Celebrating 100 Years of Innovation & Excellence
STV at 100 Years
STV executive chairman Dominick M. Servedio, P.E., and president and chief executive officer Milo E. Riverso, Ph.D., P.E., thank the firm’s clients, partners and employees for a century of support and success.

The Foundation Firms
For STV to reach 100 years, it took the drive, vision and enduring impact of numerous firms that formed its foundation and strengthened its core.

Building Value Together
STV’s decision to go private changed the landscape of the firm.

An Imprint on History
From its first projects to today’s, STV’s work has made a lasting impression.

Social Building Blocks
A history of supporting the health, education and welfare of communities everywhere.

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GRAPHIC DESIGN
Whitney Plant
Providing Defense for Our Nation
Supporting the U.S. military and its partners at home and overseas.
- Local Responders .................................................. 43
- Researching the Extreme ........................................ 46
- Bringing More to Federal Clients Overseas .............. 50

From Space to Cells
Supporting the advancements of science, technology and energy.
- National Honors Times Two ..................................... 56
- Advancing Technology in the Private Sector .............. 58
- Overseeing the Evolution at Brookhaven ................. 61

Taking the High Roads
Roadways and bridges meet rising demand and higher safety standards thanks to STV.
- Providing a Lift for Moveable Bridges ....................... 66
- Safer Roads for All .................................................. 69
- Looks Matter ............................................................ 70
- Emergency Responders .......................................... 75

Transportation Masters
Developing ways for commuters to get around by train, bus and more.
- Overseeing Projects for the FTA ............................... 80
- Leading the Way at High Speeds .............................. 86
- Supporting the Mass Movement of Goods ............... 91
- Aviation Aces ....................................................... 100
- Getting on the Bus ............................................... 107

Powering the Environment
STV’s energy and environmental disciplines provide greener solutions across all markets.
- Protecting the Endangered ...................................... 111
- Developing Alternative Solutions ......................... 112
- Building Waterfalls .............................................. 117
The roots of STV can be traced back to 1912 to a single structural engineer who specialized in designing structures and foundations. Now, as our firm has reached the century mark, we are still building on these foundations – embracing our tradition and experience while forging a vision to leave an even larger mark on the future.

As you read about STV’s 100 years of history, you will note that even as the world and industry were changing, our philosophy towards our clients, business partners and employees has been consistently rooted in the idea that to achieve a sustained level of success, you have to be quality-driven and client-focused. You have to hone your craft and gain knowledge and experience by developing solutions for a wide range of projects.

We’d like to thank all of you who have made this milestone possible: our clients, who have worked with us to develop lasting relationships; our business partners, who shared the opportunity to work on one-of-a-kind projects and embraced new technologies; and our employees, who strive to make STV the best it can be by constantly reinventing what it means to be the company of choice. As an employee-owned firm, our planners, architects, engineers, environmental scientists and construction managers have a personal stake in the business, which means quality performance is a top priority as we look toward our next 100 years.

ENDURING. DRIVEN. VISIONARY.
To grow into what we are today, it took the drive, vision and enduring impact of numerous firms to form STV’s foundation. The earliest of these foundation firms opened its doors in New York City in 1912. Since that time, STV has strengthened its core by adding other organizations, many of which have deeply embedded roots in their communities that go back to the first half of the 20th century.

**Elwyn E. Seelye & Co./Seelye Stevenson Value & Knecht**

Elwyn E. Seelye was a Cornell University-educated engineer who worked with the New York Central Railroad during the design of Grand Central Terminal. As described in a 1953 interview in *Consulting Engineer* magazine, “Seelye prefers to speak of himself as a ‘bottom-of-the-caisson man,’ and as a stickler for personal follow-through and supervision of the toughest phases of any project on which he works.” He founded his firm, Elwyn E. Seelye & Co., in 1912 in New York and by 1913, brought in the first of the firm’s employees, fellow Cornell graduate Albert Stevenson, also a structural engineer.

From the earliest years of his career, Seelye was known for innovative designs of structural foundations. The bulk of the firm’s early work came through providing engineering services as subconsultants to architects. As a result, Seelye worked with many nationally recognized designers such as John Russell Pope, McKim, Mead & White and Joseph Freedlander, as well as well-known school architects E. Post Tooker and Reginald Marsh.

In 1945, Seelye published the first of his three books dedicated to engineering, *Data Book for Civil Engineers*. 
Volume one focused on design, volume two on specifications and costs, and volume three on field practice. While concrete and steel have changed over the years, there are engineers to this day who still refer to the books and their hand-drawn charts and diagrams.

By the 1940s, Seelye began to branch out and brought in partners who had experience working in new areas, including mechanical and electrical engineering. In 1947, Col. Burnside Value, a former army engineer, joined the firm, managing the company’s work for the U.S. Air Force, the U.S. Army Corps of Engineers and the U.S. Navy’s Bureau of Yards and Docks. By 1951, the final piece of Seelye’s partnership was in place when A. Wilson Knecht, a Stevens Institute of Technology graduate, joined the firm, creating Seelye Stevenson Value & Knecht (SSV&K). Seeyle died in 1959.

Knecht eventually rose to become chairman and director, a position he held until SSV&K was acquired in 1972 by STV, Inc., an engineering and architectural firm based in Pottstown, PA. SSV&K became a unit of STV, Inc., with Knecht as director and president until his death in 1973. Under STV, SSV&K continued to grow into a nationally recognized name throughout the United States. By the early 1970s, SSV&K and STV ventured into the mass transportation industry. Charles Defendorf, a veteran of the Penn Central Railroad, was brought in as president. One of his key hires to build up the rail practice was an assistant director with the New York Metropolitan Transportation Authority, Dominick M. Servedio, P.E. Today, Servedio is STV’s executive chairman.

“SSV&K hired a number of employees who had previously worked at major railroads across the country,” said William F. Matts, P.E., who joined SSV&K in 1978 and today is executive vice president and chief operating officer of STV’s Transportation & Infrastructure Division. “With this level of talent and expertise, we were never fazed by the fact that we were aggressively entering an industry where we had to compete against firms much bigger than ours.”

Sanders & Thomas/STV, Inc.
In March 1945, Pottstown, PA, like the rest of the United States, was bustling with industrial activity in the wake of World War II. Whitney Sanders and A. Ralph Thomas, an associate at Jacobs Aircraft Engine Co., decided to take
advantage of the growing demand for technical services by launching their own firm, Pottstown Tool and Engineering Company. The firm was renamed Sanders & Thomas (S&T) the following year.

The partnership set up its operations in the Security Trust Building in Pottstown. S&T soon began expanding into other parts of Pennsylvania, including Reading and Philadelphia, and by 1952 added architectural engineering capabilities through a partnership with architect Charles Bickler. The resulting subsidiary firm went on to design a number of schools, churches and other buildings that still stand in Pottstown today. They also supplied a range of services for the U.S. military and federal government. This included testing equipment in S&T's Douglassville office, which was dubbed “The Mushroom Farm” since it had no windows. The testing space was later converted into engineering space.

When S&T merged in 1968 with Voss Engineering, an equipment manufacturer based in Callery, PA, the letters “S,” “T” and “V” were brought together for the first time as STV, Inc., the management holding company established to make possible the acquisition of other firms. Soon after, STV went public.

STV acquired SSV&K in 1972. As Sanders and Knecht told employees at the time of the acquisition, the partnership made sense: “We feel that together we offer engineering capabilities that can take on jobs of practically any type or complexity.”

Lyon Associates

In 1983 STV acquired Lyon Associates, a full-service firm well-known for its international work. Lyon was also able to cement STV’s presence in some of its largest markets today, the Baltimore/Washington, D.C. area and southern California.

“The firm was founded by a number of self-made people,” said Whitney “Sandy” Sanders II, LEED® AP, the founder’s son and a long-standing employee of STV/S&T who’s now retired. “The firm was able to gain respect from its clients early on, and it was on that basis that we were able to grow.”

WHITNEY “SANDY” SANDERS II, P.E., LEED® AP
S&T co-founder’s son and a long-standing employee of STV/S&T
Lyon Associates was founded in 1961 by Frank Lyon, who had acquired Thomas B. Bourne & Associates and its senior personnel. The firm, originally headquartered in Okinawa, Japan, accomplished a tremendous amount of work in Southeast Asia during the Vietnam War, supporting the United States in designing and overseeing construction of military bases, ports and other defense infrastructure in countries such as Vietnam, Thailand, Korea and the Philippines.

“Lyon had a great reputation overseas and was well-known in many arenas,” said Anthony Corteal Jr., STV senior vice president, and a former Lyon employee. “He was a big-picture guy, whose practice went on to establish the foundation for some of what STV does today.”

Lyon was able to make more of an impact in U.S. markets through the acquisition of smaller firms with long-established roots in Los Angeles, Baltimore and the Washington, D.C.-metropolitan region. The Lyon subsidiaries Maryland Surveying and Engineering, and Ewell Bomhardt and Associates supplemented STV’s existing Baltimore practice, Baltimore Transportation Associates, which was established in 1972. Lyon acquisition H.D. Nottingham & Associates, based in McLean, VA, brought with it full-service engineering, architectural and planning services, dating back to 1955.

On the West Coast, Lyon had acquired Los Angeles-based architectural, engineering and planning firm, Donley Bundy & Associates, which was founded in 1952 and had experience in a number of buildings and facilities types, including K-12 schools, augmenting STV’s engineering and architectural practice in Southern California. The Lyon acquisition also included the portfolio of longtime Los Angeles architect Samuel Lunden, who designed numerous landmark buildings including the Pacific Stock Exchange on Spring Street in downtown Los Angeles and had experience dating back before the 1920s.
In the 1990s, the international component of Lyon was sold back to its original owner; that firm is once again operating as Lyon Associates.

**Silver & Ziskind**

The Silver & Ziskind acquisition in 1994 augmented STV's architectural expertise in the justice and institutional sectors, bringing in a portfolio of pioneering planning and design work that included correctional facilities, courthouses, hospitals and other medical treatment centers, and schools. Founded in 1986 with offices in New York and San Francisco, Silver & Ziskind became a permanent joint venture partner with STV in 1989 before its official acquisition five years later.

In 2011 one of the firm’s founding partners, David Ziskind, FAIA, NCARB, LEED® AP, who is still with STV as a senior vice president and chief architect, was recognized for his unique philosophy and global influence on the field of correctional design when he was elected to the College of Fellows by the American Institute of Architects, the organization’s highest honor.

Ziskind and his colleagues have championed correctional design and philosophical concepts such as bi-nuclear schemes that divided housing units with program areas to separate different security levels; facilities designed with a focus on substance abuse and mental health treatment to reduce recidivism; and the evolution of the mini-jail concept, with central unit management areas where programs and services are provided.

“I first became invested in this field of architecture because I saw it as an opportunity to challenge myself and to change the way people think of correctional and justice facilities,” Ziskind said.

**Ralph Whitehead Associates**

By 2006, STV was already well-established in the transportation design industry, but that year’s acquisition of a Charlotte-based civil engineering firm, Ralph Whitehead Associates (RWA), extended STV’s reach more firmly into the southeastern United States.

Founded in 1959 by North Carolina State University graduate Ralph Whitehead, RWA set up shop in Charlotte in 1961 and would go on to work on more than 100 projects in the Charlotte area, including a landmark grade-separation project that helped establish the RWA brand in the city. The firm provided design services for municipalities, state departments of transportation and freight railroads, and eventually expanded its practice to include storm water management, environmental services, geotechnical engineering and design-build projects.

“Ralph was a tenacious recruiter and was always trying to bring the best business development personnel to the firm, which led to RWA’s growth,” said Ed Jenkins, P.E., STV senior vice president and one of seven employees, along with current STV employees Stu Matthies and Bob Baughman, to purchase RWA from Whitehead in 1990. “He had a passion for engineering and was able to build his firm from scratch.”

The firm’s ongoing expansion has led to current offices in Duluth, GA; Atlanta, GA; Richmond, VA; North Charleston, SC; Rock Hill, SC; Jacksonville, FL; Overland Park, KS; and Orlando, FL. In 2009, Whitehead, who died in 2004, was posthumously elected to the North Carolina Transportation Hall of Fame.

**STV Today**

As the firm evolved and grew to better serve its clients, the name evolved as well. From STV, Inc. to STV Engineers, to STV Group and STV Incorporated, the firm’s principles and core values remained the same. In 2001, STV’s employee and public shareholders overwhelmingly voted to take the firm private. Today, STV is 100 percent employee-owned, with employees in more than 35 offices across North America. We thank our employee-owners for being client-focused, innovative and driven to be the best.
STV went private in 2001 under the leadership of then-chairman Michael Haratunian (left) and chief executive officer and president Dominick M. Servedio (right). Today, Servedio is STV’s executive chairman.

One of the defining moments in STV’s 100 years of history came in September 2001 when the firm became a private, 100-percent employee-owned company. It was a decision that was not made lightly, and not without the overwhelming support of STV’s employees and board of directors. But it has proven to be incredibly beneficial, providing more long-term fiscal stability and incentive for employees to collaboratively share in the success of the company.

“I always felt, and feel today, that it was the right thing to do,” said Dominick M. Servedio, P.E., STV executive chairman. “Whereas before we had only a few people owning the majority of STV, now, no one owns more than 1 percent of the company. It was the best decision for our employees.”

Prior to becoming private, STV had been a publicly-traded company on the NASDAQ stock exchange since the 1970s. Around 1981, the firm introduced an employee stock-ownership plan (ESOP) to function as a retirement nest-egg for staff. As time went on, the amount of employee-owned stock, along with stock acquired by the firm’s executive management, only left about 10 percent of STV’s shares available on the open market. The lack of publicly available shares generated little interest from institutional investors and individuals. For example, between 1995 and 2000, the firm had some of its best years in its history profit-wise, but STV’s stock price remained stagnant.
“We believed the value of the stock price and the ESOP was not reflective of the value of the firm,” said Peter Knipe, STV chief financial officer and board director. “The decision to go private unlocked the value of STV.”

Before the decision to go private was reached, other alternatives were first explored, including the sale of the company. But Servedio and the board of directors didn’t believe selling STV would be in the best long-term interest of the firm and its employees. So the board worked with financial advisory firm Ernst & Young to structure a plan to become a 100 percent employee-owned firm.

In order to do this, the firm had to buy out all outstanding shares from non-ESOP shareholders. An outside loan was needed to acquire the capital for this transaction, meaning the company would be going into debt. But to pay back that debt, STV would make an election with the IRS to be treated as an “S Corporation” for tax purposes. As an S Corporation, STV would not have to pay most of the corporate level income taxes that it had been paying since the firm’s only shareholder would be the ESOP, which is not subject to income tax. The tax savings from the S Corporation election amounted to nearly 50 percent of STV’s annual income. In addition to being able to use these savings to pay back the loan, it was also projected to increase the value of the company’s ESOP shares.

But before the transaction became official, STV needed the support of its employees. A four-person outreach team was developed consisting of Servedio and Knipe along with Linda Rosenberg, STV senior vice president of marketing & communications, and Bruce Nickles, STV vice president and director of marketing communications for the federal and central region.

“We were responsible for going to every major STV office over a very short period of time to discuss the plan with employees,” Rosenberg said. “That’s where we explained what going private would mean to all of us for the long-term. It was very exciting, and a game-changer.”

Nickles said a key part of his presentation to employees was how the benefits of going private would best be reflected in everyone’s retirement accounts.

“I realized that under our current (publicly-owned) structure, if I retired then, my wife and I would be able to live comfortably for about a week-and-a-half,” Nickles said. “I challenged my

“I was very proud of the company for making this decision.”

DOMINICK M. SERVEDIO, P.E.
STV Executive Chairman
co-workers to see the downside to this plan, because I couldn’t. It was a plus for all of us.”

The plan was approved with tremendous employee support. As a result, a new board of directors was appointed and going forward, under the ESOP plan, employees voted on future board appointments. New company by-laws were also written.

“I was very proud of the company for making this decision,” Servedio said.

“And it also couldn’t have been possible without the full support of the board of directors. I have always been very thankful to them for that.”

Since just before the firm went private, STV’s stock value has increased by nearly 300 percent, accurately reflecting the firm’s growth and accomplishments in the design and construction industry. Additionally, the ESOP structure is better aligned with the firm’s vision to be client-focused and quality-driven. Rather than relying on the whims of the stock market to set the firm’s value, employees now participate in a system that reflects performance and a long-term investment in the success of the company.

“We wanted something that would motivate our employees and we believe our decision to go private did just that,” Servedio said. “It’s now up to employees to continue to take advantage of this opportunity. It’s in their hands.”

The six-member board of directors feature a wide range of public- and private-sector experience. As part of STV’s decision to become a private, 100-percent employee-owned company in 2001, board members are elected annually by employees.
The world has seen significant changes over the past century and with it the needs of our clients. STV and its predecessors have always been driven to meet those needs. Along the way, the firm has demonstrated its global influence and vision through its role planning, designing and overseeing the construction of projects and initiatives that transcend the traditional parameters of the industry.

STV has historically been known for its work on iconic structures, those that are instantly recognizable by sight or just the mere mention of their names. Or those that are so revered, they are forever preserved and protected through their designation as a national landmark or on the National Register of Historic Places. These projects have come to define the eras in which they were built, designed with the innovative ideas emblemizing the great advances made in the United States over the past 100 years.

And most importantly, they serve as the firm’s foundation, allowing STV to continue to inspire and innovate through its work today.

“STV continues to make history, helping to design and build new iconic landmarks in the 21st century,” said executive chairman Dominick M. Servedio, PE. “By constantly adapting to meet our clients’ evolving needs, our firm is laying the foundation to inspire the communities we serve for the next 100 years.”
Remarkable Buildings in Remarkable Cities

In the first half of the 20th century, STV’s earliest predecessor firms provided engineering expertise to a number of new and existing structures that are still nationally recognized and celebrated today.

One of these, the Thomas Jefferson Memorial in Washington, D.C., functioned as a symbol of hope for a country at war when it opened in 1943, while still providing inspiration nearly 80 years later. Elwyn E. Seelye & Co., STV’s earliest antecedent firm, performed structural and foundation design for the memorial, which was hailed as a “shrine to freedom” during President Franklin D. Roosevelt’s dedication ceremony speech according to the *New York Times*. As a national memorial, the structure subsequently was added to the National Registry of Historic Places and today is managed by the National Park Service. The West Potomac Park site plays host to many events, including the annual National Cherry Blossom Festival.

On the other side of the Potomac, after Seelye’s firm evolved into Seelye Stevenson Value & Knecht (SSV&K), comprehensive structural analysis was provided in 1956 for the restoration of the Capitol Dome. The cast iron dome was originally designed in 1856 and was in need of extensive reinforcement and restoration work. Improvements were concealed so as not to disrupt the beauty of the national monument. SSV&K also designed an electronic bird repellant system and lighting protection system to protect the dome.

Earlier that century, Seelye provided structural engineering services for a facility that today functions as Washington, D.C.’s largest concert hall. In 1929, Seelye supported famed architect John Russell Pope’s design of Constitution Hall for the Daughters of the American Revolution. By 1930, the National Symphony was founded and called the facility home for the next 41 years. Constitution Hall has played host to numerous U.S. presidents and...
Decades before global audiences were able to tap into high-definition televisions and streaming internet programs, STV’s predecessors played an integral role in the manufacturing and production of the phenomenon known as color TV.

After the founding of Sanders & Thomas (S&T) in 1945, STV’s antecedent firm in Pottstown, PA, the firm hired salesman C. Russell Shively, who developed a relationship with RCA Manufacturing in nearby Lancaster, PA. At the time, RCA was producing some of the first color television sets in the United States. Shively’s rapport with this client led to a long-standing relationship that lasted more than 30 years.

“Our employees traveled to Lancaster every day to work on RCA assignments,” said Whitney Sanders II, P.E., LEED® AP, the son of S&T founder Whitney Sanders.

The firm provided design services for electronics machinery and process systems, including the development of the first color TV picture tube manufacturing line in the world, machinery for electron tube testing and checkout, and other services.

Once color television grew in popularity, television studios needed to adjust. In 1964, Seelye Stevenson Value & Knecht, another STV predecessor, was contracted to provide mechanical, electrical and structural engineering services at the CBS Production Center in New York City. The work continued through 1971 and included the installation of quiet, high-capacity air conditioning that allowed the studios to switch from black and white to color television broadcast while compensating for the higher temperatures being generated from the new color equipment. By 1965, CBS was producing landmark color television, including the “CBS Morning News with Mike Wallace,” the first major news network program broadcast in color, and the first-ever color broadcast of an NFL game on Thanksgiving Day in 1965.
A Home for Culture

British critic Matthew Arnold once said that culture was a “study in perfection.” In the first half of the 20th century, Elwyn E. Seelye aided in the enrichment of society by providing engineering design for a number of significant cultural institutions that are still inspiring visitors to this day.

One of the firm’s earliest works was the Freer Gallery of Art in Washington, D.C., the Smithsonian’s national museum of Mediterranean and Asian art and the first Smithsonian museum to be dedicated to the fine arts. It was also the first Smithsonian museum created from a private collector’s bequest – railroad car manufacturer Charles Freer, who told the Smithsonian he wanted “to unite modern work with masterpieces of certain periods of high civilization.” Construction of the museum was initially delayed because of World War I. Groundbreaking eventually took place in 1919 and it opened in 1923.

In New York City, Seelye’s ongoing partnership with architect John Russell Pope led to the design of the Theodore Roosevelt Memorial at the American Museum of Natural History. Dedicated in 1936, the memorial functions as the main entrance to one of the most storied campuses of the U.S. Military Academy (USMA) at West Point has been the home of future U.S. presidents, generals, astronauts and corporate leaders. With more than 200 years of history, the entire central campus, located in New York, has been designated as a national landmark.

But with such age and history comes the need for modernization and renewal. STV has played a central role in equipping the West Point community for the 21st century through a number of new buildings and the rehabilitation of existing ones.

“IT IS a historic site and one needs to be respectful of that,” said Price Jepsen, AIA, NCARB, LEED® AP, director of planning and programming in STV’s Buildings & Facilities Division. “At more than 200 years old, they’re still reinventing themselves, and we’ve been able to help them meet their current needs.”

Jepsen has overseen the design of two brand new facilities at West Point, the Jefferson Hall Library and Learning Center – which was the campus’ first new building in more than 30 years when it opened in 2008 – and the USMA Prep School, which was completed at the end of 2011.

Per the requirements of the client, the U.S. Army Corps of Engineers (USACE), the new structures needed to honor the historic aesthetic of the existing campus. In a September 2008 article in the New York Times, Marc Santora wrote of Jefferson Hall, “The six-story building itself – located on the compact central campus, distinguished by its nearly uniform Gothic-influenced stone buildings – attempts to nod at the past while still appearing modern. Most striking is its use of glass, including 8,000 glass bricks that form a glass curtain on the north side.”

STV’s design experts have a wealth of experience restoring some of the campus’ most historic structures going back some 20 years. In 1985, the firm was contracted by the USACE to design upgraded mechanical and electrical

The storied campus of the U.S. Military Academy (USMA) at West Point has been the home of future U.S. presidents, generals, astronauts and corporate leaders. With more than 200 years of history, the entire central campus, located in New York, has been designated as a national landmark.

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famous museums in the world. Seelye’s work included engineering special caisson foundations.

Other landmark cultural institutions that bore Seelye’s engineering expertise included the Museum of the City of New York, which opened in 1932 to exhibit artwork honoring New York City’s history; the Wadsworth Atheneum, the oldest public art museum in the United States and the first to collect contemporary American art, which opened in Hartford, CT, in 1934; and the Frick Collection in New York City, where renovations took place in 1935. The Frick is one of the preeminent small art museums in the United States.

The Space and Atomic Age
The 1950s and 1960s represented a period of dramatic change in the United States and throughout the world. The end of World War II and the onset of the Cold War led to a revolution in scientific and technological thought. U.S. president John F. Kennedy spoke openly about a determination to put a man on the moon. There was a universal desire to learn more about atomic matter and physics.

