NUCLEUS

MODULAR TRAFFIC LIGHT SYSTEMS

PRESENTS

The next generation of traffic light solutions

SABS DESIGN EXCELLENCE AWARD · 2008

CURRENT TRAFFIC LIGHT SYSTEMS

Where legacy infrastructure falls short

- Expensive outlay and **high replacement costs**
- High ongoing maintenance requirements
- Long "down time" for repairs after accidents
- High-impact-resistant poles cause **injury to motorists** and damage to pavements & vehicles
- Energy-inefficient incandescent lighting
- Limited lamp lifetime

THE EXTENT OF CRASHES INVOLVING POLES

A well-documented global safety problem

A study by Pilkington in 1988 found that **14.4% of roadside crashes** in the US involved traffic light poles and street light poles — likely an underestimate, given how many pole accidents go unreported. Pole crashes were **6 times more likely** than other crashes to lead to a fatality and 3 times more likely to result in serious injury. 80% were frontal impacts; the remaining 20% were side impacts, which more commonly proved fatal.

Jones and Baum's US study found poles were the most frequently struck roadside object (21.1%), accounting for 2.2% of all crashes — and featuring the highest injury rate (50.5%) of any crash type except rollovers.

Mak and Mason (1981) found poles accounted for 28.4% of roadside crashes and 3.3% of all crashes, with 1.2% of pole crashes causing a fatality (6.2x more likely than average) and 43.4% causing injuries (3x more likely).

Source: report to the Motor Accident Commission, University of Adelaide, Australia, May 1999.

GLOBAL RESEARCH

The extent of roadside crashes, as reported across the literature

AUTHOR(S)	LOCATION	EXTENT OF ROADSIDE CRASHES
Lawson	West Midlands, UK, 1980–1982	32% of fatal
Lawson	Birmingham, 1980–1982	7% of injury crashes
Proctor	Great Britain, 1994	18,585 casualty
Nilsson & Wenall	Sweden	25% of fatal
de Leur et al	British Columbia, Canada 1991	16.9% of highway crashes
Tignor et al (1982)	USA 1980	20,000 fatalities (40%)
Mak & Mason	USA 1976	11.7% of all crashes
Kedjidjian	USA 1991	30% fatal
Ray, Troxel & Carney	USA 1980–1985	33% of all crashes
Corben et al	Victoria, Australia 1994	23% of casualty
Sanderson & Fildes	Victoria, Australia 1978–1982	22% of casualty

