DEVELOPMENT OF TRAFFIC OPERATIONS SOFTWARE TOOLS

PROBLEM STATEMENT

For the past 20 years, the Florida Department of Transportation (FDOT) has recognized the need for a system of software tools for the design and analysis of traffic signal operations at intersections, arterial routes, and networks on the State Highway System. FDOT has been a leader in developing and using these tools, beginning with the Signal Operations Analysis Package (SOAP) in 1978, the TOPCOP library of computerized procedures in 1980, and the Wizard of Helpful Intersection Control Hints (WHICH) model integrator in 1992. Collectively, these tools have contributed significantly to the productivity and credibility of FDOT staff at the Central and District Office levels. The importance of effective software tools has continued to grow as congestion management and ITS functions expand throughout the state.

The new Windows-based computing environment has created a need to revisit these tools. Improvements are needed in the model logic, the user interface, and the flow of data between model components. A complete redesign of the current package is required to meet the needs of the FDOT in planning, project development and engineering, roadway design, traffic operations, and ITS.

OBJECTIVES

The objectives of the project were to provide the Department with preprocessor, postprocessor, and user interface software for traffic engineering and planning to replace the existing MS-DOS versions of the Arterial Analysis Package (AAP) and WHICH with Windows-compatible modules.

The preprocessor must identify the component model data requirements and provide graphic and batch data entry edit functions using data definitions based on the Highway Capacity Manual and industry-standard data dictionaries. The postprocessor must interpret user selected component model outputs, and provide reports, tables, and charts for single model- multiple run, multiple model-single run or multiple model-multiple run cross reference comparisons. The user interface must present the user with the look and feel of standard Windows software.

FINDINGS AND CONCLUSIONS

The product of this research is a set of productivity enhancement tools that provide a high degree of connectivity between existing and future design, optimization, and analysis models used by FDOT. The principal component models are the latest versions of the Highway Capacity

Software (HCS), SOAP-2K, PASSER II, Passer IIJ, and CORSIM.   The tools are integrated into a single software product referred to as the Arterial Analysis Package (AAP) version 2K. The AAP now accommodates single intersections, arterial routes, diamond interchanges, and "star" networks.

The program has been completed and is able to perform useful work for signal system design and evaluation.   The architecture has been designed to facilitate future enhancements. The final report describes the operation of the AAP. It provides full instructions for installation, setup, and operation of the program. It is essentially the user's guide for the program.   The full contents of this report have been reformatted and incorporated into a context sensitive HTML-based help feature that may be accessed from any point in the program.

BENEFITS

This project has provided the FDOT with a significantly enhanced set of tools for systems planning, PD&E, roadway design, traffic operations, and ITS projects. The scope covers design, operations, and analysis.   These tools should find broad application at the district level and among local agencies and the private sector elements that perform work for all levels of government. Their improved potential for signal optimization will benefit the motoring public directly in the form of reduced delay stops, fuel consumption, and other operating costs.

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