

The Town of Cary is pleased to submit a nomination for a state-of-the-art three-tiered, public project which has wide-reaching appeal and value to Town citizens. The three components of the project include improvements to a historically underutilized public greenway trail, design and construction of 12 nitrogen removing best management practice devices (BMP's) through a partnered agreement with the State of North Carolina, and a state of the art stream restoration design to restore over 5,000 linear feet of degraded stream channel. This project grew out of concerns from adjacent property owners that the highly urbanized stream was eroding property and creating frequent and recurring flooding conditions, putting their homes and families at risk. The resulting project has brought together several previously disconnected neighborhoods, provided improved walkability and has the full community support while leveraging State investment to test cutting edge water quality improvement devices.

The Higgins Trail greenway was an unimproved trail in the downtown region of Cary. This trail is located between three residential neighborhoods and two major thoroughfares. The greenway previously had a mulch (unimproved) trail with limited access now has a start and terminus that connects neighborhoods and consists of a paved trail system that is markedly more accessible.

The trail was nestled in a deciduous forest in the middle of this residential area. Adjacent to the trail is an unnamed tributary to Swift Creek – a federally protected stream in the Swift Creek Watershed. Over time, the tributary displayed characteristics suggestive of continued urbanization typical for increased development. The sinuous nature of the stream had been straightened, stream banks were eroded, the channel was incised, and properties adjacent to the stream experienced structural flooding during intense rain events. As flooding persisted, concerns increased and ultimately resulted in the Town taking mitigating measures.

Other concerns related to nitrogen loading and other pollutants being input into the watershed by increased impervious surfaces through development. These concerns were of significance considering that Swift Creek is classified as an impaired stream on the federal 303-D protected list with a TMDL for biological impairment with impervious surface as the surrogate.

In addition to the greenway improvements, the restored channel provides aesthetic, educational, and environmental benefits. The stream was restored using natural channel design techniques to provide a stable channel with environmental benefits such as improved habitat and flood reduction. The BMPs increase the environmental benefit of the project by removing pollutants from runoff. The use of constructed wetlands in a stream restoration project for specific treatment purposes is an innovative approach and offers an excellent opportunity to evaluate their use and effectiveness.

The methods to build the trail included standard construction practices for paved greenway trails. But because the Town desires vehicular access vehicles to be able to access the trail, the pavement design standards and bridge construction standards were enhanced to a level compatible with handling vehicular traffic for emergency access and medical emergency evacuations. All in all, there are five bridges constructed as part of this project. The stream restoration component was designed and constructed in accordance with standard natural geomorphic channel design criteria. The constructed wetlands were designed to meet North Carolina Ecosystem Enhancement Program criteria in terms of design and location.

## Application Narrative

### 1) Natural Resource Assessment

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### 2) Water Quality Protection

The project is unique in that it's the first of its kind to retrofit a residential neighborhood with this type of nutrient reducing best management practice devices (BMP's). This was accomplished by the Town applying for a grant from the NC Ecosystem Enhancement Program (NCEEP) to design and construct constructed wetlands on the project site. The stream was restored using innovative natural channel design techniques to provide a stable channel with environmental benefits such as improved habitat and flood reduction. The BMP's increase the environmental benefit of the project by removing pollutants from runoff water coming from impervious surfaces. The use of constructed wetlands in a stream restoration project for specific treatment purposes is an innovative approach in North Carolina and offers an excellent opportunity for the State to evaluate their use and effectiveness.

### 3) Wildlife Habitat Protection

Working together with the State NCEEP afforded to project to be enhanced both from a functional standpoint by increasing the water quality benefit and a form standpoint by increasing the natural diversity within the project. An additional benefit to the project is the preservation of this 18-acre parcel as a natural riparian corridor. The established wooded buffer along the stream further improves the environmental benefits of this project and provides a rural setting within this urbanized area.

### 4) Vegetation Protection & Enhancement

The stream restoration project included re-vegetation of the buffer with numerous native species of plants. The 100-foot buffer on both sides of the stream will allow for the riparian area to thrive. The 12 new BMPs including constructed wetlands increase the environmental benefit. The project is in the one year warranty period and will be monitored for invasive species. The site will be monitored and maintained for a five year period in which maintenance will include replacement of dead trees and removal of invasive species. The Town will furnish water quality monitoring data to the NCEEP

on a quarterly basis for a two year period following BMP construction. Additionally, a BMP maintenance and inspection report will be submitted every five years. The Town of Cary will also be maintaining the BMP's to ensure functionality for a period of 30-years.

5) Green Building

Upgrading the trail to improved conditions including pavement, benches, trash receptacles, and education signage increased the walkability, safety, and environmental awareness within this area. It has also added access to all citizens and increased the opportunities for exercise while maintaining a rural setting in this urbanized community. This project meets sustainable development principals by providing better transportation choices with the improved greenway trail that has additional access points and is now accessible to all of Cary's citizens.

6) Integration with Community

The Higgins Trail was an unimproved trail in the downtown region of the Town of Cary. The trail, which was located between three neighborhoods (one single family and two multifamily), had low to moderate usage in its unimproved form. The trail had only two access points and was not directly accessible by two of the three neighborhoods. The resulting project has brought together several previously disconnected neighborhoods, provided improved walkability and has the full community support while leveraging State investment to test cutting edge water quality improvement devices.

7) Long-Term Management & Maintenance

The Town will furnish water quality monitoring data to the NCEEP on a quarterly basis for a two year period following BMP construction. Additionally, a BMP maintenance and inspection report will be submitted every five years. The Town of Cary will also be maintaining the BMP's to ensure functionality for a period of 30-years.

8) Community Outreach & Education

The Park, Recreation and Cultural Resources Department is currently working on education signage to be placed along the trail to explain the various components of the stream restoration, water quality wetlands and history of the area. The stream and wetlands are required to be maintained differently than a typical park setting. Maintenance and monitoring manuals are being established for this to ensure maintenance meets regulatory standards.