



BRINGING BROADBAND TO THE BAYOU

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But the people cannot have wells, and so they take rain-water. Neither can they conveniently have cellars or graves, the town being built upon “made ground”; so they do without both, and few of the living complain, and none of the others.

— On New Orleans, Mark Twain from *Life on the Mississippi*

Two years ago, GuideLines® Online brought readers the story of Renaissance Integrated Solutions (RIS) and a disruptive pipe-bursting technology that would allow municipalities to rehabilitate failing sewer systems while deploying an advanced, and profitable, fiber-optic infrastructure for virtually the same cost as replacing the pipes alone.

Dozens of major cities across the United States were under fire from the Environmental Protection Agency (EPA) to clean up their antiquated wastewater management systems, and few – if any – of them were able to absorb the massive investment required without major increases in fees and taxes for citizens. The RIS solution offered these cities a lifeline by not only addressing the sewer problem, but creating a powerful economic development tool to help the city bring new business to town.

New Orleans, Louisiana, birthplace of jazz and home to nearly 500,000 citizens, is bringing both better sewer systems and fiber to its residents and businesses with RIS technology, the first major U.S. city to do so. How is the “Crescent City” getting it done? What were the deciding factors in pursuing this path to rehabilitation? And what’s next for the City of New Orleans?

DPR Technology: Two Infrastructures in One

Renaissance’s patented dual-purpose rehabilitation (DPR) solution uses pipe-bursting technology to rehabilitate the sewer system while simultaneously installing new fiber-optic conduits around the exterior of the new sewer pipes. Pipe bursting, a widely accepted method for infrastructure rehabilitation, plows through the existing pipelines underground, compacting the pipe fragments into the surrounding soil – with the added benefit of upsizing the thruway as it does so – and then typically drags new pipe behind it.

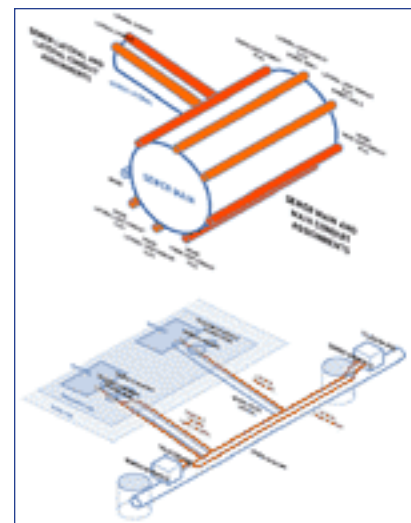


Fig 1: Renaissance’s DPR technology brings fiber-optic conduit, co-located but separate from the sewer line itself, to every building in the sewer system.

With DPR, in addition to the new, high-density polyethylene (HDPE) pipes that replace the aging sewer lines, the exterior of each new sewer pipe is surrounded by conduits for fiber-optic cable. The Renaissance technology can be used not only to rehabilitate the main lines of the sewer system, but the lateral connections that run to each premises. The result is two unique and separate assets, one wastewater management system and one communications infrastructure, using the same rights of way and reaching every building in the city (see Figure 1). Unlike other methods that use sewer rights of way to deploy communications conduit, the two infrastructures are separate rather than a “pipe-within-a-pipe” deployment. In fact, the fiber conduits and the HDPE sewer pipe are not attached and do not affect one another.

Renaissance’s chief executive officer and co-founder, Stephen Paletta, said this elegant solution was designed to address what is quickly becoming a national crisis – failing sewer systems – in such a way that municipalities, which are traditionally cash-strapped for such improvements, can not only address the problem but do so in a way that is both economically and politically advantageous.

“Most community residents do not care much about their sewer system as long as the toilet flushes,” said Paletta. “Sewer rehabilitation has been a money pit for most cities, with huge costs and little visible reward for the average citizen. In fact, a typical sewer rehab comes with a fairly hefty tax increase or boost in sewer service fees for the city’s residents, which makes no one happy.

“However, if a city can upgrade that sewer while simultaneously creating a brand new revenue source – a fiber-optic network to lease to carriers or operate themselves – to pay for most, if not all, of the improvement, that’s a huge win for the city. And at the same time, you are paving the way for an ultra-fast, high-tech infrastructure throughout your city, which offers residents extraordinarily tangible benefits.”

