



Regaining Trust and Confidence to Boost the Economy and to Recover from the Pandemic



Next Generation Tolling Back Office Solutions

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1st Generation Tolling Back Office Solutions

- **Tolling used to be all about Traffic and Revenue**
 - That was a simpler time
- Traffic
 - Vehicles queued at toll booths
 - Record the traffic count by class
- Revenue
 - Cash collected there and then in a bucket
 - Compare traffic versus revenue
 - Easy to spot any leaks in the bucket
- 1st Generation Tolling Back Office Solution
 - Simple journals / ledgers



2nd Generation Tolling Back Office Solutions

- **Tolling was still all about Traffic and Revenue**
- Traffic
 - Vehicles queued at toll booths
 - Automated traffic classification and counting
- Revenue
 - Mixed mode lanes – Cash, ACM, ATPM, ETC
 - Slight delays in revenue realisation
 - Cash, Pre-Paid, Post-paid / Wait for Direct Debits / lodging ACM vaults
 - Compare traffic versus revenue
 - Still relatively easy to spot any leaks in the bucket
- 2nd Generation Tolling Back Office Solution
 - Additional transaction types in journals / ledgers
 - Customer registration / tag issuing / CRM 'Lite'



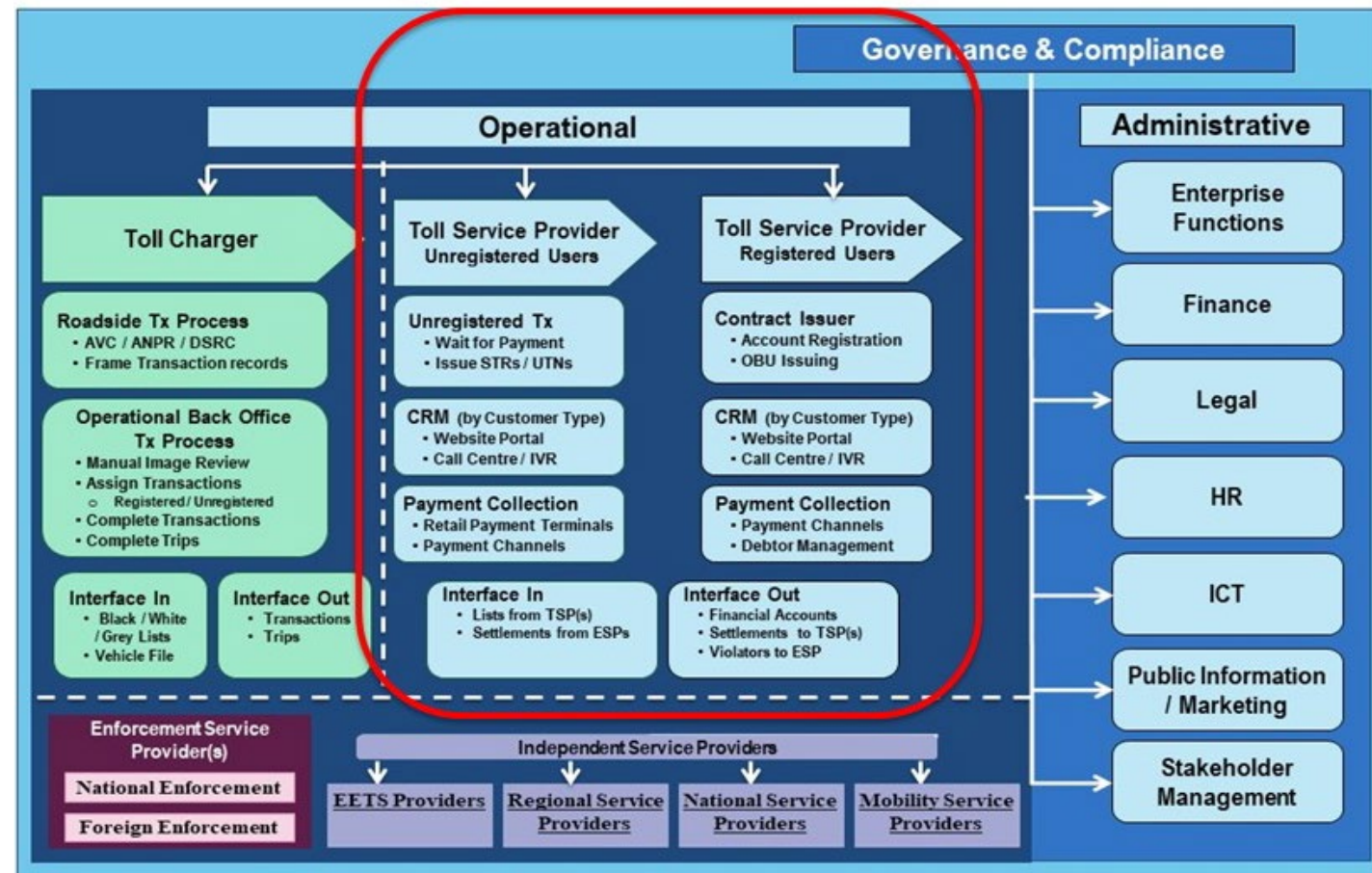
3rd Generation Tolling Back Office Solutions

