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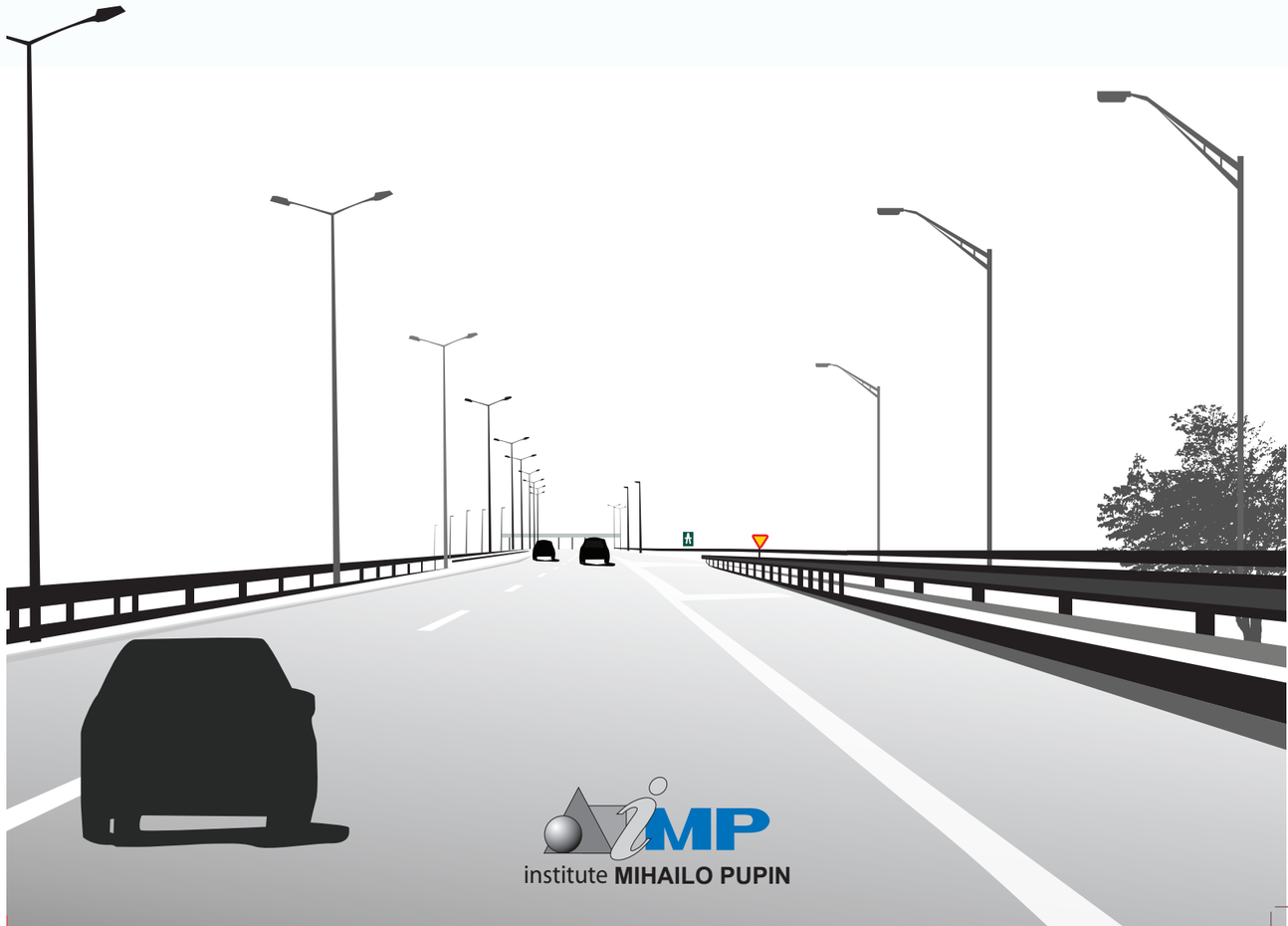
NO-STOP ELECTRONIC TOLL COLLECTION

eGO™



institute MIHAILO PUPIN

Mihajlo Pupin Institute's (MPI) enviable reputation in the implementation of up-to date toll collection systems stems from its more than 25 - year long presence in this area. MPI's toll collection systems are installed on all Serbian motorways, in Montenegro and on the bridge Mobutu Sese Seko in Democratic Republic of the Congo

Mihajlo Pupin Institute is the leading toll collection system manufacturer in Southeastern Europe. Continuous system development and upgrades, aimed at incorporating the latest technology breakthroughs, have ranked the Institute among the few companies capable of responding to all motorway tolling operators' requirements.

With its latest toll collection system MPI has become one of the leading manufacturers, offering completely new toll collection technology solutions, unique on a world scale, with the best cost/performance ratio. The new toll collection system complies fully with European CEN 278 interoperability standard. It also provides simple and reliable operation combined with the highest security of data exchange with encrypted data transfer. It is an easy to maintain system that prevents completely any form of fraud by both toll collection operators and toll evading drivers.

The toll collection system incorporates either MPI's internally developed units or brand-name products, integrated so as to satisfy the requirements of both toll collectors' work conditions and environment protection.

