

THE INSTITUTION OF ENGINEERS, MALAYSIA



ROAD MAINTENANCE IN MALAYSIA

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ROAD MAINTENANCE IN GENERAL

Proper road maintenance contributes to:

- A reliable transport at reduced cost, as there is a direct link between road condition and vehicle operating costs (VOC).
- eliminating rapid deterioration of the road and eventual failure from both climatic and vehicular use impacts.
- An improperly maintained road can also represent an increased safety hazard to the user; Leading to more accidents, with their associated human and property costs.



ROAD MAINTENANCE IN GENERAL

Road maintenance is essential in order to;

- (1) preserve the road in its originally constructed condition
- (2) protect adjacent resources and user safety, and
- (3) provide efficient, convenient travel along the route

ROAD MAINTENANCE IN GENERAL

There are 3 categories of road maintenance:

- **Routine works**
- **Periodic works and**
- **Special / Emergency works**

ROUTINE WORKS

- These are works that are undertaken each year that are funded from the recurrent budget.
- Activities can be grouped into cyclic and reactive works types.
- Cyclic works are when the maintenance standard indicates the frequency at which activities should be undertaken.
- Reactive works are those where intervention levels, defined in the maintenance standard, are used to determine when maintenance is needed

ROUTINE WORKS

- i. **Pavement** - Pothole patching, sealing of surface cracks, clearing vegetation on paved surfaces, repairs to concrete pavement joints, paving blocks and slabs.
- ii. **Road shoulder** - Regrading and topping up of shoulders as required, filling irregularities in unsealed shoulders and filling pavement/shoulder level differences.



ROUTINE WORKS

- iii. **Grass cutting** - Cut and dispose grass
- iv. **Roadside furniture** -Cleaning of road signages, guardrails, kilometre posts and delineator posts as per cycle
- v. **Bridges and culverts** - Cleaning works and removal of vegetation as per cycle
- iv. **Drainage**- Cleaning and desilting works as per cycle



Cleaning of road signage and delineator posts as per cycle



Cleaning works and removal of vegetation as per cycle



Cleaning and desilting works as per cycle

PERIODIC MAINTENANCE

- These include activities undertaken at intervals of several years to preserve the structural integrity of the road,
- or to enable the road to carry increased axle loadings.
- The category normally excludes those works that change the geometry of a road by widening or realignment.

PERIODIC MAINTENANCE

Periodic maintenance works comprise;

- preventive maintenance works – upgrade roads, culverts, drains or slopes to prevent floods, land slides and also clearing hazards to improve road safety
- Pavement strengthening of roads - resurfacing, resealing, overlay, widening and pavement reconstruction
- repair, replacement and installation of roadside furniture, drains, culverts, slopes and guardrails



EMERGENCY MAINTENANCE

- These are activities whose needs cannot be estimated with any certainty in advance.
- The activities include emergency works to repair landslides and washouts that result in the road being cut off or made impassable.
- A contingency allowance is normally included within the recurrent budget to fund these works, although separate special contingency funds may also be provided.



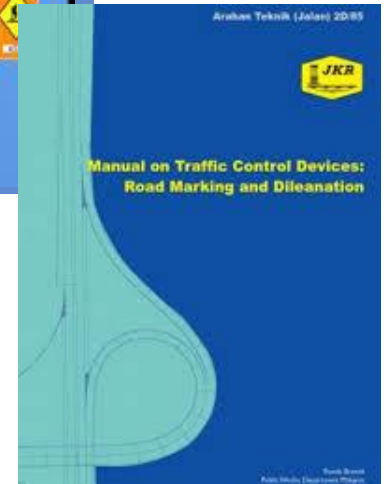
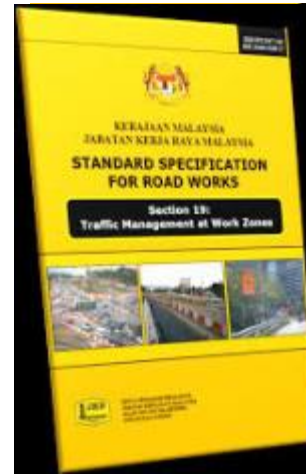
EMERGENCY MAINTENANCE

Emergency maintenance works include;

