



CYIENT

# REDUCE ROAD MAINTENANCE COSTS AND IMPROVE DRIVABILITY AND SAFETY

Cyient's Road Health Analytics solution provides actionable insights for municipalities and smart cities

## Overview

The drivability of roads and motorways has a direct impact on citizens' safety and experience. Poor road conditions are among the leading causes of traffic congestion, pollution hotspots, and unsafe driving zones in cities and also have a significant economic impact. Municipal authorities and smart cities across the globe are investing significantly in road repair and maintenance.

Cyient's Road Health Analytics (RHA) solution can reduce costs for annual road repairs by up to 20% and provide comprehensive metrics and analytics-based insights. RHA enables informed decision-making, improves the livability index of cities, and reduces costs related to vehicle repairs and insurance claims.

## The Economic Impact of Poorly Maintained Roads

### United States<sup>1</sup>:

- **33,000** traffic fatalities per year; 33% involve bad roads
- **\$68 Bn** annual spend on road repairs
- **\$240 Bn** estimated cost of bad roads to businesses until 2022
- **27%** of major urban roads are deemed substandard

### United Kingdom:

- **£2.8 Bn** annual cost of vehicle repair due to potholes<sup>2</sup>
- **£30 Mn** compensation claims paid out due to poor roads<sup>3</sup>
- **£6 Bn** budgeted by councils to improve local roads<sup>3</sup>

### India:

- **10,727** fatalities due to bad road-related accidents in 2015<sup>4</sup>
- **\$14.5 Bn** spent on road transport and highways in FY17<sup>5</sup>

### Australia:

- **\$50 billion** committed toward road infrastructure<sup>6</sup>

Often, despite their focus on improving road conditions, municipalities face critical challenges such as:

### Financial

- Unreliable data to optimize budget spends and reduce costs
- Lack of a mechanism to measure road quality and costs and enforce Service Level Agreements

### Technical

- Unavailability of reliable and scalable solutions for harnessing data for near-real-time road condition monitoring
- Lack of machine learning-based automated big data analytics

### Operational

- Unavailability of road condition maps and analytics "on-demand" in real time
- Unutilized road condition data for navigation or routing

### References

<sup>1</sup> <https://www.pothole.info/the-facts/>

<sup>2</sup> <https://www.potholes.co.uk/facts>

<sup>3</sup> <https://www.independent.co.uk/news/uk/home-news/potholes-repair-bill-14-billion-tipping-point-2017-a7513586.html>

<sup>4</sup> <https://www.ibef.org/archives/detail/b3ZlcnZpZXcmMzcyMzgmODA4>

<sup>5</sup> [http://minister.infrastructure.gov.au/pf/releases/2016/May/budget-infra\\_02-2016.aspx](http://minister.infrastructure.gov.au/pf/releases/2016/May/budget-infra_02-2016.aspx)

<sup>6</sup> [http://minister.infrastructure.gov.au/chester/releases/2017/may/budget-infra\\_02-2017.aspx](http://minister.infrastructure.gov.au/chester/releases/2017/may/budget-infra_02-2017.aspx)

# Cyient's Road Health Analytics Solution: How It Works

By leveraging our extensive geospatial experience, Cyient has developed an integrated cloud-based mobile solution that enables real-time road condition mapping and analytics. This solution provides actionable data and insights for road repairs, infrastructure upgrades, and monitoring, reduced traffic congestion and pollution hotspots, safer driving zones, and more.



### Data Gathering

- The solution uses data from sensor dongles, smartphones, and navigation devices
- Data is crowdsourced through large communities like city transport fleet, ridesharing vehicles, navigation device companies, and fleet and logistics companies
- The GPS-enabled app records the exact position of potholes, bumps, and uneven road surfaces by tracking the drive quality and measuring the intensity of the bumps

### Benefits

- Data gathering from low-cost devices is easy to deploy and scale
- Multiple sensor readings on a regular basis help automatically validate data and eliminate false readings
- Multiple methods of data gathering help scale data collection



### Data Processing

- The gathered data is processed, classified, and labeled by applying our machine learning algorithms, and published on a regular basis as near-real-time road health analytics insights

### Benefits

- Machine learning automates big data analysis and improves the solution output over time



### Data Mapping and Analytics


The road condition health map generated is provided "as-a-service" on the cloud as a dashboard with the most up-to-date data for:

- Municipalities to view, plan, and track actionable data on road repairs, congestion, safety, etc.
- Fleet and logistics companies to plan and manage smoother operations
- Providing users a more realistic time-to-destination and optimum ride for navigation and routing

### Benefits


- Forecasts and tracks costs and quality for road repairs
- Measures and tracks before and after effects of actions taken to improve congestion, safety, and pollution hotspots
- Improves business operations and citizens' livability

## BENEFITS OF ROAD HEALTH ANALYTICS



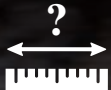
**Reduce costs**

Save up to 20% on annual road repair costs by improving quality; and enforcing 5%-10% performance guarantees in contracts




**Plan for predictive road repair**

Shift from reactive, costly repairs to proactive cost-effective maintenance for reduced spend; optimize and prioritize workload




**Measure repair quality**

Measure contractors on the quality of work (tracking deterioration rate) and significantly improve work quality




**Improve insights and decision-making**

Improve decision-making based on near-real-time insights and metrics powered by machine learning algorithms



**Enhance drivability and safety**

Improve drivability and safety of roads by increasing average driving speed, and reducing accidents, congestion, and pollution hotspots



**Increase productivity**

Reduce travelling and wait time; improve time-to-destination by analyzing the underlying cause of slow speeds on certain roads

## About Cyient

Cyient (Estd: 1991, NSE: CYIENT) provides engineering, manufacturing, geospatial, networks, and operations management services to global industry leaders. We leverage the power of digital technology and advanced analytics capabilities, along with domain knowledge and technical expertise, to solve complex business problems. As a Design, Build, and Maintain partner, we take solution ownership across the value chain to help our clients focus on their core, innovate, and stay ahead of the curve.

Relationships lie at the heart of how we work. With more than 15,000 employees in 22 countries, we partner with clients to operate as part of their extended team, in ways that best suit their organization's culture and requirements. Our industry focus spans aerospace and defense, medical, telecommunications, rail transportation, semiconductor, utilities, industrial, energy and natural resources.

For more information, please visit [www.cyient.com](http://www.cyient.com)

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