As such, the firms that would eventually form STV played a critical role in the design of two first-of-a-kind facilities that emblemized the country’s thirst for sights unseen during this era: the Vehicle Assembly Building (VAB) at NASA’s Kennedy Space Center in Florida – still the largest single-story building in the world – and the Fermi National Accelerator Laboratory (Fermilab) in Batavia, IL, a landmark high-energy particle physics facility that housed the world’s second largest particle accelerator (for more information and photos of Fermilab, please see “From Space to Cells” on page 53).

At 125 million-cubic-feet, the VAB was designed by the joint venture team URSAM, consisting of SSV&K, Max O. Urbahn, Roberts & Schaefer Co., and Moran, Proctor, Mueser & Rutledge, for the U.S. Army Corps of Engineers.

systems in Building 600, a historic landmark that now houses the offices of the superintendent, dean and other personnel. In 1996, STV was contracted to convert a then-86-year-old structure that was the academy’s original cavalry stable into an in-processing center for new officers. During the early 2000s, the firm designed a new press box at Michie Stadium, and provided architectural and engineering services for the reconstruction of a 34,000-square-foot marksmanship facility, which included topographic and geotechnical surveys, design analysis, drawings, specifications, and a cost estimate for a crew sailing area.

Currently, STV is working with another firm to upgrade the gothic-style USMA Science Building into a state-of-the-art facility with chemistry and physics labs.
The facility was initially used to assemble skyscraper-tall moon rockets and eventually the Space Shuttle. At its tallest point, 524 feet, the building was nearly half the height of the Empire State Building. Completely air-conditioned, the VAB is considered an engineering marvel (for more information about STV’s work for NASA, please see “From Space to Cells” on page 53).

“Colossal as the (Vehicle) Assembly Building at the John F. Kennedy Space Center is, the task faced by the designers matched it in every sense,” read a February 1964 article in the Engineering News-Record. “They had to complete the design of this unprecedented structure in less than a year.”

In an October 1964 report from the Associated Press, Urbahn, speaking on behalf of the design team said, “Inside [the VAB] it is somewhat more interesting, with whole buildings hanging from its sides, some of them moving up and down and in and out like suspended file drawers.”

For the 400-billion-electron-volt Fermilab, Robert Wilson, the lab’s first director when the project broke ground in the late 1960s, envisioned its contents as holding “great beauty” that would “add to the satisfaction of our lives,” according to a paper published about the project by the University of Illinois.

In a joint venture, SSV&K provided total mechanical and electrical design, as well as civil and structural support services for the U.S. Department of Energy. The largest component of the project was the design of a circular tunnel four miles in circumference. To function, a proton beam was shot through a small evacuated tube along a linear accelerator and accelerated by a radio-frequency field. The beam was guided by a series of electromagnets channeling it around a booster ring and into a larger ring. At almost the speed of light, the protons were finally sent smashing into the nuclei of target atoms, breaking them apart.

During the design phase, STV helped save the client millions of dollars, and the firm’s innovative construction management process made it possible to complete construction in two-and-a-half years, one year ahead of schedule.
STV and its predecessors have provided planning, design and construction oversight services for buildings and facilities that honor an entire gamut of American legends – from the founding fathers to the “Babe” and Mantle.

In 1974, Seelye Stevenson Value & Knecht helped extend the life of “the house that Ruth built” by designing all mechanical and electrical systems, including field lighting and the sound system, for the $52 million renovation of Yankee Stadium. The renovated stadium played host to some of the greatest moments in professional sports history, including “Mr. October” Reggie Jackson’s three home-run outburst in the 1977 World Series and the team’s dominant 1998 championship season.

When a new Yankee Stadium was being planned by the Yankee organization and New York City in 2005, STV assisted the New York City Economic Development Corporation and the New York City Department of Parks and Recreation in the master planning and development of 5,000 parking spaces to support the new stadium. The planning work also included integrating pedestrian access to new public parks at the site of the old stadium.

Today, STV is providing owner’s representative services on behalf of the Empire State Development Corporation for the construction of a new arena in Brooklyn, NY, which is the future home of the Nets basketball organization. When the arena opens at the end of 2012, it will be the first time a professional sports team has called Brooklyn home since the Dodgers left for California in the 1950s. The state-of-the-art arena promises to redefine the landscape of New York’s most populated borough, while bringing championship memories to a new generation of sports fans.
Since it first opened in 1939, the famous Coney Island Parachute Jump Tower has been a part of the STV family. The 260-foot-tall steel structure was invented by Commander James H. Strong for the 1939 World’s Fair in Flushing Meadows-Corona Park in New York City. Elwyn E. Seelye & Co., STV’s earliest forerunner, provided the engineering for the foundations. The parachute jump was moved to the Coney Island amusement park in Brooklyn, NY, in 1941, again with Seelye’s firm providing foundation services, and was eventually decommissioned as a thrill ride in the 1960s.

Fast forward nearly 40 years to when STV was given the opportunity to preserve what has been nicknamed the “Eiffel Tower of Coney Island.” The firm was contracted by the New York City Department of Design and Construction to provide project management services for the tower’s restoration, which is now on the National Registry of Historic Places. This work included condition assessment services, a summary report, prioritization of options, structural rehabilitation design and construction phase services.

The project was honored with the Lucy G. Moses Preservation Award in 2006, and by the New York Chapter of the American Council of Engineering Companies with a Gold Engineering Excellence Award in the Structural Systems category in 2007.

In 2008, STV was retained by the client to oversee a new lighting design for this iconic structure. This project is still being developed.
Bringing Our Historic Transportation Infrastructure into the 21st Century

More recently, STV has been able to harness both its extensive design and transportation industry expertise to take part in the modernization and renovation of some of America’s most famous transportation institutions.

As a subconsultant to Beyer Blinder Belle, STV was the lead engineer, providing structural, civil, mechanical, electrical and plumbing services for the $250 million restoration of Grand Central Terminal in New York City, dubbed by many as the greatest railway terminal in the world. The terminal is both a National Historic Landmark and the first New York City Landmark. STV’s engineers investigated the building’s foundations, columns, beams, girders, roadway and sidewalk support beams to help restore the terminal to its original Beaux-Arts grandeur from when it first opened in 1913. The project received the 2000 Presidential Award for Design Excellence. Coincidentally, Elwyn Seelye was an assistant engineer during the original construction of Grand Central, before he founded STV’s first predecessor, Elwyn E. Seelye & Co. in 1912.

Across the Hudson River, STV served as the project manager overseeing the team responsible for the development and rehabilitation of the Hoboken Terminal and Yard Complex since 1995. The terminal, which is listed on both the New Jersey and National Registers of Historic Places, is a multi-modal transportation hub integrating commuter rail, light rail, rapid transit, and bus transit with ferry service in New Jersey. All work at the site was performed in strict accordance with the Secretary of the Interior’s Guidelines for Historic Structures.

The STV-led team performed design for the restoration of the elegant main waiting room, the modernization of Yard B and a new wheel-truing building. In December 2011, ferry service returned to the terminal for the first time in four decades, marking the culmination of the 15-year project.

“The design team has been challenged by the need to upgrade existing building systems to integrate new technologies and systems, all with minimal disturbance to the existing historic fabric that makes this structure special,” said Bruce Jabbonsky, RA, project manager for the initiative.

The Renewal of Lower Manhattan

Perhaps no construction project touches the nation’s soul more than the work to rebuild lower Manhattan after the Sept. 11, 2001 attacks. For this momentous initiative, STV is assisting the Port Authority of New York & New Jersey (PANYNJ) on a number of different projects, ensuring that new global icons and landmarks are rising from the ashes of Ground Zero.
In 2004, STV was contracted by PANYNJ to be the architect-of-record for a new World Trade Center Transportation Hub as part of the Downtown Design Partnership, the joint venture team that includes AECOM and is in association with Spanish architect Santiago Calatrava. The Transportation Hub boasts an iconic design with steel “wings” at the top of the structure, mirroring a bird. The Hub will include a permanent Port Authority Trans-Hudson service terminal, connect to 13 subway lines via the Fulton Street Transit Center and other terminals, and link pedestrians to the World Financial Center and its ferries through an underground concourse. “This is the Port Authority’s gift to New York City,” Calatrava said in 2004 after unveiling the design.

To make this landmark facility possible, STV and its partners needed to engineer a solution that was a milestone in its own right. Because an active New York City subway line runs through Ground Zero, the firm developed a way to excavate beneath the 1,000-foot-long subway box, while maintaining current transit service. The tight corners of the work area required construction crews to intricately tear at rock and soil with small

Some of STV’s brightest minds have developed ways to brighten historic buildings and monuments in Washington, D.C.

One of the most notable lighting design projects performed by STV and its predecessors goes back to 1970 when antecedent firm Sanders & Thomas (S&T) developed a dramatic floodlighting system for the Federal Triangle. It stretched from the White House to the Capitol Building and contained a number of key federal offices and buildings, such as the FBI Building, the National Archives and the Department of Justice. In conjunction with the annual lighting of the National Christmas Tree, when President Richard Nixon turned the switch to illuminate the city’s splendor that December, the Federal Triangle was lit for the first time in Washington, D.C.’s history. The goal of the project was to beautify the architectural features of the buildings for night enjoyment while reducing the city’s crime rate.

“The lighting was expected to be complementary to the lighting of the Capitol area so as not to detract from its dramatic effect,” Whitney Sanders, the co-founder of S&T, told the Pottstown Mercury newspaper before the lighting debuted.

More recently, in 2004 STV was brought in by the National Park Service to design a lighting system for the Vietnam Veterans Memorial that would eliminate shortcomings of the old system and comply with current codes. The existing system had frequent lamp burnouts, allowed water infiltration into the lighting units, and created tripping hazards for visitors to the Memorial. In conjunction with George Sexton Associates, the firm designed a new system using luminaires, which require little maintenance and utilize state-of-the-art ceramic metal halide long-life lamps.
equipment. While underpinning work is quite common, to do so over a distance of 1,000 feet, under an active subway line while service was maintained, was a significant challenge.

In addition to the Hub work, STV was selected by PANYNJ to provide owners representative services for the National September 11 Memorial & Museum and One World Trade Center, formerly known as the Freedom Tower. The memorial – twin reflecting pools built in the footprints of the former Twin Towers – debuted September 2011 in an emotional ceremony that marked the 10th anniversary of the attacks. One onlooker described the pools to the Washington Post as “an entrance to eternity.” Construction is ongoing for the museum. Meanwhile, One World Trade Center is still rising rapidly and, when completed at 1,776-feet-tall, it will be one of the tallest buildings in the world and an iconic fixture in the New York City skyline.

“We are proud to be a part of the Downtown rebuilding effort, which has come to represent healing and renewal,” said Dominick M. Servedio, P.E., STV executive chairman. “As engineers, architects, planners and construction managers, it is our nature to rebuild, working to improve the quality of life of everyone.”

Photo courtesy of the Port Authority of New York & New Jersey

STV executive chairman
So says the African proverb, “It takes a village to raise a child.” But it takes a firm like STV to raise that village by providing planning, design and construction management services for building types that are essential to communities, such as schools, libraries, hospitals, health clinics and housing. Without these facilities, a village may be rudderless.

Going back as far as STV’s earliest predecessors, the firm has continually responded to the needs and trends of the community by assisting public and private agencies in the development of institutions that provide vital social services: new and improved schools at the K-12 and higher educational levels that meet growing class sizes and enrollment; healthcare facilities that incorporate constantly evolving technology and innovative medical advancements; safe and reliable public housing that is outfitted with modern amenities; and humanely-designed correctional facilities that have earned STV’s design leaders accolades throughout the industry.

STV has performed work on buildings and facilities that are a part of communities both urban and rural. With such a long-running history of working on these social building blocks, STV has demonstrated that not only does it focus on its clients, but it also focuses on the village and the needs of its entire population.
Meeting a Growing K-12 Population Across Many Eras

As New York City’s population exploded in the early 1900s, the surrounding areas in Long Island, Westchester County and New Jersey transformed from rural farmsteads into thriving suburban communities. Elwyn Seelye, founder of STV’s earliest forerunner, Elwyn E. Seelye & Co., had become well-known for his ingenuity in structural engineering. So to meet growing demand in these newly-minted suburbs, he partnered with esteemed school architects E. Post Tooker and Reginald Marsh to work on the firm’s earliest K-12 projects.

Like Seelye, Tooker and Marsh were published authorities in the industry. In 1920, the duo authored an article in Architecture magazine entitled, “General Principles of School Planning and Construction,” in which they outlined design concepts and general requirements for school buildings. Together, Seelye and Tooker & Marsh collaborated on dozens of elementary, middle and high school buildings, with Seelye supplying the structural engineering and Tooker & Marsh providing the architectural design. The partnership’s first work
was traced back to Cohoes High School (now Cohoes Middle School) in Albany County, NY, in 1919. Other schools designed by the two firms included Hicksville High School in Hicksville, NY, in 1926; White Plains High School in White Plains, NY, in 1929; Mineola High School (now used as a middle school) in Mineola, NY, in 1930; and Garden City School in Garden City, NJ, in 1936.

K-12 projects had become a mainstay for the firm, helping to carry Seelye through the Great Depression and up to the present day.

As Seelye schools continued to sprout up around the New York tri-state area during the 1930s and 1940s, the population in a blue-collar industrial town in Montgomery County, PA, was also on the rise. It was Pottstown, PA, where Sanders & Thomas (S&T) was founded in 1945 as a response to the post-World War II industrial boom that spurred growth and demand for social services and facilities. Seelye and S&T were still years from merging, but their paths were growing closer.

Five years after its founding, S&T brought in local architect Charles Bicksler to oversee a new partnership of architects and engineers, launching S&T Associates as the firm’s primary architectural arm. Under Bicksler’s leadership, S&T designed a number of buildings in the greater Pottstown area that can still be found today, including K-12 schools, churches, banks and retail stores.

By the end of 1956, S&T had just completed what was described to the Pottstown Mercury as its “busiest year” and with good reason – construction was completed on St. Pius X High School and ground had been broken on Owen J. Roberts High School during a ceremony where “the crowd gathered on the high hills which overlook(ed) miles of meadows, farmlands and more hills to the south and west.” And the firm’s prospects were to become even brighter. In 1958, S&T was selected to design the new Pottstown Senior High School. Not only was the school a prized project in a growing portfolio, but it earned glowing praise from the client upon its completion.

“Several educators said (Pottstown Senior High School) was one of the best-planned, best-designed and best-situated schools of its size in the entire state.”

HAVARD FOSNOCHT
Pottstown Superintendent of Schools
“Several educators said it was one of the best-planned, best-designed and best-situated schools of its size in the entire state,” said Pottstown superintendent of schools Havard Fosnocht at the January 1961 dedication ceremony.

S&T’s ongoing success in architectural work led to the firm’s geographic expansion, including a new office in Massapequa, NY, on Long Island, just a few miles outside of New York City. While the Massapequa office specialized in recreational design, such as parks, swimming pools and marinas, S&T’s architects also contributed to Long Island’s growing K-12 school population with the design of East Hampton High School, which opened in 1970 on the island’s east end.

An addition at PS/IS 102 in New York more than tripled the size of the school.

ADJUSTING FOR THE AUTOMOBILE

While immigration and migration in the early 1900s created a population explosion in New York City and its surrounding areas, the rise of the “horseless carriage” created another kind of boom during this time period. Some of the firm’s earliest work centered on facilities that would help the city and its residents adapt to the increased use of automobiles. The Kahn Garage, which opened in 1914 at 120th Street and Lexington Avenue, remains one of the earliest recorded projects designed by an STV predecessor.

“The science of garage construction has kept pace with the phenomenal growth of the motor industry as a whole,” said Elwyn Seelye, founder of STV’s earliest forerunner, in an April 13, 1913, New York Times article. “In the days when a motor car was a horseless carriage, it was housed in any empty shed that the owner happened to possess. ... A few fires, however, and the discovery that gasoline was out of place in stock fodder worked a revolution in sentiment.

It began to be apparent that the motor car must have its own accommodations.”

As parking needs became more advanced, STV predecessor Seeley Stevenson Value & Knecht served as consulting engineers for the Kent Automatic Parking Garage, a high-rise garage in Manhattan that included an automatic “parker” that was said to “save time by bringing a car from its parking space to the ground floor without starting the car’s motor,” according to the New York Times.

To help improve safety for pedestrians and vehicular traffic in New York City, Seelye also provided structural engineering design for the Fifth Avenue traffic towers. These signal towers, designed by architect Joseph H. Freelander, were equipped with telephones, push-button signals and flashlights that were operated by a police officer to help traffic flow along the busy Fifth Avenue corridor in midtown Manhattan.

The Kahn Garage in New York is one of Elwyn E. Seelye’s earliest projects. (right)
By 1972, with A. Wilson Knecht as the remaining partner, S&T’s parent firm, STV, acquired SSV&K. The two firms complemented each other, strengthening their presence in core market areas, such as education, while expanding and diversifying their services to include complete multi-disciplined engineering and architectural design.

**Entering the Urban K-12 Market**

Nearly 10 years later, STV’s acquisition of Lyon Associates in 1983 brought with it an even larger K-12 market in Southern California, home of the Los Angeles Unified School District, the second-largest public school system in the United States. The Lyon subsidiary, Donley Bundy & Associates, was an architectural, planning and engineering firm that was responsible for designing dozens of Los Angeles-area public schools during the 1950s, 60s and 70s, including Los Angeles High School, Verbum Dei High School, West High School, Redondo High School, South High School and Charles Drew Junior High School.

Roy Donley, one of the firm’s principals, had even developed a reputation for flexible design in the K-12 market. The Madison Elementary School in Torrance, CA, was designed as a “portable school” as sections of the facility could be picked up and rearranged to adjust to population shifts.

“In this way, flexibility is built into each school,” Donley said, as reported in 1961 by *The Press* in Torrance. “Classrooms can be easily added when enrollment increases.”

With this West Coast K-12 experience in tow, STV grew its planning, architectural and engineering design services in California. Most recently, the firm has designed an expansion of the Fulton College Preparatory School in Van Nuys, CA, where 97,500 square feet of additions were needed to meet skyrocketing enrollment, and a new Valley Region Elementary School #13 to take the strain off crowded schools in Panorama City, CA.

By the 1990s, STV had cultivated an ongoing relationship with the New York City School Construction Authority (NYCSCA), which oversaw a student population of more than one million – the largest school system in the United States. Under the direction of Maher Labib, former executive vice president and chief operating officer of STV’s Buildings & Facilities Division, the firm worked on a number of unique school projects, including Curtis High School in Staten Island. This state landmark was more than 100 years old and contained numerous distinctive architectural features such as decorative gargoyles, grotesques, parapet walls, finials, flames and floral patterns. STV’s restoration work on the school earned the firm a Lucy G. Moses Preservation Award from the New York Landmarks Conservancy.

The firm’s work with the NYCSCA also demonstrated STV’s ability to work under extraordinarily tight deadlines in order to successfully deliver a project. The In-Tech Academy in the Bronx, a 168,000-square-foot school, which integrates technology, general education and college preparatory facilities, was designed on a fast-track schedule in under six months.

Today, the NYCSCA is in the midst of a five-year capital plan, which includes adding more than 13,000 new school seats across New York’s five boroughs by 2012. Just as STV’s predecessors were instrumental in designing new schools to accommodate rapid popula-
A FORAY INTO MANUFACTURING

For a small portion of STV’s history, Sanders & Thomas (S&T), an STV predecessor in Pennsylvania, expanded into manufacturing, merging with Voss Engineering Company, a manufacturer of equipment used in the metals industry in Pennsylvania. In 1967, the “V” in STV stood for Voss, though the firm is no longer associated with STV today.

Concurrently, in 1967, S&T acquired Kooly Kupp, a manufacturer of polystyrene containers with plant facilities in Boyertown, PA. With the catch-phrase, “hot or cold, a pleasure to hold,” Kooly Kupp was a short-term venture, closing in 1976.

Innovation growth, the firm today is heavily involved in a number of NYCSCA facilities that are key components of this five-year plan. The 90,000-square-foot addition at PS/IS 102 in Queens has more than tripled the size of the existing school, while a new 154,000-square-foot school in the Spring Creek neighborhood of Brooklyn addresses overcrowding in neighboring districts near John F. Kennedy International Airport.

And while the firm is working to achieve the client’s goals of adding more seats and space, STV’s design philosophy calls for an environment that is conducive to a top-notch education for students.

“We believe the school facility inherently shapes the quality of the learning experience, affecting social, emotional and cognitive development,” said David Ziskind, FAIA, NCARB, LEED® AP, STV senior vice president and chief architect.

Taking Higher Education Even Higher

At universities and colleges throughout the United States, campuses are undergoing constant reinvention, from facilities that integrate new technology to dining halls that satisfy the evolving tastes of students. Throughout its history, STV has worked closely with...
its higher education clients to ensure these new campus facilities foster environments that both educate and entice their student populations.

One of the firm’s earliest higher education projects can be traced back to 1921 when Elwyn E. Seelye & Co. teamed up with renowned architects McKim, Mead & White to design Foster Hall at the University of Buffalo. At the time, the building housed the university’s chemistry department, and is still in use today as Buffalo’s School of Dentistry Research Facility.

During the early 1930s, Seelye’s firm partnered with architect Randolph Evans to help design a Georgian-style campus in the Midwood neighborhood of Brooklyn, NY. The design and construction of Brooklyn College was a critical public works component of President Franklin Roosevelt’s economic plan to combat the Great Depression.

“We not only have put to work many thousands of good people who needed work; but we are also improving the educational facilities of this great borough, not just for today but for generations to come,” Roosevelt said at the 1936 dedication ceremony.

In 1962, a New York State legislative initiative sparked a new wave of higher education projects. The State University Construction Fund was established to expedite the completion of a $700 million master plan for the State University of New York (SUNY), giving SUNY the facilities it needed to double its enrollment from 53,000 to 106,000. As part of the windfall from this fund, SSV&K provided structural engineering design for the Earth and Space Sciences Building; dormitories and a dining hall at SUNY Stony Brook; and the design of site grading, drainage, roads, parking and utilities at the SUNY Oswego, Brockport and Alfred campuses.

The SUNY work helped to further establish SSV&K in the higher education sector, and led to other awards in the Northeast including a new computer center at Princeton University in New Jersey and a new fine arts facility at the University of Bridgeport in Connecticut in 1969, as well as a return to Stony Brook for a new fine arts building in 1970.

It was at the home of the “Nittany Lions” where S&T began its expansion into the Pennsylvania higher education market during the 1970s. The firm provided the preplanning for a $4.2 million intramural sports recreational center, which included two gymnasiums, swimming pool, squash and handball courts, golf and wrestling facilities, and club meeting rooms for Penn State University. S&T provided similar preplanning services for an undergraduate library at Penn State.

**Designing for Today’s Students**

The firm continued to transform both public and private institutions in the Keystone State. Since 1995, STV has been performing planning, architectural, engineering, interior design and construction management services for the growing community at Kutztown University in Berks County, PA. One of the campus’s signature facilities is the 62,000-square-foot Academic Forum.
which houses both classrooms and dining space for students. STV provided design and construction management services for the forum. At the historic Villanova University campus, the firm provided complete architectural and engineering design for a new Center for Engineering Education and Research, which was dedicated in 1998. By collaborating with university students, staff and faculty, STV designed a facility that did not detract from or obscure the surrounding historical buildings on campus.

STV was also a forerunner in the early 2000s movement to create more inviting and chic dining hall facilities so schools could attract more students and compete with off-campus restaurants.

Throughout the Pennsylvania State System of Higher Education, STV has updated or designed new dining halls at such schools as Bloomsburg University, Slippery Rock University, Clarion University and Lock Haven University and has performed similar design work at other universities around the country. Why travel off-campus when there’s a wood-fire pizza oven at the College of St. Benedict in Minnesota? One food blogger even commented that their pizza was “far better than any of the local pizza joints.”

Today, STV continues to support the expansion and rehabilitation of the nation’s higher education network through a full range of disciplines, including planning, design and construction management. Nearly 70 years after Franklin Roosevelt gave his dedication speech at the site of Brooklyn College, STV’s Construction Management Division oversaw the conversion of Roosevelt’s Manhattan townhouse into a state-of-the-art conference and research center called the Roosevelt House Public Policy Institute at Hunter College. The project received a 2010 Lucy G. Moses Preservation Award from the New York Landmarks Conservancy.