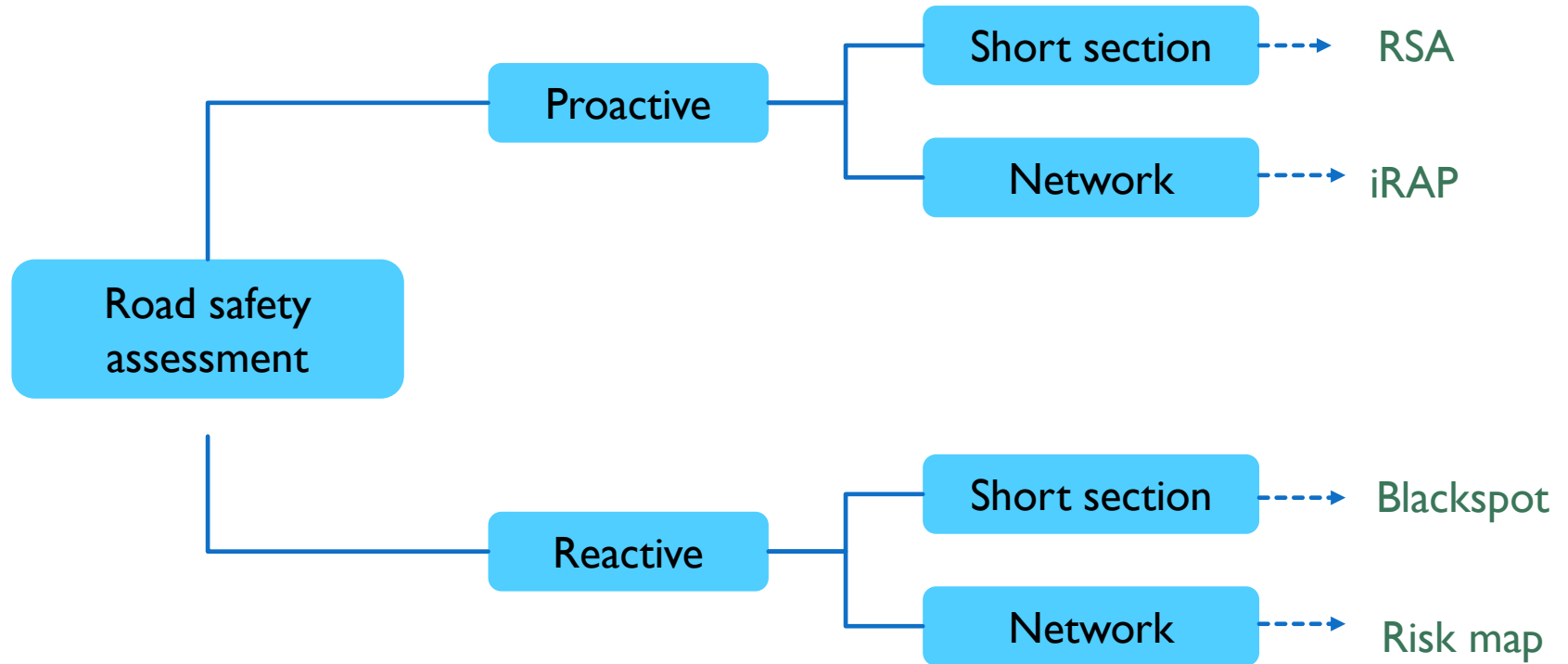
- Traffic management, clearing works and provision of temporary diversions in the event of slope failures, bridge or culvert failures
- Traffic management, clearing works in the event of oil/chemical spills, floods, or fallen trees



