Bridging the quality gap – Gerrie van Zyl

Low Volume Roads Workshop
Napier 2009
BACKGROUND

South Africa
Cape Town
Our experience
Accessibility
Improving track to formed roads
Mobility & Safety:
Gravel roads still not good enough
Efforts to bridge the “Gap”

- Surfaced Low Volume Roads
- Reduced standards
- Surfaced Standards
- Surfaced Highway

Quality of Service

Cost
Resistance to reduce standards

- Geometric standards
- Shorter design life
“I have always felt that it is easier to design a pavement for a high volume rather than a low volume road. On the low volume road we are continually striving for low cost, which makes our design extremely sensitive from the standpoint of thickness, quality of pavement and surfacing materials, geometric design, and many other factors.”

Eldon Yoder
Studies towards appropriate standards
SADC Guideline on Sustainability for Low Volume sealed roads

- Politically supported
- Socially acceptable
- Environmentally sustainable
- Institutionally possible
- Financially attainable
- Technologically appropriate
- Economically viable?
SABITA: Traffic Actions

... selection of appropriate seal types

- **Turning/ Braking**
  - Sand
  - Double
  - Cape
  - Asphalt/ Epoxy
  - Blocks
  - Concrete
SABITA: Gradient

...selection of appropriate seal types

- **Shoving**
  - Braking, curves
  - Thickness
  - Base type
- **Erosion**
  - Kerbs?
- **Constructability**
SABITA: Maintenance capability

... selection of appropriate seal types
SABITA: Environment

...selection of appropriate seal types

- Population Stresses
- Community needs
- Climate
Result

- Numerous success stories
- But also
Continuous poor performance

Sand Seals

Slurry Seals

Single & double Seals

Cape Seal

Asphalt
Main reasons

• Practitioners not using “Guidelines”
• Poor design (Drainage/ pavement structure)
• Poor construction and QA
• Maintenance
Efforts to bridge the “Gap”

- Track
- Formed
- Gravel
- Sealed Gravel Roads
- Surfaced Standards
- Surfaced Highway

Quality of Service vs. Cost
Sealed Gravel Roads: Success stories

Graded Aggregate Seal
Labour intensive seals: Success stories (Slurry bound Macadam)

- Spread
- Level
- Place
- Protect
- Apply slurry
- Vibratory roll
Reclaimed Asphalt on gravel roads
Sealed gravel road: Failures
Efforts to bridge the “Gap”

- Track
- Formed
- Gravel: Improved design and maintenance
- Surfaced Standards
- Surfaced Highway

Quality of Service vs. Cost
Western Cape Efforts

- Processes and management systems
- Training
- Equipment
- Design
- QA
- Monitoring
Construction Plant & Quality Control

- Plant and Equipment: Then
- Construction: Place & Go!
- Plant and Equipment: Now
- Construction: Quality & Control
Controlled Construction Processes

- Effective Grid rolling
- Remove Oversize Manually
- Pneumatic Roller Final Compaction
- Wet Rolling (Slushing)
Wearing Course Finish

Poor Grading

Improved Grading

Compaction at OMC

Excellent Riding Quality
Borrow Pit Development, Mining & Rehabilitation

Public Participation

Borrow Pit Rehabilitation

Improved Mining Techniques

Environmentally friendly toilets
Results

- Reduced gravel loss
- Slow roughness deterioration
- Change in maintenance strategy
- Impact !!!
Efforts to bridge the “Gap”

- Surfaced Highway
- Surfaced Standards
- Gravel: Chemical treatments
- Gravel
- Formed
- Track

Quality of Service vs. Cost
Chemical additives
Chemical additives
Results

Chemical treated roads versus Sealed alternatives and Gravel control

- Control
- CTB + Seal
- Worst Chemical
- Best Chemical

Roughness (IRI)

Month
Are we learning something?
Some questions to be answered

- Do we really understand our business?
- Are we meeting our obligations?
- Have we stagnated?
Workshop Topics

• Safety
• Road user
• Environment
• Appropriate standards/ value for money
• LVR performance
• Best maintenance practice
• Appropriate structures
• Materials and testing
Key challenge

- What is the best I can do using available
  - Materials
  - Equipment
  - Labour and skills
  - Optimising on in-situ conditions

Ref: Dr J Cook
Optimise materials

- Waste materials
- Non standard materials
- Standard materials
- Alternatives to reduce demand
We can bridge the “Gap”

- Formed
- Gravel
- Engineered Gravel “well maintained”
- Treated Gravel Roads & Alternative materials
- Appropriate standards Sealed Low Volume Roads
- Surfaced Standards
- Surfaced Highway

Quality of Service → Cost
Horses for Courses
There will always be obstacles
Thank you

• Conference committee and organisers
• Presenters
• Delegates
END