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STV TRANSPORTATION AND INFRASTRUCTURE DIVISION'S NEWSLETTER

FANTASY HARBOUR BRIDGE

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STV

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MEET THE AUTHOR

G. Stuart Matthis II, P.E.
Vice President

Stu Matthis has 28 years in the transportation industry, with emphasis on roadway and bridge projects. He currently leads business development and strategic initiatives in the southeastern United States for maintaining and developing client relationships and setting individual project pursuit strategies.

Photo © 2009 Jeffrey G. Katz/CenterSpan Productions

A FANTASY FULFILLED

BY G. STUART MATTHIS II, P.E.

It's not often that a bridge engineer gets to work on a record-setting bridge design, but STV/Ralph Whitehead Associates' Amos Liu, P.E., and his 10-person bridge group in Charlotte met that challenge on the $36,100,000 Fantasy Harbour Bridge in the popular tourist area of Myrtle Beach, SC.

The South Carolina Department of Transportation (SCDOT) selected STV/RWA for design services associated with the "final link" to Myrtle Beach's metropolitan loop. The work included more than three miles of roadway, an interchange, and a huge bridge crossing the Atlantic Intracoastal Waterway, connecting with the Fantasy Harbour Interchange at the US 17 Bypass. In order to completely span the waterway, a 330-foot main span was required. Given the project price tag, STV/RWA was charged with developing two competing alternatives – steel and concrete – on which contractors could choose to bid.

"The 330-foot steel spans were not out of the ordinary," Liu commented, "but 330-foot spans really stretch the limits for concrete girders, short of going to segmental boxes." A concept called spliced girders, which involves smaller pieces that are essentially "stitched together" in the field, had become more practical for 250-foot spans, but had not been seen in this span range. Because it was more economical than box girders, Liu and his engineers selected the spliced girder concept for further investigation.

To make the design work, a three-span continuous arrangement of 270-foot, 330-foot and 270-foot units was selected for both the steel and concrete designs. Finite element modeling confirmed that stresses and deflections at the various joints were within tolerable ranges. Additionally, STV/RWA's engineers designed the temporary falsework upon which the girder segments rested until they were joined into a single continuous girder line stretching 870 feet end-to-end – nearly three football fields. The operation was completed by post-tensioning, making the girder lines self-supporting and ready to receive dead and live loads.

When the bridge was advertised for bids, the low bidder chose the steel option – still a sizable accomplishment in its own right. RR Dawson Bridge Company, Powhatan, VA, was the selected bidder, and work began in 2006. The project was successfully completed in 2009 and opened to traffic on July 1st with numerous local and state dignitaries in attendance. The bridge will be used by an estimated 25,000 drivers a day.

Besides the record-setting span design, the project offered numerous other challenges, including the need for ground modification techniques to strengthen the poor subsurface material; the requirement for seismic design to withstand earthquakes; and permitting issues with the Army Corps of Engineers and US Coast Guard. These and other challenges were met successfully, and the project was delivered on time and under budget.

"This bridge will increase mobility and connectivity in the region, and provide congestion relief to existing facilities," said project manager E. Richard Capps Jr., P.E., STV vice president. He noted that the Fantasy Harbour Bridge represents the 11th major highway bridge over 1,000 feet in length that STV/RWA has designed for the SCDOT.

One of the unique design elements for the bridge is the inclusion of paths for pedestrians and bicyclists. The bridge was designed to accommodate six lanes without any widening, Capps said, so the paths can be removed in the future to accommodate additional traffic.

The subsurface conditions at the site were extremely poor, Capps added, and required extensive ground improvement. Stone columns were used to increase the bearing capacity of the soil to support the bridge.

"Richard and his staff at STV displayed a high level of project management and structural design expertise on this very complicated project," said Michael W. Barbee, SCDOT program manager. "STV's commitment went well beyond their contractual obligations and their partnership was a vital component in the success of the Fantasy Harbour project."

The Fantasy Harbour Bridge was named to Roads and Bridges magazine's "Top Ten Bridges" ranking, published in the November 2009 issue. The SCDOT, Horry County, the City of Myrtle Beach and STV/RWA were recognized for this major accomplishment at the "Roads & Bridges Live" Bridge Infrastructure conference held in New Orleans in November 2009.

MEET THE AUTHOR

Kevin Hahn-Keith, P.E.
Resident Engineer

Phase five of the Ben Franklin Bridge painting project was Kevin Hahn-Keith's first project with STV. Kevin has 17 years of construction and engineering experience, and is a registered professional engineer in Pennsylvania, and a certified bridge safety inspector in Pennsylvania and New Jersey. He works for the Eastern Pennsylvania/ New Jersey group of the Transportation and Infrastructure Division.

PRESERVED FOR THE FUTURE

Painting the Ben Franklin Bridge

By Kevin Hahn-Keith, P.E.

The Ben Franklin Bridge is the gateway to the heart of historic Philadelphia, just a few blocks from Independence Hall and the Liberty Bell. The oldest bridge owned by the Delaware River Port Authority (DRPA), it was maintained for decades by painting over the original coats of paint. Each successive coat temporarily improved the bridge appearance, but they all eventually failed, leaving rust spots as they peeled away.

