

Intelligent Traffic solutions for Smart Cities

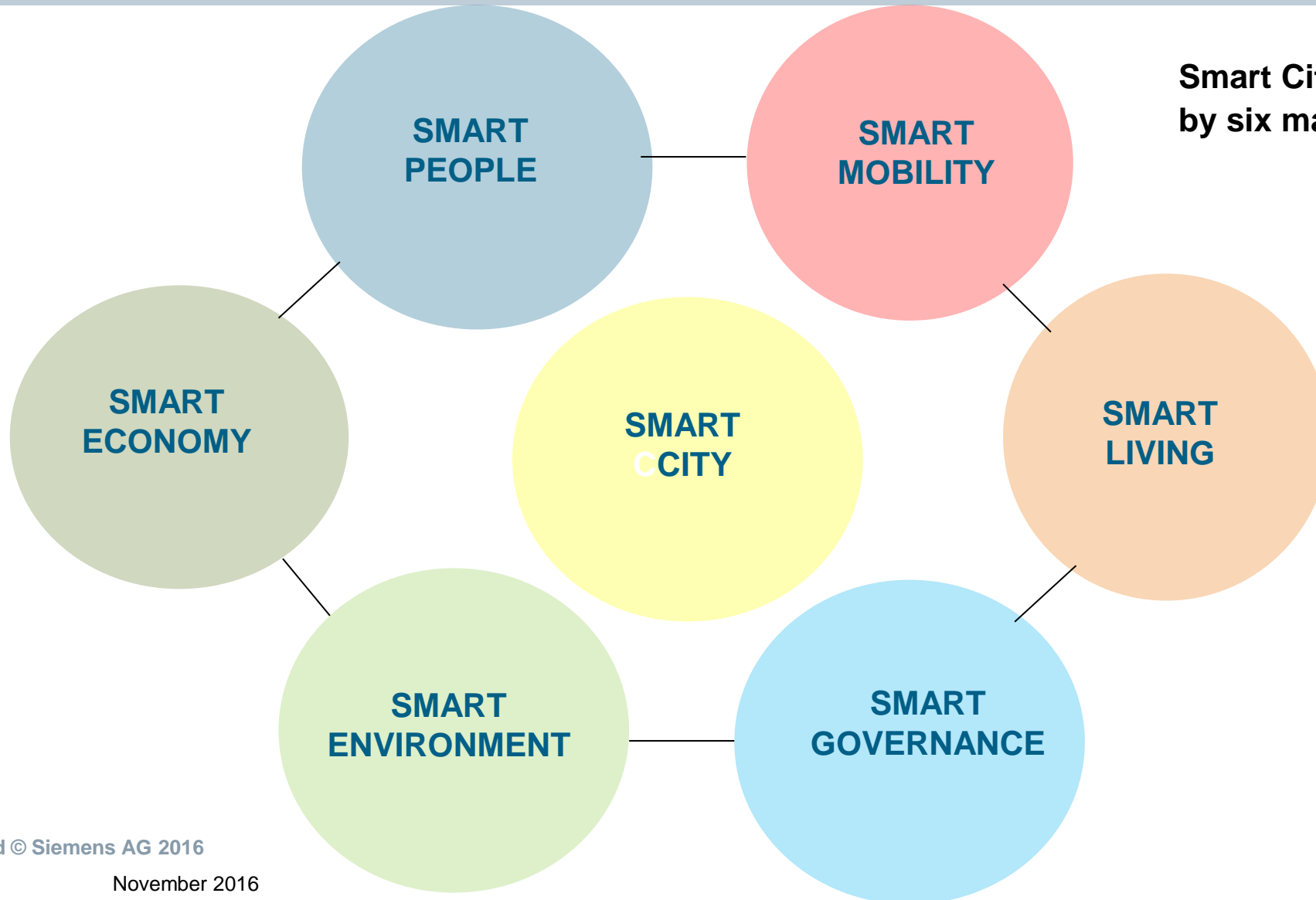
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[siemens.com/mobility](https://www.siemens.com/mobility)

Smart City Model – main domains and indicators

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Smart City is recognised and ranked by six main dimensions



- Mixed modal access to mobility providers – intermodal traveling
- Prioritized clean and non motorized options of mobility
- Integrated ICT (Information and Communication Technology)
- sustainable, innovative and safe transport solutions,
- Low emission and efficient travel solutions (traveling time)

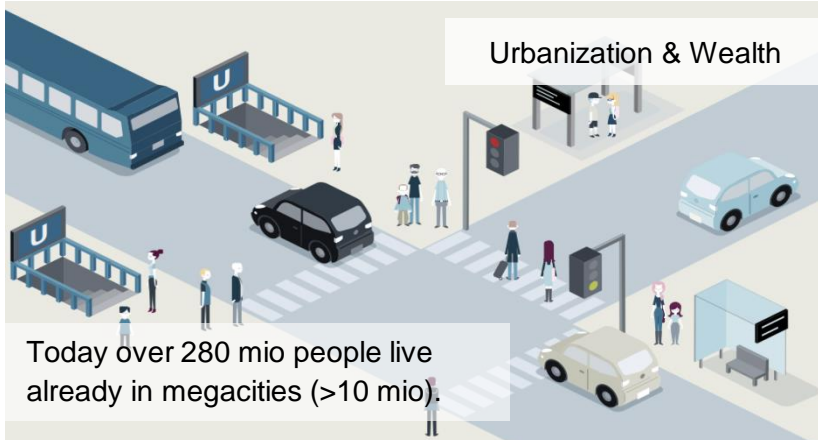
General current trends and challenges for cities: Let us build an integrated infrastructure

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TRENDS


NEED

CHALLENGES



Urbanization & Wealth

Today over 280 mio people live already in megacities (>10 mio).



- Cities grow by two inhabitants per second
- Aging and individualism
- Different modes of transport merge

Secure,
flexible,
integrated
Infrastructure



1.2 mio dead people and 50 mio injured worldwide per year
→ More than 3,000 road kills a day!



Activities referring to traffic is the second largest reason for CO₂ production (26%).

Average speed in big cities will drop further



The number of vehicles in developing countries increases five times faster than in developed countries. In 2030:
→ 4 x in Indonesia
→ 10 x in China

Focus

As good as humans is not good enough!

Siemens recommendations of next measures for becoming a smarter City by a smarter mobility dimension

1. High efficient and safest traffic lights
2. Intelligent Street lighting – part of road safety
3. Central control platform of street lighting
4. Central Control of traffic equipment and traffic flow
5. Smart parking solutions
6. Public transport prioritization
7. Bicycle prioritization
8. Vehicle communication

1. Traffic light equipment of Cities

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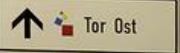


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The solution to high energy consumption and light bulb replacement costs

Introducing the new Silux 24V

The world's first and safest 1 Watt LED Signal Head



siemens.com/ah

Highest energy efficiency on the market

80% reduction of power consumption compared to standard 40V LED

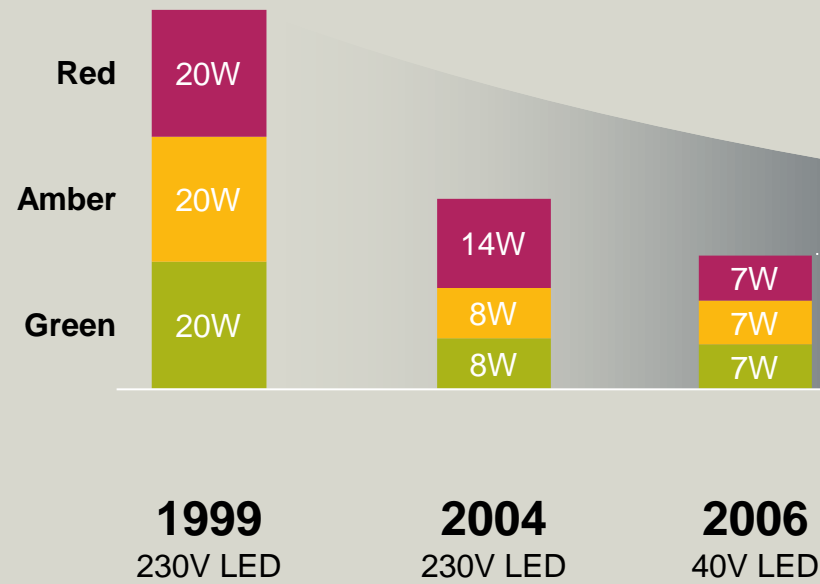
SIEMENS



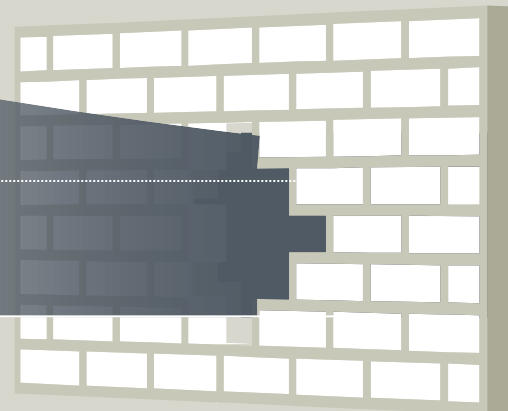
1Watt Technology Silux2 VLP signal head

Power consumption

of one LED signal head in Watt

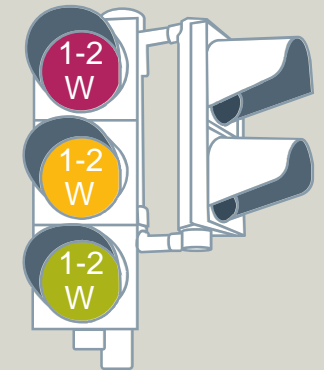


Next generation signal heads



Siemens Silux2 VLP 1Watt Technology

↓ -80%



2016

Digital LED design

Unique certified SIL3 safety level – First system with certification for traffic controller and signal head

SIEMENS



1Watt Technology Silux2 VLP signal head

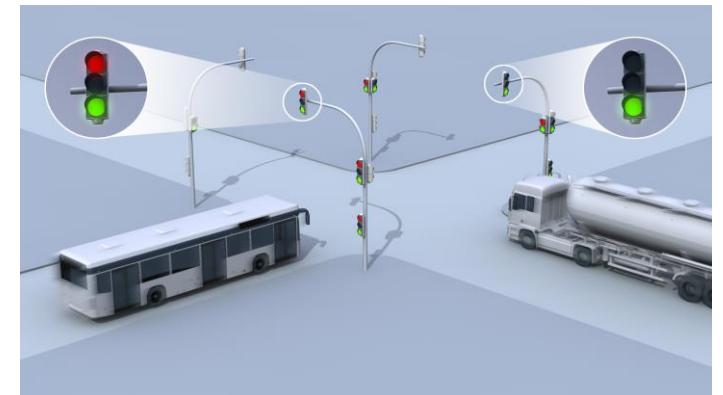
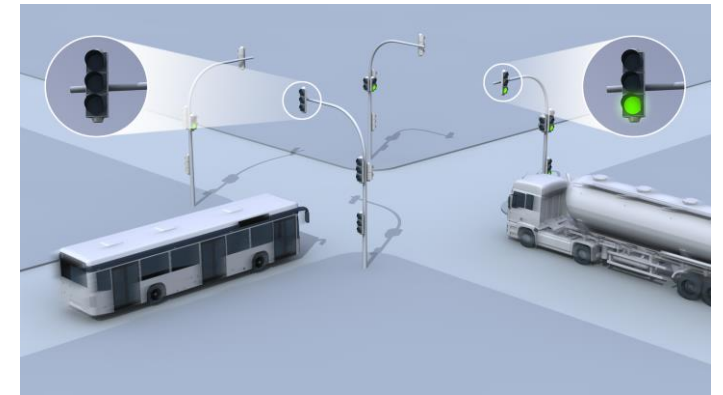
Siemens has been a promoter in the Traffic Industry for many years to design all safety relevant signal monitoring modules in a traffic controller according to the **requirements of IEC/EN 61508**

Since there arise critical situations at signalized junctions often because of a mal operation of the traffic lights, where several people can die, the EN61508 suggests the development of systems according to the **Safety Integrity Level 3 (SIL3)**

Our modern Sitraffic controllers are designed according to the SIL3 requirements and so are some more advanced traffic controllers in the European marketplace

As a **responsible technology provider**, we do our very best every day to design traffic infrastructure that complies to the highest functional safety standards available

With the **SIL3 certified 1Watt Silux2 VLP signal head**, Siemens is proud to offer the worlds first SIL3 intersection design including both, controller and signal head



New: SIL3 certificate for Silux2 VLP signal head!

