Mobile meets tolling: the time is finally right

Smartphones and electronic tolling have both been around now for well over a decade, so why is it only now that the two technologies are beginning to work together?

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1. A-to-Be provides a multitude of tolling solutions including self-service, electronic and satellite, as well as solutions connected directly to smart devices

2. A-to-Be's mobile tolling solution powered by Bluetooth

3. The company's solutions are vendor-independent and plug-and-pay

Thanks to digitalization, virtually every industry relies on an extremely powerful tool: the smartphone. Just within the transportation industry, we see apps for traveler information, avoiding traffic, integrating modes of transportation, navigation, carsharing, as well as apps related to finding fuel, parking and other mobility-adjacent services.

Today, more than 10 toll payment apps operate in the United States, and A-to-Be is introducing a toll payment app based on an innovative Bluetooth application. These toll payment apps make up a very small portion of toll transactions so far, although their use is growing. With the proliferation of apps for everything else – especially for mobility – one may ask, what is taking so long? Why is mobile only just now meeting tolling?

The mobile revolution began while the tolling industry was still undergoing its own revolution: embracing electronic toll collection (ETC). Since its first implementation in Texas and Oklahoma in 1989, electronic tolling has become the established default for tolled facilities in most parts of the United States. According to a study by KPMG, about 10% of US toll operators are planning to convert to all-electronic tolling (AET), in addition to the 50% of operators that already use AET, and those who use ETC but not in a full AET mode.

Many systems still operate cash lanes for customers who cannot (or will not) make the switch, but with ETC now fully mainstreamed, electronic tolling is undoubtedly the most convenient for tolled highway, bridge, and tunnel operators and frequent users. The Covid-19 pandemic has pushed the tolling industry even further in adoption ETC, with customers demanding a system that is contactless, safe, and digital.

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The number of toll payment apps currently operational in the US, according to A-to-Be

As ETC continues to evolve, the key decision for operators is not whether to go electronic, but how to evolve their ETC systems to benefit from emerging new technologies. Tolling agencies are paying close attention to app developers promising an era of seamless tolling through mobile phones. Companies can leverage a smartphone's built-in GPS, compass, gyroscope and camera to deliver more accurate and real-time information.

Can a smartphone toll?

When evaluating the smartphone's usefulness as a tolling technology, experts must consider both its advantages and its potential drawbacks. On one hand, today's smartphones combine GPS, Bluetooth, and a mobile data connection, which can be used for mileage-based road user fees (MBUF, also known as road user charging or RUC), tolling systems with gantries, and more. On the other hand, these technologies require highly precise location data, and tolling systems with a mobile tolling component must be finely tuned in order to ensure accurate transactions and revenue collection. These challenges have not stopped the toll payment apps currently operating in the US, and they are not stopping new companies from entering the market. Recognizing an increasing need for contactless, safe and convenient services, as well as the increasing power of mobile devices, A-to-Be has been developing an AET solution built on commercial-off-the-shelf technologies.


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Luís Nunes, global chief sales officer, A-to-Be, Luis.Nunes@a-to-be.com

Harnessing Bluetooth

A-to-Be's LinkBeyond roadside suite of products will soon include a mobile tolling solution powered by Bluetooth which can be used for several types of payments, including electronic tolling. It relies on local access mediation (LAM), also used in more common applications such as access control to buildings, as well as ticketing and payment for transit agencies.


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Bluetooth beacons positioned at the toll sites become a complement – or a substitute – for RFID antennas and can also replace cash/credit cards. To use the technology, customers install a simple payment app that links their license-plate-based account to an e-wallet. When the customer passes the plaza, the Bluetooth mediator awakens the app, and produces a notification that the toll plaza has been recognized (no interaction is required from the driver), also identifying the actual lane passed.

As for transponder-based transactions, the tolling system's existing video enforcement system (VES) captures an image of the car's rear license plate, in case of any violation.

At the same time, the backend software system transmits the information of the passing car to the operational back office. There, toll transactions are created, posted, and charged in real-time.

A-to-Be's mobile tolling app technology is field-proven, with multiple applications for Via Verde in Portugal and with applications being piloted in the US. The technology functions well at highway speeds, and it has been tested and proven in various traffic patterns.

The e-wallet function accepts multiple payment options including credit/debit cards and gift cards – which can be purchased with cash, to include those who prefer to use cash – and users can have 'garages' with multiple vehicles associated with the same account. Users with existing transponder-based accounts can still use this solution.

The system works seamlessly without interfering with transponder-based accounts, and the Bluetooth technology is powerful enough to differentiate between the tolled road and nearby, separate roads. Built-in functionality ensures that only a single account is charged in each passage.

Today, the needs of the tolling industry and the technological capabilities of smartphones are converging. Mobile phones, along with the location information and Bluetooth technologies that all smartphones can provide, can now yield the accuracy and precision that tolling requires. Mobile tolling can complement, or in the case of the Bluetooth-based tolling example, even replace, transponder-based tolling in order to offer customers an easy-to-set-up, easy-to-use, virtually instant way to create and use a tolling account. While it's still a young technology, there is enormous potential for mobile-based tolling. Today, the time is finally right.