa
Songea
Mtwara
Lindi
Mbamba Bay
ZAMBIA
MOZAMBIQUE
MALAWI

# National Development of Contracting Industry

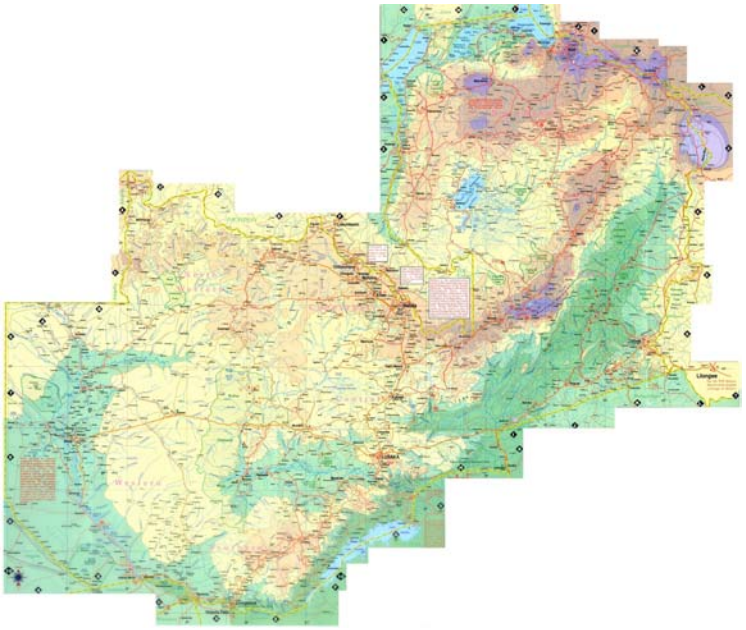
- National Construction Council 1979
- Management Action Group set up 1994
- Tanzania Civil Engineering Contractors Association set up 1995
- Contractors Registration Board 1998
- In 1986 43 contractors and 2005 > 1,000
- Equipment available for hire from Tanroads plant pools

# Tanzania Investment Strategies

| | |
|---|---|
| Deferred maintenance cost factor | 2.0 |
| Maintenance cost as % of asset | 3.0 |
| % annual Increase in budget | 1.0 |

| | | Year 10 Projection (2015) | | |
|---|---|---|---|---|
| (US$m) | 2005 | Strategy 1 | Strategy 2 | Strategy 3 |
| Asset Value | 2,600 | 2,660 | 3,047 | 3,435 |
| Maintenance backlog | 1,400 | 1,766 | 908 | 49 |
| Initial Capital expenditure | | 130 | 65 | - |
| Initial Rehabilitation expenditure | | 65 | 130 | 180 |
| Initial Maintenance expenditure | | 65 | 65 | 80 |