- **Tolling still all about Traffic and Revenue**
- **But now also about the Customer**
 - Proven correlation between compliance and quality customer service
 - Customer Experience levels crucial to both traffic and revenue
- **Traffic**
 - No queueing at toll plazas
 - Traffic recorded, classified and identified via electronic sensors
 - Variable / Dynamic / Distance-based pricing
 - Shift towards demand management
 - Shift towards emission reduction
- **Revenue**
 - Revenue realisation dependent on customer type / payment type
 - Prepaid, post-paid, registered, unregistered, violator etc.
 - Comparing traffic versus revenue is more complex
 - Not so easy to spot any leaks in the bucket



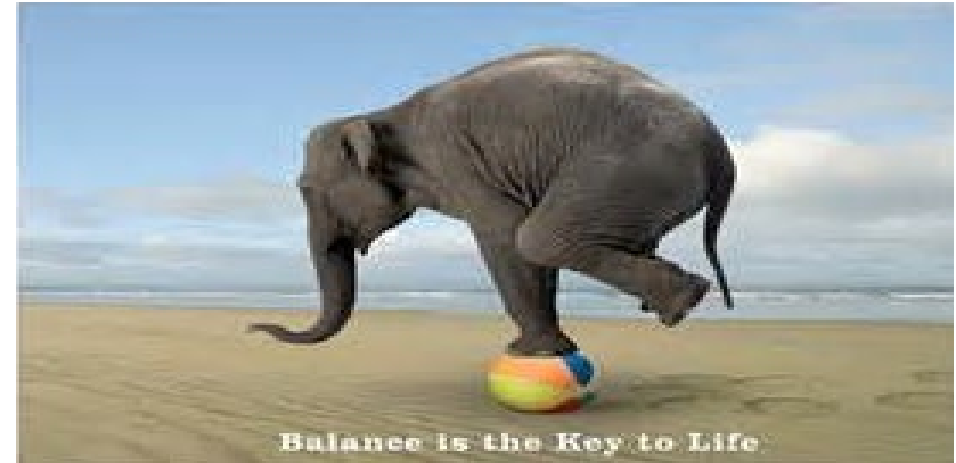
3rd Generation Tolling Back Office Solutions *(continued)*

- Shift towards Independent Toll Service Providers
 - Introduction of interoperability also changed customer ownership model
- Changes in violation enforcement
 - Different service providers depending on customer location
- 3rd Generation Tolling Back Office Solution consists of:
 - ERP modules
 - CRM modules
 - Increased business rules to reflect different customer types
 - Multiple 3rd-party interfaces
 - Complex journals / ledgers



