Tracking Roads and Road Systems

RoadMIR and RoadKPI framework

What you need to read before reviewing this document?

You need to read the document on the "Plan for risk mitigation" for roads and road systems.

This document does consider that civic bodies have taken multiple steps to aid in good maintenance and planning like the use of modern engineering tools such as GIS, which have been used to digitize road inventory and road history of all Arterial and Sub-arterial roads.

The given template helps implement risk mitigation by associating certain key indicators for a road, a stretch, a route or a ring road system.

It is expected that a specialized **"Risk Mitigation panel"** will collect (either via the commuters (people) directly or via its delegated representatives) different details about those roads, stretches, routes, or ring road systems that are important for improved commuting and services.

These details will be used by the Concerned Civic Bodies, Traffic Guides, Pollution Level Controllers and Emergency Response & Disaster Mitigation Guides for **intervention, incidence mitigation and resolution**

IMPORTANT DETAILS

Road system name: **Road system Id:**

Management Index Specification: MIR ____

Date of submission: **Time of submission:**

Mapping from:

Mapped till:

Mapping pending:

Type of road system: Road/Stretch/Route/Ring road

Type of transportation that uses road system: Public transport/Private transport/Pooled transport/Personal transport/Priority transport

Added commuting systems: Overhead Metro/Underground Subway/Tram

Current Risk Health: Acceptable/Other reports/Do not know

Health details:
...
Associated images (to be uploaded in.jpeg format with details on location):

Key indicators (KPI(s))
The key indicators can help a Commuter, Risk management panel and the different management entities record and use information to manage issues and help reduce problems associated with roads and road systems.

a. Nature of planning (Rated as a crucial influencer):

( ) **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)

(**)** **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)

( ) **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)

( ) **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)

( ) **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)

( ) **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)

( ) **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)

b. Nature of congestion (Rated as important negative influences):

( ) Perennial congestion
( ) Seasonal congestion
( ) Time-based congestion
( ) Incidence specific congestion
( ) Feeder Traffic specific congestion
( ) Goods/Freight movement specific congestion
( ) Congestion due to other influences

c. Stabilizing aspects (Rated as positive influences):

( ) Has a Management Index Specification
( ) Has satellite images
( ) Included in Google maps
( ) Is of good quality
( ) Has multiple-lanes
( ) Has sensor-enabled medians or bordering road barricades
( ) Has reliable traffic signals
( ) Has SMART Meters
( ) Accountable traffic intervention possible at location
( ) Not in close proximity to industries
( ) Not in close proximity to rivers and other rainfall affected water bodies,
( ) Has storm water drains
( ) Has well maintained manholes and septic systems
( ) Not affected by festivities
( ) No pedestrian sidewalks
( ) No encroachment

( ) No alteration
( ) Not sidelined by trees
( ) No afflicted by dumping of industrial waste
( ) Not afflicted by dumping of public waste
( ) Has a proper sewage system

d. Probable Hazards (Rated as very important negative influences):

( ) Is an inter-link for other roads or routes etc
( ) Is in close proximity to neighboring states
( ) Is in probable or escalated tension areas
( ) Is a sensitive area (where satellite imagery a threat)
( ) Is in close proximity to an industrial cluster
( ) With curving meanders
( ) Has a steep incline with improper entry or exit
( ) Has underlying dangerous landforms
( ) Is in close proximity to dangerous landforms
( ) Has a history of unattended potholes
( ) Has potholes
( ) Is sidelined by less maintained trees
( ) Is in close proximity to rivers and other rainfall affected water bodies
( ) Is in close proximity to marshes or swamps
( ) Is part of a bridge or connects to a bridge
( ) No storm water drains
( ) Has poorly maintained manholes and septic systems
( ) Afflicted by incidences of bottlenecks
( ) Is difficult to manage via surveillance
( ) **Is prone to crime** (due to lack of surveillance/being a remote location/ lack of traffic signals/lack of lighting)
( ) **Is prone to accidents** (due to lack of sufficient planning for pedestrian and passenger safety)

e. Associated planning, risk mitigation, repair and/or restoration programmes

The addressing of problems is either well-planned or not well-planned, where there are selective classifications that can help identify issue levels for the commuter:

Planned (Rated as positive influences)
( ) Forecast based
( ) Control Room based
( ) In time surveillance based

Not well-planned (Rated as very important negative influence)
( ) Only reciprocal (where problems are addressed in a reactive manner)
( ) Only when problems are escalated
( ) Only when mass grievances are reported

f. Signage deployed to mitigate risks to commuters or people
( ) **Road signs identifying traffic safety norms** (one-way or two-way signs, permitted timings, speed limits, rules for pedestrian and passenger safety, rules about overtaking, rules against cutting lanes, rules for parking, signage about low visibility zone, low height clearance and load levels)

( ) **Signage for accident relief, emergency response and assistance** (like contact information for the nearest "ambulance services, hospital, police station, fire department, disaster management department", associated civic body)

