Taking NZ to the world  
– and bringing some of it back  

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Agenda

• Overview of general work
  • Nigeria
  • Nepal
  • Sri Lanka
  • Tonga
  • China

• Some learnings for New Zealand
Overview of Projects
Nigeria
Summary of the Project

• Build a stronger rural community through improving the road network
• 5 year performance based contracts
  • World Bank Output and Performance-based Road Contract (OPRC)
• In an area where terrorist activity was occurring
• Strong tribal affiliations exist
• People are generally very poor and have subsistence living
Nigeria Lots N1 and N2
Nigeria - Network Selection

• If we want the OPRC Contractor to…
  • Think like the road authority
  • Act like the road authority, and be
  • More efficient than the road authority

• ....then we need to give them a road network that looks like what the road authority would manage
  • All roads in a geographically small area
Nigeria Example

BEFORE

AFTER
Nigeria

BEFORE

AFTER
Nigeria Example

• Community developed
• Fresh food markets established
• Economic growth
• Employment opportunities

• A community that has something worth fighting for

• Industry has started to be developed that understands OPRC and associated risks.
### Summary of Review

<table>
<thead>
<tr>
<th>Critical Success Factor</th>
<th>Situation in Kaduna OPRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Agency Institutional Buy-in</td>
<td>Requirement met, with all parties involved committed to making the OPRC work. In particular that OPRC was set as the delivery method of the road improvements from the outset is a considerable strength of the project.</td>
</tr>
<tr>
<td>Financial:</td>
<td>Assurance of funding obtained via World Bank funding. Contractors noted concern if the contract period were to be outside the funding period of the World Bank. The financial payment model in the contract has not been well considered with very little payment related to the maintenance activities and an unworkable payment setup for the initial works (km-months rather than simply paying for completed km).</td>
</tr>
<tr>
<td>Legal:</td>
<td>Met as the four Lots are all in place.</td>
</tr>
<tr>
<td>Institutional Knowledge in both the Transport Agencies and the Lending Institutions:</td>
<td>Partially met. Overall the understanding was not sufficient given the weakness of the consulting advisors selected and contracting industry.</td>
</tr>
<tr>
<td>Bidding Process:</td>
<td>Contractor selected on lowest price conforming basis with no specific requirement for OPRC (or similar) experience. Contractors did not understand the role of the Road Management Units.</td>
</tr>
<tr>
<td>Performance Measurement</td>
<td>Performance measures are easily measured and of a suitable form, with the exception of measuring road roughness (IRI) on an unsealed road.</td>
</tr>
<tr>
<td>Performance Payment</td>
<td>Consequences are possibly out of kilter with the level of conformance delivered. In particular it is noted that there is no overall tolerance on any of the indicators, and that in most cases failing at any single location within a 1 km length deems the whole length to have failed.</td>
</tr>
<tr>
<td>Risk Sharing:</td>
<td>Not met as the contract has pushed all the risks to the contractor.</td>
</tr>
<tr>
<td>Timing:</td>
<td>While the timing in Kaduna was of a similar timeline (Design Consultant appointed in 2008, and Contractors commenced in 2011), the fact that there has been such limited turnover of key staff in all levels of the process (World Bank, FPMU, SPIU, Supervising Consultant and Contractors) is considered a major contributor to the success of the project so far.</td>
</tr>
<tr>
<td>Sufficient technical support during implementation</td>
<td>Not met, but all parties appear to agree that such a solution would have been highly beneficial to Kaduna.</td>
</tr>
<tr>
<td>'Control' of underpricing</td>
<td>Not met, with all contractors clearly unaware of the costs of maintaining a road network. With the payment model in the contracts permitting the contractors to tender a price for the maintenance activities, rather than an overall financial model that allocates the total tender price, there is little means to control the underpricing. Future iterations should focus on ensuring that contractors are aware of the likely costs to meet the performance standards.</td>
</tr>
<tr>
<td>Control of the minimum level of improvement work</td>
<td>Not applicable within the scope of the pilot trials, although such a method could have been instigated to ensure regular 'top-up' regaveling occurred on the unpaved network.</td>
</tr>
</tbody>
</table>
Mantra #1

Society pays for good roads whether they have them or not!
Nepal
Network Management & Maintenance

• Had a traditional approach to road maintenance
  • Road maintenance division in control of all activities
  • Annual routine maintenance and resurfacing contracts
  • Strengthened Maintenance Division (SMD)

• Trialled PBMC in 8 contracts
  • 2003-2012
  • 3-5 year contract periods
Current Issues With SMD

• **Routine Maintenance:**
  • General perceived decrease in the productivity of the Length Workers,
  • No specific performance standards set and an aging workforce that cannot be easily modernized.