CONCEPT OF THE TOLL COLLECTION SYSTEM

The Mihajlo Pupin Institute's solution for toll collection systems can be used in open and closed systems. Its' hierarchical structure ensures high reliability and low vulnerability, and its redundancy concept allows almost normal operation even in cases of some component failures.

TOLL LANE LEVEL

A toll lane level is the basic hierarchical system level. In a closed toll system it comprises an entrance subsystem and an exit subsystem.

Each entrance is provided with a vehicle pre classification subsystem, which classifies vehicles according to the number of axles and height at the first wheel.

Vehicle classification is followed by automatic in-drive reading of license plate contents performed by a license plate recognition subsystem. Depending on whether it is a lane with magnetic tickets or a full-speed (no-stop) lane, data on vehicle class, license plate number, entrance lane, toll station and entrance time are written either in the magnetic ticket which is issued to a driver or in an electronic tag.

At toll system exit, vehicle classification (either pre or post classification) and license plate recognition are performed once again and the data obtained are compared with those written in the magnetic ticket or electronic tag.

If these two sets of data are identical, a standard toll collection procedure is carried out. A magnetic ticket owner may effect this payment in cash or by a credit or debit (DKV, a toll operator's card, etc.) card.

Plastic cards (credit and debit) may be contact-type cards (with a magnetic stripe) or contactless (RF tags).

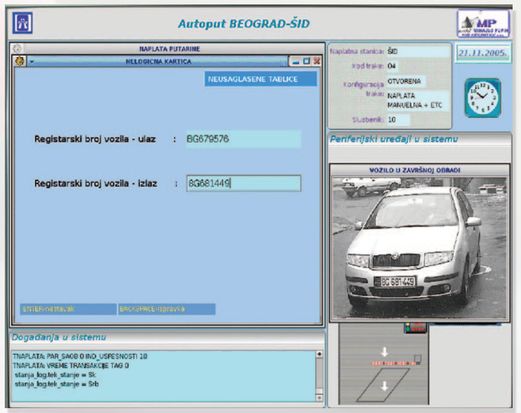
Vehicles equipped by a tag are allowed to pass without stopping provided their tag indicates a sufficient amount of money (prepaid customer accounts) or the amount due is later billed to a tag owner (postpaid accounts).

All vehicles for which entrance and exit sets of data disagree are subject to a special enforcement procedure intended to prevent fraud.

The video system for automatic licence plate recognition is an original MPI's product, unique on a world scale, providing reading accuracy in over 99% of cases even at 120 km/h speeds. Apart from being technologically perfect and highly reliable, this system is several times cheaper than comparable systems made by other suppliers.

TOLL PLAZA LEVEL

At the toll plaza level all pay toll systems are interconnected in a LAN and connected to the toll plaza server that includes several workstations: toll plaza manager, maintenance service and internal audit/control. The toll plaza server stores data on all transactions together with vehicle licence plate numbers and (jpg) images of vehicles.
All these data are stored in an encrypted form using special MPI developed encryption algorithms and keys. This allows data access from all server workstations, preventing at the same time the possibility of data modification.



CENTRAL LEVEL

At the highest level of the entire toll collection system, there is a central data processing server. This server receives encrypted data from all pay toll plazas in an on-line or off-line mode. All received data are decoded in the central server and later processed using the MPI developed software support. This ensures that no participant in toll collection or data processing have a possibility to modify data.

The central server sends to toll collection plazas data on effective exchange rates, «black lists» of credit cards, system time, etc. All toll collection data are stored in a database. If they sign a contract with a toll operator, motorway users (individuals or companies) may use the Internet to access the central server database (for their own vehicles only) to obtain at any moment information on vehicle entrance or exit time, toll payment place, vehicle class, toll amount paid, payment method, travel time between two tolling points, etc. This provides companies - vehicle owners with an insight into all relevant details, on one hand, and toll operators with extra income, on the other.

By using the Internet or mobile telephony the owners of prepaid accounts (no-stop toll payment) may add certain amounts to their accounts and the amount added is written in a tag on the nearest toll plaza they approach.

FEATURES

- Support to open and closed pay toll systems
- Toll collection transactions using magnetic tickets and/or RF tags (electronic toll collection)
- Full-speed (no-stop) tolling transactions through prepaid and postpaid customer accounts
- A variety of payment methods: cash, credit and debit cards, electronic tags
- Possibility of combined manual toll collection (using magnetic tickets) and electronic no-stop collection in the same lane
- Automatic vehicle classification based on contactless axel counts
- Video system supporting automatic licence plate recognition
- Video enforcement
- Displays of various traffic information (snow, ice, wind, accident etc.) on toll indicators
- Ease of operation (user-friendly MMI) and simple staff training
- High system modularity and serviceability
- Ergonomically designed, ultraviolet radiation protected toll operator booths with overpressure
- PC technology
- QNX, LINUX or WINDOWS operating systems
- WAN and LAN environment
- INOX indoor and outdoor units
- High data security provided by encryption techniques
- WEB accessible database
- Toll payment using WEB services or mobile telephony

EFFICIENT, RELIABLE AND COST EFFECTIVE TOLL COLLECTION