At Westchester Community College in Valhalla, NY, STV was the construction manager for the Gateway Center, which made a dramatic entrance in 2010. With its visually striking glass façade
and sustainable “green” features, it was Westchester’s first LEED® (Leadership in Environmental and Energy Design) Gold-certified building. The center’s classrooms, lecture halls, and computer and language labs are geared towards seamlessly weaving English as a second-language students into the campus community – a true gateway that’s emblematic of the many ways STV and its predecessors firms have supported the higher education community for nearly 100 years.

**Making a Place Called Home**

In addition to schools, some of the earliest Elwyn E. Seelye & Co. work can be traced back to residential spaces in a bursting-at-the-seams New York City during the early 20th century. Seelye’s structural engineering expertise led to the construction of a number of sophisticated and first-of-their-kind apartment types around Manhattan, including the Sherman Square Studios apartment building at West 73rd Street in 1929, a “studio colony” designed by architect Walter Russell that featured soundproofed studios for musicians, and the 25 East 83rd Street Apartments in 1938, which is believed to be the first centrally air-conditioned building in New York City.

The formation of the New York City Housing Authority (NYCHA) in 1934 was a catalyst for a number of residential projects designed by Seelye, and is a cli-

The transformation of the City of Baltimore’s downtown and waterfront areas has been a decades-long process, dating back to the early 1980s when the city was littered with decaying warehouses left over from the industrial boom of the early 1900s. STV, with its deep roots in Baltimore, has been a key partner working with the city, stakeholders and developers to plan and design a number of mixed-use developments that have contributed to the rebirth of Maryland’s largest metropolis.

STV first established an office there in 1972 as a branch for Sanders & Thomas, a predecessor firm. The office grew in 1974 with the purchase of Zollman Associates, which was renamed Baltimore Transportation Associates. When STV purchased Baltimore-based Lyon Associates in 1983 – a firm that had been in the city since 1970 – with it came a more definitive focus on planning, surveying and mixed-use land development. This served as the cornerstone for STV’s downtown Baltimore development work today.

“Prior to being acquired by STV, Lyon had a lot of experience working on mixed-use, high-profile waterfront developments, similar to the work we now do in Baltimore,” said Anthony Corteal Jr., STV senior vice president and a former Lyon employee. “That institutional knowledge of developing in an urban environment has served us well.”

STV’s Baltimore development work included a planning and feasibility study for a proposed 1.8 million-square-foot mixed-use program on a 27-acre former industrial site at Baltimore’s Inner Harbor in the late 1990s; and civil design, a traffic impact study and permitting services for the Ritz-Carlton Residences, a condominium complex along the Inner Harbor waterfront, which opened in 2009.

More recently, the firm provided comprehensive master planning services for the 4.8 million-square-foot Westport Waterfront mixed-use, transit-oriented development in the Middle Branch area of Baltimore, which is currently under construction. STV was also responsible for preliminary master planning and infrastructure design, while playing a lead role in the entitlement process for the West Baltimore Uplands Redevelopment, one of the largest urban infill projects – the use of land for redevelopment within a built-up area – presently under construction on the East Coast.
Decades later, STV has come full circle with NYCHA when the city needed to rehabilitate its public housing.

that STV still works with to this day. In the wake of World War II, NYCHA partnered with famed developer Robert Moses to clear old tenements and remake New York into a modern city. Many of these developments had more than 1,000 apartment units each and were designed to be modernist, tower-in-the-park-style structures.

Seelye’s firm was involved with the structural engineering for a number of NYCHA housing complexes that still exist today. The then-$13.5 million Queensbridge Houses opened in 1939 as the largest public housing development in the United States, a distinction the complex still holds. As the New York Times described the complex: “A suburban atmosphere is provided by a fifteen-acre park developed by the city Parks Department. The 26 housing units, the community building and the children’s center occupy only one-fourth of the land. Playgrounds for small children, interior courtyards and garden walks planted with trees cover the balance of the property.”

The bulk of NYCHA’s developments were built between 1945 and 1966. SSV&K provided structural design for a number of these housing complexes including the Kingsboro Houses in Brooklyn, Alfred E. Smith Houses in Manhattan, and Edenwald Houses, the Bronx’s largest housing development, located near the Baychester neighborhood.

Decades later, STV came full circle with NYCHA when the city needed to rehabilitate its public housing. In the late 2000s, the firm was awarded a task order contract by the agency to provide construction management services for a number of housing complexes around the city, including the Johnson Houses in the Harlem section of Manhattan, Whitman and Ingersoll Houses in Brooklyn,
and Highbridge Gardens in the Bronx, which was one of the first NYCHA properties to put American Recovery and Reinvestment Act funds to use.

**Raising the Bar for Health Care**
The health care world is constantly on the move as advanced medical technology is continuously being introduced. A steady stream of research is providing doctors and medical staff with new and innovative ways to care for and cure patients. As a result, health care facilities, such as hospitals, clinics and geriatric centers, are frequently being upgraded to meet the needs of the community. Throughout the course of the 20th and 21st centuries, STV and its predecessor firms have been involved in a number of health care facility initiatives.

As New York City’s population continued to grow in the early 1900s, Elwyn E. Seelye & Co. and SSV&K were involved with the design of a number of hospitals around the city and its suburbs. In 1937, the firm teamed up again with prominent architect John Russell Pope to design Greenpoint Hospital in Brooklyn, NY. In the same year, Seelye and Pope also worked together on Meadowbrook Hospital, known today as Nassau University Medical Center, in East Meadow, NY. In Queens, Seelye provided structural engineering and special foundations engineering for the Triboro Hospital in Jamaica, NY.

By the 1950s, SSV&K was supporting the expansion and rehabilitation of one of the nation’s most esteemed medical centers – Bellevue Hospital.
Construction-related services such as construction management (CM), construction administration, and owner’s representation are not a new concept for STV and its antecedent firms. Impressive and innovative structures like the Vehicle Assembly Building at NASA’s Kennedy Space Center in Florida and the Enrico Fermi National Accelerator Laboratory in Illinois were not only designed by the firm, but also built under its watchful eye and supervision.

But to better meet the needs of its clients, STV launched STV Construction in 1995 to focus on the firm’s expansion into construction and program management. And in addition to the transportation, industrial and commercial markets, the CM practice supports a variety of social services including education, health care, recreation and corrections. STV Construction later evolved into the Construction Management Division, one of STV’s core practices.

The division’s growth picked up in 2004 after Milo Riverso, Ph.D., P.E., was brought in to lead the group. Now STV president and chief executive officer, Riverso’s leadership more than doubled the division’s revenues, while boosting its client base. The group continues to provide CM, owner’s representative and project controls services for clients on both coasts of the United States.

Similar to STV’s planners, engineers and architects, the firm’s CM employees work on projects that aim to improve quality of life throughout the community. At the Hunts Point Recreation Center, which provides a place for children to exercise and play in New York’s reviving South Bronx neighborhood, the center was built and opened ahead of schedule in 2000 thanks to the CM Division’s supervision.

In the School District of Philadelphia, STV managed the $212 million construction program for 11 schools in the nation’s fifth largest school district. As part of this program, STV supported the rebuilding of Commodore John Barry Elementary School, which tragically burned down in 2004. STV operated under extreme time constraints to manage construction of a new school that went on to achieve LEED® (Leadership in Energy and Environmental Design) Gold Certification.

“It’s exciting to be a part of a program like this and to see how these facilities change the face of a community,” said Timothy Mason, CMAA, CSI, vice president.
Center in New York, NY, the oldest public hospital in the United States and the site of countless medical milestones, including the first maternity ward and the development of the polio vaccine. SSV&K worked with architectural firm Skidmore Owings & Merrill (SOM) over the next decade providing structural, mechanical and electrical engineering for Bellevue’s Medical Center, Medical Science Building, Hall of Residence, Institute of Rehabilitation and University Hospital.

For another first-class medical facility, SSV&K teamed-up with SOM to provide structural renovations at the Memorial Sloan-Kettering Cancer Center in New York in 1961. Sloan-Kettering was the first health center in the United States to dedicate services specifically to the psychological aspects of cancer and the relief of cancer pain.

During the 1970s, the United States continued to make major breakthroughs in the field of medicine and science and the U.S. was committing an enormous amount of funds to the medical and health care industries. At that time, SSV&K performed mechanical and electrical design services for the rehabilitation of the Downstate Medical Center in Brooklyn, which included new operating room facilities. Concurrently, S&T provided architectural and engineering services for a 120,000-square-foot research wing addition at the Walter Reed Army Medical Center in Washington, D.C. This facility included the nation’s first public medical museum, which displayed visual information about the human anatomical system.

The nation’s health care and well-being remains just as much a priority today as it did when SSV&K and S&T were designing their first medical facilities. With clients focusing on efficient, yet flexible designs that provide high quality care, STV’s health and science group is applying its design philosophy to these current needs.

At the Bronx Psychiatric Center in New York, STV is in the midst of planning and designing a new care facility and infrastructure for the campus’ redevelopment. With the state requesting a comprehensive plan that emphasizes a person-centered, recovery-oriented approach, STV is designing a facility that focuses on a normative, residential environment.

“Our health care industry clients today are looking for us to do more with less, to create adaptable spaces while retaining an excellent quality of life,” said Bruce Gombos, STV vice president.

Pioneers in Correctional Design
In the field of correctional design, STV espouses a unique philosophy that recently earned one of its leaders, David Ziskind, FAIA, NCARB, LEED® AP, STV senior vice president and chief architect, industry accolades for his lifetime of forward and pioneering thinking.

But even dating back to the firm’s earliest correctional work, STV and its forebears...
were involved with planning and design projects that stressed humane conditions and contemporary environments.

In the early 1980s, S&T provided mechanical and electrical engineering design for a new 530-bed Montgomery County Correctional Facility in Pennsylvania. The facility housed maximum-, medium, and minimum-security inmates. As part of S&T’s design work, the firm developed multiple housing units which divide inmates into smaller groups based on custody levels. Each unit contained yards for daytime recreation.

For the State Correctional Institution in Grateford, also in Pennsylvania, S&T, in a joint venture, was instrumental in the development of the “prison within a prison” design – a 418-cell diagnostic and classification center that was used to test inmates entering the penal system to determine how they would adapt to prison life, and a psychiatric unit that promoted inmate care.

STV’s partnership with Silver & Ziskind, which first began as a permanent joint venture in 1989, brought to the firm a group with nearly four decades of experience planning and designing correctional and justice facilities. Prior to joining STV, Ziskind was known for pioneering the “mini jail” concept during the renovation of the landmark Manhattan Detention Center for Men, also known as “The Tombs.” Silver & Ziskind’s design work at the Correctional Treatment Facility in Washington, D.C., in 1987 focused on substance abuse and mental health treatment programs. After
the facility opened in 1993, recidivism in Washington, D.C. dropped from 80 percent to 20 percent for those who were discharged through this program.

As a part of STV, Silver & Ziskind also worked on a number of projects over the span of three decades at Rikers Island Correctional Facility, New York City’s primary jail complex. A master plan that was conducted throughout the 1990s focused on the implementation of new fire and life safety systems, which led to the design of multiple design-build initiatives to improve five Rikers facilities. That same year, in response to a federal court order calling for a state-of-the-art solution for inmates being diagnosed or suspected of carrying tuberculosis, Silver & Ziskind designed a 140-bed Communicable Disease Unit prototype, the first of its kind and magnitude to be built at Rikers.

STV fully acquired Silver & Ziskind in 1994. In the following years, STV’s correctional design practice worked on dozens of facilities that reflect the firm’s philosophy regarding the use of materials and lighting. These facilities also integrate a specific sound design philosophy that combats the continuous noise of public areas. The group advocates the use of acoustically treated materials that also bring light into common areas and cells through secure windows, clerestory and skylights.

“The goal for all of our correctional design work is to provide an environment that enables rehabilitation, education and treatment, and ultimately reduces recidivism,” said Ziskind, who last year was elected to the College of Fellows by the American Institute of Architects for his influence in the field of correctional facility design. “We don’t design for punishment. Incarceration is the punishment. We design facilities that can help give incarceration a positive outcome.”

On an international level, STV introduced a modernized correctional facility to Israel, whose prior prison system consisted of old British forts that were built to stem the advances of the Ottoman Empire prior to World War I. The Tzalmon Medium-Security facility in Kallanit was Israel’s first new prison and became a model for future correctional modernization projects in the country.

Currently, STV is working at another landmark institution, this time in America’s heartland. At the Iowa Correctional Institution for Women, the firm was asked by the client to rethink the prison building type from the ground up and develop a 21st century facility that would integrate gender, health and age-responsive programming into the fabric of design, ultimately serving as a model for future facility development. As the only women’s facility in the country with an assisted-living facility and mental health care integrated into housing units, the Iowa project illustrates a new model for corrections.
The generations have changed – from the “Greatest Generation” that defended the United States and its allies during World War II, to the “Millennials” of today who grew up during the Gulf Wars. But a constant for more than 70 years has been the role STV and its predecessors have played in supporting a strong U.S. military through the planning, design and construction management of bases, barracks and other essential facilities, and the promotion of new technology to aid and protect American troops.

It’s a role that continues to evolve. That’s because the face of danger is also continuously changing, necessitating a steadfast focus on U.S. military facilities around the world, while also enhancing buildings and infrastructure at a state and local level. The world has profoundly changed from the firm’s first defense work during World War II to what STV has accomplished today in a post-September 11 world, but the priorities we share with our clients remain the same.
“Our approach with our federal military clients has to be flexible to accommodate their constantly changing needs,” said James R. Vilbert, P.E., LEED® AP, senior vice president and director of operations for the central region and branch offices of STV’s Building & Facilities Division. “We need to be able to design in two and three dimensions. We need to be able to deliver projects through traditional delivery methods or design-build. We need to be able to work on any kind of military facility such as headquarters or training facilities while also providing for every branch of our armed forces. Throughout the years, STV has demonstrated that we can adapt and we do just that with our military clients.”

World War II and Our Growing Military

December 7, 1941, has long been known as a “date that will live in infamy.” The United States had been at peace when the Japanese attacked the U.S. naval base at Pearl Harbor, leading President Franklin Roosevelt to direct “that all measures be taken for our defense.” Now engaged in the “second great war,” the United States needed to invest its resources and rapidly grow its military to succeed in the Pacific and European theaters of war.

In 1941 and 1942, Elwyn E. Seelye & Co., STV’s earliest forerunner, was contracted by the U.S. Army to provide engineering design services for at least five different military camps that were essential in the mobilization, embarkation and rehabilitation of American troops. This included Camp Shanks in Orangeburg, NY, dubbed “Last Stop USA” for the sheer number of army personnel that passed through before being shipped overseas. As the army’s
largest port of embarkation during World War II, the camp served as a staging ground for about 1.3 million troops, including 75 percent of those who took part in the invasion of the Normandy beaches on D-Day. As many as 50,000 troops occupied Shanks’ 2,040 acres at one time, and Seelye provided engineering design for the camp’s water supply, roads, sewers, sewage treatment system and docks. And in short order. In three months, more than 2,500 buildings and supporting infrastructure were built on the former Rockland County farm.

At the same time, Seelye designed an addition at Camp Upton on Long Island, NY – the future home of the Brookhaven National Laboratory. Upton was active during World War I, but by the war’s end in 1918, the bulk of the camp’s infrastructure was auctioned off. World War II led to Upton’s revival as a military induction camp, as the site’s infrastructure and utilities were in desperate need of upgrades and expansion. By the end of the war, Upton

In addition to serving the U.S. military and private contractors, STV has also supported those who are often the first responders during an emergency – the local police and fire departments.

Currently, in a joint venture with Turner Construction Company, STV is providing pre-construction, construction and post-construction services for a new, 750,000-square-foot police academy in Queens, NY, for the New York City Police Department (NYPD), the largest police force in the United States.

“The new academy will vastly improve the officer training that goes into making the NYPD the world’s greatest and most advanced police department by providing a state-of-the-art facility that can serve the department’s 21st century needs,” New York City Mayor Michael Bloomberg said at the 2009 groundbreaking ceremony.

On the design side, STV has worked on a number of award-winning facilities for New York’s bravest and finest. The renovation of the 9th Precinct building for the NYPD received a Diamond Award in 2008 from the New York Chapter of the American Council of Engineering Companies. STV’s design incorporated state-of-the-art structural and safety upgrades while preserving the Depression-era façade.

A few years earlier, the firm received a 2004 Award for Excellence in Design from the Art Commission of the City of New York for the new double-width, double-occupancy facility that houses Engine Company 277 and Ladder Company 112 in the Bushwick area of Brooklyn.
was used primarily as a convalescent and rehabilitation hospital before closing in 1945 to make way for Brookhaven, which opened two years later. Brookhaven was a site STV would return to in the future.

In addition to Shanks and Upton, other vital military infrastructure designed by Seelye included roadways and utilities at Camp Kilmer in Stelton, NJ, which by the war’s end was the largest processing center for troops heading overseas during World War II, and airfield runways at Fort Dix in Fort Dix, NJ, which is still used today as a basic training ground.

In support of industrial clients who were developing equipment and technology for the U.S. military, Seelye worked on a wide range of projects for Grumman Aircraft Engineering Corp. on Long Island. Grumman had been commissioned by the U.S. Navy to develop aircraft during World War II and was growing at a rate of nearly 1,000 employees a month to meet this demand. Grumman was responsible for the design of the F4F Wildcat, the only effective fighter craft available to the U.S. Navy for the first few years of World War II, and then later produced the quick and highly maneuverable F8 Bearcat, one of the fastest propeller-driven planes ever crafted. Seelye provided engineering services for various structures at Grumman’s Bethpage, NY, headquarters, including a hangar, wing assembly plant and multiple warehouses.

The Post War Boom and the Cold War
World War II had ended, but by the late 1940s, the United States was preparing for a different kind of war – a “Cold War” with the Soviet Union, and a period of great military tension and economic competition between the two superpowers. That, coupled with the confluence of military and industrial influence on the U.S. economy and its lawmakers – a phenomena dubbed by President Dwight Eisenhower as the
“military-industrial complex” – led to a greater demand for planning, design and construction services for the armed forces than ever before.

STV predecessor Sanders & Thomas (S&T) in Pottstown, PA, was largely born out of this “postwar economic boom” period. The firm’s two founders, Whitney Sanders and Ralph Thomas, were both previously employed at Jacobs Aircraft Engine Co., a Pottstown-based industrial company that developed engines for U.S. military aircraft. When they launched S&T in 1945, many of their earliest clients were in the military and industrial sectors, including Jacobs, the firm’s first client.

“My father and Ralph Thomas started out developing tools and machinery such as rocket motors for aircraft but soon grew an expertise in defense systems,” said Whitney “Sandy” Sanders II, LEED® AP, a retired STV senior vice president and Sanders’ son. “We tested these machines, such as the water jet catapult, for the U.S. Navy at our offices and we later became the firm that designed first-of-a-kind facilities for the government.”

Meanwhile in New York, Seelye expanded its services to account for the nation’s growing focus on the military sector. The firm brought in Col. Burnside Value, a former army engineer, as a partner to manage the company’s U.S. Air Force and U.S. Army Corps of Engineers portfolios in 1947. Value led the firm’s joint venture work with New Jersey-based architects Frank Grad & Sons, performing engineering design services for Army Corps facilities in France, England and Argentina.

It would be another two decades before Seelye and S&T would merge, but the Cold War era brought the two firms together on a number of high-profile military initiatives, such as the Distant Early Warning (DEW) Line along the Arctic Circle. The DEW Line was established to detect incoming Soviet bombers and provide warning of a land-based invasion. In the mid-1950s, Seelye designed steam and power generating facilities, along with water distribution and sewage disposal plants for a series of “Pine Tree” bases along the DEW Line. Seelye personally visited the project sites to observe the work being performed. Although he couldn’t publicly disclose details about the DEW Line, a reporter from Consulting Engineer magazine in 1953 wrote “it was a rough trip – his second to the Far North in full parachute gear and with nights spent sleeping on the floor of his plane.”

Then, during one of the defining moments of the Cold War era – the Cuban Missile Crisis – 12 S&T “engineering specialists” were rushed to bases in Alaska and Greenland along the DEW Line. “The exact nature of their assignment is classified but one spokesman pointed out ‘with the tension over in Cuba the way it is now, we certainly don’t want a breakdown in our missile warning system,’” the Pottstown Mercury reported in October 1962.

Both firms were also vital to the development of the Polaris and other missile technology. Polaris missiles debuted in the early 1960s to function as nuclear-armed, submarine-launched ballistic missiles. S&T was contracted by the Naval Air Engineering Laboratory to provide design, analysis and test services for a Polaris launching system.
at the Philadelphia Naval Shipyard. In 1963, Seelye, with A. Wilson Knecht as a new partner and now known as Seelye Stevenson Value & Knecht (SSV&K), was contracted by the U.S. Navy to provide engineering services for the Fleet Ballistic Missile Team Trainer Building at the U.S. Naval Submarine Base in New London, CT, the Navy’s first submarine base. The New London base was also home to the USS Nautilus, the world’s first nuclear ballistic submarine. SSV&K was involved with the design of the missile handling equipment, electronic computer installations, classrooms, laboratories and special training spaces to support the base and the Nautilus.

Helping the U.S. military reach even greater points of the uncharted world, S&T was involved in two significant deep water projects for the U.S. Navy during the 1970s. The Ocean Pressure Simulation Facility in Panama City, FL, was the most expensive oceanographic project in Florida at the time and S&T was the lead architect. The facility developed, tested and evaluated underwater systems and equipment at depths of up to 2,000 feet. About 10 years later, the U.S. Navy’s Hyperbaric Research Facility, located in the National Naval Medical Center in Bethesda, MD, was dedicated. S&T designed the facility, including the test chambers, building and life support systems, giving the Navy the capability to conduct research for the first time at simulated depths up to 3,400 feet.

**The Military’s Reagan-Era Renaissance**

By the mid-1970s, the United States had withdrawn from Vietnam, leaving both the military and the American people dispirited and demoralized. Congress was wary of funding many new military initiatives. But that changed under President Ronald Reagan in 1980.

“The military had been knocked around by Vietnam and needed to be told by the top person that they were honored and appreciated,” retired Gen. Edward “Shy” Meyer, Reagan’s Army chief of staff, told the *Baltimore Sun* in June 2004.

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*Researching the Extreme*

Seaplane testing for the U.S. Navy performed by S&T.
Between 1980 and 1985, defense spending more than doubled, from $142.6 billion to $286.8 billion. This renewed investment was reminiscent of the postwar economic boom nearly 30 years earlier, leading to the development of new technology and military facilities around the country, many of which propelled the United States through the first Gulf War in 1991. The firm was involved with the planning, design and construction of a number of landmark Reagan and Gulf War-era initiatives.

With the military being so aggressively mobilized under Reagan's policies, a new and more efficient method of tracking and shipping equipment – ranging from anchors to paper clips – was required. SSV&K provided engineering and architectural design services for four U.S. Navy facilities integrating the Sperry Systems Management Naval Integrated Storage Tracking and Retrieval System (NISTARS). NISTARS featured computer-programmed, robot-like devices that traveled between storage aisles, selecting supplies and transporting them.

A U.S. Navy air pilot has to be prepared for the most extreme conditions – wind blasts as high as 600 knots, and both horizontal and vertical acceleration forces and pulses of a magnitude that is completely foreign to the vast majority of the world’s population. And with 30-plus pounds of flight gear to carry around on a typical flight mission, that equipment has to be built to withstand extremes as well.

For more than 30 years, STV and its predecessors have supported the military by providing engineering technical support, research and testing on behalf of the U.S. Department of Defense. The bulk of today’s work is carried out by the firm’s California, MD, office, which works intimately with Naval Air Warfare Center Aircraft Division personnel in Patuxent (Pax) River, MD. But the roots of this specific brand of military support can be traced back to the 1960s, when Sanders & Thomas, an STV antecedent firm in Pennsylvania, helped the Naval Air Engineering Facility develop early catapults and arresting gear for aircraft carriers out of the Philadelphia Navy Yard.

“We work in a variety of laboratories, looking at a wide range of equipment that is essential for the safety of those involved,” said William Hines, STV vice president and defense national practice leader in the Buildings & Facilities Division.

