

This article appeared in the March/April 2000 issue of ***Talk of the Towns & Topics***, a publication of the Association of Towns of the State of New York, and is reprinted with permission.

“Firms (and Towns) Benefit from Bringing Technology to the Infrastructure Cycle”

By Richard F. Laberge, P.E., President

Laberge Group

Driving the success of E/A firms is the never ending “Infrastructure Cycle” of Design – Build – Maintain – Restore – Design. The rapid growth and subsequent sprawl following World War II created a tremendous demand for design and construction. With such a demand for construction, little thought went into plans for maintenance. Now, much of the infrastructure that was built in the 1940’s, 50’s, 60’s, and even in the 70’s is inadequate for current needs and is being scrutinized over concerns for public safety. It usually takes a crisis - a bridge collapse, water main break, some type of accident, or a threat of competition, to initiate a proactive approach to asset management.

Compounding the problem is that the information related to design specifications, maintenance records, etc., is often stored in filing cabinets, notebooks or miscellaneous binders, and is not readably accessible. With such a system, making good decisions about maintenance, repair or replacement is extremely difficult and frequently requires the help of consulting engineers.

Design firms that have adopted new technology can help with these issues in a number of ways. On new Design/Build Projects, firms can provide information in both paper and

electronic formats. Many governmental agencies and large corporations already require this. Firms can also provide additional consulting services in developing a strategy for long-term maintenance. When selected to evaluate and create solutions for existing structures, firms can integrate technology in the process and assist clients in transforming existing paper records into an easy-to-use database system. These approaches help improve the infrastructure and assets needed to sustain economic growth on both a public and private level.

Fortunately there have been a number of breakthroughs that make it affordable for practically any organization to transform a paper-based system into a master database. What was once only available to elite corporations and government agencies is now available on a widespread basis with only a modest investment. Using a combination of Global Positioning Systems (GPS), laptop and pen-based computers, various software applications, scanners, digital cameras, etc., project and asset information can be efficiently consolidated with off-the-shelf software like Microsoft Access.

Once selected to evaluate infrastructure conditions, firms must collect and interpret data. Given the limited access, availability and reliability of information in a paper-based system, firms generally perform some type of onsite inventory and/or inspection. By integrating technology early-on in this process, information is collected in the field electronically, and in a format that is easily transferable to other applications.

Digital photographs, plans, maps, notes, forms, etc. can be instantly accessible to project managers at the “home office” through a network system allowing firms to better manage the workflow. If available, the original designs, descriptions, noted repairs, etc. that are stored in a

client's file cabinets, which are frequently needed anyway, can be entered or scanned into a computer for electronic retrieval. Once completed, all the information related to the project can be packaged in a functional database system that is user-ready by clients and relatively inexpensive. This "packaged" format then allows clients to better manage their assets and improve decision making.

An illustration of this concept is Region 8 of the New York State Department of Transportation. Encompassing seven counties to the immediate south of the Capital District, Region 8 is responsible for 5,696 miles of highway, more than 1,124 State owned bridges, and 1,241 small bridges and culverts. While Federal initiatives provide for the inspection of bridges that span more than 20 feet, standards are less stringent for structures between 5 and 20 feet. The Region recognizes the importance of these smaller structures in terms of public safety, flood control, and storm water management. By integrating technology (GPS, Digital Cameras, Laptop and Pen-based Computers, etc.) into the inventory and inspection process, the Region has been able to centralize records while making them available to multiple organizational levels. They have also been able to pinpoint structures that need immediate repair. Using standardized evaluation procedures, the Region has been able to identify short- and long-term needs and can project future maintenance requirements as well.

The application and benefits of these principles is unlimited. In property management, a database could be used to track and manage signage, parking conditions, accident reports, etc. A key point is that practically any type of information can be cataloged in a master database. Such a database should be viewed as standard equipment, much like the typewriter once was.

Further, any data that can be linked to an address and/or GPS coordinates can be integrated into a Geographic Information System (GIS).

For firms that have internally adopted technology, there is a great opportunity to provide additional consulting services in the areas of information systems, maintenance strategies, and asset management. Whether it's public infrastructure like highways, bridges, and water systems or commercial concerns like buildings, real estate or equipment, the approach is the same. By analyzing and helping clients understand the Infrastructure Cycle, firms can better retain clients, develop long-term relationships, and expand their consulting services.