

Green stormwater infrastructure and neighborhood satisfaction: a comparison study on
landscape familiarity, aesthetic appreciation, and feelings of safety

by

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A REPORT

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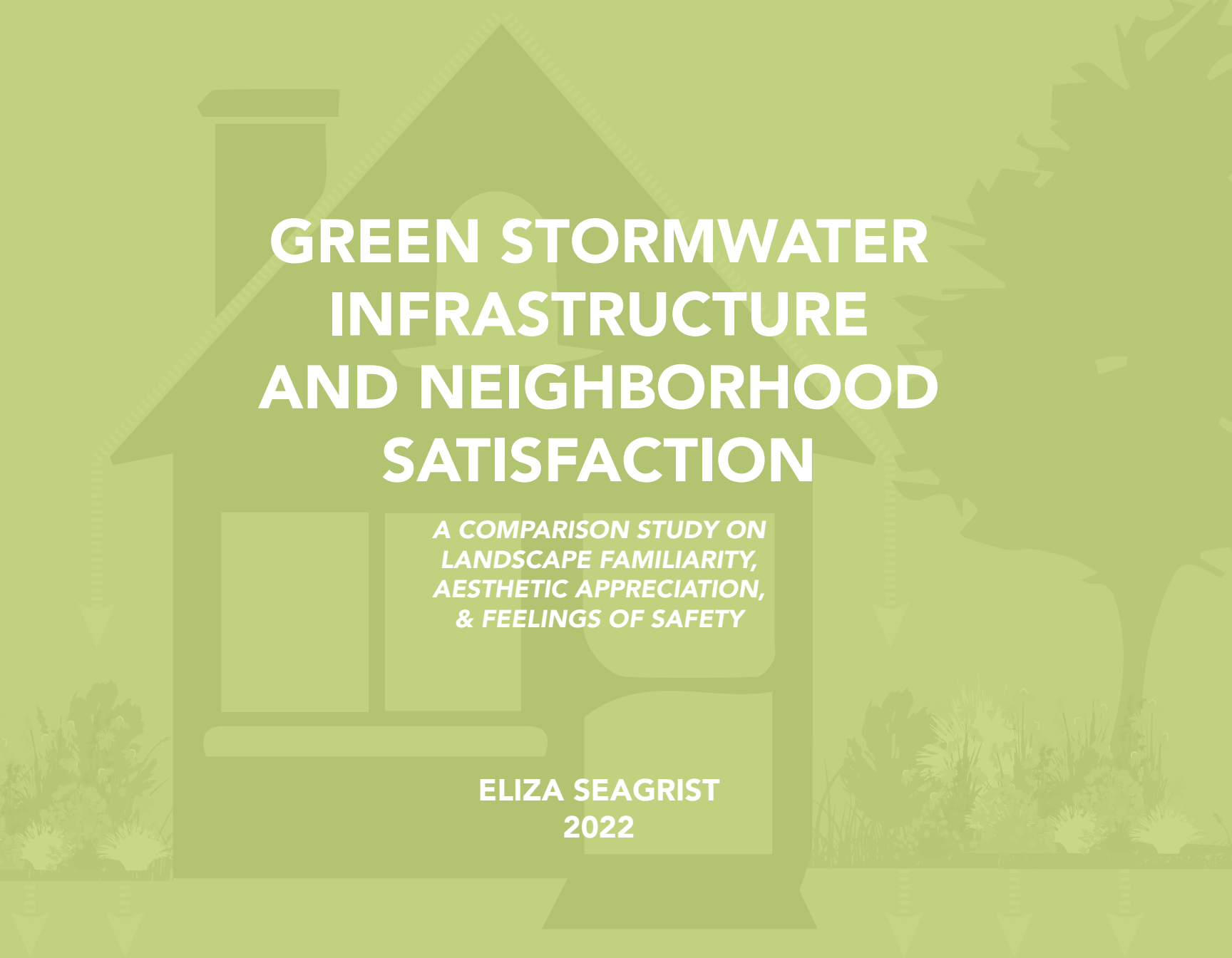
Key Words: *Green Stormwater Infrastructure, Neighborhood Satisfaction, Familiarity, Environmental Awareness, Aesthetic Preferences, Feelings of Safety*

Abstract:

Flooding and water quality are predominant issues in cities worldwide with combined sewer systems overflowing public bodies of water (Millennium Ecosystem Assessment Board 2005). While the direct, positive impact of green stormwater infrastructure on flooding and water quality has been widely documented, the preferences of residents on the characteristics of green stormwater infrastructure has been less explored. Understanding residents' aesthetic appreciation and feeling of safety is important when gauging neighborhood satisfaction, which may indirectly influence their overall well-being (Hadavi & Kaplan 2016, Hur et al. 2009). This study aims to address these issues by examining residents' neighborhood satisfaction as well as their aesthetic preferences concerning three different types of urban greening: unmaintained landscape, traditionally manicured landscape, and landscape designed for managing stormwater.

A random sample of 95 participants from two different study areas with relatively similar demographic makeup in Kansas City, Missouri participated in a photo-survey featuring photos of existing landscape conditions in their neighborhoods. Participants are residents from the North Town Fork Creek neighborhood (n = 55) and the Marlborough Community Coalition (n = 40). North Town Fork Creek lacks green stormwater infrastructure, implying that residents have low exposure to this type of urban greening, while the Marlborough Community Coalition has green stormwater infrastructure currently in place. The survey includes visual images of the three types of existing urban greening which are linked to questions assessing neighborhood satisfaction and preferences regarding participants' exposure to such types of urban greening. More specifically, participants were assessed on their familiarity and environmental awareness to these landscapes

as well as their aesthetic acceptance and feelings of safety to characteristics associated with the design of green stormwater infrastructure: high biodiversity and the use of native plant species (Suppakittpaisarn et al. 2017). Results of the survey were assessed and compared between the two study areas. The findings showed that when residents are more familiar with, exposed to, and aware of the environmental benefits of green stormwater infrastructure, they tend to prefer high plant diversity and native plant species while also showing lower preference toward the low biodiversity and exotic plant species of traditionally-manicured landscapes. These findings were translated to planning and design solutions that are applied to both neighborhood study areas. While this study is a sample, the results offer important insights into how familiarity and environmental awareness to green stormwater infrastructure may influence residents' aesthetic preferences and feelings of safety towards such landscapes and should be adapted into other neighborhoods around Kansas City and in other cities in the United States that struggle with flooding and water quality issues.

The background of the slide is a solid olive green color. Overlaid on this background are faint, stylized white silhouettes of a house with a chimney on the left and a large tree on the right. The house has a gabled roof and a small porch. The tree has a thick trunk and a full, rounded canopy. The overall aesthetic is clean and modern, with a focus on nature and architecture.

GREEN STORMWATER INFRASTRUCTURE AND NEIGHBORHOOD SATISFACTION

*A COMPARISON STUDY ON
LANDSCAPE FAMILIARITY,
AESTHETIC APPRECIATION,
& FEELINGS OF SAFETY*

ELIZA SEAGRIST
2022

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Green Stormwater Infrastructure and Neighborhood Satisfaction

*A Comparison Study on Landscape Familiarity,
Aesthetic Appreciation, & Feelings of Safety*

Major Professor: Sara Hadavi
Supervising Committee: Howard Hahn and Jeff Smith

Kansas State University

College of Architecture, Planning, and Design
Department of Landscape Architecture and Regional & Community Planning

For my family: Mom, Dad, Pitcher, and John.

In loving memory of Momma Jo

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I would like to thank my parents, Mary Ann and BJ, and my brothers, Pitcher and John, for their unconditional love all my life. You all pushed me to follow my passion and your support means the world to me. All those summers of working in our vegetable garden and the camping and hiking trips we all took together helped shape my passion in giving back and protecting God's creation. Thank you for all those memories! I am excited for our next adventures.

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ABSTRACT

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A random sample of 95 participants from two different study areas with relatively similar demographic makeup in Kansas City, Missouri participated in a photo-survey featuring photos of existing landscape conditions in their neighborhoods. Participants are residents from the North Town Fork Creek neighborhood (n = 55) and the Marlborough Community Coalition (n = 40). North Town Fork Creek lacks green stormwater infrastructure, implying that residents have low exposure to this type of urban greening, while the Marlborough Community Coalition has green stormwater infrastructure currently in place. The survey includes visual images of the three types of existing urban greening which are linked to questions assessing neighborhood satisfaction and preferences regarding participants' exposure to such types of urban greening. More specifically, participants were assessed on their familiarity and environmental awareness to these landscapes as well as their aesthetic acceptance and feelings of safety to characteristics associated with the design of green stormwater infrastructure: high biodiversity and the use of native plant species (Suppakittpaisarn et al. 2017). Results of the survey were assessed and compared between the two study areas. The findings showed that when residents are more familiar with, exposed to, and aware of the environmental benefits of green stormwater infrastructure, they tend to prefer high plant diversity and native plant species while also showing lower preference toward the low biodiversity and exotic plant species of traditionally-manicured landscapes. These findings were translated to planning and design solutions that are applied to both neighborhood study areas. While this study is a sample, the results offer important insights into how familiarity and environmental awareness to green stormwater infrastructure may influence residents' aesthetic preferences and feelings of safety towards such landscapes and should be adapted into other neighborhoods around Kansas City and in other cities in the United States that struggle with flooding and water quality issues.

CONTENTS

01

INTRODUCTION

CHAPTER 1

08

BACKGROUND

CHAPTER 2

25

METHODS

CHAPTER 3

40

RESULTS & FINDINGS

CHAPTER 4

67

DESIGN APPLICATION

CHAPTER 5

99

CONCLUSION

CHAPTER 6

103

REFERENCES

CHAPTER 7

LIST OF FIGURES

Figure 1: Circa 1980s Brush Creek Flood on Blue Parkway

Figure 2: Study Process

Figure 3: Combined Sewer System and Water Contamination

Figure 4: How Green Stormwater Infrastructure Works

Figure 5: Midwest Regional Cues to Care

Figure 6: Southwest Regional Cues to Care

Figure 7: Context Map of Study Area Neighborhoods

Figure 8: Mill Creek and Overflow Outfall for Combined Sewer in North Town Fork Creek

Figure 9: Wetland Pond at 81st and Troost Avenue

Figure 10: Types of Urban Greening Present in Study Areas

Figure 11: Study Variables

Figure 12: North Town Fork Creek Participants' Demographics

Figure 13: Marlborough Community Coalition Participants' Demographics

Figure 14: Traditionally-Manicured Landscapes in Vacant Lots

LIST OF FIGURES (CONTINUED)

Figure 15: Not as Familiar Right-Of-Way Bioswale

Figure 16: Traditionally-Manicured Park at Town Fork Creek Greenway

Figure 17: Unmaintained Sidewalk Landscapes

Figure 18: Right-Of-Way Bioswales

Figure 19: Traditionally-Manicured Grass

Figure 20: Unmaintained Sidewalk Landscape

Figure 21: Summary of General Description Findings - Familiarity, Biodiversity, Native Planting, and Feelings of Safety

Figure 22: Summary of General Description Findings - Environmental Awareness & Neighborhood Satisfaction

Figure 23: Photo Cluster “famil_HBD_TPH” for North Town Fork Creek

Figure 24: Photo Cluster “famil_HBD” for Marlborough Community Coalition

Figure 25: North Town Fork Creek Associations - Effect of Familiarity on Aesthetic Appreciation of Biodiversity and Native Plantings in the Landscape

LIST OF FIGURES (CONTINUED)

Figure 26: North Town Fork Creek Associations - Effect of Familiarity and Environmental Awareness on Aesthetic Appreciation of Biodiversity and Native Plantings in the Landscape

Figure 27: Marlborough Associations - Effect of Familiarity and Environmental Awareness on Aesthetic Appreciation of Biodiversity and Native Plantings in the Landscape

Figure 28: Marlborough Associations - Effect of Familiarity and Environmental Awareness on Feelings of Safety in the Landscape

Figure 29: Locations of Design Interventions

Figure 30: Constructed Wetland in a Park

Figure 31: Suitable Area in North Town Fork Creek for Constructed Wetland

Figure 32: Proposed Earthwork for Wetland Park

Figure 33: Master Plan for Wetland Park

Figure 34: Views within Wetland Park

Figure 35: Bioswale Prototype Design Considerations

Figure 36: Bioswale Prototypes Base Designs

Figure 37: Before and After: Bioswale Prototypes Base Designs

LIST OF (FIGURES CONTINUED)

Figure 38: Orderly Planted Right-Of-Way Bioswale

Figure 39: Nuanced Plant Palette Suitable for Bioswales Prototypes in North Tow Fork Creek

Figure 40: Plant Species Suitable for North Town Fork Creek

Figure 41: Bioswale Prototype 1

Figure 42: Bioswale Prototype 2

Figure 43: Bioswale Prototype 3

Figure 44: Bioswale Prototype 4

Figure 45: Educational Sign in Marlborough Community Coalition

Figure 46: Designed Educational Signage

Figure 47: Green Stormwater Infrastructure in Parks (81st & Troost Avenue and Arleta Park)

Figure 48: Proposed Overseeding at 81st & Troost Avenue

Figure 49: Proposed Overseeding at Arleta Park

Figure 50: Native Plant Species Suitable for Marlborough Community Coalition

LIST OF TABLES

Table 1: Design Characteristics of Green Stormwater Infrastructure.