# Zambia



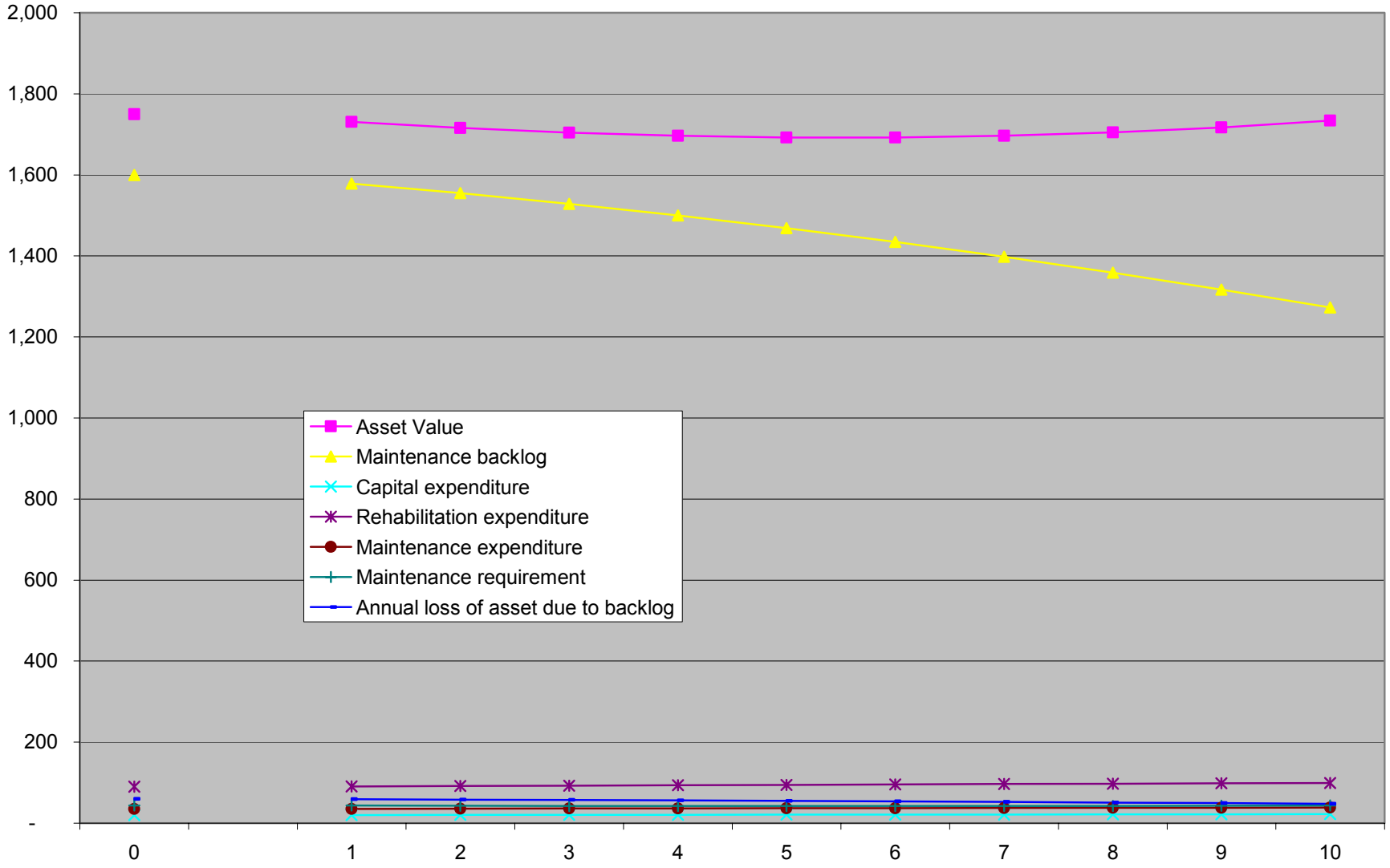
# History of Transition

- 1993 - President Chiluba introduces private sector reforms in most sectors – very few contractors
- 1995 – 2001 – greenhouse contracts in E. Province
- 1998 – National Construction Council
- 2002 – New Transport Policy & Road Act
- 2006 – 450 contractors
- 2006 – Road Development Agency takes over national network of 67,000km

