



A Sustainable Roads Rating System for South Africa

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PEOPLE



PLANET



PROFIT

Background of SuRF



- Initiative started in 2011 as Greenroads SA and was subsequently renamed to SuRF, which is Sustainable Roads Forum
- Its an industry initiative to introduce sustainability best practices into the roads sector by means of a Sustainability Rating Tool
- SuRF is currently unfunded and relies entirely on industry support
- There are 15 representative bodies and government authorities on the Forum, with SANRAL ER, SARF and SABITA the most active supporters, plus inputs and guidance from the CIDB, the Concrete Institute and Stellenbosch University
- The rating tool has been developed for SuRF by RHDHV, who currently also act as secretariat for the Forum

Sustainability Structure of the Tool



- More equitable focus on triple bottom line i.e. **People, Planet, Profit** or alternatively **Environment, Economy and Social Equity**
- Concepts: **project** related carbon **footprint**; carbon **reductions** as a result of **interventions**, and carbon **offsets**
- Allow targets to be set by the roads authorities
- Measure the implementation in a uniform, transparent manner

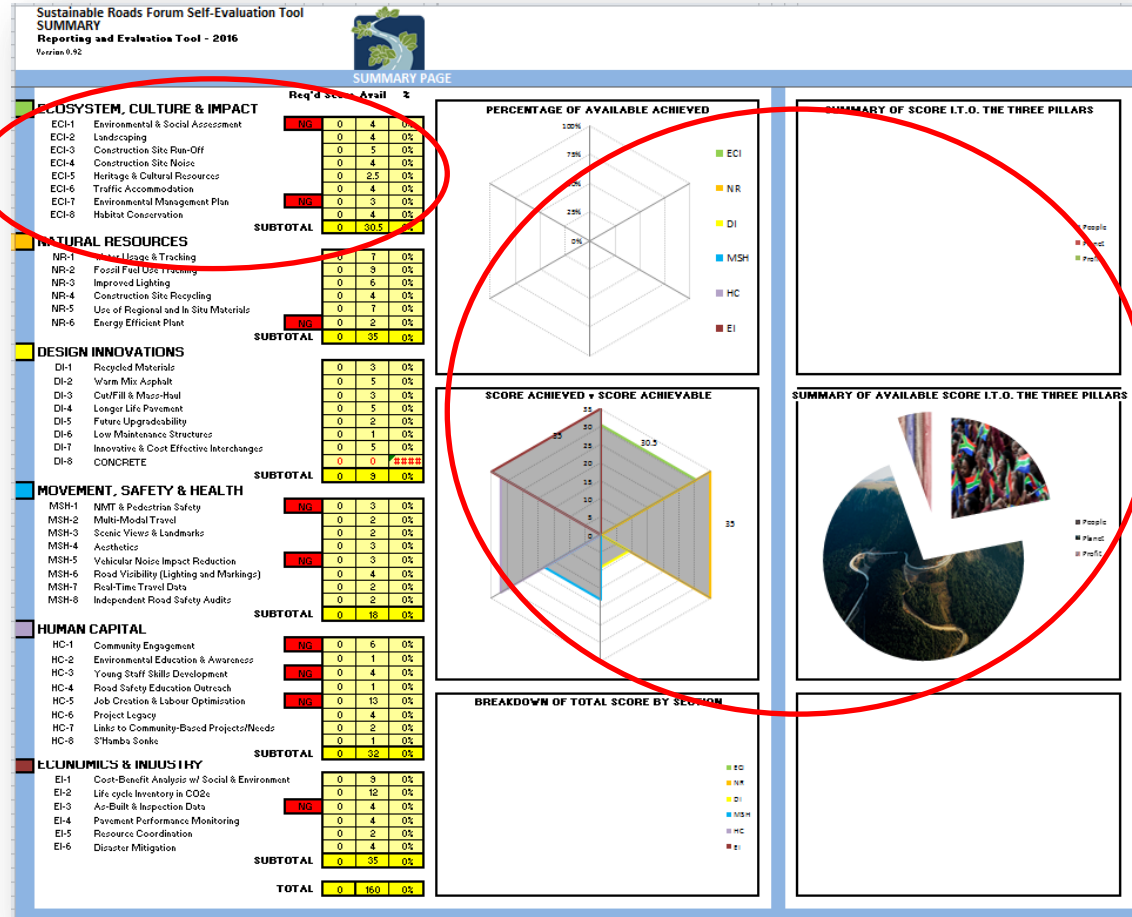
Purpose of the SuRF Tool



- ...to guide project teams on various sustainable best-practice tasks on road infrastructure projects - in the form of credits
- Excel-based spreadsheet, with built-in calculations
- Output is a comparative sustainability score for individual road projects, with support for both planning/design and construction phases - normalised (e.g. per lane-km) where possible
- Provision for training, self evaluation or audit verification

