



Proposal for RainReady Carrboro
July 25, 2019

The Town of Carrboro, North Carolina has requested this proposal from the Center for Neighborhood Technology (CNT) to develop program recommendations for a neighborhood-scale RainReady program.

Project Understanding

The Town of Carrboro, North Carolina, is experiencing a variety of flooding-related challenges. Carrboro, which shares a municipal boundary with Chapel Hill, is situated at the headwaters of two creeks, Bolin Creek and Morgan Creek. Some older neighborhoods have insufficient stormwater infrastructure and were built in floodplains before flood management best practices were put into place.

This proposal concerns the watershed of a tributary to Morgan Creek, upper Toms Creek, where many homes are 40+ years old, several dozen of which were built in the floodplain/flood fringe. Some of these have experienced recurring flooding. Flooding has been a concern since the 1980s, with more intense storms observed in the past 5- 10 years, resulting in regular nuisance flooding and occasional more severe flood impacts to these homes. In 2013, the most significant recent flood event resulted in substantial/reported impacts to about half a dozen homes. Following this, the Town conducted two “neighborhood walkabouts” that included gathering data from residents. An engineering flood study, with a calibrated model, was completed in 2016. Flood mitigation alternatives were considered but the findings placed a constraint on implementation options. In 2017, the Town formed a new Stormwater Utility. In 2018, Hurricane Florence resulted in additional flood impacts.

The Town participates in the National Flood Insurance Program (NFIP), and is currently assisting four homeowners who have requested FEMA acquisition and elevation assistance for properties located in the regulated floodplain. However, poorly drained soils, development patterns, and older infrastructure, are creating drainage problems outside the floodplain as well.

Residents are concerned about the increase in intense storms, feel the problem is worsening, and are seeking additional actions from the Town. The Town has initiated a study of the public stormwater conveyance system for this watershed and is considering other actions that the Town can take. However, the Town is constrained by both legal and financial/capacity barriers for actions that can be taken on private property.



Project Approach

CNT will assist the Town in developing recommendations for a RainReady-type program in the target neighborhood. RainReady programs are designed with following overarching principles in mind.

- **Equity:** Equity is achieved when demographic factors such as a race and income are no longer a predictor of flooding severity.
- **Affordability:** By reducing the cost of flood damage to homes, the total cost of housing is reduced.
- **Resiliency:** Resilient housing reduces the vulnerability of residents to climate impacts including flood damage, indoor health quality and building integrity.
- **Community:** Housing programs which incorporate nature-based solutions, such as rain gardens, provide resiliency benefits to the broader community.

1. Identify Existing Conditions

- 1.1. Review available federal, state, and local data concerning flooding, housing and socioeconomic conditions of the target neighborhood. Carrboro staff will provide local datasets.
- 1.2. Develop a survey and evaluate survey results concerning housing tenure and ownership, flooding impacts and concerns, knowledge of flood risks and solutions, attitudes towards green infrastructure, familiarity with home renovation projects, desired type of assistance, and ability to invest in building-scale flood mitigation measures. Carrboro staff will disseminate the survey to neighborhood residents. CNT may conduct follow up interviews with a limited number of survey respondents who indicate interest in providing additional information.
- 1.3. Conduct telephone interviews with municipal and contract staff concerning neighborhood conditions, zoning and codes, local building construction and flood mitigation techniques, financing options, available skilled workforce, regulatory authority, liability, and local costs for administration and construction. CNT will request interviews with staff across municipal departments.

2. Develop Program Design Recommendations

CNT and Carrboro staff will co-design recommendations for the proposed neighborhood flood mitigation program.

- 2.1. Develop templates for flood mitigation retrofits for the different types of flooding occurring within the target neighborhood, based on a typical single-family home. Carrboro Public Works/Stormwater and Planning staff, and the Carrboro contract Engineer will define the typical building type and appropriate local building solutions for the flood types being considered.
- 2.2. Develop construction cost estimates for the retrofit templates. Carrboro Public Works/Stormwater and the Carrboro contract Engineer will provide local cost data.
- 2.3. Identify level of grant funding needed for a typical neighborhood resident to perform the recommended construction retrofit. This assumes that the preparation of the construction scope will be prepared without cost to residents. Grant funding need will be determined from resident survey responses.



- 2.4. Calculate the estimated stormwater infiltration benefit of implementing flood mitigation retrofits across the neighborhood. The calculation will be based on published green infrastructure infiltration values, green infrastructure elements in construction templates, and resident survey responses.
- 2.5. Identify community engagement needs to address neighborhood resident knowledge gaps, attitudes, and preferences. Engagement needs will be identified from resident survey responses.
- 2.6. Define program applicant prioritization criteria, in the event that a program is oversubscribed.
- 2.7. Identify key program evaluation metrics and performance indicators.
- 2.8. Conduct case study research to identify potential financing options for a resident assistance program. CNT will identify financing methods used by 3 to 5 resident assistance programs offered by local governments.

3. Program Recommendations Report

CNT will draft and present a final recommendations report that incorporates the findings from Task 1 and the work products from Task 2.

Estimated Project Schedule and Budget

September 2019	Notice to Proceed	
October – November 2019	Project Kickoff Task 1: Identify Existing Conditions	\$12,000
December 2019 – February 2020	Task 2: Develop Program Design Recommendations Task 3: Program Recommendations Report	\$12,990
Total		\$24,990

Notes and Assumptions: The program schedule is dependent on factors such as notice to proceed, weather conditions, and resident and Town staff availability. This proposal assumes travel for two CNT staff to one (1) in-person meeting.