Table 2: Design Forms of Green Stormwater Infrastructure.

Table 3: Case Studies that Manage Stormwater.

Table 4: Study Area Demographic Information – US Census 2020

Table 5: Study Participation and Recruitment

Table 6: North Town Fork Creek “Familiarity” Photo Cluster Correlations

Table 7: Marlborough Community Coalition “Familiarity” Photo Cluster Correlations

Table 8: Nuanced Native Plant Palette Suitable for Bioswale Prototypes in North Town Fork Creek

Table 9: Native Plant Species Suitable for Short-Grass Prairie in Marlborough Community Coalition

LIST OF APPENDICES

Appendix A: Glossary

Appendix B: Study Timeline

Appendix C: IRB Exemption Letter

Appendix D: Data Collection Tool

Appendix E: Photo Clusters

Appendix F: Raw Data Analysis Results

INTRODUCTION

CHAPTER 1

INTRODUCTION

DILEMMA

Approximately 772 cities in the United States have a combined sewer system where sanitary sewer, industrial wastewater, and stormwater are collected in the same pipe and transferred to a sewage treatment facility for processing (EPA 2017). Rising city populations and climate change put pressure on this outdated system, resulting in detrimental consequences not only for the environment and its processes, such as flooding and water contamination (see Figure 1), but also for the well-being of city residents (Koepke 2017, Millennium Ecosystem Assessment Board 2005, Trice 2019). There are several studies showing that green stormwater infrastructure provides ecological services to reduce the potential for flooding and water contamination (Canfield et al. 2018, Chini et al. 2017, EPA 2016, Koepke 2017, Trice 2017). However, not enough studies have documented residents' preferences, specifically aesthetic appreciation, and feelings of safety, for the characteristics of green stormwater infrastructure such as plant biodiversity and native planting (Suppakittpaisarn et al. 2017, Suppakittpaisarn et al. 2019b). These characteristics are important aspects to consider when proposing green infrastructure within a residential area because not all urban greening is the same, and residents' acceptance and support will help with maintenance and long-term sustained benefits of such landscapes. Landscapes designed to manage stormwater have unique characteristics such as high plant biodiversity as well as using native plants in order to capture, retain, and cleanse stormwater during and after a rain event (Chini et al. 2017).



Figure 1: "circa 1980s Brush Creek Flood on Blue Parkway". Community Builders of Kansas City. 2021

The literature has suggested that preferences for landscape characteristics may be associated with awareness and familiarity (Herzog & Kaplan & Kaplan 1976). Studies have shown that being aware about the environmental function of more "natural" landscapes, such as with native grasses and forbs of a prairie ecosystem (Nassauer 1993), may improve people's preferences for such native planting and planting design in their residential landscapes (Kurz & Baudains 2012, Nassauer 1993). However, most residents are familiar with traditional landscaping characteristics such as a manicured lawn and keeping a neat garden with annual vegetation (Hayden et al. 2015, Nassauer 1995). These practices have been in use since the rise of suburbia in the 1950s-1960s (Berrall 1978) and are often associated with low biodiversity, exotic species, and high water consumption (Hayden et al. 2015). These landscapes lead to an unstable environment with higher chances of flooding and water contamination (Millennium Ecosystem Assessment Board 2005).

PROJECT OBJECTIVES

Since familiarity and awareness have shown to influence landscape aesthetic preferences (Herzog & Kaplan & Kaplan 1976), this study examines the extent to which familiarity and environmental awareness to different types of urban greening (unmaintained landscape, traditionally manicured landscape, and landscape designed for managing stormwater) are associated with residents' aesthetic appreciation and feelings of safety about two different characteristics of green stormwater infrastructure: plant biodiversity and native planting in the North Town Fork Creek and Marlborough neighborhoods of Kansas City, Missouri. These neighborhoods were chosen because of their current states of urban greening, one with low quality and unmaintained landscape and the other with traditionally manicured landscape and green stormwater infrastructure, respectively. Understanding residents' preferences about landscape aesthetics and feelings of safety is important when gauging neighborhood satisfaction, which influences overall human well-being (Hadavi & Kaplan 2016, Maslow 1943) and will assist urban planners, landscape architects, and policy makers as cities increasingly need to implement green stormwater infrastructure to reduce flooding and water contamination.

RESEARCH QUESTION

While the performance of effective green stormwater infrastructure is well known and often preferred by experts (Suppakitssapairn et al. 2019b), the design characteristics of green stormwater infrastructure may not be so well received by neighborhood residents. People may view green stormwater infrastructure as messy and unmaintained (Suppakitssapairn et al. 2019b) or they may not understand how to maintain these types of landscapes (Hahn & Kellams 2016). In order for green stormwater infrastructure to be successfully sustained in a residential setting, local communities should be involved. Therefore, their attitudes toward green stormwater infrastructure should be improved, because residents' preferences matter and may depend on familiarity (Herzog, Kaplan & Kaplan 1976) and environmental awareness (Kurz & Baudains 2012, Nassauer 1993, Naussauer 1995) to green stormwater infrastructure. This study compares two neighborhoods with and without green stormwater infrastructure to explore the following question:

"TO WHAT EXTENT ARE FAMILIARITY AND ENVIRONMENTAL AWARENESS TO DIFFERENT TYPES OF URBAN GREENING (UNMAINTAINED LANDSCAPE, TRADITIONALLY-MANICURED LANDSCAPE, AND LANDSCAPE DESIGNED FOR MANAGING STORMWATER) ASSOCIATED WITH RESIDENTS' OVERALL NEIGHBORHOOD SATISFACTION, AESTHETIC APPRECIATION, AND FEELINGS OF SAFETY ABOUT PLANT BIODIVERSITY AND NATIVE PLANTING?"