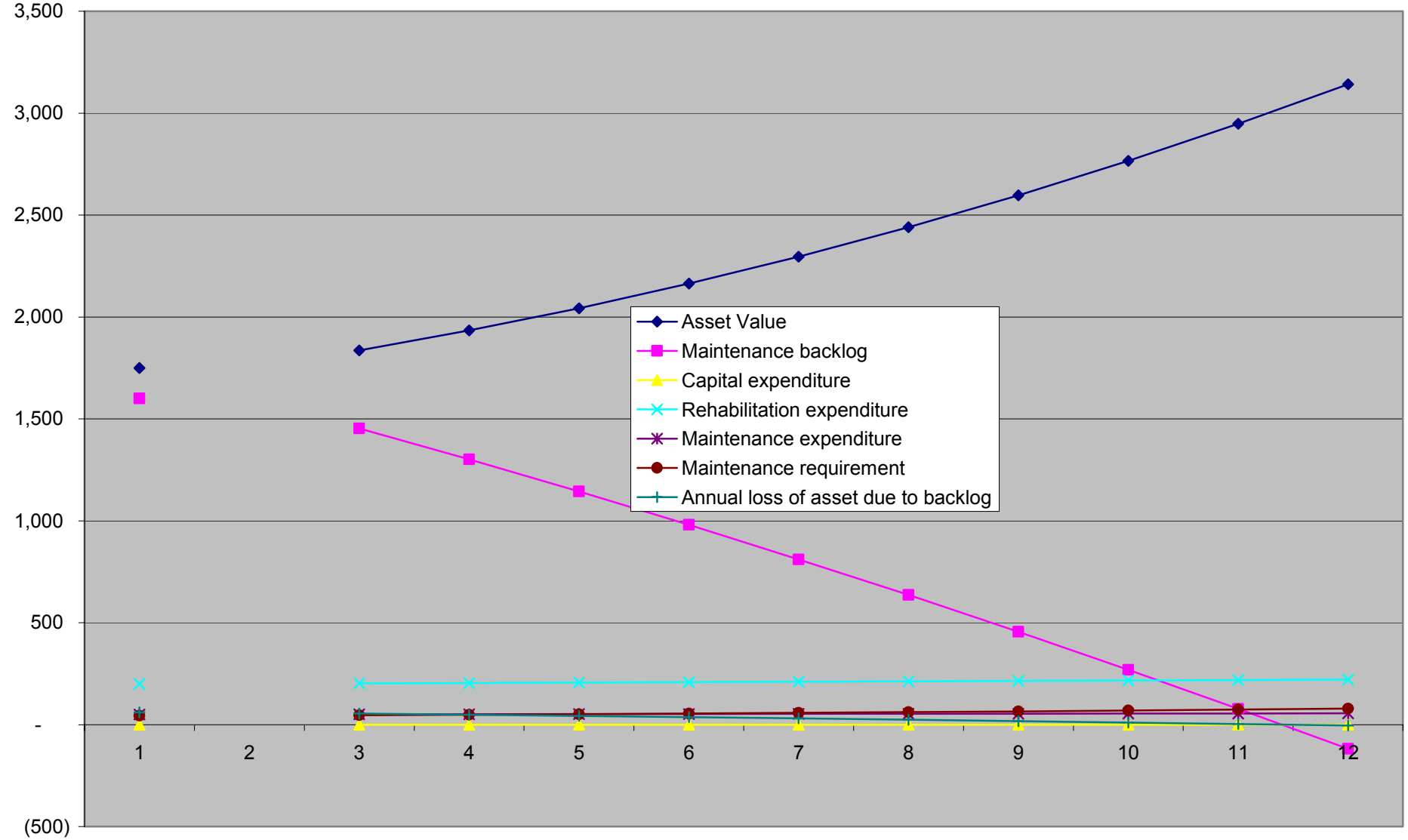
# Zambia's Investment Strategies

| $millions | | Year 10 Projection (2016) | | |
|---|---|---|---|---|
| | **2006** | **Strategy 1** | **Strategy 2** | **Strategy 3** |
| Asset Value | 1,750 | 1,734 | 1,861 | 3,014 |
| Maintenance backlog | 1,600 | 1,272 | 1,163 | (9) |
| Initial Capital expenditure | | 20 | 20 | - |
| Initial Rehabilitation expenditure | | 90 | 90 | 190 |
| Initial Maintenance expenditure | | 35 | 45 | 50 |

# Zambia Current Strategy



# Zambia Strategy 2



# Strategies to Develop Domestic Contractors

- Give priority to maintenance at sub national level
- Package contracts attractively vertically and horizontally
- Simpler forms of contract and specifications
- The Development Team Model
- “Greenhouse contracts”
- Technical competitive tendering
- Labour or low cost equipment based c[illegible]ng


Thank
You!