THE COST OF IMPACT

Impact damage under the current system

THE COST OF IMPACT

Residual damage under the current system

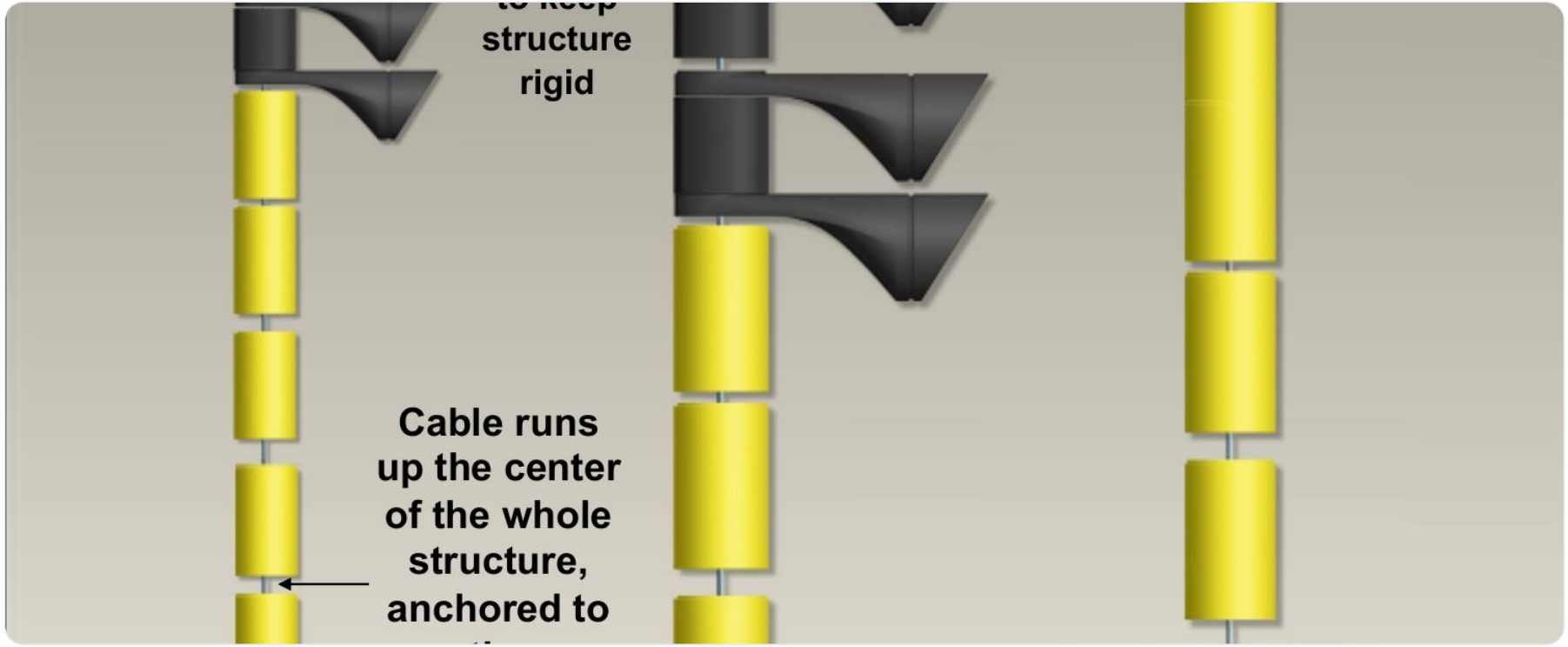
MODULAR TRAFFIC LIGHT SYSTEMS

Advantages of the MTLS

- **Zero impact resistance** — causes no injury to motorists and minimal damage to pavements and vehicles
- Economic outlay and low replacement costs
- Zero maintenance
- Rapid repairs after accidents
- Energy-efficient LED lighting
- Extended lamp lifetime — up to **100,000 hours**

