

### **Caltrans District 7; Inter-Regional Transportation Management Center**

Caltrans District 7 (Los Angeles) will move their TMC operations from the existing District office to a new CHP/Caltrans facility in 2002. The move will include significant operational enhancements to the District's new system. Major items include integration of : State Highway signal operations, State maintenance and construction operations, SMART corridor operations, integration with local signal operations and integration with other Corridor operations. The project will emphasize use of web technologies and object based integration methods featuring CORBA.

### **Los Angeles Mode Shift Project**

The mode shift project will integrate specific ATIS strategies within the expert system of Caltrans

District 7's new ATMS, in order to offer specific route and mode choices for travelers when major incidents occur on the freeway network. The system will be deployed in compliance with the Southern California Showcase Architecture. NET is the prime contractor for the project. The project recently completed the system architecture phase, with a CORBA implementation envisioned.

### **Salt Lake City ATMS; System Integration**

The Salt Lake City ATMS is well into the system integration phase. The project focuses on the integration of a new traffic signal control system and a new Freeway Traffic Management system (to be adapted from the GDOT freeway management application). NET is the prime contractor

### **Kansas City ATMS.**

The Kansas City Area is initiating their first project from the region's strategic ITS deployment plan; a comprehensive freeway traffic management system. The project will involve both Missouri and Kansas State DOTs. NET is a sub-contractor to Black and Veatch and serves as Technical Director for the program. User requirements, System Requirements and System Architecture have been defined.

### **St. Louis, MO. ATMS** NEW

NET has been retained as the prime contractor to install the central element of the State's ATMS program. The central s/w will be operational this year.

### **Springfield, MO. ITS** NEW

NET has been retained as the prime contractor for the Springfield region ITS initiative. Work was initiated in the early part of this year.

## **IDOT TRAFFIC SYSTEMS CENTER (TSC) UPGRADE**

The IDOT Chicago area TSC has been in operation for some 35 years. The system manages traffic on 150 center lines of freeways, using 100 ramp meters, 20 CMSs, 11 HAR transmitters and 2200 loop detectors. The central system is some 13 years old and requires upgrade. Work was recently completed to identify a comprehensive set of user and system requirements for the new system. NET is currently installing the system through a sequence of s/w builds and will be completed this year.

## **SanDiego Intermodal Transportation Management System**

The region's strategic ITS deployment plan placed major emphasis on the development of the Caltrans TMC into a center of Intermodal Transportation Management. NET was selected as the prime contractor with BRW as a major sub-contractor. The systems engineering effort will leverage the work completed on the Southern California Showcase architecture and implement a distributed object application using the CORBA standard. User and system requirements have been defined. Integration activities will commence in the next 60 days.

## **LosAngeles IMAJINE Program**

The intent of the program is to integrate: freeway operations with local street operations, Bus operations with local signal operations and para-transit operations with fixed route bus services. The system will be deployed in compliance with the Southern California Showcase Distributed Object Architecture. Final System integration activities are underway.

## **Atlanta Area ATMS**

GDOT has initiated the next phase of the Atlanta ATMS; with the intent of adding numerous enhancements to the system which was put in place for the 96 Olympics.

## **Atlanta Metropolitan Area Integration** NEW

NET was recently selected for this project to support GDOT staff in the introduction of the TMDD data dictionary to the NAVGIATOR system and integrate a CORBA proof of concept for center to center integration. Work is anticipated to commence in the immediate future.

## **Orange County TravelTIP**

TravelTIP is Orange County's ATIS initiative and will serve as the base system for implementation throughout the Southern California corridor. TravelTIP will be deployed using the corridor's distributed object Showcase architecture. In the design phase of the project an extensive survey was completed which indicated that 85% of commuters were primarily interested in freeway traffic flow conditions. NET is the prime contractor. The system will be operational this year.

## **South Eastern Wisconsin Communications, Data System Infrastructure (CDSI)**

The project is focused on: the development of a communications architecture to support the

State=s ATMS and ATIS programs, and the development of a strategic plan to implement the architecture. NET is the prime contractor.

## **SOUTHERN CALIFORNIA PRIORITY CORRIDOR - INTERMODAL TRANSPORTATION MANAGEMENT AND INFORMATION SYSTEM - "SHOWCASE"**

*" In summary, the vision of Showcase upon full implementation is as follows:*

- 1. The corridor will be developed as an area wide interactive/integrated intermodal transportation management and information system based on real-time, computer assisted transportation management information needed by the public...provide computer assisted decision/management support ... to transportation management centers ...*
- 2. All agencies will be linked via an information/communications network...connect modes currently uncoupled...allow agencies to share information...provide relative information to the user...*
- 3. ...incident management is one area that will receive increased attention as the network grows."*

Southern California Priority Corridor Steering Committee : January 10,1995

Work completed includes:

- ! Inventory of existing and planned ITS infrastructure throughout the corridor
- ! Concept of operations for both inter-modal transportation management and a comprehensive traveler information system
- ! Functional requirements definition for corridor wide interoperability
- ! Logical Systems Architecture
- ! Implementation plan to support broad scale deployment of the implementation
- ! High Level design for first implementation phase
- ! Software Proto-type has been completed and integrated with a legacy system
- ! Phase III has been initiated. The first build of system architecture has been completed and successfully passed acceptance test. The next version release of the s/w is scheduled for completion before the fall of this year.

## **TRANSPORTATION MANAGEMENT CENTER (TMC) UPGRADE - CALTRANS DISTRICT 7 (LOS ANGELES AREA)**

### Description of Project

This project involves the provision of engineering and software services for the system

development, design, specification, procurement, installation and integration of all elements within the Caltrans Los Angeles District Traffic Management Center (TMC). The project encompasses two phases: phase 1 is for the preliminary systems design and phase 2 is for system implementation. The existing TOC will be upgraded to provide a modern facility with state-of-the-art equipment and software to effectively manage more than 500 miles of freeway network in the Los Angeles area. The TMC will also act as the focal point for coordinating the activities of Caltrans with other agencies such as California Highway Patrol (CHP), the Los Angeles Department of Transportation (LADOT) and other operating agencies, thus providing a coordinated response to congestion producing traffic incidents. In addition to the TOC, an Emergency Operations Center (EOC) and Emergency Resource Center (ERC) will also be developed to provide a central location for coordinating Caltrans emergency response in times of regional crisis.

Many of the TMC's congestion and incident management functions will be automated to increase the operational and system efficiency. In particular, user interface for the operation of ramp metering and incident management functions will be minimized. The system will be in full operation by June 30, 2000.

## **SYSTEM MANAGEMENT AND INTEGRATION OF CALTRANS DISTRICT 7'S ITS DEPLOYMENT PROGRAM**

NET has been retained and is underway to provide system management and integration services for Caltrans District 7's \$300 million ITS deployment program. The primary areas of work include:

- ! System Management
- ! End to End Integration
- ! Advanced Traveler Information System Design and Implementation
- ! System Cut-Over Plan
- ! Maintenance Master Plan
- ! Training
- ! Technologies Evaluations
- ! Configuration Management Plan
- ! Design of an integrated Corridor Control mechanism

## **TRANSPORTATION MANAGEMENT CENTER / INTEGRATION OF ATMS VERSION 2.0 - CALTRANS DISTRICT 12 (ORANGE COUNTY)**

### Project Description

This project was initiated in September 1999 to install the Caltrans ATMS version 2.0 (developed by NET in Los Angeles) prior to Y2K. The system was successfully ported and in full operation within 60 days.

## **FIBER OPTIC COMMUNICATION NETWORK AND CCTV INSTALLATION (CALTRANS)**

There are three separate contracts which involve the same tasks but for different freeways. They are:

- ! Caltrans District 7 : I-10, I-101, and I-405 (128 miles of freeway)
- ! Caltrans District 7 : I-605 and I-710 (47 miles of freeway)
- ! Caltrans District 12 : SR-55 and I-405 (12 miles of freeway)

### Project Description

The above projects upgrade the existing traffic operations system (TOS) and provide an advanced communications infrastructure to support both the existing traffic operations system and the future ITS efforts. NET's initial efforts included the preparation of the project report which identifies the operational requirements, system design, implementation concerns, and construction costs for the specific projects.

The emphasis of these projects is on the operational analysis and engineering design for deploying operational field-elements to upgrade the existing traffic operations system. Project plans, specifications, and cost estimates will be prepared to support the installation and construction of these elements. Elements included in the design are variable message signs, fixed-message signs, highway advisory radios, CCTV surveillance stations, ramp meters, and count stations.

In addition to the installation of field-elements, these projects provide a state-owned communications infrastructure to support the upgraded traffic operations system, future ITS deployments, and inter-agency operational communications. A mixture of media is being exploited to optimize the life-cycle costs of modern communications system with high reliability and an open-systems architecture. These projects provide plans, specifications, and cost estimates to construct the hybrid network of twisted-pair cables, fiber optic cables, microwave radio-links, and satellite-communications links employing very small aperture terminals (VSATs).

NET's efforts include technical assistance during the construction phases of these projects as well as integration assistance for the design efforts of other consultant teams working on similar projects that support the NET communications design. NET is also providing assistance and coordination to ensure conflicts between the TOS Upgrade projects and other roadway projects such as the installation of HOV lanes are identified and mitigated.

### Current Status of Work

- ! PS&E for all segments completed

! Construction support ongoing

## **WEST HARBOR CROSSING TUNNEL ATMS/SCADA IMPLEMENTATION; HONG KONG**

An integrated traffic management/SCADA implementation to coordinate complex tunnel systems with an equally complex traffic management system. The design will be similar to work previously completed by NET in the Tate's Cairn Tunnel where an integrated traffic management/SCADA system has been operational for the past two years. The system is operational

## **HONG KONG LANTAU FIXED CROSSING - TRAFFIC CONTROL SYSTEM PROJECT**

This contract is part of a \$39.2 million contract for the supply and installation of traffic control and management system for 16.7 Km of road, bridges and tunnel connecting to the new Hong Kong airport. The facilities for the traffic control and management system include CCTV, telecommunications, emergency telephones, traffic signs, variable speed limit signs, lane use signals, variable message signs, over height detectors, automatic incident detection system, public address system, together with all ancillary facilities and computing system to be located in the central control center and local control rooms.

As the primary sub-consultant to the prime contractor GEC, we are responsible for the design and development of the computerized traffic controller subsystems and automatic incident detection subsystem. This includes procurement, testing and installation of computer hardware, software and communications equipment to monitor and control the status of the operational traffic signaling equipment. The system will have many specialized features to provide the traffic operations staff with easy to use system to manage traffic including:

- ! equipment failure management
- ! alarm management
- ! traffic statistic reporting
- ! graphical user interface
- ! automatic operation plans

The work includes development of operation procedures for four different levels of operation states including provisions for a double-deck bridge traffic operation and contra-flow operation in the tunnel. The operational states are :

- ! Normal/Scheduled contra-flow
- ! Transitory/Non-emergency
- ! Emergency
- ! Ad-hoc

## **LOS ANGELES / VENTURA COUNTIES STRATEGIC ITS DEPLOYMENT PLANS**

The project, following the FHWA planning model, will identify ITS deployment potential on local freeway, surface streets and alternative modes. The plan was completed at the end of last year.

## **ORANGE COUNTY CITIES / CALTRANS DISTRICT 12 INTER-CONNECT**



NET has been selected as prime contractor on multiple projects to integrate signal operations for numerous Orange County cities with Caltrans District 12 ATMS. A common architecture and integration approach has been successfully employed in these various contracts.