awarded/rejected contract data is passed from AASHTOWare Project Preconstruction to AASHTOWare Project BAMS/DSS. This is usually done once a month or after the awarded/rejected information for each bid letting has been entered in AASHTOWare Project Preconstruction. Also at set times determined by each agency, construction data is passed from either AASHTOWare Project SiteManager™ or AASHTOWare Project Construction Administration™ to AASHTOWare Project BAMS/DSS.

The data collected at various stages of a project is used in many ways in the AASHTOWare Project BAMS/DSS data models. AASHTOWare Project BAMS/DSS has models that use historical data to generate bid-based price estimate data and trend analysis, bid competition analysis, and ad hoc analysis information. The bid-based price estimate data is passed to AASHTOWare Project Cost Estimation and/or AASHTOWare Project Estimator to assist in preparing more accurate estimates. It can also be passed to AASHTOWare Project Preconstruction, but this is not typical.

System Specifications

For details about system specifications for all AASHTOWare Project products, please refer to: www.cloverleaf.net/sys_arch/.

For more information about this product contact AASHTO or the AASHTOWare® contractor:

STATE HIGHWAY AND
TRANSPORTATION OFFICIALS
AASHT**O**
THE VOICE OF TRANSPORTATION

444 North Capitol Street N.W., Suite 249
Washington, DC 20001
Phone (202) 624-5821
Fax (202) 624-5806
E-mail tbianchi@aashto.org
Internet www.aashtoware.org

InfoTech

2970 SW 50th Terrace
Gainesville, FL 32608
Phone (352) 381-4400
Fax (352) 381-4444
E-mail info@infotechfl.com
Internet www.infotechfl.com

AASHTOWare Project BAMS/DSS™

Historical Database and Data Analysis

Data is produced and collected during the entire project lifecycle. Analyzing that data and applying it to future projects increases accuracy and improves efficiency. The ideal tool for this type of analysis is AASHTOWare Project BAMS/ DSS™, the AASHTOWare Project Decision Support System.

AASHTOWare Project BAMS/DSS is the original historical database and bid analysis software. An integral part of the client/server version of AASHTOWare Project BAMS/DSS is widely regarded as the premier software product for the analysis of highway construction bid and project data. The system is built around a relational, open architecture historical database specifically designed to provide decision support in the following areas:

- Bid monitoring and evaluation
- Vendor (contractor) analysis
- Contract analysis
- Item price estimation
- Collusion detection
- Planning and budgeting process

This historical repository contains information from all phases of the estimating, bidding and contract lifecycle along with analysis models to support the wide variety of management information requirements. AASHTOWare Project BAMS/DSS provides both standard models and ad hoc analysis capabilities, permitting each agency to use the available information to meet its own needs. AASHTOWare Project BAMS/DSS also provides the historical data and reporting capabilities to detect and expose bid rigging and collusive activity, producing such key reports as:

- **Contract Profiles—**provides a concise summary of information about selected contracts.
- **Contract Award and Bid Evaluation—**reports on bidding pattern comparisons between bidders, engineer's estimates and historical prices.
- **Vendor Profiles—**produces a summary of bid related information during a specified time period.
- **Vendor Competition and Market Shares Analysis—**examines bidding activity among selected vendors and determines the level of competition.
- **Vendor Work Location and Activity Maps—**pinpoints a vendor's win, loss, bid and subcontract activity along with facility locations.
- **Line Item Profiles—**produces graphical and tabular displays that can be used to identify the bid items most responsible for a vendor's bidding deviation on a specified contract.

- **Item Price Estimation and History—**provides a systematic evaluation of historical bid prices and estimates.
- **Item Price/Quantity Variance—**analyzes the variance between the awarded and the final costs and quantities on a specified contract.

Who Uses AASHTOWare Project BAMS/DSS?

There are several different types of users of the AASHTOWare Project BAMS/DSS system who use it for a variety of purposes:

- Top Management–keeping abreast of the entire highway agency's construction process.
- Planning Officers—looking at the entire highway agency's construction process to plan for future construction.
- Contract Administrators—reviewing contractor and subcontractor progress and status.
- Contract Awards Committee—analyzing bids to award contracts.
- Construction Cost Estimators—estimating costs based on historical bids.

