Roughness index mapping:

# References

1. IRC SP 16:2019
2. MORTH

**Roughness:** is the result of either the built-in irregularities due to construction defects or it may also appear on the road surface due to the consolidation or displacement of different materials placed within the pavement structure due to traffic movement.

**Surface evenness:** refers to regularity of surface finish both in longitudinal and transverse directions.

* Surface evenness is an important factor for evaluation of surface condition of road and hence forms an imp. Input into any PMMS (pavement maintenance management system)
* Through assured maintenance, road roughness can be contained to lower levels, the road agencies would also be benefit through deferred reconstruction investments.
* The relationship between vehicle operating cost and road roughness are well established through several studies conducted both in india and abrod.

Table

Description automatically generated

* Roughness analysis can be compared based on how they process the sinusoid.
* Roughness involves at least two dimensions in a complex way, as it involves variation of profile height along its length.
* Two system for measuring:

1. Measures the profile of the road is termed as the profilometric system
2. System that are rely on the movement of suspension system in response to the unevenness of the road surface travelled by a vehicle (Response Type Road measuring system)

* Importance of Road roughness:

1. Effect on Road safety: It can cause the significant loss of braking force or slip resistance on a vehicle.
2. Effect on VOC (Vehicle operating cost): As the roughness increases the vehicle operating cost increases.
3. Fuel Consumption Cost: As Roughness increases, vehicle speed decreases and subsequently the fuel consumption increases.

* Roughness measurement methods:

1. Profilometric systems
2. Response type road roughness measuring system

* Classification of road roughness measuring system:

1. Class 1: precision Profilers: highest standard of accuracy ( sampling intervals less than 250mm and with the precision of less than 0.5mm on a very smooth pavements)

Instruments: Speed profilometer and Laser profilometer

1. Class 2
2. Class 3: Response type measurements. Measures the dyanamic response of vehicle to the road surface by using either mechanical or accelerometer devices. Estimation is done after the calibration.
3. Class 4: physically drives along the road.

* Units:

1. RI: mm/km
2. IRI: m/km

* Permissible values of roughness for expressways, NH, and SH

Table

Description automatically generated

* For Major district road and other district road:

A screenshot of a computer

Description automatically generated

* Village road:

A screenshot of a computer

Description automatically generated

* Selection of appropriate equipment:

Graphical user interface, text

Description automatically generated

* Data analysis and reporting:

Shall be analyzed as per the standard procedure of the respective equipment.

A screenshot of a computer

Description automatically generated with medium confidence

* Rectification:

1. Subgrade:

A screenshot of a computer

Description automatically generated with medium confidence

2.

A screenshot of a computer

Description automatically generated with medium confidence

1. Cement concrete pavement:

A screenshot of a computer

Description automatically generated with medium confidence