



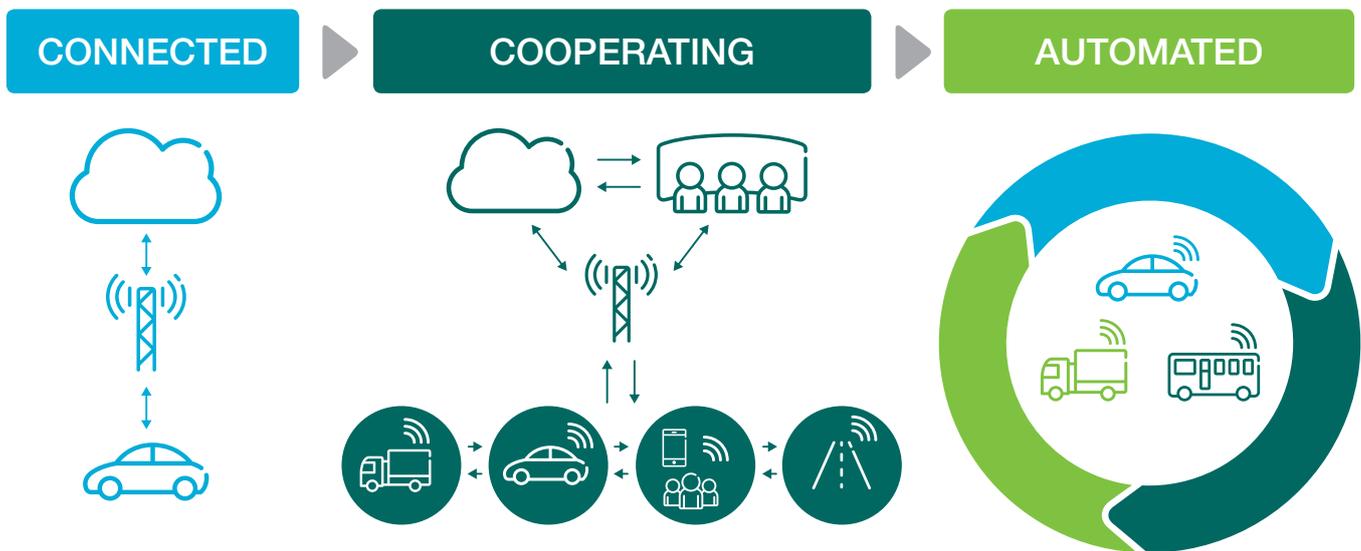
ERICSSON

CONNECTED TRAFFIC CLOUD

A New Approach to Intelligent Traffic Management

CHANGING THE GAME OF TRAFFIC INFRASTRUCTURE

Transport plays a vital role in society and its role will be even more important tomorrow. Once real-time data from vehicles, infrastructure and people is given the opportunity to interrelate, our everyday lives will improve radically.



To a great extent, the industry is already connected — but in silos. The lack of standardization and a complex environment forces road authorities and industry players to rely on limited sets of information, from a small number of sources.

This reality counteracts automation in the transport industry. New data sources will be crucial for providing drivers, automated vehicles and the general public with information that will help them avoid potentially dangerous road conditions, road construction, traffic congestion and emergency situations.

Turning Insight into Action

Releasing the potential confined in today's information silos, requires a unified and agnostic ecosystem; a hub that enables all real-time data to interrelate, regardless of whether it comes from within the network or from other sources.

When traffic and road information is allowed to interact, i.e., when applications and data can be combined in a secure and trustworthy manner, it is possible to proactively deliver the right information to the right stakeholders. This will give us a more efficient and sustainable urban environment with a new range of digital services.

With real time insight, traffic flows can ultimately become automated. Think mobility as in driverless vehicles, with predefined routes and self-learning, self-educating systems.

Ultimately, instead of you catching the bus — the bus will catch you.

END-TO-END TRAFFIC MANAGEMENT

Connected traffic can realize the full potential of digitalization. It is the foundation for new services, safer cities, reduced emissions and increased efficiency. Put simply; it will increase the quality of people's everyday lives.

The Connected Traffic Cloud gives authorities and cities the ability to aggregate and analyze diverse, real-time data from connected vehicles, infrastructure and devices. The cloud will thereby expand their insights and assist operational decision-making.

