

## **THE CENTRAL DATA WAREHOUSE, PHASE 2**

### **PROBLEM STATEMENT**

The foundation for successfully deploying Intelligent Transportation Systems rests upon the effective means of (1) collecting traffic data, (2) filtering that data to improve its quality and accuracy, (3) processing it, and (4) disseminating the resulting information to the end user. Without such information, travelers must speculate on changing traffic conditions. Consequently, traffic information plays a substantial role in the decision-making process of road users with respect to departure time, mode selection, and route choice. Widespread traffic information is expected to reduce traffic congestion and pollution, lower fuel consumption, enhance traffic safety, and improve traffic management. Thus, one of the chief goals of a traffic management center is to deliver up-to-date information on traffic conditions to both *current* and *prospective* travelers.

Phase One of this research was funded by the FDOT Research Center and completed in March 2002. It laid out a plan for the conceptual design of the Florida traffic information data warehouse. The main challenge in Phase Two was to implement the plan described in Phase One with appropriate modifications as applicable to Central Florida. The Central Florida Data Warehouse (referred to as CFDW in this report and hereafter) is a prototype that can be used as a model for the rest of the state.

### **OBJECTIVES**

There are three main objectives in this study:

1. Design and implement the Central Florida Data Warehouse (CFDW).
2. Develop and launch the Central Florida Regional Transportation Operations Consortium's Traffic Information Web Site known as iFlorida site ([www.iflorida.org](http://www.iflorida.org)).
3. Maintain and host the web site once it is launched.

### **FINDINGS**

This report documents the management effort and the steps taken towards completion of the first year of a three-year effort needed to deploy the traffic information data warehouse in Central Florida. Hardware and software components of the CFDW planned for the first year were completed and demonstrated to be functional online.

This large-scale Transportation and Community and System Preservation (TCSP) project can be divided into a number of smaller projects that were successfully completed in this first year. These include the primary fiber connection on the University of Central Florida (UCF) campus

project, the data grinding project, the web user interface (UI) design project, the video design project, and the Geographic Information Systems (GIS) integration project.

The primary fiber connection was laid out from the entrance of the University of Central Florida at Alafaya Trail along old Central Florida Blvd. to the Multilingual Multicultural Center, which connects through express fiber to the UCF Computer Science building, where the data warehouse servers resided. The primary fiber link was used to transmit live video from the I-4 cameras to UCF. The UCF research team invented a new loop detector data cleaning and filtering algorithm capable of imputing the data to fill in the holes for missing or incomplete loop detector data. This first step is crucial before any loop data can be used for deriving useful traffic information, which could be disseminated to the traveling public.

The data grinding project cleaned the loop detector data and imputed missing data at the 5-minute aggregate level. The new algorithm for loop data imputation was developed and successfully implemented online. The web UI project produced the Central Florida Regional Transportation Operations Consortium's Traffic Information Web Site (or iFlorida web site, [www.iflorida.org](http://www.iflorida.org)), which was launched to the public in late October 2003 and maintained by UCF through February 2004. The web site complied with a "Web Site User Requirements Document" written by UCF and approved by FDOT D-5 and the Consortium. The web front end was integrated with the Geographical Information Systems (GIS) software (procured from ESRI or Environmental Systems Research Institute, Inc.) to ensure functionalities of the iFlorida web site.

A video project was successfully implemented with 16 selected cameras that show live video snapshots on the website. Fifteen of these cameras are located along I-4, and the sixteenth camera is located at the interchange of I-95 and SR 528 in Brevard County. The snapshots refresh every 20 seconds. Finally, the CFDW successfully provided web-based, real-time, and predictive travel time information to commuters and tourists in Central Florida and beyond.

## **BENEFITS**

The iFlorida web site and the Central Florida Data Warehouse (CFDW) can be expanded to include arterials and toll roads in Central Florida. Once the CFDW and the iFlorida web site are expanded and implemented at full scale, they will provide the one-stop shop for traffic information in Central Florida. They are expected to positively impact traffic congestion, pollution, fuel consumption, traffic safety, and traffic management.

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