Unique certified SIL3 safety level – Optical signal head monitoring in addition to power monitoring

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1Watt Technology Silux2 VLP signal head

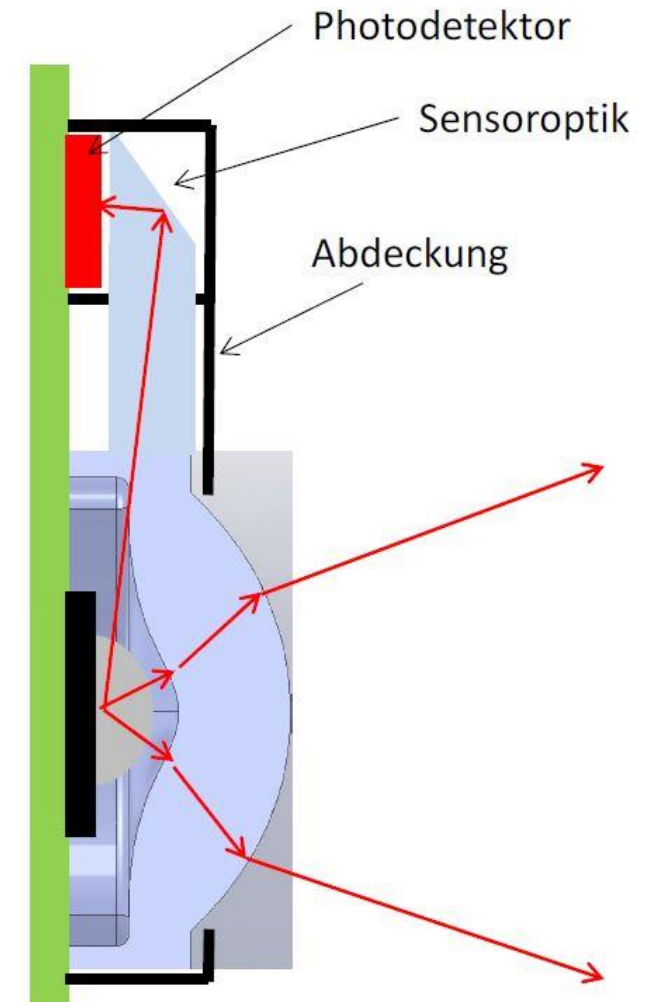
Additional optical sensor to monitor LED functioning

Measuring of LED light temperature, intensity and more information

Transfer of LED light information to digital electronic board

Innovative design to auto calculate extraneous light

New: additional optical monitoring inside signal head

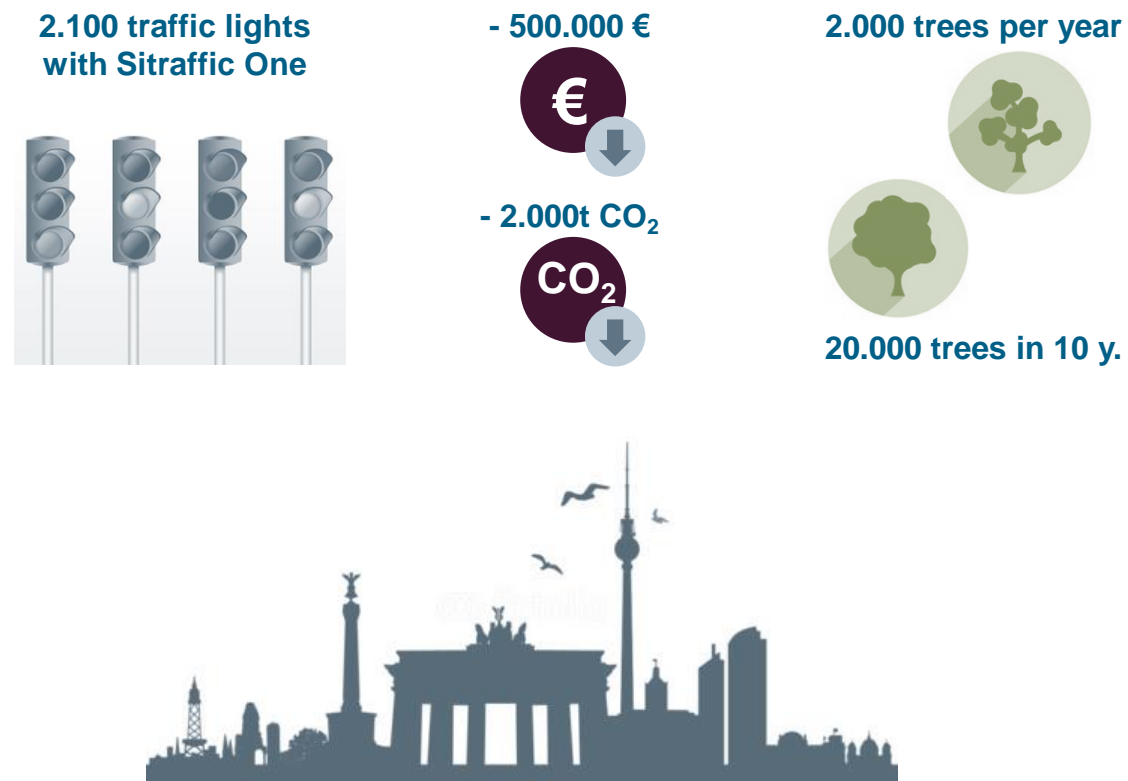


Highest energy efficiency on the market

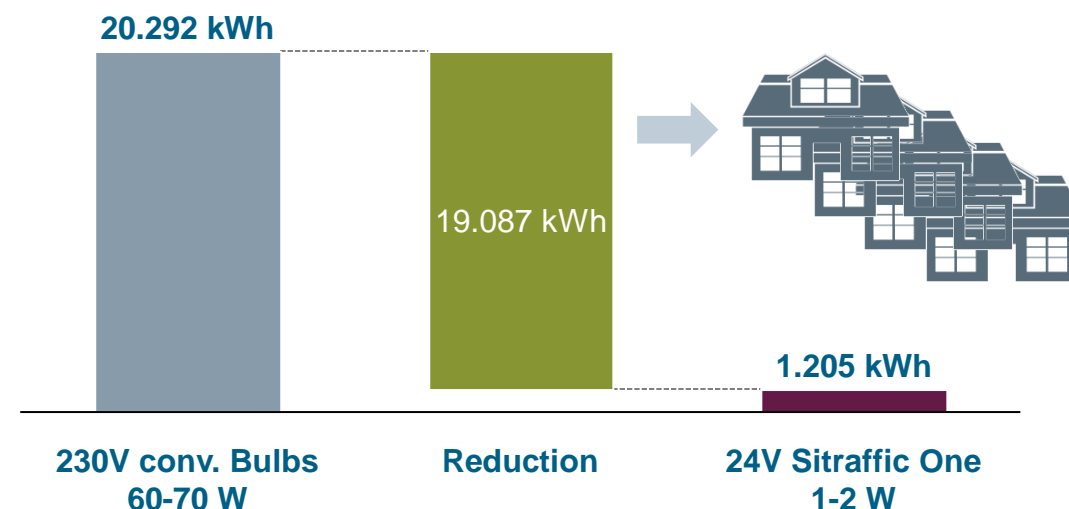
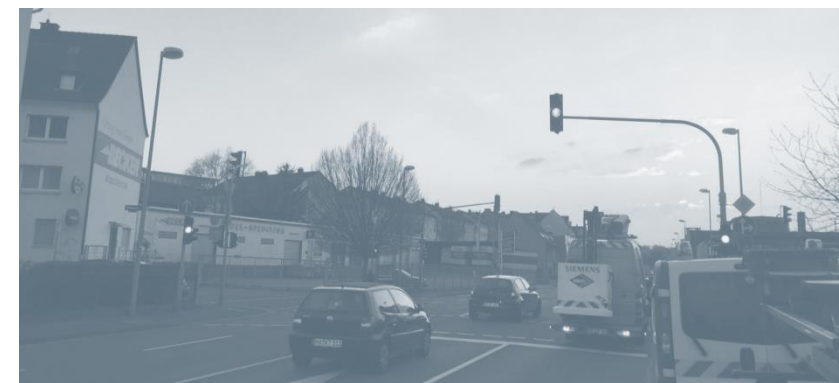
Sittraffic One – The new 1Watt Technology

SIEMENS

A city with the size of Berlin could save more than 500.000 € cost for energy per year by using our new 1Watt Technology¹



On our pilot installation at the city of Herne we measured a yearly reduction of energy consumption of more than 19.000 kWh (projection)



2. Street lighting equipment

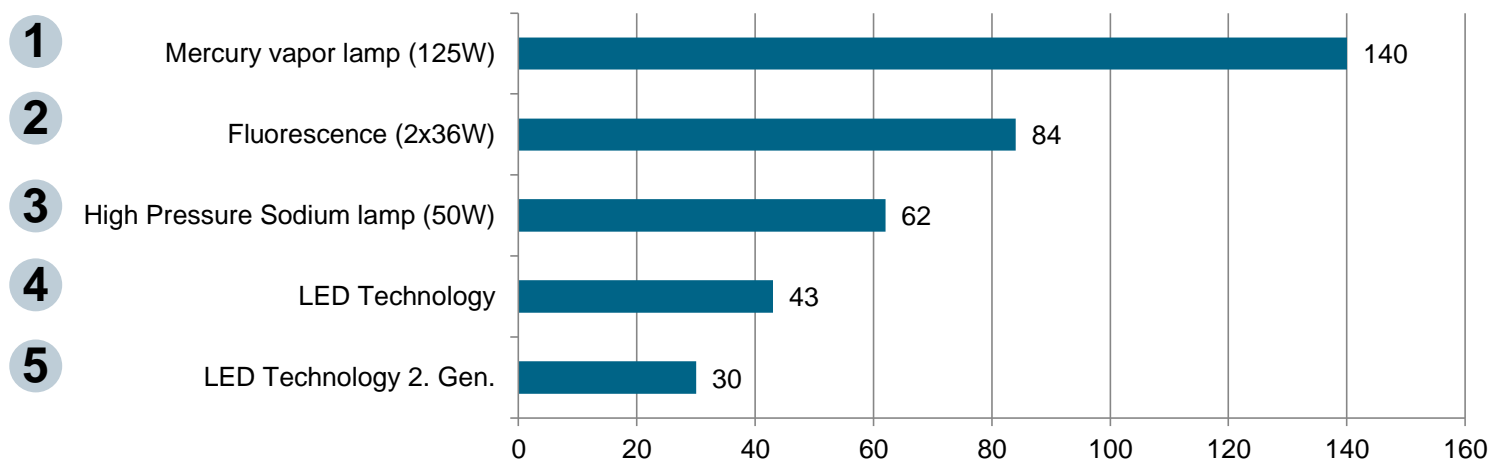
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Intelligent Street Lighting (ISL)

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Street lighting is one of the biggest cost factors of municipalities when it comes to energy consumption (ca. 1/3). Therefore, a high percentage of municipalities focus on this aspect in order to save money.