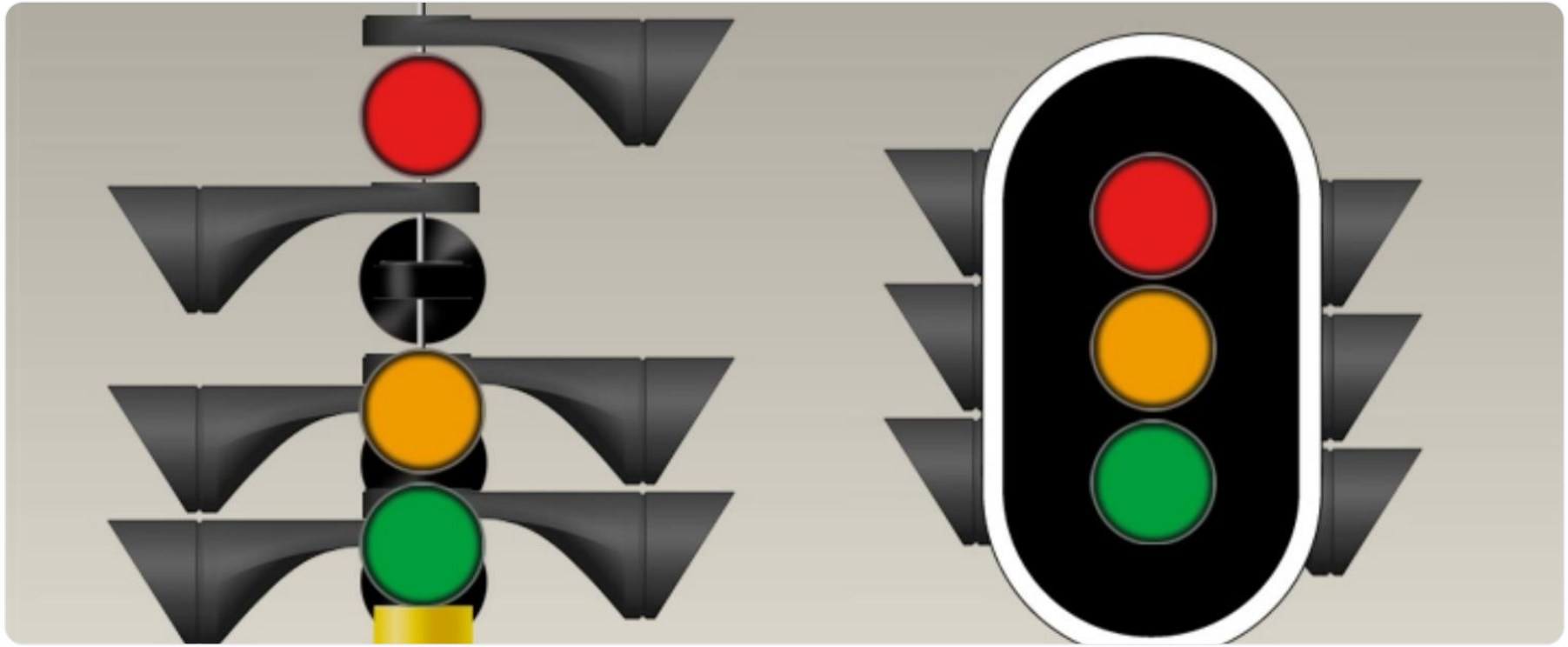
ENGINEERING

Exploded view of the modular pole



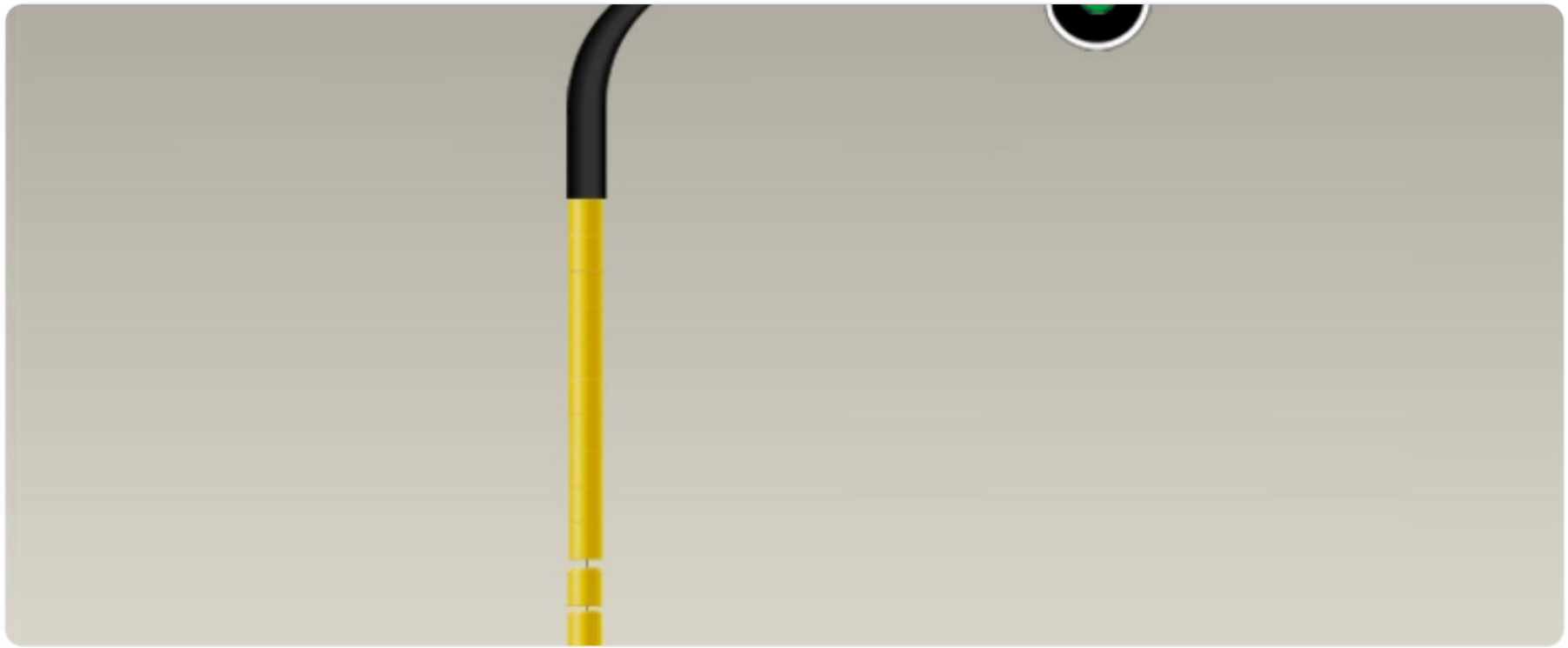
ENGINEERING

Hanging overhead signal head



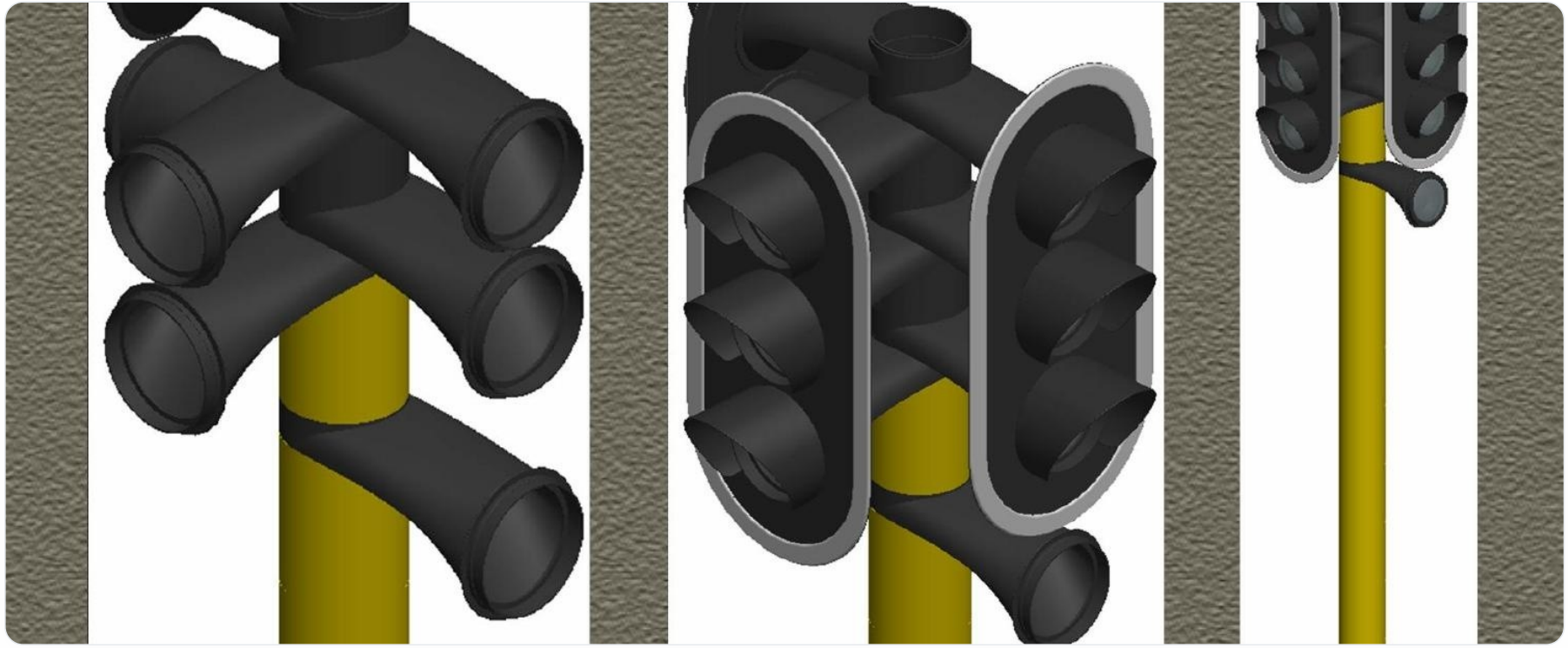
ENGINEERING

Boom-supported signal head



ENGINEERING

Multiple head construction



CASE STUDY

Sandton City intersection

JOHANNESBURG ROADS AGENCY

JRA Approval

City of Johannesburg
Johannesburg Roads Agency (Pty) Ltd

Joburg
a world class African city

68 Super Street
Cnr. Jeppe Street
Johannesburg
2001

P/Bag X70
Braamfontein
South Africa
2017

Tel +27(0) 11838-5787
Fax +27(0) 11 838-5176
www.joburg.org.za
www.jra.org.za

5 November 2008

Modular Traffic Light Systems
Attention: Barry Geer

Re: Approval of MTLS

This letter serves to confirm that after a 12 month pilot project the Modular Traffic Light System has been approved for installation and use by the Johannesburg Roads Agency (JRA)

Yours truly,

Chris Bruyns
Manager: Traffic Signals
Tel: (011) 838 5787
Fax: (011) 838 5176
cbruyns@jra.org.za