Ericsson believes in the combined strength of individually proven platforms from existing vendors, hence the name the Connected Traffic Cloud. The cloud will enable collaboration and data sharing between all stakeholders. It will be an important cornerstone in the transport industry's transition from merely being connected to also being collaborative and automated.

In addition, safe and secure data from the cloud to traffic management functions is imminent. While preserving data integrity, security and ownership when working in cloud platforms, the use of application programming interfaces will allow reduced time-to-market for any service provider or data consumer.

Modern messaging technology and supporting development environments will provide controlled yet easy access to various sources of traffic data. At any predefined and required level of quality.

When real-time data from traffic, infrastructure and people becomes interrelated, it will enable the transport industry to take the first steps toward automation.



INTEGRATE ALL ASPECTS OF THE TRANSPORT ECOSYSTEM IN REAL TIME

The Connected Traffic Cloud is a completely new way to connect everything and everyone that moves. It is a solution that takes interaction between infrastructure, traffic and all stakeholders to a new level.

The Connected Traffic Cloud enables end-to-end traffic management. It addresses the challenging expectations placed on cities, regional and national transportation authorities, and on public and private transport companies.

One Solution, Total Integration

By creating an overlay, everyone connected to the cloud can cooperate on the real-time data generated in the streets. The Traffic Cloud routes data between partner applications, it ensures that events are shared with relevant stakeholders

and it links connected applications. The cloud forms an ecosystem where all networked stakeholders are allowed to exploit and monetize their data, and to also enhance their end-user services.

Realizes the System of Systems Paradigm

The solution is based on a managed cloud platform and designed with built-in scalability and modularity. This flexibility allows the system to easily adapt to the environment in which it is used with almost no modifications to existing operations.

Selected key industry players are pre-integrated into the Connected Traffic Cloud, with end-to-end security and privacy. New services can, of course, be introduced later on, without the need to re-install local software in the control center.

Leverage Your Data

The Connected Traffic Cloud enables deep linking between applications and systems. Tap into new value chains; collect, connect, monitor, exploit and monetize your real-time data in a protected environment.



THE SCOPE OF THE CONNECTED TRAFFIC CLOUD

The ecosystem uses the latest technologies to benefit society and the environment. It has the capacity to quickly change scale and to be highly efficient by providing predictive and contextual information related to the systems.



PREDICT AND SUGGEST

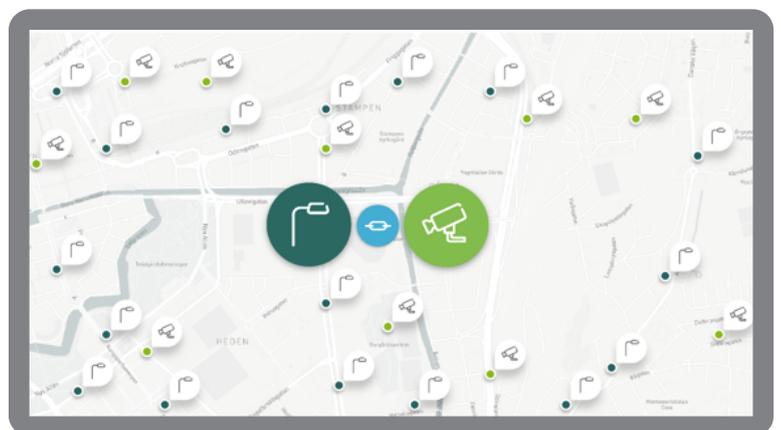
Intelligent traffic management is about connecting people, infrastructure, vehicles and places. This out-of-the-box software enables monitoring, managing and sharing of real time traffic data and road condition data, between people, various modes of transportation and authorities.

Tools for tracking and analyzing performance, predicting and suggesting events and for assisting with operational decision-making.

COMBINE AND CONTROL

Collect real-time data from vehicles and roadside infrastructure before pooling resources and proactively delivering timely and accurate information to the right recipients.

Achieve more by grouping systems and controlling them, e.g., by dimming streetlights when no cars are on the road.



DEPLOYMENT SCENARIOS

The Connected Traffic Cloud is a solution that enables different sources of real-time data to interrelate via an open ecosystem. An ecosystem that can be used to suit your business interests.

The Connected Traffic Cloud is built for three purposes:

- As an industrial IoT platform that handles device and data management.
- As an overlay system that integrates stakeholders with a system of systems approach.
- To host stakeholder's and Ericsson's software applications.