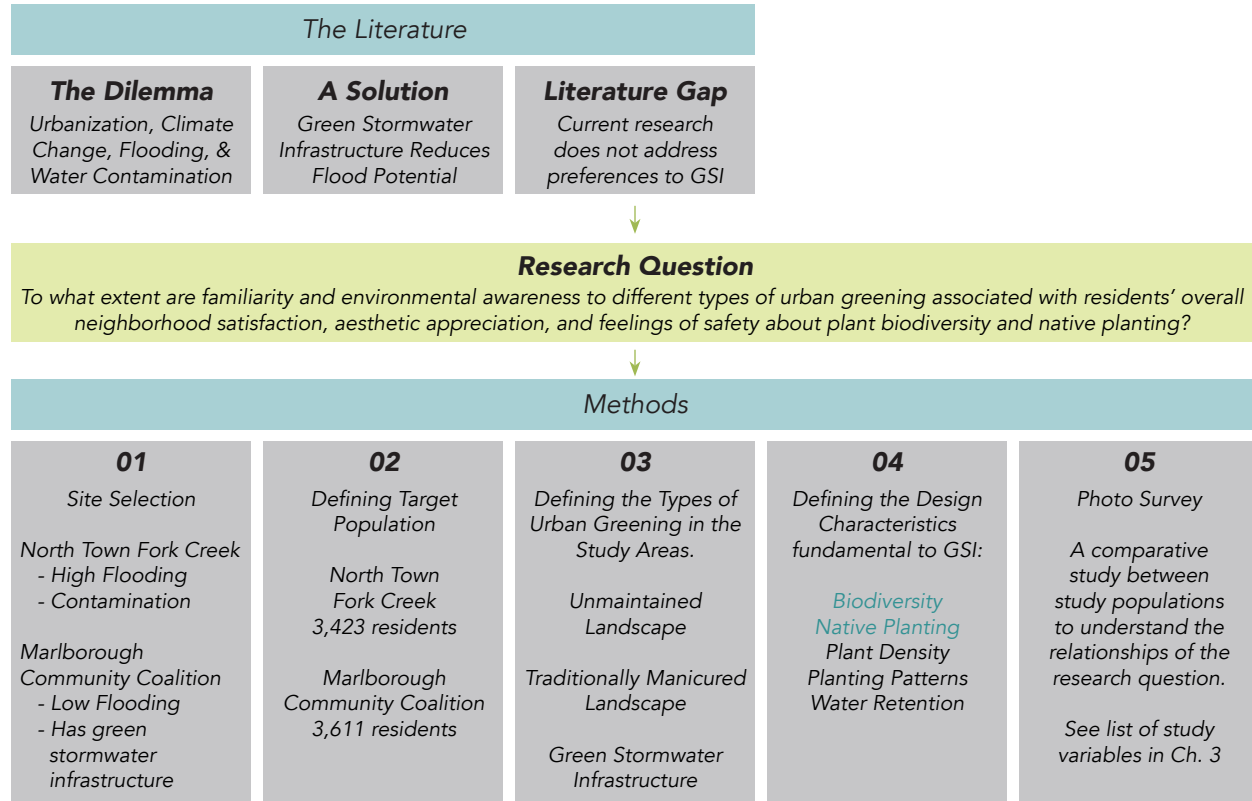


Figure 2: Study Process

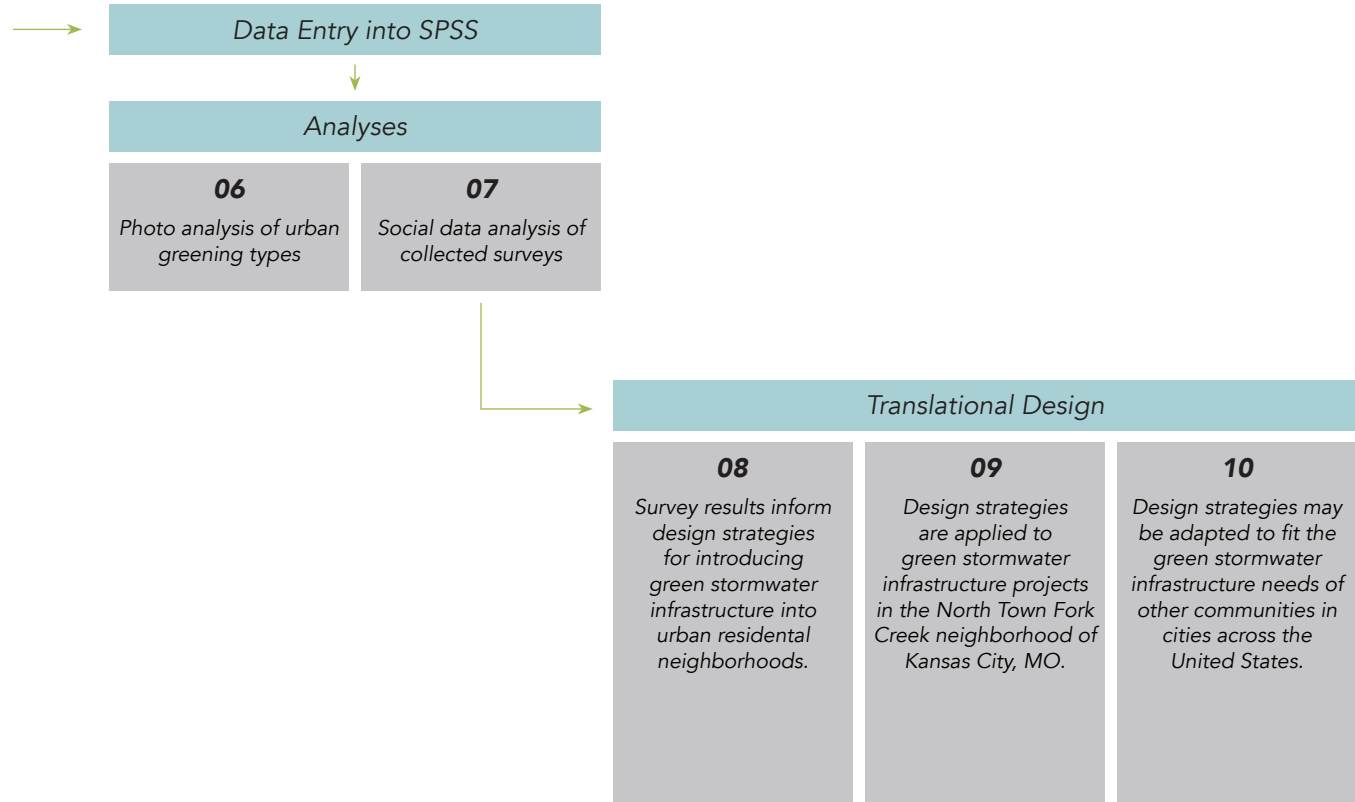


Figure 2: Study Process Continued

BACKGROUND

CHAPTER 2

BACKGROUND

URBAN ENVIRONMENT

URBANIZATION AND THE BUILT ENVIRONMENT

By 2050, sixty-six percent of the world's population is expected to inhabit cities (Kondo et al. 2018) and therefore, urbanization of land surrounding our cities should be expected for the future. Typical urbanization strategies include building roads (Millennium Ecosystem Assessment Board 2005), and channelizing, diverting, or burying streams and rivers (Koepke 2017, Trice 2019) to make room for new growth. This results in an increase of impervious surfaces within the environment. Impervious surfaces redirect stormwater upon impact into culverts, drains, and pipes that often lead to combined sewer systems and wastewater treatment plants (Koepke 2017, Trice 2019). Concrete and other impervious surfaces increase the velocity of water on the surface, leading to a higher risk of flooding in both urbanized and natural areas (EPA 2016, Koepke 2017, Trice 2017, Turner et al. 2016). Increased flooding leads to higher risks of water contamination (see Figure 3; Chini et al. 2017, Koepke 2017, Millennium Ecosystem Assessment Board 2005, Trice 2017) and reduces water quality (Millennium Ecosystem Assessment Board 2005). Increased flooding also contributes to bank erosion and will ultimately degrade the natural environment (Canfield et al. 2018a, Koepke 2017). Humans depend on the natural ecosystem to satisfy their basic needs. If the environment degrades, it will ultimately negatively impact humans' overall health and wellbeing (Millennium Ecosystem Assessment Board 2005).

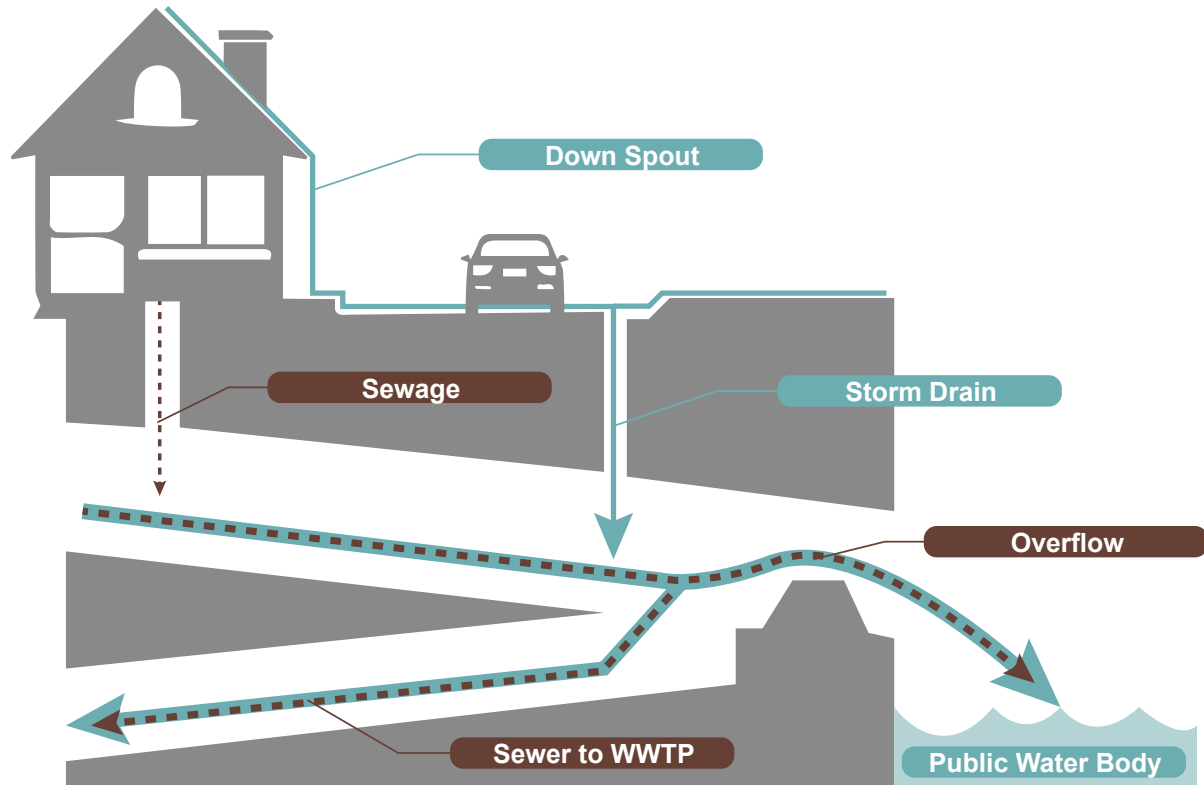


Figure 3: Combined Sewer System and Water Contamination

THE URBAN ENVIRONMENT AND GREEN STORMWATER INFRASTRUCTURE

There is a solution to the issues created due to urbanization: implementing green stormwater infrastructure. Green stormwater infrastructure is a subcategory of green infrastructure (Suppakittpaisarn et al. 2017, Suppakittpaisarn et al. 2019b) that specifically looks at managing stormwater using green roofs, rain gardens, bioswales, infiltration planters, and constructed wetlands (Canfield et al. 2018a, Suppakittpaisarn et al. 2017). Green stormwater infrastructure typically employs native vegetation because of its hardiness, environmental tolerances, and ability to absorb and cleanse water (Canfield et al. 2018a, Chini et al. 2017, Suppakittpaisarn et al. 2017, Suppakittpaisarn et al. 2019a). Other characteristics of green stormwater infrastructure include high biodiversity, water retention, high planting density, and natural planting patterns (Suppakittpaisarn et al. 2019b). See Table 1 for the design characteristics and Table 2 for the design forms of green stormwater infrastructure.

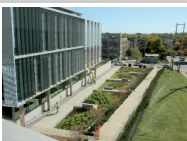
Table 1: Design Characteristics of Green Stormwater Infrastructure

DESIGN CHARACTERISTIC	DEFINITION & IMPORTANCE	REFERENCES
High Biodiversity	Having a wide variety of plants within a landscape. High biodiversity helps landscapes fight against disease and pest infestations as opposed to landscapes that have a “monoculture” or a limited variety of plants.	Canfield et al. 2018a, Millennium Ecosystem Assessment Board 2005
Native Plant Species	Native plants are hardy and tolerant of stressors commonly found in their native area as opposed to exotic plant species that are more susceptible succumbing to environmental stressors. Native plants may range in aesthetic attributes such as heights, forms, and seasonal colors and textures.	Canfield et al. 2018a, Chini et al. 2017, Suppakittpaisarn et al. 2017, Suppakittpaisarn et al. 2019a
Natural Planting Patterns	Plants in a natural environment arrange themselves into a harmonious community where individual plant needs are met based on specific ecological niches in the environment. To maintain a healthy environment, arranging plants in their native patterns is important.	Rainer & West 2015, p. 36
High Planting Density	The density of vegetation cover is a significant aspect of green stormwater management. Landscapes with more plants tend to hold more water in their root systems and foliage. Density has been studied to be related to perceptions of safety and comfort.	Millennium Ecosystem Assessment Board 2005, Whittinghill et al. 2015
Water Retention	Green stormwater infrastructure has the ability to retain high amounts of water through having high biodiversity and employing native plant species, patterns, and density as opposed to landscapes with just turf or with high amounts of impermeable surfaces.	Benedict & McMahon 2002, Millennium Ecosystem Assessment Board 2005

Table 2: Design Forms of Green Stormwater Infrastructure

DESIGN FORM	DEFINITION
Green Roofs & Walls	Green roofs and walls are constructed systems that are built into buildings and other engineered structures. They manage stormwater by intercepting it at the source.
Rain Gardens	Rain gardens can vary in shape and size, although their purpose remains constant. Water is directed into these gardens and is absorbed by the plants' root systems.
Bioswales	Bioswales are vegetated systems that act as corridors for moving stormwater. These are highly engineered and designed with substantial regrading and earthwork.
Infiltration Planters	Infiltration planters are structures that often sit in the right-of-way beside roadways with open bottoms to allow stormwater to slowly infiltrate into the ground. They contain many subgrade layers as well as vegetation.
Constructed Wetlands	These highly engineered wetlands are designed to either retain (as a wet pond) or detain (as a dry pond) water on site. Wetlands often use vegetation to line the edges of the area to create a natural form and allows for wildlife habitats.

Table 2: Design Forms of Green Stormwater Infrastructure Continued

EXAMPLE PROJECT		REFERENCES
	Image a: "Seaton Hall Upper Green Roof, Kansas State University". Skabelund. 2009.	Canfield et al. 2018a, Skabelund et al. 2009
	Image b: "International Student Center Rain Gardens, Kansas State University". K-State Research and Extension. n.d.	Canfield et al. 2018a, K-State Research and Extension n.d.
	Image c: Middle Blue River Basin Green Solutions Pilot Project, 81st & Lydia, Kansas City, MO	Canfield et al 2018a; Strom, Nathan, & Woland 2009, P. 263-265
	Image d: " Carl R. Ice College of Engineering Infiltration Planters, Kansas State University". Kansas State University. 2016.	Canfield et a; 2018a; City of Portland, Oregon 2006
	Image e: Middle Blue River Basin Green Solutions Pilot Project, 81st & Troost, Kansas City, MO	Canfield et al 2018a; Strom, Nathan, & Woland 2009, P. 164-170

Vegetation of green stormwater infrastructure mimics the natural processes of the environment by slowing down and intercepting stormwater runoff (Chini et al 2017, EPA 2016, Hahn & Kellams 2016), retaining stormwater on site and preventing it from entering the city's combined sewer system (Collett & Rodman 2014, Jiang & Kaljevic 2016, Jiang & Kaljevic 2017, Ozer & Stanford 2016), treating stormwater naturally, and allowing it to infiltrate back into the natural watershed (see Figure 4; Canfield et al. 2018a, Hahn & Kellams 2016, Lee et al. 2015, Thoren & Louw 2013). See Table 3 for a list of case studies featuring green stormwater infrastructure. In addition to reducing flooding and improving water quality, other important positive environmental benefits of green infrastructure include carbon capture and ambient temperature reduction (Canfield et al. 2018a).

