Not only do Toshiba's Automatic Traffic Supervision Systems have the standard functions for controlling the train traffic stably and accurately, but they are also custom-built depending on the railway conditions, thus enabling the systems to appropriately change the timetable and automatically control the train traffic based on the timetable.

As a railway system integrator, Toshiba supplies Automatic Traffic Supervision Systems equipped with the latest info-communications technologies, including a Traffic Regulation Subsystem and a GPS/GIS-based Traffic Monitoring System.

Two cost-effective function packages are offered for the Automatic Traffic Supervision Systems: a basic package (which includes traffic situation monitoring, automatic/manual route setting and timetable modification functions) and an optional package (which comprises high-level traffic regulation subsystem and other system interface functions). The optimal system can be fashioned by choosing the suitable functions depending on the railway conditions.

We actively employ the latest technologies such as cloud computing and GPS. These enable the systems to have more advanced functions such as a function for displaying information on a digital map and a guidance function for the train driver.

We are also active in reducing costs.

Find out more on http://toshiba-railway.com
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We provide the optimal customized systems by selecting only the necessary functions from these three systems and seamlessly interface these functions with one another.

Total and Efficient Solution
Toshiba provides Automatic Traffic Supervision Systems (ATS) enriched with the latest info-communications technologies, which enable stable and highly reliable train operations and a high level of automation for rail operations. The systems permit the implementation of optimized timetables. They also relieve the train controllers of routine tasks.

The ATS tracks each train on the main line in accordance with the train timetable, train location and train number information. From the tracking result, the ATS automatically sets the route of each train, records the actual train arrival time and departure time, and calculates the delay time at each station and relevant locations.

### Functions

- **Timetable management**
  - Management of standard, current, and other timetables
  - Enables timetable database construction
  - Allows current timetable switching

- **Traffic situation monitoring / observing**
  - Tracks trains
  - Watches for conflicts between train routes based on the train tracking information
  - Alerts when train delays and emergencies such as earthquakes occur
  - Displays all the current train and line information on the easy-to-understand Traffic Monitoring System (TMS) screens

- **Automatic route setting**
  - Can automatically set routes based on timetable databases

- **Manual route setting**
  - Enables manual route setting whenever needed
  - Provides settings for the supervision mode and the control mode
  - Helps train controllers change the signals in an emergency

- **Traffic simulator**
  - Includes a signaling simulator and a train movement simulator by default
  - Can be used not only for system tests, but also for training the train controllers

- **Passenger Information Systems (PIS) control**
  - Connects with the PIS equipment and then sends the timetables and other information for the passengers

- **Other system interfaces**
  - Interfaces to external systems such as SCADA systems and train radio

### Features

- Consists of industrial PCs and Linux machines, allowing flexible configurations to match the scale of the target train traffic
- Enables high reliability and maintainability by its redundant configuration and distributed functions
- Enables train controllers to instantly grasp the situation with its fully graphical interface for train diagrams and operation status screens
- Has a human-machine interface that supports effective traffic regulation
- Distributes the train operation status and the passenger information to the relevant systems
- Has a traffic simulation function that enables efficient tests and verifications, and can be used to train the train controllers
- Can show superimposed standard, current, and other timetables on top of one another
- Can present train timetables graphically
- Expires train timetables in accordance with the train type or the train diagram

### Automatic Traffic Supervision Systems

- **Regulation assistance**
  - Can produce typical timetable modification patterns depending on the traffic (restricted train operations, changed routes, etc.)

- **Information change distribution**
  - Capable of automatically generating the timetable change information and transmitting this information to the relevant places (stations, offices, train cabs) and systems (PIS)

- **Train operation prediction**
  - Forecasts train traffic trends based on the planned timetable and the current operational status
  - Displays the information on the screens in the form of time-space diagrams
  - Triggers an alarm to the train controller if the interval between the trains is predicted to exceed a predefined headway

- **Conflict check**
  - Automatically checks for any conflicts between a train and railway conditions, or between trains, after the timetable modification has been input
  - Has dispatching functions (connection assurance, conflict recognition, conflict resolution)
  - Has an improved on-time performance through the generation of regular headways

- **Enables changing the train graph on the screen directly by dragging and dropping**
- **Automatically changes the current timetable after the execution of the restoration function**
- **Enables superimposition of standard, current, and other timetables on top of one another**
- **Enables changing the train graph on the screen directly by dragging and dropping**
- **Has a traffic simulation function that provides various kinds of sub-functions such as suspension of train operations or changes to the train running order**
- **Provides the updated information trends to the train controllers using the function that forecasts the train traffic, based on the planned timetable and the current operational status**

### Traffic Regulation Subsystem

Conflicts, such as those possibly resulting from the mixed operation of regional trains and the relatively faster long distance trains, are detected by the Traffic Traffic Regulation Subsystem, represented in the train graph, and then resolved automatically at an early stage by the system. In line with operational priorities, the transport flow and connection assurance are secured. The train traffic diagrams can also be edited directly in order to quickly resolve any disorders in the train operations.

This function also transmits timetable changes to relevant systems such as Passenger Information Systems (PIS).
Toshiba provides GPS/GIS-based Traffic Monitoring Systems equipped with the latest info-communications technologies. The system can acquire position information using the GPS onboard equipment, transmit this information along with other train information, and then display the train position on a digital map. Train controllers can intuitively grasp the traffic information together with the information on the map (crossings, bridges, hazardous areas, etc.). The system also features good scalability. For instance, additional functions such as a driving guidance function and an arrival-and-departure time announcement function can also be installed.

**Features**

- Useful for any kind of railway vehicle (passenger vehicles, railway maintenance vehicles, etc.)
- Utilizes packet data-based communication between the GPS onboard equipment and the ground system, provided by a common carrier
- Can be installed on a private server, or on a cloud system provided by Toshiba
- Capable of using any PC or smartphone web browser to check the train information
- Even if the TMS goes down, the train tracking function can still be continued by a backup system

**Functions**

**Train traffic monitoring**
Tracks trains
Displays all the current train and line information on the screen

**Traffic situation monitoring**
Judge the conditions of the tracks based on the real-time information from the GIS
Alerts when train delays and emergencies such as earthquakes occur

**GIS map display**
Displays the positions and other information of all the GPS-equipped trains on digital maps
Capable of showing the entire length of the trains

**Driving guidance**
Informs the train driver of the speed-limited areas, departure times, station skips and stops, etc.