In the late 1990s, the DRPA conducted specialized tests to determine the feasibility of blasting off the layers of old paint and repainting the entire structure with newer paints that weathered better and were lead-free. A three-coat system was designed to prevent paint break-down and the formation of rust. The base coat is a zinc-based primer, which is similar to galvanizing the steel; the next coat is epoxy-based; and the final coat is urethane-based, providing Ultra Violet (UV) protection similar to sunscreen. Dust- and noise-control procedures were also tested to determine the possibility of completely blasting the steel safely and quietly in the densely occupied urban area surrounding the bridge. The successful test results led to dividing the bridge into five painting phases to ensure a large enough pool of bidders, given the difficulty painting contractors would have fronting a bond to paint the entire bridge.

STV was selected as the construction monitor for the fifth and final phase of the Ben Franklin Bridge painting project. This phase included grit blasting and painting of the Philadelphia approach to the main span, cable support struts, anchorage interiors, and targeted steel repairs.

"STV's role was to monitor the contractor for contract compliance, inspect completed work, document the project, coordinate operations, and act as a liaison with the DRPA," noted Robert Scancella, P.E., STV's project manager. The contractor was a joint venture of Liberty Maintenance and Alpha Painting.

Noise-control, dust-containment, and coordination of operations with traffic and transit movements were constant challenges. The Philadelphia approach is located in a busy area of the city, with office buildings, residences and stores

A Landmark Bridge

The Philadelphia to Camden Bridge opened on July 4, 1926 and, at the time, was the longest suspension bridge in the world with a span of 1,750 feet and 8,290 feet end-to-end. In 1976 during the Bicentennial, the structure was renamed the Ben Franklin Bridge after one of Philadelphia's most famous residents. The bridge carries over 19 million vehicles annually and PATCO's Hi-Speed Line that serves over 10 million passengers each year, acting as a multimodal transportation link between New Jersey and Philadelphia. Passing under the bridge are ships in the Delaware River, Interstate 95 highway traffic, Southeastern Pennsylvania Transportation Authority trains, along with local cars, busses, bikes, pedestrians and horse-drawn carriages.

just a few feet away from the bridge. The work also involved dangerous heights, confined space, lead exposure and numerous other hazards. Worker and public safety issues were addressed through pre-activity meetings in combination with a public relations hotline, website, and regular public meetings and daily communications among the resident engineer, contractor, and the DRPA bridge and Port Authority Transit Corporation (PATCO) transit operations. Additional coordination that included permitting was conducted with various city and state agencies.

As a value-added service to the client, STV's structural inspectors checked the blasted steel for cracks and section loss because old paint and rust can hide steel deficiencies during initial inspections. This work aided the designers of a future steel repair project on the bridge.

The STV monitors and the contractor worked nearly around the clock for several months. The work within the PATCO track and train envelope was done at night or on weekends to minimize interference with the frequent passenger service. Paint inspectors rotated shifts to make sure the dust-containment was secure, the steel completely blasted, and the painting done correctly. The paint inspectors also acted as the eyes and ears of the resident engineer, making sure traffic control was performed correctly, noise was within specified limits, and other specification requirements were fulfilled.

The end result is a completely repainted bridge, no longer a rusting eyesore with peeling lead-based paint. Tons of old paint, from both the bridge and the surrounding area, have been removed, making the environment safer. The new paint is expected to last 20 years, but because of the zinc-based primer, the bridge will not have to be blasted to bare metal next time it is painted. Since the paint no longer contains lead, future painting projects will require less hazardous material containment. The project was completed without claims, under budget, and ahead of schedule. Impacts to local area residents and businesses were minimized, and they are now pleased to have their neighborhood returned to normal.

SIGNATURE STRUCTURE
Over WMATA White Flint Transit Station

By Donald R. Graber, P.E.

MEET THE AUTHOR

Donald R. Graber, P.E.
Senior Project Manager

Don has more than 35 years of engineering experience in design, inspection research and training in bridge related topics. Based in STV's Fairfax, VA, office, he is currently providing program management support services for the design-build Dulles Corridor Metrorail Project's new Silver Line to Dulles Airport. Don is also the project manager for bridge inspection projects in the Trenton office.

The North Bethesda Center is a residential/commercial/retail mixed-use complex being constructed on a 32-acre site in the Maryland suburbs of our nation's capital. To provide a grand entranceway to the project, LCOR, the master developer, contracted STV to design a signature vehicular and pedestrian bridge that will carry Main Street over the Washington Metropolitan Area Transit Authority (WMATA) White Flint Station on the Metrorail Red Line. The bridge, centerpiece of the new White Flint master plan, will connect LCOR's Main Street shopping environment to a similar activity center on the west side of Rockville Pike.

North Bethesda Center occupies land leased from WMATA as part of its Joint Development Program to build transit-oriented projects around Metrorail stations, and is the largest joint development project that WMATA has approved. The pedestrian-friendly, town-center-style development links all new buildings to the Metro station, and ultimately will include more than one million square feet of office space, 202,000 square feet of street-retail space, and 1,250 multifamily housing units.

