In order to address the shortcomings of this major federal highway, the City of Charleston is proposing an innovative infrastructure reinvestment: the US Highway 17/Septima Clark Parkway Project. This project will facilitate critical disaster response and improve the safety of traveling on US Highway 17. Since Hurricane Katrina, there has been a national awakening and awareness of investment in infrastructure. The defect of soils and sound infrastructure has been implicated as a major contributor to loss of life and property in a crisis or disaster.

US Highway 17 is today a dangerously dysfunctional primary transportation route. The necessary reinvestment in US Highway 17 is required to connect our four schools in the Charleston peninsula and our regional Level 1 Trauma Center are a critical concern. There are difficulties in travel access to the peninsula, access to businesses and homes in the area and emergency response and critical medical facilities inaccessible, and the surrounding community repaired.

The negative impacts the surrounding community have been significant—disconnected neighborhoods, speed, lacks, damaged infrastructure and a general state which has increased the price to pay in 1964 for criticism. US Highway 17 traffic across the peninsula and down the East Coast everyday these impacts would be unacceptable.

The American Recovery and Reinvestment Act provides the opportunity for all these issues to be addressed and in the price to remove the scar of a 1964’s highway that certainly would not be the U.S. Highway 17—now Septima Clark Parkway—today. The solution arrived at is a dramatic departure from our current US Highway 17.

This project will make US Highway 17 a functional, efficient, environmentally friendly reinvestment: the obsolete US Highway 17 will be made a functionally efficient, environmentally sensitive and aesthetically-pleasing US Highway 17/Septima Clark Parkway Project. This investment in transportation that all governmental agencies would take pride in.

The City of Charleston hopes you to consider the importance of this project. With this infrastructure reinvestment, the obsolete US Highway 17 will be made an economically efficient, environmentally sensitive and aesthetically pleasing US Highway 17/Septima Clark Parkway Project. This investment in transportation that all governmental agencies would take pride in.

The negative impact to our hospitals, including the Veterans Hospital, is cut off by flooding. Access to regional Level I Trauma Center is impeded. Safe access during times of heavy rainfall and especially during flood events caused by this highway is inaccessible during storms. Now is the opportunity for all these issues to be addressed and in the price to remove the scar of a 1964’s highway that certainly would not be the U.S. Highway 17—now Septima Clark Parkway—today. The solution arrived at is a dramatic departure from our current US Highway 17.

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ACKNOWLEDGEMENTS:

CITY OF CHARLESTON
- OFFICE OF THE MAYOR
- DEPARTMENT OF PUBLIC SERVICE
- DEPARTMENT OF TRAFFIC AND TRANSPORTATION
- DIVISION OF PUBLIC AFFAIRS
- POLICE DEPARTMENT
- DEPARTMENT OF PARKS

CHARLESTON CIVIC DESIGN CENTER
DAVIS & FLOYD ENGINEERING
BLACK & VEATCH CORPORATION
WCIV ABC NEWS CHANNEL 4
PRODUCTION DESIGN ASSOCIATES
EVENING POST PUBLISHING COMPANY
Investment in infrastructure is fundamentally an investment in the physical and organizational structures necessary for the operation of an efficient and equitable society. Viewed functionally, infrastructure ensures the health, safety and welfare of communities, and facilitates the daily commerce of socio-economic entities.

In 1964, U. S. Highway 17 Expressway gorged the historic city of Charleston, SC, scarring our city, dividing neighborhoods, greatly exacerbating drainage problems and creating a visual blight. Now is the chance to repair the damage and to prevent tragic occurrences caused by this highway being constructed without sufficiently attending to the storm water implications.

During times of heavy rainfall and especially when combined with high tide, this vital transportation link is rendered impassable. Safe access to our hospitals, including the Veterans Hospital and our regional Level 1 Trauma Center are a critical concern. There are difficulties in travel across the peninsula, access to businesses and homes in the area and emergency rescue access to anywhere in the drainage basin. Even getting our children to and from the four schools in the area is fraught with risk.

In order to address the shortcomings of this major federal highway, the City of Charleston is proposing an innovative infrastructure reinvestment: the US Highway 17/Septima Clark Parkway Project.