( ) **Signage and barricades around (perimeter) of potholes, poor quality manholes and septic systems**

( ) **Signage with precautionary and must know information about ring road, flyover, bridge, tunnel, subway, metro track, tram track, and level crossing**

g. Traffic management advisory for this road system (Rated as positive influences)

( ) Stay off this road/stretch/route/ring road at particular times
Details on timings:

( ) Stay off this road/stretch/route/ring road on particular days
Details on days:

( ) Recommend moderate utilization whenever possible
( ) Restricted for goods carriers
( ) Restricted for heavy motor vehicles
( ) Restricted for autos
( ) Restricted for 2-wheelers
( ) Restricted for high-fuel-consuming vehicles
( ) Restricted for pollution accelerators
( ) Connects or connected to bad roads or problem afflicted routes
( ) Not to be used by vehicles solely using renewable energy or batteries
[Due to Environment factors]
( ) Not to be used by Emergency Response vehicles
( ) Not to be used by Special Needs vehicles
( ) **Not to be used by commuters without personal security arrangements**

h. FUEL CONSUMPTION (CAUSATIVE INFLUENCES)

Recommended types of vehicles that can use this road system:

( ) Petrol vehicles
( ) Diesel vehicles
( ) LPG vehicles
( ) Renewable energy or battery powered vehicles
( ) Other types of vehicles

Details about how much fuel may be consumed:

Unpredictable-fuel-consumption/High-fuel-consumption/
Medium-fuel-consumption/Low-fuel-consumption/
Fuel-consumption-not-a-priority

i. **ASSOCIATED TRAFFIC MANAGEMENT (RATED AS POSITIVE INFLUENCES)**

LiveUpdates possible from SMART Meters: Yes/No/Not applicable

Alarms possible from SMART Meters: Yes/No/Not applicable

LiveUpdates possible from Google maps: Yes/No/Not applicable

Notifications possible about trends in route: Yes/No/Not applicable

Notifications possible for GPS based Emergency Response network:
Yes/No/Not applicable

Intervention possible by route forecasting: Yes/No/Not applicable
Details:

Vehicles can avail of renewable energy or battery charging services in this route: Yes/No/Not applicable

Commuters can avail of drive guidance services in this route:
Yes/No/Not applicable

Commuters can avail of emergency breakdown services in this route:
Yes/No/Not applicable

Commuters can avail of surveillance based security and/or police assistance in this route: Yes/No/Not applicable

h. ACCIDENT RELIEF, EMERGENCY RESPONSE AND ASSISTANCE VIA THE COMMUTER DESKNETWORK (RATED AS POSITIVE INFLUENCES)

[ ] Equipped with first aid provisions
[ ] Has clearance for air lift
[ ] Has installation of collapsible ground/floor escalation systems (for the evacuation of passengers using elevated metro railways)
[ ] Equipped with fire extinguishers and fire fighting systems
[ ] Equipped with smoke alarm systems
[ ] Equipped with mandatory sensors (related to Commuter health and relevant assistance)
Details: These sensors need to measure and report the ambient temperature, quality of air, possible visibility levels, relative wind velocity & humidity levels, and relative loading (where load levels are important for flyovers, bridges and ramps)
[ ] **Equipped with (crime detection specific) surveillance sensors or Intelligent security systems that ensure fast track police control room assistance (related to Safety for women/Security for commuters and relevant assistance)**
Details: The sensors being integrated into the sentinel can include crime detection sensors and systems for intelligent security solutions, where visibility levels are improved, sound sensors are installed to relay any signs of screaming or scuffles, traffic signal violations are monitored, fast track monitoring of the sudden appearances of vehicles with commuters at unpredicted times of the day

What is important about all this profiling?

1. Track updates for a road system are currently available via Google Maps.

2. The need is to include details in a report where these details are important for triple bottom line thinking:

a. Commuter Health (personal gain)

b. Commuter Savings (as an effort to fight climate change and impact to the environment)

c. Pedestrian and Passenger Safety (personal gain)

d. Risk Mitigation Desk Intervention and incidence management (associated gains for the entire community)

The solution being proposed leverages the data and information available via the Road system configuration forms and ticketing system that by design help interpretation, ticketing, resolution and guidance.

( ) **Management of (negative influence specific) Key indicators**
[ ] Nature of congestion
[ ] Probable Hazards
[ ] Lack of Signage deployment
( ) Repair or restoration
[ ] Interpretations on Fuel consumption
[ ] Lack of support for renewable energy or battery powered vehicles

( ) Sustainable infrastructure (positive influence specific) Key indicators
[ ] Stabilizing aspects
[ ] Planning behind repair or restoration
[ ] Signage and barricade deployment
[ ] Traffic management advisory
[ ] Pedestrian and Commuter safety
[ ] Associated Traffic Management
( ) Accident relief, Emergency response and assistance

Details of problems faced:

Resolution sought: