

Siemens... An Experienced Partner

Your Partner in Traffic Management

In addition to the proven products and capabilities of Siemens ITS North America, the company's commitment extends to include on-site engineering support and system maintenance.

Siemens traffic systems experts work hand-in-hand with local traffic engineers to analyze the traffic network and design a program especially suited to meet the transportation demands of a given area.

Siemens' breadth of worldwide traffic related services include traffic planning, traffic engineering, systems installation, maintenance and training. What distinguishes Siemens from the competition when it comes to solving traffic problems? It is the company's vast catalog of transportation products, services and capabilities. Among the 19 Siemens companies operating in the U.S., numerous synergies are formed in related fields such as transportation. For example, Siemens ITS North America has established a

cross section of expertise ranging from advanced automotive technologies, to high-speed and light-rail trains, marine equipment, traffic management systems and air traffic controls. It is this broad base of resources and expertise that distinguishes Siemens ITS North America from its competitors, and enables Siemens engineers to team with municipal traffic engineers to analyze and identify the optimal solutions for any region.

Progress Based on Experience

Siemens is among the original pioneers of ITS-related technologies. Companies like Siemens

Automotive, Siemens Traffic Control Systems, Siemens Traffic Controls Limited and Siemens Transportation Systems have substantially contributed to the world's various modes of transportation today.

Particularly over the past quarter of a century, Siemens has played integral roles in the development of computerized traffic signals, dynamic traffic control systems, mass transit and light rail systems and advanced vehicle navigation and driver information systems.

Siemens ITS North America is drawing from this broad base of expertise in its role as a principal partner in one of the two teams (the Loral Team) selected by the U.S. Department of Transportation's National ITS Architecture competition. This competition is part of a collective effort by private industry, the U.S. government and academia to structure a single consensus national ITS architecture that would remain stable and flexible for at least the next 20 years. It will be designed to communicate with and be compatible to new components as they are introduced and incorporated.

The ITS architecture can be viewed as a framework that will support a multitude of ITS-related products and services. Resulting from this framework, standards will be set for infrastructure and products, ensuring compatibility from city to city and across the country.

Siemens ITS North America is an operation of Siemens AG, the world's sixth largest electrical and electronics concern, and one of the top 20 companies on the Fortune International 500 list. Siemens employs 382,000 people in 150 countries and maintains over 200 manufacturing facilities worldwide. In the U.S., Siemens employs 46,000 people from coast to coast, and maintains 48 manufacturing facilities.

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Published by Siemens Intelligent Transportation Systems
Subject to change without prior notice

Printed in the United States
1000
7/28/95

SIEMENS

Intelligent Transportation Systems for North America



Operation Overview

That Was Then. . .

More than 70 years ago, Europe's municipal leaders and urban planners observed that the machine that had begun to exceed the capacity of the narrow city streets and intersections throughout the continent.

That was the inspiration for Siemens innovators who were among the first to identify transportation and traffic management solutions resulting in some of the world's first traffic signal installations.

After a few decades, Siemens developed road network infrastructures that supported conventional traffic controls, and in 1964, the company installed Europe's first computerized traffic signal intersection in Berlin.

This Is Now.

Today, Siemens is one of the few companies in the world with the experience and technical depth to develop and implement the complex technologies required for the next generation of Intelligent Transportation Systems (ITS).

On the road or in vehicles, Siemens offers a wide range of ITS products and technologies including traffic signal controls, incident detection, adaptive traffic management and dynamic route guidance and driver information systems.



Advanced Traveler Information Systems (ATIS)

Siemens began development and extensive field-testing of vehicle navigation technology in the early 1980's.

Since then, Siemens has added a range of diverse route guidance systems to its stable of ATIS products. These include infrared (IR), global positioning satellite (GPS) and radio frequency-based (RF) technologies designed to be compatible with existing infrastructures in varying markets around the world.

The ATIS products available through Siemens ITS North America include:

- IR beacon-based dynamic route guidance and driver information system
- Autonomous navigation system using GPS and dead reckoning (internal gyroscope)
- Fully integrated driver information systems incorporating H-VAC controls, cell phone, radio and route guidance into one factory installed unit
- Additional concepts include a low-cost, navigation and driver information system using RF technology

Leading The Way With Navigation

Extensive market research in the U.S. indicates that a large consumer market is developing for navigation and driver information products that can provide multiple benefits for sales professionals, rental car fleets and delivery services as well as the average commuter.

To that end, Siemens has developed a diverse range of navigation products which span the range from low-cost guidance and information systems to top-of-the-line fully dynamic, real-time route navigation and driver information systems.

Each of the navigation products is designed to be installed either as a retro-fit for after market applications, or as a factory-installed unit that can be smoothly integrated into the vehicle instrument panel.

Euro-Scout Takes Europe By "STORM"

The world's first real-time driver information and dynamic route guidance system, Euro-Scout™, is embarking on its first national deployment program in Germany.