Spanning the northern half of the station platform, the 80-foot-long bridge features two 13-foot-wide vehicle lanes bounded by 10-foot-wide brick sidewalks. The bridge superstructure consists of concrete adjacent box beams. Since the beams must be lifted into place during nighttime non-revenue hours, precast units were selected to reduce the construction time and ease the constructability issues associated with working over the WMATA tracks. The bridge will be jointless to reduce future maintenance costs.

The substructure piles will be pre-augured to eliminate subsidence and lateral earth loads on the existing WMATA rails. Electrical continuity will be provided to address stray current induced by the nearby electrified tracks.

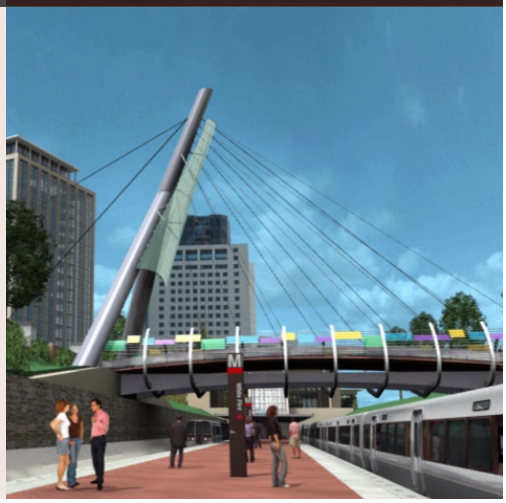
Since this is a signature structure, architectural features will be prominent. STV's subconsultant, Cooper Carry, a Virginia-based architectural firm, designed a 60-foot-tall, inverted "Y", two-legged mast structure leaning over the roadway with cables descending to the tops of the curved rib fence posts. Two backstay cables attached to the top of the mast will extend over the adjacent intersection and anchor to the tops of two, 10-foot-tall towers located on the sidewalks on the far side of the intersection. The towers will have internal diffused lighting.

The pedestrian fence will consist of stainless steel, metal mesh, anti-climb fabric. Up lighting will be enclosed behind the fence fabric at the base of each fence post, and down lighting will be provided at the tops of each post. A sail will be attached to the

mast of the bridge with embedded LED lights capable of reproducing images similar to a television screen. The mechanically stabilized earth walls will have aesthetic treatments.

In addition to supervising architects, surveyors and geotechnical subconsultants, STV is providing structural design and bridge plans, and will also provide construction phase services. The bridge is anticipated to be completed and open to vehicles and pedestrians in 2013.

LCOR commissioned a fly-through animation of the site that simulates driving under the mast and walking down the sidewalk; the movie can be viewed via a link on LCOR's project website, **www.northbethesdacenter.com**.



MAKING POSITIVE TRAIN CONTROL

By Gareth Evans and Michael Senase

A deadly collision in 2008 between a commuter train and a freight train in Chatsworth, CA, was the catalyst behind a series of federally mandated improvements for rail safety, including the implementation of Positive Train Control (PTC), a system of monitoring and controlling train movement.

To assist with the development and implementation of PTC, STV is part of a Railroad Safety Advisory Committee (RSAC) working group to help push forward this nearly $4 billion initiative by a federally mandated deadline. This facilitation team also includes Federal Railroad Administration (FRA) members, Class 1 and 2 freight railroads, intercity and commuter passenger railroads, and other rail industry groups.

After the Chatsworth collision, which killed 25 and injured more than 100, Congress passed the Rail Safety Improvement Act of 2008 requiring railroads to implement PTC systems to help prevent train-to-train collisions. This technology would assist in the prevention of collisions between trains operating over at-grade crossings; overspeed derailments, including those related to speed restrictions, temporary slow orders, and excessive speeds over switches and through turnouts; incursions into work zones without appropriate authority and verification; and train movement through a main line switch in an improper position.

Additionally, the proposed rules require railroads to submit their action plans to the FRA by mandated deadlines. A PTC implementation plan and development plan are both required by April 16, 2010; a PTC safety plan is required before equipped trains can operate; and a final deadline for all affected railroads to implement PTC is December 31, 2015.

The amount of work required for railroads to complete these requirements depends on the complexity of their organizations. A railroad that predominantly runs on its own lines, like the Southeastern Pennsylvania Transportation Authority, will have more to do than a railroad that is a tenant on another organization's lines, like the Virginia Railway Express. And of course, after the PTC implementation and development plans have been submitted, there remains the work of actually following through on those plans.

AFTER PAPERWORK IS COMPLETED

The PTC process will involve numerous communications systems: Signal logic processors (SLP) calculate the appropriate signaling aspects for the train, which are then transmitted to the locomotive. A computer-aided dispatching system is used to monitor and control train movements. Onboard logic processors (OBLP) track the vehicle's location in relation to track switches, civil speed restriction limits, and maintenance forces known to be working along the alignment, and then enforce the PTC as required. Wayside interface units are installed along the railroad right-of-way and are the interface between the OBLP and SLP, monitoring track circuit occupancies and controlling power switches, signals and other signal system wayside appliances. Some systems may use transponders, passive electrical devices installed between the rails, automatically transmit a specific reply that contains information required of the PTC system.

