



# Toll Collection Systems

Waste no time on tolling

Mihajlo Pupin Institute has considerable references and 25 years experience in design, production, performance and implementation of toll collection systems, with capacity to supply turnkey solutions. Our extensive R&D in this field resulted in one of the most cost effective and technically advanced solutions available on the global market. This motorway toll collection system combines modern technologies and classic approach. It is a highly effective, simple and low cost to install and maintain. The system is developed in compliance with EU standards and recommendations and demands of the biggest motorway concessionaires.

Our toll collection system is hierarchically structured; it is fully modular, based on PC technology and up-to-date real time operation systems, relational data base system and dedicated encryption of data transmission. Based on this approach we have designed system which is highly reliable, resistant to frauds, comfortable for toll operators, supports diverse tolling transactions and it is fully interoperable with all modern toll collection systems in Europe.

Toll line controllers are based on industrial PC-technology and dedicated electronic interface boards. QNX is chosen as an operating system as it is extremely stable and robust, and thus suitable for highly-demanding real-time applications.

### Features

- Support for **open and closed** toll collection systems
- Toll collection transactions via **magnetic tickets** and/or **RF tags** (electronic toll collection)
- **Automatic vehicle classification** (AVC) based on contactless solutions enabling high precision in all environmental conditions
- **Various ways for tolls payment:** cash, automatic by credit and debit cards, prepaid credits on RF tags
- **Video system** (both at the lane entrance and exit) supports automatic registration plate recognition and **video enforcement**. In our standard offer images are archived for the period of two months.
- Possibility for **combined manual** (magnetic tickets) and **ETC lines** (RF tags) at a single pay toll plaza
- Possibility for **displaying various traffic information at toll indicators**, such as: road conditions, meteorological data, traffic conditions or advertisements.
- **User-friendly MMI**
- **QNX OS, Linux and/or Windows platforms, My SQL RDBS**
- **Servers** in Control Centre and Toll Plaza Centres, as well as all **work stations and lane controllers** are interconnected within a systems WAN
- All toll operator **desks and cases** are **made of stainless steel and inox**

## Toll Plaza

Toll plaza subsystem is the supervisory system for all line controllers. It collects all the data from lane controllers including financial transactions, digital images of vehicles, technical malfunctions, line operator's actions and failures. At the same time toll plaza subsystem is receiving data from central system such as: exchange rate, "black list" of credit and debit cards frauds, toll plaza line configuration, encryption keys, system time, toll operator's passwords etc.

## Central Acquisition System

The basic functions of the central acquisition system are:

- Collecting and archiving of data relevant to the toll collection process from the plaza computers
- Making all strategic and tactical decisions concerning the toll collection system,
- Enabling efficient monitoring of the staff performance at toll stations.

All data concerning toll collection process and equipment status are permanently collected from the plaza computers and stored in a central system database. Main Control Centre is connected through an optical communication link with Plaza Control Centres. Also, Centre is constantly exchanging data with various institutions such as: banks, insurance companies, institutions that handle credit and debit cards, RF tags vendors, etc. through a computer network.



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