Sitraffic
Traffic Center Systems
The flexible platform for integrated solutions
siemens.com/mobility
Perfect overview: Siemens’ platform for traffic control centers combines strategic traffic management with operational control in a single user interface.
Work with the expertise of the worldwide market leader:  
Your partner for tailor-made solutions in traffic engineering

All over the world, authorities are faced with major challenges: The rising world population means growing cities and even more traffic with even greater environmental impact. Innovative, networked solutions are essential if we want to meet the growing demand for mobility without neglecting environmental pressures. As worldwide market leader, Siemens has almost 100 years of experience in the development and implementation of integrated traffic systems – with more than 1,000 installed traffic control centers across the world.

Digitalization of transport  
Siemens’ Sitraffic® traffic center platform combines strategic traffic management with operational control, forming the basis for the digitalization of traffic. This helps meet the users’ expectations for intuitive operation and mobility, both today and in the future.

From simple entry-level devices to complex systems  
Our Sitraffic control center platform is based on a very simple idea. The function modules run on a common basis and can be expanded or combined with additional modules at any time. So the system can grow as the requirements of the city or municipality increase. From small installations for monitoring individual field devices to advanced traffic management systems, Sitraffic can keep pace with traffic developments, securing the investment of each phase for the long term.

Efficient, user-friendly, secure  
The traffic center systems are intuitive and easy to use. They provide the operator with all important information at a glance. The shared data pool saves time and prevents errors. A major advantage of the unified platform is the consistent user interface, which can be flexibly adapted to suit specific workflows in the traffic control center. Thanks to its open and widely used interfaces, Sitraffic control center systems can be flexibly integrated into the existing and future system landscape. This protects your investment and provides flexibility for future expansion.

As a supplier of traffic technology, Siemens ITS is certified to the international information security management standard ISO/IEC 27001. All Sitraffic products, systems and services are developed, integrated and operated in this certified environment. As a result, potential IT threats are systematically identified, analyzed and monitored and the right IT security technologies and processes are implemented to effectively and efficiently minimize the risks. One of our key objectives is the continuous improvement of IT security.

Sitraffic traffic center systems – with features that set new standards

- **Ease of use.** Intuitive, easy operation thanks to an application-oriented and individually configurable user interface.
- **Interoperability.** Thanks to its open interfaces, the Siemens traffic center platform can be combined with existing systems.
- **Connectivity.** The native integration of Connected Vehicles enables direct communication between vehicles and the control center.
- **Scalability.** A scalable system that can be extended and expanded by additional modules as required.
- **High performance.** The consistently service-oriented system architecture enables both high performance and, above all, flexible scalability in the systems.
- **Security.** Siemens ITS is certified to the international information security management standard ISO/IEC 27001 as a supplier of traffic technology.
In every city there is a plethora of traffic-relevant systems that work largely independently of each other. Each of these systems gathers valuable data, contributing to a holistic understanding of the traffic situation like individual stones in a mosaic. The prerequisite for efficient traffic measures is the active use of all available information – from individual counting loops to planning data on major sporting and cultural events as well as roadworks. Here the central open interface of the Sitraffic traffic control centers functions as a central data hub so that no valuable information is overlooked or disregarded.

Less congestion, better traffic flow
Sitraffic traffic management centers offer powerful tools to regulate the interaction between the control center and the connected traffic systems and to synchronize the different measures, of course also across

The Sitraffic traffic center platform: Modular, scalable, for all tasks.

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The Sitraffic traffic control centers are growing in line with their tasks. In addition to the extensive basic functions ("Basis"), they offer flexibly combinable function modules from the operational level ("Sitraffic Scala") to a strategic traffic management system ("Sitraffic Concert").

Mobility of the future: Improved traffic management, greater security and lower environmental impact
multiple modes of transport. Using the Strategy Management module, packages of actions can be designed in order to quickly and efficiently counteract critical situations and impending traffic overloads. Planned or foreseeable situations such as major events, roadworks or critical weather conditions can be well prepared for in advance, using targeted traffic guidance measures to limit the expected negative impact. In addition, unforeseen incidents such as accidents or acute hazards can be responded to quickly, efficiently and in a coordinated manner. This significantly increases the ability to act while at the same time reducing the risk of errors. Every action plan, whether developed in advance or created on an ad-hoc basis to deal with each incident, can include actions from all the integrated systems. This allows not only coordinated traffic guidance measures, but also early information of the road users via all connected channels such as internet-based information services, radio or dynamic message signs.