A REALITY

In collaboration with another firm, STV was recently selected to assist SEPTA with the requirements of the PTC mandates. In addition supporting the development of FRA-required plans, STV's work involves the vehicle aspect of the system. This includes developing and specifying carborne equipment such as the OBLP, the driver's display, the track transponder and other ancillary equipment, as well as methods of mounting and installing the equipment, and methodologies for testing the vehicles.

CHALLENGES OF PTC

As the PTC endeavor evolves, the magnitude of the effort necessary to comply with the regulation is becoming clearer. At least 75,000 wayside interface unit locations must be designed, procured, constructed, installed and tested, and in excess of 24,000 locomotives and cab cars will require installation of PTC equipment that includes a new interface to the vital braking system. Civil survey information must be collected, input into a database, and confirmed to be accurate for more than 70,000 miles of track. Dispatching centers must be modified to communicate with vehicle and wayside equipment, while employee handheld sets must be engineered, designed, procured, manufactured, tested and placed into service.

All of these tasks must be accomplished as the railroads remain in operation. Additionally, every railroad participating in the PTC implementation must train employees to operate and maintain this new equipment, and develop a maintenance and operations plan. In order for the railroads to succeed in this effort, accurate infrastructure information must be developed and input into the system, reliable communications networks and access to those networks must be available, and interoperability has to be provided as trains move from one system to the next.

Gareth Evans
Senior Vehicle Specialist

Gareth joined STV in 2008, after working for 23 years for rail vehicle equipment suppliers. He has worked on rail vehicles in the United States, Europe, Asia and Africa. Gareth is currently working on projects for NJ TRANSIT and Montreal's Agence Métropolitaine de Transport.

Michael Senase
Systems Manager and Associate

Michael (Mickey) joined STV in 1996 after a 17 year career with Chicago NorthWestern RR. He has worked on projects in St Louis and Chicago and in Portland, OR. Mickey is currently working on the Kensington Interlocking Improvements Project.

SEPTA'S NEXT GENERATION OF COMMUTER RAILCAR

Silverliner V

By Thomas Janssen

Providing service to over 35 million annual riders in three states, The Southeastern Pennsylvania Transportation Authority (SEPTA) serves the country's fourth largest commuter rail market. With a rail fleet primarily composed of over 300 electrical multiple units (EMUs) that average over 35 years of age, SEPTA wanted to replace the oldest vehicles in its fleet with 120 modern, state-of-the-art commuter rail vehicles – the Silverliner V fleet. STV was selected to provide project management, engineering and quality assurance in support of this program.

The new stainless steel Silverliner V cars will be equipped with quarter point doors that can easily be converted from high to low platform boarding, greatly improving passenger flow and decreasing station dwell times. An integrated ramp provides easy access for wheelchairs or strollers and eliminates the current, platform-stored, removable ramp.

Once aboard, passengers are greeted with the rail car's bright and open interior. LCD screens will give helpful information about the train's route, stations, and connections to other transportation services, with the capability to feature advertisement or news media information.

The United Transit Systems (UTS), a consortium of South Korea-based Hyundai-Rotem and Japanese Sojitz, has been selected to manufacture these vehicles, making the project even more interesting. Hyundai-Rotem has built thousands of railcars for the international market over the past 45 years, but is a new supplier in the US passenger rail industry – where we have different, and sometimes unique, requirements and processes.

The carshells are being assembled in Changwon, South Korea, where STV employees are monitoring carshell manufacturing and pilot car test activities. Final assembly of the cars is taking place at Hyundai-Rotem's newly renovated facility in Philadelphia, PA, where STV is providing test and inspection services. This facility, when in full operation, will produce 200 cars per year and create over 300 new jobs.

While the project uses engineering resources from our offices in Philadelphia, Baltimore, Newark, and Chicago,

Above: Transfer of Silverliner V cars from the Hyundai Rotam Outfitting Shop to the Port of Masan for delivery to the United States.

Thomas Janssen
Project Manager

Tom has worked in the rail industry for 16 years with experience in the US and abroad. After starting his career at a rail vehicle manufacturer, Tom led all vehicle and system efforts at a transit agency before joining STV in 2006. He has been supporting SEPTA on the Silverliner V procurement.

Below: Silverliner V car in the Hyundai Rotam Outfitting Shop in Changwon, Korea.

STV's project management team is co-located with SEPTA's New Vehicles Department. This seamless integration with the authority's project staff results in streamlined communication and increased efficiency.

Together with SEPTA and UTS, STV is working to make the new vehicles a high-quality addition to SEPTA's commuter rail fleet and a welcoming experience for the region's daily commuters.