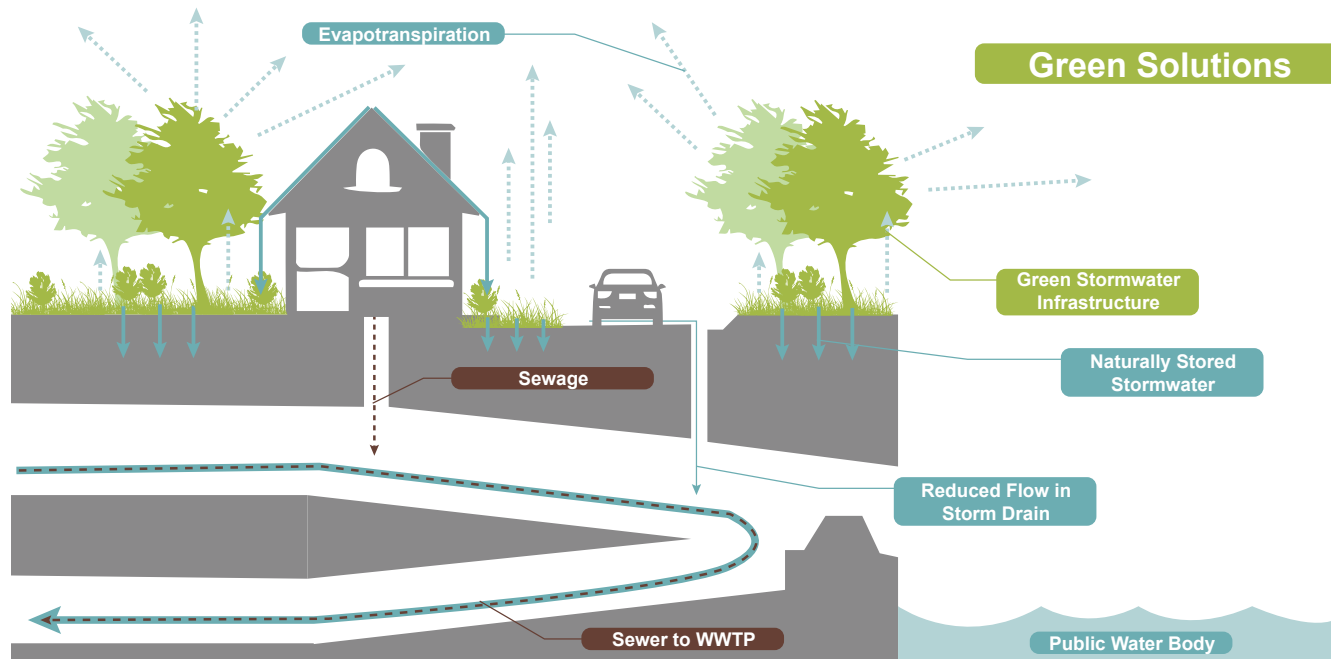


Figure 4: How Green Stormwater Infrastructure Works

Table 3: Case Studies that Manage Stormwater

PROJECT	LOCATION	PROJECT SIZE	AMOUNT OF TREATED WATER	REDUCED RUNOFF FLOW	REFERENCES
1315 Peachtree Street	Atlanta, GA	23,567 square feet	18,036 gallons	60%	Collett & Rodman 2014
Middle Blue River Basin Green Solutions Pilot Project	Kansas City, MO	100 acres	360,320 gallons	76%	Hahn & Kellams 2016
Virtua Voorhees Hospital	Voorhees Township, NJ	125 acres	144 million gallons	98%	Jiang & Kaljevic 2016
Hennepin County Medical Center Whittier Clinic	Minneapolis, MN	3.5 acres	2.3 million gallons	88%	Jiang & Kaljevic 2017
Wayne Ferguson Plaza	Lewisville, TX	1.5 acres	31,700 gallons	32%	Ozdil et al. 2017
SoundScape Park	Miami Beach, FL	2.5 acres	1.2 million gallons	---	Ozer & Stanford 2016
Randal Children's Hospital	Portland, OR	5.5 acres	6.7 million gallons	---	Thoren & Louw 2013
Indian Bend Wash Greenway	Scottsdale, AZ	13 square miles	18 million gallons	---	Scottsdale Water 2016

HUMAN SATISFACTION

Human wellbeing is dependent on satisfaction (Hadavi & Kaplan 2016, Maslow 1943). Satisfaction is influenced by external stimuli from the surrounding environment and affects humans' physical activity and mental health (Kondo et al. 2018, Kuo 2015, Suppakittpaisarn et al. 2019a, Ward-Thompson et al. 2012). External stimuli are based on the characteristics of the environment such as maintenance, materials, density, biodiversity, and water quality, which can impact feelings of safety and access to resources.

NEIGHBORHOOD SATISFACTION

Neighborhood satisfaction is multi-dimensional and is important to consider when designing outdoor spaces, particularly in urban residential areas. Several factors have been identified by the literature that are associated with neighborhood satisfaction: personal, social, psychological, and environmental (Hur et al. 2009). Different variables influence the degree of neighborhood satisfaction a resident has including, but not limited to, the nature components, specifically the amount of green features of the outdoor space, and the feelings of perceived safety in the neighborhood (Hadavi & Kaplan 2016). Natural components may affect how the space is used and how safe people feel within their landscape (Hur et al. 2009).

SATISFACTION OF LANDSCAPE PREFERENCES: AESTHETIC APPRECIATION & FEELINGS OF SAFETY

Preferences toward green stormwater infrastructure, like other types of urban greening, are dependent on aesthetics (Hadavi & Kaplan 2016, Herzog & Kaplan & Kaplan 1976, Suppakittpaisarn et al. 2019b) and the feeling of safety (Branas et al. 2011, Suppakittpaisarn et al. 2019a), and may also be influenced by the cost of installation and maintenance (Hahn & Kellams 2016, Hayden et al. 2015, Turner et al. 2016). People tend to have different preferences on aesthetic appreciation and feelings of safety toward green stormwater infrastructure depending on plant biodiversity and plant species (Suppakittpaisarn et al. 2019a). Typical residents tend to prefer manicured lawns and property due to their familiar look and traditional maintenance practices (Hahn & Kellams 2016, Suppakittpaisarn et al. 2019b) as well as having “cues to care” (Nassauer 1995).

Cues to care in design may range and vary based on region and culture; however, the underlying principle is that specific cues signal care of the landscape. In the Midwestern region of the United States, cues to care include mowing, flowering plants, trees, wildlife feeders, bird houses, bold, geometric patterns that are clearly visible, trimmed shrubs, plants in linear rows, fences, architectural details, lawn ornaments, paint, and foundation planting (see Figure 5; Nassauer 1995). In the Southwest region, similar cues to care are often preferred by neighborhood residents. However, city codes and regulation and environmental affordances often result in more mesic or desert-like cues to care with more rock and xeric-scaping than “oasis” like landscape (Martin et al. 2003). For example, in Las Vegas, Nevada, zoning ordinance § 17.24.060, turfgrass, a ground cover typically used in traditionally-manicured landscape, is not permitted in a single-family residential front yard. Turfgrass may

not exceed 50% of the side or rear yards and may not exceed 5,000 square feet. In a multi-family residential area, turfgrass is only permitted in recreational or park areas (City of Las Vegas, Nevada n.d.). In San Diego, California, turfgrass may not exceed 25% of groundcover in a single-family residential lot (City of San Diego, California, Ord. No. 10032 SEC. 86.716, n.d.). In lieu of turfgrass, groundcover may consist of rock with drought-tolerant or desert vegetation (see Figure 6). Other southwestern cities, such as Phoenix, Arizona; Albuquerque, New Mexico; and Los Angeles, California do not have restrictions on the use of turfgrass but highly recommend other groundcover options. City regulations and recommendations are due to regional environmental conditions and challenges, such as drought and water shortages, which make it unsustainable to cover large surfaces with a turf lawn.



Figure 5: Midwest Regional Cues to Care



Figure 6: Southwest Regional Cues to Care

Perceived cues to care have been linked to the impression of safety in a neighborhood, although “feeling safe” has different meanings to different people. A neighborhood’s aesthetic look can cause different feeling of safety for people which can range from fear about hidden dangers in a landscape, such as insects and other wildlife, (Suppakitpaisarn et al. 2019a) to the larger crime context within a neighborhood (Aiyer et al. 2015, Branas et al. 2011). Green stormwater infrastructure is a highly biodiverse landscape that utilizes native planting with natural plant patterns and high density in order to manage stormwater effectively (Canfield et al. 2018a, Chini et al. 2017, Suppakitpaisarn et al. 2017, Suppakitpaisarn et al. 2019a). These types of plantings can create fear in residents because of their perceived “lack” of care.

Feelings of safety will then influence the preferences people hold for their landscapes and are dependent on subjectivity (Maslow 1943) ranging from person to person and from situation to situation (Hahn & Kellams 2016, Suppakitpaisarn et al. 2019a, Suppakitpaisarn et al. 2019b, Turner et al. 2016). A 2002 study (Jorgensen et al. 2002) investigated how people responded to the treatment of spaces and edges near woodlands in terms of feelings of safety and how that impacted their preferences of the treatment. A less dense and more open space was considered by participants to be safer than more natural, shrubby spaces (Jorgensen et al. 2002). People orient their way of living to fit their preferences that influence their feelings of safety in their environment (Maslow, 1943, Suppakitpaisarn et al 2019a, Suppakitpaisarn et al 2019b, Turner et al 2016).

EXPOSURE & SATISFACTION OF LANDSCAPE PREFERENCES

Awareness to a landscape's performance and function may impact people's preferences. For example, designers tend to prefer green stormwater infrastructure such as bioretention ponds and green roofs with high biodiversity and native plants (Suppakittpaisarn et al. 2019b), whereas lay people tend to prefer a traditionally-manicured landscape with low biodiversity and non-native plant species. However, Hayden et al. (2015) found residents responded favorably to a native landscape when asked about their preference considering ecological and water-use contributions rather than aesthetics, recreational opportunities, maintenance, and cost. Also, for people who live in a region or neighborhood for a long period of time, it has been found that they may tend to show higher preferences for the landscape types generally found in that area as compared to people who relocated from another region (Herzog, Kaplan & Kaplan 1976, Martin et al. 2003).

SUMMARY

Ecosystems are the planet's life-support systems, and their services are indispensable to the wellbeing and health of people everywhere (Millennium Ecosystem Assessment Board 2005). Urban greenspace, as part of ecosystem services, is shown to be linked to residents' wellbeing and neighborhood satisfaction, though not all urban greenspaces are the same. Green stormwater infrastructure, in particular, protects the water supply and property from the consequences of urbanization including flooding and water contamination (EPA 2016, Hahn & Kellams 2016, Millennium Ecosystem Assessment Board 2005, Trice 2019). However, there is little empirical evidence that connects green stormwater infrastructure with satisfaction of aesthetic preferences based on exposure to such landscapes, particularly in urban neighborhoods. Exposure to green stormwater infrastructure and being familiar with it may play an important role in how people respond to the specific design characteristics of such landscapes including biodiversity and native planting (Herzog, Kaplan & Kaplan 1976, Martin et al. 2003). Green stormwater infrastructure has the potential to improve both the environment and human wellbeing around the world in a new age of urbanism and climate change if the two conditions are met:

- 1) ECOLOGICALLY, THE LANDSCAPE IS PHYSICALLY FUNCTIONING;**
- 2) PEOPLE'S PREFERENCES ABOUT THE LANDSCAPE'S DESIGN CHARACTERISTICS ARE BEING SATISFIED.**

METHODS

CHAPTER 3

METHODS

SITE OVERVIEW

This study targets the populations of the North Town Fork Creek and Marlborough Community Coalition neighborhoods within the southeast side of Brush Creek in Kansas City, Missouri (See Figure 7). North Town Fork Creek has been devastated by flooding since 1935 when Brush Creek was widened and channelized (United States Army Corps of Engineers et al. 1992). The neighborhood is also prone to water contamination from Mill Creek, an overflow outlet for Kansas City's combined sewer system (see Figure 8) within the Brush Creek Watershed. The Marlborough Community Coalition was characterized in a similar way but was a part of the Middle Blue River Basin Green Solutions Pilot Project, which installed green stormwater infrastructure in 2012 (Burns & McDonnell and Kansas City Water 2013). After ten years of implementation, this study explores the differences between residents' responses to green stormwater infrastructure in these two neighborhoods.

