AutoKinex™
for Agencies

Connected Vehicle Toll Technology

Accelerating the Connected Future



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Verra Mobility: A Leading Provider of Technology-Enabled Solutions

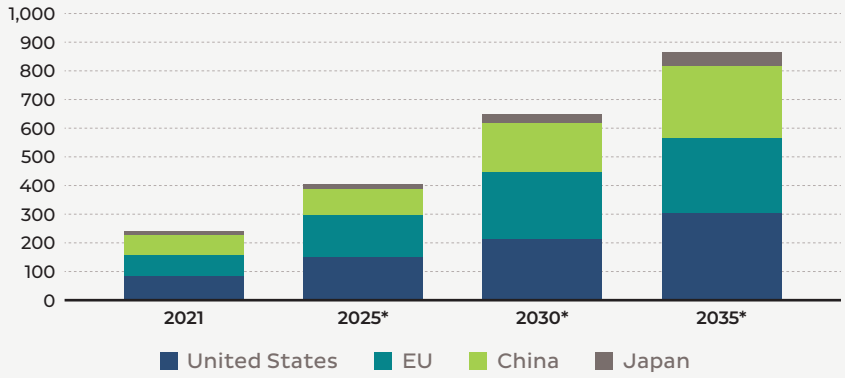
Verra Mobility, the developer of **AutoKinex™ for Agencies**, is the industry leader in toll-managed services, providing these services to the world's largest fleets, automotive OEMs, and consumers, as well as integrating with toll agencies and authorities throughout the USA and Europe. Our systems process hundreds of millions of toll transactions annually, and we also provide a range of complex ancillary services to our clients. Verra Mobility leads the industry:

#1	**The number one provider of road safety cameras in the U.S., partners with over 4k jurisdicitons and school districts**
97%	**Verra Mobility has relationships with toll authorities that account for 97% of daily toll transactions**
70+%	**of violations processed received electronically. Integrated with over 400 of the largest issuing authorities**
7M+	**Verra Mobility provides services for over 7 million rental car and commercial fleet vehicles**
TOP 8	**Verra Mobility is partnered with the top 8 Fleet Management Companies in North America**
300M+	**Verra Mobility process more than 300 million toll and violations transactions annually**
1750+	**U.S. company based in AZ with 1750+ employees & offices around the globe**

The Connected Vehicle Revolution

The global move to the Connected Vehicle is well underway. Statista, a leading German online platform specializing in data gathering and visualization, provides information that indicates "the size of the global connected car fleet is projected to increase more than threefold in the coming years." Here in the United States, the number of connected vehicles is "expected to surpass 305 million in 2035," representing a nearly four-fold increase from 2021.

Size of the global connected car fleet in 2021, with a forecast for 2025, 2030, and 2035, by region (in million units)



AutoKinex, with its technology-agnostic approach, does not rely upon specialized on-board vehicle hardware or roadside infrastructure. Instead, AutoKinex can operate seamlessly with any vehicle regardless of the OEM manufacturer, and works with or without existing tolling infrastructure, thus supporting phased deployment or hybrid operational models, and facilitating parallel operation or gradual transition.

AutoKinex for Agencies – Accelerating the Connected Future

AutoKinex for Agencies is a turnkey, future-proof, comprehensive solution that simultaneously ensures seamless vehicle flow and accurate fee collection. The AutoKinex platform is a cloud-native, vehicle-integrated tolling platform that utilizes onboard GPS, cellular connectivity, and secure cloud processing to calculate and collect tolls in real time. AutoKinex is reliable, accurate, and cost efficient and is tested and proven in high-volume and unique real-world toll environments through multiple agency pilots. Highly configurable yet simultaneously interoperable, AutoKinex can be easily adapted to suit the specific requirements of individual toll agencies.

AutoKinex is commercially deployed and live on multiple OEM brands, yielding exceptional results. These commercial deployments provide non-commercial and commercial drivers throughout the US with in-vehicle notifications of toll roads and rates as well as the ability to pay for tolls through their in-vehicle digital wallets. This transaction process is managed by Verra Mobility and settled with toll agencies through commercial toll accounts nationwide.

AutoKinex Increases Revenue, Improves the Customer Experience, and Reduces Costs

- Prevents toll revenue leakage through accurate detection, real-time processing, secure transaction handling, and enhanced adjudication.
- Delivers real-time occupancy detection for HOV/HOT via vehicle sensors.
- Enables accurate real-time toll calculation based on vehicle location, classification, route, and time.
- Maintains high transaction accuracy standards (minimum 99.5%) for all vehicles using toll roads.
- Leverages advanced in-vehicle communication technologies to enhance on-road communications with customers.
- Offers one-time tolling and automated enrollment.
- Develops opportunities to enhance driver safety, increase customer usage, and maximize on-road collective efficiencies.
- Ensures seamless vehicle flow with no need for stopping or slowing.
- Easily integrates with existing tolling systems and back-office platforms, supporting a smooth transition and broader adoption.
- Fully operational without gantries, roadside sensors, and fiber networks, reducing capital and operational costs.
- Protects agencies from risks and costs associated with possible 900 MHz spectrum realignments.
- Takes advantage of emerging technologies to achieve economies of scale.