Credit Structure

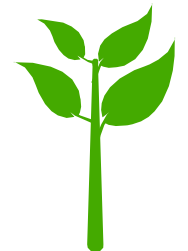
- 6 main sustainability fields/areas
- Currently with 41 individual credits/interventions
- Up to 5 action items per intervention
- Designed to give a sustainability score against:
 - Commitments made
 - Total available score
- Also compares performance between 3 pillars of 'People, Planet & Profit'



1. Ecosystem, Culture & Impact



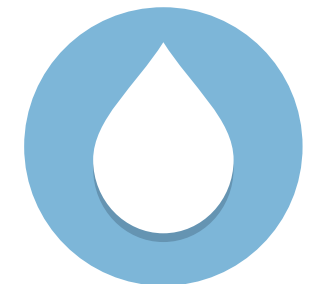
ECI-1		Environmental & Social Assessment
ECI-2		Landscaping
ECI-3		Construction Site Run-Off
ECI-4		Construction Site Noise
ECI-5		Heritage & Cultural Resources
ECI-6		Traffic Accommodation
ECI-7		Environmental Management Plan
ECI-8		Habitat Conservation



2. Natural Resources



NR-1		Water Usage & Tracking
NR-2		Fossil Fuel Use Tracking
NR-3		Improved Lighting
NR-4		Construction Site Recycling
NR-5		Use of Regional and In-Situ Materials
NR-6		Energy Efficient Plant



3. Design Innovations



DI-1		Recycled Materials
DI-2		Warm Mix Asphalt
DI-3		Cut/Fill & Mass-Haul
DI-4		Longer Life Pavement
DI-5		Future Upgradeability
DI-6		Low Maintenance Structures
DI-7		Innovative & Cost Effective Interchanges



4. Movement, Safety & Health



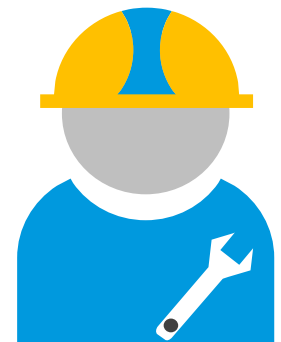
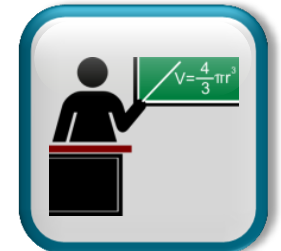
MSH-1	NMT & Pedestrian Safety
MSH-2	Multi-Modal Travel
MSH-3	Scenic Views & Landmarks
MSH-4	Aesthetics
MSH-5	Vehicular Noise Impact Reduction
MSH-6	Road Visibility (Lighting and Markings)
MSH-7	Real-Time Travel Data
MSH-8	Independent Road Safety Audits



5. Human Capital



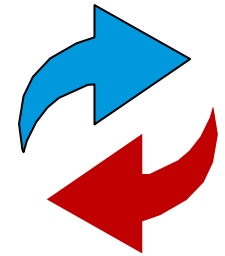
HC-1		Community Engagement
HC-2		Environmental Education & Awareness
HC-3		Young Staff Skills Development
HC-4		Road Safety Education Outreach
HC-5		Job Creation & Labour Optimisation
HC-6		Project Legacy



6. Economics & Industry



EI-1	Cost-Benefit Analysis w/ Social & Environment
EI-2	CO2e Life Cycle Inventory
EI-3	As-Built & Inspection Data
EI-4	Pavement Performance Monitoring
EI-5	Resource Coordination
EI-6	Disaster Mitigation





Key Focus Areas in Pilot Phase

- **Energy** use tracking and reporting
- **Water** use tracking and reporting
- Initial carbon footprinting (currently only construction energy use, future version to address more fields)
- **Job creation**, with focus on labour intensive methods, SMME, BBBEE spend etc.
- Test Credits so that they make **intuitive sense**, even if they are still refined over time

25% score is achieved for 10% or more...

FEEDBACK FORM NR-2 - Fossil Fuel Use Tracking

CHECK NR-2.1 – TRACKING OF ENERGY USE

Will monthly energy use be monitored and reported on during construction?

