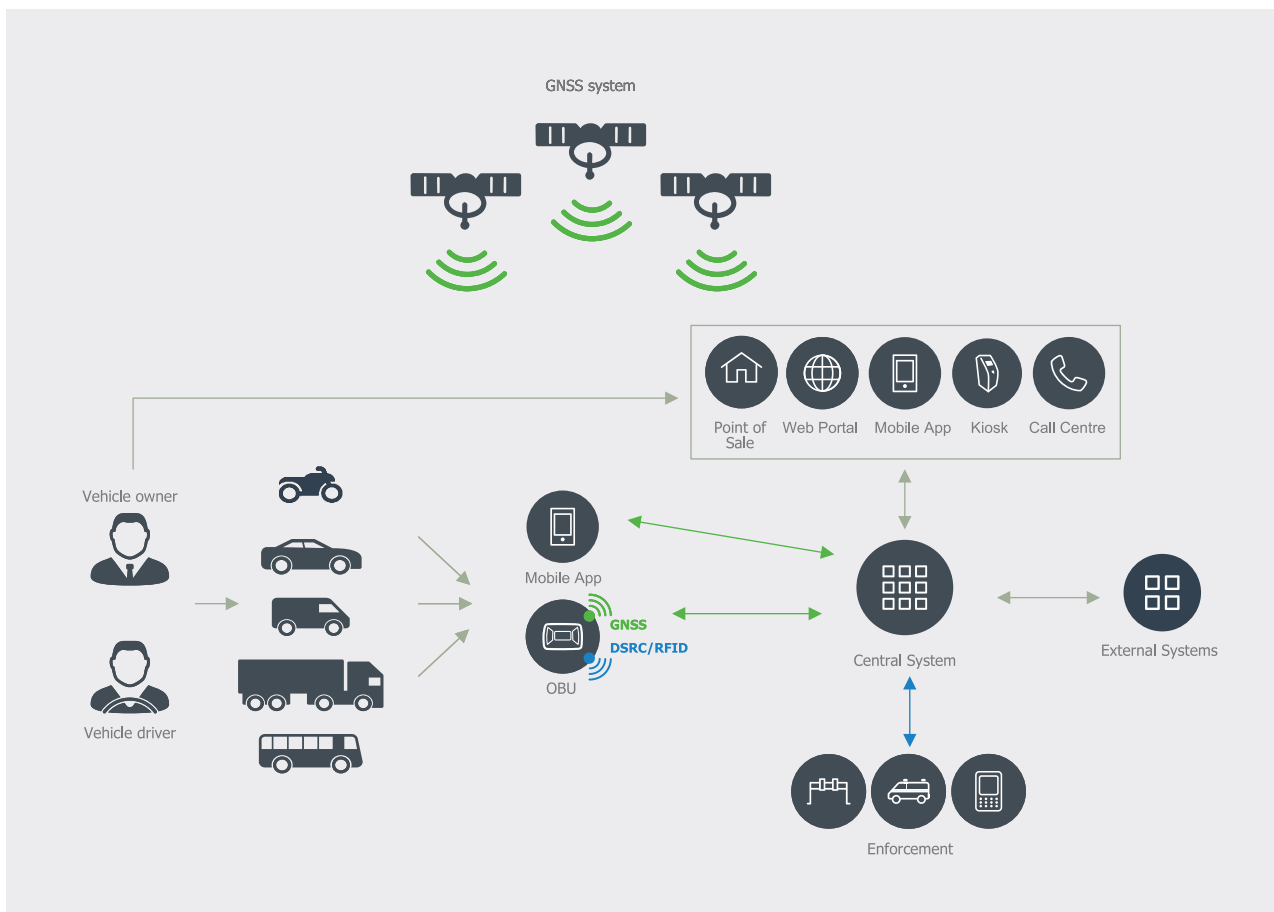


Satellite-Based Electronic Toll Collection (GNSS)

Satellite technology enables toll collection across multiple lanes of free flowing traffic without the need to change the speed or direction of the vehicles. GNSS tolling provides flexibility for the implementation of new system extensions, allowing it to keep pace with changing requirements without the need for the construction of costly new infrastructure.