• **Recurrent Maintenance:**
  • Procurement delays
  • Contractor’s unwillingness to carry out job in cycles as contractually required
  • Of the 34 Divisions within DOR, only 2 completed 100% of their contractual allocations, with some as low as 55%.

• **Periodic Maintenance:**
  • Procurement delays
  • Contractors poor performance in work execution in a timely manner with quality
  • Not uncommon for contractors to be 1-2 years late in delivering their contracted works, with some 3-4 years late.
## OPRC Readiness Assessment

<table>
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<tr>
<th>Critical Success Factor</th>
<th>Situation in Nepal at Time of Pilot Trials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Road Agency Institutional Buy-in:</strong></td>
<td>Requirement met, with all parties involved in determining to trial PBMC model.</td>
</tr>
<tr>
<td><strong>Financial:</strong></td>
<td>Assurance of funding obtained via the RBN.</td>
</tr>
<tr>
<td><strong>Legal:</strong></td>
<td>Met as the 8 prior contracts indicate no legal impediments.</td>
</tr>
<tr>
<td><strong>Institutional Knowledge in both the Transport Agencies and the Lending Institutions:</strong></td>
<td>Overall the understanding of PBMC was relatively weak amongst both the DOR and contractors. It was also weak amongst consultants, although they were not used extensively by either DOR or contractors.</td>
</tr>
<tr>
<td><strong>Bidding Process:</strong></td>
<td>Based on pilot PBMC where contractor was selected on lowest price conforming basis with no specific requirement for OPRC (or similar) experience. Contractors did not understand the role of the Inspection Units.</td>
</tr>
<tr>
<td><strong>Performance Measurement:</strong></td>
<td>Performance measures were noted as being hard to follow and did not cover all items of importance.</td>
</tr>
<tr>
<td><strong>Performance Payment:</strong></td>
<td>While a range of payment deductions were made, these did not drive the right outcomes such that it would appear that they need refinement.</td>
</tr>
<tr>
<td><strong>Risk Sharing:</strong></td>
<td>Not met as the contracts pushed all the risks to the contractor.</td>
</tr>
<tr>
<td><strong>Timing:</strong></td>
<td>The first pilot project was implemented within 18 months of first suggestion.</td>
</tr>
<tr>
<td><strong>Sufficient technical support during implementation</strong></td>
<td>None provided</td>
</tr>
<tr>
<td><strong>‘Control’ of underpricing</strong></td>
<td>Not accounted for with low bids resulting</td>
</tr>
<tr>
<td><strong>Control of the minimum level of improvement work</strong></td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
Sri Lanka
Context

- 26 years of civil war
- Large exodus of top level expertise
- Minimal investment in the rural road network or the road authority during the civil war
- Now looking to catch up with past under investment
Key Projects with the Road Development Authority (RDA)

• **Asian Development Bank (ADB)**
  - Rebuilding the rural road networks, connecting villages to employment centres
  - Key advisors of myself and Rowan Kyle of Opus

• **World Bank**
  - Capacity building of the RDA
  - Systems and policy updates
  - Rebuilding roads

• **JICA**
  - Bridge management

• Plus numerous road construction projects
  - 150km of toll roads, with another 200km under construction
Capacity Building Initiatives

- Upgrading and integrating AMIS
  - Web based, fully integrated system with GIS etc.
- Updated data collection manuals and processes
  - Doug Brown of New Zealand
- New bridge management processes
- Re-calibration of HDM-4
- Refining business processes to make best use of the above
Road Network Rebuild – iROAD (ADB)

• Myself and Rowan Kyle (Opus) working with local RDA team
• Rural road sections as traditional contracts
• Study tour by senior officials to New Zealand
• State highways as OPRC
  • 8 contract packages
  • Approximately 100km in each
  • Seven year contracts
  • Most requiring rehabilitation or resurfacing in first 1-3 years

• Challenges
  • Still a very political environment
    • Road selection for contracts
    • After national elections everything is up for renegotiation, with new people in key roles.
  • Need for a comprehensive capacity building programme
Tonga
Tonga MOI

• Tonga Ministry of Infrastructure
• Approximately 120 staff
• Established from merger of three ministries in 2012
• Runner-up for the Institute of AM award of best AM project in 2013
  • Against 1500 of the leading asset management organisations in the world across many sectors
Tonga Situation in 2010

• Devoid of proper asset management and sustainable funding mechanism, roads being allowed to deteriorate to a point where not only are the government costs of repair higher, but also the costs of vehicle damage are excessive.