3rd Generation Tolling Back Office Solutions *(continued)*

- Evolution has led to different tolling back-office business offerings:
 - **Bespoke**
 - Core solution customized to meet business rules
 - Extent of customization depends on core solution platform
 - **COTS** – Common Off The Shelf
 - Another term is “Compromise Off The Shelf”
 - “Configuration” = “Customisation”
 - **SaaS** – Software as a Service
 - Also requires Compromise
 - Can only be customised if all SaaS users agree



- Selection depends on achieving the right balance
 - Operational Impact of Compromises
 - Total Cost of Ownership
- **Selection should also depend on extent of future-proofing**

Next Generation Tolling Back Office Solutions

- As a vendor, we respond to our client's needs which in turn are driven by wider transport network policies
- The transport sector is rapidly evolving whereby rapid technology change and increased connectivity is totally transforming our business
 - Transitioning towards a digital transport network
 - The adoption of digitalisation as an integrated component of a well-interconnected, interoperable and efficiently managed transport system to improve the safety, security and environmental performance of the transport sector in Europe
 - Transitioning towards prioritising sustainable transport policies to achieve climate action objectives
- The twin climate and digital transitions are the main policy drivers within the tolling and mobility sectors
- This transformation is leading to:
 - New business models
 - Organisational change
 - Cross-sector competition and collaboration
 - Requirements for new skillsets
 - Increased overhead in keeping abreast of regulatory and technical developments



Next Generation Tolling Back Office Solutions

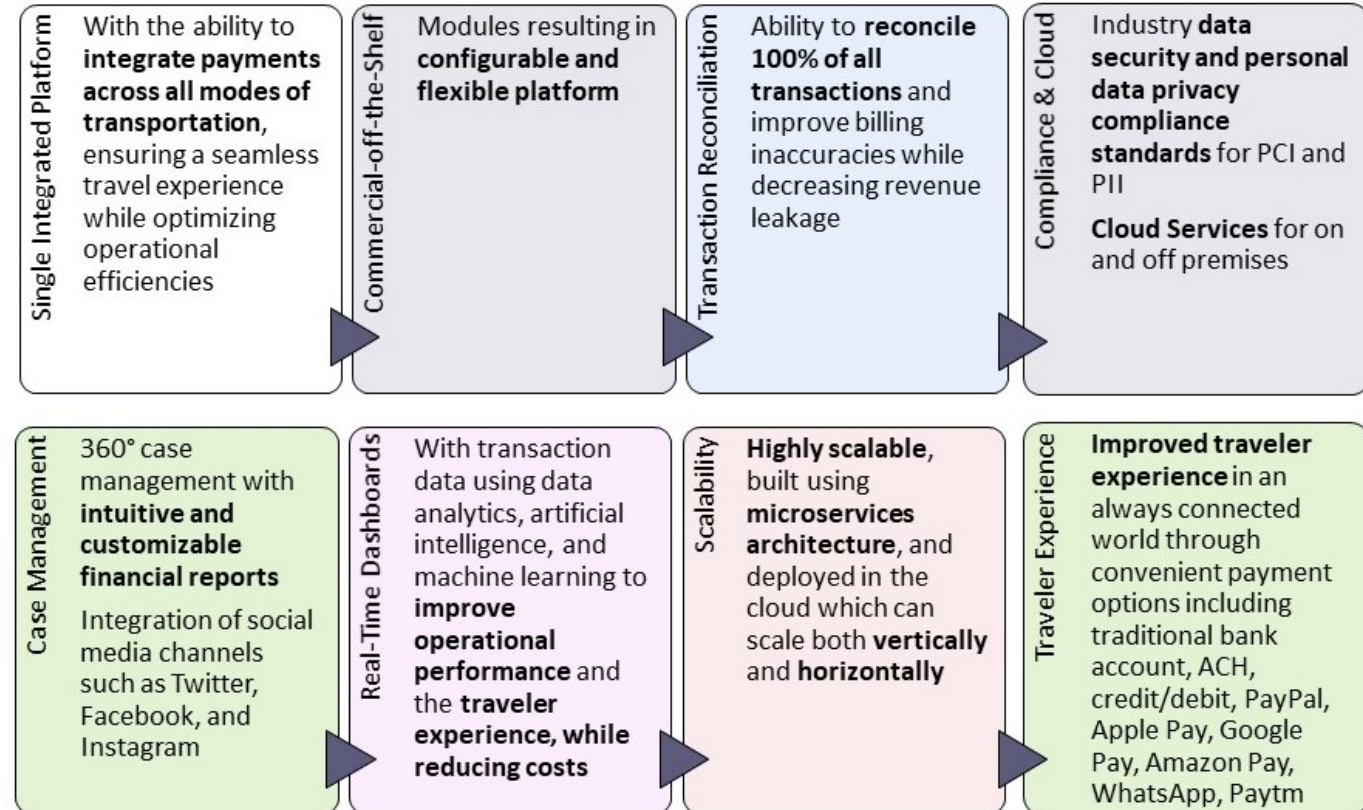
- **Next Generation Tolling Operations driven by twin tracks of:**
 - Digital Transformation
 - The Green Deal
- **Tolling continues to be about Traffic and Revenue**
 - But is now merging into the wider mobility ecosystem
 - Some Toll Operators will transition to Mobility Operators
 - Some Toll Operators will remain focused on tolling
 - With varying levels of integration with Mobility Operators
- Customer-centric approach will intensify
- Increased collaboration and stakeholder management
- Governance, Risk and Compliance requirements will continue to become more complex
 - Especially given increased volume of data processing and data sharing
- Complex **transition** towards a digital transport network
 - There is no “one size fits all” approach to operations or system provision



Next Generation Tolling Back Office Solutions

- **ToP-BOS is our Flagship Back Office System**

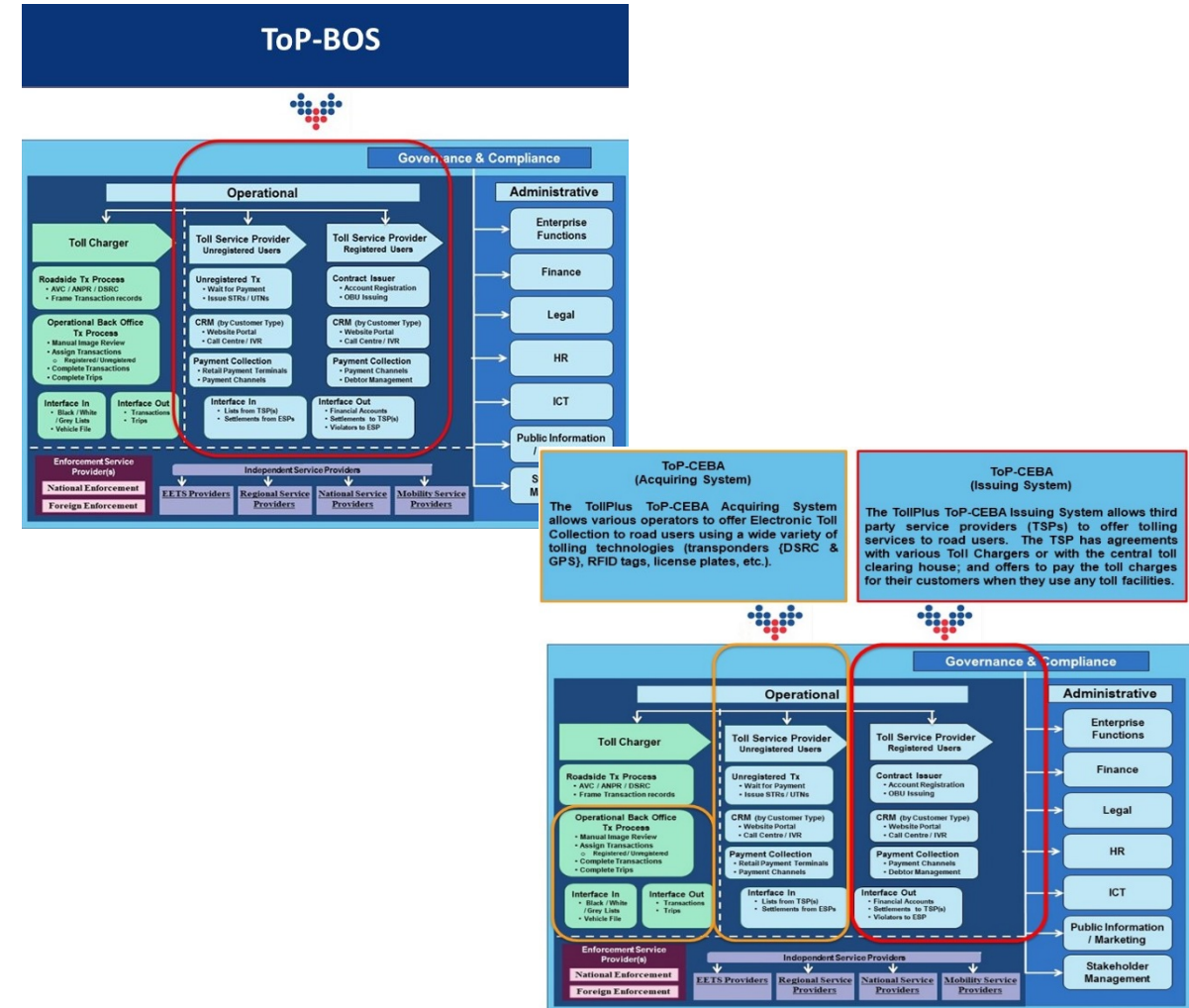
- An extendable, scalable, flexible, reliable, and configurable application
- Utilizes a state-of-the-art, highly parallel, and robust service-oriented microservices architecture
- Built on high-speed stream processing in a redundant, clustered, load-shared configuration delivering the near real-time processing of transactions
- Designed to meet current and future needs of toll operators
 - Our product suite is built on a proprietary, low latency framework that features **robustness, scalability, flexibility, modularity, and adaptability**



Next Generation Tolling Back Office Solutions

- **Modularity Matters**

- The ToP-BOS design is based on best practice bank card issuer/acquirer transaction processing technology
- Our ToP-CEBA product utilizes reconstituted ToP-BOS modules to successfully apply this issuer/acquirer concept on the Indian ETC market
- ToP-CEBA is successfully deployed in several Indian banks where ToP-CEBA processes over 100 million transactions per month (including issuance and acquirer systems) resulting in monthly revenue collected of approximately \$300 million dollars across over 200 charge points for 4.5 million tag accounts
- ToP-CEBA is fully compliant with India's rigorous financial governance, information security, and data protection regulations



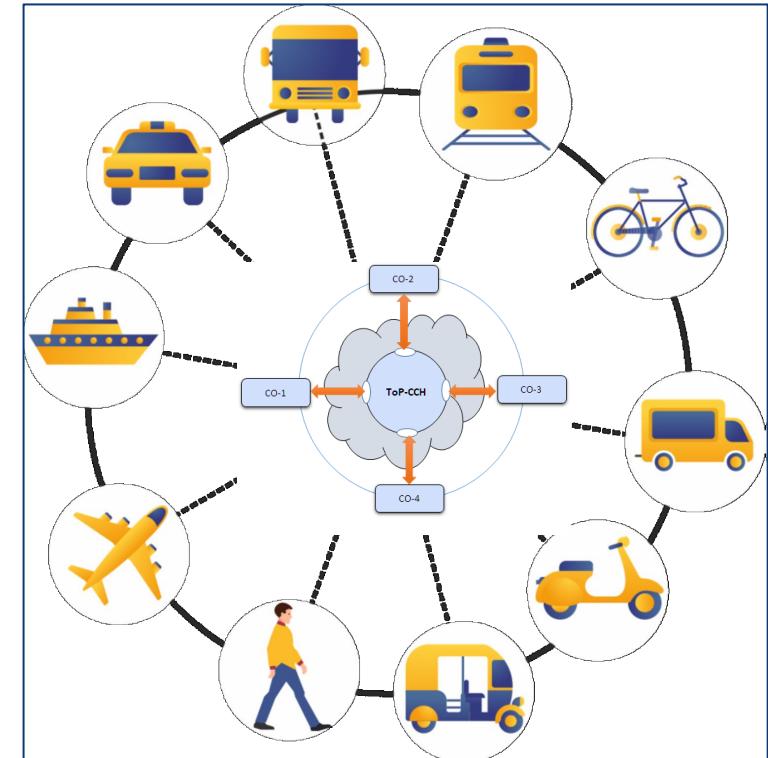
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- **Modularity Matters - Mobile Payment Integration**
- Fintech industry is rapidly evolving with disruptive modes of payments through various open and closed loop channels
- TollPlus has embraced this trend in supporting multiple modes of payments
 - Traditional bank accounts, ACH, and debit/credit cards
 - Mobile wallets such as Apple Pay, Google Pay, Amazon Pay, WhatsApp, Paytm
 - Peer-to-Peer wallets including PayPal, ZellePay, and Venmo