Items under STV’s purview include aircraft launch and recovery equipment; life support and survival systems, including inflatable survival gear, aircrew escape systems, crash safety equipment and seat survival kits; and systems that increase aircrew survival rates during emergency and helicopter landings.

The Pax River facility is home to a one-of-a-kind ejection tower (pictured to the left) that propels test mannequins 110 feet high and the horizontal accelerator, consisting of a “sled” device that is hydraulically controlled along a 100-foot test rail and is used to test crashes at up to 50 horizontal g-forces. The accelerator is also certified for National Highway Traffic Safety Administration testing of infant, child and toddler car seats.

There's no part of a pilot’s equipment that is left unexamined by STV’s Pax River team – even the uniform’s stitching. Pax River features a sewing machine called the “silver dollar machine” for its ability to stitch through a silver dollar.
The Large Cavitation Channel was dubbed the world’s “largest and quietest water tunnel.”
to the end of the aisle where they could be distributed. SSV&K designed the 1.6 million-square-foot facilities – which extended two football fields long and 60-feet high – in Oakland, CA, Alameda, CA, San Diego, CA, and Norfolk, VA.

Perhaps the project that was most emblematic of the country’s renewed focus on the military was Fort Drum’s expansion in New York. SSV&K, in a joint venture with Urbahn Associates, was contracted by the U.S. Army Corps of Engineers in 1985 to provide the design of an entirely new infrastructure at Fort Drum, which was needed to accommodate the newly formed 10th Mountain Infantry Division, converting the Watertown, NY, training camp into a major Army installation. The firm designed all new roads and drainage, as well as water supply and distribution, sanitary collection and treatment systems, an electrical substation, a base-wide security building, and a high-temperature hot water system.

It was a dramatic program, encompassing 107,000 acres, which needed to accommodate an additional 25,000 people. The program was the then-largest single construction project in the history of the U.S. Army Corps of Engineers New York District and the SSV&K team was awarded the largest of nine contracts.

“Although all expansion design phases are concurrent, the infrastructure design will be among the first implemented, making its schedule a critical element to the overall program,” said then-SSV&K president Michael Haratunian in the Summer 1985 edition of QR, the firm’s corporate newsletter at the time.

Toward the end of Reagan’s presidency, the firm was playing a key role in the design of a number of innovative military facilities that supported critical research for the armed forces. The Guided Weapons Evaluation Facility at the Eglin Air Force Base in Florida, one of the country’s largest air bases, was home to two large, electronically shielded and radio-frequency-absorbent chambers that simulated the entire frequency spectrum of guided weapons. The facility – one of the only kind in existence – was designed by S&T and needed to account for suppressing radio and electromagnetic frequencies by at least 100 decibels, a challenging engineering task.

Aiding military designers in making U.S. Navy vessels quieter and more fuel-efficient, SSV&K, in a joint venture, designed the Large Cavitation Channel (LCC) at the David Taylor Research Center (later renamed the Carderock Division of the Naval Surface Warfare Center) in Memphis, TN. At 236 feet long and 65 feet high, the LCC tested the propulsion power, efficiency and acoustics of large-scale ships and submarines. It was soon dubbed the world’s “largest and quietest water tunnel.”

During the build-up and aftermath of the Persian Gulf War in 1991, an emphasis was placed on analyzing and upgrading equipment for use on the battlefield. Utilizing research and development services the firm still provides today in California, MD, and Lakehurst, NJ, (see sidebar on pages 46-47), S&T became highly regarded for military initiatives such as the testing of headgear and flight suits that would protect troops from chemical and biological warfare, and the writing and editing of user manuals for this new equipment. The firm was recognized for “Singularly Distinctive Service” by the U.S. Air National Guard for its chemical and biological weapon protection research and for its support of programs that investigated the stress of acceleration on air crews during combat.

“S&T’s personnel deserve as much credit for their civilian efforts as those who directly fought the war,” retired Major General James Whinnery said during a special awards presentation at S&T’s offices in 1991.
As the U.S. military escalated its presence in Southeast Asia during the Vietnam War era, one STV predecessor was playing a pivotal role supporting clients such as the U.S. Army Corps of Engineers, U.S. Navy and U.S. Air Force in international venues.

When STV acquired Lyon Associates in 1983, with it came a wide range of military experience in an international setting, complementing STV’s earlier experience during World War II and the Cold War era. Throughout the 1960s and 1970s, Lyon provided a wide range of services, including design, construction management, master planning and aerial photography for military facilities such as missile installations, defense command centers, logistical control centers and aircraft hangars across the Pacific Rim. The firm also had experience planning and designing a number of international ports and other offshore developments for the federal government. When Lyon was first founded in 1961, its headquarters were in Okinawa, Japan, giving the firm proximity to countries where U.S. military work was needed, including Thailand, Korea and Vietnam.

“We think Lyon Associates is an outstanding engineering firm whose experience and expertise will add greater stability and diversity to the STV Engineers group and will enable us to expand both our national and international images,” said Richard Holland, STV chairman and chief executive officer at the time of the acquisition.

With Lyon in tow, STV immediately began work overseas for its traditional military clients. For the U.S. Army, STV/Lyon designed multiple laboratories at Camp Carroll in Korea in 1985, which provided vital services for other medical facilities and military units around the country. In the Philippines, the firm provided site surveys, design and contract document preparation services for the dredging of the Subic Bay for the U.S. Navy in 1987.

The international component of Lyon was later sold back to the original owner in the 1990s.

**The Post-September 11 Military**

After the United States was attacked on September 11, 2001, the federal government’s military spending reached unprecedented heights. With wars in Afghanistan and Iraq, and the need to keep Americans at home more secure, the Pentagon budget increased by nearly 83 percent during the following 10 years. As it did throughout other eras of significant military investment, STV supported its federal clients by planning, designing and overseeing the construction of a variety of facility types, while adapting to evolving trends in the design and construction industry.

To improve operational efficiency, the U.S. Department of Defense adopted the federally-mandated Base Realignment and Closure (BRAC) program in 2005, which called for closing excess bases and bringing new facilities to existing ones. For BRAC, STV designed new Armed Forces Reserve Centers, which included facilities such as training centers, administrative space and living quarters in Newark, DE, Lewisburg, PA, and Scranton, PA, providing all engineering and architectural services. In Fort Lee, VA, the firm designed brand new munitions and explosives training and robotics training buildings.

“These projects are important in providing state-of-the-art training facilities for the U.S. Army Reserve and National Guard units,” said STV federal programs manager Cynthia Manning, P.E., PMP, LEED® AP, BD+C.

The projects also demonstrate the growing trend toward the design-build delivery method – when a project owner contracts a design team and a builder as a single entity. With a goal of delivering projects more cost effectively and in
a shorter period of time, about 60 percent of STV's current federal projects portfolio utilizes design-build.

In addition to the BRAC projects, design-build has also been used for large-scale military complexes, such as the 138,000-square-foot Brigade and Battalion Headquarters at Fort Stewart, GA, which, for the first time for a U.S. Army facility, incorporated six battalions and the brigade command under the same roof. STV and its client/build partner, Mortenson Construction, coordinated design and construction with other projects underway at Fort Stewart, home of the 3rd Infantry Division, and the largest Army installation east of the Mississippi River.

And harkening back to Seelye’s work for the Grumman Aircraft Engineer Corp., which supported the production of the Hellcat and Bearcat aircrafts during World War II, STV’s Construction Management Division is currently overseeing major building renovations and site improvements for Boeing’s new Chinook H-47 Focused Factory Conversion in Ridley Park, PA. These infrastructure renovations, accomplished while production quotas are steadily increasing for the Boeing operations group, are being performed while construction of the aircraft continues within the same building. The renovated Focused Factory will enable Boeing to meet the growing demand for a versatile, multi-use aircraft in the ever-changing theater of operations around the globe.

The factory is used for the production of the CH-47 Chinook, a twin-engine heavy lift helicopter that has been used extensively by the U.S. military in operations in Iraq and Afghanistan.

“Our work in both the public and private sectors has enabled us to build up a strong relationship with Boeing,” said Andrew Munter, senior project manager for the Boeing construction management team on site. “The newly renovated Boeing facility will play a key part in enhancing our nation’s military response capabilities.”

“The newly renovated Boeing facility will play a key part in enhancing our nation’s military response capabilities.”

ANDREW MUNTER
senior project manager for the
Boeing construction management team

The Boeing Chinook H-47 Focused Factory.
From Space to Cells

SUPPORTING THE ADVANCEMENTS OF SCIENCE, TECHNOLOGY AND ENERGY

English philosopher Francis Bacon once said that “time is the greatest innovator.” For the past 100 years, there have been innovations in science and technology that have likely gone far beyond Bacon’s wildest dreams. Again and again, STV and its predecessors have supported leading-edge clients, such as the National Aeronautics and Space Administration (NASA), the U.S. Department of Energy (DOE), and the U.S. Department of Agriculture (USDA), by developing the built environment to support some of the world’s greatest scientific marvels – from sending men to the moon, to studying microorganisms that can’t be seen by the human eye.

A Higher Level of Engineering

In the latter half of the 20th century, the world’s population was filled with curiosity as to what existed beyond the Earth’s atmosphere. The United States and the Soviet Union were engaged in a “Space Race” to establish technological and ideological superiority in space exploration. STV and its predecessors played a key role developing the technology and facilities that supported the United States in its quest to make these great discoveries. For more than 40 years, the firm worked on a number of landmark, first-of-a-kind initiatives for NASA and the agency’s federal partners. Tackling projects of such complexity and innovation presented great challenges. “There was a higher level of engineering required,” said Michael Haratunian, former chief executive officer and current chairman emeritus and board member of STV, who worked on the engineering design team for the Vehicle Assembly Building (VAB) at NASA’s Kennedy Space Center in Florida during the 1960s and 1970s. “We were used to doing commercial and institutional buildings, and here we were being asked to design something with much higher tolerances and much more sensitivity.
so it could handle the equipment being used for the space program.”

By the 1970s, NASA was committed to transforming Kennedy Space Center “for a new era when it will operate more like an airport,” according to a 1978 New York Times article. Rather than shooting rockets into space, NASA was creating a fleet of reusable shuttles for missions. STV’s predecessor, Seelye Stevenson Value & Knecht (SSV&K), was called back to the iconic VAB to help design modifications that would accommodate this new mode of space transportation (for more information about the VAB, see page 17). Additionally, SSV&K was tasked with providing design services for a brand new building at Kennedy Space Center – the Space Shuttle Orbiter Processing Facility (OPF), one of the most sophisticated and complex aircraft maintenance hangars in the world.

Once the VAB and OPF were fully constructed and modified for the shuttle program, NASA continued to expand, requiring new research facilities and laboratories across the United States to accommodate this era of space discovery. By the 1980s, Sanders & Thomas (S&T), STV’s antecedent firm in Pennsylvania, provided architectural and engineering design services for new facilities at NASA centers such as the Goddard Space and Flight Center in Greenbelt, MD, Johnson Space Center in Houston, TX, and Langley Research Center in Hampton, VA.

The Spacecraft Systems Development and Integration Facility (SSDIF) was an award-winning structure that featured the largest known clean room facility of its type in the country. The SSDIF was used to test and integrate payloads – the carrying capacity of a shuttle, including cargo, munitions and scientific instruments – up to 60 feet long and weighing 60,000 pounds (see sidebar on page 56). Because the planned payloads for future space missions had exceeded Goddard’s capacities, the SSDIF was able to accommodate two full-size payloads simultaneously.

The Atomic Age and the Rise of High Energy Physics

The aftermath of World War II and the detonation of the world’s first atomic bomb ushered in a new era of scientific discovery and technological innovation. President Harry Truman signed the McMahon/Atomic Energy Act and the U.S. Atomic Energy Commission (which later became the U.S. Department of Energy (DOE)) was established to foster the development of atomic science and technology. Meanwhile, the increasing focus on atomic and nuclear energy led to a number of scientific breakthroughs in the area of particle physics – the

“Here we were being asked to design something with much higher tolerances and much more sensitivity so it could handle the equipment being used for the space program.”

MICHAEL HARATUNIAN
former chief executive officer and current chairman emeritus and board member of STV

Until the space shuttle program was retired in 2011, the facility accommodated two shuttle orbiters simultaneously, each one in a 29,000-square-foot hangar bay. The orbiter was considered a “no-step aircraft” that service personnel could not step or lean on. The OPF featured a series of extensible platforms that reached within four inches of the shuttle, enabling workers to replace the crucial heat-resistant tiles without stepping onto the orbiter. Adding even more complexity to the design was the fact that SSV&K designed these platforms while the design of shuttle itself was ongoing, so the firms’ engineers did not have the new vehicle’s final dimensions.
study of the existence and interaction of particles in matter. These discoveries dictated that a host of new advanced laboratories would be designed and built for the Atomic Energy Commission and related clients.

STV’s predecessors immediately emerged at the forefront for providing design and construction support services for some of the most well-known and visionary facilities during this era, leading to a host of first-of-a-kind laboratories benefitting the scientific community across the globe.

Dubbed by the *New York Times* as “the largest scientific machine ever built by man,” the Enrico Fermi National Accelerator Laboratory in Batavia, IL, popularly known as “FermiLab,” was once the world’s largest proton accelerator and the preeminent home of the study of high-energy physics, space and time when it was dedicated in 1974. In a joint venture with Daniel, Mann, Johnson & Mendenhall (DMJM), SSV&K provided total mechanical and electrical, as well as civil and structural engineering support services for this ground-breaking DOE laboratory complex (for more information about FermiLab, see page 17).

But the firm’s work on these highly sophisticated laboratories went well beyond FermiLab. In Tennessee, at Oak Ridge National Laboratory, birthplace of the Manhattan Project – which led to the development of the world’s first atomic bomb – S&T provided design services for a number of facilities. S&T’s first work at Oak Ridge can be traced back to the early 1960s with the design of the Environmental Sciences Laboratory. The project coincided with a number of congressional committees calling on the Atomic Energy Commission to expand and diversify national laboratory programs. The Environmental Science Laboratory was a part of Oak Ridge’s evolution.

In 1992, STV received a unique and monumental honor when the firm was awarded not one, but two Federal Design Achievement Awards from the National Endowment for the Arts. With close to 500 applicants and only 57 winners that year for the organization’s highest design honor, STV was the only architectural/engineering firm to receive two awards. The firm received the honors for its work on the Centers for Disease Control’s Viral/Rickettsial Diseases Laboratory and NASA’s Spacecraft Systems Development and Integration Facility, two groundbreaking facilities in the field of science (see main article for more information). Federal Design Achievement Awards are judged by a jury of design professionals and presented every four years.
S&T returned to Oak Ridge in the 1980s, opening an office in the area after the firm was selected to provide design services for large-scale renovations and modifications at one of the lab’s uranium processing plants. The work included the replacement of outdated equipment, some of which had been in service for more than 30 years. S&T would go on to provide similar services for a DOE uranium processing facility in Fernald, OH. The greatest challenge tackled by S&T at these facilities was to ensure “safe geometry” requirements were strictly adhered to during the design process to minimize the possibility of a nuclear accident.

By 1986, SSV&K and DMJM had teamed up again to design a new kind of particle accelerator in Newport News, VA. The Continuous Electron Beam Accelerator Facility, now called the Thomas Jefferson National Accelerator Facility, was part of a new generation of high-energy physics laboratories that utilized a continuous electron beam produced, accelerated and guided by electrical and magnetic forces, rather than a pulsed electron-particle beam that was used in previous accelerators. The end result was a facility that provided physicists with an unprecedented view of atomic nuclei.

**Protecting Against Bioterrorism and Deadly Diseases**

During World War II, the United States became increasingly concerned about the threat of bioterrorism against its military and citizens. In 1942, President Franklin Roosevelt created the War Research Service to study and develop defensive measures against potential bacterial and viral attacks. As a result, the federal government needed new kinds of laboratories that would enable scientists to safely study toxic agents such as smallpox, anthrax and other diseases.

S&T was already an established partner with the U.S. military, having developed and tested numerous first-of-a-kind devices (see page 45 for more information). So it was only fitting that the firm rose to the government’s challenge by designing what is believed to be one of the first Biosafety Level 4 (BSL-4) equivalent laboratories in the U.S. at Fort Aerial of the Continuous Electron Beam Accelerator Facility, now called the Thomas Jefferson National Accelerator Facility.
With a vast portfolio of advanced technology and laboratory projects for federal clients like the U.S. Army, the U.S. Department of Energy and the U.S. Department of Agriculture, it’s no surprise that throughout STV’s history, the firm and its predecessors have been responsible for the design and construction of a number of sophisticated laboratories, clean rooms and other innovative facilities for private sector clients.

One of the firm’s earliest laboratory commissions was in 1969 for the pharmaceutical giant Squibb (now known as Bristol Meyers Squibb). STV predecessor Sanders & Thomas (S&T) designed an expansion at the company’s Radioactive Isotope Pharmaceutical Facility, which was used for the manufacture of radioactive isotopes. As part of the contract, S&T designed extensive environmental and employee protection systems to shield against radiation hazards.

By the 1980s, S&T had designed the Chronic Studies Facility in Newark, DE, an animal research facility for DuPont, one of the world’s largest chemical manufacturers. The lab was a totally contained and isolated facility free from outside contaminants.

The firm has also had an ongoing rapport with aerospace, security and defense giant Lockheed Martin. One of the more notable projects for Lockheed was designed and built in the late 1990s – a new communications and power center for the company’s Astro Space Division in Bucks County, PA. The 400,000-square-foot high-tech complex is used to fabricate, assemble and test satellite payloads and antennas for the international communications market. Recently, STV planned, designed and managed construction of a 19,000-square-foot high-bay addition at the facility. Demonstrating evolving design and construction trends, the addition was designed using three-dimensional Building Information Modeling software and achieved LEED® (Leadership in Energy and Environmental Design) Silver certification. The firm also designed a LEED® Gold certified high-tech conference center for Lockheed during the same timeframe.

“BSL-3 and BSL-4 labs presented very unique design challenges,” said Ronald Frick, R.A., a retired S&T/STV employee who managed a number of significant laboratory and advanced technology projects for the firm. “With a BSL-4 lab, we had to design an environment that allowed the person freedom of movement inside of a protective suit, while also being completely safe and secure.”
STV overcame even more design challenges in the western Utah desert at Dugway Proving Ground, a U.S. Army facility that tests biological and chemical defense systems in an isolated environment. In the mid-1980s, S&T provided a range of design services for a first-of-a-kind aerosol testing facility capable of containing the most deadly airborne microorganisms and toxins. Dubbed the Life Sciences Test Facility, S&T designed the required specialized systems, such as breathing air, ventilation and waste systems for this BSL-3 laboratory.

Around the same time as when the Life Sciences Test Facility was being developed, S&T was also called upon to direct its high-end laboratory design expertise in a non-military setting. With the onset of the AIDS epidemic, which was first recognized by the Centers for Disease Control (CDC) in 1981, S&T was asked to design a new laboratory at CDC’s Atlanta headquarters. The award-winning Viral/Rickettsial Diseases Laboratory at the Centers for Disease Control.

At the state level, STV supported the New York State Office of General Services with the design of the David Axelrod Institute for Public Health in Albany, NY. At the onset of the 1990s, New York state was home to more cases of AIDS than anywhere else in the country, spurring additional testing and prevention research. In a joint venture, STV provided complete engineering design for the laboratory, which was used for the research and testing of AIDS and other communicable diseases such as tuberculosis.

Supporting the USDA in the Research of Plants and Animals

With its mission to provide leadership and scientific research on food, agriculture and the nation’s natural resources, the USDA required advanced laboratories that were able to study all things related to plants and animals. With 30 years of design and construction management experience at U.S. military, CDC and DOE facilities, STV applied its expertise to a number of laboratories and administrative spaces used by the USDA to study diseases like salmonella and E. coli. These labs were also instrumental in developing biotechnology to promote the agriculture and livestock industries.

“We have provided services for facilities that researched organisms ranging from bugs to bison and elk and more,” said James Bannon, P.E., LEED® AP, STV senior vice president and principal-in-charge for a number of laboratory projects for the USDA. “And because we are a full-service firm, we assist our clients and their missions in a number of ways, utilizing our architectural, engineering, planning and estimating expertise.”

STV and its predecessors have performed work for some of the most sophisticated facilities owned by the USDA, such as the Plum Island Animal Disease Center in New York. When the USDA established Plum Island...
in 1954, it was the only government research facility devoted to the study of contagious foreign diseases of animals. So the research performed at the facility was absolutely critical in protecting the country’s food supply against agro-terrorism and illnesses such as foot-and-mouth disease and swine fever.

Starting in the early 1980s, S&T worked on a wide range of project types at Plum Island, including the study and design of equipment used for a new virus production laboratory; and the design and construction management of new facilities and systems such as a wastewater treatment plant, HVAC system upgrades and new telecommunications and electrical distribution equipment. Similar to S&T’s earlier design work on government labs like USAMRIID, these new and upgraded USDA facilities needed to be designed to safely accommodate highly sensitive research programs.

In the 2000s, STV was a critical partner for USDA’s landmark $460 million modernization of the Ames complex in Iowa, creating the agency’s largest animal health center. The firm performed design services for a new Low Containment Large Animal Facility. STV also provided construction management services for the entire program. As the owner’s representative, STV supported site staff as they upgraded and consolidated facilities for the National Animal Disease Center, National Veterinary Service Laboratory and the Center for Veterinary Biologics. Part of the upgrades included a BSL-3AG Large Animal Housing Facility, used to research programs on domestic animals and wildlife and study infectious food agents.

Currently, STV has been supporting the USDA’s Animal and Plant Health Inspection Services and Agricultural Research Service divisions under two task order contracts, providing design and construction administration services at facilities such as the Beltsville Agricultural Research Center in Beltsville, MD, the Jean Mayer Human Nutrition Research Center on Aging in Boston, and the Hawaii Fruit Fly Production Facility in Waimanalo, HI. To support the renovations at the Beltsville facility, which is the largest agricultural research complex in the world, STV provided a feasibility study and design-build bridging documents. The project marked USDA’s first-ever major design-build initiative.
One Long Island site has undergone significant change over the past 70 years – from a military base during World War II to an elite nuclear physics, chemistry and biological research complex today. STV and its forbears have helped to guide this evolution, as Camp Upton became Brookhaven National Laboratory.

STV predecessor Seelye Stevenson Value & Knecht (SSV&K) designed infrastructure for Camp Upton when it was an induction camp during World War II (for more information about STV's military work, please read the article on pages 41-51). When the war ended, the site fell under the ownership of the U.S. Atomic Energy Commission, and later the U.S. Department of Energy, who converted the site into Brookhaven lab, a high-tech facility where Nobel Prize-winning research was conducted many times over.

One of the facilities that housed this Nobel Prize-winning research was the National Synchrotron Light Source (NSLS) a high-energy accelerator, which was promoted as the “second generation” of electron synchrotrons when ground was broken in 1978. SSV&K provided engineering design and construction supervision services for this complicated facility. During the construction of the NSLS, scientists invented a special periodic arrangement of magnetic elements to provide optimized bending and focusing of electrons. As a result, SSV&K developed a structural design that permitted little vibration or settlement, allowing for precise alignment of the device’s storage rings.

Nearly 25 years later, STV provided structural, mechanical, electrical, plumbing, fire protection, geotechnical and civil engineering design services for a new Research Support Building at Brookhaven, consolidating administrative and support functions into a single location. The building earned LEED® (Leadership in Energy and Environmental Design) Silver Certification.
Taking the High Roads

ROADWAYS AND BRIDGES MEET RISING DEMAND AND HIGHER SAFETY STANDARDS THANKS TO STV

For STV, a road that’s traveled makes all the difference. For decades, the firm and its predecessors have supported the nation and its burgeoning roadway and interstate network, planning, designing, and supervising the construction of new and rehabilitated roadways and bridges that keep people moving safely and efficiently.

41,000 Miles of New Highways

One of the largest public works projects in American history, the National Interstate and Defense Highways Act of 1956, was geared toward providing new and faster traveling roadways that would help Americans move from urban areas into the suburbs. More than $25 billion was reportedly allocated for the construction of 41,000 miles of the Interstate Highway System as part of this massive undertaking.