This project will facilitate critical disaster response and improve the safety of travelling on US Highway 17. Since Katrina, there has been a national awakening and awareness of investment in infrastructure. The deficit of safe and sound infrastructure has been implicated as a major contributor to loss of life and property in a crisis or disaster. US Highway 17 is today a dangerously dysfunctional primary transportation route.

The necessary reinvestment in US Highway 17 requires the commitment and participation of all levels of government in order to fully transform a crucial commerce route within Charleston’s regional transportation and emergency management infrastructure.

The negative impacts on the surrounding community have been significant—disconnected neighborhoods, speeding traffic, dangerous pedestrian conditions, noise and pollution, and a general blight—but deemed the price to pay in 1964 for seamless flow of US Highway 17 traffic across the peninsula and up and down the East Coast. Today, these impacts would be unacceptable!

The American Recovery and Reinvestment Act provides the opportunity for all these issues to be addressed and in the process to remove the scar of a 1960’s highway that certainly would not be built in this manner today. This project will make U. S. Highway 17—now Septima Clark Parkway—functional and beautiful, insuring that whether it is a thunderstorm or an approaching hurricane, this highway is passable, its adjacent emergency response and critical medical facilities accessible, and the surrounding community repaired.

“I urge you to consider the importance of this project. With this infrastructure reinvestment the obsolete US Highway 17 will be made a functionally efficient, environmentally responsive and aesthetically-pleasing US Highway 17/Septima Clark Parkway, and will represent a state of the art investment in transportation that all governmental jurisdictions will take pride in.” –Mayor Joseph P. Riley, City of Charleston
1. US HIGHWAY 17 ISSUES
1.1. BACKGROUND

At the heart of this Project is US Highway 17, also known as the Crosstown. Constructed in 1968, the Crosstown is a six-lane portion of US Highway 17 connecting the Cooper River and Ashley River bridge crossings. It provides a travel route for over 54,000 vehicles per day, and serves as the lifeline for emergency response vehicles associated with three major hospitals and several disaster response agencies. As a designated evacuation route serving the region during hurricane season, its availability immediately proceeding and during the onset of such storm events is critical.

US 17 is currently flooded and rendered impassable by moderate to severe storm events and shallow coastal inundation. Like much of the Charleston peninsula, this route traverses land challenged with flat grades, continuing ground subsidence, and elevations that are low and impacted by tides; frequently rainfall intensities force closure of multiple lanes of travel, bringing traffic to a stand-still, with the potential risk of loss of life due to delayed response times for emergency service vehicles. This risk and consequence is easily magnified during the evacuation, rescue, response, and early recovery phases of a tropical event.

- US 17 is the only federal north-south coastal highway, a major route for interstate commerce and commuters, carrying 55,000 cars per day.
- This major highway is a \textit{regional hurricane evacuation route} impacted by tides and storm events, and is impassible during heavy rains.
- Flooding of the \textit{500-acre drainage basin} representing 20\% of the Charleston peninsula severely impacts the community during heavy rain.
- Access to regional hospitals is impacted: \textit{Ralph H. Johnson Veterans Administration Hospital} is inaccessible in heavy rains, and access to the \textit{Medical University of South Carolina’s Level 1 Trauma Center} as well as its hospitals and clinics are cut off by flooding.
- Four schools, including Charleston’s only inner-city public high school and the only charter elementary school in federally-subsidized housing project in the US are inaccessible during storms.
- New SC National Guard Readiness Center, District US Army Corps of Engineers Headquarters along with City of Charleston Police Headquarters and two Fire Stations are inaccessible during heavy rain.
- The stormwater run-off negatively impacts water quality in the Ashley River when cars, buildings and houses are flooded.
1. US HIGHWAY 17 ISSUES

1.2. HISTORICAL PERSPECTIVE

In 1964, U. S. Highway 17 Expressway scarred the community by dividing neighborhoods, greatly exacerbating drainage problems, increasing noise and pollution, and creating a visual blight. The impact on the community was deemed the price to pay for seamless flow of traffic across the peninsula and up and down the East Coast. Now is the chance to repair the damage.
1. US 17 HIGHWAY ISSUES

1.3. TRANSPORTATION CONNECTIVITY

Charleston is located in the heart of what is regionally known as the Lowcountry, a designation which quite aptly describes the landscape of this historic coastal city. Charleston’s topography rarely rises more than a few meters above sea-level, and during high-tide many areas actually slip below that vital water-mark. Such low elevations present serious problems on the downtown Charleston Peninsula, home to nearly a third of Charleston’s 121,000 residents and the nucleus of Charleston’s economy.