Possibilities for Energy Savings

- change of Lamps (light bulbs)
- change of Luminaires (LED lights)
- Replace of power cables
- using of Electronic Ballasts
- light management

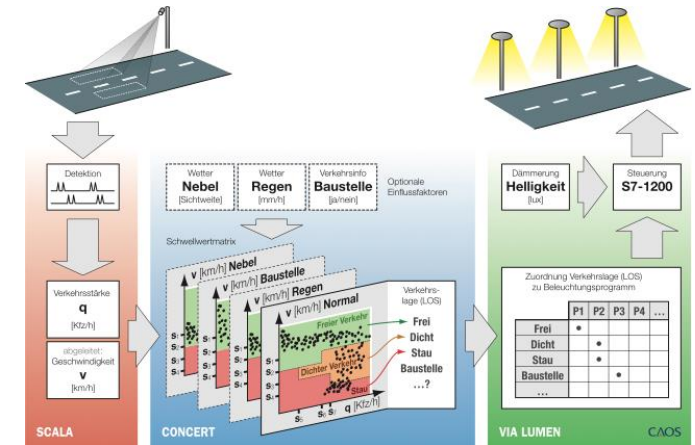


light management: further 25% savings possible

Traffic depending street lighting in Dusseldorf

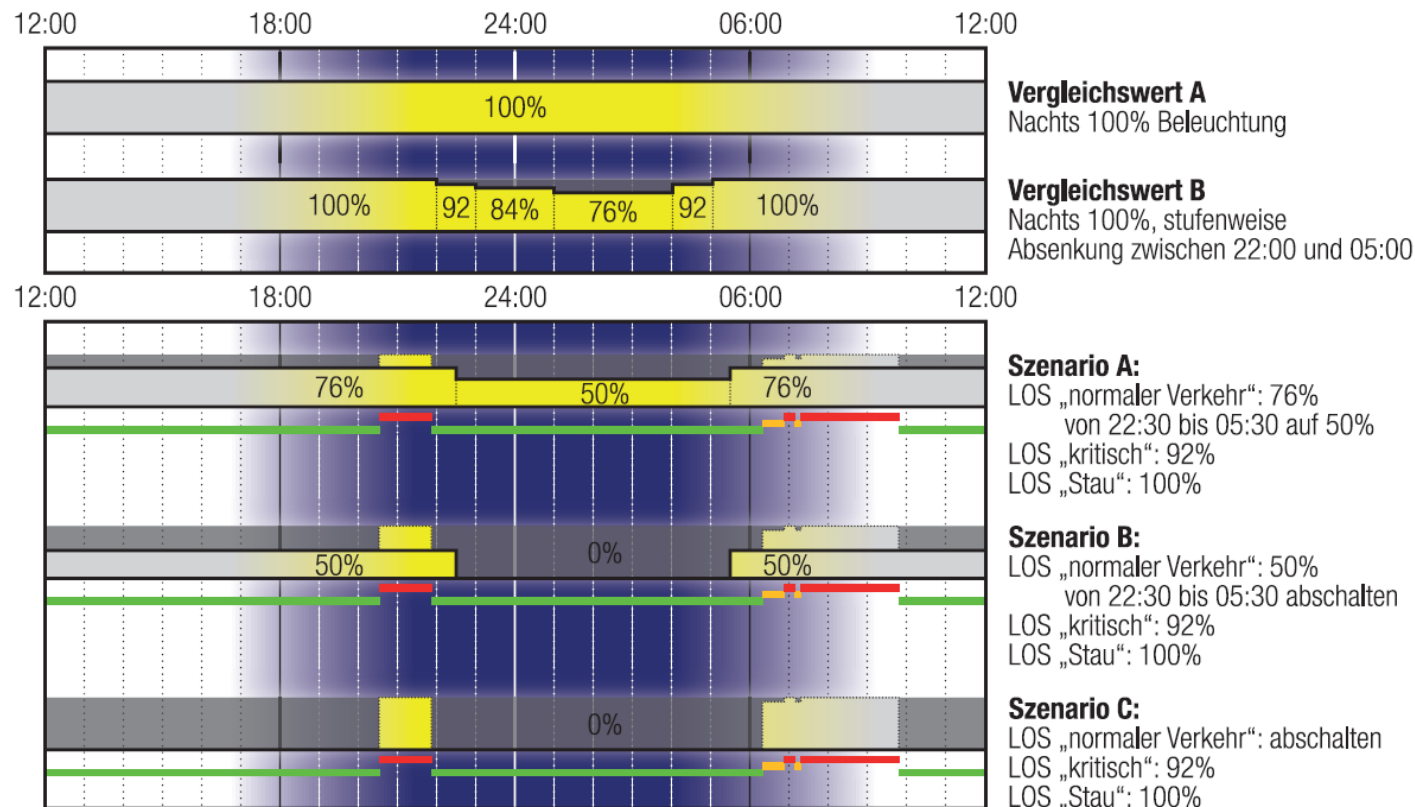
Solution

- Project start: taking of inventory of the installed light points, followed by the installation of a system – as light management system
- On Danziger Straße (the road to Dusseldorf Airport), the luminaires are controlled/dimmed depending on the measured traffic volume. Energy savings of up to 60% are realistic



The city of Dusseldorf received an award for traffic-dependant street light management.

Traffic depending street lighting in Dusseldorf

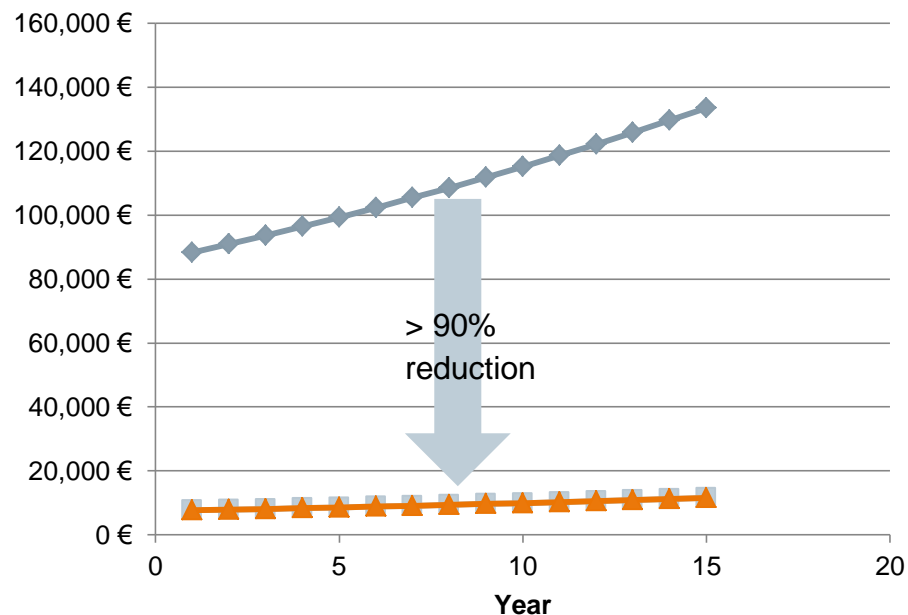


Dusseldorf „Danziger Straße“:

- 4287 hours per year
- 2,6 km with 172 luminaires
- overall power 13,8 kW towards downtown, 14,3 kW out of town
- without night reduction 120 MWh power consumption per year (scenario „A“)
- with static night reduction 108 MWh power consumption per year (scenario „B“)
- with traffic depending night reduction < 79 MWh power consumption per year (scenario „C“)

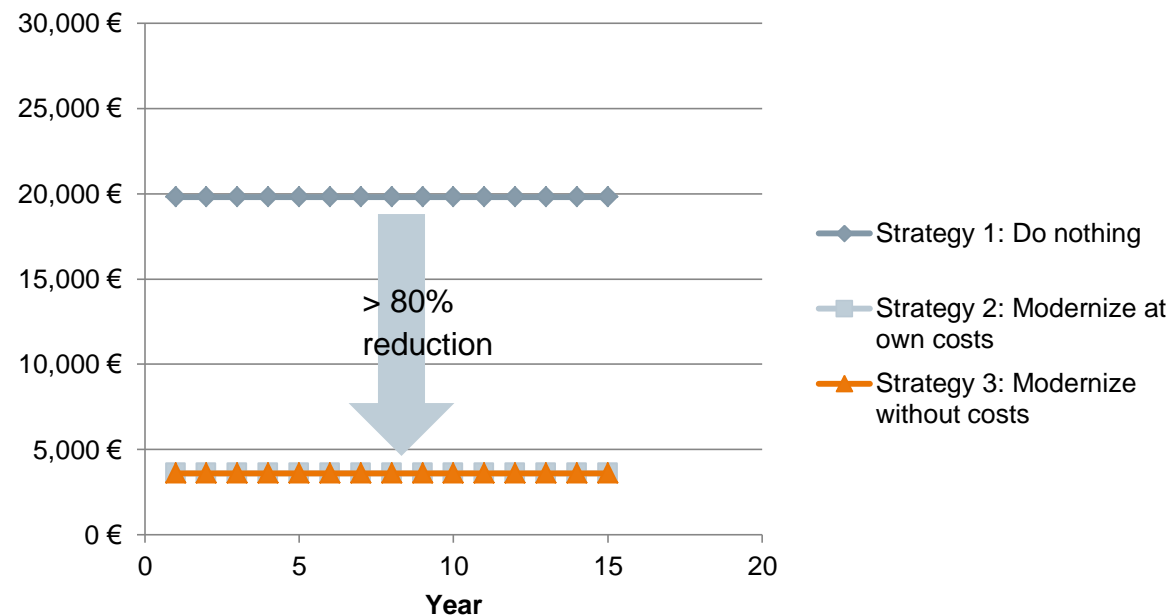
Comparison of Energy and Maintenance Costs

Energy Costs (yearly)



