

# ***India's First Artificial Intelligence Based Smart Road Monitoring Mechanism in New Town Kolkata***

## **1.1 Introduction**

As a smart city, New Town Kolkata aspires to create a model of excellence in introducing and implementing innovations in every possible way that is directly or indirectly connected to its ease-of-living quotient. From endorsing green concepts to expanding its digital footprint in the township to introducing sustainable urban mobility and clutter-free roadways, New Town Kolkata has been incessantly working towards tapping the endless possibilities that it houses as an intelligent township. One such initiative by New Town Kolkata is implementation of an innovative artificial intelligence based smart road monitoring mechanism, which is first of its kind in India.

## **1.2 Need for the Intervention**

The city views the issue of road health and potholes with utmost seriousness. Viewed broadly, bad road conditions, including potholes, is a pressing problem that continues to plague India, despite the path of development that country is treading on. Poor conditions of the roads harm citizens directly or indirectly in ways more than one, and pose one of the biggest hurdles in a country's development to the extent of even claiming lives in adverse cases.



Therefore, smooth roadways and adequate road safety, coupled with digital intervention, is one of the pre-requisites of a smart city in order to enhance its ease-of-living quotient and enable the safety of citizens. Clutter-free and pothole-free roadways add to the convenience and safety of the city and also imparts a smart look to the city, instilling a feeling of security within the citizens. Thus, a smart road monitoring system, allowing for road health check from time to time, is of paramount importance for a smart city like New Town Kolkata.

The innovative road monitoring initiative undertaken will enable the city authorities to regularly check the condition of the road network in the township and detect potholes, by completely leveraging the latest technology, and with minimal human intervention. Consequently, it would lead to timely measures being taken to achieve a pothole-free smart road system within New Town.



Additionally the system will enable capturing data pertaining to dumping of construction waste on roadsides, illegal encroachments, and any other incident requiring attention, along the roads.

### 1.3 Brief overview of the initiative

The smart road monitoring mechanism that New Town has implemented essentially involves regular tracking of the road condition and other incidents of importance along the streets, with the help of a vehicle-mounted dashboard camera. An HD dashboard camera is mounted on top of a vehicle, which is driven at a speed of 20 km/hour at a pre-decided route set by the city authorities. As the vehicle moves, the camera keeps recording the road conditions through its lenses, which covers a 130 degree view. The cameras are GPS and AI enabled and can not only take the necessary pictures but can also assess the kind of road distress. Once the survey is done by the camera, the camera footage are downloaded to a central computer on which a road survey software has been installed.



*A typical dash board camera, with a vacuum cup below to easily mount on a vehicle*

The road images are then reviewed through the software, which is an image processing software followed by generation of a report containing the specifications of the road distress captured on camera. This allows for easy monitoring of the road conditions in New Town, with intelligent techniques and zero human intervention.



*A dashboard camera atop a vehicle, ready to undertake a road survey*



*A vehicle-mounted dashboard camera, recording the road conditions*

### 1.4 Report Generation by the Road Survey Software

The road survey software, upon processing the recordings of the camera, generates a detailed excel report containing the nitty gritty of the road distress identified.

It catalogues the geographical coordinates (latitude/longitude), contour detection, feature identification, shape detection, and severity of every distress spotted along the route covered by the vehicle carrying the camera, along with the name of the roads featuring distress spots.



Processed image from the Road Survey Software, identifying the different kinds of road distress spotted by the camera

Additionally, the report generates a map plotting the exact spots of road distress with red markings on google map, thus providing a holistic approach to the monitoring mechanism. The procedure enables the township authority to take note of the exact spot of road distress, assess it, and take prompt action.



Locations of potholes plotted on Google Map by the Road Survey Software generated report

### **1.5 Key Benefits Achieved**

- Enabling easy survey of roads for locating distress spots, requiring minimal human involvement
- Leveraging technology to efficiently cover a large area within the monitoring framework within less time
- Leveraging technology to capture any other incident along the streets like dumping of construction waste, spilling of waste, collection of water, etc.
- Enabling report generation that details out the near-exact location of the potholes and other distress spots on the scanned roads, thus making it convenient for the city authorities to identify the locations as well as assess the distress severity, and accordingly take prompt action

### **1.6 Conclusion**

As New Town Kolkata continues to realize its vision of a model smart city, it aspires to expand its smart horizons, while being deeply aware of the citizens' immediate needs and addressing the same in the most innovative manner. Thus, pioneering the implementation of the country's first smart road monitoring mechanism, New Town Kolkata advances on the path of smart city mission, and is dedicated to leverage innovative and intelligent solutions in the city.