As any Charlestownian is well aware, certain areas of the city are impassable due to severe flooding should a rain storm and high tide happen to coincide. US Highway 17 is the largest arterial roadway allowing passage across the Peninsula, traverses these low-lying areas. During times of flooding, standing water on this vital federal highway impedes traffic flow and makes navigating the downtown area a dangerous task for motorists. On a typical day, such an inconvenience can be frustrating and economically detrimental. But the true concern, and what makes rectifying this problem a national priority is the fact that in the path of a hurricane, such an inconvenience could prove deadly.

2007 Average Daily Trip Counts

US 17 @ Ravenel Bridge – 78,100
US 17 @ Crosstown – 54,400
I-26 (After exit to Mt. Pleasant – Just prior to downtown and Crosstown) – 53,000
I-26 (Prior to Rutledge Avenue exit and Mt. Pleasant exit) – 61,800
In 2005, SCDOT and FHWA opened the new Arthur Ravenel Jr. Bridge, a critical link in US Highway 17:
* Increased the capacity of US 17 over the Cooper River to accommodate area growth predictions.
* Improved traffic safety by meeting current design standards and eliminating substandard safety factors.
* Reduced the frequency and costs of major bridge maintenance.
* Increased the vertical and horizontal navigational clearances to accommodate the current needs of seafaring vessels.
1. US 17 HIGHWAY ISSUES

1.4. EMERGENCY MANAGEMENT

Also of importance to the region is the fact that three prominent hospitals, the Medical University of South Carolina, Roper St. Francis Hospital, and the Ralph H. Johnson VA Medical Center rely on US Highway 17 for direct access for emergency vehicles, medical and support staff and patients. For these facilities to be unreachable during a disaster would only serve to magnify and exacerbate suffering and potential loss of life.

Access to regional hospitals is severely impacted: Ralph H. Johnson Veterans Administration Hospital is inaccessible in heavy rains, and access to the Medical University of South Carolina’s Level 1 Trauma Center, its hospitals and clinics, as well as Roper St. Francis Hospital, are cut off by flooding. Certainly, all of these hospitals will be critical disaster relief centers, and access to them in any conditions is crucial to achieve effective emergency response.

New SC National Guard Readiness Center, District US Army Corps of Engineers Headquarters along with City of Charleston Police Headquarters and two Fire Stations are located within or adjacent to the drainage basin, and are too often inaccessible during heavy rain. Each of these disaster response teams utilize US Highway 17 for maneuvering about the region, and certainly require access in any conditions, particularly in or following storm events.
1. US HIGHWAY 17 ISSUES

1.4. EMERGENCY MANAGEMENT

Thus, effective disaster preparedness, and evacuation readiness demand a solution to the drainage problem along US Highway 17. Funding such an endeavor would be an easily justifiable use of federal stimulus money and a worthwhile investment for American taxpayers.
Hurricane Katrina was an awakening for the nation, a realization that preparedness is not a luxury but a requirement; that an efficient plan of evacuation can be the difference between life and death. The City of Charleston has taken these lessons to heart, reevaluating emergency plans, training and assigning staff for emergency operation roles, running drills to ensure that the plans in place will be effective.
1. US HIGHWAY 17 ISSUES

1.5. PUBLIC SAFETY/EVACUATION

However, despite all our efforts, the City cannot escape the fact that an evacuation of the Peninsula may be compromised by flooding of US Highway 17/Septima Clark Parkway, a primary evacuation route and direct conduit to Interstate 26. In fact, this flooding is at times so severe that roadways are not passable by any means, whether automobile, bicycle, or foot rendering the transportation system dysfunctional. Water frequently reaches levels capable of flooding and stalling car engines, adding stranded automobiles as yet more obstacles to an already frustrated transportation network. One can only imagine how such flooding would impact the mass exodus of civilians from the Charleston Peninsula in the event of a Katrina type hurricane.
1. US 17 HIGHWAY ISSUES

1.6. INTERSTATE COMMERCE

Additionally and of national interest, US Highway 17/Septima Clark Parkway is an important interstate roadway which traverses nearly the entire length of the eastern seaboard. Thus maintaining smooth, safe, and efficient traffic flow on the Septima Clark Parkway is of significance not only to Charlestonians, but to all who travel the east coast.