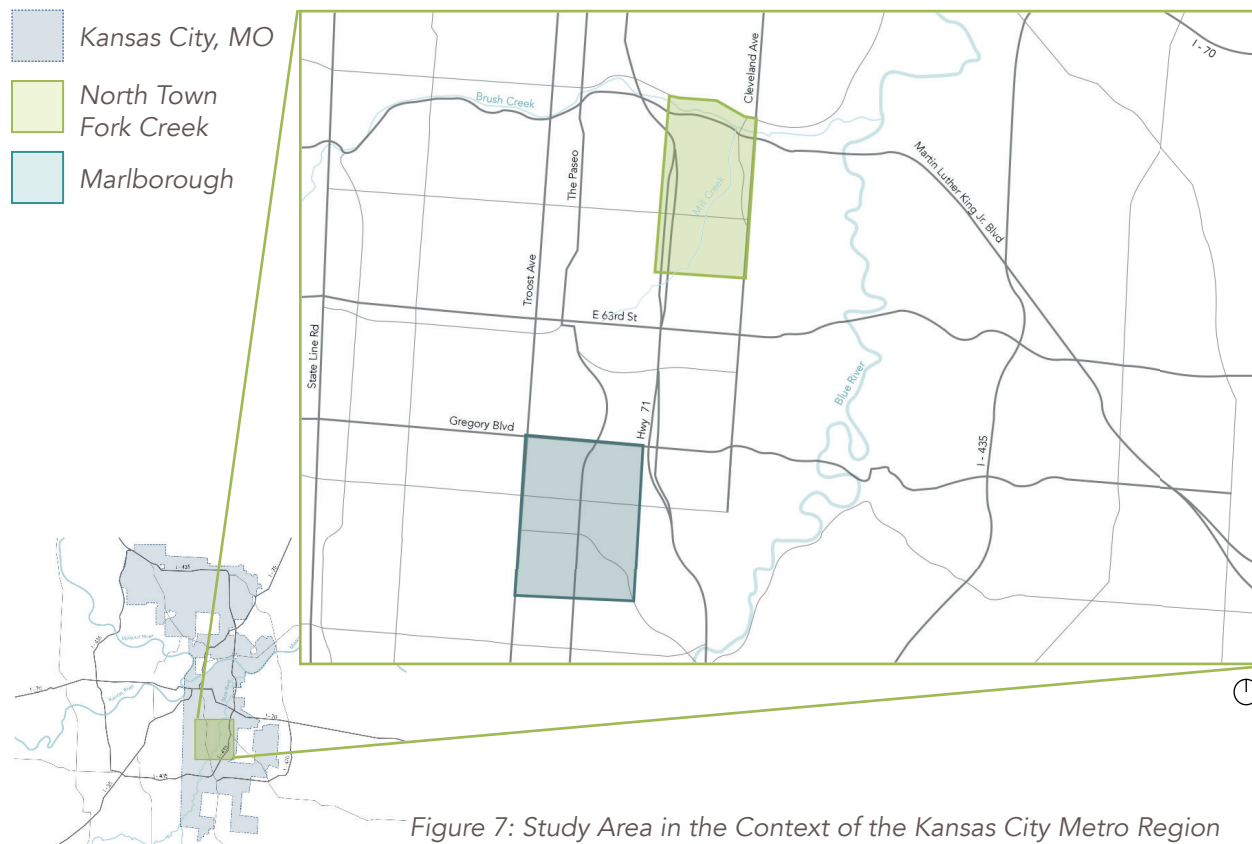


a: Mill Creek



b: Overflow Outlet into Mill Creek

Figure 8: Overflow Outlet for combined sewer system into Mill Creek in North Town Fork Creek



THE MIDDLE BLUE RIVER GREEN SOLUTIONS PILOT PROJECT

The *Middle Blue River Basin Green Solutions Pilot Project* of the Marlborough Community Coalition was the first green stormwater infrastructure project for Kansas City's Overflow Control Program (now known as the Kansas City Smart Sewer Program). The planning phase for this project began in 2008 and lasted for four years until the construction improvements were complete in 2012. The project included an extensive public engagement process throughout the course of the planning phase. After 15 months of construction, the project was completed in November 2012 (Burns & McDonnell and Kansas City Water 2013). Now, the neighborhood features 81 rain gardens, 36 bio-retention areas (see Figure 9), permeable paving, and subsurface water storage systems capable of holding 360,320 gallons of stormwater (Hahn & Kellams 2016) to prevent flood and water contamination, thus protecting the water quality within the Brush Creek – Blue River Watershed.

Since the completion of the *Middle Blue River Basin Green Solutions Pilot Project*, there has been substantial landscape performance research done on the physical functionality of the green stormwater infrastructure. Through calibrated best management practice (BMP) hydrology models, the project yielded a 76% reduction of peak flow and a 35.9% reduction of total volume of stormwater entering the combined sewer system (Burns & McDonnell and Kansas City Water 2013).

In 2016, a survey was conducted by Kansas State University researchers to evaluate the social benefits of the *Middle Blue River Basin Green Solutions Pilot Project*, 4 years after the end of construction. The study focused on the overall aesthetic appearance of the neighborhood with the implementation of the project; however, preferences about specific characteristics of the green stormwater infrastructure were not examined. They found that generally, there was a feeling that the neighborhood's appearance was improved and that the streetside rain gardens were aesthetically appealing to residents (Hahn & Kellams 2016).



Figure 9: Wetland Pond at 81st Street & Troost Avenue.

TARGET POPULATION

Both examined neighborhoods hold relatively similar population, median household income, and housing demographics; see Table 4 for demographic information about the neighborhoods. North Town Fork Creek's population is approximately 3,142 and Marlborough Community Coalition's is approximately 4,426. The sample size for this study includes 55 participants from North Town Fork Creek (approximately 1.75% of the population) and 40 participants from the Marlborough Community Coalition (approximately 1% of the population).

Table 4: Study Area Demographic Information (adapted from: US Census 2020)

	NORTH TOWN FORK CREEK	MARLBOROUGH COMMUNITY COALITION
GENDER		
Male	45%	52%
Female	55%	48%
ETHNICITY		
White	4%	17%
African-American	90%	73%
Latino or Hispanic	4%	5%
Asian	<1%	<1%
Pacific Islander	<1%	<1%
Native American	<1%	<1%
Multi-Ethnic	2%	5%
Other/Unknown	<1%	<1%
AGE		
0 - 17	20%	26%
18 - 44	36%	43%
45 - 64	30%	23%
65 +	14%	8%

Table 4: Study Area Demographic Information (continued)

	NORTH TOWN FORK CREEK	MARLBOROUGH COMMUNITY COALITION
MEDIAN HOUSEHOLD INCOME		
Less than \$25,000	53%	34%
\$25,000 - \$49,999	25%	34%
\$50,000 - \$99,999	19%	26%
\$100,000 or more	3%	6%
HIGHEST EDUCATION LEVEL		
No High School	22%	22%
High School Diploma	45%	43%
Some College	26%	27%
College Degree	7%	8%
HOUSING OWNERSHIP		
Total Housing Units	1,531	2,278
Owner Occupied	40%	36%
Renter Occupied	45%	41%
Vacant Units	15%	23%

DATA COLLECTION TOOL

A photo-survey (see Appendix D) was distributed within the two study areas. The survey includes various photographs depicting the existing landscape conditions and characteristics of the urban greening types within the study areas. Coupled with these photographs is a series of questions asking the participants to which type of green infrastructure they live closest and have the most exposure, as well as their awareness about the value and performance of green stormwater infrastructure. The survey then examines residents' aesthetic preferences and feelings of safety for plant biodiversity and plant species regarding the same urban greening types shown in images. Along with these variables, there are also questions regarding residents' overall neighborhood satisfaction and demographics. All responses to variables were assessed using a 5-point Likert scale.

Regarding plant biodiversity, the goal was to better understand how the survey participants like the variety of plants in each image. The researcher was also curious to know if participants understood the ecological importance of high biodiversity in landscapes. In terms of plant species, the goal was to better understand how people responded to native plant species while being more frequently exposed to green stormwater infrastructure as well as to the other types of urban greening depicted in the survey. The researcher also wanted to know the reason behind their responses so the design application may better represent residents' aesthetic preferences. In terms of feelings of safety, the goal was to know how safe people felt in their environment and the reasons behind their responses. The objective of the study was to find potential associations between all variables across the three types of landscapes represented in the photos.

Photos were taken within the defined study areas on September 18, 2021, between the hours of 3:30 – 5:00 pm. It was a clear and sunny day with temperatures in the low 80s. At that time of year, the vegetation was still alive and had not yet become dormant with the season change. However, the time the survey was completed did not reflect the status of the plant life within the neighborhood as the plants were dormant. The photos in the sets that were assessed by the participant in the survey had similar image composition. Context, such as the setting, presence of houses, tree canopy, sidewalks, and the amount of green in each image were similar and images were cropped as needed to maintain control across the images in each set.

In November and December 2021, a pilot study was conducted to test the survey for clarity and time. Ten participants known to the researcher were a part of the pilot test; three participants were design students; seven participants were laypeople. Not only were responses to the questions recorded, but personal comments were also considered. Based on pilot study responses, the survey was adjusted to include more specific questions before data collection began in January 2022.

STUDY RECRUITMENT & PARTICIPATION

The survey was distributed and administered both in-person with a paper copy and online. In-person survey participants were primarily recruited in public places including restaurants and the local public library. In North Town Fork Creek, recruitment took place at King's Table Soul Food restaurant and at the Kansas City Public Library: Southeast Branch. For Marlborough Community Coalition, in-person recruitment took place at Vee's Sweets & Deli and BB's Lawnside BBQ. Recruitment at restaurants proved to be most successful in collecting data. Survey participants were approached after ordering and before receiving their food. A survey packet and pen were offered to each participant. Fifty in person surveys were collected from North Town Fork Creek residents and seventeen in person surveys were collected from Marlborough Community Coalition residents.

If participants were unable to take the survey in person, a QR code to an online survey through Qualtrics was provided so that participants could complete the survey on their own digital device. Online surveys were primarily completed by residents of the Marlborough Community Coalition. The researcher attended a virtual neighborhood meeting in January 2022 to promote the survey in the coalition and a link to the survey was given to the residents at the time. The link was also provided in their January 2022 newsletter as well as through Facebook posts by the neighborhood association. A Facebook ad, sponsored by the Marlborough Community Coalition, was also released to target residents of the neighborhood for survey participation. Five online surveys were collected from North Town Fork Creek residents and twenty-three online surveys were collected from Marlborough Community Coalition residents (see Table 5).

