Management Index Specification for Road systems & Traffic Engineering

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Management Index Specification

- The Management Index Specification for Road Systems abbreviated as MIR outlines a design specification to mitigate hazards in a road system, where different aspects of a road system are considered.

- The purpose of any road being to help commuters, passengers or main stream vehicles travel from one point to another. Any road has different types of traffic, which can be outlined as follows

- **Types of traffic distances**
- 1. Short distance traffic or traffic within a neighborhood
- 2. Medium distance traffic (inter-neighborhood, inter-zonal regions or intra-city)
- 3. Long distance traffic (be it a National Highway, State Highway, District Roadway which in turn is intra-district or inter-district)
- 4. Millennium concepts like NICE roads, Ring roads, Flyovers, Road corridors

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- **Types of traffic**
- 1. Trucks, Goods and Freight carrying vehicles
- 2. Government and Private Buses
- 3. Mini buses, vans
- 4. Cars, taxis
- 5. Auto rickshaws
- 6. 2-wheelers
- 7. Cycles, Cycle rickshaws
- 8. Animal driven carts
- 9 Free or herded Livestock
- 7. Additionally Feeder traffic, Freight carrying traffic, Inter-state or Inter-city Passenger traffic, Emergency response traffic, Tube or Elevated Rail traffic

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- Every road has certain MIR assets and certain MIR liabilities, where MIR assets help road system utilization and performance, whereas MIR liabilities are always or sometimes hazardous if not suitable for a road configuration or can pose a risk to people using a road system.

- The MIR specification terms the following as **MIR assets**
- 1. Road configuration databases and/or cloud based systems
- 2. Traffic signals and traffic control systems
- 3. Disaster mitigation systems and Emergency Response systems
- 4. Defect liability based feedback systems
- 5. Planned Road signs, Billboards/Hoardings, Signages

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- The MIR specification terms the following as **MIR liabilities**
- 1. Unplanned Lanes, Road Medians
- 2. Unplanned Bordering Road Barricades
- 3. Unplanned Speed breakers or Road Humps
- 4. Unplanned or poorly constructed Pavements
- 5. Poorly maintained Manholes & Sewer systems
- 6. Impediment causing Elevated or Tube Railway infrastructure
- 7. Unmanned or poorly maintained Railway crossings
- 8. Poorly maintained Bridges and Tunnels*
- 9. Poorly maintained Trees and Greenery
- 10. Hotspots (locations that need converged administration to address the need to mitigate climate change, rising pollution levels, rising CO_2 levels, poor air quality, accident trends, traffic problems, incidences of crime, issues with road system arboriculture)

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- The MIR specification tries to balance MIR liabilities with MIR assets. To do this the specification introduces a new principle called “defect liability”, where the nature of planning, implementation, commissioning, performance, maintenance and/or reengineering are all evaluated via the need to perform reliably, improve safety and mitigate hazard or risk.

- The MIR specification integrates a Management index or defect liability indicator with each road system, where different parameters such as MTTD, MTTP, MTTN & MTTR and feedback loops all decide the balance.
- **Abbreviations and their meanings:**
- MTTD: Mean Time to Detection MTTP: Mean Time to Prioritize
- MTTN: Mean Time to Network needed Engineering infrastructure and resources
- MTTR: Mean Time to Resolution

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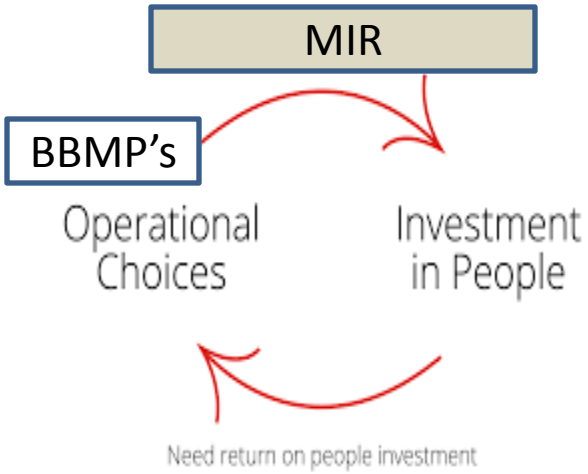

- The MIR specification uses the following core indicators and systems to define a road system configuration
- 1. Nature of planning
- 2. Defect liability systems
- 3. Associated planning, risk mitigation, repair and/or restoration programmes
- 4. Traffic management systems
- 5. ACCIDENT RELIEF, EMERGENCY RESPONSE AND ASSISTANCE systems

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- As implementing the MIR specification will need big sized budgets that depend upon the RADIUS of coverage, the city's landscape planning & development, the diversity of it's road systems, the multi-varieties of the traffic and commuting differentiations, the proposal emphasizes that the civic bodies can plan for this budgeting via 2 components
- 1**. Investment in People (IinP) schemes** (a part of SMART City budgets)
- 2. **Road Safety Insurance schemes** depending upon the nature of road system usage by a commuter/vehicle owner/business/organization/institution (a part of the contributions of citizens), where a Commuter Safety Account will be assigned to address the need for road safety.