The country’s collective focus on the nation’s roadway network led STV’s antecedents into new markets of design and construction. In 1954, Seelye Stevenson Value & Knecht (SSV&K), a predecessor firm in New York, was contracted by the State of Connecticut to provide engineering design services for one of the Northeast’s most important thoroughfares: Interstate 95. SSV&K’s design plan included 5.9 miles of roadway – then known as the Greenwich-Killingly Expressway – between New Haven and Branford, CT, including 14 grade separations. The interstate today carries more than 100,000 vehicles per day through the Nutmeg State, ranking it as one of Connecticut’s busiest highways.

I-95 in Maryland features a “spaghetti bowl” interchange.
The I-95 work marked the foundation for one of STV’s longest-tenured branch offices in Stratford, CT. “The work on I-95 was vital to the state, and we’ve gone on to consistently support the Connecticut Department of Transportation on countless highway and mass transportation initiatives ever since,” said James Sherwonit, P.E., vice president and office manager in Stratford.

As construction of I-95 in Connecticut was progressing, additional interstates and highways started uncoiling, connecting major American cities with developing suburban communities. Long Island, NY, was described by the New York Times in 1964 as “a region once consecrated to potato farms and the estates of the rich is fast turning into a 118-mile-long metropolis.” A key for Long Island’s development was the construction of the Long Island Expressway (I-495), linking the Queens-Midtown Tunnel with eastern Suffolk County in Riverhead. Starting in 1940, the highway was built in phases spanning eastward. In 1960, SSV&K supervised the construction of three miles of I-495 from Deer Park Avenue to Commack Road in Suffolk County, NY.

Similar to I-495 and I-95, in upstate New York, an interstate network known as the New York State Thruway was proposed by the state legislature to connect all of the region’s major cities. SSV&K provided design and construction supervision for a particularly scenic segment of the thruway called the Adirondack Northway. Under the federal interstate act, the Northway would later be identified as I-87, connecting the state north of Albany with the U.S.-Canadian border. Due to the firm’s ecological sensitivity and engineering expertise, the Adirondack Northway work was awarded a special certificate of appreciation by New York State’s Department of Public Works, and was named “America’s Most Scenic Highway” by Parade magazine.

During the same timeframe, STV’s predecessor in Pennsylvania, Sanders & Thomas (S&T), was instrumental in the development of a limited-access highway connecting all of the state’s rapidly growing Philadelphia suburbs in Bucks and Montgomery counties. S&T studied alternate sites for the 31-mile relocation and realignment of U.S. Route 202, from the Betzwood Bridge in the Valley Forge area to the Delaware River Bridge.
crossing in New Hope. The section was part of a larger highway expansion project that aimed to create a “beltway” around Philadelphia.

All of these early highway projects, which were born out of the federal interstate highway act, helped establish STV’s antecedent firms in this market, leading to more than 50 years of roadway and bridge design in both urban and rural areas across the United States.

**Rebuilding the New York Metro Region’s Busiest Roadways**

One of the most congested regions in the United States, the New York metro area connecting New York City to the surrounding suburbs in New York state and New Jersey, features many highway and bridge systems that are more than 60 years old. So, it’s no surprise that these heavily-used corridors would require rehabilitation, expansion and constant upkeep.

When construction of New York’s belt system began in the 1930s, the plan was to eventually link New York City, Brooklyn and Queens with the growing populations in Westchester County and Long Island. By the early 1980s, New York, recovering from its fiscal crisis a decade before, made a concentrated push to repair its roadways and bridges, dedicating hundreds of millions of dollars to the work throughout the region. SSV&K was contracted to provide in-depth inspection, surveys, mapping and design for seven bridges along the Belt Parkway in Brooklyn and Queens, including three structures over waterways. To ensure that traffic impacts would be minimal, the project was planned to be constructed in phases.

Across the Hudson River in New Jersey, the state approved a $2 billion bond issue in 1986 to widen 36 miles of the New Jersey Turnpike, a superhighway and tollway that originally opened in 1951. The plan was to accommodate rising traffic through the early 2000s. But the widening effort also needed to

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**The Adirondack Northway work was awarded a special certificate of appreciation by New York State’s Department of Public Works, and was named “America’s Most Scenic Highway.”**

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**Tappan Zee Bridge**
be environmentally sensitive since the turnpike ran along the Meadowlands, a swampy area of wetlands. SSV&K was responsible for preliminary and final engineering for the widening of 1.6 miles of the turnpike, including the addition of 12 toll booths at the Interchange 18W plaza in New Brunswick. The work also included the demolition and reconstruction of two major bridges within the section. The firm went on to provide design and construction management services for additional sections of the turnpike over the next 25 years.

The firm’s experience in the New York metro area also extends to many historic and iconic bridges. The Tappan Zee Bridge, built in 1955 to carry I-87 across the Hudson River connecting Westchester and Rockland counties, is used by hundreds of thousands of motorists every

Movable bridges are some of the most unique, and in some cases, the oldest continually operating components of the nation’s transportation network, providing designers with significant engineering challenges to keep them functional, reliable and safe. STV has extensive experience supporting movable bridge renovation and replacement projects all around the country.

“There is no doubt that movable bridges remain a key component of our national infrastructure network,” said Nicholas Altebrando, P.E., STV vice president and bridge national practice leader. “With movable bridges we have structural, mechanical and electrical engineering

A rendering of the Fore River Bridge between Quincy and Weymouth, MA.

A replacement span for the Willis Avenue Bridge was shipped by New York waterways to its current location.
day, necessitating a long-term repair and replacement program. Starting in 1997, STV has provided analysis and repair recommendations for the underdeck of the bridge, and continues to provide resident engineering and construction inspection services for current phases of the Tappan Zee’s rehabilitation.

Also ongoing, the firm is providing resident engineering and inspection services for the replacement of the historic Willis Avenue Bridge, a swing bridge that carries traffic over the East River between Manhattan and the Bronx. The work is part of a $5 billion plan to repair city-owned East River bridges and it is the largest, most complex structure in the program based on its age, and the fact that the bridge is located at critical junctures of the FDR Drive and the Harlem River Drive, major north-south parkways in New York City. STV’s team has had to manage the maintenance plan with the protection of traffic flow through the area.

Developing Long-Term Relationships in Connecticut

Dating back to SSV&K’s earliest work on I-95 in the 1950s, the firm has been involved with a number of high-profile highway and bridge initiatives across the state of Connecticut – from the capital region outside of Hartford, to the busy suburbs in lower Fairfield County. And throughout STV’s tenure in this state, the firm has supported the Connecticut Department of Transportation (ConnDOT) for the bulk of these projects.

“One of the keys to our long-term success in Connecticut is that our staff in the Stratford, CT, office and the staff at ConnDOT grew up together from junior engineers to senior management,” said Gerald Gerletz, P.E., R.L.S., STV senior vice president. “These relationships reinforce the value STV provides to the department in the implementation of its transportation program.”
When the firm’s Stratford office first opened in 1966, one of its earliest projects was the redesign of the Merritt Parkway-Route 8 interchange in Trumbull. As part of the project, SSV&K designed five ramps, five high-speed turning roadways, four miles of a divided, four-lane highway and 10 bridges. And because of the Merritt’s status on the National Register of Historic Places, the design had to preserve the beauty of the parkway (for more information about this project, see the sidebar on pages 70-71).

By the mid-1990s the firm returned to a familiar corridor, when it was selected by ConnDOT to provide design services for a large-scale renovation of I-95 through Bridgeport. The work was a segment of the $400 million Bridgeport Corridor Improvement Project and included the rehabilitation of 11 bridges and 14,000-square-feet of retaining walls, designed on a fast-track basis. At one point during construction, STV was unexpectedly challenged after a tanker truck exploded and melted part of the rehabilitated roadway in 2004. Under an emergency declaration, STV designed temporary structures for the damaged highway (see the sidebar on page 75 for more information about STV’s emergency road and bridge work).

Currently, STV is supporting the easing of congestion and the rehabilitation of I-95 between Stratford and Milford with the design of a 3,200-foot-long replacement of the Moses Wheeler Bridge. STV has been involved with planning the replacement of the bridge for more than 10 years, extending the life of the existing structure until the replacement is complete. The new structure has substantially longer spans, reducing impacts to vital natural resources in the Housatonic River below, and a wider cross section to increase safety. STV also developed a staged demolition and construction strategy to minimize impacts to motorists. Once completed, the new Moses Wheeler Bridge will serve as yet another demonstration of how STV’s long-term success in Connecticut has improved the quality of life for commuters utilizing its busiest corridors.

A “Wonder of the World” and Historic Bridges in Massachusetts

One of the most significant public works projects in recent history was the Central Artery/Tunnel (CA/T) – also

The Central Artery/Tunnel was compared to great structures like the Hoover Dam during its construction.
known as the “Big Dig” – in Boston. To help mitigate congestion on the Central Artery, which carried more than 190,000 vehicles a day, Massachusetts wanted to replace the elevated portions of the artery with a new underground roadway and extend the Massachusetts Turnpike to Logan International Airport via a new road in South Boston and new four-lane tunnel (the Ted Williams Tunnel) under the Boston Harbor. Called a “wonder of the world” by then U.S. Transportation Secretary Federico Peña when the project was first being planned in the early 1990s, it earned comparisons to the Hoover Dam and the Pyramids for its size and potential impact.

In a joint venture, STV was responsible for civil, structural, mechanical, electrical, geotechnical and utilities engineering, as well as the management of all disciplines for Section D011A – from Kneeland Street to Congress Street in the heart of Boston – of the CA/T. It was also one of the first segments of the I-93 portion of the tunnel to be awarded.

The northbound section of the tunnel involved mining beneath the city’s most congested areas. The firm designed excavation support systems for the...
“The alignment was one of the most complex, containing some of the most difficult engineering challenges to be encountered during construction.”

MARK PELLETIER, P.E.
STV vice president and Boston office manager

historic Boston South Station without interrupting service. STV also designed underpinning for One Financial Center and the Federal Reserve Bank skyscrapers. Highly variable ground conditions added to the complexity of the project, including a deep clay profile near One Financial Center that created some instability in the foundation. The sequencing of construction developed by STV protected these structures, as well as Boston’s subway network and major utilities. In the end, all the work was conducted without mass transportation or roadway service being interrupted.

“The alignment was one of the most complex, containing some of the most difficult engineering challenges encountered during construction,” said Mark Pelletier, P.E., STV vice president and Boston office manager.

More recently, STV has played an instrumental role in the design and construction of new bridge spans, replacing aging structures – some approaching 100 years old – throughout Massachusetts. In Fitchburg, MA, the firm designed a twin tower, cable-stayed bridge at 5th Street over the North Nashua River, named the Arthur J. DiTommaso Bridge. The original structure was built in 1912 and subsequently closed due to decades of neglect. The new bridge opened in 2009.

To alleviate traffic congestion on State Route 10/U.S. Route 202 in Westfield, MA, STV has provided planning, design and construction
engineering support services for the Great River Bridge. As part of this complex project, the firm designed renovations for the existing bridge over the Westfield River, which opened in 1939, along with a 280-foot CSX rail viaduct and a new “sister bridge.” The rehabilitation work performed on the existing Great River Bridge reflected the Federal Highway Administration’s renewed push to upgrade the nation’s bridge network following the tragic 2007 collapse of the I-35W Mississippi River Bridge in Minneapolis.

**Keeping Traffic Moving in Pennsylvania**

Since its inception by the state legislature in 1970, the Pennsylvania Department of Transportation and STV and its predecessors have worked together on a number of transportation initiatives, most notably highway and tollway projects geared toward easing congestion around some of Pennsylvania’s busiest cities.

While safety and functionality are crucial for roadway and bridge design and rehabilitation projects, there have also been opportunities for STV to enhance and honor the aesthetics of this critical infrastructure.

Early on, STV predecessor Seelye Stevenson Value & Knecht’s (SSV&K) design work on the Adirondack Northway section of I-87 in New York state contributed to the roadway being hailed by *Parade Magazine* as “America’s Most Scenic New Highway in 1966-67.” But in some instances, preserving the original beauty of a roadway or bridge is explicitly prioritized by the client. In Connecticut, SSV&K was contracted to redesign the interchange at Route 8 and the Merritt Parkway near Trumbull, CT, in the early 1980s. As one of the oldest parkways in the United States, the Merritt also has the unique distinction of being listed on the National Registry of Historic Places due to the beauty of the surrounding forest and the architectural design of the parkway’s overpass bridges. In accordance with the client’s specifications, the firm’s interchange work had to preserve the aesthetics of the Merritt’s bridges and forest, while upgrading its functionality.

This type of work continues today. STV’s bridge team has provided a functional and cosmetic facelift for a number of historic bridges in one of America’s oldest cities. The Summer Street and Congress Street moveable bridges, both a part of Boston’s historic Fort Point Channel area, were in need of structural upgrades. STV provided design services for these bridges, bringing the structures’ moveable bridge technology into the 21st century, while preserving their historic look and feel (see sidebar on page 66 for more moveable bridge work).

In 2001, the firm was contracted by the Chicago Department of Transportation to provide design services for the $55 million widening and rehabilitation of the Chicago Skyway between 75th and 79th Streets. STV’s work also incorporated aesthetic improvements beneath the Skyway, including brick paving, decorative lighting and dense plantings to enhance the streetscapes along the expressway and the adjacent neighborhoods.
S&T’s design work in Montgomery County in the early 1990s was aimed at saving commuters hours of travel time. The firm designed a critically important one-mile section of the 21.5-mile Mid-County Expressway (I-476), known locally as the Blue Route, which opened to traffic in December 1992. This section completed the link between I-95, southwest of Philadelphia, and the Pennsylvania Turnpike northwest of the city. Prior to the expressway’s opening, it would take commuters close to two hours to travel between the two landmarks. The completed link cut that time to less than a half-hour.

In an effort to keep motorists moving on other Pennsylvania interstates while simultaneously collecting revenue for future transportation projects, STV has been a leader in developing high-speed tolling technology in the Keystone State. In Easton, PA, the firm provided owner’s representative services and electronic toll collection system design and operation expertise for the I-78 Open-Road Tolling project. This new tolling technology allows motorists with electronic transponder tags to pass through at highway speeds while fares are collected. The toll plaza officially opened before Memorial Day in 2010.

STV is currently providing design services for a new interchange on the Pennsylvania Turnpike at Route 29 between Downingtown and Valley Forge, which will feature all-electronic, E-ZPass-only tolling technology. There will be no staffed booths and no cash will be accepted at the interchange. Once completed, the tollway is expected to provide quicker access to a number of business parks and corporate centers while alleviating traffic on local roads. STV designed an eight-span bridge, along with all of the highway geometry and stormwater management.

### Landmark Roadway Structures in Maryland

Dating back to STV’s earliest presence in Maryland, the firm and its predecessors were involved with significant highway and bridge projects leading to the construction of landmark structures connecting critical segments of the region’s interstate system. Engineers in the Baltimore Transportation Associates branch of S&T, which opened in 1972, designed the land approaches and supervised the construction of the Francis Scott Key Bridge, a 9,090-foot-long structure over the Patapsco River that connects to I-695 around Baltimore. At the time of its opening in 1979, the bridge featured the longest continuous steel through-truss structure in the United States and today it ranks as the third longest in the world.

The award-winning bridge set the stage for further roadway and bridge work undertaken by STV through the acquisition of Lyon Associates in 1983. Lyon had roots in Baltimore going back to 1970. At the time, the Fort McHenry Tunnel under Baltimore Harbor was under construction. In joint venture, STV/Lyon designed the 24-lane toll plaza at its entrance. The design team was also responsible for fare machines and administration buildings, as well as
roadways and structures on the east end of the tunnel. When the project opened in 1985, it closed the final gap of I-95 in the state. At that time, the tunnel was the largest submerged structure in the world designed specifically for vehicular traffic.

Southeast of Baltimore, STV/Lyon Associates spent nearly 15 years developing the Vienna bypass and U.S. Route 50 bridge over the Nanticoke River in Vienna, MD. Then the largest project in the Maryland State Highway Administration’s history, when it opened in 1990 the new bridge eliminated the last two-lane bottleneck on the principal highway corridor linking Baltimore and Washington, D.C., to Ocean City on Maryland’s Eastern Shore. STV’s first work on the bypass began in 1974 when Baltimore Transportation Associates prepared a design study report and started preliminary and final design. When the new link opened in May 1990, it was completed ahead of schedule and under budget.

Currently under construction is Section 100 of Interstate 95 in Maryland. This mega project involves the reconstruction of the existing four-lane freeway and construction of a two-lane Express Toll Road northbound and southbound to reduce traffic congestion. The centerpiece of the reconstruction is the I-95/I-695 interchange dubbed “the spaghetti bowl” because of its complex road geometry. STV, as part of a tri-venture, is providing the Maryland Transportation Authority with preliminary through final design and construction management services as the general engineering consultant.

Similar to tollway projects supported by STV in Pennsylvania, the I-95 Express Toll Road features high-speed fare collections. The roadway will also utilize variable priced tolling that will be higher during peak-travel times and reduced during the off-peak and overnight periods to better manage traffic flow.

The opening of SSV&K’s Chicago office in 1984 marked the firm’s expansion into the Midwest, creating planning, design and construction management opportunities across a variety of markets.

**Tollway Expansion in the Midwest**

The opening of SSV&K’s Chicago office in 1984 marked the firm’s expansion into the Midwest, creating planning, design and construction management opportunities across a variety of markets, including a number of high-profile transportation initiatives. Some of STV’s most significant roadway work in this region has been the historic expansion of two heavily-used tollways. In addition to being key corridors for motorists into and around the Midwest’s most-populous city, these tollways have long integrated advance tolling technology and funding mechanisms to keep them operational.

*Francis Scott Key Bridge in Baltimore.*
In the early 1990s, the Illinois State Toll Highway Authority’s $500 million expansion of I-294, also known as the Tri-State Tollway, created four traffic lanes in each direction, as well as new toll collection plazas to keep traffic moving. As one of the nation’s busiest highways and the state’s busiest toll road, it operated using its own toll revenue, so it could not be shut down during any period for construction. STV provided construction management services for a three-mile section of the tollway. Toll plazas were equipped to accommodate a state-of-the-art electronic toll-collecting system. STV oversaw an accelerated construction schedule in which work was completed in two years while three lanes of active traffic were maintained in each direction into the toll plaza approaches enabling the tollway to remain operational.

A decade later, STV was contracted by the Chicago Department of Transportation to provide design services for the widening and rehabilitation of the Chicago Skyway between 75th and 79th Streets, as part of the tollway’s $250 million rehabilitation. The widening included safety shoulders and a median separating the eastbound and westbound lanes for improved safety and functionality. And like the Tri-State Tollway, construction needed to occur while the roadway remained open to traffic to maintain toll revenue collection. As part of this project, STV developed aesthetically pleasing decorative features along this segment of the Skyway to enhance the visual experience for motorists and the surrounding neighborhoods (for more about STV’s aesthetically-sensitive roadway and bridge work, see the sidebar on pages 70-71).

The Southeast’s Population Boom

For the past decade, the population in the southeastern United States has been growing at an exponential rate. As a result, many of the roadways and bridges in this region have become overtaxed and congested, necessitating reconstruction and rehabilitation, or in some cases, brand new structures to accommodate additional motorists.

To augment itself in this growing market, STV acquired Ralph Whitehead Associates (RWA) in 2006, a firm with decades of experience in major southeastern cities such as Charlotte, Atlanta, Jacksonville, FL, and Charleston,
A firm that prides itself on a client-driven focus has to be ready when emergency strikes. Over the years, STV has played a pivotal role in helping its clients respond to emergencies and natural disasters that have damaged bridges and roadways by developing designs that make these corridors safe and operational again in short order.

In Connecticut, the firm has come to the aid of the Connecticut Department of Transportation (ConnDOT) on multiple occasions. In 2004, a car collided with a tanker truck on I-95, causing the truck to jackknife, burst into flames and melt the supports of the overpass. Fortunately, no one was hurt during the accident, but the vital corridor through New England was shut down for nearly two miles. STV rushed to the scene and worked with the client to design temporary structures that helped get the roadway reopened to traffic sooner than initially projected.

In the Midwest, STV worked with the Illinois Department of Transportation to assess and design improvements for the Jefferson Street Bridge in Joliet, IL, a double-leaf bascule structure that carries Jefferson Street over the Des Plaines River. The bridge had been repeatedly hit by barge tows. STV designed pier cells to enhance the structural integrity of the bridge.

STV’s disaster response work extends to rail bridges and related infrastructure. After an earthquake hit Los Angeles in January 1994, STV’s engineers worked with Metrolink to inspect damaged tracks and bridges. When Hurricane Katrina hit the Gulf Coast in 2005, the firm designed a replacement CSX Transportation railroad bridge over St. Louis Bay at Bay St. Louis, MS. The work was accomplished on a fast track basis, and a replacement was designed in 10 days.
SC. Since the acquisition, STV/RWA has supported, through planning, design and construction management services, a number of new highways and bridges that relieve traffic around these major southern cities, while also providing new links to the region’s tourist destinations.

Since its opening in 2009, the Fantasy Harbour Bridge has linked tourists and locals with Myrtle Beach, SC. The bridge made an immediate impact, named by Roads and Bridges magazine as one of the “Top 10 Bridge Projects” in the United States for 2009. At the time of its construction, the bridge was the longest spliced, post-tensioned concrete I-girder bridge in the country. STV performed environmental assessment and public outreach services, and prepared geotechnical documentation, right-of-way plans and final roadway and bridge plans for 3.1 miles of roadway approach and the bridge for the South Carolina Department of Transportation.

And with more state clients turning to design-build as a delivery method, STV has recently teamed with some of the country’s largest contractors and served as lead designer for many landmark roadway projects in the Southeast. To complete the Outer Loop of Charlotte – one of the city’s most critical roadway connections since it links to I-77, NC 16, NC 115 and U.S. 74 – STV designed the I-85/I-485 interchange. The firm’s design incorporated a unique “turbine interchange,” which featured left-turning ramps that sweep around the center of the interchange in a spiral pattern. This design, the first of its kind in North Carolina, eliminated several constructability issues and used fewer materials.

To better connect Charlotte to Greensboro, NC, STV was the lead design firm for a massive undertaking that will improve the I-85 corridor over the Yadkin River Bridge. A 2008 North Carolina Department of Transportation Study showed that the current corridor had a crash rate 77 percent higher than the statewide average and with no breakdown lanes, a single accident on the Yadkin River Bridge can shut down traffic for hours. To alleviate these concerns, STV has designed the relocation of three miles of highway and its widening to eight lanes; six new bridges, including 3,000-foot-long dual bridges over the Yadkin River; and a major reconstruction of the U.S. 29/70 and NC 150 interchange.

“Many of these projects are designed for improving capacity in the growing areas of the Southeast,” said Richard Capps, P.E., senior vice president of STV’s southeastern transportation division. “Utilizing design-build has allowed our firm and our build partners to create some dynamic solutions that address both mobility and safety issues.”

The I-85/I-485 interchange will be North Carolina’s first “turbine” interchange.
It was a calculated gamble that would play a significant role in shaping STV to this day. In the 1970s, while the nation was still reeling from the boom of interstate highway construction, STV was looking into an underserved market – passenger and freight rail. Charles Defendorf, former chief engineer of the Penn Central Railroad, was brought in as president of Seelye Stevenson Value & Knecht (SSV&K), a subsidiary of STV. The goal was to build a nationally recognized rail and mass transportation firm from the ground up.

“Defendorf was very well-known nationally so the intention was to use his expertise to start something,” said Michael Haratunian, former chief executive officer and current chairman emeritus and board member of STV. “But keep in mind during the early 1970s, rail was still not a national priority. Luckily, our leaders had the foresight to go forward with this plan anyway.”
The Federal Transit Administration’s (FTA) New Starts program is the federal government’s primary financial resource for supporting locally planned, implemented and operated major transit capital investments. For more than 20 years, STV has supported this program by providing project management oversight (PMO) services for New Starts and other FTA initiatives in numerous cities around the country.

As part of its PMO program, STV has overseen numerous transportation corridor studies, design programs, construction projects and other assignments, working with each transit agency to review and report on the schedule, budget and quality of its major transportation investments.