Provide the information required below

Month	Site Camp						
	Grid Energy Use	Off-grid Use	Total Energy Use	CO ₂ e from Grid Energy	CO ₂ e from Off-Grid Energy	Percent of Site Camp Energy from Renewables	CO ₂ e reduced at Site Camp via Use of Renewables
CO ₂ e/kWh	[kWh]	[kWh]	[kWh]	[t CO ₂ e]	[t CO ₂ e]	[%]	[t CO ₂ e]
Month 1	0.00103	#N/A	0	0	#N/A	#DIV/0!	#N/A
Month 2			0	0	#N/A	#DIV/0!	#N/A
Month 3			0	0	#N/A	#DIV/0!	#N/A
Month 4			0	0	#N/A	#DIV/0!	#N/A
Month 5			0	0	#N/A	#DIV/0!	#N/A
Month 6			0	0	#N/A	#DIV/0!	#N/A
Month 7			0	0	#N/A	#DIV/0!	#N/A

Vehicles, Plant and Generators						
Petrol used	Diesel used	Alt. Fuel used	Electric vehicles	CO ₂ e from Petrol & Diesel	CO ₂ e from Alt. Fuel	CO ₂ e Redux due to Alt. Fuel
[kL]	[kL]	[kL]	[kWh]	[t CO ₂ e]	[t CO ₂ e]	[t CO ₂ e]
3.29684	0	#N/A	1.03E-03	0	#N/A	#DIV/0!
				0	#N/A	#DIV/0!
				0	#N/A	#DIV/0!
				0	#N/A	#DIV/0!
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Pilot Phase Outcome

- N3 objective:
- Tool objectives:
 - Data collection for industry benchmarking
 - Test of user interface
 - Are the right questions asked
 - Are the questions asked right



Sustainable Roads Forum Self-Evaluation Tool
CREDIT
 Reporting and Evaluation Tool - 2016
 Version 0.92

Additional Information

ECl-6 : Traffic Accommodation
 ECOSYSTEM, CULTURE & IMPACT

Description:
Identify and implement innovative traffic accommodation measures to reduce road user congestion through the project site during construction.

Motivation:
Road construction and maintenance is a necessary part of maintaining a modern society of connected citizens. Unfortunately, construction adjacent to existing traffic can cause significant congestion (and resulting CO2 emissions) during the construction period due to lane closures, bottlenecks and detours.

In addition to the increased emissions and consequent environmental impact, the congestion also has a negative impact on road users resulting in delays, lost time and significant costs to the local economy.

Actions:

ECl-6.1 - Carry out a cost-benefit analysis to identify traffic accommodation and construction activities that reduce road user congestion and emissions through the construction site.

ECl-6.2 - Implement an innovative construction approach or traffic accommodation scheme that minimises the negative impact of the construction on existing road

BACKGROUND:

100% is scored for either subitem 1 or subitem 2. But please note that whilst this credit provides 100% score for carrying out either method, it is strongly encouraged to carry out both subitem 1 and subitem 2 for comparative purposes and to help calibrate the two approaches going forward.

100% is scored for both subitem 1 and 2. 50% is scored for just subitem 1. 0% for just subitem 2.

FEEDBACK FORM ECl-6 - Traffic Accommodation

CHECK ECl-6.1 - COST-BENEFIT ANALYSIS

Option 1: A cost-benefit analysis has been carried out by a **specialist** in order to compare the social, environmental and economic impact of conventional traffic accommodation to an alternative traffic accommodation

Name of specialist:
 Qualifications:
 Name of company:

CONVENTIONAL TRAFFIC ACCOMMODATION

Total lost man hours due to traffic delays: hr
 Total CO₂e due to delays: tonnes CO₂e
 Cost to economy due to delays: R (millions)

ALTERNATIVE TRAFFIC ACCOMMODATION

Total lost man hours due to traffic delays: hr
 Total CO₂e due to delays: tonnes CO₂e
 Cost to economy due to delays for alternative: R (millions)
 Costs associated w/ designing alternative: R (millions)
 Costs associated w/ constructing alternative: R (millions)

Lost man hours gained from alternative: hr
 Reduced CO₂e due to alternative: tonnes CO₂e
 Savings to economy due to alternative: R (millions)

Summary of alternative traffic accommodation:
"Provide a brief summary of the alternative traffic accommodation approach intended to mitigate traffic congestion through the construction site. Describe the anticipated effects on traffic speeds and volumes."

Option 2: A cost-benefit analysis has been carried out using **general assumptions** (see below) in order to compare the social, environmental and economic impact of conventional traffic accommodation to an alternative traffic

Note: Traffic volumes should be extracted from traffic count data as provided by the road owner or...

Note: Either Option 1 or Option 2 should be completed for ECl-6.1. If both are completed, only values from Option 1 will carry through to the summary.

Provide a summary of the cost-benefit analysis numbers as carried out by the specialist. Bear in mind that the "benefit" to the economy is the same for regardless of whether a conventional traffic accommodation plus or an innovative traffic accommodation plus is implemented. For that reason, the only numbers to be compared are the "cost" to the economy for the two different traffic...