Networking is the watchword for tomorrow’s transport systems

“Connected Vehicles” or “Car-to-Infrastructure” communication is the Internet of Things for road traffic. This technology ensures that vehicles can communicate with each other and, above all, with the traffic infrastructure. In the future, networked vehicles will warn each other fully automatically of potential hazards such as accidents or icy roads, as well as being informed in real time about traffic signal phases and roadworks. Siemens is a pioneer in the field of traffic control: Sitraffic traffic centers support all the relevant field devices and communication functions.
A scalable platform that meets individual requirements: Shared basis, flexible modules, maximum consistency

The Sitraffic control center platform provides a powerful shared basis for all applications, allowing the coordinated operation of the function modules for traffic management, traffic control, parking guidance, traffic planning and more. The result: made-to-measure system solutions built from a selection of modules – for unique scalability, high flexibility and easy adaptation to changing scenarios. All modules are fully synchronized with each other and use a shared data base, ensuring maximum consistency.

Multiple combination options
Since the function modules can be combined across different task areas, Siemens can implement customized solutions of different levels of complexity, from connecting individual systems and devices through to a fully integrated traffic management system. This is possible not only for the initial installation, but also later as part of an expansion process, without the loss of any investment.

User-oriented interface
For the operator, the ease of use of the Sitraffic traffic centers is an essential feature. The system must provide the user with clear and constantly updated information on the traffic situation and with the right tools for immediate intervention. The application-oriented structure matches the operating processes, which makes operation easy and intuitive despite the wide variety of available functions. And the benefits don’t stop there: The user interface is uniform for all traffic applications.

The traffic management center (VMZ) in Berlin, supplied and installed by Siemens, collects and processes data from 8 traffic management systems, 22 traffic computers, 2,000 traffic signal systems and around 100 video cameras.
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<th>Basis: Basic modules of the scalable control center platform</th>
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<td>Sittraffic Motion/ Scoot</td>
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Sitraffic Concert: Modules for integrated traffic management

Strategy Management

The strategy management module of Sitraffic Concert serves to define the general control strategies according to which the different systems and processes will work. The tool retrieves all measured values, status information and operational messages as well as weather and environmental data available in the system, matches them with user-definable threshold values and assigns specific time constraints – as the basis for effective traffic interventions.

Incident Management

Additional traffic-related information can be entered and edited at a traffic information editing workstation. The tool allows, for instance, the combination of traffic news generated on the basis of detector data with information provided by the police or data on upcoming major events. This aggregated data pool provides the basis for targeted decisions and efficient traffic management measures.

Sitraffic Statistics

The Sitraffic Statistics module offers comprehensive options for the statistical analysis of data from all connected sensor types. Statistical reports include lists and graphs such as peak hour patterns, flow-concentration diagrams and daily or yearly time graphs of traffic load fluctuations.

Travel Times & Data Fusion

New technologies and processes enable direct recording of route-related data, in particular travel times. Such data are a much more precise indicator of congestion and traffic disruptions than data from local detectors. Data from a range of sources are collected and aggregated to create a more complete, accurate and up-to-date database – for optimized traffic control, traffic guidance and traffic information.

IQ Traffic

There are a large number of sources providing all kinds of traffic-related data, but up to now these data could not be used in a holistic way. The IQ Traffic module now makes it possible to combine real-time and historical data together with environmental data on a single platform, enabling integrated data analysis and the derivation of recommendations for traffic planning. A wide range of quality and impact analyses allow the evaluation and comparison of the traffic management decisions that have been taken.

Freeway Management

The Freeway Management module allows the integration of graphical representations of road section and network control systems as well as tunnel control equipment. Coordinated management leads to a more even flow of traffic at harmonized speeds and significantly reduces the risk of accidents.
This module is used to record occupancy data, opening times and the status of different parking facilities to provide a basis for efficient parking guidance adapted to the current situation. The processed parking data are displayed together with other traffic data on freely programmable information boards. Thus parking guidance forms an integral part of the overall traffic management system. Such a dynamic parking information system helps improve occupancy rates and profitability of the car parks, reduces traffic loads and environmental pollution and increases the attractiveness and quality of life in the city.

The individual routes can be activated depending on data managed by other parts of the system, for instance roadworks or event schedules, ensuring that the recommendation will guide the driver via the best route to the next available parking space.

