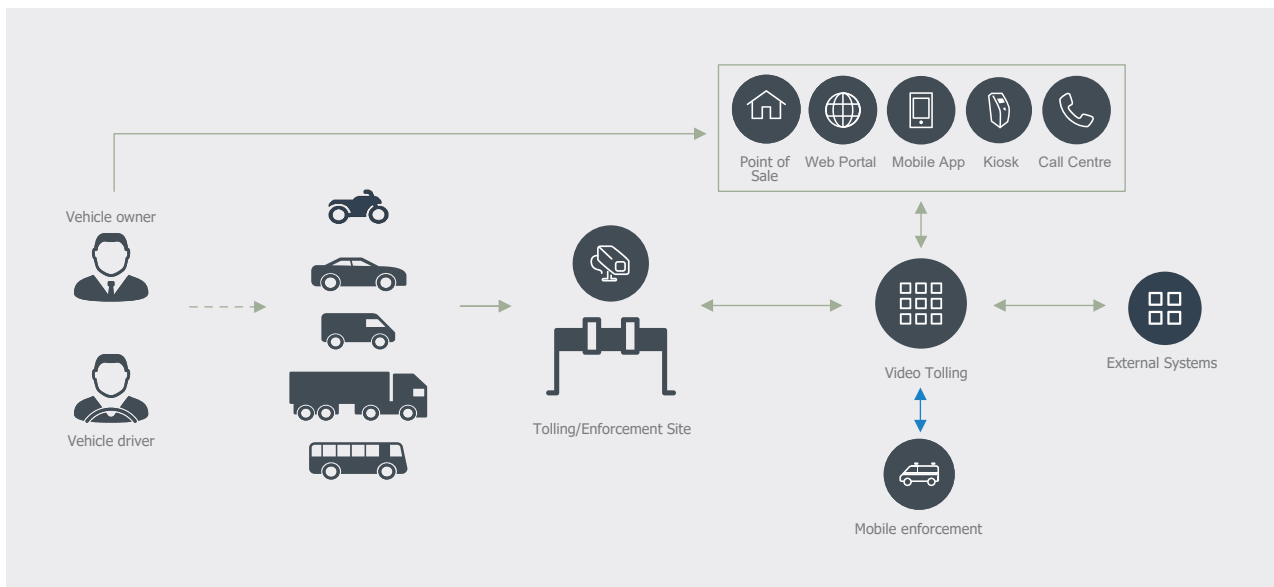


Platform

Video - Based Electronic Toll Collection (ANPR)

A great advantage of our Video Tolling System lies in the fact there is no burden on vehicle owners. The Video Tolling System does not require any vignettes, electronic tags, or on-board units to be installed in the vehicle, removing the need for complex logistical operations and high financial costs.



Our Video-based Electronic Toll Collection System is a flexible, state-of-the-art solution for free flow toll collection using video technology. It relies on cameras and AI algorithms to identify and record vehicles passing through designated tolling points. A Video Tolling System offers several benefits over traditional tolling methods.



More information:
qrfy.com/p/2023_trc_p12

Key benefits

- **Elimination of the need for physical toll booths** results in reduced congestion and improved traffic flow
- **Increased accuracy and efficiency in toll collection**, minimises errors and the need for manual intervention
- **Convenience for drivers** by enabling seamless, contactless payments and reducing the need to stop or slow down at toll plazas

Our Video Tolling System is able to process large amounts of data at a time. Automatic Number Plate Recognition (ANPR) interacts with all models of vehicles, ranging from motorbikes to heavy goods vehicles. This makes it a suitable solution for a wide range of environments, including busy urban freeways, country-spanning highways, high-density expressways and car parks.

The cameras are equipped with advanced optical character recognition (OCR) technology that can read license plates and extract relevant vehicle information. The Video Tolling System can be customised for each

of the toll modes in regard to the manner of collecting toll data. It is also possible to implement a combination of those modes together.

Modes

- **Open Mode**

Is used to charge vehicles for entry into the toll section. This mode has a wide range of applications, spanning from toll bridges and tunnels to isolated zones, such as rest areas. Open Mode is cost effective and fit for use on long-spanning roads such as highways and expressways. Its use requires only a singular gantry at every toll section entry.

- **Closed Mode**

Entry and exit to the tolled area are recorded and the toll is calculated based on the distance a vehicle travels between those two points. Closed mode can be used for charging for passages through cities or closed areas, where it is possible to reliably monitor all entry and exit points, such as paid parking lots. Due to the nature of this mode, it is also possible to reliably detect the amount of time a vehicle spends in the area and then link the data to the relevant toll event.

Once the vehicle is identified, the central system calculates the appropriate toll based on factors such as distance travelled, vehicle category, and any applicable discounts or fees. The system allows for full customisation of the way vehicle passage data are rated, and are tailored specifically to the needs of the toll operator. Instead of calculating tolls based solely on the vehicle data, the toll operator can opt in to apply additional factors. These range from the current season all the way to a particular hour of the day or type of road. Toll operators can use these settings to influence traffic flow within an area, to prevent drivers from avoiding higher tolls and to lower congestion.

Toll charges calculated using gathered data can be paid by several payment methods and payment regimes. The main supported regimes are Post-Pay Mode and Pre-Pay, which differ mainly in method and frequency.

In addition to the flexibility of the system, many different sales and communication channels can be included. Popular options include smartphone applications, kiosks, or online self-care portals. Points of sale and call centres where vehicle

owners can personally interface with the system can also be used. This makes the system accessible to all kinds of vehicle owners who wish to stay informed about their toll transactions.

Checking compliance with toll obligations is performed by the enforcement feature of the central system based on data relating to real usage of tolled roads captured by cameras and mobile enforcement vehicles.

The architecture of the Video Tolling System also allows for monitoring of traffic density or, from a long-term perspective, calculation of traffic trends once enough data has been collected. This data can be utilised for evaluating traffic trends and creating accurate predictions for future traffic patterns. These predictions can assist in future infrastructure development and with the implementation of future changes to toll rates, allowing the entire toll system to evolve solely within itself without the need for additional external software.

The Video Tolling System can operate through a datacentre or the cloud, which is effective and flexible and provides a solution with an almost unlimited computing power and data storage.

Despite the versatility and wide scope of possible applications, the system remains accessible to toll operators as well as commuters and travellers. Although it is complex and sophisticated, the deployment and operation of this Video Tolling System can be carried out cost effectively without any impact on accuracy or reliability.

Overall, Video Tolling Systems streamline the toll collection process, improve traffic management and enhance the overall driving experience for commuters and travellers alike.

Components

- Strategically placed **stationary gantries** that hoist cameras to capture images and/or videos of vehicles as they enter and exit tolling zones
- **Central system** that processes data from cameras, matches it with the vehicles registered in the system, and calculates and collects toll fees as well as evaluating violations
- Sales and communication channels for providing customer services
- **Mobile enforcement vehicles** that evaluate toll violations within the toll area

