Intelligent solutions for motorways, tunnels and waterways
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- Ramp metering
- Outstations
- Detection of traffic and weather conditions as well as environmental data
- Automatic incident detection
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- Parking space management for motorway service areas
- Video surveillance

Tunnel solutions and technologies
- Modular tunnel control center
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- Detection of NO₂, CO and low visibility
- Lighting
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- Fire alarm and fire fighting systems
- Power supply
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- Safety technology
- Video surveillance
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- Thermal image cameras and hazardous cargo detection
- Incident management

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- Automation solutions for sluices and bridges
- Control centers
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- Electro-acoustic systems
- Controllers
Services

- Financing concepts
- Traffic planning
- Design and installation
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- Preventive and corrective maintenance
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- Remote data access via CRSP (Customer Remote Service Platform)
- Turn-key complete systems

The Magic Triangle:
three key elements of intelligent traffic management

Ensuring that people and goods reach their destination safely and within a reasonable delay while limiting the burden on the environment – this is one of the huge challenges of our time. And a task of growing importance because already today the industrialized countries have to shoulder US $ 810 billion in annual costs generated by the traffic overload on the roads. Siemens Mobility provides the technical solutions designed to master this challenge and ensure an improved balance of mobility, safety and environmental protection.
Traffic volumes keep rising. But the number of roads and lanes is limited. Moreover, there are less and less spatial as well as the financial resources available for the rapid extension of our motorway networks. That’s the situation that we are confronted with every day.

However, things can be changed! Because there are ways to ensure smooth traffic in the existing transport network and minimize congestion, incidents and accidents, fuel consumption and emission levels! On numerous transport routes totaling thousands of miles all around the world we have proven that such improvements are possible – using intelligent traffic technology for meeting the demands for mobility, safety and eco-friendly travel to an equal degree. On above-ground and under-ground roads as well as on waterways.

Complete Mobility from Siemens is the basis for integrated transport and logistics solutions ensuring safe, cost-effective and environmentally compatible transport of people and goods. Siemens has all capabilities needed to get it done.
Traffic technology brings results! On the A9 motorway from Munich to Nuremberg, for example, intelligent traffic information and control systems from Siemens have helped reduce accident numbers by 35 percent, with the number of injured passengers lowered by 31 percent, and the number of accidents involving grave personal injuries by 30 percent; on the motorways in Tyrol, the number of accidents has even fallen by 40 percent and congestion volumes by 20 percent. Impressive results made possible by leading technology.

At whatever place around the world we implemented this technology, congestion and accidents have been reduced and road capacity has improved. Not to forget the positive environmental effects because less congestion means less fuel consumption and consequently less air pollution. In comparison to stop-and-go traffic, smooth traffic flow lowers fuel consumption by up to 20 percent, nitrogen oxide emissions by up to 50 percent and carbon monoxide production by up to 33 percent.
Seamless system technology – from the individual outstation right up to the traffic management center

Detectors for comprehensive data provision

Every traffic management concept starts with the collection of the fundamental data such as traffic density and speed, air quality and weather data, and many more. For all these tasks, our portfolio includes the right sensors and detectors, even those that detect stranded vehicles.

Roadside stations generate control impulses

Our Sitraffic® outstations translate the data provided by the sensors and detectors into control impulses for the variable message signs. This process relies on a proven and widely applied technology that complies with the applicable standards (e.g. TLS) in every respect and even sets the norm in a range of countries. Yet, the safety check routines of our outstations go far beyond the requirements of the industry standards. For instance, lamps and LED chains are monitored not only in ON, but also in OFF state. This ensures the permanent serviceability even of those components that are rarely activated, but are all the more important for the safety of the road users.

An extra lane expands road capacity

Today, our technology makes it easy to temporarily add an extra lane, simply by opening the hard shoulder for traffic whenever the traffic load on the main lanes is too high. This measure provides an effective – and cost-efficient! – way of coping with the typical morning and afternoon congestion on the freeways to and from the city.

This solution is one of our major success stories, be it in the form of “rush-hour lanes” in the Netherlands or “temporary opening of hard shoulders” on the A9, A8, A99 and A73 motorways in Bavaria. In this context, efficient information exchange between the detectors, the traffic center and the variable message signs is of central importance.