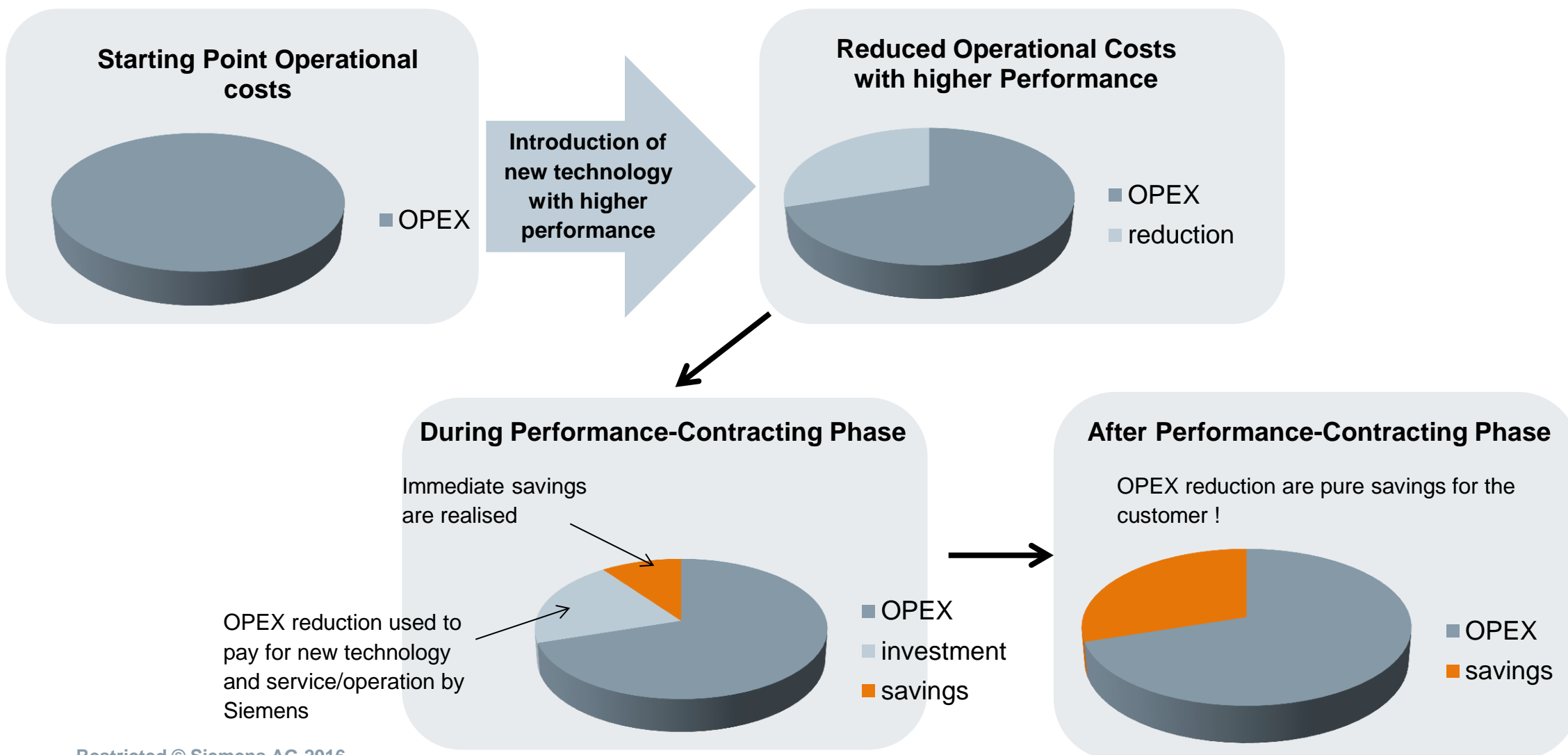
This is the biggest of introducing LED technology

Light Replacement Costs (yearly)

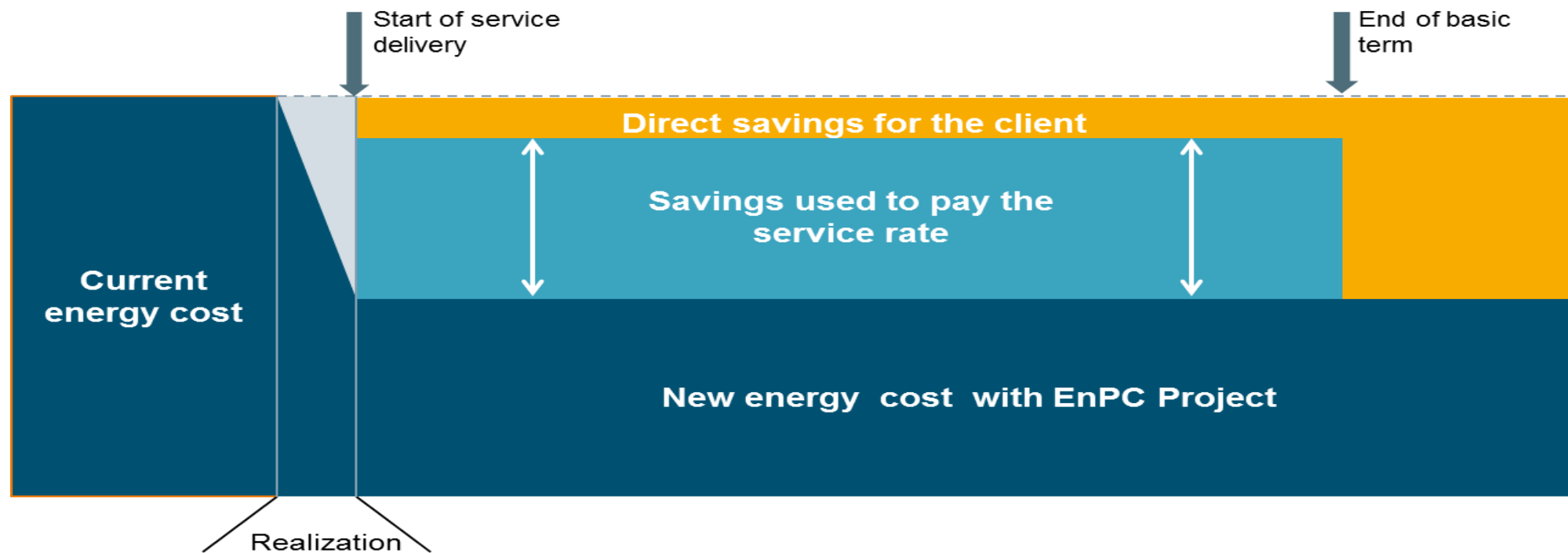


LED technology also brings a benefit in terms of maintenance costs

Main Idea behind Performance-Based Contracting for refinancing



Business Model Energy Performance Contracting



Siemens' performance based solutions allow facility and technology improvements to be made within existing budgets.

Siemens guarantees (energy) savings throughout the contract period.

The savings are used to pay for the investment.

Improvements reduce OPEX while providing new, efficient equipment.

3. Central Control of street lighting equipment

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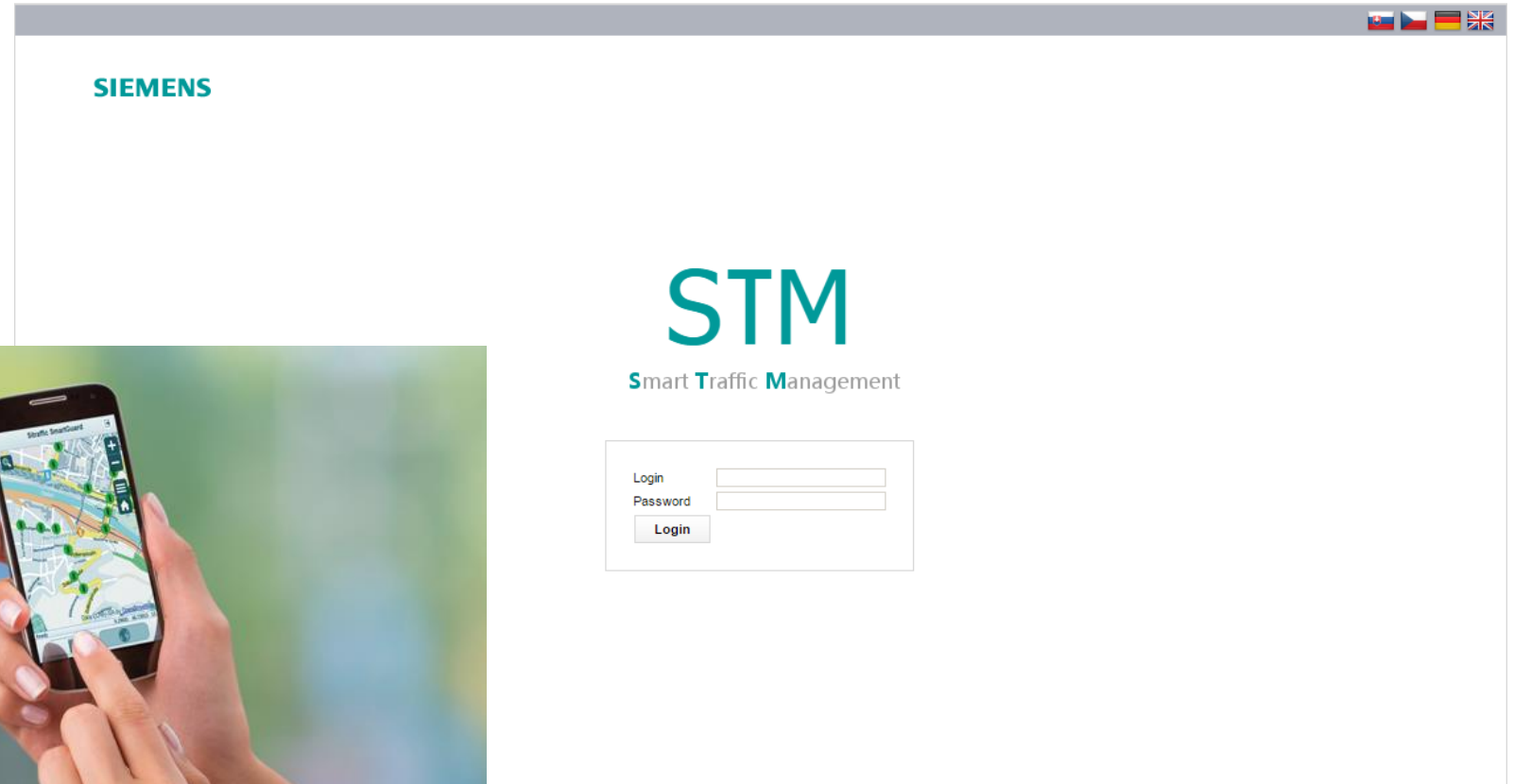


Smart lighting management

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STM

is a Web-based Application (Portal) for collecting and managing Problem Reports, and Asset Management for Street and traffic Signals.

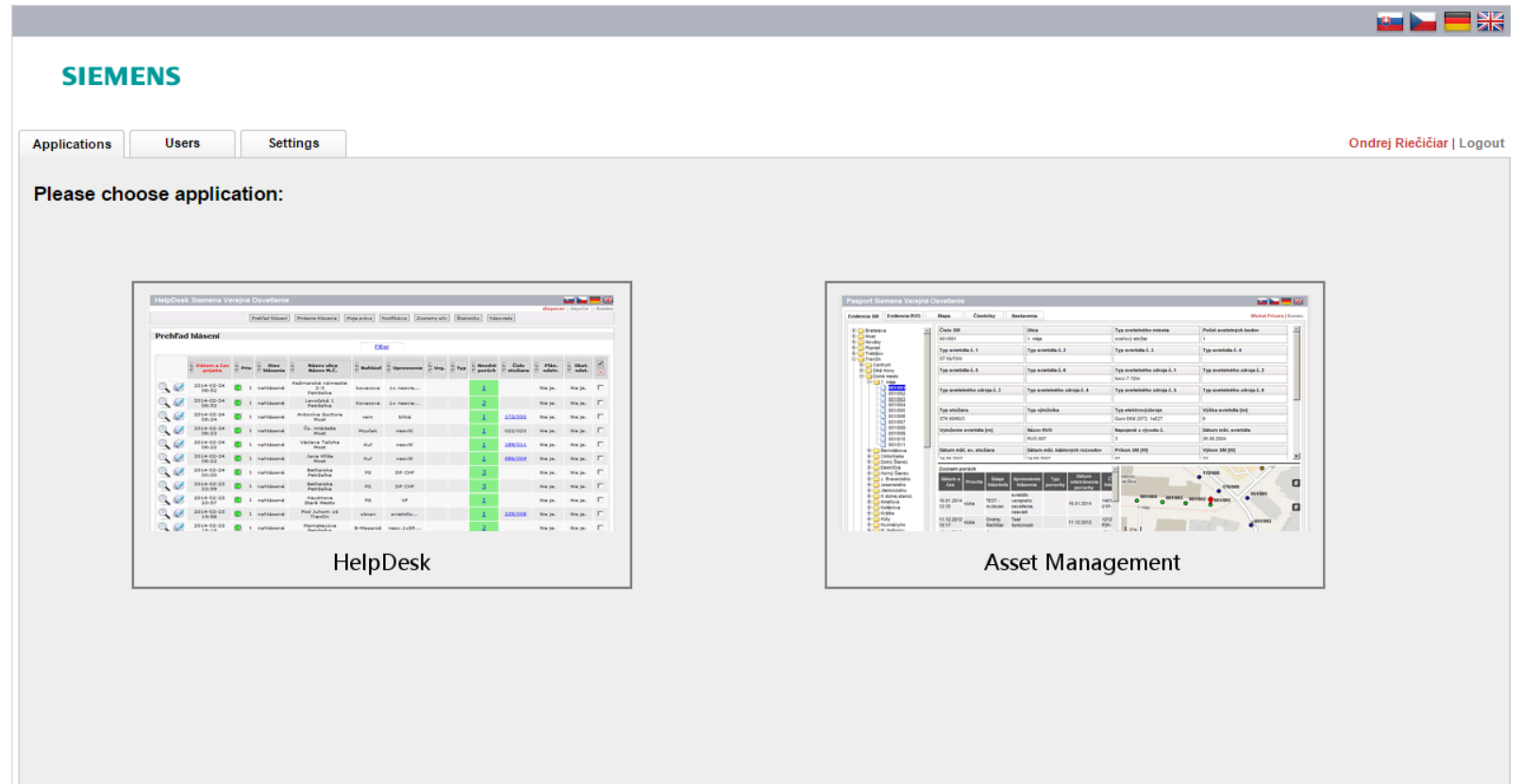


Control Center Management

STM

includes two Modules:

1. HelpDesk
2. Asset Management



HelpDesk

is a Module for collecting and managing Problem Reports

Applications > HelpDesk Siemens Public Lighting

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Users : Manage operators Manage dispatchers Manage cities Access logs

Lists : Manage cities Manage cities and regions Error types Notification of citizens 10

Reports : Report list Add report Statistics Help

Report list

Filter (active)

	Date and time reported	Priority	Report state	Street City District	Pillar Number	Reported by	Specification	Urg.	Type	Not removed errors	Planned removal	Actually removed	
	2015-10-15 15:01	1	Reported	Vvšehradská 15 Devín	P126/072	MAREK CHN...	svietidlo, nesvieti			1	Nie je.	Nie je.	<input type="checkbox"/>
	2015-10-15 14:27	1	Reported	Pribišova 4 Karlova Ves	K030/100.132	Belux	VP 2x Auris			4	Nie je.	Nie je.	<input type="checkbox"/>
	2015-10-15 14:17	1	Reported	Fajnorovo nábrežie Staré Mesto	S054/015	Belux	Rozbite Plexi KK			1	Nie je.	Nie je.	<input type="checkbox"/>
	2015-10-15 14:15	1	Reported	Vajanského nábrežie Staré Mesto	S054/004	občan	1x nesvieti			2	Nie je.	Nie je.	<input type="checkbox"/>
	2015-10-15 14:13	1	Reported	Vajanského nábrežie Staré Mesto	S054/015	občan	1x nesvieti			2	Nie je.	Nie je.	<input type="checkbox"/>
	2015-10-15 14:10	1	Reported	Rázusovo nábrežie Staré Mesto	S242/037	občan	1x nesvieti			3	Nie je.	Nie je.	<input type="checkbox"/>
	2015-10-15 14:07	1	Reported	Karlovská Karlova Ves	K026/247	Belux	Rozbite Plexi KK			16	Nie je.	Nie je.	<input type="checkbox"/>

HelpDesk - Accesses



Applications > HelpDesk Siemens Public Lighting

Users : Manage operators Manage dispatchers Manage cities Access logs
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ricciar (Admin) | Logout

Report list

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	2015-10-15 14:13	1	Reported	Vajanského nábrežie Staré Mesto	S054/015	občan	1x nesvieti			2	Nie je.	Nie je.	<input type="checkbox"/>
	2015-10-15 14:10	1	Reported	Rázusovo nábrežie Staré Mesto	S242/037	občan	1x nesvieti			3	Nie je.	Nie je.	<input type="checkbox"/>
	2015-10-15 14:07	1	Reported	Karloveská Karlova Ves	K026/247	Belux	Rozbite Plexi KK			16	Nie je.	Nie je.	<input type="checkbox"/>



HelpDesk - Accesses

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Have you seen a not working street light?
Inform us about this incident!



Register the incident with your Smartphone.

If you are close to the lamp, simply scan the QR Code from the sticker at the pole or go to our webpage www.siemens.sk/hlasenieporuchosvetlenia.



Fill in our On-line Form.

You can enter the ID-Number of not working street light at our webpage www.siemens.sk/hlasenieporuchosvetlenia. You can use the interactive map there.



Call our Callcenter.

You can register the incident in our 24/7 Callcenter. You will find the ID-Number and the phone number at the pole.

4. Control of traffic equipment by traffic platform

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System Environment

Siemens Sitraffic portfolio with the entire range of software and hardware products.



API Management

Internet	API	SiBike	Stream – PT & Emergency	Truck Guidance

Traffic Management

	Strategy	Event-M.	Statistics	TT & Data Fusion	Environment-M.	Guide	ESCoS CMS
Concert							
Scala	Service	Visualization	QM	TASS	Motion MX	sGuard	SAM
TMS-Kernel	Monitoring	GIS	User-M.	Smart Data	IT-Security	Office	sCore

Field Devices

Attached Actuators		Attached Sensors			Attached Vehicles		Integrated Subsystems	
Controller		Pedestrians	TEU	Bluetooth	CCTV	Car2X	Public Transport	Environment
VMS								
		Bike	Loop	ANPR	Radar	FCD	Truck	Pollution
								Tunnel



Sitraffic Smart Guard

Cloud-based asset monitoring central system.

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Cloud-based asset monitoring central system with intuitive user interaction via tablet or smartphone.

Intuitive User Interface

With Sitraffic smartGuard the first web-based traffic control application came to market and picks up inherent benefits of touch screen use. Johannes Wetzinger from the City Administration of Innsbruck states:

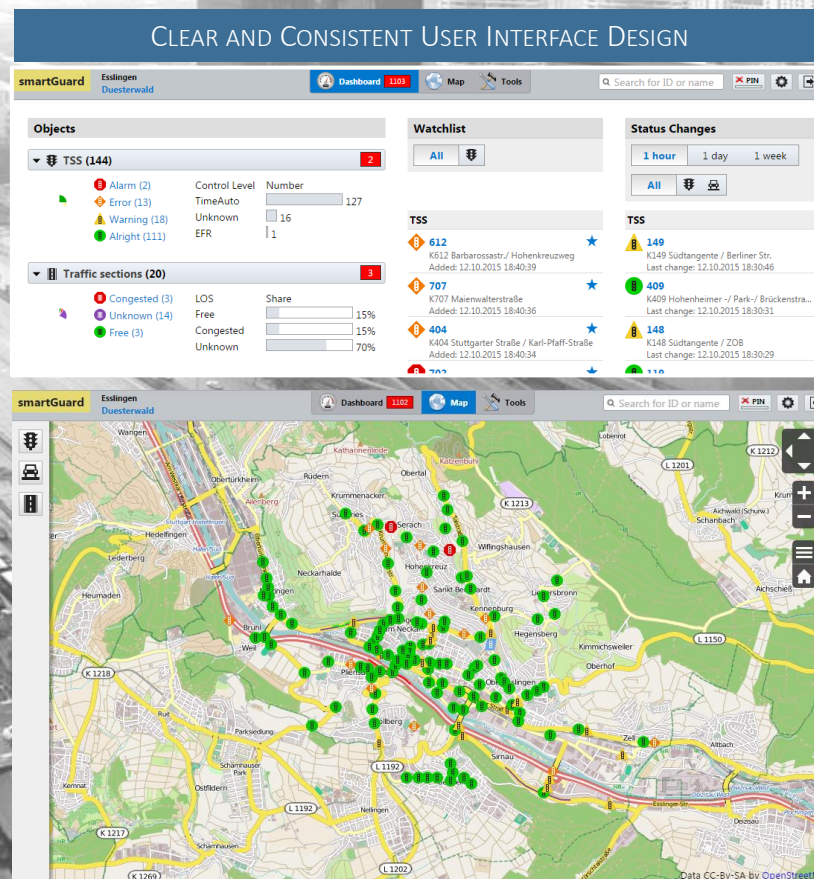
"The graphical user interface is well designed and clearly structured. The stylish graphical symbols allow easy access to the detail data of an intersection. An excellent product!"

Proof of Concept

By now, more than 5000 traffic lights are connected with Sitraffic smartGuard – across 13 countries in Europe. Worldwide: USA, Columbia, India, Turkey

Award Winning Technology

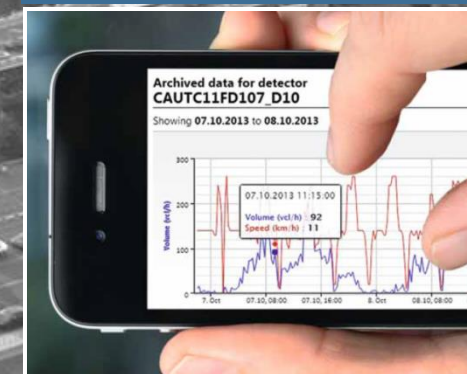
At the Mobility Innovation Award 2014 Sitraffic smartGuard prevailed in a competitive field of future-oriented mobility solutions.



USED IN 17 COUNTRIES



SGUARD ON SMARTPHONE



5. Smart Parking

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What is Intelligent Parking?

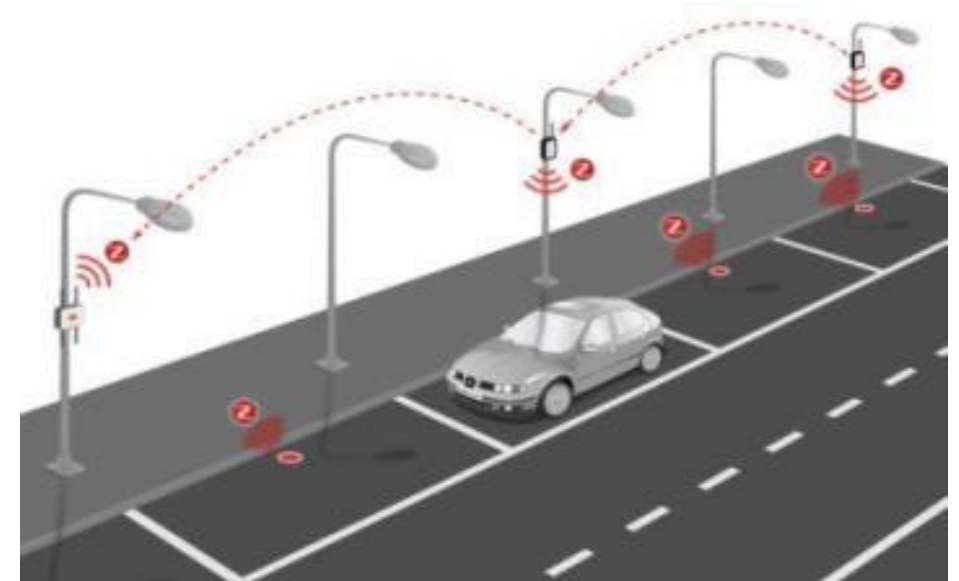
Intelligent Parking uses sensor technology to improve parking management

Purposes

- Identify real-time occupancy to guide drivers to nearest spot
- Guide enforcement officers to potential offences
- Provide occupancy data for planning

Benefits

- Reduces congestion, cuts pollution and emissions
- Makes better usage of existing bays
- Cost savings with enhanced enforcement
- Enhances driver experience



Parking bay sensors



Mobile
guidance
apps



Enforcement and monitoring

Sensor options

Wireless radar for outdoor parking bays

SIEMENS



The sensor is wireless and is fitted in-ground using a resin. It uses radar technology to detect parked vehicles.