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- The Commuter Safety Account will provide an insurance cover for
- 1. Commuters or passengers using public or private transport services (like buses, vans, taxis, autos, metros, electric trains etc)
- 2. Private individual vehicle owners
- 3. Private organization or institution vehicle owners
- 4. Cyclists or Cycle rickshaw owners
- 5. Animal driven cart owners and herded Livestock owners, where there will be a need to comply with certain rules to be able to claim any compensation

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People's Trust

- 6. Pedestrian Safety, where earning (daily) pedestrians will need to pay a separate small amount as part of a pedestrian group insurance policy (to help cover all pedestrians for risks like poorly maintained roads, pedestrian crossings, potholes, drains, manholes, septic systems, traffic signals but will also need to comply with certain rules to be able to claim any compensation).

- This amount will also help BBMP provide ped-friend help, audio assistance or even (use at) special-in-need walkers to help aged people, handicapped or disabled people cross busy roads or difficult to navigate road sections

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BBMP TE to train ped-friends or dedicate resources to help pedestrians and prevent hazards to life

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- The MIR identifies the need for the following **Nature of planning**
- ( ) **Design standards compliance** (width of road, margins for pillars, gradient designs, curves designs, median designs, arboriculture safety, pedestrian and passenger safety, safe commuting between 2 points, reasonable time taken to travel from one point to another, enablers for vehicles that use renewable energy)
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- (**)** **Accountability for Traffic factors** (speed standards set for road systems, reaction time based on PIEV*, navigation standards, safe stopping sight distance, safe overtaking or passing, safe sight distance for entry into any associated intersections, feedback systems)
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- ( ) **Accountability for Environment factors** (sentinel screening and risk mitigation for unforeseen snow fall, hailstorms, heavy rainfall, thunder storm and lightning arrestors, ease of maintenance despite severe weather conditions)
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- ( ) **Maintenance Systems reliability** (proper design out maintenance, risk mitigation & maintenance, inspection and maintenance of extensions, gradient-design validation, policy for emergency services, policy for disaster management services)
- **PIEV* stands for** – Perception time, Intellection time, Emotion time, Volition (Final action) time

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- PIEV – Perception time, Intellection time, Emotion time, Volition (Final action) time
- Perception time – time required to perceive a situation or object
- Intellection time – time required to compare different thoughts, regroup thoughts and different points of understanding, register new "information, thoughts or sensations"
- Emotion time – time required to compare "emotional responses, sensations or disturbances"
- Volition time – time required for final action

- PIEV time required depends upon aspects such as
- 1. Physical characteristics of the driver
- 2. Psychological factors influencing or affecting the driver, savings & safety interests
- 3. Environmental conditions, influencers, situations, road & traffic health
- 4. Purpose of trip, trip planning,
- 5. Type and speed of vehicle, condition and adherence to norms
- 6. New Votary specification and choices for traffic health
- 7. (Occupation based or Trends based) Self-assessment for fitness, drive guidance
- 8. Availability of feedback systems

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- **Nature of planning (continued)**
- ( ) **Quality of associated Drainage systems** (design and implementation after consideration of water table, sub-grade soil, reinforced earth, nature of geo-grids that are to be used in the road construction, management of seepage flow & capillary rise, reliable impervious wearing surface of road with aggregators and binders)
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- ( ) **Quality of traffic signalling systems** ("(Google Earth related) satellite imagery, or drone flight imagery or sentinel sensor feedback based" Risk Mitigation Desk notifications and proactive responses by the traffic management network, by nature of design "intelligent signaling solutions" that decide as to how traffic has to be managed or routed in case there is a disaster, accident, or in a case where part of the road or road system is rendered unusable)
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- ( ) **Satisfactory Emergency Response planning** (Equipped with signage and barricade deployment, contact numbers for nearest "ambulance services, hospital, police station, fire department, disaster management department", availability of first aid provisions, equipped with fire extinguishers & fire fighting facilities, equipped with smoke alarm systems, equipped with sentinel sensors, has clearance for air lift to save life, has collapsible floor/ground escalation systems at designed locations to help evacuate passengers from elevated metro railways)

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- The MIR specification has been further detailed via the following deliverables
- 1. Sustainable Commuting - A Road Safety framework
- 2. Sustainable Support Structures – A SMART Cities version
- 3. Climate Change Mitigation, Traffic decongestion and Commuter Safety – Booklet Guide and Reckoners (this is specifically targeted for Traffic Management and Control)
- The complete specification, guide and handbooks will be made available on purchase of the toolkit for the Road Safety framework. The solution offering does also include development of mobile applications for the same, where this will be taken up on finding more business interest.
- You can ask for the toolkit by contacting the consultant K.S.Venkatram on +919342867666 or by emailing venkataoec@gmail.com