Photo © Shutterstock

LAX TRANSIT CONNECTIONS:

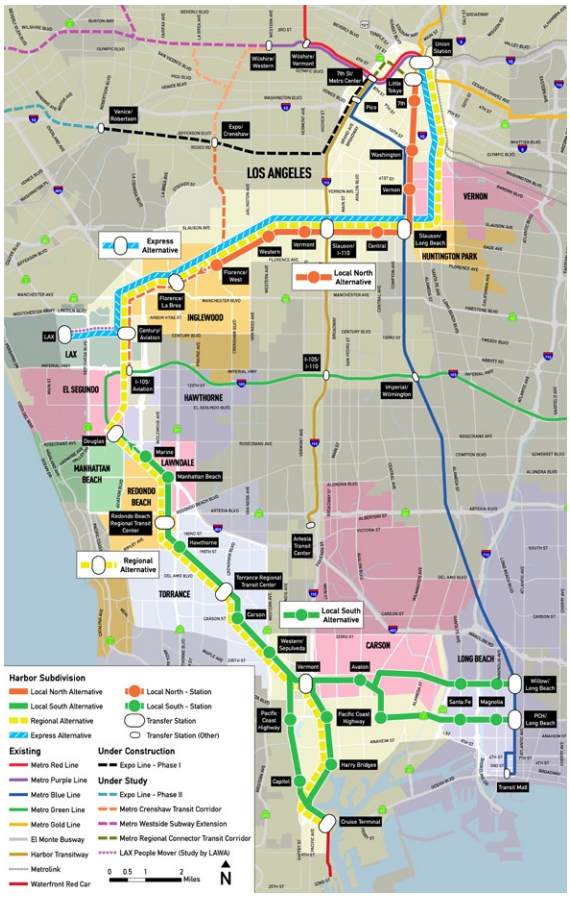
THE HARBOR SUBDIVISION

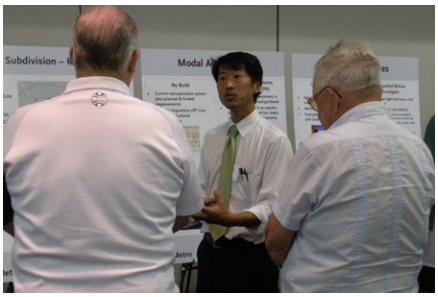
By Tyler Bonstead and Melissa Reggiardo

The traffic in Los Angeles is among the worst in the nation, especially in areas surrounding Los Angeles International Airport (LAX) and along the Harbor Subdivision Transit Corridor, which connects LAX to Union Station in downtown Los Angeles in the north and the Ports of Los Angeles and Long Beach in the south. The area is home to over 800,000 residents and 700,000 jobs, and is an ideal candidate for a new mass transit line. The Los Angeles County Metropolitan Transportation Authority (Metro) commissioned STV to evaluate the potential to for transit service in the 30-mile-long Metro-owned corridor, Harbor Subdivision, with the potential for the first express rail connection between downtown Los Angeles and LAX. A new rail connection between Union Station and LAX could cut the current 30to-60-minute trip (depending on traffic) to under 20 minutes, and would connect to the STV-designed California High-Speed Rail Project at its Union Station hub. For the Harbor Subdivision project, STV led conceptual planning and engineering activities such as siting the line and stations, engineering design, urban design, operations planning and cost estimating.

The Harbor Subdivision is one of several projects being led by STV's West Coast planning group, and is one of six corridors currently being studied in Los Angeles County for new rail service. The passage of Measure R will provide an estimated $40 billion in funding over 30 years and other projects such as the Westside Subway Extension, Crenshaw Transit Corridor, Exposition Light Rail Line between Los Angeles and Santa Monica, and the Regional Connector in downtown Los Angeles.

STV began its analysis in summer 2008 by defining the transportation problems and suggesting possible alternatives. An initial screening process examined 25 routing and terminus options, six vehicle modes and five potential travel markets. Many of these initial options were eliminated in spring 2009





Tyler Bonstead

Transportation Planner

Tyler has five years of experience in the transportation planning industry (all with STV), and is the deputy project manager for the Harbor Subdivision project. He also has extensive planning and engineering experience on the California High-Speed Rail Project, Perris Valley Line Metrolink extension, and other light rail, commuter rail and bus rapid transit projects.

Melissa Reggiardo

Transportation Planner

Melissa earned her master's degree in urban planning from UCLA in 2008. She is the lead planner for the Harbor Subdivision project, and is also involved with a variety of other rail planning projects in Southern California, including the Redlands Corridor, California High-Speed Rail Project, and Westside Transportation Study.

TRANSIT CORRIDOR

after extensive analysis and two rounds of public meetings examined issues such as ridership potential, operational and right-of-way constraints, and community impacts. Twenty options grouped into four main alternatives were further developed and evaluated in the latter stages of the study. A final analysis led to the development of a Phased Implementation Strategy for the Harbor Subdivision that identified the highest-priority projects to be built. An extension of the existing Metro Green Line (Light Rail Transit) from the LAX area to Torrance in the South Bay scored as the highest-priority project. Several other projects, including more regionally-focused service between LAX and downtown Los Angeles, or LAX and the Harbor communities of San Pedro or Long Beach, may be included in follow-up phases.

