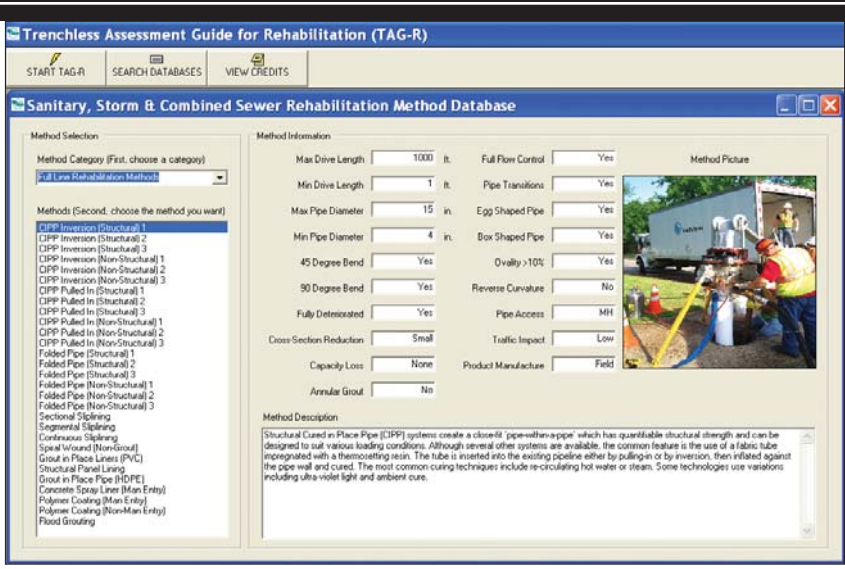

Figure 1. Database of trenchless technology options.

SOLUTION SELECTOR

Software from NASSCO helps users identify the trenchless technology best suited for specific pipe and work site conditions

By Erik Gunn

Trenchless technologies for replacing water and sewer pipes — lining, pipe bursting and others — have become well established. For prospective users, a key question is which trenchless technology is the most cost-effective for a given application.

The National Association of Sewer Service Companies (NASSCO), with the Trenchless Technol-ogy Center at Louisiana Tech University, has stepped in with the Trenchless Assessment Guide for Rehabilitation software (TAG-R).

The software provides guidance in the decision-making process. By entering specific variables related to a particular trenchless project, users can generate a list of alternative tech-nologies best suited to the task.

While far more complex and sophisticated, the software is roughly analogous to online utilities such as mortgage calculators that output a monthly payment when a user enters variables such as the principal and interest rate.

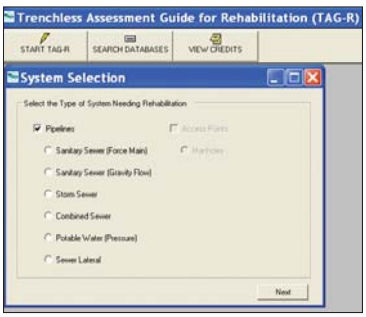

Figure 2. System Selection screen.

For demonstration, NASSCO provided a copy of TAG-R for an office computer equipped with the Microsoft Windows XP operating system. Once the software was installed, Gerry Muenchmeyer, technical director, illustrated the process of using TAG-R to choose a trenchless method.

Walk-around

TAG-R was installed from a standard Windows-type setup file that left behind a desktop shortcut to the application. The installation took less than 10 minutes. Once installed, the components, including a Micro-soft Access database underlying the program, took up just over 116 megabytes of hard disk space.

Clicking on the shortcut icon first opened a dialogue box disclaiming any warranty for any system chosen as a result of using the program. A second disclaimer noted that the software "limits input data to those readily available to utility and municipal engineers at the design stage of a renewal project."

The opening screen displayed three buttons in the top left corner of the window: Start TAG-R, Search Databases, and View Credits. The latter opened a window showing the NASSCO and Louisiana Tech logos and the names of the application developers.

The Search Databases button brought up a complete overview of the information stored in the TAG-R software. It opened a window offering a choice of four databases of rehabilitation methods:

- Sanitary, storm and combined sewers
- Lateral and connection seals
- Potable and nonpotable water lines
- Manholes.

