

# Future of Tolling: The Path to Interoperability

Why national compatibility of toll systems in the United States is important and achievable right now.



TransCore is a U.S. owned and operated company with toll collection products engineered, manufactured and supported by TransCore's 1,800 strong U.S. workforce.

## A Convenience Driven Culture

Global credit card use, "roaming" phone services, internet anywhere at anytime. We have grown to expect the convenience of freedom. Today, more services are available to us on a national level, so much so, that consumers now demand them. For the tolling industry, it used to be that patron and industry acceptance of local wireless payment or electronic toll collection was enough. But now, we're not happy unless these services are barrierless – at highway speeds, available to us anytime and anywhere, without regional boundaries.

To many of us, it is surprising that electronic toll collection has not become interoperable after more than 20 years in operation. When electronic payment for toll collection made its debut in the 1980s, it was considered a novelty. It started slowly in a few widely dispersed metropolitan centers, with the technology suppliers providing different technologies and systems to their customers. Back then, no one was concerned they were different. Electronic toll collection was a way to alleviate heavy congestion during rush hour periods, and this is still one of its primary benefits.

Today, most toll collection is done via electronic means with transponder based tolling as the most efficient collection method. However, a host of different solutions are in use across the United States. In most cases, these different systems DO NOT work together yet but they can.



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## Understanding the Issues

### *The Future of 5.9 GHz DSRC*

- ▶ Safety is the driving force, not tolling. The focus of the technology needs to be on OEM integrated safety systems before confusing the priorities.
- ▶ Standards have not yet been finalized for 5.9 GHz. After more than four years, still an evolving, fluid process and needs to focus on safety priorities.
- ▶ In the current financial environment, the auto OEMs may find it difficult to provide the substantial funding required to incorporate 5.9 GHz technology.
- ▶ Previous assumptions that localized 5.9 GHz would provide the medium for a broad collection of commercial applications has been eclipsed by wide-area alternative and superior commercial services including 3G cellular, WiMax, etc.
- ▶ Crucial to avoid wasteful expenditures on low priority items when more economical, smarter and less risky alternatives are available.

### **What factors make compatible tolling systems beneficial?**

Operators of long-distance heavy trucks have operational issues with diverse electronic tolling systems. The disparate nature of the deployments from state to state requires multiple transponders – many trucks carry more than a half dozen of them. Also frustrating is municipal back office systems that do not communicate, so motorists cannot register a transponder into one system and then use it in other places – even if the transponder technologies are identical. This is the equivalent of needing a different cell phone in every city.

Furthermore, electronic toll collection is a success story with deployments increasing over the next decade to fund maintenance and expansion of transportation infrastructure.

### **Can we have national interoperability in U.S. tolling systems today?**

We can. Several initiatives are underway. One example is the EZPass InterAgency Group (IAG), where the operators of tolling systems in the northeast United States collaborated to allow transponders of one type to travel from system to system within the IAG network. More recently, the toll agencies within Texas have agreed to make their operations interoperable, as have the agencies within Florida and the agencies within California.

These initiatives bundle certain local systems into larger regional systems. But the results are still regional rather than national. And all the collaborations to date have been among users implementing the same technology solution.



***Today, market driven innovation has produced multiprotocol technology that allows a variety of choices, including all presently available ones, to co-exist.***

## What are our choices?

**A: Replace all outstanding systems with new technology.** This approach is proposed by those who want to migrate everything to the new 5.9GHz DSRC technology. There is no solution more wasteful and disruptive than this one. This requires changing the (expensive) hardware in thousands of tolling lanes and replacing tens of millions of operating toll tags. If and when DSRC becomes widely deployed for its primary mission (safety systems), then it might be considered as a future tolling system candidate, otherwise, right now it is cart before the horse. Considering the time required for buildout of infrastructure and implementation into significant numbers of new vehicles, this possibility is many years (potentially a decade) away.

