

A red Siemens tram is shown on a city street, moving towards the viewer. The tram has a sleek, modern design with large windows and a red upper body. Digital overlays are present: a large yellow question mark on the left, a blue and yellow dotted line with icons (pedestrian, train, tram, person) crossing the tram, and CO2 reduction statistics (28t, 42t, 15t) with downward arrows. The background shows a city street with buildings and trees.

**SIEMENS**

*Ingenuity for life*

# Moving beyond rail services.

Ensure maximum availability  
with a tailored service contract.

# Trust Siemens to extend and enhance the service life of your vehicles.

When reliability and sustainability of your operations are on the line, who would you trust more than the people that built your vehicles? With Siemens you have a partner that not only knows your trainsets best but can also draw upon 100 years of rail service expertise and a global network of experts. We've developed a portfolio of innovative services that can be tailored to your individual needs to deliver maximum availability, reliability, and return on investment.

The economic efficiency and availability of rail service are the keys to your success. Siemens Rail Services helps you attain these objectives as your reliable partner. With our ground-breaking technologies, we help you optimize your operations and utilize your assets more efficiently. An important ingredient is digitalization – ranging from the prospective analysis of complex technical questions to prescriptive maintenance and on through to next-generation business models that enable you to focus on your core business of mobility. Are you ready?

## Rail Services Locations in the U.S.

Customer value through proximity, vertical integration and customized services





# Digitalization

Enabling recognition instead of failure

## Make mobility safer, faster, and more convenient

Digitalization is enabling huge developments in the way maintenance is performed. Now it's possible to use real-time diagnostic data to prevent errors and faults. With prescriptive maintenance, systems are now able to offer recommendations based on forecasts. In turn, this heralds the next generation of maintenance, in which service providers will use data-based decision-making support to enable them to offer guarantees of availability. Locomotives, trains, components, train automation systems – everything is a valuable source of data. With Siemens Digital Services, a state-of-the-art system that processes this wealth of transportation data, transport operators analyze trends and monitor the status of machinery and the flow of passengers and goods to offer a smooth transportation experience.

## Spot weaknesses before they're an issue

Decrease downtimes, increase availability and capacity. Siemens Digital Services monitor and analyze data in real time for prescriptive services and intelligent energy management. Through our services we've helped existing rail lines increase capacity by 30% or more.





# Digital Services

Intelligence that keeps your trains on the move

Siemens enables our customers to improve operations, maintenance and safety to create value and enhance rider experience. We create smart solutions that not only allow mobility providers to react swiftly to any given situation, but to anticipate the situation before it occurs.

## Services include:

### Railigent Connect

Connect your vehicle fleet and infrastructure to the Siemens Mobility Services data platform with protection against failures and costly damages

### Fleet Monitoring

Get an overview of events affecting both vehicles and the line – everywhere, at any time

### Smart Data Analysis

Benefit from the fact that we take data and analyze the connections, identify patterns and trends, and make an accurate diagnosis if any anomalies are found

### Failure Prediction

Initiate action before any errors occur or before they have any effect – proactively and with confidence in the outcome

### Performance Analysis

Get more out of your components – by using our Digital Services to improve availability and performance

### Operation Support

Put your operations onto a new footing by providing insights into your operational practices and patterns – enabling you to optimize your operations





# Maintenance Services

Proven solutions for maximum availability and efficiency

Improve the effectiveness of your operations with a tailored service program that best addresses your needs and capabilities. Our expertise extends across all vehicle types and their subsystems, including urban, regional, long-distance, and high-speed networks.

No matter your fleet, Siemens maintenance services offer you flexibility. We can provide a full complement of experienced technicians. Or, through a Technical Support, Spares & Supply Agreement (TSSSA) we can back-up your team with supply chain management, engineering support, and onsite experts. With a maintenance service contract, you'll have the peace of mind that comes from improved reliability, reduced uncertainty, and more predictable costs.

## Services include:

### Full Maintenance

We optimize your maintenance activities

### Technical Support, Spares & Supply Agreement (TSSSA)

Improve maintenance operations with your existing workforce

### Technical Support, Spares & Supply Agreement (TSSSA)

Fixed Fee Performance based contract with Guarantee's; Predictable Cost Basis and Continuous Improvement

*"This is a very modern train. Everything is being monitored and data is being collected on anything that is happening, be it a normal event or fault."*

Tom Rutkowski, VP of Engineering and  
Chief Mechanical Officer – Virgin Trains USA





# Spare Part Services

The parts you need, right when you need them

Ensure that your specialists have the right components on hand – quickly, easily, and reliably. Our Spare Part Services optimize your inventories with new, repaired, or refurbished spare parts. And, with innovative production methods, such as 3D printing, we can manufacture improved spare parts designed exactly to your unique specifications. We also protect you from parts obsolescence with solutions that ensure availability over the entire life cycle of your systems.

## Services include:

### Day-to-Day Spares

On-time delivery of spare parts, special tools and test equipment

### Capital Spares

We ensure that spare parts are available quickly and easily

### Part Exchange (UTEX)

Unit exchange and rebuilt components that enhance longevity and reduce cost

### Repairs

Fast, high-quality repair for your spare parts and critical components

### Vendor Managed inventory (VMI)

“On-time and in-full” material delivery service



*“We are very pleased with the performed workmanship and would highly recommend Siemens for this type of accident repair project.”*

Bryan Sawyer, Utah Transit Authority

# Upgrade Services

Enhance the value of your systems, long-term

Increased energy efficiency, improved comfort, and greater reliability – there are many good reasons for modernizing, enhancing, or repairing your rail vehicles and subsystems.

Another good reason is extension of the life cycle of your assets for a better overall ROI. Whether interior conversion, system upgrade, or refurbishment – with Siemens Upgrade Services, you can be confident that your fleet will travel into the future with maximum comfort, low emissions, and high energy efficiency. We provide expert enhancements, refurbishments, and accident repair.

## Services include:

### Communication System Upgrades

Step up to the latest technology, quickly and easily

### Passenger Information Systems / CCTV

Enhance the passenger experience and safety

### Refurbishment

Overhaul services for your fleet and subsystems

### Accident Repair

Accident repair services for your vehicles, including appraisal and insurance processing

### Major Component Upgrades

Bogie/Truck and axle overhaul services

## Our mission

*With digitalization we enable mobility operators worldwide to make trains and infrastructure intelligent, increase value sustainably over the lifecycle, enhance passenger experience and guarantee availability.*

## Our vision

*We are global entrepreneurs, trusted by our partners to pioneer transportation, moving people sustainably and seamlessly from the first mile to the last.*

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## Vehicle Accident Repair Services

Proven service that provides confidence and reliability

Accidents happen. When they do, you can count on Siemens expert services to repair your damaged vehicle to OEM specifications so it can return to revenue service in peak condition. We back up our vehicles with proven service that keeps your rolling stock moving. Siemens is your reliable partner for even the most difficult repairs, helping extend the life of your fleet.

### Risk-free repairs

Thanks to the expertise of our repair teams and the ongoing involvement of our engineers and quality assurance staff, the repairs will be risk free to you. With Siemens as your partner, you can be confident that your repaired light rail vehicle, locomotive, passenger car or bogie will be OEM qualified and compliant.

### Expertise you can count on

We know what it takes to repair damages from all types of accidents, from those involving cars or trucks, to

derailments, to front-end damage from hitting the catenary pole or another LRV, locomotive or passenger car. Our comprehensive approach uses state-of-the-art technologies and market-leading expertise that put the safety of your vehicle front and center.

And our experts have seen it all. They can recommend the best solutions to get your vehicle back in working order and serving your ridership as soon as possible. The results are striking, as shown in the UTA photographs. Depending on the severity of the damage, repairs will be carried out at your location or at our McClellan Park Customer Services Center.

### Inspection and investigation

We're an industry leader in using 3D scanning to digitalize the measurement process, a crucial aspect of damage inspection and investigation. Our experts scan the damaged vehicle with a laser 3D scanner in order to create a comprehensive 3D model. By comparing

it to the original design model, they can pinpoint the exact damages, so you know upfront what work needs to be done. Digitalization means a damage report takes just weeks instead of months to complete.

For bogies, our experts use a FARO arm to precisely measure the damaged frame. They compare these measurements to the original drawings of the bogie as manufactured to see where the damaged frame is out of tolerance due to twisting or other damages.

We believe in transparency, so you'll receive a damage report that includes a comprehensive description of the damages and high-level recommendations about what needs to be repaired.

### Structural repairs

Repairs are made by the people who know your vehicle best: the same Siemens engineers and technicians who helped design and build it. We will have experts on-site at your location or, if



needed, we will safely transport the vehicle to our Customer Services Center. In either case, your repairs will take advantage of the latest technology, vehicle expertise and industry best practices.

Our experts develop complete repair specifications based on a final engineering investigation that unearths any hidden damages. We'll work with you to create a scope of work and timeline for structural repairs.

