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## CITY ROAD ASSET MANAGEMENT SYSTEM

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**Abstract:-**There are a large number of efforts around the world to obtain more net benefits from road infrastructure assets. The road network constitutes one of the largest community assets and is predominately government-owned. Road administrations must maintain, operate, improve, replace and preserve this asset while, at the same time, carefully managing the scarce financial and human resources needed to achieve these objectives. All of this is accomplished under the close scrutiny of the public who pay for and are regular users of the road network, and who increasingly demand improved levels of service in terms of safety, reliability, environmental impact and comfort. Asset management as applied to the roads sector represents “a systematic process of maintaining, upgrading and operating assets, combining engineering principles with sound business practice and economic rationale, and providing tools to facilitate a more organized and flexible approach to making the decisions necessary to achieve the public’s expectations”. Governments are placing greater pressures on road administrations to improve the efficiency of, and accountability for, the management of the road network. Indeed, in many countries, local highway authorities face formal accountability and reporting requirements on how they manage their assets. Asset management systems offer the prospect of significantly improving road network management outcomes. This report is a review of asset management systems as applied to the roads sector and an analysis of the responses to a survey conducted among those countries represented on Working Group on Asset Management Systems.

**Keywords: -**Smart City, Pune, RAMs, Asset management systems

### I. INTRODUCTION

Pune is the second largest city in the Indian state of Maharashtra, after Mumbai. It is the ninth most populous city in the country with an estimated population of 7.1264 Million. Pune is situated at approximately 18° 32" north latitude and 73° 51" east longitude. The city's total area is 252sq. km. Fig 1. Shows the roads in Pune city and suburban areas.

The population of the Pune has been growing rapidly, between 2001 and 2011; the city grew by 12.6%, increasing from 2.5 million to 3.5 million. The decadal growth rate of Pune for the last 10 years has been at least 12.5% and it's estimated that population in 2019 is 7.1264 Million. There has been an unprecedented increase in the traffic volume over recent years. The number of motor vehicles registered in the Pune has reached to 36.27 lakh, from 33.37 lakh the previous year (2016-2017).Currently, the road network in the Pune is one of the main options to serve the growing needs of the transportation from the public and private sectors. Other modes, such as metro are in the process of development. Therefore, maintaining roads in the Pune at a high level of service is greatly needed.

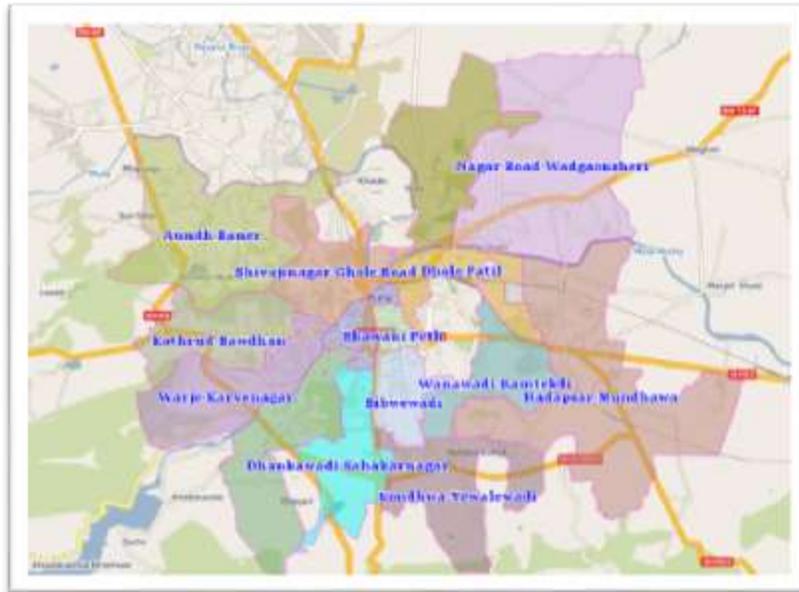


Fig 1. Map showing road network of Pune City

## 1.1 Objectives and Contributions

The primary goal of Road Asset Management is to think, plan and act on the basis of long-term decisions aiming at optimizing maintenance while keeping costs at a minimum and contributing to other political objectives while modernizing the network.