In 2008, the South Carolina State Ports Authority (SPA) served 1,855 ships and barges at its seaport terminals in Charleston, Georgetown and Port Royal. In the Port of Charleston, the SPA handled 1.64 million TEUs, or 20-ft equivalent units. The SPA’s Charleston breakbulk cargo totaled 587,000 tons. Top commodities across Charleston docks include agricultural products, consumer goods, machinery, metals, vehicles, chemicals and clay products.

RANKING: In 2008, the Port of Charleston was one of the busiest container ports along the Southeast and Gulf coasts. It is recognized as one of the nation’s most efficient and productive ports. The Charleston Customs district ranks as the nation’s eighth largest in dollar value of international shipments, with cargo valued at more than $62 billion annually.

PLANNING FOR THE FUTURE: The SPA has several major projects underway to serve its customers and the state’s business community. The $148-million Charleston harbor deepening project completed in May 2004 took the inner harbor channels to -45 feet at mean low water. In 2005, the Arthur Ravenel Bridge spanning the Cooper River was completed and, with 186 feet of vertical clearance at mean high water, allows Charleston to handle
The role of US Highway 17 with reference to interstate commerce also cannot be underestimated. This roadway is integral in maintaining the flow of goods into and out of the Southeastern United States, as the Port of Savannah and the Port of Charleston are two of the largest seaports along the Eastern Coast. US Highway 17 is a key link in allowing this movement of cargo which is so vital to United States economy.

CARGO PROFILE: Charleston is one of only a handful of ports to have received the Presidential “E” and “E-Star” awards for excellence in exporting. Although shippers in two dozen states use Charleston to access foreign customers and suppliers, 45% of SPA tonnage and about a third of containers are related to South Carolina firms. North Europe and Asia are the SPA’s top markets, combining for 54% of total volume, but more than 150 nations are served directly from SPA docks.

ECONOMIC IMPACT: International trade through the SPA’s facilities provides 260,800 jobs paying $11.8 billion in wages to South Carolinians. In all, trade pumps nearly $45 billion into the state economy and generates $1.5 billion in state and local taxes.

SOURCE: SC STATE PORTS AUTHORITY
1. US HIGHWAY 17 ISSUES

1.7. ECONOMIC DEVELOPMENT

The area surrounding US Highway 17 on the Charleston peninsula represents a high concentration of major regional employment centers. The Medical District in particular is a major employer in the region, and generates a significant amount of economic activity. With expansions of facilities, the numbers of employees and the economic impact of this area will continue to grow, placing even more importance on addressing the issues of US Highway 17.

Major Employers in Charleston Region (with facilities in the study area)

Medical University of South Carolina
9,520

Roper St. Francis Healthcare
4,300

City of Charleston
1,753

The Citadel
500

SC Federal Credit Union
407
1. US HIGHWAY 17 ISSUES

1.7. ECONOMIC DEVELOPMENT

The Horizon Area Redevelopment Project is a major economic development and urban revitalization initiative to advance the knowledge based sector of the Charleston regional economy. The project will be a national model for a research-oriented urban infill development, an innovative initiative that will incorporate all of the elements necessary to create a vital urban place in the knowledge-based economy. Its success is very much predicated on creative solutions to the US Highway 17 issues.

