The Oklahoma Department of Transportation (ODOT) recently found it necessary to update its commercial vehicle enforcement operations. Facilities were getting old, were not ideally located and were unable to deal with increased truck traffic on the state’s major highways. With Oklahoma’s infrastructure at risk, ODOT decided to invest in new, technologically advanced facilities that would enable cost-effective screening of all commercial vehicles.

International Road Dynamics (IRD) was selected by ODOT as its technology solution provider and has commissioned two electronic screening systems (ESS) with a third system currently being deployed. These systems provide optimized commercial vehicle electronic screening and enforcement at the ports of entry (POE) into the state. The systems leveraged IRD’s expertise as a system integrator by integrating multiple sensor and machine vision technologies with state-of-the-art operational control centers and back-office systems for credential validation.

WIM and static weighing
The mainline lanes use double-threshold IRD-PAT Bending Plate weigh-in-motion (WIM) scales for weighing trucks at speeds of up to 80mph (128km/h), providing accuracies typically within 3.5% of actual gross vehicle weight (GVW).

Message signs and, for those trucks so equipped, active transponders direct individual trucks to either ‘report to’ or ‘bypass’ the weigh station. Reporting trucks are re-weighed and re-sorted at a lower speed ramp system, also using double-threshold IRD-PAT Bending WIM, providing accuracies typically within 2.6% of GVW. Trucks with no axle spacing or WIM violations, a clear credential record, and that have not been selected for a random inspection, are directed into the static scale bypass lane. All other trucks are directed to the static scale.

Weighing commercial vehicles at the static scale is a fairly easy but repetitive task, which presented an opportunity for partial automation. IRD AutoWeigh automatically directs trucks on and off the static scale, checks the truck weights and credentials, and alerts enforcement officers in the event of a violation. This feature is designed to operate with officer supervision and, as such, the officer can take control from the AutoWeigh system at any time. If an officer does not intervene after a predetermined time, trucks are directed to exit the facility. This enables the truck queue to keep flowing in all circumstances.

Screening
Two laser scanners mounted above the mainline detect oversize and overweight trucks and operate in conjunction with over-height detectors. Oversized commercial vehicles are identified and if they do not have an associated oversize or overweight permit they are directed to report to the station, where officers can initiate further inspection.

In addition to screening commercial vehicles for size and weight violations, the ESS captures license plate and USDOT number data from trucks traveling at highway speeds in all conditions. This data is compared with an on-site state and federal credential database to identify trucks with a poor safety history. Operators can adjust ESS safety thresholds and thus automatically have trucks exceeding these thresholds identified. Other checks, such as current registration and insurance, are done at the same time. Any commercial vehicles exceeding operator set thresholds are then directed for additional inspection.
The biggest challenges facing western road authorities today

It's not easy to be part of a senior team in a road authority in the western world, dealing with trends that include a decline in per-capita driving, emerging travel alternatives such as web-enabled ride sharing, and funding uncertainty. Yet there are consistent trends in any future scenario that can be imagined. The largest risk is to do nothing. Public bodies are notoriously slow to react and ignoring the rapid technological changes all around will be devastating to the credibility of transportation agencies.

In this new series of columns, I will draw on my experience as director for Colorado DOT to look at emerging trends in the era of transportation connectivity, big data and automation, and what agencies should do to react to them. First is the new era of traffic information.

DOTs have long had relationships with the private sector, especially in engineering and construction. Now is the time to extend those relationships to a new industry sector – traffic data companies, who compile data from consumer and fleet vehicles, as well as mobile devices, and provide real-time data services to public agencies. Florida DOT (FDOT) and Waze recently entered into a data-sharing partnership that cross-licenses traffic data between the two entities. FDOT will share its traffic incident and road closure data with Waze, and Waze will share its traffic speed and incident data with FDOT. This is a great example of a public-private partnership that will extend FDOT's capabilities in dealing with big data sets.

It's reasonable to say that the future sophistication of private data analytics will outstrip the ability of public transportation departments to keep up with traffic data reporting. Furthermore, companies will be developing original manufacturer and aftermarket systems that reside on vehicle dashboards that will outperform information disseminated by DOTs. DOTs will continue to collect specialized traffic data and operate cameras on heavily traveled routes. But the era of road authorities as traffic information reporting entities will disappear in the next decade.

It will not only be about phasing-in new technology, but also about phasing-out the old. Authorities should be cautious about investing in internet-based traffic reporting systems, fixed variable message signs (VMS), or telephone-based information systems (511 in the USA). If consumer traffic data reporting is moving to the private sector, the information will not only find its way to smartphones, but also to car dashboards; it is unwise to continue to invest in traffic information reporting systems that will be obsolete within years. Partnerships with the private sector for data reporting to consumers will yield a better return on investment. With smartphone penetration in the USA at 67% and growing, fixed VMS are a questionable investment.

There are exceptions to this overall recommendation. For example, actively managed express lane corridors will continue to need a range of dynamic signing to enable safe and effective operations. But an overall strategy for evolving traffic management capital investments is needed now.

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Partnerships with the private sector for data reporting to consumers will yield a better ROI