- Efficient Road Data Collection  
-Data driven decision at an affordable cost. Start collecting standard IRI and PCI with your Smartphone today.
- Asset Tracking and Monitoring  
- Advanced Reporting  
- Predictive Maintenance
- Data Driven paving and Maintenance decisions at affordable cost.  
-RAMs is generally to optimize the economic benefits by minimizing the sum of maintenance cost and road user cost
- Municipal authorities for planning budgetary requirement based on Scientific and rational analysis of present road condition
- Perfect and very easy to Prepare Estimate, Planning, Programming.

## II. ASSET OF ROAD

### 2.1 Road Inventory data

1. Name of Road
2. Road ID
3. Width of MVL
7. Type of carriageway
8. Type of median
9. Type of shoulder

- |                      |   |
|----------------------|---|
| 4. Width of footpath | 10. Condition of footpath, Road Marking |
| 5. Type of footpath  | 11. Roughness of Road                   |
| 6. No. Of Lane       | 12. +10 More                            |

## 2.2 Structure Inventory data

Bridge, Culvert, Flyover, Underpass, Grade separator, ROB, RUB, Skyway etc.

- |                             |                        |
|-----------------------------|------------------------|
| 1. Object ID                | 15. Parapet Type       |
| 2. Road Name                | 16. Parapet thickness  |
| 3. Bridge Name              | 17. Wearing coat type  |
| 4. Bridge Type              | 18. Pier top thickness |
| 5. Name of crossing Element | 19. Pier bottom tk.    |
| 6. Construction Year        | 20. Pier height        |
| 7. Number of span           | 21. Foundation type    |
| 8. Span width               | 22. Bed protection     |
| 9. Clear road way width     | 23. Vt. Clearance      |
| 10. Wing wall               | 24. Flow direction     |
| 11. Road width              | 25. HFL                |
| 12. Total length of Bridge  | 26. Low water level    |
| 13. Sub structure Type      |                        |
| 14. Slab thickness          |                        |

## 2.3 Under Ground Utility Data

This Data collected by manually by survey team in filled in TAB to connected to RAMs App. Like Road Nome, Location, pipe type, Pipe Dimension etc.

## III. ROAD ASSET MANAGEMENT (RAM) OFFERS A SOLUTION

Road Asset Management provides decision makers with the necessary tools for efficient and sustainable management of roads. The process goes through the following steps:

- Establish a complete inventory of all road networks with all its elements
- Provide a clear picture of the current condition/performance of the road network
- Estimate the value of the asset
- Predict future demand of traffic and service needs
- Estimate maintenance needs and costs
- Prioritize objectives related to the desired quality and performance of the road network
- Set up funding scenarios for the regular and timely maintenance and upgrade of the road asset
- Define a strategy (RAM Plan)
- Implement the RAM Plan

### 3.1 Potential benefits from implementing an asset management system

The many benefits and expected outcomes available to a road administration upon implementation of an asset management system can be placed into the following categories:

- Communications (both internal and external to the administration).

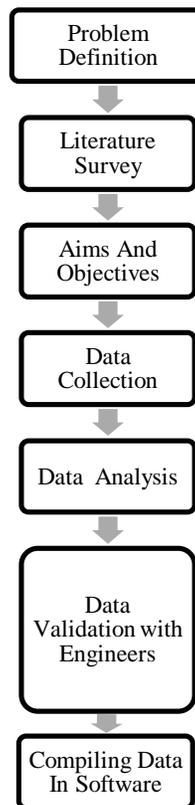
- Asset inventory, condition and level of use.
- Road network performance.
- Asset management tools.
- Budget process.
- Staff development.

#### IV. PROBLEM STATEMENT AND METHODOLOGY

##### 4.1. Problem Statement

The road authorities in the Pune are in smart city project the challenge of maintaining the road network at its highest level of service while investing the minimum amount of money. To achieve this requires searching for and adopting efficient and cost effective road maintenance approaches. One such approach is the PBC to help to enhance the innovation and technologies related to road maintenance methods, reduction in cost, and substantial shift of risk from client to contractor, and increased overall satisfaction of the road users.