Sitraffic Office integrates all necessary processes for signal program planning and supply to traffic light systems. The system provides planners, software engineers, operators and service technicians with all required tools and access to the shared data base. Data consistency is one of the features that make Sitraffic Office unique. This eliminates the need to enter data more than once and substantially reduces the risk of errors.

With Sitraffic smartGuard, you can access data and functions not only via the classical user interfaces at the control center, but also via mobile devices. This makes the tool an ideal addition to our Sitraffic Scala/Concert traffic management center. Quick and easy access to your traffic system – anytime and anywhere! This allows you, for instance, to monitor traffic during major events right from the comfort of your home.

The SAM (Service & Alarm Management) offers automatic 24-hour operation for unmanned control centers, incident tracking and fault statistics, as well as calendar-controlled fault alert forwarding via SMS, e-mail, fax, printer, signal panel (standby duty roster). Separate inputs (relay cards) allow the detection of malfunctions in customer-specific systems such as lifting equipment, lighting switching points, UPSs, air-conditioning systems and more.
### Sittraffic ESCoS CMS

The CMS (Central Management System) is a comprehensive system solution with a local service via ‘Decentralized Environmental Awareness Messages’ (DENM). Traffic users can be advised in advance of current traffic conditions and critical situations such as icy roads, accidents and traffic jams. Vehicles, for their part, adopt the function of mobile sensors for traffic guidance systems, providing up-to-the-second information about the current traffic situation.

### Sittraffic Stream

The innovative prioritization system ensures that fire engines or rescue vehicles, for instance, are automatically given the green light at every intersection. As the module leverages the advantages of modern satellite navigation, there is no need to install expensive roadside equipment. Each fire engine carries an on-board unit (OBU) that determines its current position by GPS and transmits the vehicle’s position to the control center when passing one of the virtual registration points. The control center then switches all traffic lights on the rescue route to green as soon as the vehicle approaches.

### SiBike

The app for dynamic green-phase switching for cyclists makes it possible to extend and coordinate green phases as required. The cyclist’s smartphone uses GPS (Global Positioning System) to determine the exact position, speed and direction of travel. When the cyclist passes a virtual registration point, the app sends a green-request message to the traffic control center. Then the control center transmits a switching command to the controller for the upcoming traffic light, ensuring that the timing of the green phase is adapted to the cyclist’s speed.

### Flow Control for Trucks

This intelligent feed control system will help make logistics programs even better in the future. It captures truck data, matches it with regional real-time traffic data, and plays it back to mobile devices and LED signs. Incoming truck drivers thus receive all the important traffic information already as they enter the area, enabling them to reach the next free loading bay or terminal quickly and in a coordinated manner.

### Virtual Traffic Signs

Virtual traffic signs provide traffic information directly and individually to road users on their mobile devices. This works by means of a mobile app, which pushes any relevant traffic information to the user’s smartphone. Such a push message is triggered when the app user passes a so-called 'trigger line' with a certain direction vector. Via an app server, Sittraffic Concert transmits the message to the smartphone – a smart way to provide the app user with customized traffic information.
Traffic light systems run by the civil engineering office, the transport authorities’ operational control centers, the fire brigade’s control center, public roadworks administration systems, event management centers or the dispatch offices of taxi companies all have one thing in common: They can provide valuable data for targeted, effective traffic management. The Sitraffic traffic center platform has been designed to communicate with a wide variety of systems that the individual modules draw upon.

Without open interfaces, smooth data exchange between a heterogeneous array of systems or the link-up of field devices from different manufacturers and different periods would be impossible. The use of interface standards ensures maximum ease of integration. The Sitraffic family of traffic control center systems has full command of all these standards, ensuring effortless interoperability.

OCPI (Open Content Provider Interface)
Via this open interface, the Sitraffic traffic centers can exchange a wide range of data with the connected systems. Siemens ensures full upward and downward compatibility of the OCPI interface (Open Content Provider Interface) across several software generations.

Sitraffic Canto (Communication in advanced new technology in outstations)
Sitraffic Canto is a proprietary standard that Siemens is making available for licensing to other manufacturers in order to meet the customer’s requirements for an open system. Sitraffic Canto provides an especially powerful method for center-to-field communication and can be used to connect existing older controllers to modern traffic centers.

OCIT (Open Communication Interface for Traffic)
OCIT has been defined by a committee made up of the different system providers and is a widely used standard in the area of traffic computer systems and traffic light installations. It exists in two versions: OCIT-O (outstations) for communication with the field units, and OCIT-C (center to center) for communication between centers.