The Horizon Area Redevelopment Project will leverage the resources and public leadership necessary to build a 21st century economic engine to drive the Charleston region forward. The project will integrate Life Sciences Research cluster and incubator facilities; MUSC Clinical Research centers; supportive commercial mixed-use, including retail and office development; mixed-income residential infill providing a range of housing types, and creating a true live-work environment; new and improved public urban spaces, recreational facilities and parks; and the necessary infrastructure, including streets, utilities and drainage.
In the year 2000, Hillary Rodham Clinton and then Secretary of Transportation Rodney Slater designated the East Coast Greenway as one of our nation’s 16 National Millennium Trails.

The Millennium Trails initiative was part of the White House Millennium Council’s efforts to stimulate national and local activities to “honor the past and imagine the future.” The public/private partnership was led by the Department of Transportation, Rails-to-Trails Conservancy, and a collaboration of other agencies and organizations.

“Transportation is about more than asphalt, concrete, and steel, it’s about people,” said Secretary Slater. “The National Millennium Trails connect our nation’s landscape, heritage, and culture and demonstrate our national commitment to improving the quality of life for all Americans. The designated National Millennium Trails symbolize America’s legacy for the Millennium.”

The East Coast Greenway, conceived in 1991, already stands beside such storied pathways as the Appalachian Trail and the Iditarod. Passing by or near many of our nation’s most important cultural and historic sites, as well as some of our most beautiful areas such as North Carolina’s Outer Banks, the Maine coast, and the Florida Keys, the East Coast Greenway is truly representative of the Millennium Trails ideal.

First Lady Hillary Clinton said, “Through the Millennium Trails project, we are building and maintaining trails that tell the story of our nation’s past and will help to create a positive vision for our future.”

The new Arthur Ravenel Jr. Bridge over the Cooper River includes the well-used and wildly popular Wonders Way Bicycle and Pedestrian Lane. This lane has closed one of many missing links in the East Coast Greenway route. Inspired by this success, the City of Charleston is also separately pursuing a retrofit project to add a bicycle and pedestrian lane to the Ashley River Bridge of US Highway 17, effectively bookending the Crosstown, which is currently inaccessible and dangerous for bicyclists and pedestrians.
1. US HIGHWAY 17 ISSUES

1.9. SAFER ROUTES TO SCHOOLS

Area schools are significantly impacted by the intrusion of US Highway 17 into their communities. Students attend these neighborhood schools from both sides of US Highway 17, many of them walking or riding bikes. High traffic speeds and growing volumes make safe passage to school each day far too dangerous for children.

In a heavy rain event, safe passage is further compromised by flooding of streets and sidewalks, making simply attending school a difficult challenge for students of all ages. Schools in the area of US Highway 17 have reported significantly-higher absentee rates on days of rain or anticipated storms, a particularly unacceptable problem for students who may already be at risk.

**Four schools** are inaccessible during storms, including Burke High School—Charleston’s only inner-city public high school—and Burke Middle School, Mitchell Elementary and Charleston Development Academy, the only charter elementary school in federally-subsidized housing project in the United States.
1. US HIGHWAY 17 ISSUES

1.11. COMMUNITY REHABILITATION

The area of the Charleston peninsula protected by this Project is a diverse combination of demographics, land-uses and architecture. The Project boundaries affect several Charleston peninsula neighborhoods including Cannonborough, Elliottborough, Gadsden Green, Hampton Park Terrace, Radcliffeborough, Westside and peripherally affect the East Side and North Central neighborhoods.

The Project area also includes several blocks of the central commercial district along King and Meeting Streets, the commercial corridor along Spring and Cannon Streets and part of the medical complex that includes MUSC, Roper Hospital and the Veterans Hospital.

A mix of commercial, residential, civic and institutional uses occur in this area. Of the 2,557 properties in the project boundaries, approximately 82% are residential, comprising 63% of the geographic area. Thirteen percent of the total properties are commercial, while civic or institutional uses comprise the rest of the area. With the City’s MHI at 84% of the national average and 95% of the state average, the City is not in a position to add a significant tax or fee increase.
1. US HIGHWAY 17 ISSUES

1.1. COMMUNITY REHABILITATION

This Project provides benefits from the local level up and through the national level. The City is moving the Project along to:

- Maintain or improve the character of the existing neighborhoods
- Provide a safe and reliable evacuation route during storm events
- Protect significant existing local, state and federal infrastructure from damage from floods
- Provide economic stability for the area economy
- Preserve a major transportation corridor and access to significant local and regional facilities
- Provide a long term solution that will protect against increased coastal environment changes
2. US HIGHWAY 17 SOLUTIONS

2.1. CHARLESTON'S COMMITMENT

The US Highway 17/Septima Clark Parkway project includes Spring-Fishburne-US 17 Stormwater Drainage Improvement Project (Project) is a significant City effort to alleviate frequent flooding within roughly 20% of the Charleston peninsula. The most severe flooding occurs when moderate to heavy rains coincide with the normal high ocean tide cycle. With each flooding event, existing private, city, state and federal infrastructure is subject to damage and the potential washout or movement of supporting soils. In addition, the impacted area is home to the region’s largest and most significant health care facilities and the city’s police headquarters which become inaccessible during flooding events.

After years of studies and investigations, the City has authorized the design of the ultimate solution to this flooding. That solution is the construction of a series of deep stormwater collection tunnels, a large stormwater pumping station at the edge of the Ashley River and a number of local neighborhood stormwater and drainage improvements.

The City is moving ahead with the Spring-Fishburne-US 17 Stormwater Project because it is needed to: (1) maintain the character of the existing neighborhoods, (2) provide a safe and reliable evacuation route during tropical events, (3) protect against increased coastal environment changes and (7) maintain all weather access for ambulances and private vehicles to the essential services provided by the Veteran’s, MUSC and Roper hospitals.

BACKGROUND INFORMATION

At the heart of this Project is the fact that area flooding has worsened and impacts on residents and travelers have increased. Disruption to area businesses and institutions has become a larger issue and with each flooding event, local and regional commerce and industry are even more threatened.

The best example of how this Project impacts the area is to take a close look at the ongoing flooding impact on US Highway Route 17 (US 17) also known as the Crosstown. Constructed in 1968, the Crosstown is a six-lane Federal highway (US17) running north-south and connects the Cooper River and Ashley River bridge crossings. It provides a travel route for over 53,000 vehicles per day, serving as the lifeline for emergency service vehicles associated with three major hospitals and the City of Charleston’s Police Station. As a designated evacuation route serving the region during hurricane season, its availability immediately proceeding and during the onset of such storm events is critical.

US 17 is currently flooded and rendered impassable by moderate to severe storm events and shallow coastal inundation. Like much of the Charleston peninsula, this route traverses land challenged with flat grades, continuing ground subsidence, and elevations that are low and impacted by tides within the Ashley River.

Today, flooding is experienced to some degree with most rainfall events, and summertime thunderstorms frequently have rainfall intensities that force closure of multiple lanes of travel, bringing traffic to a stand-still. Such occurrences also result in flood damages to vehicles and neighboring structures, with the largest potential hazard being the loss of life due to delayed response times for emergency service vehicles. This risk and consequence is easily magnified during the evacuation, rescue, response, and early recovery phases of a tropical event. Included is a pictorial of past flood events which provides a picture of the extent of the challenges facing residents, visitors, businesses and institutions.

The long term solution to this flooding is the construction of a series of deep stormwater collection tunnels, a large stormwater pumping station at the edge of the Ashley River and a number of local neighborhood stormwater drainage improvements.

Stormwater and flood relief projects are not normally eligible for Federal-aid funds. As part of Project planning, the City is looking to expand its receipt of additional outside funding. To date, the City has identified only a limited number of potential funding sources.

FINANCIAL ISSUES

The City funds its stormwater utility from two revenue sources. The first is a 2 mil property tax levy which is set aside for ongoing City wide stormwater management and operations. In 2006, this tax levy generated $1,503,166. The second is a stormwater utility surcharge on City wide sewer and water bills associated with the user’s property area and use. In 2006, this stormwater utility fund generated $4,882,547. The 2006
expenses were $3,128,940 (City wide stormwater management, repair and operations costs) so $1,753,607 was set aside in the City's Drainage fund for capital projects like this.

