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Smart systems. Smart traffic.

Siemens Intelligent Traffic Systems

siemens.com/traffic

The world of mobility is facing tremendous challenges
We are facing the next mobility revolution

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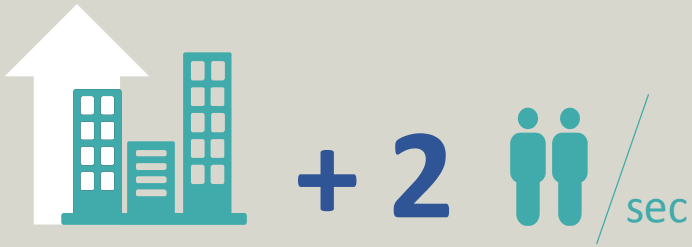
Trend



- Cities grow by two inhabitants per second
- Aging and individualism

More and more people and goods need to be moved predominantly by rail and road.

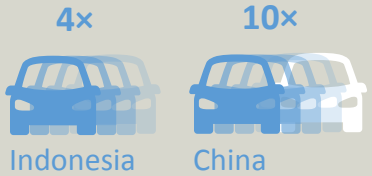
Different modes of mobility will grow together.

Increasing traffic leads to challenges for cities and urban regions in the areas of ...

...mobility

Average speed in big cities will drop further

2030
Car density will increase ...



...environment

Road traffic accounts for **20%** of the total CO_2 emissions in the European Union

...safety

	Germany	United States	China
Major car accidents every ...	49s	5s	0.6s
Road deaths/100T & years	4.7	11.4	20.5

...to be handled within tightened budgets

Economic crisis in Europe biggest challenge for all major cities

Intelligent Traffic Systems- For us Ingenuity for life means…

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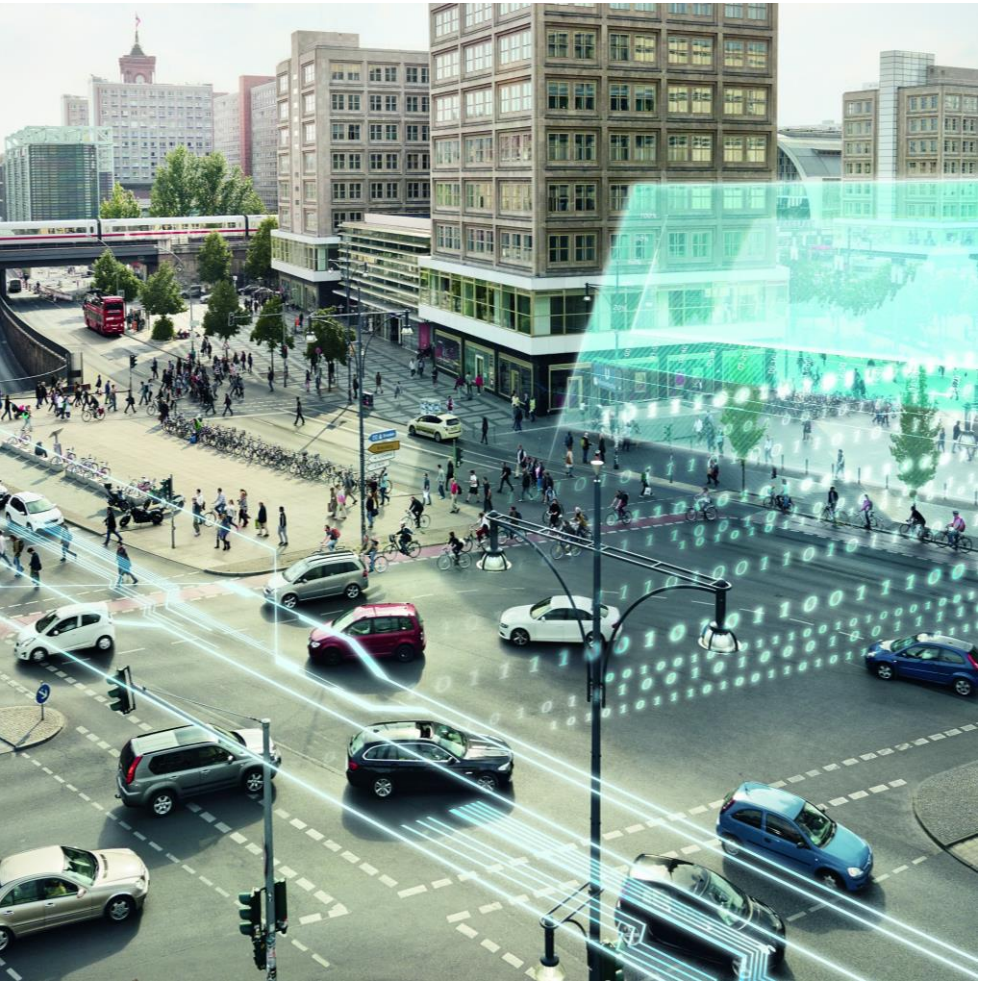