Entire installation process takes approx. 20 minutes



6. Stream

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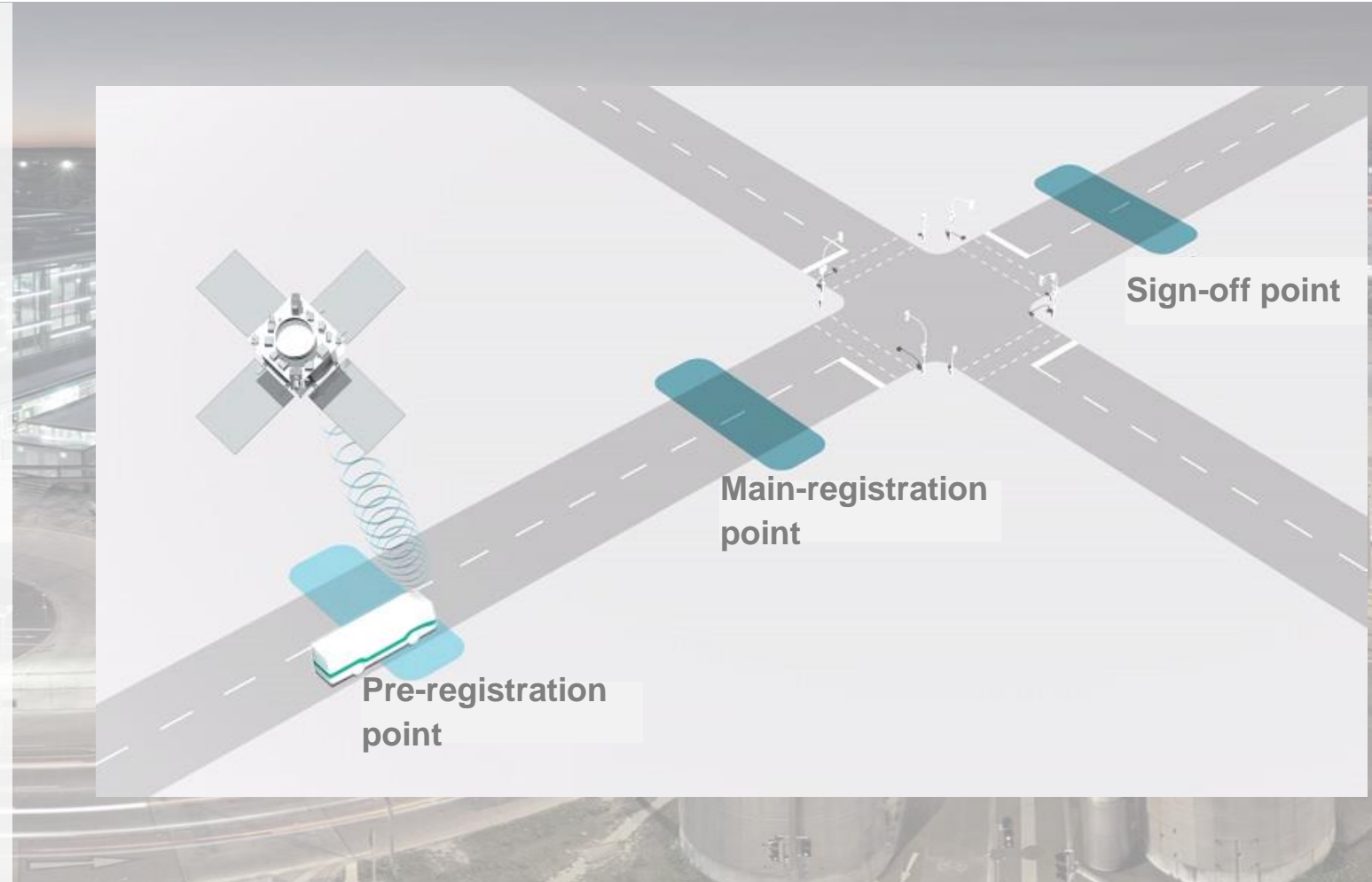
**Prioritization of Public
Transport and Emergency
Vehicles via Traffic Lights
using Virtualized Trigger
Points**





Easy solution without any local hardware installations needed

- Configuration of trigger points via Google Earth Pro
- Easy reconfiguration of trigger points from the control center possible
- Highly developed method for recognizing matching at trigger points
- Optimized M2M communication to/from central with reduced and stable latency and high availability of real-time streaming
- Minimal expense of implementing of OBU's





Architecture

New Satellite-Based Solution for Prioritizing Public Transport

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With Sitraffic Stream* Siemens applies an innovative approach for vehicle prioritization

* Simple tracking real-time application for managing traffic lights and passenger information

GPS-Position

Localization of the vehicles via GPS (Recognition Device-ID).

OBU

Recognition of reached trigger points and transmitting request telegrams to the controller via the Stream server

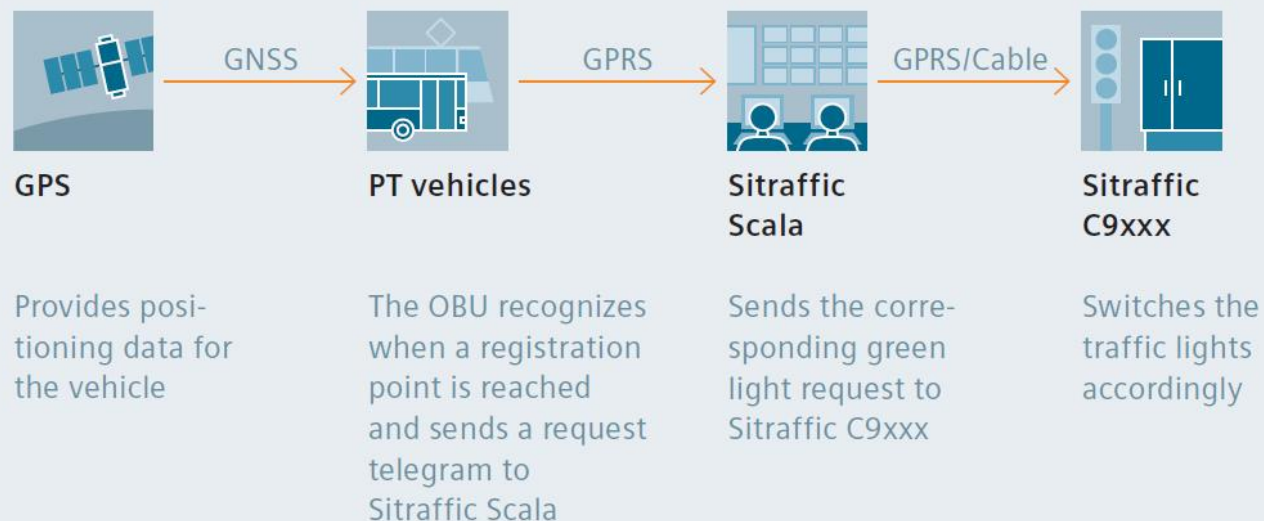
Stream / Scala / Intelligent Gateway

Transmitting of request telegrams to the Sitraffic controller.

Traffic Light

Appropriate switching of traffic lights for public transport vehicles (buses)

PRIORITIZATION OF VEHICLES USING VIRTUALIZED TRIGGER POINTS



7. Sitraffic SiBike - Prioritization by Smartphone App

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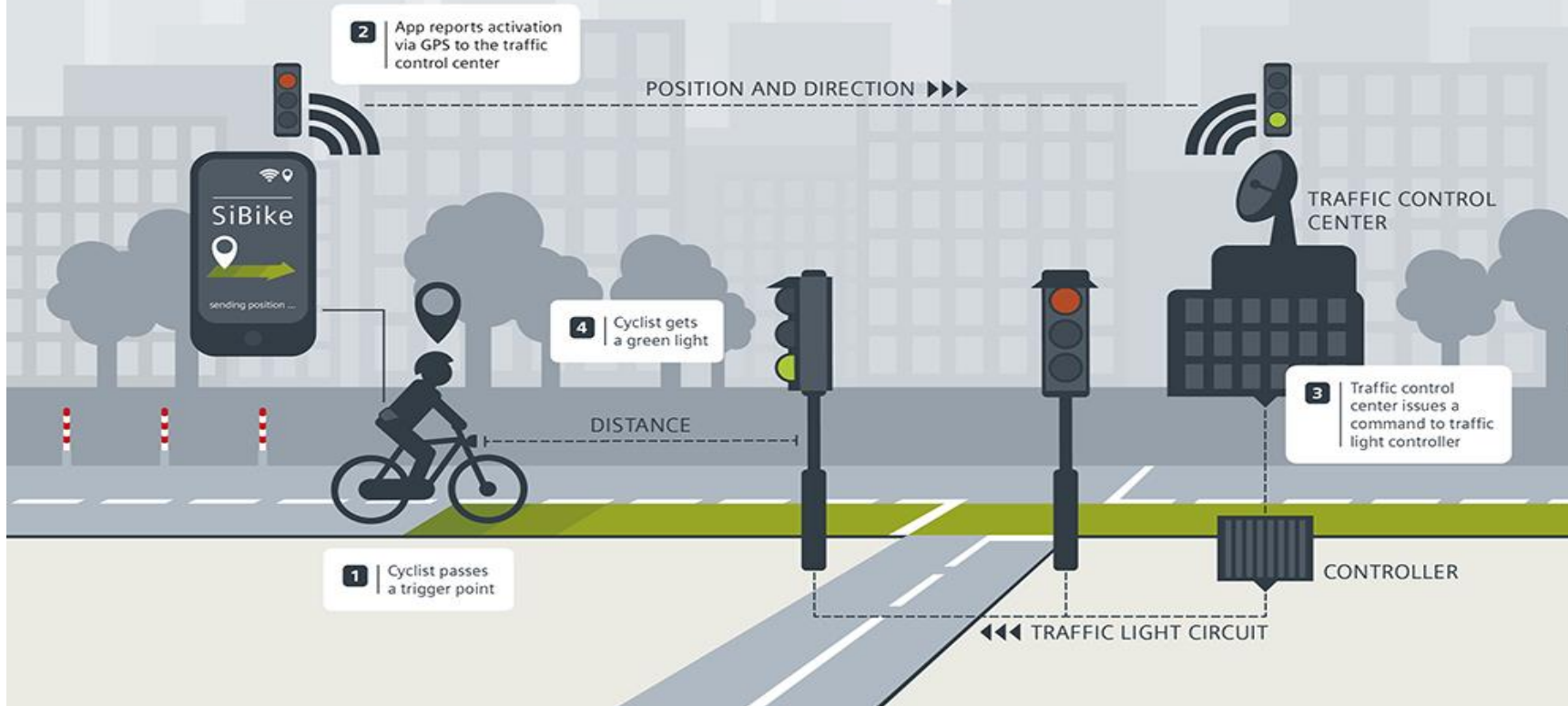