If the City attempted to fund the entire Project locally, the annual interest and principle payments would run about $8,000,000/year (based on issuing a 20 year, 5.00%, $105,000,000 principal municipal bond). This payment would require the City to increase its city-wide stormwater revenues by more than 2½ times. Other challenges with attempted local financing relate to; (1) having a disproportionate amount of stormwater utility revenue being spent in one area, (2) having the Project beneficiaries include extensive county, state and federal interests, and (3) State law limiting the amount of local tax or fee increases and this increase could be outside of those limits.

The Need: Alleviate frequent flooding within roughly 20% of the Charleston peninsula, and:
- Preserve US Highway 17, a major transportation corridor & access to local/regional critical use facilities
- Build a long term Project to protect against increased coastal environment changes
- Provide a safe and reliable evacuation route during tropical events
- Protect significant existing local, state and federal infrastructure
- Maintain the character of the existing neighborhoods
- Provide economic stability for the area economy
- Maintain all weather access to the services of Veteran’s, MUSC and Roper hospitals, Burke High School, US Army Corps of Engineers Charleston District Office, Charleston Housing Authority

The Project: A new stormwater collection tunnel and pumping system consisting of:
- A series of deep stormwater collection tunnels
- A large stormwater pumping station at the edge of the Ashley River
- A large stormwater outfall structure to the Ashley River
- A number of local neighborhood stormwater drainage improvements

Financial: Financing of the Project is expected through local, state, regional and federal funding:
- Residents pay a 2 mil property tax and a stormwater surcharge on sewer bills, in 2006:
  - The 2 mil property tax generated $1,503,166
  - The stormwater surcharge generated $4,882,547
  - The city-wide stormwater management, repair and operations cost $3,128,940
  - $1,753,607 was available for long-term stormwater capital improvements
- To finance this Project locally would cost about $8,000,000/year for 20 years
  - Stormwater revenue would have to increase 250%
  - The City's $28,514 MHI is 84% of the national average and 95% of the state average

Support: The Project is continuing to secure written support from the following affected persons:
- State, County, City, local institutions and area business leaders
2. SOLUTIONS

2.1. STORMWATER DRAINAGE

Tunnel and shaft location diagram

2.2
2. SOLUTIONS

2.1. STORMWATER DRAINAGE

Drainage basin hydraulic modeling
2. US HIGHWAY 17 SOLUTIONS

2.1. STORMWATER PUMP STATION

Conceptual rendering of Pump Station
2. US HIGHWAY 17 SOLUTIONS

2.1. STORMWATER PUMP STATION

Outflow Analysis

Figure 2. Topo-Bathymetry Data Coverage

Figure 3.3 - Spring tidal maximum velocities close-up with indicative position of outfall

Figure 3.4 - Spring flood tidal maximum velocity contours (in ft/s)
2. US HIGHWAY 17 SOLUTIONS

2.1. SURFACE IMPROVEMENTS

The project will provide necessary improvements to public safety, and will positively transform the character of US Highway 17 from an unsightly urban blight to a federal highway worthy of the name “Septima Clark Parkway.”
2. SOLUTIONS

2.1. SURFACE IMPROVEMENTS

Far more than simply aesthetic enhancement, the surface improvement component of the project will advance pedestrian safety and community connectivity, and help reduce some of the negative environmental effects of US Highway 17.
While the purpose of the spring/fishburne us17 drainage improvement project is to alleviate flooding, improvements will also include both temporary and permanent provisions for addressing stormwater runoff quality. During construction, temporary facilities and practices will be specified to minimize the amount of erosion occurring within disturbed areas and maximize the efficiency by which suspended solids are captured and removed from the runoff. Improvements will also be designed to include, where practicable, permanent/post-construction provisions for treating runoff being conveyed and discharged by the improved system.

Permitting authority and regulating agencies

Scdhec / ocrm: The ocean and coastal resource management (ocrm) division of the south carolina department of health and environmental control (scdhec) will be responsible for reviewing and approving the stormwater management plan and issuing a coastal zone consistency certification for the project. This review process will address water quality, verifying that the project will have limited to no adverse effects on rivers, streams, marshes, or other coastal waters. A notice of intent (noi) will be submitted for seeking coverage under npdes general permit scr100000 - stormwater discharges from large and small construction activities. Upon approval of the construction plans and stormwater management plan, ocrm will allow the project to be covered by the general permit.

