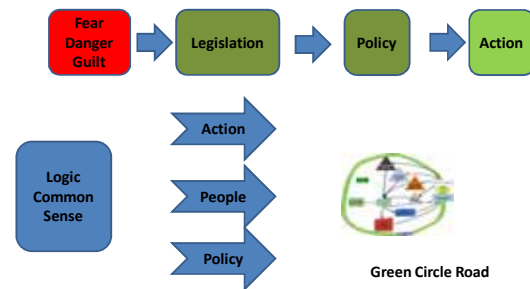


Australian Study Tour of South Africa:  
Durban:  
the warmest place to be

Sustainability in eThekweni  
9 September 2011

### Green shoots



## Why the sustainable way?

### We believe sustainable practices....

- Besides meeting the latest buzzwords,
- Gives us longer lasting products
- Is cheaper
- Allows quicker construction
- Better quality product?
- In cases is the only technical option

### Are carbon calculators used only to convince cynics and naysayers?



### But is this sustainability ?

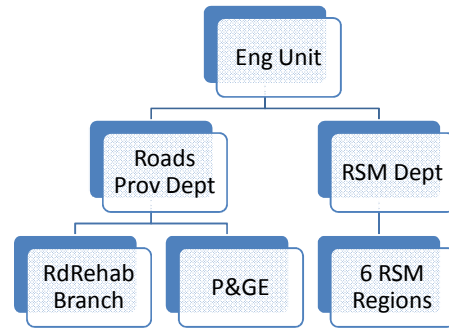
- But, is this sustainable practice or just plain common sense packaged to suit the prevailing challenges
- Judge for yourself

So we are moving towards

Mitigation

Adaptation

Visionary management  
Institutional structure recognised as an enabler



Roy Gooden

System support

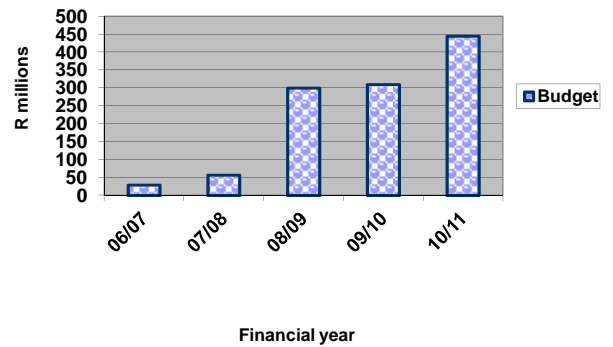
Starts with our PMS

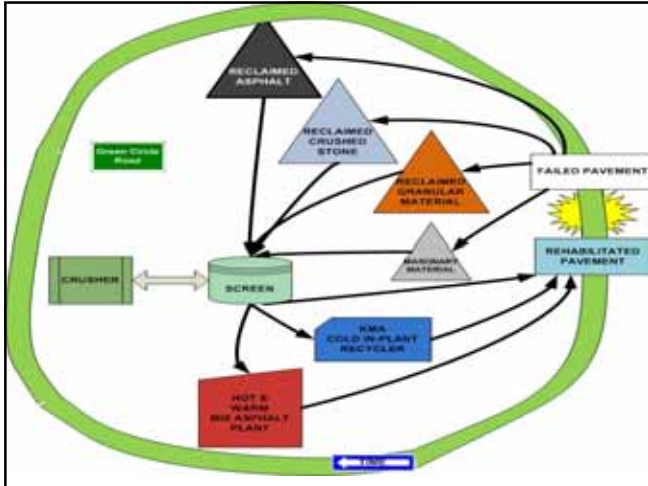
Doing the right things at the right times