STV continues to guide the Harbor Subdivision project through more detailed conceptual engineering and environmental clearance as part of a follow-up phase that began in early 2010 and continues through 2012.

Rendering Courtesy of Maryland Transit Administration

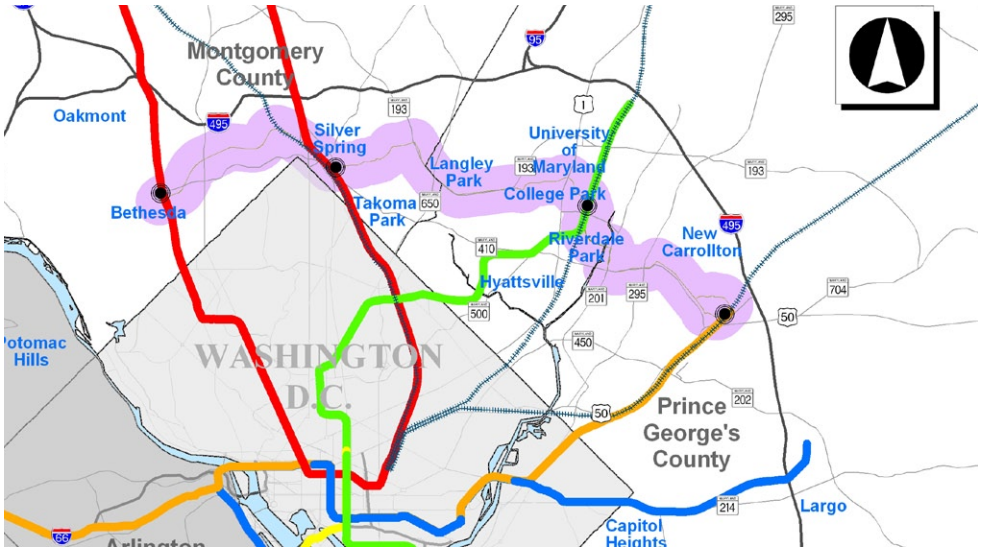
PURPLE LINE
Improving Transportation Options

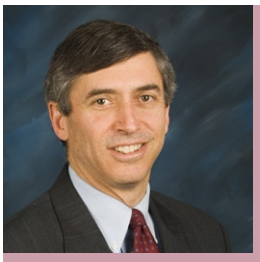
By Joel K. Oppenheimer, P.E.

In the Maryland suburbs just outside Washington, D.C., traffic volume has grown to beyond capacity and congestion causes delays for commuters and other travelers. To help resolve these issues, the Maryland Transit Administration (MTA) has proposed a 16-mile-long, east-west transit corridor—the Purple Line. The new line would run from Bethesda in Montgomery County to New Carrollton in Prince George's County, offering an alternative to driving while also giving more options to area residents who already use transit. As part of a joint venture in contract with the MTA, STV has provided planning services for this important project since 2006. The firm's responsibilities include transportation planning, traffic and environmental studies, and conceptual engineering for the proposed Purple Line.

As a circumferential transit way inside the Capital Beltway, in addition to relieving roadway congestion, the Purple Line would provide direct connections to the Washington Metropolitan Area Transit Authority (WMATA) Metrorail Red, Green and Orange lines. These lines serve Bethesda, Silver Spring, College Park (University of Maryland) and New Carrollton, all densely populated communities located just outside Washington, D.C. The new line would also connect to three Maryland Area Regional Commuter rail lines, Amtrak and local bus services. As a result, it would link significant major employment and activity centers along the corridor, and encourage transit-oriented development at station locations. The MTA's goal is to obtain Federal Transit Authority (FTA) New Starts funding, the federal government's primary financial resource for supporting locally-planned, implemented and operated transit "guideway" capital investments.

The Purple Line project arose out of several previous studies of transit alternatives, most recently including bus rapid transit and light rail transit options. During the first two years of the current planning study, STV provided transit operations analyses, traffic planning, environmental studies and public involvement for the Alternatives Analysis/Draft Environmental Impact Statement (AA/DEIS). Planning for the project included the light rail operations, and the review and reconfiguration of the local bus network to support the new Purple Line service. STV also supported the effort with indirect and cumulative effects analyses, a visual quality analysis and other environmental studies.





Joel K. Oppenheimer, P.E.
Vice President

Joel has more than 30 years of professional experience in the transportation industry, and has led complex multi-modal transportation projects in the Mid-Atlantic region. As a vice president and registered professional engineer in nine states, Joel currently leads STV's Maryland efforts in transportation and infrastructure and is responsible for identifying new opportunities in this region to support the firm's continued growth.

An important part of STV's contribution to the AA/DEIS preparation was the study of traffic through the University of Maryland campus. STV's traffic engineers used a software program, VISSIM*, to model the transit, cars and pedestrians on Campus Drive both before and after the Purple Line improvements. The firm also conducted public involvement, working with University of Maryland leaders to develop strategies to gain consensus for an acceptable transit option through the campus. Most recently, new issues emerged concerning the possible impact of electromagnetic interference and vibrations from the light rail vehicles on sensitive lab instruments, which were studied and are being addressed.