Technical Description

Sitraffic SiBike – green wave for cyclists

SIEMENS

Green wave for cyclists



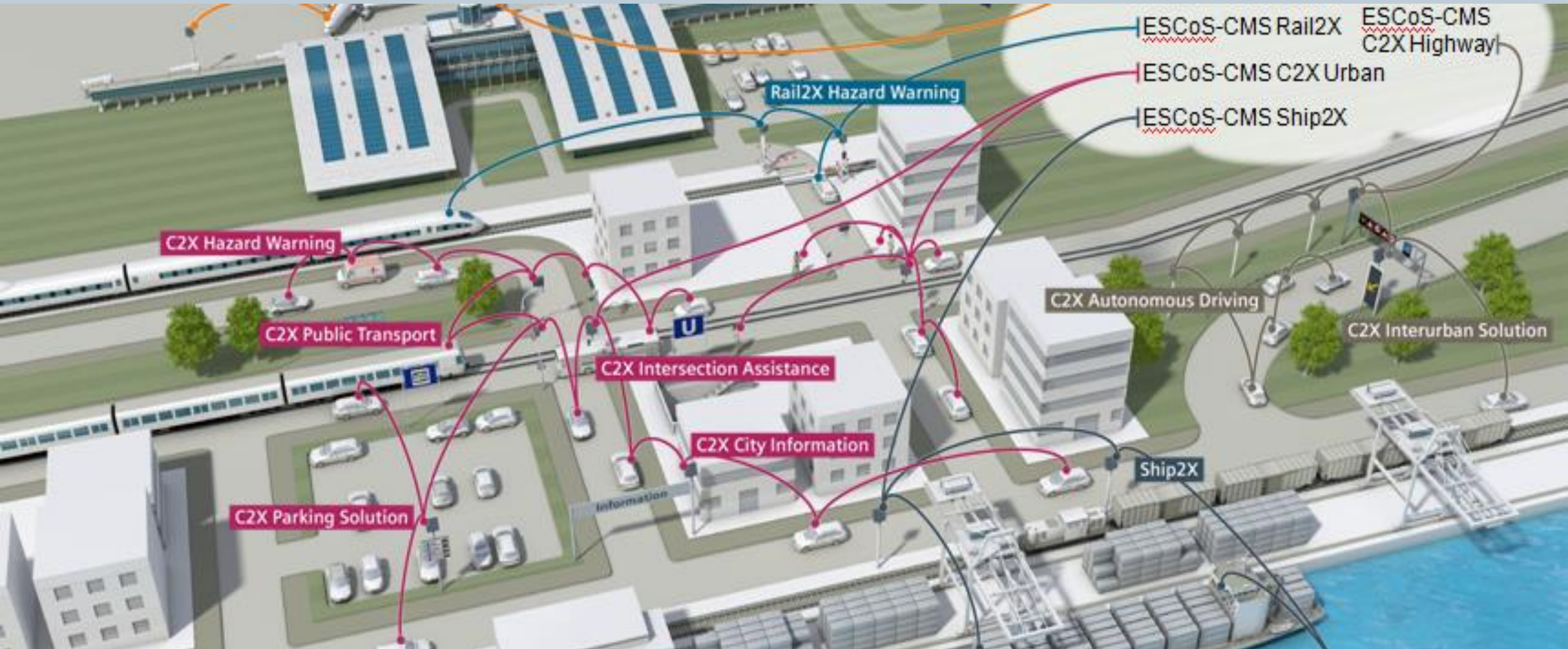


Technical Description Sitraffic SiBike – green wave for cyclists

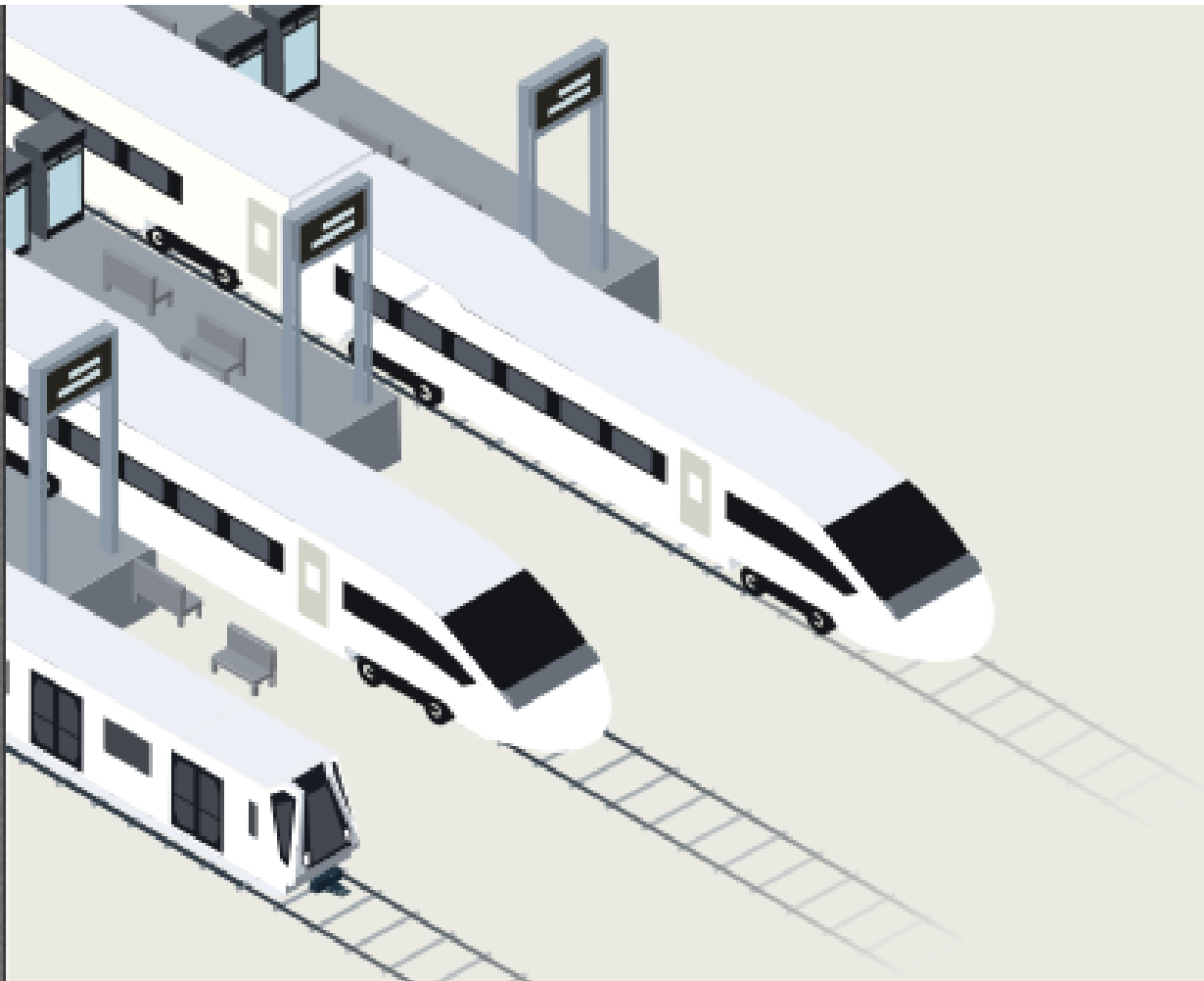
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8. Vehicle to Infrastructure Communication



8. Vehicle to Infrastructure Communication



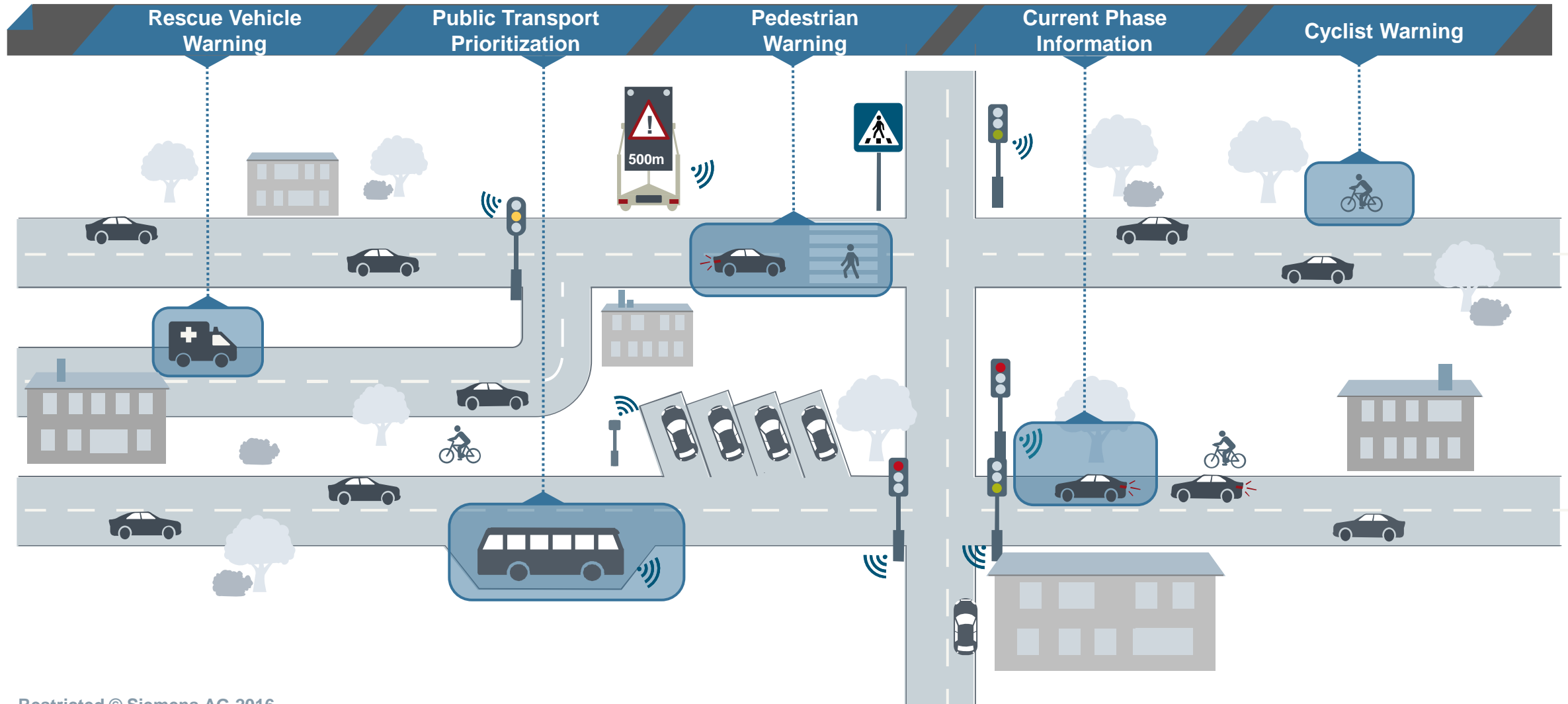
Vehicle-to-X refers to an intelligent transport system where all vehicles and infrastructure systems are interconnected with each other. This connectivity will provide more precise knowledge of the traffic situation across the entire road network which in turn will help:

- Optimize traffic flows
- Cut accident numbers
- Reduce congestion
- Minimize emissions

Sittraffic ESCoS – CMS

Where are Car2X use cases in urban areas?