…thinking mobility further
through adaptable and modular solutions.
Smart systems. Smart traffic.

WE UNDERSTAND …	… your challenges: Increasing traffic, higher pollution, tight budgets.
WE SOLVE …	… your individual problems with individual solutions. You are unique!
WE CARE …	… about you: No matter where, no matter when. We are there – always.
WE INNOVATE …	… with you: Jointly we pave the way for self-driving vehicles.

Why Siemens?

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We make the best traffic management systems in the world

Advanced feat
options for su
and managem

Sitraffic® sm
world's bigge
but without

Hosted Traffic Management at its best

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s move

Congestion consequence of 1 Indian city (Bangalore)

'11.8 Mio citizens waste 600 Mio person-hours annually and almost 280,000 litres of fuel are wasted per hour'

Niti Aayog,
Govt. of India
Report – Sep 2018

What do we offer?

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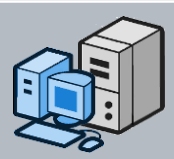
Management

Advanced Traffic Management Center

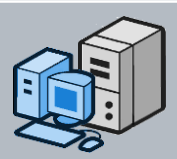
- Access to all relevant data
- Data processing, interpretation and archiving
- Common visualization and operation
- Cross-subsystem automation („Strategy Management“)

Subsystems



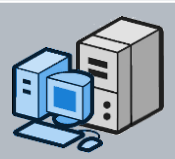
UTC

- Monitoring
- Control
- Optimization



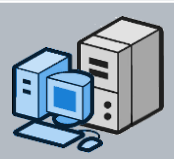
VMS

- Monitoring
- Sign creation
- Publishing



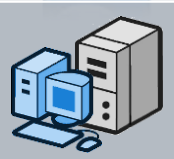
CCTV

- Monitoring
- Recording
- Pan/Tilt/Zoom



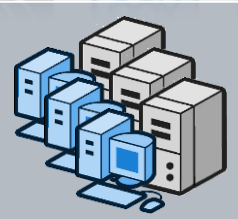
Strat. Detection

- Monitoring
- Processing
- Archiving



Environmental

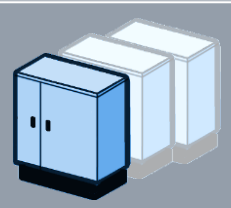
- Monitoring
- Processing
- Archiving



... further subsystems...

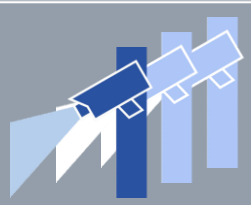
... further cloud services...

Local

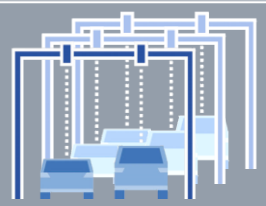


- Controllers
- Detectors
- Signal heads

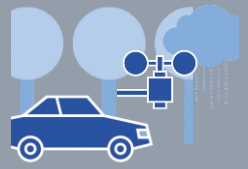
- Matrix Signs
- Lane/Speed
- Text



- Videocameras
- 360°-Cams
- PTZ Cams

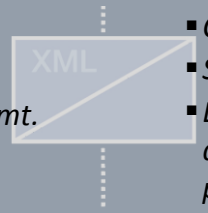


- Radar
- PIR
- Loops etc.