Note: "Costs associated..." re the alternative traffic accommodation approach. If...

An example might include the cc Describe the approach in detail.

Option 2 is intended to provide alternative traffic accommodation hold constant across all project assumptions cannot be modified.



Reg.No.1998/009584/30
 BUILDING SOUTH AFRICA THROUGH BETTER ROADS

Royal HaskoningDHV

Pilot Phase on N3



Reg.No.1998/009584/30

**BUILDING SOUTH AFRICA
THROUGH BETTER ROADS**

Pilot Phase on N3



PACKAGE	DESCRIPTION	LENGTH KM	NO. OF NEW BRIDGES/ WIDENINGS	I/Cs TO BE UPGRADED
A	EB Cloete (including portion of N2 North and N3 West)	6,3	10	1
B	Westville Viaduct (Km11.8) to Paradise Valley (Km17.5)	5,7	13	2
C	Paradise Valley (Km17.5)-Marianhill Toll Plaza	7,5	5	3
D	Marianhill Toll Plaza (25) to Key Ridge (2.8)	11,1	9	2
E	Hammarsdale I/C upgrade (Km 9.4)	0	1	1
F	Hammarsdale (9.1) to Cato Ridge (20.1)	11,3	3	-
G	Keyridge (Km2.8) to Hammarsdale (Km 8.1)	5,3	4	-
H	Cato Ridge (Km19.4) to Dardenelles I/C (Km26.6)	7,2	6	2
I	Dardenelles I/C (26.6) to Lynnfield Park (Km 30.6)	4	4	1
J	Lynnfield Park (Km 30.6) to Asburton I/C (Km 1.5)	5,3	4	1
K	Asburton I/C (Km 1.5) to Murray Road (Km6.1)	4,6	2	
L	Murray Road (Km 6.1) to New England Rd I/C	2,9	9	
M	New England Rd I/C to Twickenham Road (Km16.4)	7,5	8	
TOTAL		79,3	78	



- Estimated to cost approximately R15,7 billion (2015), excluding PMB Ring road

Reg.No.1998/009584/30
BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

Planned ver.2 Improvements

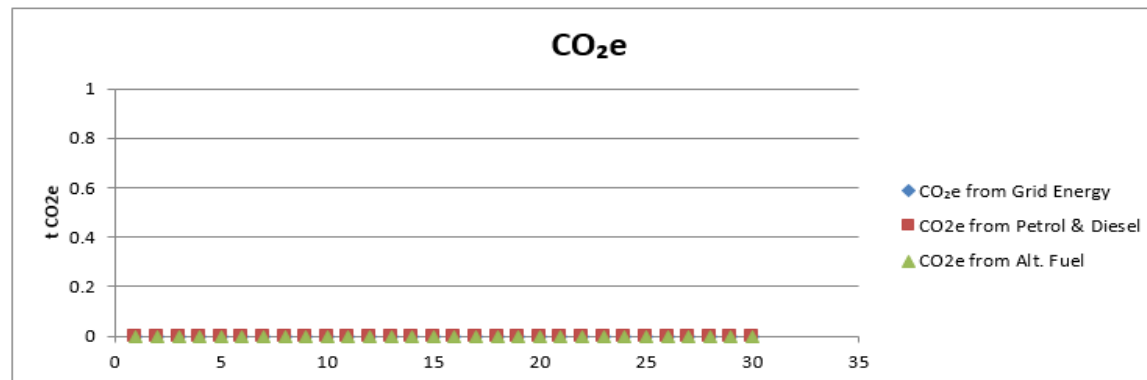
- Incorporating industry feedback
- Full scope carbon footprint & carbon savings and offsets
- More default/typical values – assumed values and conversion factors
- Improved relevance of summary report output – e.g. improved feedback on water, energy etc. savings
- Alignment with industry needs



CHECK NR-2.1 – TRACKING OF ENERGY USE

Will monthly energy use be monitored and reported on during construction?

Complete the energy use monitoring sheet under the ENERGY sheet



Industry Status

- Lobbying for use by industry
- Incorporated into new draft *roads policy*
- Research the socio economic credits in line with Government objectives and making them measureable in relation to government outcomes
- Formalise the SuRF structure
- Set up a sustainable funding source for SuRF
- Need volunteers to evaluate current credits and draft future credits



Comparison to other countries



Infrastructure Sustainability Council of Australia (ISCA)

- Infrastructure authorities Regulations
- Operating income over 4 years \$79.1 million
- Inbuilt on the procurement model
- Reporting vs performance management
- Penalties for pollution