STV’s PMO work has opened up new markets to the firm, especially in the Pacific Northwest, and has enabled it to work on a number of historic and complex transportation initiatives, such as the rehabilitation of the St. Charles Streetcar in New Orleans, the oldest continually operating streetcar line in the world, which was named to the National Registry of Historic Places in 1973. More recently, STV performed PMO services for the $1.9 billion University Link in Seattle, a 3.1-mile light rail extension from the Pine Street Stub Tunnel in downtown Seattle to Husky Stadium at the University of Washington.

SSV&K received some of its first contracts from inter-city and rapid transit rail agencies such as Amtrak, New York City Transit, and the Massachusetts Bay Transportation Authority (MBTA) to plan, design, inspect and oversee the construction of stations, maintenance shops, vehicles and other transportation infrastructure. Meanwhile, Defendorf assembled a team of experts with decades of experience working for railroads such as New York Central, Reading, Boston & Maine, Pennsylvania and Long Island Rail Road (LIRR).

One of Defendorf’s key hires as a vice president was an assistant director at the New York Metropolitan Transportation Authority, Dominick M. Servedio, P.E., Today he is executive chairman of STV.

“One of the keys to building this practice was the decision to bring in individuals with actual rail operations experience,” Servedio said.

By the end of the 1970s, Sanders & Thomas (S&T), STV’s forerunner in Pennsylvania, was also providing planning, design and construction management services for projects that supported the growth of passenger and freight rail. Meanwhile, significant capital funding became available for commuter railroads that brought suburban passengers into major business centers like New York City, Chicago and Philadelphia, leading to some of SSV&K and S&T’s earliest work for now long-time clients like the LIRR, Metra, and the Southeastern Pennsylvania Transportation Authority (SEPTA).

Over the next few years, the firm’s rail expertise continued to evolve. In 1981, SSV&K acquired Ford, Bacon & Davis Consulting Services Division, which performed front-end and investigative consulting services, especially appraisals, valuations and rate studies for utilities, transportation agencies and railroads, industrial clients and insurance, legal and financial institutions.
Amendments made to the Clean Air Act in 1990, the federal law designed to control air pollution and address acid rain, ozone depletion and toxic air pollution, spurred the creation of new transportation systems in major American cities such as Houston, Dallas and St. Louis. In many of these cities, constructing or expanding a commuter rail system wasn’t feasible due to space and cost constraints. So municipalities turned to light rail transit, a flexible and adaptable mode of mass transportation that could be implemented along its own right-of-way or existing rights-of-way such as city streets, while connecting to business centers and existing transportation hubs. Another option was Bus Rapid Transit (BRT) – a public transportation system that uses buses along designated rights-of-way. And as was the case during the growth of inter-city, rapid transit, commuter rail and light rail, STV evolved in conjunction with the needs of the transportation industry, providing planning, design and construction management services for light rail and BRT systems around the United States.

Finally, it was the acquisition of two firms that helped cement STV’s ability to not only support the movement of people, but also freight. Lyon Associates, which was acquired in 1983, had a long history planning, designing and overseeing the construction of seaports and other major waterfront freight terminals. Lyon was sold back to its original owner in the 1990s, but STV continues to work with these clients to this day. The acquisition of Ralph Whitehead Associates in 2006 brought in a firm with more than 50 years of experience in the southeastern U.S., working with all class I railroads across the United States.

**Beginning with a Plan**

At the start of nearly all major transportation initiatives – from stations and shops, to full rail and bus systems – there needs to be a plan. Planning determines how a new transportation system may interact with the existing environment, or examines which commuter solution is the most practical and financially feasible to design and construct.

“At STV, we’ve always understood that a great project starts with great planning,” said Molly MacQueen, LEED® AP, STV vice president and national environmental planning manager. “If we’ve done this work well from the very beginning, the project we deliver is everything we hope it could be.”

In many instances, STV and its antecedent firms have performed planning services as a precursor to providing design and/or construction management services for larger initiatives. For example, in the early 1990s, STV was contracted by the Southern California Regional Rail Authority to study the feasibility of developing commuter rail lines into Los Angeles Union Passenger Terminal, which was primarily being used for Amtrak long-distance train service. A few years later, STV would play a central role in the full design and construction of this commuter rail service (see page 85 for more information). In similar fashion, STV performed planning services for extending an existing light rail system in St. Clair County, IL. STV would go on to play a critical role in the eventual design and construction of this transportation system as well (see page 85 for more information).

STV’s transportation planning group fully established itself as a national leader when the firm helped push...
STV was instrumental in the planning component for East Side Access, which will bring LIRR service directly to a new terminal under Grand Central Terminal.
forward LIRR’s more than 20-year-old goal to bring its commuter rail service to Manhattan’s East Side. This massive initiative, called East Side Access, entailed constructing a new terminal underneath Grand Central Terminal, thus shortening the rides for numerous Long Island commuters who can only access the city via Penn Station on the West Side. STV analyzed locations for a new terminal, property acquisitions required for the project to be built, and track alignments and interlockings that could impact existing services.

Once this operational study was completed, STV was retained by LIRR to perform a major investment study to obtain Federal Transit Administration funding for East Side Access. STV developed an operations plan and simulated future operations for the new route, among other tasks. Ultimately, LIRR received the federal funding needed to advance East Side Access to design and construction phases. The Metropolitan Transportation Authority contracted STV in joint venture to provide tunnel engineering and other services for East Side Access, which is now under construction (for more information on STV’s role in East Side Access see pages 93 and 116).

In the years following East Side Access, the firm would go on to study and analyze potential transportation solutions throughout the United States. STV managed the major investment study and draft environmental impact statement for the development and evaluation of more than 30 transportation alternatives that would provide new public transportation services in the 62-mile corridor connecting Reading, PA, to Philadelphia. In western Pennsylvania, the firm managed an alternatives analysis for the corridor between downtown Pittsburgh and Pittsburgh International Airport, looking at existing bus service, busway/light rail extensions, new highways and commuter rail service on existing rights-of-way.

Beyond the Northeast, STV’s planning expertise has been extended to high-growth corridors in Tennessee and Alabama. To increase mobility and reduce highway congestion, in the early 2000s the Nashville region decided to investigate a commuter rail line. The city had been without passenger rail service of any kind since 1979 when Amtrak’s Floridian route was discontinued. STV, in a joint venture, prepared an environmental assessment as part of the preliminary engineering phase, accomplishing the work in only seven weeks. The firm then designed improvements to track and grade crossings and the replacement of eight bridges and rehabilitation of four bridges. STV also provided standards and design for the platforms, Americans with Disabilities Act (ADA) access and canopies at the seven stations along the 32-mile commuter line, which went into operation in 2006 and connects Riverfront, TN, to Lebanon, TN.

During the same timeframe, STV developed a number of alternatives to improve transportation and mobility in Birmingham, AL, home to one of the most extensive highway and roadway networks in the Southeast. The alternatives analysis included an evaluation of five corridors in the Birmingham metropolitan area. STV identified the corridors that had the highest potential for enhancement, looking at modes such as light rail and bus rapid transit.

More recently, STV’s planning team evaluated new potential corridors that will better link commuters in Los Angeles and Baltimore to busy commercial hubs. Still in its early design phase is a proposal to connect the Los Angeles County Metropolitan Transportation Authority (Metro) Green Line to the Los Angeles International Airport, which is not currently connected to the region’s rail network. STV, in a joint venture, was contracted in 2011 to provide planning, environmental services and conceptual design to bridge the 1.5-mile gap between the airport and a planned Metro rail hub.

“We have worked very closely with Metro and the airport to prepare a long-term vision for the corridor in hopes of providing a better connection for passengers and workers to the world’s fifth-busiest airport,” said Tyler Bonstead, a transportation planner for STV.

“At STV, we’ve always understood that a great project starts with great planning,”

MOLLY MACQUEEN, LEED® AP
vice president and national environmental planning manager in the Transportation & Infrastructure Division

In Maryland, the Purple Line is a proposed 16-mile light rail line that would connect with a number of other transportation services in Montgomery and Prince George’s counties, including the Washington Metro, the Maryland Regional Commuter Rail system and Amtrak’s Northeast Corridor. The goal of the project is to improve east-west transit travel in the metropolitan Washington, D.C. area while relieving roadway congestion and encouraging transit-oriented development around station locations. Working as a major subconsultant to the general engineering consultant team, which is contracted by the Maryland Transit Administration (MTA), STV is performing transportation planning, operations planning, social and environmental studies and preliminary engineering for the Purple Line. STV has evaluated traffic and pedestrian impacts of various alignment alternatives
for the proposed service. The commission also builds on earlier planning work STV conducted for the MTA, including a feasibility study for the Yellow Line light rail in the early 2000s.

STV’s transportation planning expertise goes beyond the feasibility and operational analysis of new rail and bus transit corridors. Over the years, the firm has emerged as a leader in the use of pedestrian simulation software to determine commuters’ movements in terminals and stations. STV’s planners have become adept in Simulation of Transient Evacuation and Pedestrians (STEPS) software, which calculates virtual traffic patterns and movements through facilities. STEPS models have been developed for projects like the World Trade Center Transportation Hub, East Side Access at Grand Central Terminal and the Hoboken Terminal rehabilitation.

“This software takes the guesswork out of the planning stage and allows for a realistic view of a new design for the most efficient flow before plans are finalized,” said Steven Scalici, P.E., senior associate and national traffic planning and analysis manager.

Bringing New Passenger Rail Systems to North America

Over the past 30 years, a number of major North American cities have introduced brand new passenger transportation systems – primarily commuter rail and light rail – as a way to alleviate roadway congestion, be more environmentally friendly and to foster new residential and commercial development in these urban centers. These full build-outs often require a planning component, as well as the design and construction management of new track alignments, stations, shops and yards, systems, vehicles and more. Throughout its history, STV and its predecessors have again and again demonstrated what it means to be a full-service firm in the transportation arena, providing all of these planning, design and construction services, and then some, in order to bring new modes of transportation to cities and neighborhoods in need of more options.

One of the earliest, and most significant full rail system build-outs STV supported was in the “freeway capital of the world.” The firm was selected by the Southern California Regional Rail
Authority as the general engineering consultant for Metrolink, a brand new commuter rail system in Los Angeles. STV was responsible for program management, planning, engineering, design and construction management for various key assignments throughout the system’s development. This included the modification of nearly 230 track-miles of existing right-of-way; the addition of second main tracks, sidings, and line extensions; and work involving new maintenance facilities, storage yards, signals and communication systems and local permitting.

With more than 50 stations throughout the entire system, STV prepared the commuter station design manual for Metrolink. The firm also designed eight stations and reviewed the plans of the local government’s architect for a number of other commuter rail stations; most were entirely new facilities, while others were existing stations requiring rehabilitation.

The birth of Metrolink ushered in a new era of commuter transportation in California. Extending throughout Los Angeles, Orange, Riverside, San Bernadino and Ventura counties in Southern California, the project formed the nation’s sixth largest commuter rail system once it was completed. “The future of transportation in California is rail,” said Gary Hausdorfer, then-chairman of the Orange County Transportation Authority board, at the opening ceremonies in October 1992.

STV was also there for Metrolink when disaster struck. In 1994 a large earthquake rocked Southern California, damaging the region’s roadway network, and forcing commuters to Metrolink at an exponential rate. The firm worked around-the-clock with its client and partners to get the commuter services fully operational as quickly as possible. STV also performed design and construction management services for two new commuter rail stations – which were designed in one week and constructed in two weeks.

“Our work for Metrolink in Southern California really cemented our rail practice on the West Coast,” said William F. Matts, P.E., executive vice president and chief operating officer of STV’s Transportation & Infrastructure Division. “Since that commission, we have never been without major rail work on the West Coast.”

In the mid-1990s, STV, in a joint venture, was commissioned to provide program and construction management services for a different MetroLink – a light rail system terminating in St. Louis. When the service first opened in 1993, ridership far exceeded expectations, reaching levels that were not initially projected until 2010. As a result, the 25-mile St. Clair County extension was planned to more than double MetroLink’s service. The extension included 13 new stations in undeveloped areas of Illinois.

A key to the project was a land-use plan geared toward feeding new riders in each community to MetroLink. STV’s role also included preliminary through final design, land acquisition, testing and startup for the extension. County board officials praised the completed project for exceeding demands in the face of the aggressive design and construction schedule and the extension won a 2002 Gold Engineering Excellence Award from the New York Association of Consulting Engineers.

The rise of alternative delivery methods such as design-build, and design-build-operate-maintain (DBOM) in the late 1990s were instrumental in STV’s role during the creation of three significant and historic rail transportation systems in the Northeast.

The Hudson-Bergen light rail in New Jersey was the first major transit system in the country to be designed and constructed under a DBOM contract – which takes the design-build method a step further by including a team member to operate and maintain the completed project for a specified period. As a subconsultant to the DBOM consortium, STV performed track alignments and engineering design for bridges, stations and parking facilities, a vehicle maintenance facility, utilities and traffic signals for the project, which was heralded as a “spectacular achievement” by the New York Construction News Best of 2000 program.

With 24 stations, the Hudson-Bergen line connects the communities of Bayonne, Jersey City, Hoboken, Weehawken, Union City and North Bergen in Hudson County, the sixth most densely populated county in the United States. The first segment of the system, extending from
With more than 50 stations throughout the entire system, STV prepared the commuter station design manual for Metrolink.

Bayonne to Newport, went into service in 2000. The next segment, extending the line to Hoboken in Hudson County, was completed two years later.

The success of the Hudson-Bergen line led to STV’s next major DBOM initiative, the first new rail line to be built in New York City in more than 40 years. Despite it being the busiest international airport in the United States, a rail link to John F. Kennedy International Airport (JFK) in New York City was a long-stated need that was unable to gain traction until the late 1990s. That’s when STV, design consultant for the AirRail Transit Consortium, helped develop AirTrain JFK, an 8.3-mile light rail route connecting JFK with the Long Island Rail Road and New York City subway system.

As part of its work, STV designed the service’s elevated guideway, a six-mile precast box-girder structure supported by cast-in-place columns. More than 5,400 precast segments were used to complete the superstructure, making it the longest precast segmental bridge in the United States at the time of AirTrain JFK’s debut in 2003.

AirTrain JFK consists of 10 fully-enclosed airport terminals. The system
presented the unique challenge of designing in a constrained airport environment already in the midst of a massive rehabilitation. During the course of the project, nearly every terminal at JFK was either under major construction or in the planning stages of it. As a result, STV had to be adaptable as design progressed.

By the early 2000s, STV had been selected as the lead engineering design consultant for the historic Greenbush Line on the MBTA commuter rail system. The Greenbush Line was actually first established in the mid-19th century to carry passengers and freight, but the line had been disbanded for nearly 50 years. This forced commuters in the towns of Braintree, Weymouth, Hingham, Cohasset and Scituate to the roads as their only means of travel.

The reconstruction of the 18-mile-long Greenbush Line called for every element of STV’s design expertise—a reconstructed railroad right-of-way, an 800-foot-long cut-and-cover underpass through Hingham Square, seven new stations, a brand new signal and communication system, 18 bridges, and a layover facility at the end of the line in Greenbush, MA. Accomplished through a design-build contract, the service opened in 2007 and has had a major impact on the area’s mobility.

“We were able to build and grow upon each of these experiences,” said Brian Flaherty, STV senior vice president and design-build national practice leader. “I like to think that we learned how to use design-build together to deliver a quality project for the client.”

STV had a wealth of experience supporting high-speed rail (HSR) initiatives years before HSR was a national buzzword in the United States.

Some of STV’s earliest U.S. HSR work dates back to 1984, when the firm was contracted by the Pennsylvania High Speed Intercity Rail Passenger Commission to provide oversight services in reviewing a study to determine if a high-speed passenger rail service was feasible between Pittsburgh and Philadelphia.

When Amtrak was introducing its brand new Acela HSR service along the Northeast Corridor in the 1990s—the country’s first HSR service—STV worked in a number of different arenas for this historic initiative. The firm was selected to lead the design-build team for three maintenance facilities at Southampton Yard in Boston, Sunnyside Yard in Queens, NY, and Ivy City Yard in Washington, D.C. (see article on page 96 for more information about these shops). Additionally, the firm was contracted by the Coalition of Northeast Governors High-Speed Rail Task Force in its program with Amtrak and the Federal Railroad Administration (FRA) to observe vehicle tests for proposed train sets to be used on the Northeast Corridor. The scope of work included review of the test plan, witnessing tests and reviewing Amtrak’s reports. A major component of the analysis was determining how to increase vehicle speed through the notably curvaceous right-of-way between New York City and Boston.

HSR became a national priority again in 2009 when President Barack Obama earmarked billions of dollars in investment for new services. STV was already designing the Orange County to Los Angeles section of the California High-Speed Train, the first truly dedicated HSR system in the United States. STV’s segment would connect the nation’s first, fifth and sixth most populous counties via high-speed rail service.

The design of this service incorporated a number of challenges, including how to implement HSR without adversely affecting freight and passenger service. Design proposals included crash walls to separate existing freight and passenger trains, flyovers and grade separations for other rail lines and roadways, and stations providing interconnectivity to other modes of transportation such as commuter rail, rapid transit and bus transit. There was also an extensive environmental component that STV’s planning team performed for this initiative (see page 116 for more information).

The desire to create HSR corridors has since extended to other parts of the United States. The firm is currently designing a 4.2-mile stretch of double-rail track between Thomasville and Lexington, NC, which will tie in to the Southeast HSR corridor, and in Virginia, an 11.4-mile third-track extension on the Virginia Railway Express’ Fredericksburg line, which could also potentially be integrated into a HSR line. In a separate commission, STV was selected by the FRA to provide project management oversight consulting support services for additional HSR proposals on both U.S. coasts.
2004 Super Bowl, which was planned at Reliant Stadium in Houston and was slated to bring hundreds of thousands of people into the city.

STV worked with METRO as the program manager, overseeing every component of the initiative, which featured an at-grade, street-embedded rail system, 16 stations and a maintenance facility. Due to a Texas law, design-build was never an option for this project, so STV developed a fast-track delivery plan, enlisting construction contractors when the final design was only 30 percent complete. Not only did the project make its Super Bowl deadline, it debuted 10 months ahead of schedule and was the fastest Federal Transit Administration (FTA) New Starts light rail system to be designed and built on record (for more about STV’s support of New Starts projects, see the sidebar on page 80).

In another growing Texan city, STV recently wrapped up a nearly 15-year effort to develop a comprehensive light rail system in Dallas and its surrounding communities and business centers. In 1997, STV, in a joint venture, was named general engineering consultant and provided program management, design, and construction management services for the initial extension of the Dallas Area Rapid Transit (DART) system, a $1 billion, 25-mile, 13-station light rail transit build-out that included track, bridges, utilities, grade crossings and expanded maintenance facilities. The light rail extension more than doubled DART’s existing transportation network, bringing service beyond the Dallas city limits into the heavily populated suburbs of Garland, Plano and Richardson.

During the extension’s second phase, STV, again in joint venture, provided
similar services for the construction of the 25-mile Green Line connecting southeast Dallas to the cities of Farmers Branch and Carrollton. At the opening ceremonies for the Green Line in December 2010, the project was heralded as a demonstration of “visionary leadership in transit,” by an FTA official. “The Green Line changes everything for our customers,” said Gary Thomas, DART president and executive director.

Similar to Dallas and Houston, over the past decade, Charlotte, NC, has emerged as one of the fastest-growing cities in the United States. STV was first contracted by the Charlotte Area Transit System (CATS) to perform project management support services during the design and construction of the 9.6-mile-long Blue Line, which opened in 2007. These services included design review and constructability analysis of the trackwork, facilities and system elements, including signals, communications, traction power and overhead catenary power systems.

During this time, STV first worked with Ralph Whitehead Associates (RWA), an engineering design firm with more than 50 years of experience in Charlotte and throughout the Southeast. RWA was also involved with the Blue Line project team. STV acquired RWA in 2006, setting the stage for CATS to retain the firm in 2008 to provide transportation planning, environmental investigations and documentation, and preliminary engineering services for the construction of a 9.3-mile Blue Line Extension (BLE). The work also included planning and design for traction power, overhead catenary, train control and communications systems.

The BLE was identified as a necessity for Charlotte as the city continues its population growth, running from Center City Charlotte – the region’s central business district – northeast to the University of North Carolina – Charlotte (for more on STV’s environmental work for the BLE, see page 116).

With so many notable accomplishments, it was only fitting that this market would bring STV into a brand new geographic region in Canada. STV is currently supporting the single largest public works project ever executed by the City of Ottawa, Canada’s capital. In a four-way joint venture, the firm was awarded the preliminary engineering and project management services for the Ottawa Light Rail Transit Project, which calls for more than 12.5 kilometers of new light rail over the next 5 years.

The planned east-west light rail system will provide more mass transportation options to the city, which already has a BRT system in place. Ottawa serves as the capital for the Government of Canada, and is home to the Parliament, the Senate and the Supreme Court. It is also one of the world’s top five regions for research and development. As a result, employment is expected to increase by 30 percent in the city by 2031, placing considerable demands on the existing transportation system.

“Based on our successes in the United States, especially in Houston and Dallas, to name a few cities, we were a good fit to lead this joint venture,” said Richard Amodei, STV senior vice president. “We wanted to be leaders in the Canadian market, and this project gives us an opportunity to demonstrate that.”
Developing and Rehabilitating Rail Corridors

In cities where passenger rail options already exist, population and ridership growth have often necessitated improvements to these inter-city, rapid transit, commuter and light rail systems. STV and its forerunners have an extensive history, going back to some of the firm’s earliest work in the rail industry, in the planning, design and construction management of rail corridor infrastructure, including bridges, tunnels, and track alignments.

One corridor where STV has worked extensively is the Northeast Corridor between Washington, D.C., Philadelphia and Boston, the most heavily traveled passenger rail corridor in the United States. This pathway is used by Amtrak’s inter-city service, in addition to a number of commuter rail and freight railroads. Dating back to the late 1970s, a major overhaul and improvement program for the Northeast Corridor was outlined by the U.S. Government, which ultimately took shape in a number of different ways.

In the early 1980s, the firm played a key role in one of the most significant rail transportation projects in Philadelphia history – the Center City Commuter Connection, which entailed connecting two independently-running regional commuter railroads via a four-track tunnel. At $320 million, it was then the largest project undertaken by the City of Philadelphia. When it opened in 1984, it marked the first cross-town commuter rail service of its kind in the city’s history, as well as the first U.S. system of its kind to link two separate railroads in this fashion. STV predecessor S&T prepared the environmental impact statement for the tunnel and provided cost estimating, preliminary and final design, and construction phase services. The firm designed extensive renovations at Suburban Station to accommodate additional commuter traffic, while communications and signalization for the entire project were required to centralize all communications and train control functions.

By the early 1990s, the Northeast High Speed Rail Improvement Program, a multi-billion dollar initiative to upgrade the corridor north of New York to handle a proposed high-speed rail service, had been implemented. STV provided detailed inspections and surveys for 15 bridges along a 17-mile section of the corridor between Groton, CT, and Westerly, RI, and final design for the rehabilitation of five of those bridges. Also included in the project were field surveys, analysis and design for track structures and access roadways and utilities affected by the construction. By 2000, Amtrak had initiated its Acela Express service, the nation’s first high-speed rail service which runs along this corridor (for more information about STV’s work supporting high-speed rail, please see the sidebar on page 86).

A little further south in Bridgeport, Connecticut’s largest city, STV, in joint venture, performed a comprehensive study, inspection, total design and construction support services for the award-winning $90 million replacement...
SUPPORTING THE MASS MOVEMENT OF GOODS

With such an extensive history supporting the development and expansion of passenger rail systems across North America, it only made sense for STV’s expertise to extend to the freight rail sector and other methods of moving mass quantities of goods such as through ports and harbors.

One of the firm’s earliest freight rail initiatives was along the waterfront in Brooklyn, NY. That’s when STV forerunner Seelye Stevenson Value & Knecht performed project management, planning and final design of a rail system and right-of-way for the expansion of the New York Dock Railway, a freight system that utilized both rail and water to move goods along the New York Harbor into Brooklyn throughout the 20th century. The railway was also used by a long-term STV client, New York City Transit, as a way to transport new subway vehicles.