- Metereology
- Air quality
- Noise

- *Media Services*
- *ANPR/JTMS*
- *Parking*
- *Fleet Mgmt.*
- *Highway Mgmt.*
- *Floating Cars*
- *Road-User-Carging*



- *Smart-Data Services*
- *C2X applications*
- *Social Media*
- *Data- and application providers*

ATMS evolved from pure UTCs to integrated traffic and transport systems – and continue towards data-driven, multi-modal mobility management

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Today

Hardware Focus → **Software/Data Focus**

Strong focus on traffic light monitoring

Central signal timing optimization as key innovation

First GIS implementations

Data acquisition mainly via loops

First Integration of traffic-related subsystems

CCTV, VMS, parking and strategic detection as first non-traffic light subsystems

IP-based communication and FCD as key innovation

First web-portals and smartphone apps

Intermodality and digitalization on the rise

Integration of all modes (PT, bikes etc.) and roads (urban/highways)

Alternative data sources, big-data applications and cloud-based services

C2X-based traffic control

Central Tower for all aspects of mobility

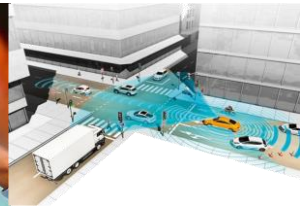
Coordination of autonomous vehicle flows

Individual guidance/optimization of journeys (all modes)

Complete mobility management





<2000 | **2000-2010** | **2010-2020** | **2020+**

NextGen applications of advanced video analytics platform for intelligent traffic management solutions

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Use Case 1

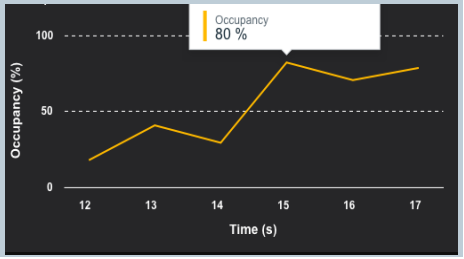
Vehicle detection, Tracking & Counting

- Detect vehicles and pedestrians in the field of view of the camera
- Track vehicles for **accurate counting** and **speed estimation**
- Improve turning movement count based on type

Use Case 2

Density Estimation & Statistics

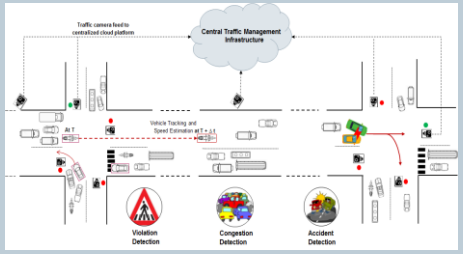
- Real-time estimation of road occupancy (density)
- Statistical reports with time graphs of hourly, daily, weekly and monthly variation of traffic density



Use Case 3

Anomaly detection

- Detection of traffic violation (e.g: helmet detection, illegal parking/stopping)
- Accident detection & localization. Notify medical and law-enforcement authorities



Optimized Signal Control

Mimimize wait time, fuel consumption and air pollution levels with **lane prioritization and prediction of optimal green signal time**

Road Infrastructure Planning

Improved town planning by simulating various road traffic conditions based on the **historical data collected from the platform**

Pollution Control

Accurately ascertain contributors to air pollution based on **vehicle-type count at intersections/road-segments**

Learning to ‘Act’

Improved efficiency and reduced turnaround time for acting upon road accidents **by fully automating the notification pipeline**

Managing the intersection traffic under infrastructural constraints poses fresh challenges to our solution portfolio

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Problem

- Traffic congestion at intersections is the main cause of fuel wastage and **concentration of hazardous fine air particles** in the air
- **Lack of lane discipline** makes it difficult to scientifically manage the traffic flow
- **Increase in road accidents** at the intersections due to signal jumping and reckless driving
- **Multiple policemen** manage chaotic intersections – exposed to harmful environmental conditions

Existing Portfolio

- **Sitraffic – central traffic control**, processing and storage of traffic data
- **SCOOT – adaptive system** for managing and controlling traffic signals in urban areas
- **Sensors** include induction loops, wireless ground sensors, passive infrared detectors, high resolution camera system and radars
- Capital intensive requiring proper traffic engineering and studies

Pilot @ELCITA, Bengaluru

- **Efficient data sensing and monitoring** of heterogenous traffic and pedestrian density using low-end cameras and existing CCTV infrastructure in real-time
- **Accurate forecasting** of the traffic density by collecting and aggregating meaningful data
- **Minimization of the wait time** at traffic intersections with decentralized signal control, thereby minimizing the pollution levels and energy consumption
- **Scalable** across intersections in the city