Stop Revenue Leakage and Increase Transaction Accuracy

AutoKinex for Agencies minimizes leakage due to a significant reduction in unidentified plates and other scenarios. In addition, manual review of license plates for low confidence plate reads is reduced through GNSS (Global Navigation Satellite System) adjudication. Our GNSS-based tolling framework incorporates edge-processing capabilities within the vehicle to capture and validate vehicle identification number, location, timestamp, and transaction metadata in real-time.

This data is enriched with authenticated vehicle identifiers retrieved from the vehicle's onboard telematics or embedded SIM modules. The data can be transmitted via secure V2I channels for cross-validation with AVI-derived identifiers such as license plate reads or tag IDs, ensuring multi-source transaction assurance and resulting in toll revenue leakage reduction through scenarios that include the following:

- Security is enhanced by enabling automated identification and verification of vehicles, reducing toll evasion and fraud.
- The VIN, as a unique and reliable identifier, is extracted directly from the onboard system and matched to the registered license plate, enabling seamless integration with existing tolling systems. By bypassing sole reliance on license plate recognition, this approach eliminates revenue leakage caused by stolen plates, weather conditions, or damaged/obscured plates that traditional LPR cameras may fail to process.
- In the event of a hardware failure, AutoKinex, through its capture and validation of vehicle and transaction data, can still provide the information to the toll agency systems.
- AutoKinex for Agencies also supports redundant data reconciliation logic, allowing it to act as both a primary source and an auditing data source. This enables real-time anomaly detection, classification cross-checking, and enhanced adjudication workflows, especially in environments with variable OCR performance due to hardware limitations, environmental conditions, or license plate variation.

No Specialized Roadside Infrastructure or Vehicle Hardware Required

AutoKinex for Agencies functions on a foundation of GNSS vehicle location, proprietary algorithms, and technology-agnostic communication with Connected Vehicles to deliver tolling technology without infrastructure. AutoKinex leverages embedded vehicle telematics and communications and does not require specialized hardware, either in the vehicle or on the roadside. AutoKinex delivers the same superior tolling experience to the toll agency, the vehicle, and the driver regardless of the OEM vehicle brand.

Consequently, our platform delivers tremendous cost efficiencies through reduced infrastructure, particularly for new toll roads that will not require the same amount of capital expenditure. While AutoKinex will function seamlessly alongside legacy systems, our solution significantly reduces the toll agency's capital and ongoing costs as well as environmental impact. AutoKinex also mitigates the possible risk of traditional 900 MHz spectrum allocation realignment.

With AutoKinex' elimination of the need for gantries, roadside sensors, and fiber optic networks, this significantly reduces:

- Capital outlays and ongoing maintenance
- Construction-related emissions
- Land use and habitat disruption
- Ongoing energy consumption from powered roadside equipment

Other advantages of infrastructure-free tolling include:



Rapid Experimentation
Pilot new tolling models without upfront investment in roadside infrastructure.



Connectivity Resilience
Overcome limitations tied to vehicle connectivity and infrastructure availability.



Network-Wide Testing
Extend trials across your entire toll network, not just select facilities equipped with V2X RSUs.



Advanced Sensor Data
Access to advanced sensor data to determine complex toll scenarios like high occupancy vehicles and trailer configurations.

Improve the Customer Experience

In addition to its agency-centric functionality, AutoKinex provides an improved user-centric experience via our companion app which includes comprehensive functionality for both Connected and non-Connected Vehicles.

Infotainment Messaging Sequence

Notification of **Toll Road** *(fig. 1)* → Notification of **Toll Charge** *(fig. 2)* → **Payment Confirmation** *(fig. 3)*

AutoKinex' most valued feature is real-time in-vehicle alerts that notify drivers of toll roads and incurred charges, as well as instant payment options, thus delivering clear cost transparency and enhancing user trust. From the agency's perspective, this additional transparency can reduce disputes, improve satisfaction, increase payment timeliness, and lower support call volumes.

The in-vehicle messaging process is simple, informative, and highly valued by drivers. As drivers approach toll roads, they receive real-time notifications as illustrated in the figures below; then, at the toll charge point, they receive a notification of the toll charge and confirmation of successful payment.