The acquisition of Lyon Associates in 1983 brought in a portfolio of more than half a century of waterfront development experience. Lyon had planned and designed port and offshore infrastructure in international markets such as Republic of Korea, Philippines and Guam throughout the 1960s and 1970s. In 1982, STV/Lyon was awarded a contract with the Maryland Port Administration to design the $220 million Seagirt Marine Terminal on the Patapsco River in Baltimore. When it opened in 1990, the 265-acre state-of-the-art terminal could handle 150,000 containers annually, doubling the port’s capacity. Thirty years later, STV continues to provide a range of services for the port administration.

By the mid-2000s, STV had been contracted by the New York City Economic Development Corporation in joint venture for the planning component for the Cross Harbor Freight Movement Project, a major freight rail initiative. With highway truck traffic expected to increase exponentially by 2025 in the New York metropolitan region, and direct freight rail options limited between South Brooklyn and New Jersey across the Upper New York Harbor, there has long been a call to examine potential freight rail options to better serve this region. As part of a major investment study, several alternatives were identified, such as expanding railcar barge service across New York Harbor and constructing a new rail tunnel from Brooklyn to either Staten Island or Jersey City, NJ. After the investment study, STV was retained, in joint venture, to prepare an environmental impact statement, provide conceptual engineering, and conduct public involvement programs.

During the same timeframe, STV acquired Ralph Whitehead Associates (RWA). RWA’s project portfolio included decades of experience supporting major freight transportation companies in the southeastern United States.

“Some of Ralph Whitehead’s earliest work involved a number of grade separation projects in Charlotte for the old Southern Railway,” said Robert Phillips, P.E., STV vice president and project manager. “From there, a railroad engineering service was created that’s since evolved into a nationally known company that provides a range of freight services.”

Currently, the firm is providing construction management services for the S-Line expansion project in Florida for CSX Transportation (CSXT). This initiative was triggered by the sale of CSXT’s A Line to the State of Florida for a new commuter rail service north and south of Orlando. Because CSXT will continue to serve industry in the Orlando-area, all through-freight service is being moved to the S-Line. As part of this project, CSXT is relocating a rail freight classification yard from Orlando to Winter Haven and a new state-of-the-art intermodal facility is being built to serve the entire state.
of the Peck Drawbridge and 3,000-foot-long Bridgeport Railroad Viaduct. Close
to 100 trains crossed the half-mile-long, 40-span Peck Drawbridge a day, which
is primarily used by Amtrak and Metro-North Railroad’s passenger rail services
and Consolidated Rail Corporation’s freight service. Constructed in 1903, the
existing span had serious corrosion and fatigue damage due to its age.

One of the key elements of this project was STV’s long-term program that
ensured the serviceability of the existing structure while a new structure was put
into service. A staged construction plan successfully maintained a normal train
timetable utilizing a minimum of two of the four existing tracks.

Additionally, the initiative provided an opportunity for STV to improve the
quality of life around the community. The vertical and horizontal clearances of
the bridge were increased at the request of the U.S. Coast Guard to allow the
passage of larger vessels and reduce the number of required bridge openings.
And because the Bridgeport Viaduct spanned antiquated city streets that were
originally designed in the 19th century, the roadway network within the project
area was upgraded, resulting in increased horizontal and vertical clearances and
safer intersection geometry.

The project received a 1999 Gold Award in the New York Association
of Consulting Engineers’ Engineering Excellence Awards and was also named
the Bridge Project of the Year by New York Construction News.

A few years earlier, STV designed emergency repairs for another moveable
rail bridge, the Lower Hackensack River Drawbridge. In December 1994, a
commercial vessel pulled by two tugboats struck the structure, which carries NJ
TRANSIT’s Morris & Essex Lines. The next morning, STV and NJ TRANSIT
personnel inspected the bridge to assess the damage. They determined that repairs
could be made without disrupting service on the commuter rail line. The project
earned an Engineering Excellence Award from the New York Association of Con-
sulting Engineers (for more information about STV’s moveable bridge experience,
see the sidebar on pages 66-67).
A number of historic bridges were reconstructed during the Pasadena Blue Line project.

Moving from the East Coast and the Northeast Corridor, STV’s vast experience developing and expanding passenger rail services in California brought the firm to Pasadena in the mid-1990s. A proposed extension of the Los Angeles County Metropolitan Transportation Authority (METRO) Blue Line necessitated the rehabilitation of a number of existing structures along the corridor, including the Arroyo Seco Bridge, which was originally built in 1896 and has been named a City of Los Angeles Historic-Cultural Monument by the Los Angeles Cultural Heritage Commission. STV provided construction management services for the reconstruction of this structure and the Los Angeles River Bridge Crossing, in addition to the retrofit of 13 other bridges and the replacement of the Lacy Street Bridge.

STV managed the dismantling and reworking of the Arroyo Seco from a single-track structure to accommodate a two-track light rail line. Because the reconstructed bridge maintained its original architectural style, the project earned a California Preservation Foundation Award from the California State Historical Society.

One of the largest line segment infrastructure projects in the United States is currently under construction. After its successful work planning East Side Access, STV, in joint venture, was selected to provide tunnel engineering services for this massive project, the largest construction program ever undertaken by Metropolitan Transportation Authority Capital Construction. The tunneling component consists of the creation of eight miles of new tunnels in Queens and Manhattan that will connect to the existing 63rd Street tunnel under the East River, along with a new LIRR terminal at Grand Central. Construction is taking place in a dense urban environment encompassing some of the most valuable residential and commercial real estate in the country.

The development of East Side Access has provided other opportunities to STV. The firm developed the conceptual design for the new line’s systems including signals, communications, central control and traction power. As a spin-off project, STV prepared conceptual design documents to improve the infrastructure of the Harold Interlocking in Queens to remedy rail congestion caused by converging operations of LIRR, Amtrak and NJ TRANSIT.

There is also an extensive environmental component to the project, in which STV is taking a lead role (see article on page 116 for more about STV’s environmental work). All of this work needed to be expertly planned and coordinated, since construction was taking place around active railroad sites and underneath the fully developed streets of the country’s biggest metropolis.

Setting Up Shops and Yards

One of the firm’s earliest commissions in the rail transportation industry occurred in the 1970s during the rehabilitation of the paint shop and car wash at New York City Transit’s massive Coney Island Complex, the largest rapid transit yard in the world. Rail maintenance facilities have since grown into one of STV’s flagship market areas. In addition to providing planning, design and construction management services for shops and yards that are components of larger commuter rail and light rail system build-outs, the firm has also been instrumental in countless initiatives focused primarily on the expansion or
“We are the largest rail maintenance facility designer in North America and have been a part of the planning, new construction and rehabilitation of numerous rail facilities for transportation agencies nationwide.”

DAVID BORGER, P.E., P.P.
senior vice president and transportation facilities national practice leader

rehabilitation of rail inspection and maintenance facilities. Many of these landmark projects provided the impetus for STV to move into new geographic markets, while developing innovative solutions that still affect the industry.

“We are the largest rail maintenance facility designer in North America and have been a part of the planning, new construction and rehabilitation of numerous rail facilities for transportation agencies nationwide,” said David Borger, P.E., P.P., STV senior vice president and transportation facilities national practice leader.

It was a maintenance facility project in the early 1980s – the John D. Caemmerer West Side Storage Yard and Maintenance Facility – that helped cement STV as a national leader in the transportation industry. A $500 million state transportation bond had just been passed in New York to address the region’s overcrowded passenger rail network. State Senator John Caemmerer, the project’s namesake, fought for a facility he called “the single most important capital improvement project on the Long Island Rail Road.” By being able to store up to 320 commuter cars, the new storage yard, which was

One of STV’s earliest commissions in the rail shop and yard sector was at the massive Coney Island Complex in Brooklyn, NY.
adjacent to Pennsylvania Station in Manhattan, was promising to increase LIRR service by more than 30 percent, enabling the commuter railroad to meet its growing ridership demands.

STV predecessor SSV&K performed an initial feasibility study to determine the optimum location and layout for the yard, along with potential environmental impacts. The firm then provided complete design services for the $170 million yard (more than $400 million in today’s dollars), which included a number of complex tasks considering the size and scope of LIRR’s expansion plans and the site’s proximity to existing transportation infrastructure.

Early in the project, the North Access Connection Tunnel, a 1,500-foot-long concrete box, was constructed under the site for future routing of Albany-bound Amtrak trains into Pennsylvania Station. SSV&K designed and supervised the construction of this structure.

Four tracks from Penn Station fanned out to 31 tracks within the yard. These storage tracks were capable of holding five miles worth of electric equipment at one time. At the southeast corner of the yard was a six-track maintenance shop for cyclical inspections, light and medium repairs and wheel truing. This shop allowed cars to be inspected and serviced without being shuttled back to Long Island. The north side of the yard featured a car cleaning platform where up to 24 cars at a time could be serviced.

To support the movement of vehicles within the yard, SSV&K provided complete architectural and engineering design and construction inspection services for LIRR’s control center, which featured a master control board, a closed circuit television system and security systems. Adjacent to the control center was a 28,000 kilowatt electric substation. At the time it was constructed it was the largest direct current power substation in the world.

This highly successful project made a great impression on LIRR. Before joining SSV&K in 1988, Robert Sturm, STV’s recently retired chief of rail planning, worked for the LIRR and frequently dealt with the firm.

“Based on my experience as a client, the extreme willingness of the company’s personnel to work with me, to help me, to fill in the blanks, (STV) was superior to the other firms I dealt with,” Sturm said.

The West Side Yard was also the impetus for additional commissions from LIRR. SSV&K performed a range of services for the 11-phase, 10-year LIRR program to replace all of the agency’s major repair facilities. One of the most notable complexes in this program was the Holban/Hillside Rail Maintenance and Storage Facility, comprised of three buildings across 68 acres in Queens, NY. In addition to an initial operations analysis, alternative site selection and a complete system inventory of existing shop conditions, SSV&K was responsible for shop layout and design of building systems, including traction power, lighting and communications systems throughout the complex. Inside the main repair facilities, the firm provided design services for a shop that could service 60 rail cars at one time. The facilities also featured state-of-the-art robotics and automated systems to increase repair efficiency for LIRR.

During the same time period, SSV&K was supporting a historic rebuilding effort in Boston. SSV&K undertook the master planning and engineering design for the 380,000-square-foot Boston Engine Terminal for the MBTA. The agency required a state-of-the-art main-
The Metropolitan Transportation Authority, LIRR and MBTA have since become long-term clients for STV. As STV was working with the agencies on massive maintenance complex commissions, the firm was selected for one of its Peninsula Commuter Service in San Francisco. STV continues to service mass transportation clients in this region of the state out of its Oakland and San Jose offices.

One of STV’s most significant shop and yard accomplishments – and a true industry game-changer that ushered in a new methodology for project delivery – was the Bombardier/SEPTA Frazer Rail Maintenance Facility in Pennsylvania. In 1986, the firm performed project management, engineering design and construction management services for the facility, which would be used to repair SEPTA vehicles. This initiative was unique because it was the first design-build transportation project in the United States to be operated and financed by a private entity – in this case Bombardier. It also marked STV’s earliest foray into the design-build arena.

“It was an innovative project, and the design-build methodology allowed us to work closely with Bombardier to develop innovative strategies that kept costs down and the project schedule aggressive,” said Kenneth Bossung, P.E., P.P., an STV vice president and project manager who was involved with the Frazer project. Remarkably, the new facility opened just one year after the start of site preparation.

By the 1990s, STV’s reputation as a leader in the design of shops and yards led to its selection to lead the design-build team for three Amtrak rail maintenance facilities at Southampton Yard in Boston, Sunnyside Yard in Queens, NY, and the Ivy City Yard in Washington, D.C. These facilities were designed to support the railroad’s Acela program, the first high-speed rail service introduced in North America and hailed by then-Amtrak chairman Gov. Tommy Thompson of Wisconsin as the “revitalization of train service in America.” Meant to serve as a prototype for future high-speed rail repair shops, the facilities were completed ahead of schedule in 2000.

By 1985, the firm had opened its first office in Northern California to supply preliminary engineering for a new centralized service inspection and maintenance facility for CalTrain first contracts with NJ TRANSIT, now another long-term client. SSV&K, in joint venture, provided master planning and design services for the $120 million Meadows Maintenance Complex in Kearny, NJ. In addition to design services, the firm worked with NJ TRANSIT to develop a preventive maintenance program for the replacement of components and complete car systems, which focused on repairing vehicles before in-service failures.

By 1985, the firm had opened its first office in Northern California to supply preliminary engineering for a new centralized service inspection and maintenance facility for CalTrain.
Today, STV’s shops and yards portfolio continues to build on the firm’s earlier accomplishments in this project type, providing award-winning planning, design and construction management services that can meet the client’s needs and inspire innovation. In 2009, STV received an Engineering Excellence Award from the Connecticut chapter of the American Council of Engineering Companies for its design of the New Haven Rail Yard running repair shop. The call to design and construct the facility was the result of an emergency situation in Connecticut in which more repair space was quickly needed to fix the state’s aging rail equipment. Design was completed within three months and the facility was constructed within a year. To accomplish this, the building was designed as a pre-engineered structure. Because many of the line’s vehicle components were freezing in the cold weather, the firm designed a heating system to address maintenance issues.

In Stockton, CA, STV designed a 108,000-square-foot facility for the San Joaquin Regional Rail Commission, which is expected to be the first maintenance facility in the United States to achieve LEED® Silver Certification. Ground was recently broken on the project, which will inspect and service vehicles used on the Altamont Commuter Express. For its “green” elements, photovoltaic electrical panels will reduce dependence on grid-sourced power; HVAC and lighting control systems will leverage natural ventilation; rainwater will be harvested for irrigation; and industrial grey water will be recycled.

**Terminals and Stations for New Generations**

A transportation system’s stations and terminals have evolved beyond just starting-off points and destinations for users. In many cases, they are intermediary points, where commuters switch between rail lines and transportation modes. In other instances, terminals have emerged as hubs for businesses and tourists. STV and its antecedent firms have a long history dating back to its earliest work supporting new stations and the restoration of existing ones that satisfy the changing needs of a varied range of users.

The rise of new passenger rail systems in major American cities like Atlanta and Washington, D.C., was the impetus behind S&T’s first station designs during...
the 1970s. The firm designed the Metropolitan Atlanta Rapid Transit Authority’s (MARTA) Hightower Station (now the Hamilton E. Holmes Station), which opened in 1979, the same year MARTA launched its first rail service to serve the Atlanta metropolitan area’s five largest counties. S&T also performed design services for the Washington Metropolitan Area Transit Authority’s (WMATA) Pentagon Station. Opened in 1977, the station is adjacent to the Pentagon and once had a secure and direct route to the military complex before it was closed in 2001. WMATA, an agency the firm still supports to this day, had just begun operations a decade earlier.

But it was an early commission from the MBTA that went on to have a major impact on the firm’s rail practice, demonstrating SSV&K’s versatility and ability to think fast during an emergency. In the early 1980s, SSV&K’s newly formed Boston office was brought in to conduct a planning study for the relocation of the MBTA’s light rail Green Line. From there, SSV&K’s role evolved into guiding the transformation of Boston’s historic North Station into a multimodal hub for rapid transit, trolley and commuter rail – a dramatic program the firm supported for more than a decade. The expansion included a new underground car garage, and a multimodal transportation station supporting a new Boston Garden arena. In a joint venture, SSV&K provided project management; planning; civil, structural, mechanical and electrical system design; construction phase services; environmental permitting; cost estimating; and constructability review for the program. The firm’s work also included the design of commuter rail platforms; communications, signalization and electrification systems; and tunnel ventilation.

The firm’s experience at North Station enabled it to respond quickly when disaster struck. In 1984, a fire destroyed a vital trestle bridge, cutting off all commuter rail service into North Station. SSV&K was called to the scene to provide emergency fast-track services for the design and construction supervision of the rebuilt structure.

“From that point in time, we were noted for our ability to get the job done very quickly and efficiently on a fast-track basis, which helped us move on to other major projects in the Boston area and throughout the rest of the United States,” said Mark Pelletier, P.E., STV vice president and Boston office manager.

One of those major projects was in Atlantic City, where STV supported a new, $200 million convention center and rail terminal complex, which resurrected the Atlantic City Line after it ceased
operations in 1983. In a joint venture, the firm provided master planning, project management, engineering design and construction inspection services for the complex, which was conceived to help restore Atlantic City’s prominence as a seaside resort and convention destination. Because the feasibility study revealed that the site’s proximity to the Atlantic City Expressway, beach thoroughfare, and other roadways constrained the project, the exhibition hall was designed at a higher elevation than the terminal, with parking and other services placed below grade. The rail terminal opened in 1989.

During the same timeframe, the firm was involved in a number of rehabilitation projects for significant stations within the New York City subway network – one of the biggest rapid transit systems in the world. STV performed mechanical and electrical design services for the Fulton Street Station in lower Manhattan, which had just been designated a New York City Historic Landmark. The firm redesigned the lighting and signage systems at the complex – which consists of four linked stations servicing eight subway lines.

Soon after funding was approved in New York City Transit’s 1992-96 capital improvement budget, STV was contracted to provide structural, mechanical design services for the Fulton Street Station in lower Manhattan, which had just been designated a New York City Historic Landmark. The firm redesigned the lighting and signage systems at the complex – which consists of four linked stations servicing eight subway lines.

“...in the future, New Yorkers may look back at the summer of 1998 as the architectural apogee for the once-decrepit landmark.”

NEW YORK TIMES

Years before Charles Defendorf arrived, and the seeds were sown for a passenger and freight rail practice, STV’s predecessors were performing a range of engineering design and construction management services for facilities servicing a completely different mode of public transportation – the commercial airline industry.

More than 50 years ago, STV’s earliest forerunner, Seelye Stevenson Value & Knecht (SSV&K), built on its airfield design experience work during World War II. Some of the firm’s earliest airport assignments were for the expansions of the Greater Rochester International Airport in Rochester, NY and Stewart International Airport in Newburgh, NY. SSV&K would provide various services for decades at these

AVIATION ACES
and electrical engineering design services for the modernization of the Union Square rail complex, another station that links multiple subway lines within the rapid transit network. Increased residential and commercial development in the Union Square area spurred increased demand at the complex. Since one of the project’s goals was to improve passenger circulation between the surface and mezzanine levels of the station, STV designed new stairs, passageways and elevators for the complex.

Perhaps one of the most challenging projects of its time was the restoration of Grand Central Terminal, among the most famous train stations in the world. Toward the end of the terminal’s landmark $250 million restoration program in 1998, the New York Times wrote: “In the future, New Yorkers may look back at the summer of 1998 as the architectural apogee for the once-decrepit two airports, including the design of runways, taxiways, pavement, lighting and instrument landing systems.

To accommodate the growth of many airlines during the “Golden Age” of air travel in the ’60s and ’70s – a time known for its white-glove service and the image of Hollywood stars taking to the skies – SSV&K continued to perform a range of engineering design services at many notable airports. The firm teamed with I.M. Pei, “the master of modern architecture,” for the recently razed National Airlines terminal at John F. Kennedy International Airport (JFK) in New York. The project was notable for being the first terminal in the United States to use glass as primary building material.

In another first for the airline industry, in the mid-1980s, STV’s Los Angeles office provided engineering and architectural services for the country’s first energy-saving cogeneration system at Los Angeles International Airport. An airport-wide energy monitoring and control system provided status information for the air conditioning systems, hot and chilled water pumping systems and steam thermal consumption.

Following these early landmark projects, STV has supported other major American airports undergoing significant capital expansion programs. To accommodate more international travelers at Baltimore Washington International Airport (BWI), STV, in joint venture, performed engineering design services for the construction of a new extension of BWI’s international terminal. Major components of the initiative included a new customs facility and a large food court/retail area. At O’Hare International Airport in Chicago, the world’s third-busiest airport, STV provided engineering design services for the demolition and replacement of dozens of air handling units as part of the facility’s expansion in the mid-2000s.

Most recently, the firm was awarded a significant construction management contract at JFK International for major operational improvements at its Delta terminal. The firm is also the design architect and architect-of-record for a campus of buildings, including a new terminal, parking garage and central utility plant, at the expanding Bradley International Airport in Connecticut. The overall program is required to meet the State of Connecticut Sustainability Guidelines, which have been incorporated into the schematic design effort.
Landmark. As sparkling as it must have been on opening day in 1913, the terminal has gained sweeping vistas and useful pathways that its original designers could only have imagined. STV played a critical role in this “apogee,” providing structural, civil, mechanical, electrical and plumbing services during the renovations as a subconsultant. The project team won the prestigious Presidential Design Award for Design Excellence for this endeavor (for more information about this project, see the article on page 21).

Even after the bulk of the restoration was complete, STV continued to play a pivotal role in making visiting Grand Central a commuter- and tourist-friendly experience. The North End Access Improvement Project provided four new entrances and four underground passageways that allowed visitors to exit north of the terminal for the first time. STV provided architectural, structural, electrical and mechanical engineering design for the $65 million project.

STV’s planning, design and construction management experts recently concluded commissions for some of the busiest passenger rail systems in the country. In Washington, D.C., WMATA’s ridership set record highs in 2008 with 730,000 passenger trips daily and agency officials expect that number to climb to one million riders a day by 2030. In the past decade, STV provided design services for numerous design-build WMATA station projects that were all geared toward promoting growth on this transit system, the second-busiest in the country.

With transit options limited in Prince George’s County, MD, an eastern suburb of Washington, D.C., WMATA added two new stations on its Blue Line in 2004 at Morgan Boulevard and Largo. In a joint venture, STV provided structural,
architectural, and systems and communications design for the Morgan Boulevard Station and an adjacent parking garage. At Largo Station, the firm provided communications design, which includes closed-circuit television, a public address system, digital display signs, emergency telephones, and fire and intrusion systems. Four years later, STV designed access improvements at WMATA’s Navy Yard Station on the Green Line. The station was expected to have a surge in riders because of a new baseball stadium built for the Washington Nationals franchise. The platforms and station mezzanines were modified in advance of the team’s opening day in 2008.

In Chicago, STV was the construction manager for the renovations at the historic Howard Station for the Chicago Transit Authority (CTA). Originally built in 1908 and rebuilt in 1921, the station marks the northern terminus for CTA’s Red Line and southeastern terminus for the Yellow Line. As such, the station was in need of repairs from structural deterioration, and renovations were necessary to make Howard compliant with the Americans with Disabilities Act. The station’s signal and communications systems were also completely rewired with fiber optic cables, and a new public address sound system with customer emergency call capabilities installed. The improved station was unveiled in 2009.

In 2011, the ferry terminal at the historic Hoboken Terminal and Yard complex in New Jersey opened, marking the completion of a 15-year effort for STV. The STV-led project team designed restorations and modernizations for the complex’s main waiting room, maintenance yard and ferry terminal (for more information on this project, see article on page 21).

Currently under construction in lower Manhattan is a new icon that is expected to rival the grand transportation terminals of yesteryear like Grand Central. In 2004, STV was contracted by the Port Authority of New York & New Jersey (PANYNJ) as the architect-of-record for the new World Trade Center Transportation Hub as part of the Downtown Design Partnership, the joint venture team that is in association with renowned Spanish architect Santiago Calatrava (for more information about this project, see pages 22-23).

The end result is a hub that will be a significant addition to New York City’s transportation network, connecting Port Authority Trans-Hudson rapid transit service with the New York City subway network (via an underground tunnel linking to the Fulton Street Transit Center project, currently under construction). When the initial WTC Hub design was unveiled in 2004, New York City Landmarks Preservation Commission chairman Robert Tierney joked with reporters, “Should we preemptively landmark this?”

**Smart Systems**

Systems are the lifeblood for a mass transportation network. Third rail systems, overhead catenary and traction power substations provide the needed power to get vehicles moving, while signals and communications systems keep a transportation network running safely and efficiently. STV and its prede-
cessors have been involved in a number of landmark systems projects related to larger initiatives within the transportation industry, such as the planning, design and construction of the John. D. Caemmerer West Side Yard and Maintenance Facility, home to one of the largest direct current power substations in the world; Ivy City Yard in Washington, D.C., for Amtrak, a design-build project that included a unique wheel diagnostic system for the railroad’s state-of-the-art high-speed Acela trains; and new communications, signals and power systems for complex passenger rail networks and extensions like East Side Access in New York, CATS in Charlotte, the Greenbush Line in Massachusetts, Houston METRORail, and MetroLink in St. Louis.