- In India, we interface directly with Google Store and Amazon Store to enable customers to purchase their tags via those media
- The ToP-BOS financial module assures robust reconciliation and revenue realization across multiple interfaces



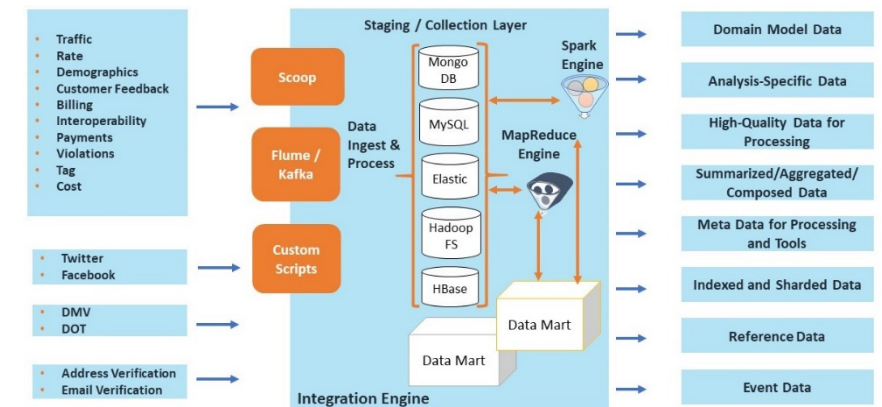
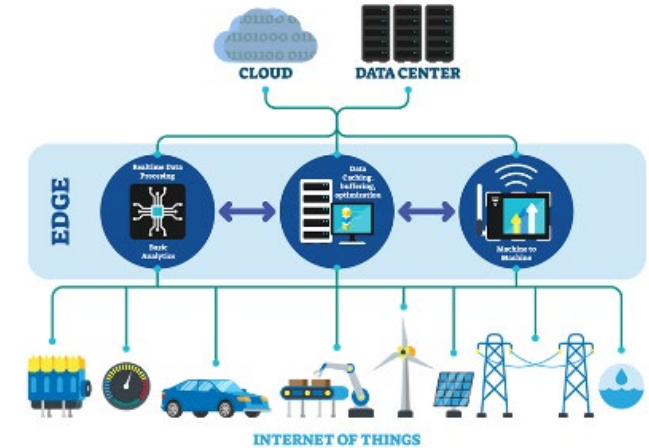
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- **Modularity Matters – Interoperability**
- TollPlus ToP-CCH product is a complete Digital Transport Network Hub solution
 - Supports interoperability for transaction management, data exchange, and financial settlement
 - Between different operators utilizing different technologies across different transport modes
- Scalability and flexibility to act as a standalone clearinghouse or as an integrated component of a more converged and federated mobility platform ecosystem
- Unique data adaptation/transformation layer enables secure processing of multiple data exchange protocols within a blended mobility ecosystem
- Architecture is readily scalable and extensible to facilitate emerging technologies
 - Integrate EDGE Gateway Interface to facilitate enhanced Internet-of-Things (IoT) applications and services
 - Integrate C-ITS / CV2X Adaptor to seamlessly facilitate real-time information exchanges with connected vehicles



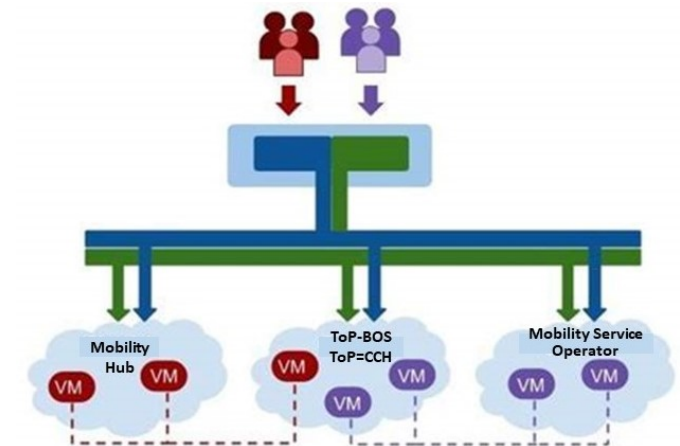
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- **Modularity Matters - Emphasis on Data**
- **Data Hosting**
 - The TollPlus product suite is data hosting platform-independent
 - On-Premise, Private Cloud, Federated and/or Hybrid cloud configurations
 - Cloud architecture is already transitioning to the “Edge”
 - processing and analysis of data takes place in smart connected objects, such as cars, home appliances, and in computing facilities close to the user
 - The TollPlus product suite seamlessly integrates best-in-breed Edge Gateway interface modules to enable IoT functionality
- **Big Data**
 - The TollPlus Big Data solution is founded on an extensible and robust architecture
 - utilizes best-in-breed COTS components integrated with our AI modules
 - Incorporates robust data privacy and security processes
 - Robust risk management processes to assure compliance with current and emerging open / shared data regulations



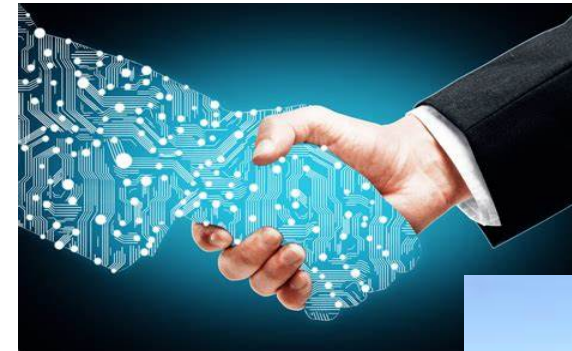
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- **Modularity Matters** – the modularity of our product suite readily enables Toll Operators to operate in today’s converged and federated mobility ecosystem
- Like the Space Station, our ToP-CCH modules can ‘dock’ with ToP-BOS to provide an immensely-powerful interface brokerage that enables an operator to:
 - Perform standalone peer-to-peer or peer-to-hub information exchange, transaction management, and financial settlement
 - Operate seamlessly in a federation with individual mobility operators, service providers, and/or with other mobility Hubs
 - Share with centralized data lakes that can be used for a range of Big Data analytical processes
 - Assure accurate revenue collection irrespective of who owns the customer
 - Minimize the overhead of managing interfaces with multiple service providers/vendors
- Incorporating the ToP-CCH adaptation/transformation module into the ToP-BOS integration management module allows:
 - Compliance with data exchange standards currently used across tolling, transit, fintech, automotive, and telco sectors
 - Compliance with emerging standards such as SAE CV2X toll payment standards
 - Seamlessly meeting today’s needs while future-proofing the transition to whatever tomorrow might bring