Cloud based Industrial IoT

GET THE FULL PICTURE

The Connected Traffic Cloud makes it possible to collect, monitor and manage data from different sources. By connecting your sensors, it is possible to stream analytics of real-time insights and to securely transfer the data through existing traffic message channels.

The device management system can compute all of the data going to and from anything connected to the ecosystem; across industries, infrastructure, people and services. And, once the cloud retrieves the data, it will share the structured information with cooperation partners connected to the cloud.

Cloud based System of Systems

REVEAL AND MONETIZE DATA

The cloud-based ecosystem is a hub for integrating service providers, stakeholders, authorities, things and people. The Connected Traffic Cloud includes, among other things, functionality to link applications in a structured way. It is also possible to create rules and define actions based on stakeholder-related events.

Data can also be distributed to external analytics, or allocated in your own analytic algorithms, e.g., the business logic hosted within the cloud. Events will also be presented in a graphical user interface which lets you link what you see in an advanced way.

Furthermore, our competitive charging and billing components from the telecom industry make it easy to monitor, exploit and monetize data. In addition to the Industrial IoT functionality, this is the overlay system that bridges the 'silo environment' that exists today.

E2E Traffic Cloud Applications

MAKE REAL-TIME DATA ACCESSIBLE TO LARGE VOLUMES OF USERS

These pre-packaged or customized applications address the needs to monitor and manage traffic and infrastructure in cities. Anything that is connected through the Traffic Cloud can be integrated into the software. Naturally, the software can be enhanced with data from different networks such as private clouds, public clouds and on-premises clouds.

This GUI overlay can be applied to traffic solutions, intelligent transportation, smart cities and automotive. Examples of pre-packaged solutions include:

- Bus Fleet Management
- Passenger Information
- Intelligent Traffic Management



When real-time data is allowed to interrelate, we will see proactive traffic management, cost efficient communication with drivers, happier citizens, reduced emissions and viable cities.



PLATFORM FEATURES

Cloud Capabilities

The Connected Traffic Cloud is an open, transport industry-specific service exposure platform. The front-end's main capabilities are to:

- Provide low latency data management between devices, business applications, information providers and information consumers.
- Quickly exploit new traffic services from back-ends that can be published in an open, secure and standardized way for information consumers.
- Register traffic service usage and provide charging, billing and settlement support between parties.

The front-end is a scalable solution that provides rich out-of-the-box components. By connecting your applications to the platform you will get out-of-the-box services like:

- Authentication and Authorization
- Interface Adaptation
- SLA Management
- Service Catalog
- IoT Asset Management
- Charging, Billing and Settlement
- Operation and Maintenance (monitoring, logging, reporting)
- Service Exposure
- Provisioning

Service Catalog

Traffic services are provided by exploiting Application Programming Interfaces (APIs) through a service catalog. The catalog is the repository of all traffic information and the optimization services available to data consumers and service providers.

The holistic and external view of the platform is available online. Via APIs, service providers can request traffic information and optimization services. Depending on the involved stakeholders, these requests may include:

