ALPR for tolling in South America

In South America, the first examples of automatic license plate recognition (ALPR) technology being applied to toll payments were seen in open road tolling (ORT) and free-flow systems. In these systems, ALPR supplemented the automatic payment conducted by reading RFID tags. If the tags were not read by the antennas or if a vehicle did not have a tag, license plate reading via computer vision would come into play.

Since this initial usage, the technology behind the hardware supporting ALPR has advanced greatly. Processors have become faster, traffic cameras ever more accessible and the license plates themselves have also improved in quality. Today, one can't help but be impressed that license plates can now be read in a matter of milliseconds.

Systems integrators and motorway licensees are now looking favorably upon the integration of ALPR technology in traditional toll systems at plazas and booths.

Just as in ORT systems, ALPR back-up technology already exists, should the ETC technology (based on RFID tags for automated toll roads) fail.

Others have fully replaced RFID technology with ALPR, primarily to save on costs. When a toll scheme has to give a significant discount or exempt neighborhood users, for instance, RFID technology can be costly – despite it being based on passive sticker tags.

ALPR technology does not use consumables like RFID does, as the identification process needs only the license plate itself, and therefore the investment costs are limited to the reading equipment. Also, it does not present the usual problems with interoperability,

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(Top) **Screenshot of the Neural Labs ALPR software** (Left) **Many traditional toll systems in South America now use ALPR technology**

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The evolution – and incredible value – of ALPR within South American toll projects

> Outlining the story of the growing adoption of ALPR technology for use in tolling
> How in some schemes, ALPR has gone from a supplementary solution to the primary solution
> Detail on the advantages of ALPR over alternative technologies
> The benefits that concessionaires are reaping in terms of accuracies and efficiencies on various toll schemes

since the device only has to read the license plate, whereas in some countries cars can have three different tags, creating interference problems and complications in calibrating the RFID equipment.

In some cases, ALPR systems are also used to monitor fraud. For example, at closed tolls the license plate is recorded upon exit to verify that it coincides with the user's ticket and the license plate that entered. At toll stations with clearing systems (payment is made in the first toll plaza and free in the second), license plates are monitored to avoid the resale of tickets during the trip. There are some monitoring cases in which ALPR backs up the RFID technology with interchangeable active tags, keeping heavy vehicles from using lightweight vehicle tags.

Personal touch

Some concessionaries in certain countries have to comply with tax regulations that require a toll booth to provide a printed personalized bill. Naturally, this operation takes longer than usual (more than the average eight seconds), creating the resulting traffic tailbacks. ALPR technology has helped speed up these times – as the systems associate the license plates with the companies, a personalized bill takes up the same amount of time as a generic one.

Except for ORT systems where almost all of the vehicles have tags, in the rest of the toll schemes (whether open or closed), the best-case scenarios achieve a 40% collection rate using ETC. The rest is paid in cash at the booth. That means that almost 60% of the flow of traffic is unknown.

Knowing the total consumer profile is invaluable information and is possible wherever ALPR technology is applied. By way of example, this information can estimate the average speed by stretch of road, for instance, it can recognize customer behavior, supply information on vehicles passing by to law enforcement, detect and collect on non-payment, etc.

From the beginning, Neural Labs has supplied toll system integration companies with its VPAR vehicle plate recognition engines for both stop-and-go and free-flow applications, and the company has learned along with them all about the specific problems facing the business. ○

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