But the firm also has experience planning, designing and overseeing the construction of stand-alone systems initiatives that provide travelers with more efficient and safe passenger rail options that meet the evolving demands necessitated by today’s federal standards.

In the 1980s, SSV&K was involved in yet another historic initiative that expanded the breadth of services offered by LIRR. The firm performed design services for the electrification of nearly 25 miles of mainline track between Hicksville and Ronkonkoma, NY. The systems work included design of an electrified third rail and more than 20 direct current substations. Signal improvements along the routes allowed for increased track capacity. The end result was a faster way for many commuters to access New York City along one of the nation’s busiest commuter railroads. Barely a month after the electrification was complete in 1988, more than 20 minutes was shaved off the trip from Ronkonkoma to New York City, and there were more than 2,000 new morning rush hour riders on the LIRR main line, the New York Times reported.

Six years later, this specialty service was so successful that STV launched a designated systems group. Today, John Ponzio, one of the group’s first members, is director of systems. The group has grown exponentially over the past decade, especially since the hiring of Martin Boyle, senior vice president and transit systems manager. Boyle joined STV in 2000 to manage the vehicles/systems component of the award-winning fast track Houston METRORail project.
The group has worked on a number of initiatives that are connected to safety along the railways. As a subcontractor, STV designed security enhancements at dozens of Amtrak facilities across the country including stations, tunnels, shops, yards, substations and rights of way. Security improvements included closed-circuit television, wired and wireless mesh networks, access control, and virtual fence implementations utilizing video analytics. Because the initiative was financed through the American Recovery and Reinvestment Act, also known as the stimulus package of 2009, scheduling was critical in retaining the federal funding.

As part of the Rail Safety Improvement Act passed by U.S. Congress in 2008, Positive Train Control (PTC) systems were installed throughout the nation’s passenger rail network. PTC refers to technology that is capable of preventing train-to-train collisions, train movements that occur through a switch left in the wrong position, and train overspeeds. STV supported SEPTA in Pennsylvania to develop specifications and installation guidelines to help the authority upgrade its commuter trains for the program.

Vital Vehicles
A transportation network isn’t complete without a reliable and comfortable set of vehicles to usher passengers around. For more than 30 years, STV and its predecessors have provided an array of design, inspection and procurement services for vehicles used on a wide range of transportation systems. The firm’s earliest commissions in this industry sector came from two of STV’s longest-tenured clients.

Soon after the MBTA acquired the Boston commuter rail system in 1976, the agency underwent a massive vehicle rehabilitation program. To assist with this initiative, SSV&K performed engineering design services for the rebuilding of Boston & Maine Budd rail diesel cars into locomotive-hauled coaches. Concurrently, SSV&K began vehicle engineering services for the New York City Transit Authority for the purchase of thousands of new subway transit cars. The firm would work on this program for more than two decades.

By 1992, STV was involved with two landmark vehicles programs, one part of a brand new commuter railroad, the other a forerunner for changing federal standards for rail cars. The firm provided engineering design, construction inspection at the assembly plant and design review for a fleet of rail cars to be used on the Virginia Railway Express (VRE), a long-planned new commuter service connecting the Northern Virginia suburbs with Union Station in Washington, D.C. The contract set the stage for additional work between STV and VRE, including construction engineering and inspection services for 19 new locomotives, which recently went into service.
STV’s vehicle specialists also provided technical assistance and administrative support for the procurement of a new commuter rail fleet for the Northeast Illinois Regional Commuter Railroad Corp. (Metra). These cars were the first in the United States to be delivered under the mandate of the Americans with Disabilities Act, which went into effect in July 1995. STV oversaw the acquisition and rehabilitation of more than 300 rail cars for the program, provided in-plant testing, and developed a project management control system that measured milestones and achievements during the process.

STV continued to grow its group of dedicated professionals who specialize in vehicles and systems throughout the 1990s. One of the key initiatives of this era was when the firm was selected to review and evaluate proposals from potential suppliers of stainless steel bi-level commuter coaches and diesel locomotives for the LIRR, one of the largest and most complex rolling stock procurements the firm ever undertook.

“On the strength of those contracts, we were able to start winning new work and had the ability to bring more talent aboard to expand,” said Christopher Holliday, P.E., STV vice president and vehicles national practice manager.

Most recently, the vehicle group assisted both NJ TRANSIT and Agence Métropolitaine de Transport in every phase of development – from engineering to project oversight – of new dual-powered locomotives that are the first in North America to utilize both overhead catenary and diesel power. These new locomotives are twice as powerful as their third-rail/diesel counterparts, marking yet another example of STV being instrumental in a “first-of-a-kind” initiative within the rail transportation arena.

“On the strength of those contracts, we were able to start winning new work and had the ability to bring more talent aboard to expand.”

CHRISTOPHER HOLLIDAY, P.E.
senior vice president and vehicles national practice manager

Dual-Powered Locomotives
for NJ TRANSIT and AMT

Photo © NJ TRANSIT
Throughout the country’s mass transportation network, rail is not the only way to move commuters. Many major American cities rely on their bus systems to either work in concert with their rail services or independently as the community’s primary method of transportation. As such, STV has served its bus clients in the same fashion as its railroad clients – by providing a full range of services covering every facet of bus transportation, from planning new and improved routes to designing and overseeing the construction of infrastructure; or assisting in the procurement of vehicles.

One of the firm’s earliest bus projects was in the early 1990s, when Seattle wanted to improve its Downtown Seattle Transit Tunnel, which routed buses from the outskirts of the city into and through downtown. STV provided project management oversight (PMO) services on behalf of the FTA for the construction of a new tunnel designed to cut travel time into downtown. This project included five new stations and the procurement of new vehicles for the bus route. The firm monitored the project’s progress to determine if it was on schedule, within budget, and in conformance with the design criteria (for more about STV’s PMO work, see the sidebar on page 80).

Over the past 20 years, more clients have turned to bus rapid transit (BRT) as a relatively quick and cost-efficient way to provide new mass transportation options on congested roadways. In many cases BRT offers metropolitan regions the benefits of rail such as dedicated guideways, intelligent transportation systems technology and comfortable state-of-the-art vehicles, with more flexibility and at a lower cost than rail. For Boston’s first BRT line, the Silver Line, STV served as the prime engineering consultant for the $104 million Courthouse Station and Tunnel, connecting Boston with the South Boston Piers area. The station is considered a showcase for the MBTA’s BRT system, with dramatic architectural features, while the 1,900-linear-foot cut-and-cover tunnel connects Sleeper Street to West Service Road in South Boston.

As part of the voter-approved Transit 2000 Plan, Phoenix, one of the fastest-growing urban areas in the southwestern United States, introduced BRT. In a joint venture, STV provided program management services for the implementation of the system. During the initial phase, the project team performed various planning services, including system planning and development, conceptual design, environmental analysis, traffic engineering, public involvement activities and technology analysis. STV representatives went to Europe to see firsthand how BRT systems work to determine what would be ideal for Phoenix. The new bus system debuted in 2003.

More recently, STV supplied planning and engineering design services for the Super Loop, a two-way circular BRT system designed to ease traffic congestion in the University City area of San Diego. The BRT system, which has grown exponentially since its launch in 2009, connects the University Towne Centre, the University of California San Diego, office parks and shopping centers. STV planned the route alignment, selected station locations, and developed a signal priority treatment plan. The firm also performed vehicle analysis and procurement services for the loop’s hybrid bus fleet.

“Super Loop fills the gap in transportation options in the city, making it easier for students, residents and employees to get around,” said Paul Kaufmann, bus systems engineering manager. “The project demonstrates yet another way STV develops solutions across all modes of transportation.”
Over the past 100 years, our stewardship of the environment has evolved. As a result, so have federal and state mandates geared towards protecting and preserving the air we breathe, the water we drink, and the land we use to shape and develop our communities. These constantly changing standards have helped bring STV’s focus on energy and environmental issues to the forefront.

Energy and environmental issues impact all of the industries we serve – including public and private sector clients. Whether it’s supporting an energy client’s implementation of low-sulfur diesel fuel throughout its pipeline system, or performing environmental design services for a new school or transportation system, STV has a track record of success in this growing market. So much so, that the firm recently created STV Energy Services, a new core division dedicated to petroleum and gas, environmental, industrial process, and electrical transmission initiatives.

“Energy and environmental remain strong markets and the outlook for future growth is positive,” said Gerry Donnelly, P.E., senior vice president and leader of the new division. “The Energy Services Division will build on our prior years of experience while developing new opportunities in this marketplace.”
Getting Started in the Energy Market

The foundation of STV’s current energy and environmental practice can be traced back to a number of projects performed at industrial facilities during the early 1980s, such as waste treatment plants, chemical processing facilities and power plants. The experience helped the firm secure a foothold in an emerging market for energy production – waste-to-energy.

The United States was rapidly running out of available landfill space during the 1980s, and with tons of trash with no place to go, many public agencies turned to waste-to-energy solutions as a way to turn garbage into power. Sanders & Thomas (S&T), a founding firm of STV, played a key role planning, designing and providing construction management services for a number of these new plants, including the Sumner County Solid Waste Energy Recovery Facility in Gallatin, TN, the first municipal plant in the country to burn solid waste to generate both steam and electricity, and the Bay Resource Management Center, a 510-ton-per-day, 12-mega-watt resource recovery plant in Panama City, FL.

By the end of the decade, S&T was preparing the design for what would be one of the largest projects of its type in the firm’s history, the Delaware County Resource Recovery Center in Chester, PA. The new facility, which occupied nearly five football fields in area, was projected to burn nearly 3,000 tons per day of municipal solid waste from residents, industrial plants and commercial establishments.

From its industrial roots, STV was able to transition into the petroleum and natural gas market, providing similar services to a new base of clients.

“We utilized the strengths and skills of our current staff in the industrial/process sector and retooled them to service petroleum and gas clients,” Donnelly said. “Someone capable of designing a PLC (programmable logic controller) or pump and piping system for a waste-to-energy or process system is able to do the same thing for a pipeline company. It’s just a different set of codes and a different product in the system.”

Supporting Cleaner and More Efficient Sources of Petroleum and Natural Gas

A number of federal mandates provided the impetus for STV’s earliest project work in the petroleum and natural gas sector. Amendments made in 1990 to the federal Clean Air Act added provisions for addressing acid rain, ozone depletion and toxic air pollution. As a result, a number of major energy companies started to produce fuels with lower sulfur and aromatics and increased oxygen content. STV supported these energy clients by providing a range of services, such as engineering and architectural design and construction oversight, to promote new and improved petroleum and natural gas delivery methods at refineries across the United States.

One of STV’s first major initiatives in this market area occurred in the mid-1990s, when the firm performed a feasibility study, environmental permitting, design, and construction phase services for installation of a
bi-directional petroleum products pipeline connecting Sunoco Pipeline LP’s Marcus Hook, PA, and Philadelphia refineries. The pipeline route covered 21 miles, crossed three states and required overcoming significant environmental, right-of-way and engineering challenges. Once the pipeline was completed, Sunoco was able to move components between refineries as an alternative to building new units and storage facilities at each refinery. Sunoco was essentially able to operate both refineries as one virtual unit in the production of petroleum products, allowing the company to meet clean air mandates. STV worked with a number of federal, state and local agencies to secure the necessary approvals and permits for construction. The use of horizontal directional drilling resulted in less surface disturbance than trenching, thus having minimal environmental impact on the area’s wetlands and wildlife. The project also marked the beginning of STV’s long-term relationship with Sunoco.

To help industry giant ExxonMobil meet a federal requirement passed in 2006, mandating that sulfur content for highway diesel fuel be reduced from 500 parts per million (ppm) to 15 ppm for delivery to retail stations, STV provided planning and design services for modifications at 16 different Exxon-Mobil terminals across the country to accommodate the new low-sulfur diesel (ULSD) products. Various types of fuels are pumped in large quantities through a

Internationally, nearly 200 countries have signed an accord agreeing to a Biodiversity Action Plan to protect endangered and threatened species of animal and plant life. As such, when a new roadway or mass transportation system is being planned, STV’s environmental experts have proven that they can work with state and federal agencies to create successful projects and preserve protected species. In the mid-2000s, STV conducted comprehensive studies during the Atlantic City Expressway Interchange 17 improvement project in Hamilton Township, NJ, to determine whether the proposed initiative would impact the site’s wetlands or the habitat of the area’s near-threatened and endangered species – most notably the Pine Barrens tree frog. The Pine Barrens is a unique ecological area that’s closely controlled by the New Jersey Pinelands Commission. This specific species of frog was listed as endangered by the U.S. Fish and Wildlife Service between 1977 and 1983 and has been classified as near-threatened since 1996.

In the Southeast, while designing the Fort Mill Southern Bypass in South Carolina, STV/Ralph Whitehead Associates determined the proposed roadway project would impact a population of Schweinitz’s sunflower, a perennial herb found only in North and South Carolina. The sunflower has been listed as a federal endangered species since 1991, though it can be found along roadway right-of-ways and embankments.

To save the sunflowers, STV’s environmental scientists developed a relocation plan, which was presented and approved by the U.S. Fish and Wildlife Service.

“We found a prairie preserve in York County, SC, and were able to successfully relocate the sunflowers to this protected area,” said Michael Iagnocco, a senior scientist for STV.
single pipeline system, therefore provisions were needed to maintain product quality by separating products with a high sulfur content, such as jet fuel, from the ULSD.

In addition to the stricter federal regulations impacting the oil and gas industries, one of the most critical factors contributing to STV’s growth in the energy sector has been the exponential surge in global demand for natural gas and petroleum products coupled with the volatility of oil prices, which have reached historic highs over the past decade. As a response, many petroleum and gas companies have been looking into expanding their production domestically while also developing ways to more efficiently deliver their product to customers, creating new opportunities for STV.

In Perth Amboy, NJ, STV was contracted by Colonial Pipeline Company to provide engineering, permitting and construction phase services for a 2.8-mile pipeline extension to the Amerada Hess First Reserve Terminal, Stolthaven Terminal. The initiative opened a more reliable delivery route of petroleum to and from the Amerada Hess terminal, which was having issues with shipping its product due to a lack of accessibility for barge service along the Raritan River. The extension allowed the terminal to maintain operations.

In Texas, STV recently completed one of its largest and most significant pipeline projects to date when it assisted Sunoco with the construction of the crude supply portion for one of the biggest oil refinery expansions in the world. STV was contracted by Sunoco Logistics to provide complete conceptual and detailed engineering design, environmental assessment, permitting, right-of-way acquisition support, and more.

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procurement support, construction management, inspection services and start-up assistance for the new crude oil supply system between Beaumont and Port Arthur, TX, and a delivery metering station at Motiva’s Port Arthur Refinery, which was expanding its production capacity from 285,000 barrels-per-day to more than 600,000 barrels-per-day.

This expanding portfolio of work has enabled STV to enter new markets in the petroleum and natural gas sectors. The firm recently opened an office in Williamsport, PA, to support PVR Midstream’s development of gathering systems for the natural gas reserves from Marcellus shale formations. And the firm provided planning and design services for a natural gas pipeline for Baltimore Gas & Electric, a new client.

**Developing New Environmentally Friendly Spaces**

Over the past 30 years, the country’s “green” movement has led to a number of federal mandates protecting wildlife and wetlands adjacent to proposed land developments, as well as the removal and mitigation of industrial and toxic waste from potential project sites. STV’s environmental experts have played a key role in converting former landfills, brownfields and other industrial sites, into new, environmentally friendly spaces utilized by schools, hospitals, correctional facilities, transportation systems and other vital components of public infrastructure.

“Our group has helped STV truly become a full-service firm as we support our planners, engineers, architects and construction managers by developing environmental solutions for a wide range of project types,” said Steven Sottung, LEED® AP, environmental manager in the Central Region of STV’s Buildings & Facilities Division.

One early instance of environmental reclamation was in the late 1980s at the site of the former Banner Mine in Peoria, IL. The mine was surface-stripped for coal from the 1950s until the mid-1970s before eventually being abandoned. STV performed an environmental analysis, designed a wildlife preserve, and performed construction management services to convert the 215-acre strip mining site to a wetland and wildlife...
preserve. The reclamation work required that numerous environmental obstacles be overcome – namely acrid water, slurry impoundments and a mine refuse pile – before the wetlands and wildlife preserve could be constructed.

By the late 1990s, STV’s environmental team was tasked with the challenge of designing a 2,800-foot stream relocation to support aquatic life near the site of a new State Correctional Institution in Forest County, PA. To accomplish this, STV gained approval from the Pennsylvania Department of Environmental Protection, the Pennsylvania Fish and Boat Commission, and the U.S. Army Corps of Engineers. The end result was a new correctional facility for the county and the preservation of aquatic and plant life, which benefitted from the relocated stream path.

In densely populated urban areas, STV’s environmental staff has supported a number of long-time clients in their efforts to expand facilities and public services. Like in the Charlotte-Mecklenberg School District, the firm provided environmental services such as permitting and mitigation design at a number of new or expanding school sites so that the new facilities and recreational areas met the federal Clean Water Act and North Carolina Isolated Wetlands Rule. In the Northeast, STV supported the New York City School Construction Authority by developing remedial plans at an industrial site. The site had been targeted by the state’s Brownfield Cleanup Program, which provides credits to companies redeveloping and cleaning up designated brownfield sites – abandoned or underused industrial or commercial sites that may have environmental concerns.

On the higher education side, STV completed an environmental site investigation to evaluate the impacts of expanding the Medgar Evers College campus in Brooklyn, NY, and managed the environmental remediation of the site under a task order with the Dormitory Authority of the State of New York. The college added nearly 340,000 square feet of new academic space on a site previously occupied by the New York City Department of Sanitation.

STV was also instrumental in supporting the construction of athletic fields at the new U.S. Military Academy Preparatory School at the historic West Point, NY, campus. Prior to the start of construction, about 11 acres of the project site were a decommissioned landfill and military vehicle motor pool. The firm provided environmental engineering services to stabilize the landfill portion of the site, while developing a capping system and methane collection system so a soccer field could be built on top of it.

**Creating a Greener Transportation Network**

It’s only fitting that a firm with such a longstanding track record of planning, designing and overseeing the construction of highways, bridges and mass transportation networks would also have an extraordinary amount of experience providing environmental planning and analyses for landmark
transportation projects servicing millions of commuters. For decades, STV’s environmental scientists and engineers have supported new and expanded transportation systems projects, allowing them to meet federal standards for air quality, wetlands mitigation, wildlife preservation and other environmental mandates.

Some of the firm’s earliest highway commissions, such as the design of the Adirondack Northway section of the New York State Thruway, the Merritt Parkway/Route 8 interchange in Connecticut and the expansion of the Taconic State Parkway at the Hawthorne Interchange in Westchester County, NY, were among the country’s most scenic roadways, so the utmost environmental sensitivity was required during the design and construction process (for more on these highway projects, please see pages 63-65).

By the 1990s, STV’s environmental group played a critical role in two major highway projects in Pennsylvania. The Cross Valley Expressway, a vital 2.4-mile link with Interstate 81 built to reduce traffic on the congested Route 309 in Wilkes-Barre, PA, was located in the environmentally sensitive Pocono Mountains region. Under an accelerated schedule, STV relocated two streams, made channel improvements to a third, and designed replacements for eight acres of wetlands. The environmental team also accounted for the fact that the expressway’s interchange at Route 315 was located on a mountainside with deep mines close to the surface. The work earned the firm a commendation from Pennsylvania’s Secretary of Transportation.

Before a new highway connecting Interstate 81 in Dunmore, PA, and Route 6 in Whites Crossing could be designed and built, STV provided a 25-person environmental field team to assess five roadway corridors for wetlands, hazardous wastes, mine land spills, cultural resources and sensitive biological resources. For what would become the Lackawanna Valley Industrial Highway, nearly 50 miles of wetlands were identified and mapped using satellite technology and other state-of-the-art mapping and surveying technology.

In densely populated urban areas, STV’s environmental staff has supported a number of long-time clients in their efforts to expand facilities and public services.
STV’s environmental experience extends to new mass transportation systems being proposed in major urban centers such as New York City, Charlotte and Los Angeles. In many cases, proposed rail, bus and light rail networks are cutting directly through or underneath these evolving communities. That’s where STV’s environmental experts come in, supporting the firm’s design and construction management teams so that some of the country’s most expansive transportation initiatives are planned, designed and built with environmental sensitivity.

For the Long Island Rail Road’s (LIRR) East Side Access project, which will connect LIRR commuters with Grand Central Terminal on Manhattan’s East Side via an underground tunnel network, STV was designated task leader for the mega-project’s environmental component in addition to serving as the general engineering consultant in a joint venture (see pages 81-83 for more information about East Side Access). Work included environmental permitting, design and using three-dimensional modeling software to model how “hot” spots of groundwater contaminant plumes might be influenced as a result of the project.

To accommodate a rapidly growing commuter population in Charlotte, STV/Ralph Whitehead Associates has been instrumental in the project management and design of the Charlotte Area Transit System (CATS) Blue Line Extension (see page 89 for more information). The planned alignment of the extension runs through a historic district of Charlotte, crossing two regulated floodways associated with wetlands. As a result, a major component of the CATS work has been the firm’s water and natural resources documentation during the planning phase of the extension. The firm prepared a report documenting wetlands, streams, floodplains, terrestrial communities and protected species habitats, coordinating with a number of public agencies to ensure the project will meet federal environmental standards in this corridor.

And for what will be the first truly dedicated high-speed rail system in the United States, STV was recently commissioned to lead the environmental services component of the 30-mile Los Angeles-to-Anaheim section of the California High-Speed Train (HST) project (for more information about STV’s high-speed rail work, see page 86). The project area is in one of the most densely populated areas of the United States. STV developed the planning and environmental documents to support the HST’s Environmental Impact Report/Environmental Impact Statement.

STV’s environmental work on these projects – many of them multi-billion dollar initiatives – demonstrates the expanding reach of the firm’s expertise in this growing market area.

“This is an evolving field. The world is always changing and as a result the environment is always changing.”

MOLLY MACQUEEN, LEED® AP
vice president and national environmental planning manager in the Transportation & Infrastructure Division

“We’re getting more experience and as a result, we’re taking on larger projects and expanding our services,” said Molly MacQueen, LEED® AP, STV vice president and national environmental planning manager in the Transportation & Infrastructure Division. “This is an evolving field. The world is always changing and as a result the environment is always changing.”
In one of the most unique projects ever supported in STV’s 100 years of history, the firm’s environmental team played a critical role in the environmental permitting and design of a once-in-a-lifetime public art exhibition that transformed iconic New York City structures like the Brooklyn Bridge into man-made waterfalls.

During a three-month period in 2008, “Waterfalls,” an exhibition conceptualized by renowned Danish-Icelandic artist Olafur Eliasson, was on display at four different locations around the city. STV was selected by the Mayor’s office to serve as the engineer-of-record for the project, which included the design of scaffolding support frames for the waterfall installations. However, due to the sensitivity of the locations selected for the exhibition, very complex environmental permitting and design protecting aquatic life and historic structures was also required.

The exhibit’s pumping system took in around 1,800 gallons of water per minute. STV helped design intake filter pools that protected aquatic life. At the Brooklyn Bridge site, STV worked with the New York City Department of Transportation to protect the bridge’s historic cobblestone promenade. When it was discovered that there was a lack of necessary water depth for the structure’s intake system at the Governor’s Island location, STV helped develop environmental solutions that overcame these challenges.

“It was an honor to be a part of an initiative that not only contributed to New York City’s beauty, but was also sensitive to the environment,” said Michael Tumulty, P.E., lead environmental engineer in STV’s eastern region.
STV marks its 100th year anniversary in 2012.

We achieved this landmark anniversary by being quality-driven, client-focused and visionary. But, we couldn’t have done it alone. We wish to extend our thanks to our clients, partners and employees as we are move forward to our next century.