**B: Mandate one existing technology and force everyone else to use it.** This achieves compatibility but the burden of change is very unequal, with some toll providers suffering no cost impact (users of the chosen technology) and others facing the monumental impact and cost of total replacement. For the tolling operators whose technology is not chosen as the national standard, the costs to change are just as high as for Option A above – thousands of toll lanes and millions of tags are still affected.

**C: Adopt multiprotocol systems where existing technologies can work side-by-side.** Market driven innovation has produced multiprotocol technology that allows a variety of technology, including all presently available ones, to co-exist for both toll authorities and toll patrons. Numerous multiprotocol solutions are available today at very affordable prices. They are well-proven, in fact, a number of toll agencies have already installed the systems or are planning for future installations. This is by far the lowest-cost, least disruptive way to achieve compatibility.

**Multiprotocol is an easy concept.** Simply, it means one device can operate in two or more technology regions. Multiprotocol can exist in either the lane elements (the readers) or the vehicle elements (the tags). Multi-protocol readers can read tags from two (or more, in some cases) technology regions. Multiprotocol tags can be read by readers in two or more technology regions. Regional interoperability already exists and needs a sponsor so benefits can be realized on a national level.



## 5.9 GHz and Tolling

- ▶ The tolling infrastructure investment for DSRC will not be made without the necessary automobile penetration first.
- ▶ Millions of onboard units will need to be deployed (i.e., built into new vehicles) before 5.9GHz could ever be used for tolling.
- ▶ There is no market driver or business case to support it.
- ▶ DSRC was designed to achieve worthwhile safety objectives, but they require a communications technology far more complex, power hungry and expensive than needed to meet the requirements of the toll collection market.
- ▶ Rationalization of DSRC aftermarket products for ancillary applications like tolling is inappropriate. This would distract from the long-term benefit that focusing on vehicle integrated safety solutions can provide.

### Sustainability, Making Greener Choices

With the growing interest in "greener" technology, the paper thin, batteryless, and multi-protocol toll transponder technology provides environmental benefits as well. As more customers shift to paying tolls electronically, this reduces congestion and eliminates idle times at toll plazas, significantly reducing vehicle emissions and improving air quality. The smaller profile tag also consumes less petroleum based raw material to manufacture and reduces transportation and shipping requirements. The batteryless design of the tag eliminates the additional cost and demand for batteries' and subsequent storage and disposal requirements.

### Why Interoperability Is Important

- ▶ Multiprotocol technology has been and continues to be a proven transition path to low cost tag technology options and is already being executed by some of the largest toll systems in the country. Taxpayers and transportation authorities in those jurisdictions have already saved more than \$100 million.
- ▶ There are real benefits and cost savings to commercial trucking companies, who have been dramatically affected by the economy and fuel prices.
- ▶ There is a real convenience factor for motorists nationally that travel across state boundaries or live in close proximity to two or more different tolling systems.
- ▶ Rental car and truck companies can see benefits as they manage their fleets across state boundaries.

### Choosing The Quickest, Most Economical Path to Interoperability

National interoperability is achievable today with multiprotocol lane hardware and/or tags that support the protocols of already deployed systems: IAG in the Northeast, Super eGo, ATA (American Trucking Associations), and Allegro in the Southeast and Midwest, and Title 21 in California and Colorado.

Many in the ITS industry have proposed grand architectures of futuristic technologies that require the replacement of almost all deployed tolling systems. Someday, these new systems may become widely deployed and take over the tolling functions. But these plans are so complex and costly that they could not achieve real system compatibility for another decade.

***In the current economic environment, it is more crucial than ever to exercise the best possible stewardship of public funds.***

### Evolution of Tag Technology



With millions of tags deployed throughout the United States, next generation and lower cost tag technology has collectively saved transportation authorities more than \$100 million.

### Toll Solutions



For more information:

Call **1.800.923.4824 • 214.932.9815** or fax **214.932.9818**

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