NTCIP (National Transportation Communications for Intelligent Transportation System protocol)
NTCIP is a family of standards that has been created to ensure interchangeability and compatibility between computers and electronic traffic control equipment supplied by different manufacturers.

VDV (Verband Deutscher Verkehrsunternehmen)-Interface
The VDV – the Association of German Transport Companies – defines the contents of the telegrams used for local public transport prioritization. These telegrams contain the log-on and log-off messages of public transport vehicles and are radio-transmitted to the intersection controllers. Local traffic-actuated switching routines can be adapted to suit this information and implement the desired prioritization of mass-transit vehicles.

TLS (Technische Lieferbedingungen für Streckenstationen)
The technical supply conditions for outstations (TLS) describe a communication standard for interurban highways. Via the TLS interface, the system receives traffic information, data on current variable message sign contents together with general and environmental data that can be used as additional inputs for urban traffic control.

Synergies through integration:
Open interfaces and binding standards

High IT Security
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One of our key objectives is the continuous improvement of IT security.

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DATEX II
DATEX II is a European standardization initiative for a variety of traffic data and traffic information applications. The Siemens center supports communication via this standard, in line with individual project requirements. DATEX II is the interface for connecting to the Mobility Data Marketplace (MDM) in Germany. The MDM is a neutral B2B platform with defined standards for data exchange in road traffic.

TMC (Traffic Message Channel)
TMC is a radio standard for the transmission of traffic bulletins to car radios. Via this interface, the traffic management system can transmit the latest traffic information directly to a broadcasting station.

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Siemens’ comprehensive technical expertise is perfectly complemented by a broad, customer-oriented portfolio of tailor-made services for all aspects of traffic engineering. The service offer is just as modular as the ITS systems in order to fit your project perfectly.
Besides technological solutions, Siemens also offers a wide range of services for the traffic sector. For optimum alignment with each customer’s requirements, our service portfolio is just as modularly structured and flexibly scalable as our traffic center systems.

**Application Service Providing (ASP)**
The demand for traffic centers that local authorities can use without extensive investments and without tying up their own resources continues to rise. ASP is the ideal answer to this demand: The service provides the customer with a selected part of the Sitratic Scala traffic computer functionality, but the control center itself is operated by Siemens.

**Operator models**
In many cases it makes economic sense to entrust the actual operation of certain traffic infrastructure elements to a competent partner. Siemens offers suitable concepts in which the company takes over responsibility for the operation and modernization of the devices and systems. This means that the customer can always rely on state-of-the-art technology – at fixed, calculable costs.

**System care contracts**
System availability is increased by proactive servicing approaches in combination with a system care contract. This ensures that all components in the traffic system – software as well as hardware – always use the latest technology.

**Operation & Competence Center**
In the event of technical faults or queries, fast and efficient support is essential. With our Operations & Competence Center (OCC), help is just a call away. As your expert partner, Siemens offers professional support not only during the warranty period, but afterwards as well. The on-call service from Siemens provides you with customized support and advice at any time, anywhere, whether by telephone, e-mail or over the Internet.

**Financial Services**
In times of limited budgets in particular, financing solutions are of increasing importance for Siemens customers. With our Performance Contracting or Energy Contracting models, we offer our customers virtually self-financing ways of realizing the necessary updates of their technical traffic infrastructure. The ‘classic’ financial solutions range from consulting and insurance to equity and debt financing.

**Training Center for Intelligent Traffic Systems**
In view of rapid technical progress it is becoming more and more vital to keep your employees’ expertise up to date. Siemens offers a comprehensive range of practical training courses covering traffic management functions and control equipment.
Two examples of intelligent traffic control by Siemens: Duisport and Potsdam

The flow of goods is increasing worldwide. As a result, transport hubs such as ports, airports, and freight terminals are facing tremendous challenges. The capacities of traffic routes in the hinterland are limited and expansion is only possible to a certain extent, if at all. The solution: more efficient use of the existing infrastructure. Faster handling of trucks offers important levers to achieve this.

Smart flow control for trucks in Duisburg
Since 2016, Duisport, the port of the German city of Duisburg, has been using Integrated Truck Guidance from Siemens. The smart flow control solution makes for substantially more efficient logistics processes and provides complete transparency of the current traffic situation in and around the hub. At the same time, the integration of more and more IT systems improves the flow of traffic, which benefits truck drivers, forwarding companies, logistics service providers and hub operators alike.