JRA

Directors:
Chairman: SH Grant, Managing Director: VG Mosoeu
Non-Executive Directors: Adv. D Stuck, GC Cunningham, D Coovadia
K Dipone, LM Maboda, Dr WG Nicolaas
Company Secretary: Adv. T Makhubela
Registration No. 2000/028965/07

INTERNATIONAL ROLLOUT

Dubai Road & Transport Authority

INTERNATIONAL ROLLOUT

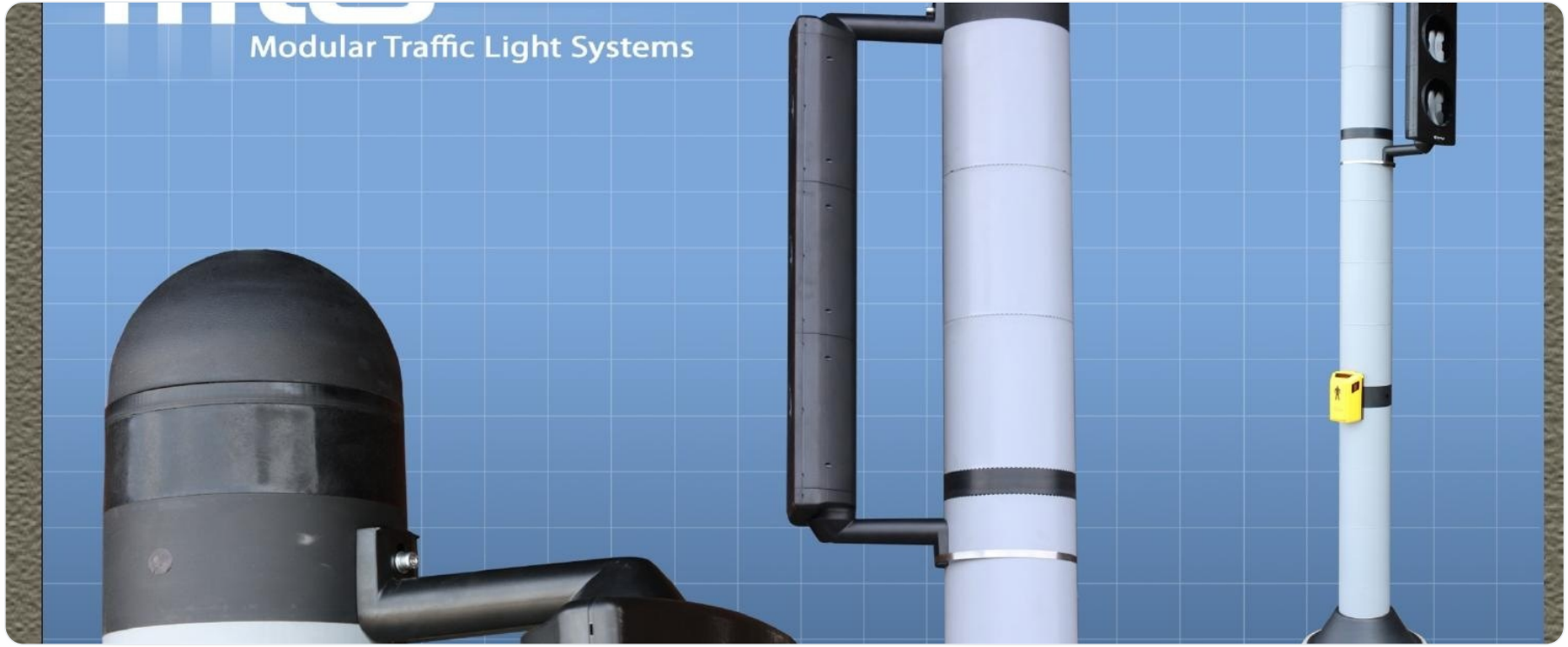
Dubai RTA approval setup

INTERNATIONAL ROLLOUT

Dubai RTA approval setup — total erection time: 18 minutes

INTERNATIONAL ROLLOUT

German market: approval

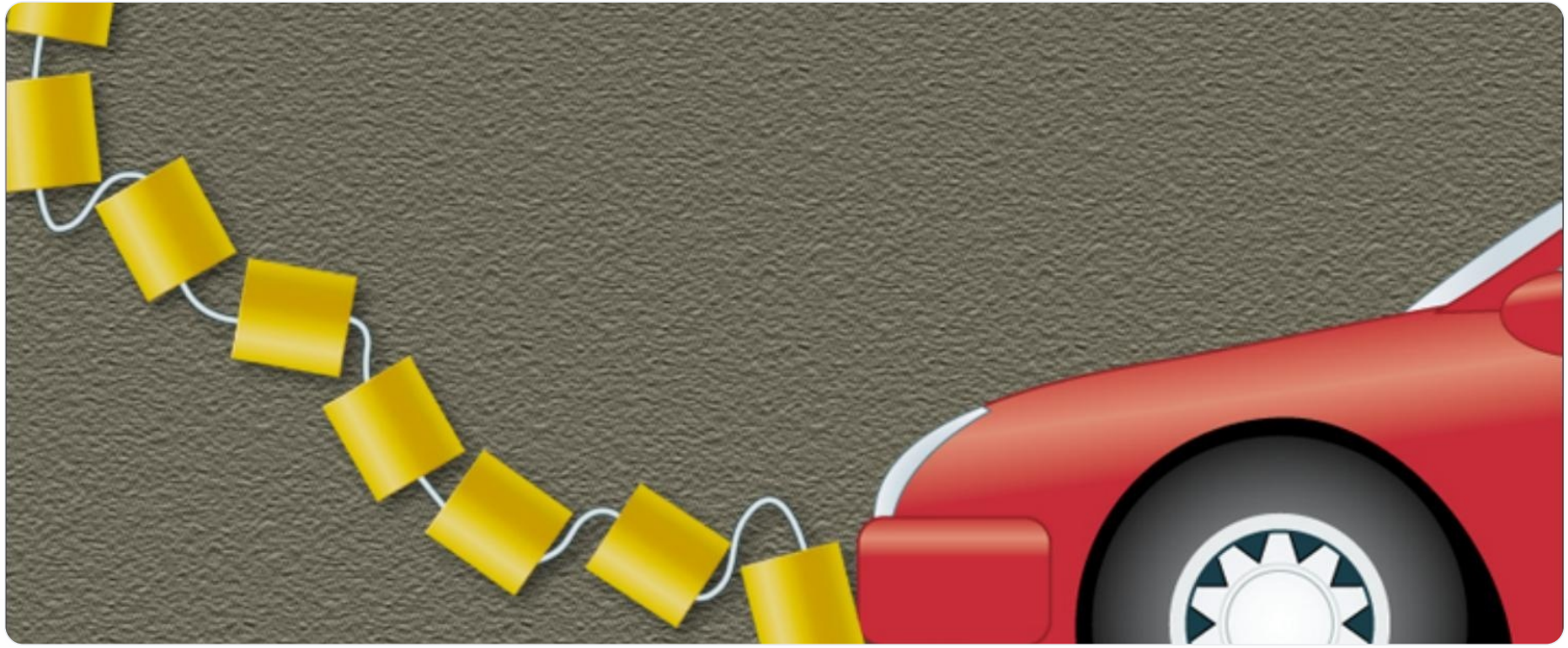


INTERNATIONAL ROLLOUT

German market

SAFETY ENGINEERING

MTLS collapses safely on impact



COST SAVINGS — REPAIRS

What the MTLS removes from your repair bill

- No need for a 5-ton truck
- No need for large work crews
- No need to re-throw a concrete foundation
- Reduced repair time
- Reduced insurance premiums

ULTRA-LOW MAINTENANCE

MTLS maintenance requires

- No galvanizing
- No painting
- No cutting
- No large work trucks
- No large work crews

PRODUCT ROADMAP

The MTLS is a work in process

PHASE 1

Presented solution with no power cables — 24V LED

PHASE 2

Solar-powered signals and wireless communication

PHASE 3

Single light system

COMMUNITY SAFETY & SECURITY

Open architecture (camera)

Due to its modular format and open architecture, MTLS can accommodate a wide variety of electronic, monitoring and surveillance equipment.