STV has also been involved in the study of transit-oriented development in and around the College Park and New Carrollton Metro stations. The firm worked closely with WMATA, the owners of the land surrounding these stations, and potential developers.

In August of 2009, Governor Martin O'Malley announced the selection of light rail transit as the Locally Preferred Alternative (LPA) for the Purple Line, with routes through Chevy Chase, East Silver Spring and the University of Maryland. The MTA now awaits the FTA's assignment of a program management oversight consultant so the project can move into the preliminary engineering stage of the New Starts process. This stage will examine engineering alignments to address specific issues and community concerns, study construction phasing and staging plans, develop the project financial plan, study land use and policy alternatives, and begin to define implementation strategies. STV will lead the systems studies, which will include traction power substations and power demands, the layout of the yards and shops, and studying the drainage and stormwater management and traffic in several segments. We will continue to assist with studying transit operations, public involvement, transit-oriented development and surveys.

Over the next two years, STV and the project study team will complete the preliminary engineering and Final Environmental Impact Statement. Pending the necessary federal and state funding, the Purple Line project will enter into final design in the spring of 2012, with construction anticipated to begin in late 2013 or early 2014. Meanwhile, STV will continue to draw upon the talents of our transportation experts company-wide to serve the MTA in its efforts to improve transportation options for Maryland residents in the national capital region.

PURPLE LINE FACTS & FIGURES

- 16-mile-long east-west light rail corridor
- Runs circumferentially inside the Capital Beltway, mainly in dedicated or exclusive lanes.
- Most alignment is at-grade within public streets.
- Total end-to-end trip in 2030 will take 56 minutes, compared to 108 minutes for simply improving and enhancing existing service.
- An estimated 64,800 daily riders, removing 19,200 cars from area roadways daily.
- Greatest ridership will be between Bethesda and Silver Spring.
- An estimated 43 percent of Purple Line riders will use WMATA's Metro for part of their trip.
- Capital costs are estimated to be $1.517 billion in 2009.

*See page 18 for more on VISSIM.

Photo © Shutterstock

A LITTLE PREVENTION

Chicago's Metra looks to stay ahead of the curve

By Paul E. Bobby, P.E., and Richard W. Flickinger, LEED® AP

Problems arise when they are least expected – an HVAC unit shuts down or a power distribution panel fails. Each could result in the temporary displacement of an entire maintenance department's workforce, not to mention a major disruption in the day's work schedule.

Metra, the commuter rail authority serving Chicago and its surrounding counties, has taken strides toward managing the risks associated with such unplanned events through its new computer-based maintenance management system (CMMS). STV, which has an ongoing service contract with Metra, worked with the agency to develop and implement a two-phase plan to standardize and automate preventive maintenance work orders for their fixed assets.

Metra's plan described selection criteria for a customized off-the-shelf Web-based CMMS application that would replace its paper-based legacy system. Their legacy system typically provided short-term maintenance schedules and generated stylized work orders through a custom data base script. In some cases, the legacy systems varied from district to district with regard to how preventive work orders were produced and managed.

Metra's plan further stated that candidate systems should be accessible from any Metra maintenance work station that has a Web browser and Internet access. The selected software application needed to standardize preventative maintenance procedures, schedule and track maintenance work orders, and generate Metra-specific reports that reflect schedule performance metrics.

STV's first task called for a three-month survey and condition assessment of Metra's facilities to identify and tag systems, subsystems, and individual fixed assets. Teams of mechanical, electrical, and systems engineering experts were required to visit each maintenance yard, major terminal, line station, control tower, tie station, and support facility. Approximately 5,000 assets were surveyed and documented that didn't fall under Federal Railroad Administration regulations.

GOES A LONG WAY

Asset survey data was then loaded into the CMMS asset data tables and assigned unique tag numbers that were linked within the data base to their physical locations and shops responsible for performing the work orders.

In addition to the surveys, STV's technical writers researched and generated preventive maintenance procedures from a variety of sources including original equipment manufacturers and supplier operation and maintenance manuals and technical data. Each procedure was assigned a unique activity number and a maintenance interval. Each asset was subsequently linked to one or more preventive maintenance tasks and assigned a trigger date for generating its first work order.

Maintenance plan Phase two provided a staggered CMMS implementation schedule by major districts that gradually phased out the existing paper-based work order system. District directors, supervisors and facility maintenance managers received CMMS training in advance of going live with the automated system. Training included basic CMMS navigation and data base maintenance instructions. The training also entailed procedures for opening, printing and closing-out preventive maintenance work orders.

Metra's CMMS has been fully implemented with work orders being scheduled, generated, and managed across all of its districts. Feedback from the Metra facilities maintenance community indicates a successful system rollout and utilization.

Paul E. Bobby, P.E.
Midwest Track Manager

Paul is a project manager and civil engineer who has years of experience in the design and construction of railroad and highway improvements. Starting out as a track laborer with Wisconsin Central Ltd. (now part of Canadian National Railway Company), he has grown to earn a solid reputation within the rail industry for his knowledge of passenger and freight rail design. Paul earned a Bachelor of Science degree in civil engineering from the University of Wisconsin/Platteville. He is a member of the American Railway Engineering and Maintenance-of-Way Association and the Maintenance-of-Way Club of Chicago.