GUIDELINES FOR ROAD MAINTENANCE



ROAD SAFETY ASSESSMENT



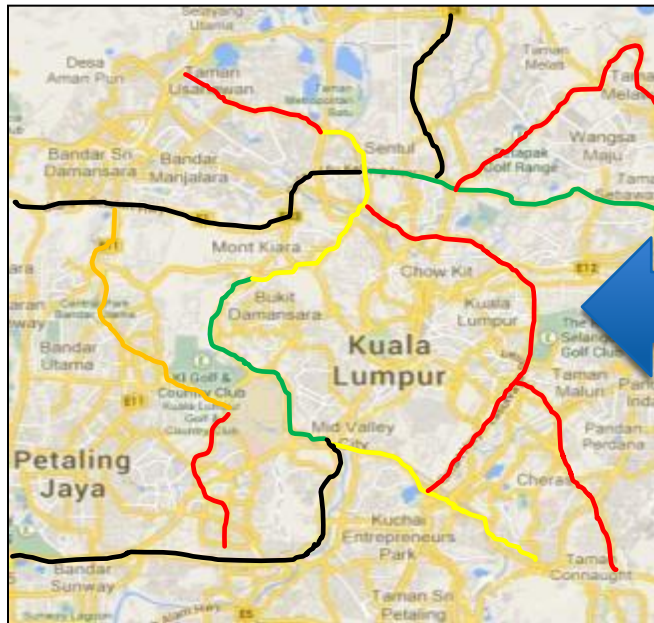
STAR RATING BANDS

iRAP tells us:

- ✓ What is the current condition of our road infrastructure.
- ✓ How safe are the road environment.
- ✓ What can be done to improve the current conditions.
- ✓ How much is the return of investment of each improvement.

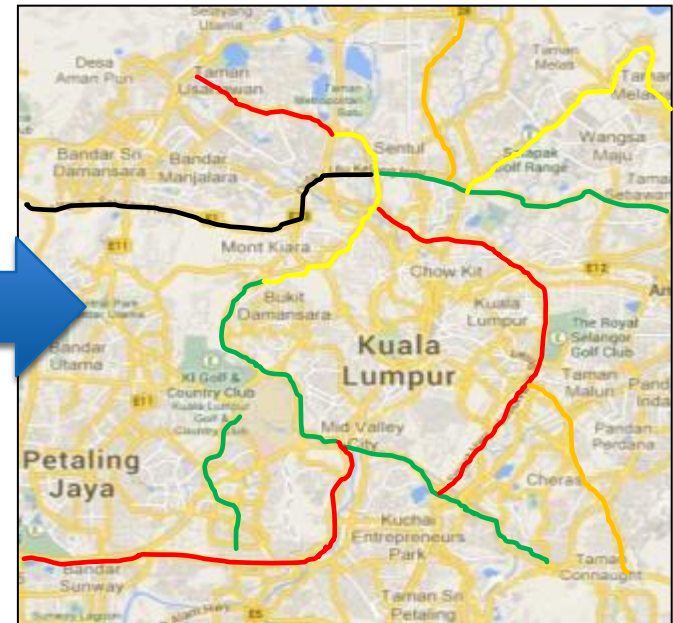
Star Rating	Star Rating Score				
	Vehicle occupants and motorcyclists	Bicyclists	Pedestrians		
			Total	Along	Crossing
5	0 to < 2.5	0 to < 5	0 to < 5	0 to < 0.2	0 to < 4.8
4	2.5 to < 5	5 to < 10	5 to < 15	0.2 to < 1	4.8 to < 14
3	5 to < 12.5	10 to < 30	15 to < 40	1 to < 7.5	14 to < 32.5
2	12.5 to < 22.5	30 to < 60	40 to < 90	7.5 to < 15	32.5 to < 75
1	22.5 +	60+	90 +	15 +	75 +

BENEFITS TO ROAD AUTHORITIES



Period 1

Compare



Period 2

- Provide a platform for tracking safety performance over time
- Allow for continuous improvement
- Sustain programme

MIROS AS iRAP CENTRE OF EXCELLENCE

Provide training courses

- iRAP Coding
- iRAP Star Ratings
- iRAP Safer Roads Investment Plan



Dept. of Public Works & Highways, Philippines



Public Works Dept. Malaysia

Engagement

- Public Works Dept., **Malaysia.**
- Department of Public Works & Highways, **Philippines.**
- Institute of Road Engineering, **Indonesia.**



Institute of Road Engineering, Indonesia



MIROS AS iRAP CENTRE OF EXCELLENCE

Develop road survey tool

- To enable iRAP data collection
- To enable data viewing and coding

Partner

- Universiti Teknikal
- Melaka, Malaysia.

Road Attribute Data Logger & Inspection System (RADIS)





THANK YOU

from

IEM

in association with

MIROS

(Ir. Richard Wong & Dr. Rizati Hamidun)