Ramp metering increases average speed

One possible measure for increasing the capacity of and the general speed level on the main motorway route is the implementation of a situation-actuated ramp metering system. As our solution in the Limmat valley in Switzerland shows, ramp metering can improve travel conditions on the main lanes by up to 25 percent and road capacity by over 2 percent. This success is due to the fact that the system takes into account the overall traffic situation in the motorway network as well as at several successive ramps. Our fully integrated motorway control system is equipped for this task.
Sitraffic centers create synergies

The key component of our motorway traffic control solutions is our Sitraffic Conduct+ motorway traffic management center. And for any tunnels along the route, the system can be ideally expanded by our Sitraffic ITCC tunnel control center. Both centers are part of our Sitraffic family of traffic technologies, enabling us to offer seamless system technology for all traffic management needs, from outstations right up to traffic control centers, and for all route sections – in the tunnel and outside, on urban freeways and on interurban motorways. Our standardized interfaces allow for easy integration of third-party systems and incorporation of all components into a powerful complete system.

Innovative concepts prepare the future

Siemens is one of the top technology leaders on the global traffic engineering market. Also in the area of motorway solutions we are always on the leading edge of development. Our new Sitraffic Dynafee module, for instance, is an innovative solution for fee calculation on special lanes. Using a dynamic algorithm, it’s the first system to calculate the fee in dependence of the current traffic quality, keeping the special lane’s capacity – and thus user acceptance – at an optimum level.

Another project recently realized by Siemens is one of the world’s first truck parking guidance systems, which informs all truck drivers still on the road of the number of free parking spots on the next service area.

### Key products and systems that Siemens deploys on motorways:
- **Centers:**
  - Sitraffic Conduct+ motorway management centers
- **Outstations:**
  - Roadside stations of the Sitraffic SST4 range,
  - Autonomous Sitraffic Stella solution
- **Variable message signs illuminated with modern LED technology**
- **Detection:**
  - Infrared video detectors with residual light amplification, high-resolution cameras for traffic data acquisition, Traffic Eye Universal, lane detectors, weather sensors for fog, rain, low visibility, black ice and wind speeds, emergency phone surveillance systems
- **Enforcement:**
  - Sitraffic Sihawk traffic surveillance system
- **Automatic number plate recognition:**
  - Sicore camera systems
- **Interfaces:**
  - Standardized interfaces (XML) to third-party systems such as CCTV, emergency phones
- **Emergency call systems:**
  - Roadside stations with off-grid power supply, emergency call intervention centers

### Flexible solutions, flexible performance scope:
- **Supply of individual subsystems**
- **Supply of autonomous solutions** (Sitraffic Stella)
- **Complete turn-key systems**
- **Supply of a well-defined basic system to be later expanded by additional functions (modules)**
- **Independent traffic management center**
- **Integrated center, including AID, CCTV, for instance**
Tunnels are special route sections not only for the drivers, but also for those responsible for planning and building these subterranean roads. No other area of traffic technology is governed by such a high number of safety categories, guidelines and standards – because nowhere else accidents have such potentially catastrophic extents and effects. For this reason, safety is a core aspect of tunnel equipment and with our innovative products and concepts we keep improving tunnel safety.

For more than 30 years now Siemens has been equipping tunnels on urban and interurban roads, for example with traffic control and regulation systems as well as all kinds of operations infrastructure, from power supply to emergency phones. The technology used is part of the same system family deployed for safe traffic control outside the tunnel: Sitraffic by Siemens.
Sitraffic ITCC: one center for managing the entire technical infrastructure

Sitraffic ITCC is a new-generation tunnel control center integrating the management of all traffic and operations equipment of one (or several) tunnels. The center design is clearly more standardized than previous tunnel centers, but its modular concept still provides the planner with every freedom to respond to customer-specific requirements. The center is built around proven industrial middleware (PVSS or WinCC) and uses Windows or Linux as operating system, irrespective of the hardware platform. As not only the center design, but also the configuration process has been standardized, the new concept allows the development of a solution in less time and at lower cost than hitherto possible.

One center for 29 tunnels

One of the world’s most progressive road construction projects has been realized in Turkey: the Blacksea Highway with a total length of 350 km. A single control center coordinates all control and monitoring processes for the 29 tunnels along the route. The center covers not only all traffic control functions, but also the entire operations infrastructure such as lighting, ventilation, power supply and distribution, fire alarm and fire fighting systems. If necessary, the seven connected sub-centers can control their sections completely autonomously. Of the 29 tunnels, over 20 are of considerable length and therefore equipped with a special video surveillance system that detects any obstacles, stopped vehicles, wrong-way drivers, pedestrians, tailbacks or other sources of danger.