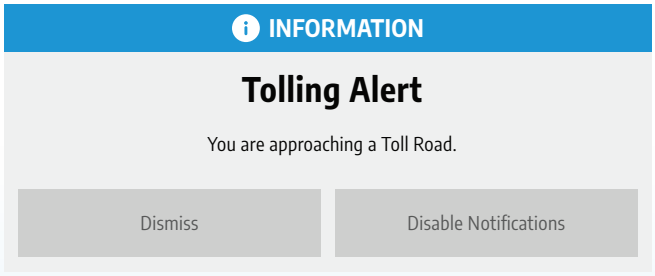


fig. 1 *Notification of the Toll Road*

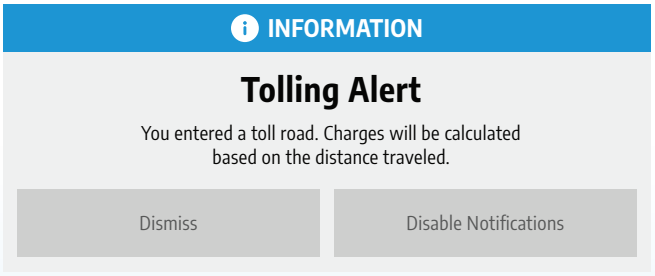


fig. 2 *Notification of the Toll Charge*



fig. 3 *Payment Confirmation*

Obtaining Driver Consent

A federal or state mandate requiring OEMs or vehicle owners to share telematics data from consumer-operated vehicles is unlikely in the near term. That's why AutoKinex, in partnership with OEMs, operates on a consumer consent model, ensuring data sharing is transparent, voluntary, and privacy-respecting. AutoKinex enables secure, policy-driven data sharing through an integrated user authorization and consent management framework, designed to adapt to evolving compliance requirements and operational demands. End-to-end encryption and adherence to data privacy regulations ensure secure handling of user and vehicle data.

Benefits of the Consent Model

Empower Consumers
Drivers maintain control over their data and choose when and how it's shared.

Enables Personalization
Consent-based data sharing allows for tailored services and improved user experience.

Builds Trust
Transparent data practices foster confidence in the system and the brand.

Reduces Risk
Minimizes exposure to legal and reputational risks associated with unauthorized data use.

Supports Compliance
Aligns with evolving privacy regulations and industry standards.



The Three Pillars of Connected Vehicle Technical Reliability

Access to Vehicle Telematics

Real-time data from the vehicle enables accurate transaction processing and contextual decision-making.

AutoKinex for Agencies provides the bridge between the toll agency and the Connected Vehicle, enabling direct communication and the collection of GNSS location information and vehicle sensor data.

This data identifies the vehicle and determines its travel lane, vehicle classification, and occupancy; calculates the toll rate; and distributes this information to the back-office system. All data is processed in the cloud. If and where required, we can also integrate with existing roadside infrastructure. For example, in today's transponder-based toll transactions, the transponder writes to the host, typically at roadside. Data travels from there to a centralized location and then to the cloud: AutoKinex can support the same protocols.

Robust Vehicle Connectivity

Strong communication channels between the vehicle and roadside infrastructure systems are essential for reliable tolling operations.

While automotive OEMs have made significant progress in embedding connectivity into vehicles, current capabilities still fall short of delivering vehicle-to-infrastructure (V2I) toll processing with the same reliability as traditional transponder systems – without adding additional vehicle hardware.

However, vehicle-to-network (V2N) toll processing achieves comparable performance to transponders because, in the event of a brief communication interruption, the transaction is stored locally on the vehicle and automatically retransmitted once connectivity resumes—typically within three seconds. AutoKinex bridges this gap with a solution designed to compensate for intermittent connectivity, ensuring toll transactions are preserved and processed with the same efficacy as infrastructure-based systems. This eliminates leakage due to impaired infrastructure or vehicle communication issues.

Enhanced Data Security

Advanced encryption and secure protocols ensure the authenticity, integrity, and privacy of toll transactions.