COMMUNITY POLICING

MTLS can accommodate LPR and general surveillance cameras

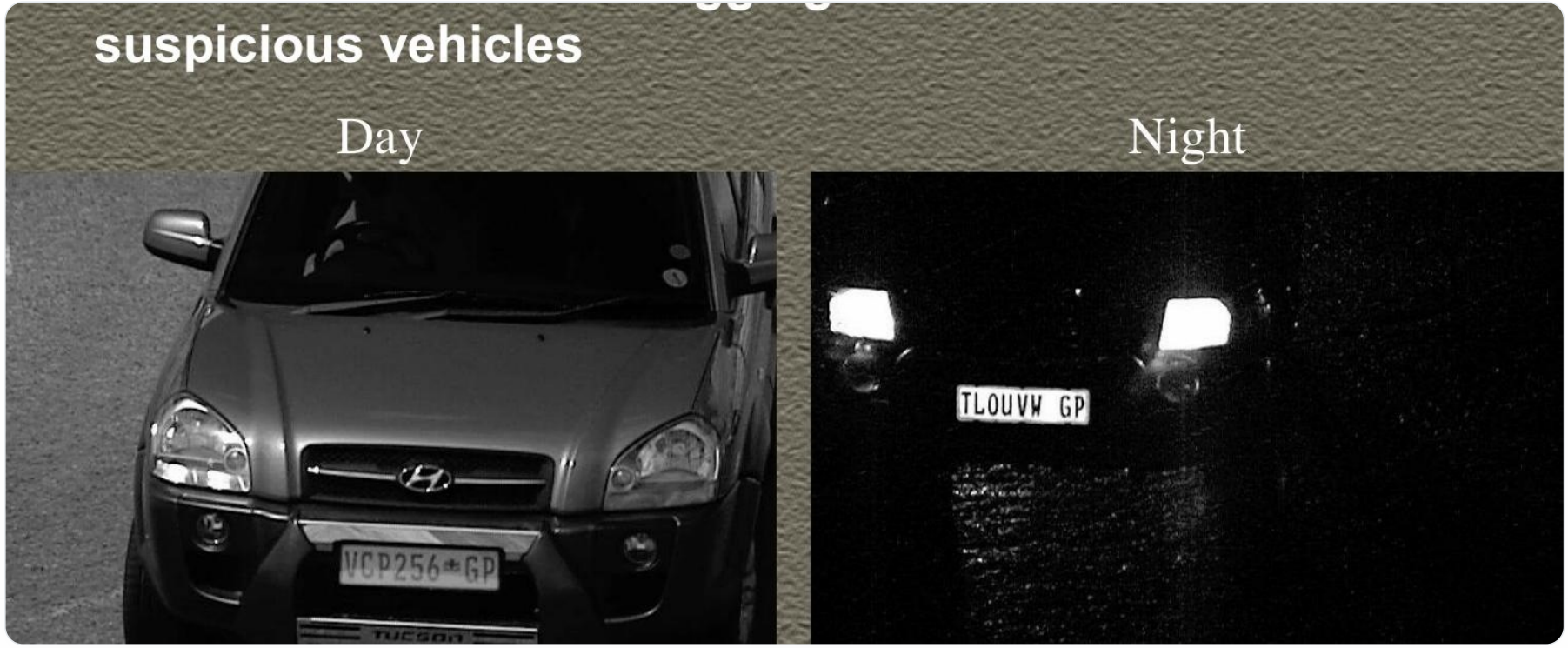
These cameras feed live video to a central surveillance destination of choice. As stolen or suspicious vehicles are detected through database interrogation, local law enforcement is notified immediately — proactive community policing.

SAFETY & SECURITY

General surveillance cameras inside the MTLS

SAFETY & SECURITY

LPR cameras inside the MTLS — real-time day & night identification



THE WORLD'S FIRST AND ONLY TRULY SAFE TRAFFIC LIGHT SYSTEM

Awards & recognition

- A 2008 SABS Design Excellence award winner
- A 2009 Endeavour Entrepreneur finalist, representing South Africa in Miami among over 20,000 entrants
- Invited to exhibit at the Smithsonian Institute's Cooper Hewitt Museum in New York for the triennial "Why Design Now!" exhibition
- Invited by Professor Mike Bruton, commissioned by the Innovation Fund, to feature in a new book on South African inventions & innovations — alongside 59 Innovation Fund–supported inventions and 141 other selected inventions


NUCLEUS

PRESENTS

The next generation of street light solutions

CURRENT STREET LIGHT SYSTEMS

Where legacy infrastructure falls short

- High-impact-resistant poles cause **injury to motorists** and damage to pavements & vehicles
- Expensive outlay and high replacement costs
- High ongoing maintenance requirements
- Long "down time" for repairs after accidents