Maximum safety guaranteed

Siemens offers the right systems for all aspects of tunnel safety, from state-of-the-art emergency call systems right up to video systems equipped with innovative automatic image processing. All user interfaces and intervention screens are clearly structured and easy to use. The prioritizing of alarms and messages ensures that important content will never be overlooked and the control center operators are able to intervene promptly and in a targeted manner.

One emergency call network covering the entire country

For the Austrian highway operator company we designed digital emergency call system. Using “Voice over Internet Protocol” (VoIP), all safety installations in the entire country are incorporated in a standardized network for digital speech and signal transmission. A specially designed interface allows emergency call installations of different brands to be linked up with the emergency call centers and with each other.

Old tunnel upgraded with new technology

With its length of 1.8 km, the Aberdeen Tunnel is the most important north-south link on Hong Kong island. We completely refurbished the 20 year old tunnel with new technology and state-of-the-art LED and prismatic traffic signs. Now video cameras are used to monitor its entire length and detect incidents. And the modernized traffic management center helps the operators keep everything under control.

From a single source and fully integrated: the tunnel’s entire traffic control and operational systems
Performance scope at your option

The tunnels equipped with Siemens technology all over the world have a combined length of more than 500 kilometers. For some tunnels we delivered only individual systems, while others were completely equipped by us in a turn-key project. And if the customer wishes, Siemens remains involved even after project completion. On the basis of private-public partnerships we play our part in operating companies, for instance, or act as your service partner providing comprehensive preventive maintenance to ensure that all systems are always fully operational.

Also in respect to the relevant safety categories we match our performances to all applicable regulations and to the customer’s wishes. Our solutions are designed to comply with the EU directive 2004/54/EC and/or any national norms and regulations.

Research for enhanced civil security

In the scope of the Script project of the German Ministry of Education and Research, Siemens is involved in creating the foundations for future traffic infrastructure protection options. We are developing technological solutions for automatic early danger detection and investigating the optimum structures for strategy and crisis management in monitoring centers. To this end, we are focusing on innovative detection and communication infrastructure for roadside installation, video surveillance and thermal detection as well as RFID communication. Currently we are working on a demonstration system using specifically developed prototype devices for analyzing a vehicle’s danger potential even before it enters the tunnel.
In some countries, waterways play an important role in goods transportation, for example in the Netherlands. The Dutch waterways network has a total length of more than 5,000 km and provides about 15,000 jobs. In 2005, for example, it served to carry 330 million tons of goods.

For some years now, the Dutch authorities have undertaken great efforts to modernize this important part of the country’s transport infrastructure and ensure well-organized and more cost-efficient transport over water. Key objectives are the central operation of all sluices and an efficient water transport management. For this purpose, Siemens Mobility provides innovative automation solutions for the sluice complexes and takes over overall project responsibility if desired.
Several sluices, one central control station

The times when each canal lock was manned by a lonely lock keeper living in a little house next to the water are long gone. To ensure reliable 24/7 operation and reduce running costs, today several sluices are integrated on the technical level and controlled and monitored from a central location. For directly monitoring the situation at the connected sluices, the control station personnel rely on large video walls displaying the video material from the local camera systems. Uniform technology and user interfaces facilitate the operators’ work and help optimize staffing requirements.

Pilot project in Zeeland: uniform technology for a province sets the standard for the entire country

The Dutch Ministry of Transport, Public Works and Water Management (Rijkswaterstaat) entrusted us with the MOBZ project for the modernization of waterways infrastructure operation in Zeeland. The project goal was to create a central control and monitoring facility for all sluices and bridges in the province – a must if a modern waterway management with 24/7 operation and open corridors (“green waves”) is to be realized.

The automation, operation and interface solutions etc. developed for this project now form the national standard for the entire Netherlands. Siemens was responsible for the complete automation, all electrical systems and the engineering.

Easy clustering

Whenever several ships can pass a sluice as a group (cluster), everybody benefits because clustering reduces waiting times and overall trip duration for the ships and the locks don’t have to be moved as often. A central control system makes it relatively easy to organize sluice operation so as to optimize clustering. When, as is now the case in Zeeland, the operators of all sluices are working out of a single control station, it’s easy for them to coordinate their decisions and realize a rational “traffic management on the water.” For the time being, true “tracking and tracing” of shipping vessels remains a vision, but Siemens is working on it – and sluice automation is an important step towards this goal.
In the Dutch province of Zeeland, goods transport on the water of existential importance. Of the province’s 2,900 km² of surface area, almost half (1,159 km²) are covered by bodies of water. Centrally controlled sluices and bridges are essential for cost-effective transport over water. In the course of four project phases, all sluices and bridges under the supervision of the Rijkswaterstaat Zeeland Division of the Dutch Ministry of Transport are being modernized. In the scope of the second phase, Siemens Mobility has already modernized four sluices. For phases 3 and 4, covering eight sluices and four bridges, the call for tenders has started.
Even after the ribbon has been cut, the start button has been pressed and the infrastructure covered by the project has been opened for traffic, we don’t simply turn our backs. Because now somebody has to make sure that the installed systems keep meeting the customer’s expectations for the long run. Also for this phase, we are the reliable partner of choice, getting involved into operations and maintenance to the extent stipulated by the contract: continuously, at regular intervals or only in case of an emergency.