City of Charleston: Under phase ii of the npdes program, the city of charleston, as a small ms4, will be delegated the authority/responsibility for reviewing and approving the project for coverage under their specific npdes permit. This program / process is currently under appeal and the process outlined in section 2.1 above still applies. Under any condition of the npdes coverage, the city will review and approve the construction plans. All structural best management practices (bmp’s) deemed necessary for this project will fall under the responsibility of the city for ownership and maintenance.

Existing conditions: Non-point source pollutants within the project footprint are typical of that for any heavily urbanized district. They will typically include heavy metals and hydrocarbons, mostly from vehicle emissions and materials deposited on roadways and parking lots. Biological contaminants are also most likely present and generated by domesticated animals living within the basin. It is possible that illicit sanitary sewer discharges are located within the existing drainage system as well. It is believed that the current flooding conditions experienced within the basin contribute to the amount of non-point source pollutants introduced and carried in the stormwater runoff. Flooding conditions along roadways typically inundate the chassis of crossing vehicles and in some occasions lead to the stalling and eventual flooding of vehicles, encouraging the transfer of oils and fuels into the runoff. Flooding conditions within private property increases the chances of domesticated animal waste being contacted and directly transported by runoff.

Erosion and sedimentation control: The engineer will specify on the plans recommended and scdhec/ocrm approved typical erosion control devices that shall be applied during construction. These methods will most likely include installation of silt fencing, construction entrances and mulching/grassing at staging areas and working shaft locations. Street sweeping will be specified where equipment deposits soil along paved surfaces surrounding the work site. Along linear portions of the project site and most applicable to the collection system, it is proposed that emphasis be placed on the timely establishment of temporary or permanent ground cover over all disturbed surfaces and that inlet protection be installed and heavily maintained until all contributing areas are fully stabilized.
Illicit discharge detection and elimination: In anticipation of connecting to existing storm systems that potentially contain illicit discharges, and in the event an illicit discharge itself is recovered, a construction program will require the contractor to test or explore the limits and types of service conveyed by all piping systems connecting to the improved drainage system. These steps will reduce the possibility of connecting an active sewer discharge into the improved storm system. Should illicit discharges be detected or located, provisions will be provided for segregating the systems and providing connection to the sanitary sewer system.

Post-construction

Drainage improvements: It is anticipated that the majority of stormwater runoff quality benefits will occur as a result of alleviating frequent flooding within the basin. By limiting the contact or contact time with contaminated surfaces, it is expected that pollutant loads currently experienced will be reduced.

Suspended solids removal: No special provisions are being applied within the collection system for the settling and collection of suspended solids. Functioning inherently with the geometric and hydraulic design of the downstream deep tunnel and shaft conveyance system, suspended solids will be encouraged to settle within or be transported to the sump located at the bottom of the pump station shaft (refer to tm-ps-1). The collected solids are understood to include or have attached the highest concentration of stormwater pollutants. As part of routine operations and maintenance, a desilting and/or dewatering of the tunnels and shafts system will transport the water and intentionally resuspended solids into a settling and baffle chamber before discharging into the outfall system and ultimately into the Ashley River.

Litter/debris removal: Aside from that of controlled inlet properties, no special provisions are being applied within the collection system for the removal of litter or debris from stormwater runoff. The collection system will embrace safety for the general public by adopting standards and applying agency-approved inlet structures where possible. These inlets will provide a relatively safe environment for the passing or crossing of the general public on foot or bicycle. Where practicable, these inlets will include an open component of the size and capacity to receive and transport litter and debris commonly encountered within the urbanized basin environment without the blocking of flow. Whether floating, neutrally buoyant, or a settling object, it is anticipated that such matter entering the collection system will be transported down to and along the deep tunnel network to the pump station shaft. From that point, settling objects will be expected to remain atop a horizontal fixed screen at the tunnel invert until removed (refer to tm-ps-1). Floating and neutrally buoyant objects will eventually come in contact with the mechanically cleaned screen system, where objects in excess of the 1.5-inch clear opening dimension will be intercepted and mechanically removed and disposed of.