ENGINEERING

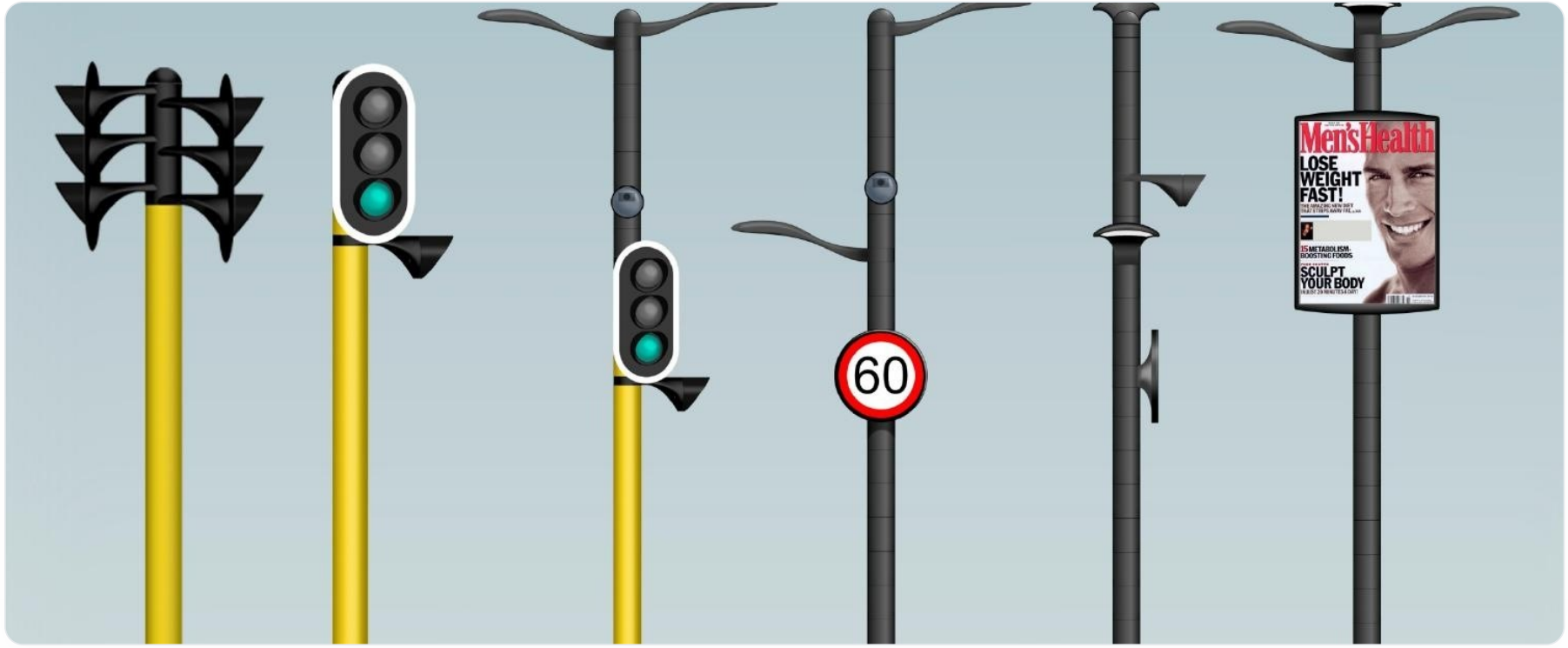
MTLS segments — pole, signal head & twin head

ENGINEERING

MTLS segments — signage, streetlight & foundation

ENGINEERING

Any of these configurations can be built from the MTLS segment kit



MAIN ROADS & PARKING

Before — traditional streetlight, unlit parking lot

MAIN ROADS & PARKING

After — MTLS streetlight with camera, advertising-ready poles

BEFORE & AFTER

Before — traditional highway lighting

BEFORE & AFTER

After — MTLS highway lighting with traffic monitoring & security camera

BEFORE & AFTER

Before — traditional highway off-ramp lighting poles

BEFORE & AFTER

After — MTLS highway off-ramp lighting

BEFORE & AFTER

Before — pedestrian walkway with no lighting

BEFORE & AFTER

After — street lighting with pedestrian light & traffic info sign

Become responsible.
Make the right decision.
Make a change to your community safety.

WINNER — SABS DESIGN EXCELLENCE AWARDS 2008