Table 5: Study Recruitment and Participation

STUDY NEIGHBORHOOD	IN-PERSON SURVEY PARTICIPATION	ONLINE SURVEY PARTICIPATION	TOTAL
North Town Fork Creek	50	5	55
Marlborough Community Coalition	17	23	40
	67	28	95

STUDY VARIABLES

INDEPENDENT VARIABLES

The independent variables are familiarity and environmental awareness to different types of urban greening: unmaintained landscapes, traditionally manicured landscapes, and landscapes designed for managing stormwater (see Figures 10 and 11). Unmaintained landscapes are characterized by vegetation overgrowth, high weed density, and litter and pollution. These characteristics were observed and documented on a site visit to North Town Fork Creek. Traditionally-manicured landscapes are characterized by clean edges, mowed lawn, well-maintained gardens, and clear geometric shapes. Green stormwater infrastructure is characterized with high biodiversity, native plants, water retention, high planting density, and naturalistic planting patterns (Suppakittpaisarn et al. 2017). The characteristics of both the traditionally manicured landscapes and green stormwater infrastructure were observed and documented on a site visit to Marlborough Community Coalition.



Figure 10: Types of Urban Greening Present in Study Areas

DEPENDENT VARIABLES

The dependent variables are people's aesthetic preferences and feelings of safety toward plant biodiversity and plant species of the same types of urban greening as well as residents' overall neighborhood satisfaction (see Figure 11). These variables are key design characteristics of green stormwater infrastructure because they influence the effectiveness of water capture and retention capabilities (Canfield et al. 2018a, Chini et al. 2017, Suppakittpaisarn et al. 2017, Suppakittpaisarn et al. 2019a). By examining these variables, the study may provide insight to residents' overall satisfaction with their neighborhood environment.

Independent Variables

- 1) Familiarity to 3 types of urban greening
 - Unmaintained Landscape
 - Traditionally-Manicured Landscape
 - Landscape Designed to Manage Stormwater
- 2) Environmental Awareness to Green Stormwater Infrastructure
 - Reduce Flooding
 - Importance of Biodiversity
 - Importance of Native Planting

Dependent Variables

- 1) Aesthetic Preferences of Biodiversity
 - Variety of Plants in the Scene
- 2) Aesthetic Preferences of Native Planting
 - Types of Plants in the Scene
 - Plants Look Like Weeds
 - Plants are Environmentally Beneficial
 - Plants are Beautiful
- 3) Feeling of Safety in the Environment
 - Safe Space
 - Plants Heights
 - Fears of Hidden Dangers
 - Feelings of Enclosure or Exposure
 - Plants Attract Insects
- 4) Neighborhood Satisfaction
 - Overall Appearance
 - Appearance and Maintenance
 - Variety of Landscapes
 - Safety for Walking

Figure 11: Study Variables

DATA ANALYSIS

Data analysis began by finding descriptive statistics of each variable for each neighborhood using IBM SPSS, version 28. Discovering the descriptive statistics of each neighborhood was an important factor in determining which associations to focus on later in analysis as well as understanding the demographic information of the participants.

The study's focus is on finding associations between familiarity, environmental awareness, and neighborhood satisfaction with plant biodiversity, native planting, and feelings of safety around the three types of landscapes. Nine to twelve items are included in each variable. Therefore, Exploratory Factor Analysis (EFA) was used to determine latent variable photo clusters for each neighborhood in the study. Principle Components was used for the constructs, with Varimax rotation and a maximum of 25 iterations for convergence. Only construct loadings with absolute values greater than 0.50 were included in the analysis and if there were double loads, the larger absolute value was selected if it was at least 0.05 greater than the alternative loader; otherwise, the photo was eliminated from the construct. Cronbach's Alpha was calculated for each cluster of photos to test for reliability. Only clusters with Alpha coefficients greater than 0.65 were retained unless the cluster was significant to the study. In this case, they were only kept if the Alpha coefficient was greater than 0.6. Photo cluster means were calculated and saved as latent variables (see Appendix E).

After determining the latent variables through EFA, Pearson correlations and linear regressions were used to determine the extent of relationship between the independent variables – familiarity, environmental awareness, and neighborhood satisfaction with the dependent variables – biodiversity, native planting, and feelings of safety. ANOVA models were calculated, and Standardized Coefficients Beta were assessed to determine the relationships and their statistical significance.

RESULTS & FINDINGS

CHAPTER 4

RESULTS & FINDINGS

SAMPLE POPULATION

NORTH TOWN FORK CREEK

Fifty-five residents of North Town Fork Creek participated in this study. Gender participation was nearly even with slightly more men than women participating. Participants' ages were primarily young to middle aged adults. The participants were also nearly even in terms of having children in their household. Most participating residents have lived in North Town Fork Creek for 6 – 10, so they should know the area well. Most participants from the neighborhood were African American and have at least a high school diploma. In general, participants were employed either full time or part time with an income primarily between \$50,000 and \$99,999. Almost every participant travel in their own personal motor vehicle (see Figure 12).

MARLBOROUGH COMMUNITY COALITION

Forty residents of the Marlborough Community Coalition participated in this study. There were significantly more females who participated than men and most were young to middle aged adults. Most participants did not have children in their household. Participating residents have lived in the neighborhood for 1 – 5 years. Marlborough Community Coalition is a much more ethnically diverse area, however most participants indicated they were Caucasian. Residents also have at least had some college and are mostly employed full time earning primarily \$50,000 - \$99,999 per year. Most participating residents also travel in their own personal motor vehicle (see Figure 13).

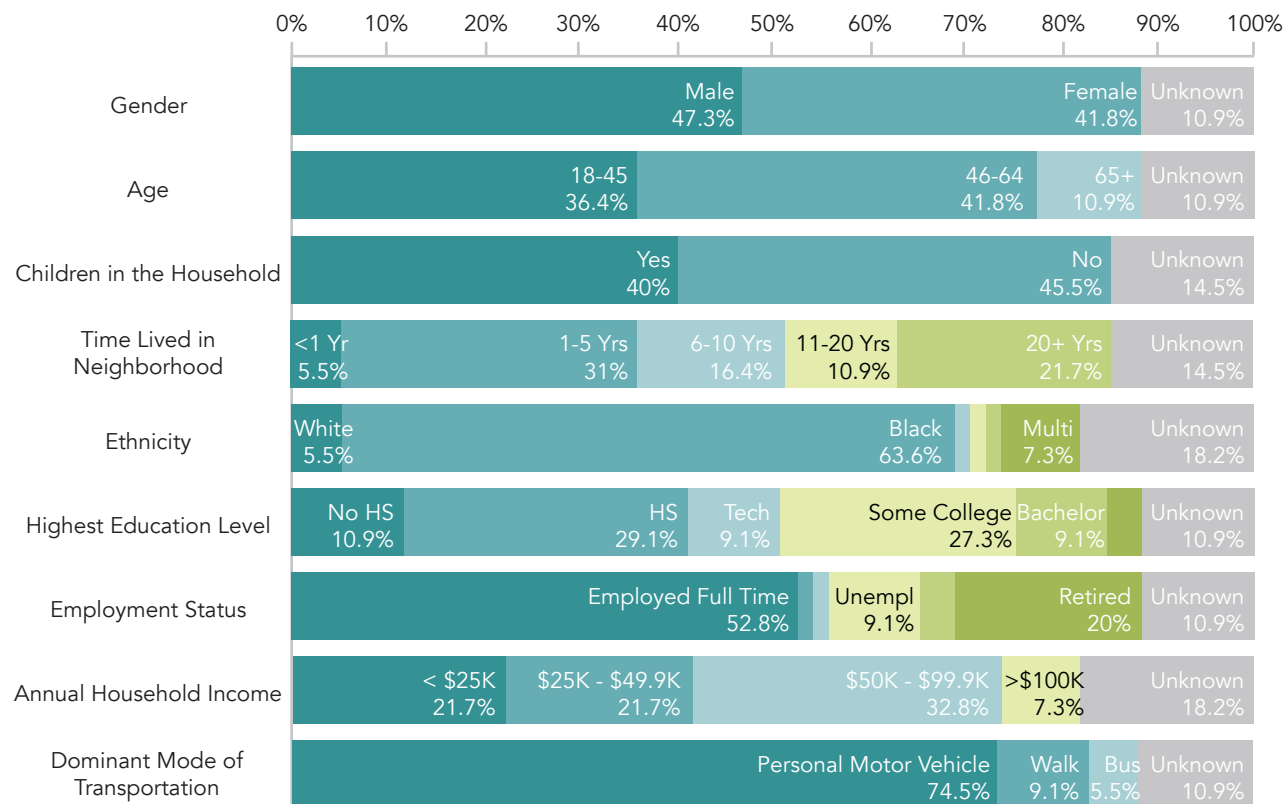


Figure 12: North Town Fork Creek Participants' Demographics

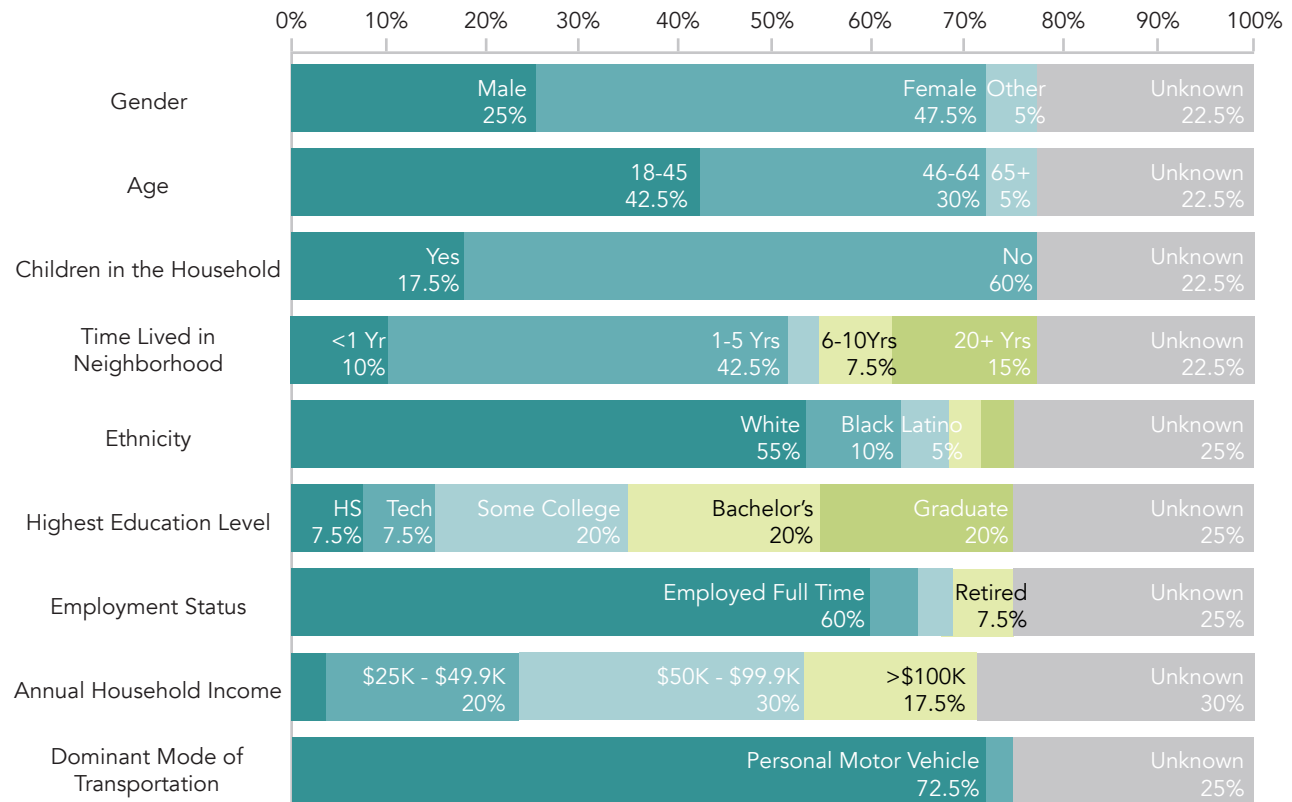


Figure 13: Marlborough Community Coalition Participants' Demographics

GENERAL DESCRIPTIVE RESULTS OF INDEPENDENT VARIABLES

FAMILIARITY

The survey respondents of North Town Fork Creek indicated that they more often see traditionally-manicured landscapes in the context of a vacant lot ($\mu = 3.43$; see Figure 14), which is plausible considering that 15% of the 1,531 lots in the neighborhood are vacant (US Census Bureau, 2020). Residents also indicated that they are not as familiar with green stormwater infrastructure as they are with the other types of urban greening ($\mu = 2.43$) which make sense since North Town Fork Creek does not have green stormwater infrastructure in place. However, participant responses from the Marlborough Community Coalition reveal that they do not recognize green stormwater infrastructure nearby their homes even though these landscapes have been in place for 10 years. A clear example of this is a photo of a right-of-way bioswale (see Figure 15) where residents responded that they do not see this type of landscape near their houses ($\mu = 2.20$).



a: Traditionally-Manicured Landscape 4



b: Traditionally-Manicured Landscape 12

Figure 14: Traditionally-manicured landscapes in vacant lots



Figure 15: Unexpectedly, even though Marlborough neighborhood contains green infrastructure installations, residents did not recognize this image of a bioswale.