As part of our repair process, we offer complete obsolescence management for older vehicles and bogies. Materials procurement includes searching for

possible replacements for hard-to-find parts. Whatever it takes, our engineers are expert at finding effective solutions for even the most difficult damage.

Quality assurance is woven into every aspect of our structural repair solutions. All work is constantly reviewed by our engineers and QA personnel to guarantee that OEM specifications are met. For example, there are critical weld inspections and nondestructive testing such as alternating current field measurement (ACFM) and magnetic particle inspection (MPI).

All vehicles undergo a final, thorough quality assurance inspection by our

experts before being returned to the field. This includes post-repair laser 3D scanning or FARO arm measurements to confirm the vehicle has been fixed and is back to OEM specifications.

### Good to go

With Siemens accident repair services, you are putting your vehicle in the best hands to complete the job. Benefiting from our first-hand knowledge of your vehicle and the latest technical tools, you can trust that your vehicle and/or bogie is safe and ready for years of continued service.



### Siemens repairs three UTA LRVs

Utah Transit Authority of Salt Lake City turned to Siemens to repair three severely damaged vehicles. The scope included extensive mechanical

engineering, obsolescence management and structural repairs on end-girders, cabs and front under-frames.

The first repaired vehicle was delivered within 6 months. UTA was pleased with the vehicle's overall condition and confident in its ability to ensure the safety of its operators and riders.

*"We are very pleased with the performed workmanship and would highly recommend Siemens for this type of project."*

Bryan Sawyer, Utah Transit Authority



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### Customer Services Center

Our 60,000-square-foot Customer Services Center is located in McClellan Park near our Sacramento, California manufacturing plant. The Service Center houses our rail refurbishment operations, rail bogie service, accident repair service and spare parts delivery.

### Siemens Customer Services

From pre-installation to ongoing maintenance, Siemens Customer Services goes the extra mile to extend and enhance the service life of all rail vehicles.

- Maintenance Services
- Performance Partnerships
- Spare Parts
- Upgrade Services
- Digital Services



# Smart Documents

## Centralized Online Manuals

Siemens is continuously looking at the latest technologies to incorporate in all aspects of our businesses including Rolling Stock Maintenance. We are utilizing Digitized maintenance manuals and Digitalization for predictive maintenance and the future will continue to bring us new ways to make maintaining vehicles more effective for the Maintainer. Siemens Smart Documents, an online digital tool is the newest in Siemens rolling stock maintenance technology that will prove to be a valuable resource in maintaining any Siemens vehicle or fleet.

Siemens Smart Documents provides customers the ability to easily and quickly access up to date maintenance information and necessary vehicle documentation, in one location, from any computer or mobile device with an internet connection. Downloading necessary information to devices makes Siemens Smart Documents incredibly versatile to users that may be in an area where an internet connection is unavailable.

The new and improved table of contents can be viewed in two different layouts, allowing quick and easy location of necessary information. System and subsystem table of contents, as used in existing technical manuals, has been updated with a specific search feature. This allows searching at a local level within a specific section of component breakdown. The visual table of contents allows for quick visual searching starting with a complete vehicle down to subcomponents.

Additionally, customization and merging of customers current digital information into Siemens Smart Documents ensures all past documentation is available for future use.

Furthering the incredible functionality, User assigned access levels can be administered to provide information access on a user by user basis.