Everyone is informed, everything flows
The position of the truck is transmitted to the logistics service provider and terminal operators via a smartphone app. At a glance everyone knows whether the probable time of arrival will correspond to the scheduled time. Depending on the situation, the drivers can continue on their route or, in the event of delays, reschedule and be assigned a new slot. This prevents congestion and reduces waiting times. Integrated Truck Guidance is the ideal basis for optimizing and harmonizing the operation of multimodal transport service providers in the hubs of the future.
Environment-sensitive traffic control in Potsdam

Implementing strategic urban traffic management that takes emissions into account can reduce traffic-related pollution. To achieve this, the concentration data of pollutants in the street network as provided by direct measurements or real-time models is integrated into the system and made available to the strategic management level at the traffic management center. The automatic selection process for the optimum traffic management strategy takes the environmental situation into account. This means that, when the situation threatens to become critical, such as when a limit value is exceeded, appropriate actions can be taken at an early stage.

Smother traffic flow

Since 2013, Potsdam has been relying on an environment-sensitive, smart traffic control system from Siemens. Whenever the NO\textsubscript{2} load is too high at any location in the city, selected ‘gatekeeper’ traffic signals respond with extended red phases, slowing down vehicle access to critical areas. In combination with other environment-sensitive control measures, this improves overall traffic flow. Since the new system went into operation, particulate emission levels have dropped considerably.

Cleaner air

Special display panels inform the road users when pollutant levels are too high and current traffic control schemes have been adapted accordingly. This innovative control mechanism makes Potsdam one of the pioneers of environment-sensitive traffic control. The new traffic system management center (VSMZ) based on Sitraffic Scala is a key tool for the city in implementing its clean-air plan.

Smother traffic flow means less traffic-generated emissions and particulate matter. With the traffic guided in an environment-conscious manner, both mobility and air quality are kept under control.
Seattle is the largest city in the northwest of the U.S. and one of the key transport hubs of the Pacific Northwest, especially due to its commercial harbor for trade with Asia, Alaska and Hawaii.

Seattle is also a Siemens “Center of Excellence” for intelligent traffic control, demonstrating the many positive effects of this technology. This is why Siemens will continue to provide the latest innovative technologies and support the city’s expansion plans for its smart traffic infrastructure system.

Successful projects say more than a thousand words. Siemens’ leading market position is reflected in the high number of traffic centers implemented over the past years across the world – from Seattle to Abu Dhabi and from Reykjavík to Berlin.

**Seattle: Intelligent traffic management**

Thanks to integrated data administration, Seattle can base its traffic management strategy also on data from its central traffic control system TACTICS and the freeway management system operated by the Washington Department of Transportation (WSDOT). Consolidation with data from Bluetooth detectors for travel time measurement allows the early detection of imminent backlogs and effective intervention via variable message signs. Moreover, Sitraffic Concert provides special planning functions to manage a wide range of events, incidents and situations and to generate travel information for the Seattle Monitoring System.

**Berlin: Europe’s most modern traffic monitoring and information center**

The Berlin Traffic Management Center (or VMZ Berlin, for short) manages traffic on a 1,500-km network of streets, tunnels, highways and freeways. For this purpose, more than 2,000 controllers, 1,100 strategic detectors, 250 cameras and eight traffic management systems are linked up to it.
Two completely different cities, one thing in common:
Both Reykjavik and Abu Dhabi use Sitraffic traffic centers for efficient advanced traffic control and guidance. With full investment security because the modular structure of Sitraffic allows for the flexible expansion of the systems at any time.

The information collected is made available via Internet, e-mail and text messages – to the public and the media as well as administrative bodies.

Reykjavik: Shorter response and travel times
Sitraffic Scala provides for efficient traffic control in Reykjavik. In addition, Sitraffic Stream was installed at six selected intersections in the city center to ensure that emergency vehicles arrive at their destination faster and more safely. Another advantage of Sitraffic: The traffic control system is absolutely future-proof since it can be expanded at any time with additional modules.

Abu Dhabi: Flexible planning on the Persian Gulf
Due to its fast-paced growth since the early 1980s, Abu Dhabi counts among the world's most modern cities. A distinctive topological feature is the collar of artificially created or enlarged islands, such as Al Reem and Al Maryah Island, around the main island. The transport infrastructure for the new business, residential and entertainment centers on these islands had to be created from scratch. Together with Elmec (Electro Mechanical) as partner, Siemens has implemented Sitraffic Scala, a traffic center that can be expanded at any time in step with the islands' further development.
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