• Civil aviation sector deteriorated because of improper asset management, thus not meeting international requirements for safety and security that placed in jeopardy the tourism market and reputation of the country.

• Safety of the maritime sector and regulatory oversight failed, as indicated by the significant loss of life (74 dead) with the sinking of the passenger ferry MV Princess Ashika in 2009.
So how did they do it?

• Clearly defined objectives that were signed off by Cabinet
• Minister actively engaged in the process
• CEO who led rather than supported

• And three years later they are the 2nd best in the world, with ongoing improvement plans in place.
Building a Road Maintenance Industry from Scratch

• Capacity building within the MOI
• Legislative reform
• Creating a road maintenance fund to get sustainable investment levels

• Successfully created domestic capacity in road maintenance
  • Started simple
  • Coaching as well as managing contractors
  • Accepted that some failures would occur

• Adapted and applied new periodic maintenance technologies suitable for Pacific Island Countries (PICs) with limited capacity contractors
China
Transport Statistics

• High Speed Rail
  • Japan
    • 2,700 km operational
    • 800 km under construction
  • All excluding China
    • 17,000 km operational
    • 7,000 km under construction
  • China
    • 19,500 km operational
    • 16,000 km under construction

• Expressways / Motorways
  • USA Interstate
    • 76,000 km
  • German Autobahn
    • 12,800 km
  • All excluding China
    • 270,000 km
  • China
    • 115,000 km and still constructing

August 2015
National High Speed Railway
Medium & Long-Term Planning 2020
National Rail Network for Coal
Medium & Long-Term Planning 2020
National Highway System
Current Construction Progress
26 lane toll plaza
All heavy vehicles are weighed at the toll plaza and pay according to their actual weight and distance covered. <1% overloading as a result
Increasing Vehicle Ownership

National Car Ownership Growth

Car Ownership in 10,000

Characteristics of Chinese Economics

- Rapid Economic Growth in China
  - Average 10% annual increment in GDP

China GDP (Trillion RMB)

- 1995: 6.08
- 2010: 39.5
Investment is Paying Off

- Over past 30 years every two weeks China has lifted an average of 1 million people out of poverty
Mantra #2

It is not the wealth of a nation that builds its transport network, but the transport network that builds the wealth of the nation.
CAREC – Central Asia Regional Economic Cooperation

The map illustrates the network of connections and corridors within the CAREC region, including countries such as Azerbaijan, Kazakhstani, Uzbekistan, Kyrgyzstan, Tajikistan, Afghanistan, Pakistan, and Mongolia. It highlights national capitals, provincial capitals, cities, towns, naval ports, and different types of connections, such as railways and other modes of transport.

Key symbols and colors used in the map:
- National capital: 
- Provincial capital: 
- City or town: 
- Naval port: 
- Railway: 
- CAREC Corridor 1
- CAREC Corridor 2
- CAREC Corridor 3
- CAREC Corridor 4
- CAREC Corridor 5
- CAREC Corridor 6
CAREC Transport Programme

• US$20b investment in new infrastructure
• @2.5% annual need for maintenance and renewal this requires an extra US$500m/year

• Start with the senior government officials to get buy in to the concept of AM
Learnings for New Zealand
Leadership is Critical to Delivering Change

• Many of our leaders think they are leading when they are merely supporting or encouraging

• If you are not leading, you are merely going for a walk!
Network Maintenance Contracts

• In both the developing and the developed world I have seen many cases of non-performance where there is not a strong independent consultant supervising contracts
  • Contracts lose their meaning and performance standards drop

• Need to ensure an alignment of organisational culture with the contract model
High Speed Rail

• UK
  • Birmingham City will be closer in travel time to central London, than Heathrow airport

• China
  • Has revolutionised society and social/family interactions

• What would a high speed rail connection between Auckland-Hamilton-Tauranga do for housing demand in Auckland?
Transport Impact on Economy

- An integrated high quality transport system is key to economic success
Questions?