Richard W. Flickinger, LEED® AP
Program Manager/
Equipment and Facilities Support

Rich has been with STV for more than 30 years. He has worked for government and private sector clients, providing a wide range of technical services that include program management, life cycle analyses, logistics data base management, operation and maintenance technical manuals, training courseware development, spare parts procurement, and facilities maintenance. Rich has degrees from Kutztown University of Pennsylvania and from Albright College.

PEOPLE ON THE MOVE

Cody T. Christensen, AICP, has joined STV as a transportation planning manager in the Rancho Cucamonga office. Cody has 10 years of experience in traffic engineering and transportation planning, including transit planning, facility feasibility studies, community and regional transportation planning, corridor studies, traffic impact studies, and bicycle and pedestrian circulation studies. Prior to joining STV's Southern California planning group, he worked in Salt Lake City, Phoenix and Kansas City and has been involved on projects throughout the Intermountain West, Midwest and elsewhere in the country including Arizona, Florida, Illinois, Iowa, North Carolina, South Carolina and Tennessee. Cody is currently engaged on both the California High-Speed Rail and Redlands Subdivision Alternatives Analysis projects.

Tony L. Melton, P.E., has joined STV in the firm's new Orlando office as the director of Central Florida operations. He currently leads STV's strategic Florida efforts in transportation and is responsible for identifying new markets to support the firm's continued growth. Tony has spent more than 26 years in the transportation engineering community and the last 12 years in the Central Florida area. His experience includes managing all phases of multimillion-dollar projects in design-bid-build and design-build. Melton has proven expertise in starting up new offices and growing them into profitable practices. He is active in the local American Society of Civil Engineers and American Council of Engineering Company chapters.

Joseph F. North has joined STV as a vice president focused on operations, safety and security work. Based in STV's Newark office, Joseph came to STV from NJ TRANSIT after a 25-year career in increasingly responsible senior operating positions in light rail, commuter rail, bus and paratransit. His other public sector experience includes stints at the Bi-State Development Agency in St. Louis and New York City Transit. Joe's early focus at STV will be managing the Delaware River Port Authority's light rail project between Glassboro and Camden, NJ. Joe brings to his position particular expertise in obtaining shared-use waivers from the Federal Railroad Administration (FRA) to permit light-weight passenger vehicles to share tracks with heavier freight trains.

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Dave E. Roberts, P.Eng., recently joined STV as director of transportation and infrastructure for STV Canada Consulting Inc., STV's new Canadian division based in Toronto. He is responsible for business development across Canada and overall management of the Toronto office and its consulting activities, including STV's current contract to provide project management services to the Toronto Transit Commission "Transit City" light rail transit expansion program. Dave is a professional engineer with 35 years experience in transit planning, policy and project management, including senior positions with transit systems, consulting firms and transit associations. In recent years, he specialized in bus rapid transit and was the lead designer for the "Viva" bus rapid transit system in York Region, north of Toronto. Dave also was chairman of the Toronto Parking Authority and served on the Board of Directors for many years.

Brian J. Flaherty, senior vice president and STV's design-build national practice leader with the Transportation & Infrastructure Division, received the 2009 Design-Build Institute of America Leadership Award in the Industry Professional category for his demonstrated commitment to design-build. With more than 30 years of experience in the engineering and construction industry, Brian has supervised a number of innovative and award-winning projects with construction costs exceeding $1 billion, and has pioneered new design-build practice methods at STV. He also played an instrumental role on many of the country's earliest large-scale design-build projects. Under his direction, STV serves as a key design subconsultant for the NJ TRANSIT Hudson-Bergen Light Rail line in Newark, the first major design-build, operate, and maintain light rail transit system in the country.

James Boice has joined STV as the manager of transportation policy and planning, based in our Stratford, CT, office. Jim is a transportation professional who worked with the Connecticut Department of Transportation for more than 30 years. Prior to joining STV, he served as the ConnDOT deputy commissioner, a position to which he was appointed by Connecticut Governor M. Jodi Rell, and retired from in June 2009. Jim earned his Bachelor of Science degree in civil and environmental engineering from Clarkson University and an associate degree in civil engineering from Hartford State Technical College.

Dominic Sabatini, P.E., has joined STV as vice president of systems and will be responsible for our systems practice. Based in Philadelphia, he has more than 35 years experience as a program manager, regional manager, project manager and engineer and has managed various kinds of transit projects including engineering and design, design-build and construction. Dominic was a program director for the Southeastern Pennsylvania Transportation Authority (SEPTA) for seven years where he oversaw the reconstruction of the Market-Frankford Elevated Subway System Blue Line, a 13.8 mile, heavy rail, electrified transit system. He earned a bachelor's degree in electrical engineering from Drexel University and is a registered professional engineer in Pennsylvania. Prior to joining STV, Dominic was a senior vice president for the mid-Atlantic region for a global transportation systems company.

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