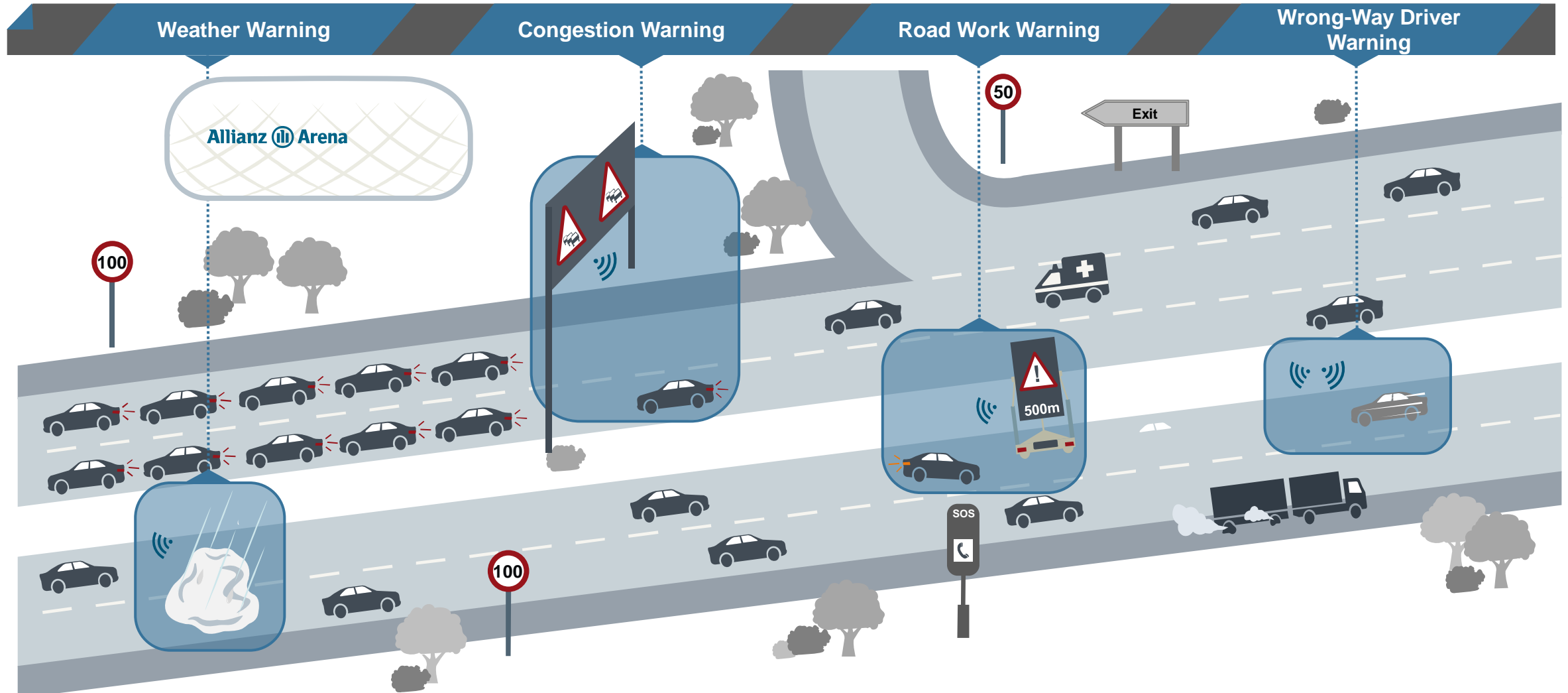
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Sitraffic ESCoS – CMS

Where are Car2X use cases in interurban areas?

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Sittraffic ESCoS C2x Long-term-vision-user's perspective

IVI

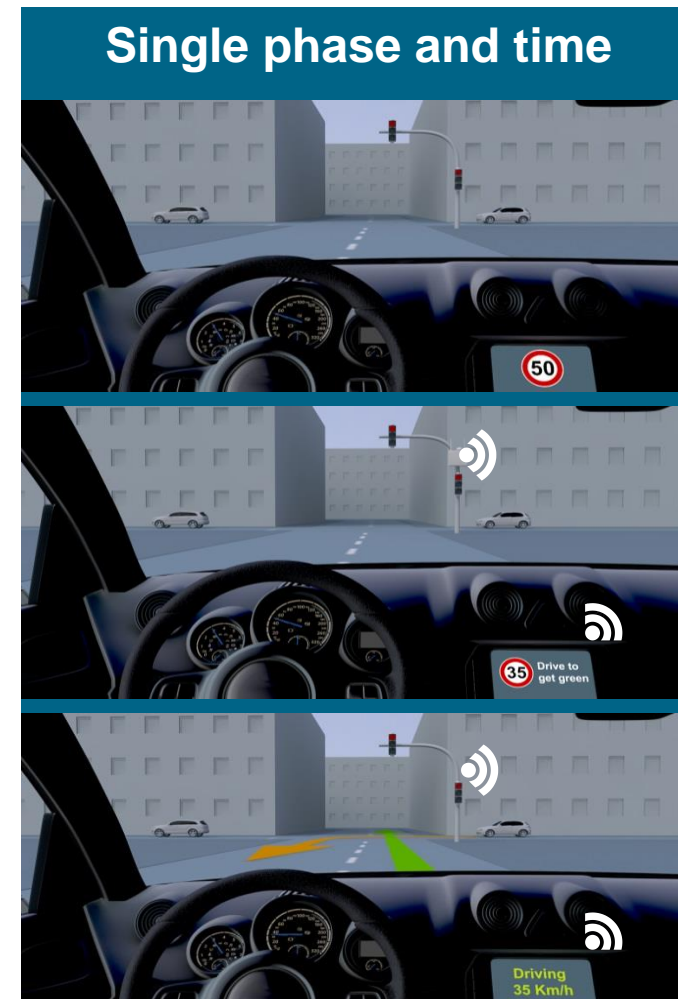
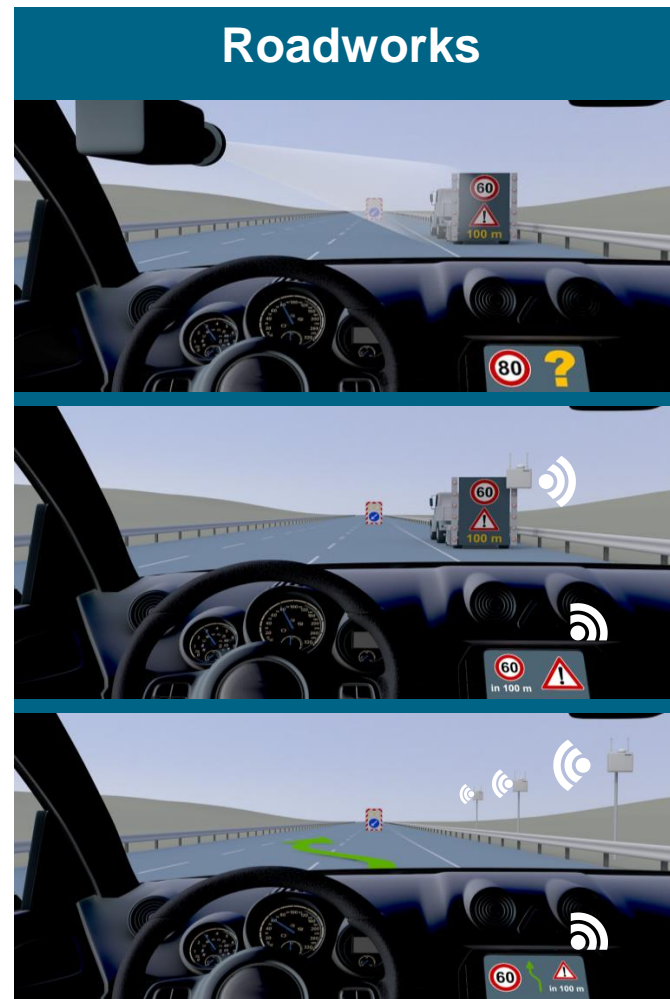
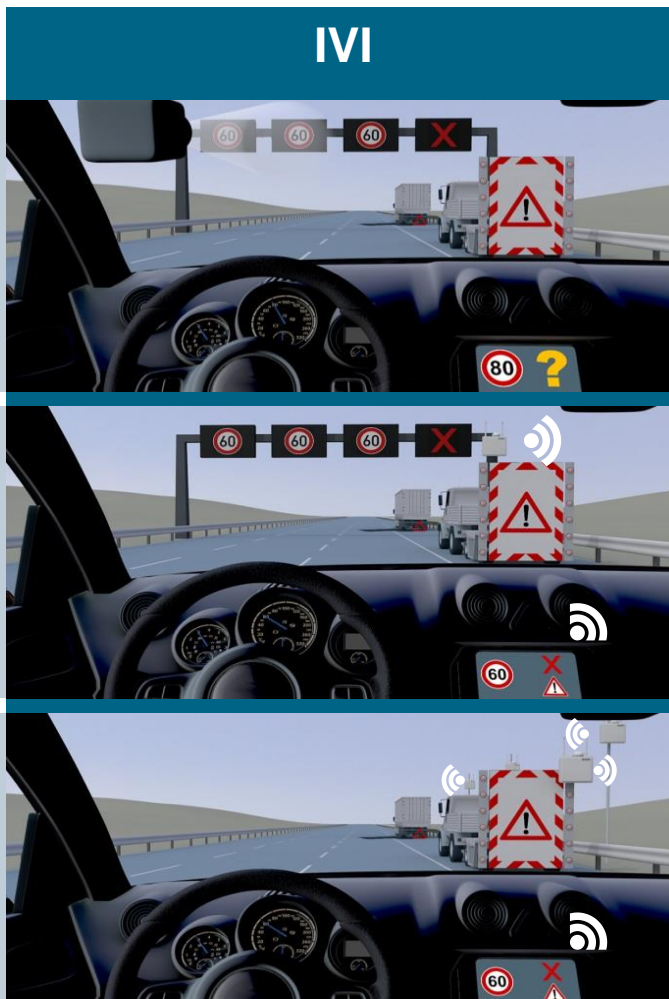
Roadworks

Single phase and time

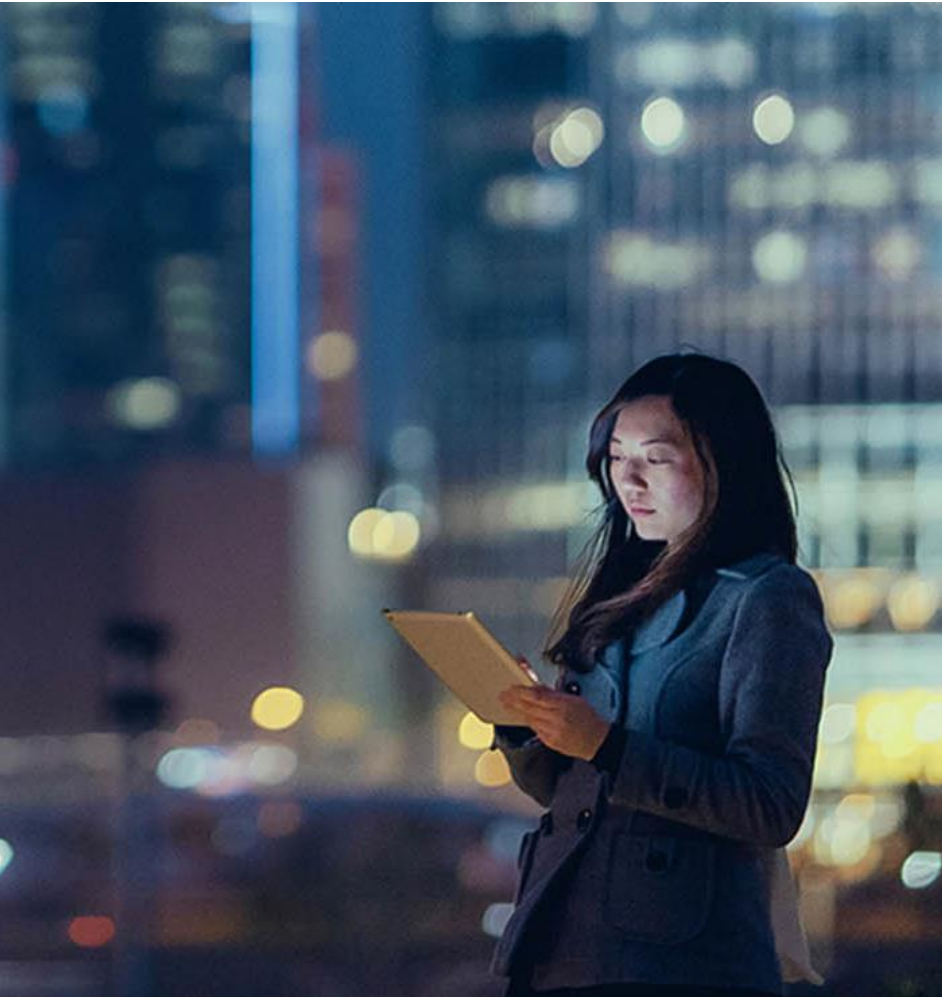
Today 2016
Assistance Driving

Tomorrow 2017
Automated Driving

Future
Autonomous Driving



Contact



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