ENVIRONMENTAL AWARENESS

Residents from both North Town Fork Creek and Marlborough Community Coalition “understood that high plant diversity is beneficial to the environment,” ($\mu = 3.79$ and $\mu = 4.70$, respectively) and that “native plants provide more benefits for the environment than non-native plants,” ($\mu = 3.65$ and $\mu = 4.50$). In both cases, however, Marlborough Community Coalition participants show higher awareness as compared to those from North Town Fork Creek neighborhood.

Only Marlborough Community Coalition residents responded that they understood green stormwater infrastructure “may reduce flooding potential in their neighborhood” ($\mu = 3.91$). This may be because since the completion of the Middle Blue River Green Solutions Pilot Project, peak flow was reduced by 76% and the total volume of stormwater entering the combined sewer system was reduced by nearly 36% (Burns & McDonnell and Kansas City Water 2013), lowering the risk of localized flooding in the neighborhood. In other words, the participants know the benefits of green stormwater infrastructure by experiencing it in their neighborhood. See Figures 21 and 22 for a summary of general descriptive findings.

GENERAL DESCRIPTIVE RESULTS OF DEPENDENT VARIABLES

BIODIVERSITY

The residents of North Town Fork Creek responded that they mostly prefer the variety of plants in traditionally-manicured park landscape of the Town Fork Creek Greenway ($\mu = 3.49$). This landscape primarily has low biodiversity with only cut grass and a few oak trees (see Figure 16). The Marlborough Community Coalition residents did not prefer the biodiversity shown in two photos of unmaintained sidewalks ($\mu = 1.90$; see Figure 17). However, residents did indicate that they prefer the variety of plants of green stormwater infrastructure along their sidewalks ($\mu = 3.68$; see Figure 18). Although residents of Marlborough Community Coalition responded they were unfamiliar with green stormwater infrastructure, it appears they were exposed to this landscape enough to appreciate its high biodiversity.



Figure 16: Traditionally-Manicured Park



*a (Top Left):
Unmaintained 16*

*b (Top Right):
Unmaintained 21*

Figure 17: Unmaintained Sidewalk Landscapes



*a (Bottom Left): Green
Stormwater Infrastructure 17*

*b (Bottom Right): Green
Stormwater Infrastructure 19*

Figure 18: Right-Of-Way Bioswales

NATIVE PLANTING

North Town Fork Creek residents responded favorably to the types of plants of a traditionally-manicured park setting showing primarily cut grass ($\mu = 3.82$) and a plausible reason is that they believe this landscape to be beneficial to the environment ($\mu = 3.63$). In contrast, the residents of Marlborough Community Coalition responded that they believed the grass in this same photo looked like weeds ($\mu = 1.70$; see Figure 19). In a similar traditionally-manicured landscape, Marlborough Community Coalition residents indicated that they did not like the types of plants ($\mu = 1.97$) and did not think they were beautiful ($\mu = 1.77$).

The Marlborough Community Coalition showed stronger positivity towards the types of plants in green stormwater infrastructure ($\mu = 4.04$) because they are both “beneficial to the environment” and “look beautiful” ($\mu = 3.84$ and $\mu = 3.92$, respectively). This is confirming the literature on how exposure to native planting and familiarity with such landscape can positively impact preferences for such landscapes (Herzog, Kaplan & Kaplan 1976, Kurz & Baudains 2012, Martin et al. 2003, Nassauer 1993).

Neither neighborhood residents responded favorably to the types of plants in the unmaintained landscape shown in Figure 20 ($\mu = 2.07$). Marlborough Community Coalition residents indicated it was because it looked like weeds ($\mu = 3.84$).



Figure 19: Traditionally-Manicured Grass



Figure 20: Unmaintained Sidewalk Landscape

FEELINGS OF SAFETY

In general, both neighborhoods' residents responded that they would feel safe around the traditionally-manicured landscapes found in parks ($\mu = 3.89$). These landscapes are wide open with cut grass and have a few shade trees. Both neighborhoods also responded that they would feel safe around the constructed wetland park and were not concerned about the plants being too tall, feeling too enclosed, or the insects that may be attracted to the landscape. Marlborough Community Coalition residents responded that they would feel safe around all other depicted forms of green stormwater infrastructure for the same reasons.

North Town Fork Creek residents indicated that they would not feel safe around an unmaintained vacant lot with high biodiversity and dense planting ($\mu = 1.92$) because the plants were "too tall and restrict views" ($\mu = 3.70$). This confirms the findings of previous studies regarding the need for cutting tall plants and opening views in vacant lots in high-vacancy areas (Branas et al. 2011, Jorgenson et al. 2002).

NEIGHBORHOOD SATISFACTION

Residents of both North Town Fork Creek and Marlborough Community Coalition were "somewhat satisfied" with the overall appearance of their neighborhood ($\mu = 3.02$ and $\mu = 3.43$ respectively). Neither North Town Fork Creek nor Marlborough Community Coalition residents were satisfied with the maintenance of vacant landscapes in their neighborhoods ($\mu = 2.30$ and $\mu = 2.48$). However, Marlborough Community Coalition residents were satisfied with the appearance of their public parks ($\mu = 3.71$) as opposed to North Town Fork Creek residents. See Figures 21 and 22 for a summary of general descriptive findings.

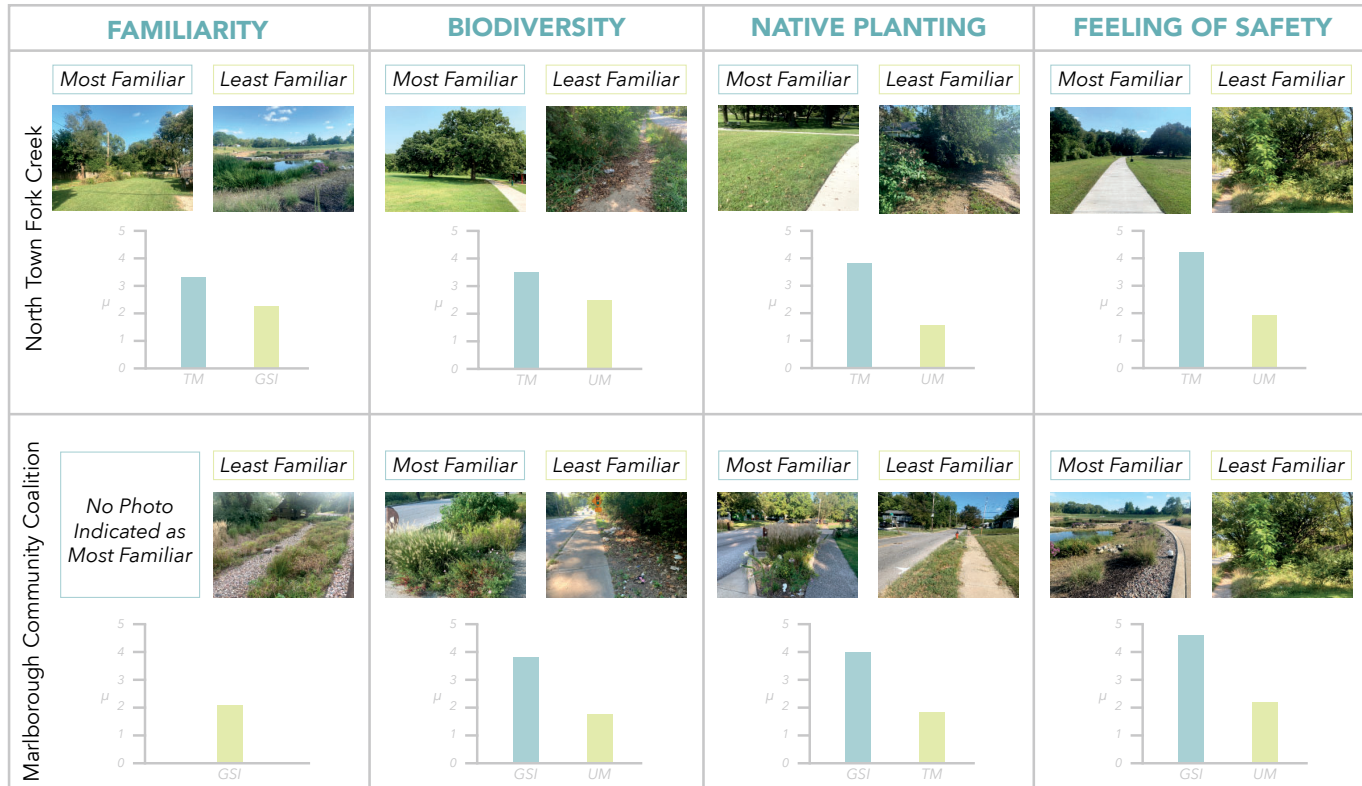
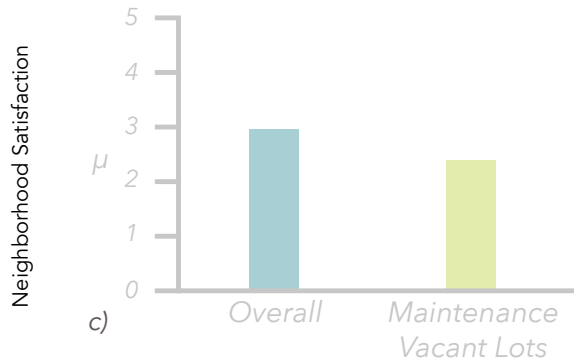
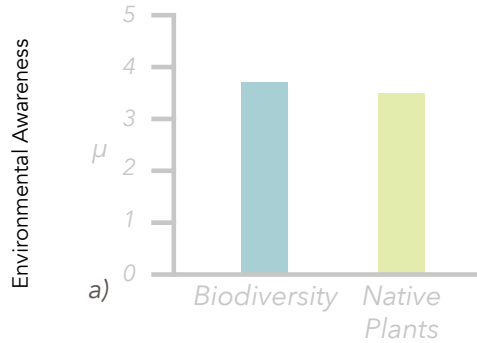


Figure 21: Summary of General Descriptive Findings - Familiarity, Biodiversity, Native Planting, and Feelings of Safety

