

# LiteToll

The Shift from  
Infrastructure-Centric  
Tolling to  
Intelligence-Driven  
Architecture

ACHIEVING GANTRY-LEVEL PERFORMANCE THROUGH DISTRIBUTED INTELLIGENCE

# Executive Summary

Free-flow tolling is advancing into a new era, characterized by a shift toward architectures that are lighter, more adaptable, and scalable. These solutions enable agencies to reduce their reliance on heavier physical infrastructure while maintaining high levels of operational efficiency.

**LiteToll**, a new lightweight roadside solution and subproduct within **Emovis Identify**, embodies this transition by combining distributed intelligence and multi-evidence capture powered by **Emovis Qualify**, all into one powerful system.

Emovis has executed real-world testing, validating key improvements to the back-office within the LiteToll architecture. The results confirmed that the intelligence-driven solution, LiteToll, can still deliver gantry-level performance while reducing infrastructure requirements, lowering capital costs, and accelerating deployment timelines for tolling authorities.

This introduces a new approach for how tolling systems can be designed and operated, while still capable of translating multiple pieces of data into reliable transactions.

**Rather than placing value primarily in traditional physical infrastructure, LiteToll demonstrates how modern, intelligence-based systems can drive performance, flexibility, and scalability.**

# Why Tolling Is Evolving Beyond the Gantry: The Shift Toward Distributed Architecture

Gantry-based systems have long served as the reference model for free-flow tolling, event detection, and identification, despite their heavy reliance on fixed infrastructure. Although these traditional models remain functional, back-office systems have become the central element, reducing both the criticality and the amount of roadside equipment required.

As the market evolves toward more agile alternatives, advances in AI-based robots and back-office systems like Emovis Qualify continue to make new approaches even more possible—and LiteToll is specifically designed to address this turning point.

Its approach combines:



Lightweight  
roadside devices



Distributed  
evidence capture



Emovis Qualify as the  
system's intelligence core

**The result is a new generation architecture solution where intelligence is not concentrated at a single point of capture, but is instead distributed across the entire system.**

# Real-World Validation of a New Approach to Free-Flow Tolling

**Tangible performance data is essential in order to support the tolling industry's transition toward intelligence-driven solutions.**

To verify the efficiency of LiteToll, Emovis performed extensive testing of its recent evolution and improvements to Emovis Qualify using real highway traffic. These trials focused on validating the system's capacity to process and authenticate data harvested from a distributed capture network, ensuring it can handle the demands of large-scale free-flow tolling.

The findings confirmed that the solution achieved reference-level performance through an architecture that is significantly lighter, more flexible, and considerably lower in cost than a traditional gantry-based system.



**GANTRY-LEVEL PERFORMANCE**  
Validated in real-world operating conditions

The comprehensive evaluation process featured:



Deployment at a tolling location processing more than

**30,000 vehicles daily**



**6 months**

of data collection across diverse traffic patterns and weather conditions



Benchmarking against conventional gantry-based systems for **direct performance comparison**



**Rigorous analysis** of detection, identification, classification accuracy as well as Manual Image Review (MIR)

# Distributed Capture: More Evidence, Better Decisions

The unique value of LiteToll is found in the system's intelligence and cooperative ability between devices, rather than in any individual sensor, camera, or its lightweight physical profile.

While each camera provides a partial perspective of traffic flow and vehicle activity, the real value emerges when these observations are combined within the Emovis Qualify back-office through:



As the number of devices increases, so does the amount of evidence available for each vehicle. Through the implementation of AI and new robots specifically designed for distributed capture within Emovis Qualify, Emovis has succeeded in turning the back-office system into the key element that makes LiteToll operationally competitive. This feature enhances the product's ability to transform an abundance of data into optimized decisions, all while reducing initial capital investment (CAPEX).

This approach establishes an architecture in which the system does not depend on a single critical point of capture, but on a collaborative capture network capable of performing consistently across a variety of roadway environments.

# LiteToll's Impact on the Free Flow Business Model

The move towards intelligence-driven tolling delivers both operational and financial advantages for tolling agencies. LiteToll shifts the focus away from physical infrastructure to a more agile deployment model, giving agencies more flexibility in how they deploy and scale tolling operations while also lowering upfront infrastructure requirements and costs.

## The analysis of the model translates into the following direct advantages for tolling authorities and concessionaires:



### FINANCIAL IMPACT

Between 70% and 90% reduction in CAPEX through the elimination of heavy infrastructure.



### FASTER COMMISSIONING

Deployment agility enables revenue collection to be brought forward by approximately 1 year compared with traditional gantry systems.



### DEPLOYMENT FLEXIBILITY

The ability to adapt the distribution of toll collection points according to changes in traffic behavior and demand.



### HYBRID ARCHITECTURE

The possibility of integration with gantries to configure optimal solutions.

By continuously processing information from multiple toll collection points, the Emovis Quality Operational Back Office (OBO) supports efficient growth and adaptation as system needs evolve. Together, these benefits shift the economic focus of tolling from infrastructure investment toward operational intelligence and system performance.



# A New Standard for Free-Flow Tolling

**LiteToll reflects a broader shift taking place across the free-flow tolling industry for both expressways and express lanes.**

**Value no longer resides in hardware-centered infrastructure, but in software-driven solutions where the ability to process and transform data into reliable transactions becomes the true competitive differentiator.**

The validation of LiteToll confirms that agencies can achieve gantry-level performance through a lighter, more flexible approach that improves deployment agility.

In this direction, Emovis remains committed to advancing the evolution of LiteToll by continuously strengthening Emovis Qualify as the system's intelligence core. Ultimately, this will help to further reinforce the solution's operational capabilities and its application in real-world tolling environments.

As tolling continues to evolve, these types of intelligence-driven architectures will play a key role in shaping the next generation of free-flow operations, helping agencies balance performance, flexibility, and cost in ways that traditional models fall short.