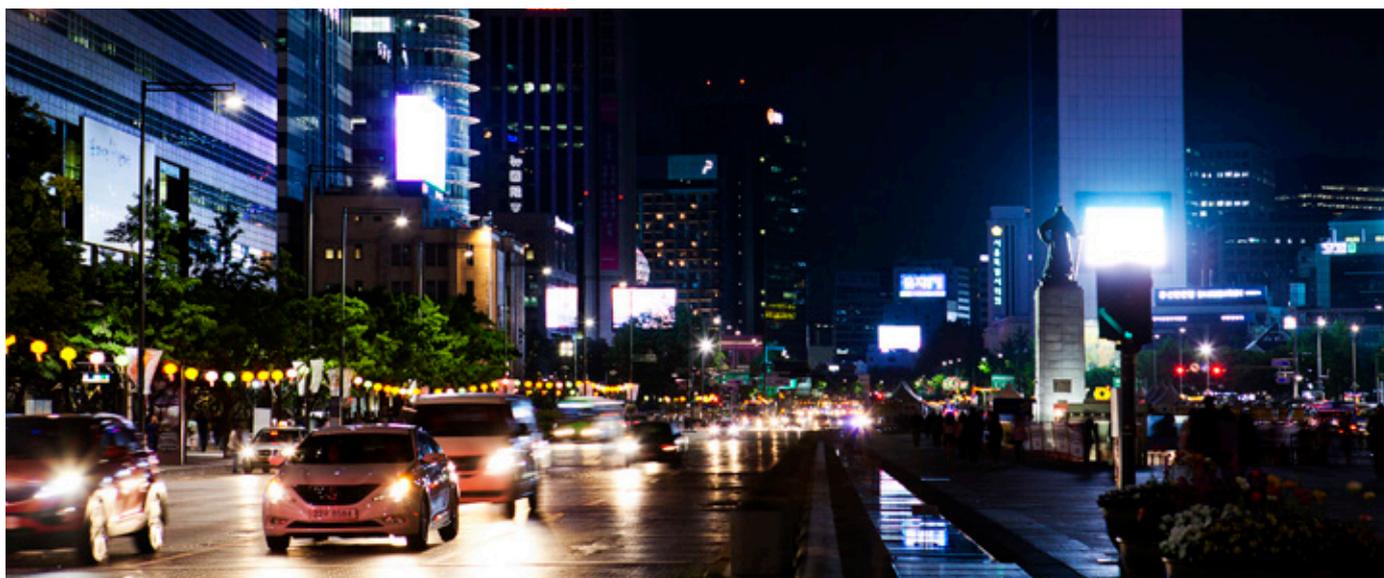
- Events: road hazards, incidents and roadwork, traffic jams
- Weather Conditions: weather information
- Vehicle State: floating car data
- Traffic Conditions: speed, flow, travel times
- Segment State: dynamic data, e.g., matrix signs, TLCs
- Section Report: historic data
- Road Restrictions: transport restrictions

The Connected Traffic Cloud enables road, rail and public transport deployments.



WHY PARTNER WITH ERICSSON?

The industry is not standardized; hence there is a need for a strong IT integrator acting as an interface. Ericsson is a leader in connecting people and things including vehicles, drivers and travelers. Our telecom heritage also makes us uniquely equipped to create ICT-based solutions, to solve complex problems and to provide seamless connectivity.



Building a service platform from scratch entails considerable risks with respect to timely delivery and quality of service. Ericsson's Connected Traffic Cloud technology is based on a service-enabling platform with API's, charging, billing and settlement services already proven in many other industries.

By using the Connected Traffic Cloud, developers and local stakeholders can easily access published API's and make use of available data from connected stakeholders in a controlled and secure way. The Connected Traffic Cloud will resolve the fact that the transport industry is not yet standardized. And Ericsson will manage integration and collaboration between industry stakeholders.

Your needs are unique, complex, and encompass many stakeholders. That's why we use an approach that is consultative and that provides management with planning and investment support.

Get Ahead

We help design and implement ICT solutions. Our cross-industry platforms are built to create even greater

value as they grow. They promote sustainability, efficiency, innovation, safety, economic growth, and better urban quality of life.

This approach also ensures that you will gain benefits in terms of development time, security, reliability, longevity, financial control and scalability.

The Connected Traffic Cloud is the key enabler for a more automated future. However, it will take many years before a complete C-ITS ecosystem is in place. But, as a starting point, the three primary features of the Connected Traffic Cloud can help you bring value to your business:

- Stakeholder Management
- Data Access Management
- Linked Software Applications

By connecting your cloud, or back-end, to the Connected Traffic Cloud, you will be able to share your data with others. And the billing capabilities in our system will ensure that you get paid for the data you provide.



Talk to Ericsson and let us propose the first steps towards a Connected Traffic Cloud.

Leading Transformation Through Mobility

We are a world leader in the rapidly changing environment of communications technology—providing equipment, software and services to enable transformation through mobility.

Some 40 percent of global mobile traffic runs through networks we have supplied. More than 1 billion subscribers around the world rely every day on networks that we manage. With more than 37,000 granted patents, we have one of the industry's strongest intellectual property rights portfolios.

Our leadership in technology and services has been a driving force behind the expansion and improvement of connectivity worldwide. We believe that through mobility, our society can be transformed for the better. New innovations and forms of expression are finding a greater audience, industries and hierarchies are being revolutionized, and we are seeing a fundamental change in the way we communicate, socialize and make decisions together.

These exciting changes represent the realization of our vision: a Networked Society, where every person and every industry is empowered to reach their full potential.

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