DPR also reduces the “nuisance factor” for cities that must rehabilitate their sewer systems, another big win for city residents and government. Pipe-bursting, because it is a trenchless solution, is less disruptive to current infrastructures, such as roads, and takes less time. Pipe-bursting methods are also safer for both crews and the environment, all of which are appealing to residents and the city’s public works agencies. Images from an actual deployment can be seen in Figure 2, and Figure 3.

And all of which was very important to the City of New Orleans, which needed to upgrade the wastewater lines running underneath the streets of its central business district, most of which is also designated an historic district.

Wastewater and Broadband in the Business District

New Orleans’ central business district (CBD), located just beside the more widely known French



Fig 2: With pipe-bursting technologies, little excavation is required for deployment; here, only a few cuts have been made in the pavement for deploying lateral connections from the main line directly to buildings. (Photo courtesy of RIS: New Orleans CBD deployment.)



Fig 3: Beginning deployment of the rugged new HDPE pipe (white) and fiber-optic conduits (multi-colored). Photo courtesy of RIS.

Quarter of the city, holds a lot of history within its 14 square blocks. A tight and congested network of narrow streets and heavy traffic, most of the CBD was once Faubourg St. Mary, the sector where Americans settled after the Louisiana Purchase of 1803, according to the New Orleans Preservation Resource Center. Today, the area, which comprises much of New Orleans' downtown, is a diverse mix of residences and businesses, with architecture ranging from ultramodern skyscrapers to Greek Revival manors and antebellum mercantile buildings (Figure 4).

Beneath these streets are aging sewer lines made of vitrified clay, some at least 100 years old, and in poor condition. Over the years, the sewers have been invaded by tree roots and suffered joint failures and cracks. The city's flat, below-sea-level geography creates an additional challenge as there is virtually no slope to maintain velocity through the sewer pipes, leading to debris settlement within them, according to Marty Dorward, vice president of Montgomery Watson and Harza (MWH), an engineering consultancy hired by the city's Sewerage & Water Board (S&WB) to oversee its sewer rehabilitation project.

The U.S. EPA has taken action against many cities, including New Orleans, in the past decade to correct wastewater problems that come with age and, in most cases, against cities that have grown far beyond the capacity of their antiquated sewer systems. A 1998 consent decree signed with the EPA mandated that New Orleans completely rehabilitate its entire sewer system by 2010 – a project with an area of 86 square miles and an estimated \$624 million price tag.

New Orleans' S&WB learned of the Renaissance solution through Morgan Stanley while researching methods for reducing bond debt. Morgan Stanley's municipal bond underwriting group has reviewed and endorsed RIS's technology as an innovative business concept. While the city had already begun its sewer rehabilitation project without Renaissance, city officials and Dorward were immediately intrigued by the possibilities it afforded.

"Renaissance brought a really compelling case with its business model, tying required municipal sewer rehabilitation with a potential revenue stream and additional value-adding infrastructure for nearly the same cost," said Dorward, who is also a member of the North American Society of Trenchless Technology. "And our central business district was the ideal candidate for a pilot of the technology. It has its own contained sewer basin, as a business district it showed the greatest initial promise for generating revenue from a fiber-optic infrastructure, and the EPA schedule required the CBD rehabilitation be completed by the end of 2005. It made a lot of sense."

New Orleans' S&WB, with the endorsement of the city's mayor, the Hon. C. Ray Nagin, brought Renaissance's DPR solution to the city's central business district, where its 26,000 feet of the main



Fig 4: New Orleans' central business district is a blend of the old and the new. Both ultramodern skyscrapers and antebellum commercial row buildings can be found within its 14 square blocks.

line and lateral sewer pipes will be rehabilitated with HDPE pipe and fiber-optic conduit. Renaissance does not deploy its pipe-bursting technology directly, but works with the city's public works agencies to adapt the technology to their own operations. In this case, the city put the deployment contract out for public bid and in December 2004 awarded the construction contract to the lowest qualified bidder. Deployment began and ends in 2005.

Once complete, more than 200 buildings will be part of the fiber-optic network infrastructure. The city, the sewerage and water board and MWH are working with Renaissance to evaluate expanding the scope of the project beyond the CBD deployment in the future.