Clicking on any of the database buttons led to a drop-down menu of sub-categories of types of projects. For instance, the sewer database menu offered a choice of full-line or spot-repair methods, and the water menu offered a choice of potable or nonpotable water methods. When the choice was made from the drop-down menu, the database showed all the methods suitable to that purpose, without taking into account any variables for the specific job.

The Start TAG-R button initiated a series of steps in which the project specifications were to be entered. The information entered enables the program to narrow the trenchless options to a short list of methods tailored to the project.

TECHNOLOGY TEST DRIVE

PRODUCT:
Trenchless Assessment Guide for Rehabilitation (TAG-R) software

SUPPLIER:
National Association of Sewer Service Companies (NASSCO)

LOCATION OF DEMO:
Via telephone

DEMONSTRATED BY:
Gerry Muenchmeyer, NASSCO technical director

LIST PRICE:
$100 for NASSCO members, $195 for non-members

Operation

At Muenchmeyer's instruction, the software was started. On the software's opening screen, a click on the Search Databases button showed the entire list of technol-ogies included in the software (Figure 1), grouped by various categories of projects listed in a drop-down menu.

Under a heading of Method Information, the tool displayed various minimum and maximum parameters under which each method can be used. Descriptions and a photograph of each process were included.

"If you don't want to run the pro-

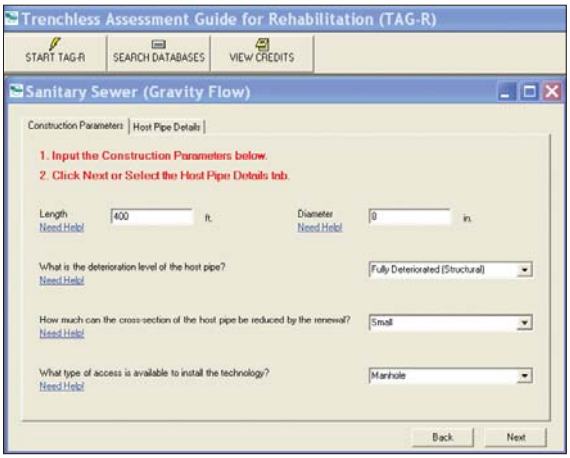

Figure 3. Gravity Flow Sewer screen with selection made under Construction Parameters tab.

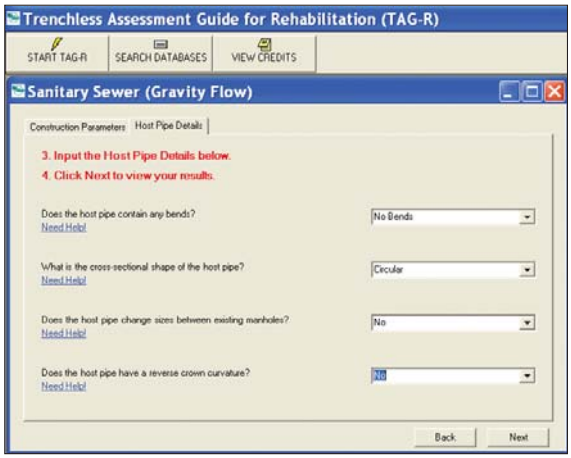

Figure 4. Gravity Flow Sewer screen with selections made under Host Pipe Details tab.

gram itself, you can get a lot of the information right here," Muenchmeyer said. However, under normal circumstances, it is unlikely that the operator would use the Search Databases view.

Closing the database window returned the view to the opening screen. The normal starting procedure would be to click the Start TAG-R button. Clicking on that button opened a new dialogue window, System Selection (Figure 2), offering initially two choices: Pipelines, and Access Points. Pipe-lines listed six alternatives:

- Sanitary sewer (force main)
- Sanitary sewer (gravity flow)
- Storm sewer
- Combined sewer
- Potable water (pressure)
- Sewer lateral.

To demonstrate the most common system for which trenchless rehabilitation is used, Muench-meyer suggested checking the Pipelines box, then selecting sanitary sewer (gravity flow). Clicking on the Next button brought up a window showing two tabs: Con-struction Parameters in front and Host Pipe Details behind.