Ruthless adherence to PMS outputs

Eric Lathlief

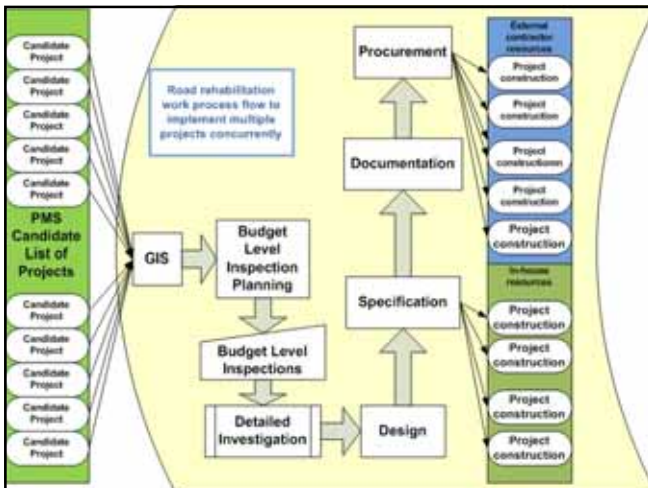
Road Rehabilitation Budget





### Project level: Network Planning Phase

- Simple on just one road
- But over a 6000km network
- Within 550 km<sup>2</sup> area
- On 300 projects per annum concurrently
- This is the opportunity!!!!!!!!!!!!



The client owns the road,  
The client owns network,  
The clients owns the material,  
The client drives policy

### Project level: Investigation & design phase

- Pavement engineer must characterise and calculate volume of material in pavement
- Sampling for failure investigation and material reuse / recycling must be separate processes.
- Cost benefit analysis must include:
  - Future type and number of recycling iterations
  - Noise / dust generated from ops
  - Construction under live traffic
  - Construction period
  - Closure of resident and business access
  - Reuse in place as first option
  - Available stockpiled materials
  - Quantity of virgin materials imported
- Pavement engineer must prove constructability and draw up traffic management plan

### Project level: Deconstruction Phase

- Selective excavation & selective stockpiling is a designed process & is specified by the pavement engineer
- Pavement engineer must specify the construction tools to be used for deconstruction
- Pavement engineer is responsible for
  - Material register and
  - Materials management plan
- Traffic management plan – disruptions due to construction works eg C4 vs BSM

### Project Level: Construction Phase

- Resident engineer must have:
  - A Quality Assurance Plan in place.
  - Training and understanding of construction tools / plant being used.
  - Training and understanding proprietary solutions being used.
  - High degree of competence in materials and failure mechanism understanding.

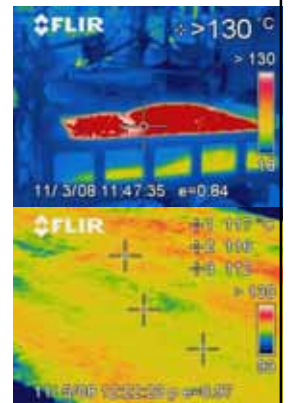
### Lower energy pavements

- Cold-in-place recycling is now routine option
- Cold-in-plant recycling
- Warm Mix Asphalt
- Crushed building “rubble”
- Crushed reclaimed road concrete



### Lower energy pavement: Warm Mix Asphalt

“asphalt that is manufactured and paved at between 20°C and 30°C lower than conventional hot mix asphalt (HMA), with all its properties and performance being equal to or better than HMA “



Tony Lewis

Wynand Nortje

## Reclaimed masonry material

- Problem area for waste sites
  - Percolation and degradation processes
- Lost latent energy, residual...
- Less virgin material
- Increase landfill lifespan

## Current status

- Hearts and minds
- Stockpiling all masonry material recovered
- Trials to determine optimum grading
- Trials to determine material behaviour in pavement
- In partnership with UKZN, Italian & US colleagues

## Question

- Should we burden reclaimed masonry materials with meeting the properties of traditional granular / crushed stone characterisation system or
- Should we formulate a new system that allows its own properties to characterise it?
- Current debate for WMA?

## Longer life pavement: HiMA

- Fixed alignment
- Fixed levels
- Construction under traffic
- Cover up what you dig up
- Traffic what you uncover
- Economic life blood of country

## Possible uses for HiMA

- Heavy and slow moving traffic
- Restricted layer thickness with significant stiffness requirement
- Perpetual / longer life pavement – this is our objective on all roads

## Daniel Mtimkulu

Tony Lewis

Wynand Nortje

### Quality, the easiest way to sustainability

- Doing the routine things well
- Correct usage of construction equipment – Wirtgen & Bomag
- Training and re-training of people
  - NQF 1 to 4 training programme with Asphalt Academy
  - Consultants & in-house professional staff
  - Training on BSM's & recycling – TG2 – Dave Collings + Jenkins + SARF
  - Training on bridging the gap for site supervision – Tony Lewis + SARF

### Partnerships

- Align ourselves with people, companies and organisations of excellence.