Next Generation Tolling Back Office Solutions

- Next Generation Tolling Back Office Solutions need to be like a precision time piece
 - Accurate, reliable and robust front end
 - Powered by precision engineering
 - Multiple cogs working in a synchronized manner
- The TollPlus Product Suite provides
 - An Innovative Adaptable and Sustainable System with Efficient Business Rule Configuration
 - Modular architecture allows management of complex business rules through configuration
 - Embraces digital transformation
 - Enables toll chargers to operate, cooperate and interoperate in a digital transport ecosystem



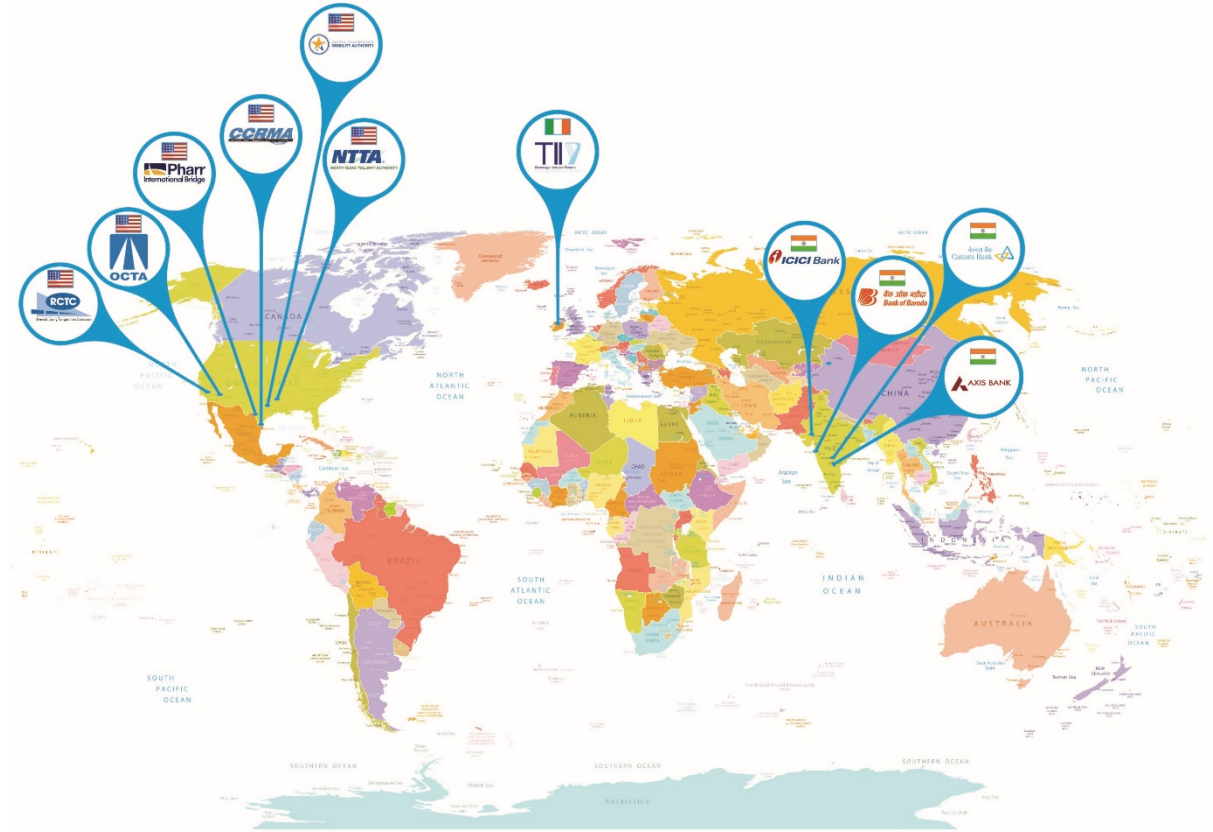
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For more information, please contact

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Tried and Tested: Proven in interoperable ETC environments in U.S., Asia, and Europe