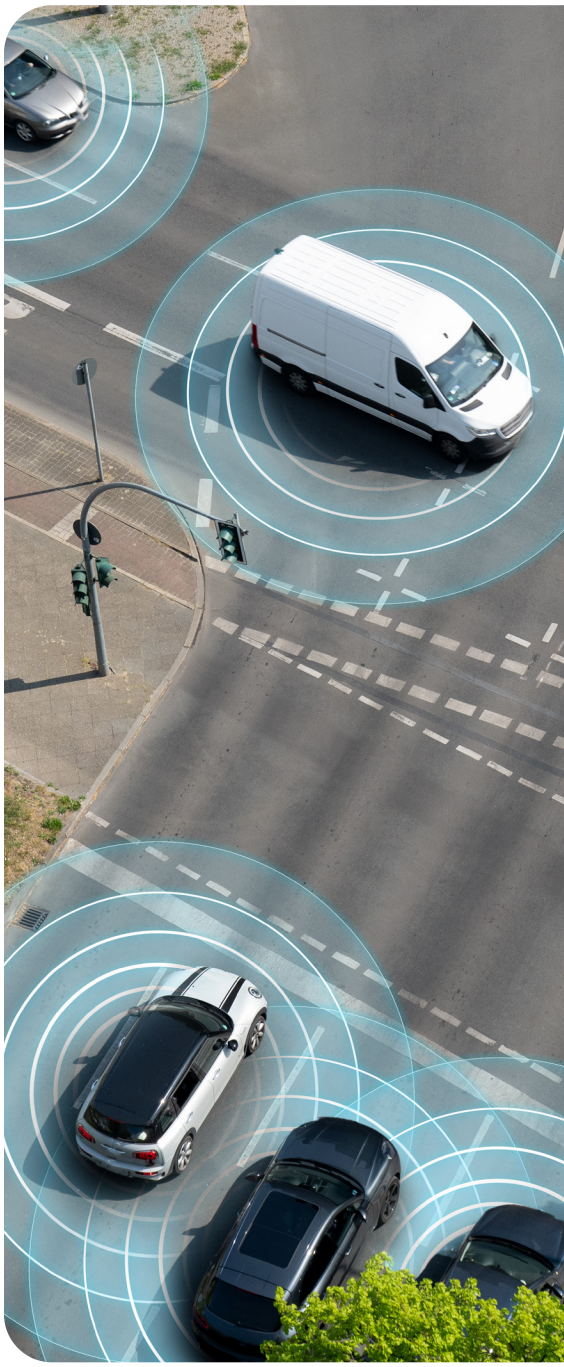
The interface with Connected Vehicles for toll collection is designed with a strong emphasis on secure, user-focused communication protocols and regulations. Vehicles are authenticated using digital certificates or tokens to ensure only authorized devices can send data. AutoKinex embeds essential mechanisms within its architecture to manage vehicle data exchange in accordance with operational standards, streamlining the enablement of compliant and policy-driven interactions without placing additional burdens on downstream systems.

As the Connected Vehicle paradigm continues to evolve, tolling and other services will become increasingly bundled into the OEMs' consumer subscription offerings. AutoKinex is purpose-built with the end user in mind, seamlessly integrating user authorization frameworks and adaptive data governance models to enable trust-driven, policy-aligned connectivity.

Future Proof with Advanced Calculation Methods and New Use Cases

AutoKinex for Agencies accommodates different methods of toll calculations and can manage the increasingly complex landscape of toll roads in the USA including traditional toll charge scenarios as well as emerging use cases made possible through GNSS tolling. GNSS tolling delivers transformative benefits over conventional roadside infrastructure models by leveraging satellite-based positioning for dynamic location-aware charging to deliver use cases that include:

- **Advanced Pricing Models.** Enables more advanced pricing models with charges varying based on factors like time of day, miles traveled by network and zones, traffic conditions, vehicle occupancy, or environmental impact.
- **Automated Enrollment.** Identifies unregistered vehicles operating within toll facilities and facilitates real-time enrollment through patented technology.
- **Congestion Zone Tolling.** Implement congestion pricing without physical infrastructure, and adjust toll rates based on traffic density, time of day, and vehicle type.
- **Distance-based Tolling & Dynamic Pricing.** Capable of implementing congestion pricing, time-of-day rates, and distance-based tolling, enabling modern, flexible tolling strategies.
- **Event Management.** Enables flexible tolling for temporary or high-impact events by activating toll zones dynamically based on event schedules or traffic patterns.
- **High Occupancy Lanes.** Collects passenger detection data from the vehicle to ascertain the number of occupants, in combination with lane-level accuracy, to ensure that the toll charge is adjusted to the appropriate rate.
- **Low Emissions Zones.** Identifies vehicle emissions profiles through integration with vehicle data systems and supports differentiated pricing for low- and zero-emission vehicles.
- **One-Time Tolling.** Provides drivers that have entered a toll charge point with the option to authorize and pay for a toll charge without opening an account.
- **Open Road Tolling.** Uses high-precision location and cloud processing to calculate tolls based on location, time, and vehicle type – ensuring fairness and accuracy.
- **Road Usage Charging.** Tracks vehicle movement via connected vehicle data and calculates charges based on distance traveled, route, and vehicle classification.



AutoKinex™

Schedule a Custom Demo

As technology continues to advance and infrastructure evolves, Connected Vehicle tolling and usage-based programs are likely to become more efficient, cost-effective, convenient, and seamlessly integrated. Verra Mobility and its solution, AutoKinex for Agencies, are at the forefront of this rapidly evolving transformation. Verra Mobility can provide toll agencies with no-cost Proof of Concept and Pilot programs to demonstrate, prove out, and refine our solution as needed to meet agency objectives. Contact us to discuss further and schedule a custom demonstration.



VERRA MOBILITY™

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