

## **CASE STUDY: Modern Computerized Toll Management System (MCTMS)**

### *Bangladesh, Ministry of Road Transportation & Bridges*

The Modern Computerized Toll Management System (MCTMS) developed by CNS is an innovative software solution for modernising toll plazas worldwide. Already active at several sites across Bangladesh, the MCTMS is a bespoke system designed to increase revenue at any toll plaza. CNS' MCTMS solution incorporates several hardware and software technologies to maximise the efficiency, security, and revenue collection of each site that the solution is implemented at.

### **Our History in MCTMS**

CNS has been implementing the MCTMS at facilities across Bangladesh since 2013 when CNS redeveloped its first Toll Plaza at the 6th Bangladesh-China Friendship Bridge for the Bangladesh Bridge Authority (BBA). Since then, CNS has overseen the introduction of the system at several other sites across the country. These include:

- 2013 - 6th Bangladesh-China Friendship Bridge (Mukterpur Bridge)
- 2015 - Meghna Bridge and Meghna-Gomti Bridge
- 2016 - Bangabandhu Bridge
- 2018 -Sahid-Mayez Uddin Bridge
- 2018 -Sayed Nazrul Islam Bridge

Over the past decade, the CNS has been proud to rapidly introduce MCTMS facilities elsewhere following the success of the MCTMS at the 6th Bangladesh-China Friendship Bridge. Building upon the initial experiences of implementing the MCTMS, CNS has continuously evolved the system to incorporate more advanced software and hardware technologies.

### **Operator Benefits**

Owing to innovative technologies incorporated by the MCTMS, CNS' intelligent system has increased revenue collected by the Bangladesh Bridge Authority significantly. At the 6th Bangladesh-China Friendship Bridge - the first MCTMS installation - annual revenue has increased by 33.3%, from 705,000 to 2,117,000 USD. Similarly, the toll plaza at the Bangabandhu Bridge has had its annual revenue increase by almost 9 million USD since the MCTMS was installed there in 2016.

However, the greatest triumph of the MCTMS so far is at the Meghna and Meghna-Gomoti Bridges. Annual revenue at these two sites combined has increased by over 20 million USD since CNS took them over in 2015.

Following its commercial successes across Bangladesh, CNS has redeveloped the MCTMS into a commercial off-the-shelf (COTS) system, ready to be deployed at toll plazas worldwide.

### **CNS Technology**

CNS' Modern Computerized Toll Management System is an amalgamation of several innovative software and hardware technologies. The combination of which is the cause of the MCTMS' proven success across Bangladesh. Crucially, the compartmentalized design of the MCTMS makes it possible to install the system at any toll booth or plaza within 24 hours.

Intelligent software technology is at the heart of the success of the MCTMS. Electromagnetic RFID Smart Card scanners allow the system to identify any registered vehicle by connecting directly with the Bangladesh Road Transport Authority's (BRTA) central vehicle registration database. With this information, the system independently cross-references the Smart Card data with the BRTA's database to identify the vehicle type and issue the correct fee. Consequently, vehicles pass through a toll using the MCTMS significantly quicker than more antiquated facilities. Owing to its interconnectivity with the BBA and BRTA, the MCTMS can be adjusted remotely on demand. New toll charges can be inputted and implemented at each location across Bangladesh within an hour. Enhanced security is another integral element of the MCTMS. Robust monitoring systems is a requirement sought by toll operators worldwide and lack of such monitoring often results in lower efficiency and revenues. To guard against such issues, the MCTMS boasts Oracle 11G database technology to prevent unauthorized access or tampering. Additional security features such as an onsite auditing and monitoring system, Counter Wise surveillance system and backup data centres serve as a bulwark against any threats to the systems integrity.

The MCTMS includes several advanced hardware technologies to enhance its innovative software. The automated Lane Management and Lane Processing System manages traffic passing through the plaza. In tandem with the MCTMS' automated barriers and customer-facing displays, this innovative solution drastically increases traffic flow through the whole system. The MCTMS incorporates a weight management system to enhance vehicle identification and facilitate a toll system based on total weight. The weight management system features a weigh-in-motion device to measure vehicles without requiring them to come to a complete stop. Another useful hardware tool built into the MCTMS is the 'touch and go system.' Customers passing through the toll can use their RFID Smart Cards to tap on an RFID sensor at the tolls, allowing them instant passage as the system automatically deducts the toll from a digital wallet. Similarly, an 'express lane' with long-range RFID scanners allows drivers to pass directly through the toll without stopping by detecting their Smart Cards as they drive through. These innovations ensure that traffic can flow consistently through a toll plaza using the MCTMS. The system also features IT and administrative hardware to support the operation of the toll. The integrated monitoring system features security cameras and backup servers to provide robust monitoring.