The front tab included five fields to be filled out. Two required numbers to be entered for pipe length (feet) and pipe diameter (inches). The other three had drop-down menus to select for deterioration level, the amount by which the pipe cross-section could be reduced, and the kind of access available to the line. For each item a Need Help button provided access to information explaining what data was to be entered for each field.

For the demonstration, 400 feet was selected for the length and 8 inches for the diameter (Figure 3). The drop-down menus for deterioration offered two choices based on ASTM standards: Fully Deteriorated and Partially Deteriorated.

Fully Deteriorated was selected. For the permissible cross-section reduction, Small was selected, and for access available, Manhole access only.

Clicking Next opened the host pipe tab with four drop-down menus for whether the pipe contained bends; its cross-sectional shape (circular or box); whether it changed size; and whether it contained reverse crown curvature. The options for no bends, circular shape, no change in size, and no reverse crown curvature were selected (Figure 4).

Clicking Next led to a screen with a limited list of technology choices — in this case four: CIPP Inversion, CIPP Pulled in Place, Folded Pipe, and Spiral Wound. Clicking on any of these produced details from the application database (Figure 5).

Muenchmeyer then repeated the process, this time directing the choice of other options: a storm sewer, 300 feet, 24-inch diameter. In this example, selections were Fully Deteriorated pipe and Small Cross-section Loss. Also chosen were Either (access pit or manhole access), No Bends, and Circular cross-section, no size change and no reverse crown curvature.

The final list of technologies was the same. Muenchmeyer then backtracked to the question about cross-sectional loss and selected Medium. Now, in addition to the technologies suggested earlier, the final list of options included sectional slip lining, segmented slip lining, and continuous slip lining.

Observer comments

The application was intuitive and straightforward to use. One confusing moment occurred when the final list of options was presented in the storm sewer example: The category listed still showed Full Line Sanitary Sewer.

The software provides guidance in the decision-making process. By entering specific variables related to a particular trenchless project, users can generate a list of alternative technologies best suited to the task.

Supplier comments

Muenchmeyer acknowledged that some refinement could be made to avoid the confusing category listing on the final screen and explained that it occurred because both sanitary sewer and storm sewer options were drawn from a single database.

NASSCO markets TAG-R as a free-standing software application, but it also includes the software as part of its training program for trenchless inspection. The training program enables municipal engineers and allied professionals to obtain a certification to qualify as inspectors of trenchless projects.

Muenchmeyer notes that during its development, TAG-R was subjected to extensive peer review by experts in various trenchless technologies to ensure that the database accurately reflected the full capabilities of each system and that it did not unfairly favor certain technologies over others.

He also observes that use of the software is only a first step in selecting a technology. "We evaluated putting risk factors in as part of the selection criteria," he says. "We ultimately eliminated that because risk is really the contractor's decision."

Use of the software would be followed by a discussion with contractors over the finer points of each option, and then a design by engineers knowledgeable about the selected technology. The computer program "is not meant to design a project." ✦

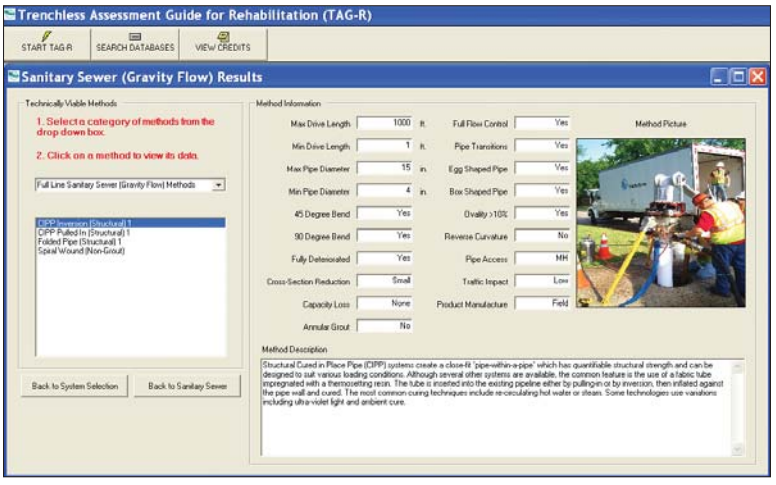

Figure 5. Results screen showing details from the application database.