Top management can use AASHTOWare Project BAMS/DSS to keep abreast of the "big picture." Several AASHTOWare Project BAMS/DSS models provide maps showing the geographical distribution of dollars, the activity of the major contractors in the state, and the major kinds of work taking place in different areas and across the state. Maps can also show the location of each item, to give a quick overview of where work is taking place.

Planning officers can use the market shares analysis capabilities to see the total amount of outstanding work. This information is helpful in determining when various projects should be let so as not to overload the market, or not to leave it too quiet so that vendors have to raise their prices to cover idle time.

Contract administrators can use AASHTOWare Project BAMS/DSS to get a quick overview of a large number of contracts.

The contract awards committee, however, will use AASHTOWare Project BAMS/DSS most frequently to determine whether contracts should be awarded to the low bidder, awarded to someone other than low bidder or rejected entirely. The major models for this activity are the bid/estimate review model and the line item profiles. They give a graphical representation of how the bidding pattern compares between bidders, engineers' estimates, and historical prices. This can be used to spot front-end loading, unbalancing, and complementary bidding.

The bid evaluation model can compare these deviations in the bidding to historical deviations on similar types of items, or if they are the kind of random alterations that can be expected in a fair market. The vendor competition models help find complementary bidding. Finally, market shares models can be used to analyze the outstanding work major contractors have, to determine if they have the capacity to be awarded the new jobs or not.

Construction cost estimators can use AASHTOWare Project BAMS/DSS in two ways: to determine how well they have been estimating award prices in the past, and to look at bid prices in the past and determine what they should estimate for the future. The cost and quantity variance models are very useful for comparing the engineer's older estimates to the actual bid and built amounts. The item rank model can be used to determine those items that are most important for accurate estimation, because it will show those items that are major dollar items across time.

The price history model can be used by estimators to look up similar jobs in the past for item prices and see what was bid. The PRICES model helps to determine the effects of both quantity and inflation over time on bid prices. The PEMETH model can be used for very sophisticated statistical analysis for key items or to provide data used by AASHTOWare Project Preconstruction™, AASHTOWare Project Estimator™ (Highway Construction Cost Estimator), and AASHTOWare Project Cost Estimation™ to automatically estimate prices in the future.

Data Warehouse

AASHTOWare Project BAMS/DSS helps perform market analysis, optimize contract sizing and scheduling, and measure the degree of competition in your markets by utilizing a historical repository of data. This repository contains information from all phases of the estimating, bidding and contract lifecycle, along with analysis models and ad hoc analysis capabilities.

The data warehousing provides a reliable means for creating precise item catalog files for use in AASHTOWare Project Estimator, AASHTOWare Project Preconstruction and AASHTOWare Project Cost Estimation, in addition to the powerful features that allow you to perform detailed bid and contract analysis, market price and vendor competition research, and short- and long-range estimate planning and budgeting.

The core of AASHTOWare Project BAMS/DSS is a historical database of information gathered from all phases of the contracting cycle:

- Descriptive and estimation information is gathered from the pre-letting phase.
- Bid information and winner's information is gathered from the letting and award phase.
- Final item quantities and completed contract information are gathered from the construction phase. The result is a database specifically designed to support executive-level decision making with timely management reports and ad hoc analysis capabilities:
- Tabular and graphic output from the BAMS/DSS models show statistical details for contracts, projects, items, and vendor performance.
- Numerous options allow the users to custom-tailor the models to meet their specific needs. Each user's option preferences can be stored in model profiles for future use.
- Each user can choose a specific subset of the database to be analyzed. These subsets are stored in mini databases for future use.
- Each user can choose the specific contracts in the database that need to be analyzed. These contract selections can be stored in subset files for future use.
- Ad hoc analysis programs can be written to perform analyses that are not available via the AASHTOWare Project BAMS/DSS models.
- Custom analysis models can also be designed and implemented.

Data Flow

AASHTOWare Project BAMS/DSS is a part of every functional area of a construction project because any data that is produced from the process is archived for analysis. At set times determined by each agency, bid data and