

**Thesis Project Portfolio**

**IVY CORRIDOR PHASE II REDESIGN FINAL DESIGN REPORT**

(Technical Report)

**ANALYSIS OF THE SOCIOTECHNICAL EFFECTS OF GREEN INFRASTRUCTURE**

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

**Alexandra “Lex” Clements**

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Department of Civil Engineering

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## **Sociotechnical Synthesis**

In the United States of America (U.S.), urban stormwater management has predominantly been composed grey stormwater infrastructure. Grey stormwater infrastructure is designed to move runoff off-site as quickly as possible and into storage or a body of water. Due to increasing in pollutant levels and storm intensity and frequency, this type of infrastructure has led to increased flooding and pollution. Thus, many U.S. cities are implementing green stormwater infrastructure as a solution to these problems. Green stormwater infrastructure grants a range of benefits to the environment and communities. It improves the health and wellbeing of residents and reduces pollution and urban heat islands. However, green stormwater infrastructure implementation can result in the displacement of marginalized communities. My capstone project entails a comprehensive redesign of Phase II of the Ivy Corridor. This project aims to provide a site design that suits the University of Virginia's needs while also improving the health and wellbeing of its patrons and the surrounding environment. It includes design specifications for green stormwater infrastructure practices onsite, namely the bioretention facility. My STS research paper analyzes how the community and stormwater infrastructure effect each other. Using the ENABLE framework, an analysis of the flow of benefits to and from stormwater infrastructure, community members, lawmakers, and other stakeholders was conducted to identify how the negative impacts of green stormwater implementation arise. By evaluating the relationships between the green stormwater infrastructure, its designers, and the community it serves, a better understanding of this network is gained. The investigation of this sociotechnical landscape allows for possible improvements to the current implementation of green stormwater infrastructure to arise.