##### 4.2. Methodology



#### V. PROCESS OF ROAD ASSET MANAGEMENT

Infrastructure is ageing due to use and time. It requires maintenance, renewal and modernization, which depend on specific needs and life time of each part of the asset. An inventory stating the condition of each asset, values and maintenance needs are the basics for an effective management, for political decision making and for transparency towards the community.

### 5.1 Full inventory

An inventory of roads is a prerequisite for improving the quality of the network in an efficient way. It should contain all the roads elements including historical data on construction and use. It should also be updated regularly. Visually the condition of many roads may superficially be satisfactory. However, only in a few Member States political decisions on investment and network management are accompanied by any sort of quality survey data. Management system has to fit to the infrastructure which is managed. For example, in the case of urban roads, elements related to the management of public transport services, energy, water and telecommunication have to be taken into consideration. This might not be relevant for motorways. Nevertheless, the RAM strategic approach applies in all cases. The table hereunder displays different elements of the road infrastructure that are considered in the establishment of the inventory.

### 5.2 Evaluate/Calculate the Asset

In order to make right decisions in prioritising investments, authorities need to estimate the value and condition of their road asset. When they do so, they often discover that roads are their biggest asset in infrastructure. Course values may significantly differ from one place to the other due to:

- Price Level (Different Costs of Labour, Raw Material)
- Density of Population (Ground, Noise Avoidance)
- Environmental Aspects
- Topography (Tunnels, Bridges)
- Technical Characteristics (Number of Lanes, Equipment,)
- Method of calculation (depreciation, replacement value.)

### 5.3 Data of Pavement Condition and Maintenance Treatment in Pune

This topic discusses the details of the data concerning pavement condition and various road maintenance treatments applied in the Pune city under smart city. The road authorities Municipalities and Department of Transport regularly collect the pavement data with the help of third party consultants. The Pune Municipal Corporation (PMC) data is used as a case study in this project. PMC includes in excess of 2400 km of greater Pune city's roads. The approximate asset value of PMC would be over 5700 crore, making it among the most valuable assets owned by Pune Municipal Corporation (PMC). The residents of Pune including workers, students and visitors use the PMC, whether as pedestrians; on bicycles or motorcycles; in buses, taxis, or cars; or as truck drivers. The mobility and safety of over 3.5 million people residents of Pune depend on proper maintenance and rehabilitation of the PMC. This section presents information about the pavement data collection equipment and methodology, total road survey is 1700km as our survey vehicle minimum range is 4m.

In the Pune, the art equipment including IRSM are used to assess the structural and functional conditions of the pavement. From the IRSM testing: roughness (ride), rut depth, surface macro texture and surface distress results were collected and layer modulus and remaining structural life were calculated and reported. Also Motion study the current axle loading was determined for evaluating remaining life.



Fig 2. IRSM

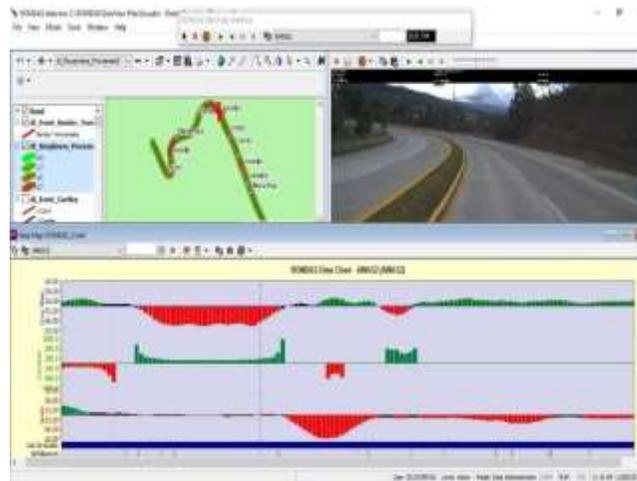


Fig 3 IRSM output

## VI. CONCLUSION

This project describes the process and Implement the RAM Plan. Detailed explanation of Road Asset Management. The primary goal of Road Asset Management is to think, plan and act on the basis of long-term decisions aiming at optimizing maintenance while keeping costs at a minimum and contributing to other political objectives while modernizing the network. The many benefits and expected outcomes available to a road administration upon implementation of an asset management system.

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