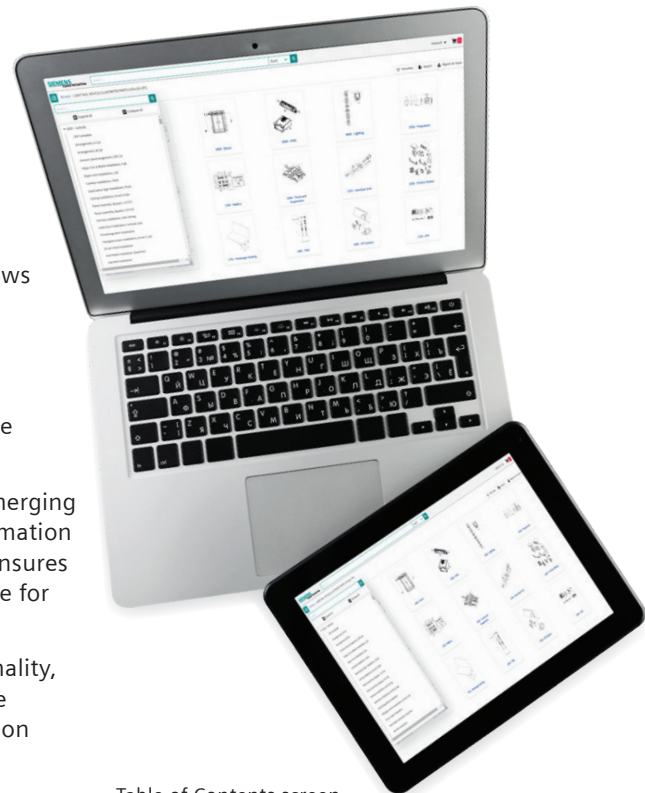


Table of Contents screen



The integrated global search feature gives customers and end users the power to search all digitized documents using familiar and common techniques. The global search function allows incredible efficiency when searching for customer, vendor or Siemens part names, part numbers and sub system components.

As updates are made to the vehicle by the customer or Siemens, documentation is updated in real-time, allowing immediate viewing by the end user. Siemens Smart Documents allows for an infinite number of necessary changes removing any doubt as to whether information is up to date.

With Siemens Smart Documents, users can view and add information about specific parts, assemblies and vehicle or fleet documentation allowing an incredibly high level of detail to maintenance personnel, management and purchasing agents.

The “where used” tab shows where the selected part is used throughout the vehicle, or on other fleets. This allows identical parts to be easily linked across assemblies and even across fleets creating time and cost saving efficiencies.

The “Report an Issue” function allows users to report issues in an efficient and quick format. The ability to attach images or documents further enhances the incredible power of this feature.



Bill of Materials screen



ISO 9001

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# Keep your rolling stock on the move.

## Technical Support & Spares Supply Agreements

Siemens Technical Support & Spares Supply Agreements (TSSSA) meets the challenges and supports the goals and objectives of transit providers by optimizing fleet reliability, maximizing fleet availability and stabilizing maintenance costs. With a TSSSA customers have a predictable cost structure that is determined by the services and support provided and eliminates the fluctuating costs that can make budgeting and maintenance so difficult.

Our TSSSA includes the provision of on-site technical experts, partnering directly with the transit agency staff who manage and support fleet maintenance operations. Additional support includes engineering and diagnostics to help optimize agency operations, and a robust supply chain management team working to provide

all necessary parts when and where they are needed.

Through on-site technical services, transit agencies have a go-to resource for analysis, engineering support, visual inspections of equipment, training and software upgrades. Siemens has the expertise, the tools and the diagnostics to identify problems and implement solutions before the situation results in a vehicle being taken out of service. Also, failures can be anticipated based on current performance and preventive action can be taken to avoid interruption in service.

With a TSSSA transit agencies operations are fully backed by Siemens central support and our global network of expertise. The Siemens Remote Rail Support Center performs data monitoring and analysis to flag and analyze faults

and system interrupts and then sends the results and diagnostics back to our on-site technicians and to key customer personnel, if necessary. Capabilities of the Rail Support Center can be enhanced through advanced digital integration and digital services such as automated vehicle fault reporting and analysis, fleet mileage collection, and real-time vehicle location and condition monitoring.

Transit agencies will benefit from a complete supply chain solution that includes agreements with all material vendors for your vehicles. Parts are ordered and stocked to make sure you have the right materials, at the right time, for preventive and corrective maintenance activities. Transit agencies no longer need to carry and manage an expensive inventory of parts. Leveraging the global Siemens logistics network, the procurement process is accelerated.



Through your TSSSA, transit agencies have direct support from the builder of your vehicles and the original engineers who know your vehicles best. Leveraging visibility into the performance and condition of thousands of vehicles worldwide, our experts have the knowledge to improve the maintenance and reliability of transit agencies fleets. Agencies will benefit from holistic support throughout the lifetime of the vehicle, by the team that designed, maintained, and optimized vehicle performance for light rail vehicles and locomotives.

Siemens is a trusted service partner for major transit providers throughout the United States, supporting long-term service agreements with Amtrak, MARTA and Virgin Trains USA.

*"This is a very modern train. Everything is being monitored and data is being collected on anything that is happening, be it a normal event or fault."*

Tom Rutkowski, VP of Engineering and Chief Mechanical Officer – Virgin Trains USA



## Benefits:

- Access to the original train design engineers
- Aligning focus and priorities with reliability and availability guarantees
- Centralized support and resources
- Eliminates the need to invest in and manage spare parts inventory
- Improving performance, efficiencies and reliability of rail vehicles
- Maintenance parts, spare parts and logistics
- On-site technical services
- Parts and equipment obsolescence protection



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