



# Schindler Elevator Corporation

## GIS integrates with SAP to increase efficiency in route planning

### Problem

Large company needed a computerized system for managing and routing thousands of technicians

### Goals

- Provide user-friendly and easy-to-use system.
- Route technicians efficiently while planning workloads.
- Make service response time fast.
- Install system on more than 500 existing Windows-based computers.

### Results

- More than \$1 million was saved in increased efficiencies with a payback of less than one year.
- Routes in more than 250 offices were created in two hours instead of more than two weeks.
- Routes were optimized by minimizing overtime, minimizing travel time, and balancing workload between technicians.
- Customers' increasing needs for detailed schedules and reports of maintenance were met.
- Viewing customer locations and job assignments in a GIS allowed Schindler to redeploy office resources.

*The Switzerland-based Schindler Group is the world's largest escalator company and second-largest elevator company. Schindler designs, manufactures, installs, maintains, and modernizes internal transport systems for almost every type of building requirement worldwide. The company specializes in the latest technology engineering along with mechanical and microprocessor technology products designed and rigorously tested for comfort, efficiency, and reliability. Schindler Elevator Corporation, the U.S. operation of the Schindler Group, was the first elevator company in the United States to achieve ISO 9001 certification for its manufacturing plants, and its service organization was among the first in any U.S. industry to receive ISO 9001 certification.*

*Schindler Elevator Corporation operates more than 250 offices in the United States and Canada. It employs more than 6,500 people and covers a wide range of areas from dense central cities to territories consisting of several states.*

### The Challenge

Schindler is responsible for tens of thousands of elevators and escalators throughout North America. Each day, thousands of highly trained technicians are on the road to service and repair these systems and help in emergencies. These routes require precise and optimized planning since technicians service many buildings with varied equipment as diverse as hydraulic elevators, escalators, and traction elevators.

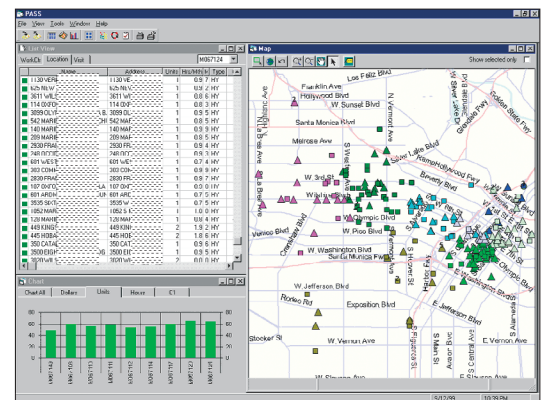
Every piece of equipment has a preassigned periodic schedule for maintenance such as greasing and cleaning. These maintenance schedules can include 10 or more visit periods ranging from daily to quarterly. In addition, each building has a visit schedule influenced by customers' preferences such as making certain the elevator is not taken out of service during the busiest time of day.

Another challenge was linking with the contract information. The service contract information for customers in North America is stored in a centralized SAP® R/3® enterprise resource planning system in Morristown, New Jersey. Schindler needed to be able to schedule technicians and link directly to the R/3 system.

To address these needs, Schindler had to route technicians based on service contract information using a system capable of not only handling scheduling but also planning workloads for technicians over a 12-month period.

### The Solution

Schindler teamed with ESRI and its Professional Services Division to form a project team consisting of people with business, project management, information technology, and operations research experience. The extensive project was named Planning Assistant for Superintendent Schedul-



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 To learn more about integrating GIS with SAP, visit [www.esri.com/sap](http://www.esri.com/sap).

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## ESRI Software Used

- NetEngine
- MapObjects

## Other Software Used

- SAP R/3

*“PASS, integrated with SAP R/3 and ESRI GIS software, is a key productivity tool for several hundred service superintendents who manage thousands of service technicians.”*

Fred Blakely, Project Manager,  
Schindler Elevator Corporation

ing (PASS). The project team decided on a client/server architecture using ESRI® MapObjects® software with local street map storage. Keeping large street data files on local PCs prevented overloading the dial-up network connections between offices and headquarters.

The brain of PASS is a set of optimization algorithms, or weighted functions, that produces an optimized result using parameters that can be changed by the user to reflect special business needs. These parameters include travel time, balance of contract value or contract hours, overtime, free time between jobs, and time for emergency calls, in addition to overtime and time window violations. PASS uses ESRI's NetEngine™ software for travel time calculation between locations.

Maintenance work is assigned to technicians so routes are geographically tight. Keeping technicians restricted to a dense area of operation avoids excessive travel time and, more importantly, will allow for a quick response to emergency calls. To plan for these compact routes, Schindler decided to deploy accurate street data-based modeling and planning tools for both mapping and routing.

The customer and equipment information is loaded from the central PASS system and displayed as a separate layer on the map. PASS offers three main views: a list view with tabular information about locations, routes, and visit schedules; a bar chart view indicating route data for profitability, workload, travel time, and contract value; and a map view including various routes in predetermined colors and symbols. The user can drag and drop locations to new routes and query jobs via mouse click. Additional views inform the user about all equipment or visit constraints at a certain location.

The PASS system is connected to SAP R/3. Downloaded data from SAP is stored on the PASS server in an Oracle® database for direct client access. Schindler's superintendents, who are responsible for managing field technicians, use PCs in the local office to run the PASS software. Each of these PASS computers is connected to a central PASS system. Superintendents can modify their data using the PASS client interface to match their needs, then upload or save the final solution back into the SAP R/3 system.

## The Results

Schindler superintendents manage several million service hours per year and maintain the visibility of tens of thousands of units of customer equipment using the PASS system. Schindler can now manipulate travel time, route balancing, overtime, personnel, and quantity of units while reviewing the overall effect on profitability and customer satisfaction. The integrated periodic routing solver now takes less than two hours to update the route structure of a Schindler service area and regenerate its schedule of visits for the entire year. Previously, more than 250 field offices each spent several weeks manually laying out service routes.

For a typical office, PASS adjusts service routes to accommodate gained and lost service contracts every two weeks. This allows Schindler to update service route structures to maintain optimum profitability and provide the best possible customer service.

Viewing customer locations and job assignments spatially allowed Schindler to restructure offices by reassigning customers between routes and superintendents. Now a key component of reviewing the finances and operations of Schindler's offices is an evaluation of the offices' use of PASS to structure routes.

Perhaps one of the most telling attributes of PASS was the management support the tool provided during the merger of Miller Elevator Service Company and Schindler Elevator Corporation into a single operating company. “We could not have integrated the service portfolios of the two companies into a single rationalized route structure within a reasonable time without the PASS system,” says Fred Blakely, project manager, Schindler Elevator Corporation.

With more than 250 offices using PASS, the system is in daily use, and has saved Schindler more than \$1 million in improved efficiency.

## For More Information



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