Euro-Scout, Siemens' infrared, beacon-based system, is currently being deployed in a comprehensive ATMS/ATIS operation called

The project calls for tying all existing traffic data gathering systems together under one central computer to collect and continuously update that information, then analyze and interpret the data so each segment of the transportation network can respond and optimize its operations.



STORM in city of Stuttgart where the beacon infrastructure is installed and the in-vehicle equipment is available to consumers.

STORM was launched by a joint venture company, Co-Pilot, which includes the Baden-Württemberg Ministry of Transport, the state capital of Stuttgart, Siemens, Daimler-Benz AG, Robert Bosch GmbH, and a number of other companies.

By 1998, Co-Pilot intends to deploy Euro-Scout in up to ten additional cities, including Berlin and Munich.

And by 2005, all major metropolitan areas of Germany are included in Co-Pilot's national deployment strategy.

Advanced Traveler Information Systems (ATIS)

Ali-Scout on The U.S. "FAST-TRAC"

In 1992, Siemens took part in the launch of the world's largest and most advanced ITS operational field test in existence with the Ali-Scout, navigation system – the U.S. counterpart to Euro-Scout.

This field test, FAST-TRAC of Oakland County, Michigan, has since expanded throughout much of Oakland County, the nation's fastest growing urban region which is located in the backyard of the nation's auto makers.

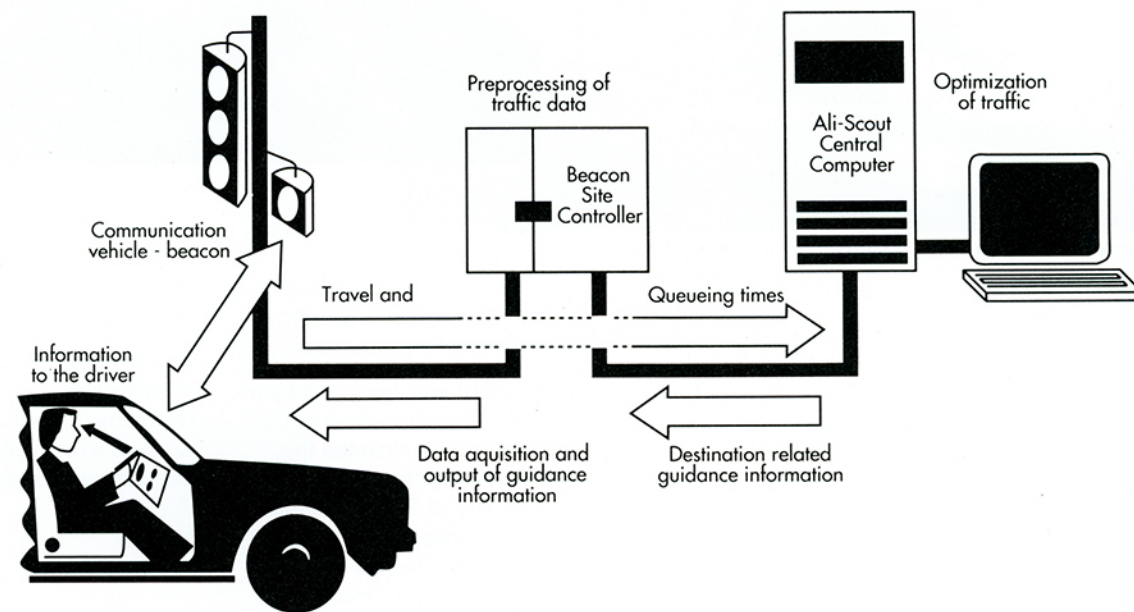
FAST-TRAC comprises over 200 computerized intersections and over 300 sq. miles of roads and freeways in the Ali-Scout beacon network.

Approximately 800 Ali-Scout-equipped vehicles were selected to take part in the congressional funded project.

Siemens is taking part in the world's first attempt to integrate the ATMS and ATIS components of a major traffic network. This integration effort sets

FAST-TRACK apart as the most advanced and fully dynamic traffic control operation on the globe.

The feedback from project participants has already begun to help U.S. transportation experts shape the architecture for smart roads and intelligent vehicles of the next century.



Ali-Scout Communications Network

On The Road or In Vehicles: Siemens Offers A Range of ITS Solutions in North America

In 1995, Siemens harnessed its Advanced Traffic Management Systems (ATMS) and Advanced Traveler Information Systems (ATIS) technologies into one operation concentrated on meeting North America's full range of ITS needs. The operation, known as Siemens ITS North America is based in Auburn Hills, Michigan.

Siemens ITS North America includes the expertise and products from three Siemens companies — Siemens Traffic Control Systems (Germany), Siemens Traffic Controls Limited (UK), Siemens Automotive Corporation (USA).

Advanced Traffic Management Systems (ATMS)

Siemens ITS North America draws from a wealth of traffic management experience which includes over 100,000 diverse

installations adapted to different transportation infrastructures around the world.

Siemens ATMS technology is improving traffic throughput in and around major cities in South America, Asia, Africa, Europe and North America. These product capabilities and services include:

- Advanced Vehicle Detection Systems
- Integrated Traffic Management Systems
- Freeway Incident Detection and Management Systems
- Maintenance Management Systems
- Adaptive Urban Traffic Control Systems
- Public Transit Priority Systems

From Busy City Streets to Crowded Interstates; Siemens Has The Solutions

Commuters in the U.S. are nearing a transportation crossroads. Surface streets and freeways leading in and out of around America's big

cities are swelling with vehicle overpopulation at a staggering rate each year, while funding for improved highways is expected to remain the target of federal cut backs. These factors, combined with inadequate traffic management systems, are resulting in increased pollution levels, driver frustration and a rising number of stress-related vehicle accidents.

Siemens' experienced system hardware and software teams have engineered the optimum solutions designed to solve various traffic problems.

Suitable for the largest cities and smallest towns in North America, Siemens traffic controls are categorized in two distinct areas with highly specialized capabilities. They are called Liberty™ and MinuteMan™.



Liberty was the battle cry that spawned a new nation. It stood for the freedom of individuals to do what they want and go where they like, when they choose to.

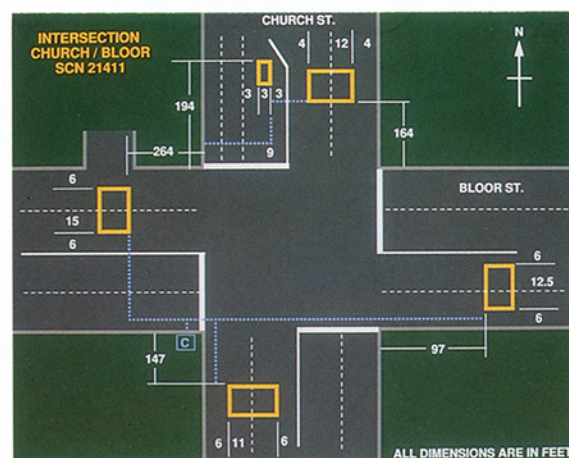
The Siemens Liberty system also represents the ability of individuals to commute freely through America's metropolitan areas without fear of being trapped in traffic snarls caused by antiquated traffic controls.

The Liberty system has already begun to revolutionize the way traffic managers control traffic on urban roads.

Advanced Traffic Management Systems (ATMS)

Liberty

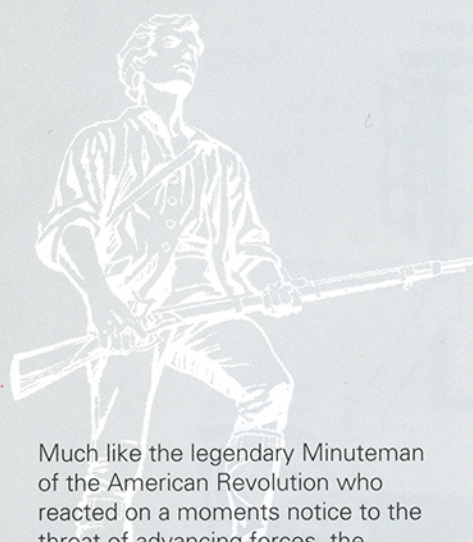
This is Siemens group of capabilities, products and software designed for traffic control applications in metropolitan areas. These include controllers and signals, remote monitoring systems, data transmission, maintenance management and fixed time controls.



Minuteman

Designed for freeways in urban or rural regions, Siemens' Minuteman is a multi-modal approach to freeway management and incident detection.

Using fuzzy logic, dynamic traffic estimation and floating car data, Minuteman serves as a proactive tool for alerting traffic managers of potential environmental or traffic related incidents, and allows them to take action to prevent traffic snarls on freeways.



Much like the legendary Minuteman of the American Revolution who reacted on a moments notice to the threat of advancing forces, the Siemens Minuteman system today stays just ahead of potential hazardous situations on the freeways and alerts traffic managers and drivers so they can react in a matter of minutes to take evasive actions.

TetraStar; The Power of Four

Siemens ITS North America's latest addition to its product stable is the new TetraStar, TIS (Traveler Information System) which has been designed to meet the needs of drivers in the U.S. as well as other global markets.

As indicated by its name, the TetraStar (tetra; having four parts) system is defined by elements of four. It uses four satellites and a internal gyroscope for pinpoint accuracy and vehicle positioning.

Add to that four in-vehicle components (display unit, navigation computer, global positioning receiver and gyroscope) which are easily installed.

And finally, TetraStar performs four distinct functions: (1) turn-by-turn vehicle route guidance; (2) driver information related to the preferred route; (3) pre-trip planning which allows the driver to preview a recommended route; and (4) an integrated reference guide which lists hundreds of points of interest



destinations and allows quick access to emergency information like hospital locations, towing services, police, etc.

TetraStar technology is featured in rental cars across the U.S., and by 1996 the system will be commercially available from coast to coast.