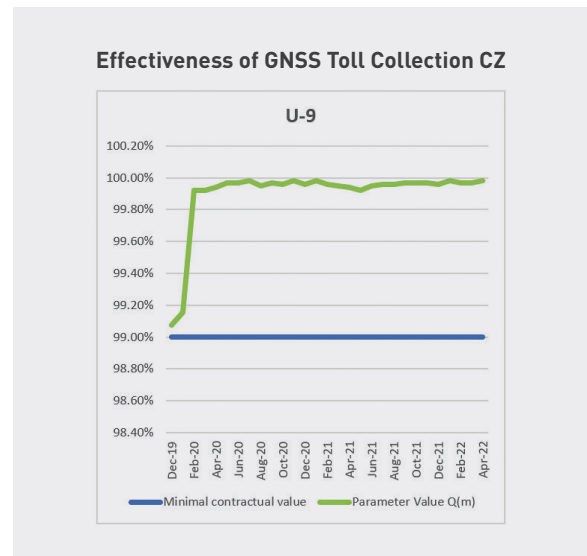
More information:
qrfy.com/p/2023_trc_p8

GNSS tolling, or Global Navigation Satellite System tolling, is a technology that utilises satellite positioning to collect tolls from vehicles based on their geographic location. It enables precise, automated toll collection by accurately determining a vehicle's position and calculating toll charges accordingly.

This solution does not require the construction of toll gantries or toll plazas, so saves on time, costs and resources associated with a non-satellite-based tolling system.

Satellite-based tolling systems provide flexibility when changing the range of a toll road network by speeding up the process and removing the need for expensive and time-consuming roadside technology. Satellite-based tolling is particularly effective in countries where the development of new toll roads is planned.

GNSS tolling is based on cutting-edge, reliable and future-oriented technologies.



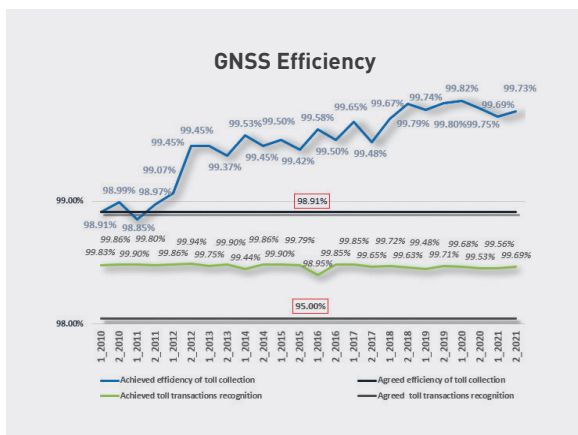
Key benefits

- **Efficient toll collection**
- **Non-discriminatory and quick access** for road users meets the terms and conditions for use of the toll road network
- **Permanent, error-free, continuous operation** of tolling infrastructure and systems increases comfort for users of the toll road network
- **Low investment and operating costs**
- **Cost and time-efficient** implementation of legislative changes related to toll roads
- **Efficient generation** of revenue from toll collection

Following the effective integration of the satellite-based tolling solution, additional advantages can be unlocked through a range of value-added services like real-time traffic updates, automatic emergency notifications, and usage-based car insurance. GNSS tolling introduces flexibility to defining toll rates based on several parameters and combinations.

Parameters for flexible tolling

- Road type (highway, motorway, lower road classes)
- Vehicle category (the combination of vehicle type and vehicle weight)
- Vehicle emissions class (such as EURO emissions classes)
- Number of axles
- CO2 emissions
- Noise level (e.g. for night and day)
- Season, month, day of the week, hours during a day
- Current traffic intensity
- Current traffic speed



When using GNSS, every vehicle liable for toll payment is required to be equipped with an On-Board Unit (OBU) or mobile app before entering the toll road network. The installation of the OBU is simple and can be performed by vehicle drivers.

From a technical viewpoint GNSS tolling is technologically complex, consisting of several information subsystems and specific applications. They ensure the operational processes of toll collection and allow easy integration with external systems. The solution can be easily adapted to national legislation concerning toll collection.

Components

- **Central Information System**

A complex IS supporting all business activities of and electronic toll collection company (customer care, billing, payments processing, etc.)

- **Event Collection System**

System made up of OBU (OBU device or mobile app) and Proxy safeguards data about toll road usage and delivery of data to the CIS

- **Enforcement System**

Verifies compliance by vehicle owners and drivers with electronic monitoring obligations and identifies non-compliance