Environmental Upgrade and Economic Development

Municipalities have been leaders in last-mile fiber deployment in the United States for several years, with mostly small and mid-sized towns across the country bringing true broadband connectivity to their citizens. Now there is a means for larger cities to join the trend, improving their citizens' quality of life while simultaneously addressing an environmental issue that time is only worsening, and one that most of them are required by law to correct.

"We have something at our fingertips that has incredible potential," said Nagin in the *New Orleans Times Picayune*. "Telecommunications companies will tell you that the last battle is getting fiber optics to the home."

The economics of using DPR technology are obvious, offering cities an opportunity to rehabilitate their sewer systems while creating a new revenue stream to help fund the repairs. But for any city, the benefits extend beyond having a fully funded new sewer system. City officials deploying DPR bring the most advanced, robust broadband technology in the world to their citizens, positioning the community for a massive competitive advantage in recruiting and retaining industry and commerce.

This is particularly true for New Orleans, which is deploying co-located sewer and broadband infrastructures first in its central business district. According to Renaissance's Paletta, before this project began, only 5 percent of businesses in the city had fiber connections (and only 1 percent of homes). With the 14 square blocks of New Orleans' central business district – which is in the heart of the city's downtown – providing direct access to an advanced fiber-optic network, the city's economic incentives for attracting and retaining businesses to the area become more robust.

Even more important in the mind of Greg Meffert, the city's chief information officer, the network allows them to fulfill a promise Nagin and his administration made when they took office: to be agents of change, and be willing to take bold steps to improve the quality of life for the citizens of New Orleans.

"We're very much a reform administration," said Meffert. "We came in with kind of a vision that almost any change is going to be good for this city. And we have a very real belief about changing the city through technology. I know it sounds cliché, but we really believed that was the only way to accomplish what we wanted to do for this city."

That included addressing what they saw as an alarming educational and digital divide among young people in New Orleans, school systems “imploding” on themselves and students unprepared for the workforce after graduation, Meffert said. Bringing in a digital network and teaming up with Microsoft and Dell on content and applications, New Orleans plans to bring training and education to its underserved constituents.

“These are lofty ideas,” said Meffert, “but they’re being made practical and pragmatic. We understand that ‘wouldn’t it be nice’ doesn’t do the job. You have to make it executable. We were ready to try the Renaissance solution (to make it happen). We’re not afraid of innovation. You can’t be.”

Once the CBD project is complete, the city plans to lease the fiber-optic conduit to telecommunications carriers, which can run their own fiber through the conduits, as well as keep a portion of the network for the city to address municipal needs. The city of New Orleans will immediately begin to recoup their investment in the sewer rehabilitation by receiving 85 percent of the leasing revenues from the carriers; Renaissance will receive 15 percent of leasing revenues. Other communities deploying the DPR technology could do the same, choose to sell their conduit outright, or deploy their own fiber optics and either run it as a new utility or lease the fiber to one or more carriers.

“New Orleans is one of the poorest cities in the country; clearly, the ability to address its sewer situation while creating a second, distinct revenue stream is a major win for this city,” concluded Dorward. “In the past, there have been numerous ideas of how to use public sewer systems to bridge the last mile, but they never took hold because the technology was based on putting the fiber inside the sewer pipe itself. That’s a tough sell with operators. This is the first system that keeps the conduit separate, keeps the two infrastructures separate.

“If cities have looked at this possibility in the past but dismissed it because of this operational concern, this is a chance to take a new look at bridging the last mile along with their sewer rehab.”

According to RIS’s senior vice president of corporate development and general counsel, David Rubenstein, “The DPR technology allows for a wide spectrum of accretive business models to be established in any given city. A city can choose to own or not own the fiber conduit, own or not own the fiber, sell or not sell communications services, or any combination of the above scenarios, each with different risk/reward payouts. Irrespective of the specific business model that is established, the municipality generates a new and significant non-rate based revenue stream on a capital investment that must be made anyhow by federal mandate.”

Meffert says cities need to be ready to invest, but also need that immediate return on investment. “Spend \$30 million but save \$40 million? That’s how you keep this train rolling,” said Meffert. “It’s absolutely critical that projects like these for cities are cash neutral at worst, better cash positive. In today’s environment, you can’t wait four years. This (the Renaissance solution) helps make that happen.”