As one of the world’s most successful suppliers of traffic solutions and infrastructure projects, we know exactly what each project phase requires. This knowledge and our extensive service portfolio offer the customer an added value that cannot be expressed in figures, but will prove inestimable for everyone involved in the project.

Services

Added value for a long service life
Comprehensive support for safe and cost-effective operation

Optimum coordination of services, spare parts logistics and personnel training boosts system availability and operational safety. With the support of Siemens Mobility, this coordination is easy to achieve because Siemens knows how to integrate these three pillars of system reliability and safety.

**Regular system checks – the bedrock of system safety and reliability**

Only gaplessly serviced systems are safe systems. Regular, standardized system checks enable our technicians to detect any failure tendencies early on and intervene before an actual problem occurs. We offer the right, customizable service packages for any requirements.

**Immediate action in an emergency: our Support Center**

In addition to our local Service Centers, we operate a Support Center in Munich that is able to respond extremely fast to any emergency. Around the clock, highly qualified transport system experts are there to provide support. They know all the problems “in the field” from personal experience and regularly alternate between support center and field service. Whatever the when, where and how of a problem – our local service technicians and support center experts provide immediate and highly professional support.

**Let your fingers do the walking: Siemens Remote Service Platform**

In view of restoring system availability as soon as possible after a failure has occurred, we have made sure that in many cases it is sufficient as a first step to send data traveling and let the technician’s fingers do the walking – across the keyboard. The tool: our Siemens Remote Service Platform. Via a highly secure long-distance data link, our service experts can directly access the customer’s systems and provide optimum support to our local service technicians. For maximized system availability, diagnoses and often also troubleshooting tasks are carried out directly per remote access. Full-scale authorization/authentication procedures eliminate the risk of unauthorized access. We also offer our customers the option of accessing their own systems via the Customer Web Portal.

**Speedy spare parts logistics**

Urgent delivery of a spare part for a defective tunnel control component in Hong Kong? New LED signal heads needed for an accident-damaged traffic light in Bogotá? For such urgent cases, Siemens Mobility can rely on one of the most innovative spare parts logistics concepts in the world. Our logistics center can dispatch any spare part for delivery within 24 hours to virtually every spot on earth.

**Unique: TÜV-certified training sessions**

Our training sessions bring together seasoned professionals – maintenance and service technicians, traffic engineers and planners – from both sides, the customer and Siemens.

1. Remote service allows our experts to analyze and diagnose problems per secure long-distance data link
2. Speedy spare parts logistics: 24-h delivery to any place in the world
3. Preventive maintenance helps nip errors in the bud
More and more customers appreciate the opportunity for their traffic specialists to exchange knowledge and experiences with peers from other cities and with Siemens’ development and engineering experts. With 40 different courses, our comprehensive range of training sessions covers everything from traffic technology 101 right up to special user trainings on individual systems.

By the way, Siemens is the only company regularly offering customer training sessions in Germany.

From design and engineering right up to service and maintenance

Our experts are well versed in all aspects of traffic engineering and support the customer across the entire lifecycle of any product or solution, from planning, engineering and simulation right up to ongoing system optimization during the operational phase. Customized service and maintenance contracts help ensure that each solution is serviced to exactly to the extent desired by the customer.

Interesting solutions – also for financing and refinancing

On request, we can also provide support in determining the most suitable financing solution. For example a refinancing solution via a toll scheme – an area where we have gathered extensive experiences across the world. And ample success! The back-office solution used for toll collection on the Brenner motorway, for example, has been extended to all toll schemes in Austria.

As general contractor we take a major load off the customer’s shoulders

If the customer wishes, we also assume general contractor responsibility for the traffic engineering part of any project. For the authorities awarding the contract, this means a major reduction in their work load because we take over the entire project management and deliver turn-key systems ready for start-up. The construction of the Espiy-Sarp tunnel in Turkey and the Tyrol traffic management system are just two examples for the many turn-key projects that we have realized as general contractors.
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