NORTH TOWN FORK CREEK



MARLBOROUGH COMMUNITY COALITION

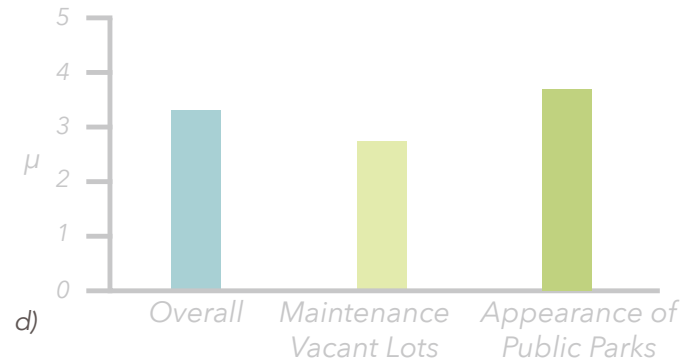
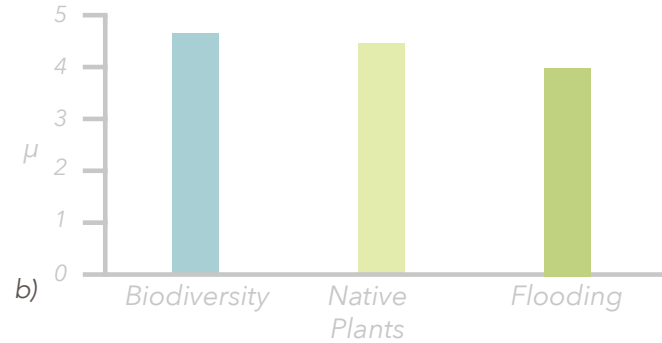


Figure 22: Summary of General Descriptive Findings - Environmental Awareness & Neighborhood Satisfaction

EFA-GENERATED PHOTO GROUPS

Prior to EFA, the researcher had pre-determined photo categories for each variable; these categories grouped photos into three groups representing the three different types of urban greening: unmaintained landscape, traditionally-manicured landscape, and landscape designed to manage stormwater (see Appendix E). After EFA, these categories were slightly altered due to survey responses in a few variables, mainly determining clusters for familiarity. Otherwise, most survey participants responses indicate that they were able to distinguish the three different types of landscapes. North Town Fork Creek responses resulted in two clusters for familiarity, two clusters for biodiversity, nine clusters for native planting, four clusters for feelings of safety, one for environmental awareness, and one for neighborhood satisfaction (see Appendix E, Table 1). Marlborough Community Coalition resulted in one cluster for familiarity, three clusters for biodiversity, eight clusters for native planting, six clusters for feelings of safety, one group for environmental awareness, and one cluster for neighborhood satisfaction (see Appendix E, Table 2). These clusters that shaped latent variables, are described in the following sections.

NORTH TOWN FORK CREEK

The photo clusters formed through EFA for the variable “familiarity” resulted with interesting findings (see Table 6). The photos group named “famil_HBD_TPH” included both unmaintained landscape and green stormwater infrastructure (Cronbach’s $\alpha = 0.780$; see Figure 23). After assessing the photo contents, it is understandable why residents grouped these images together. Similarities and correlations between the photos reveal that the grouping contains photos with high plant diversity and were taller in plant height. Therefore, while residents did not recognize the green stormwater infrastructure different from unmaintained landscapes, they did recognize the high biodiversity and tall plant heights as opposed to the second grouping of photos containing 100% traditionally-manicured landscapes (Cronbach’s $\alpha = 0.642$). These landscapes have low plant diversity and have primarily cut lawns.

Results from other variables confirmed the remaining photo groups could be categorized according to the pre-determined groups: “unmaintained landscape”, “traditionally-manicured landscape”, and “green stormwater infrastructure”.



a: GSI_3



b: UM_5



c: GSI_6



d: GSI_11

Figure 23: Photo Cluster “famil_HBD_TPH” for North Town Fork Creek

Table 6: North Town Fork Creek "Familiarity" Photo Cluster Correlations*

	GSI_3	UM_5	GSI_6	GSI_11
GSI_3		0.432	0.483	0.446
UM_5	0.431		0.544	
GSI_6	0.483	0.544		0.509
GSI_11	0.446		0.509	

* $p < 0.001$

UM = Unmaintained Landscape

GSI = Green Stormwater Infrastructure

MARLBOROUGH COMMUNITY COALITION

Similar to the first cluster formed for “familiarity” in North Town Fork Creek, residents’ responses resulted in a cluster containing “unmaintained landscapes” and “green stormwater infrastructure” as well as one “traditionally-manicured landscape” creating the cluster named “famil_HBD” (Cronbach’s $\alpha = 0.854$; see Table 7 and Figure 24). The photo correlation revealed that all photos contain high plant diversity, including the one image from a traditionally-manicured landscape even though not all plant heights are the same.

All other variables contained images that belong together. The remaining photo groups could be categorized into the same groups as what was pre-determined: “unmaintained landscape”, “traditionally-manicured landscape”, and “green stormwater infrastructure”.



a: GSI_3



b: TM_4



c: UM_5



d: GSI_6



e: GSI_7

Figure 24: Photo Cluster “famil_HBD” for Marlborough Community Coalition

Table 7: Marlborough Community Coalition “Familiarity” Photo Cluster Correlations*

	GSI_3	TM_4	UM_5	GSI_6	GSI_7
GSI_3		0.623	0.646	0.623	0.615
TM_4	0.623		0.475	0.494	0.440
UM_5	0.646	0.475		0.536	0.590
GSI_6	0.623	0.494	0.536		
GSI_7	0.615	0.440	0.590		

* $p < 0.001$

UM = Unmaintained Landscape

TM = Traditionally-Manicured Landscape

GSI = Green Stormwater Infrastructure

ASSOCIATIONS BETWEEN STUDY VARIABLES IN NORTH TOWN FORK CREEK

FAMILIARITY

Familiarity to “traditionally-manicured landscapes” showed a positive association to “preferring the types of plants” in such landscapes, primarily cut grass lawn ($\beta = 0.385$, $p\text{-value} < 0.050$). There is also a strong association to believing the plants in both unmaintained and traditionally-manicured landscapes in North Town Fork Creek are both “beautiful” ($\beta = 0.387$, $p\text{-value} < 0.050$) and “beneficial to the environment” ($\beta = 0.352$, $p\text{-value} < 0.050$). This result confirms the findings of Herzog, Kaplan, & Kaplan (1976), and Martin et al. (2003). In terms of native plants in green stormwater infrastructure, there were strong associations with believing the plants “looked like weeds” ($\beta = 0.422$, $p\text{-value} < 0.005$) and is attributed to the plants being “too tall and restricting views” ($\beta = 0.336$, $p\text{-value} < 0.050$; see Figure 25).

Familiarity to “landscapes that show tall plants with high biodiversity”, such as in unmaintained vacant lots or sidewalks as well as similarly dense to green stormwater infrastructure showed a significant positive association to “preferring the variety of plants” in unmaintained landscapes and in green stormwater infrastructure ($\beta = 0.529$, $p\text{-value} < 0.001$). However, the familiarity to such landscapes also presented a slightly positive association to “being afraid of hidden dangers” in unmaintained landscapes ($\beta = 0.307$, $p\text{-value} < 0.050$; See Figure 26).

The linear regression analysis showed that familiarity is not a significant predictor of a resident's overall neighborhood satisfaction.

Results show that North Town Fork Creek residents are mostly familiar with traditionally-manicured landscapes and with unmaintained landscapes with tall plants and high biodiversity. While residents aesthetically prefer the clean-cut grass of the traditionally-manicured landscapes, they also show interest in high plant biodiversity in their landscapes.

ENVIRONMENTAL AWARENESS

The variables for environmental awareness included 1) a latent variable including six images of green stormwater infrastructure that “reduce flooding potential” in the neighborhood (Cronbach’s $\alpha = 0.833$), 2) understanding that environmental importance of “high plant diversity”, and 3) understanding the importance of “native plant species”. In North Town Fork Creek, environmental awareness to green stormwater infrastructure reducing flooding potential showed a positive association to “preferring the variety of plants” ($\beta = 0.393$, p-value < 0.05) in such landscapes. It also showed a very strong association to “preferring the types of plants” in green stormwater infrastructure on the basis that they are both “beneficial to the environment” ($\beta = 0.460$, p-value < 0.005) and “beautiful” ($\beta = 0.553$, p-value < 0.001; see Figure 26), confirming the findings of Hayden et al. (2015).

The linear regression analysis showed that environmental awareness is not a significant predictor of a resident’s overall neighborhood satisfaction.

These results from North Town Fork Creek are significant in the point that when people are educated about the function of green stormwater infrastructure, its ability to reduce flooding potential in their neighborhood, and other environmental benefits, residents are more likely to respond well to the high biodiversity and native plantings in such landscapes.

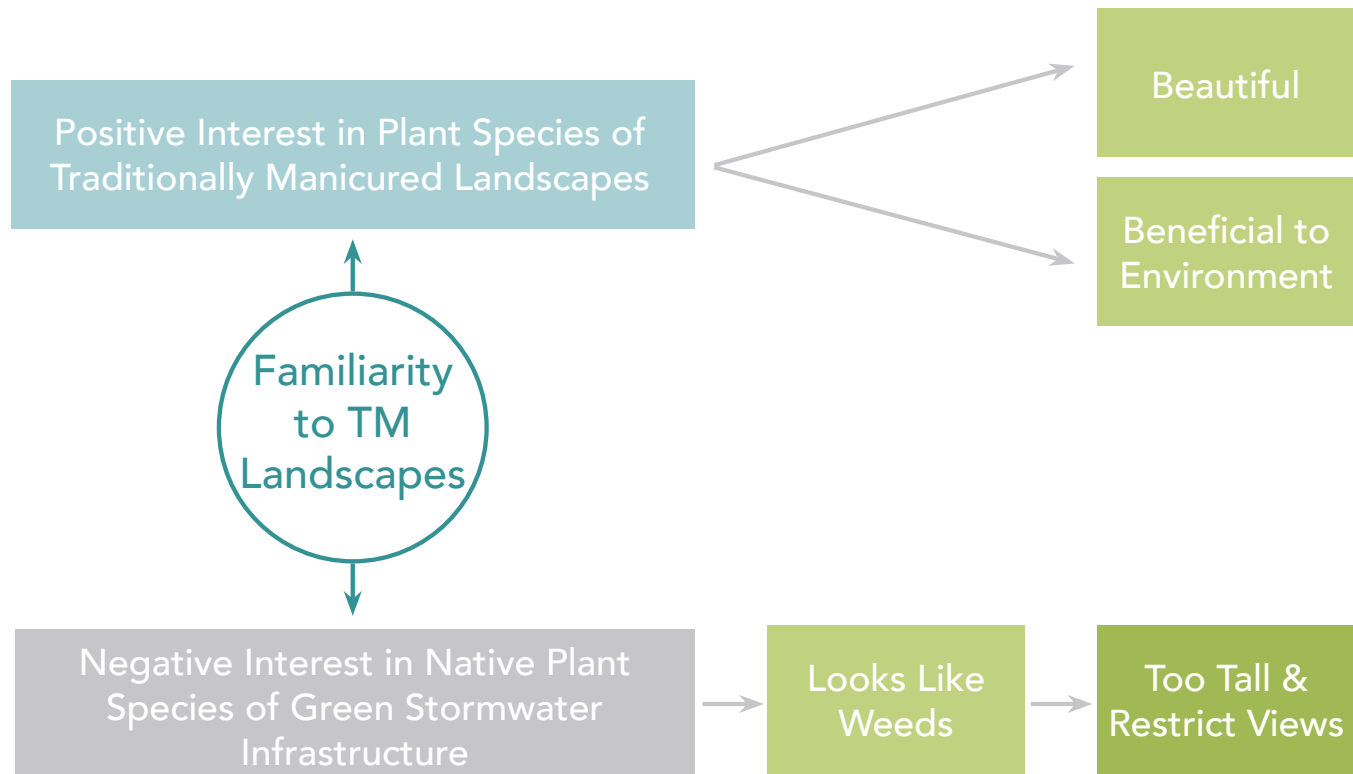


Figure 25: North Town Fork Creek Associations - Effect of Familiarity on Aesthetic Appreciation of Biodiversity and Native Plantings in the Landscape

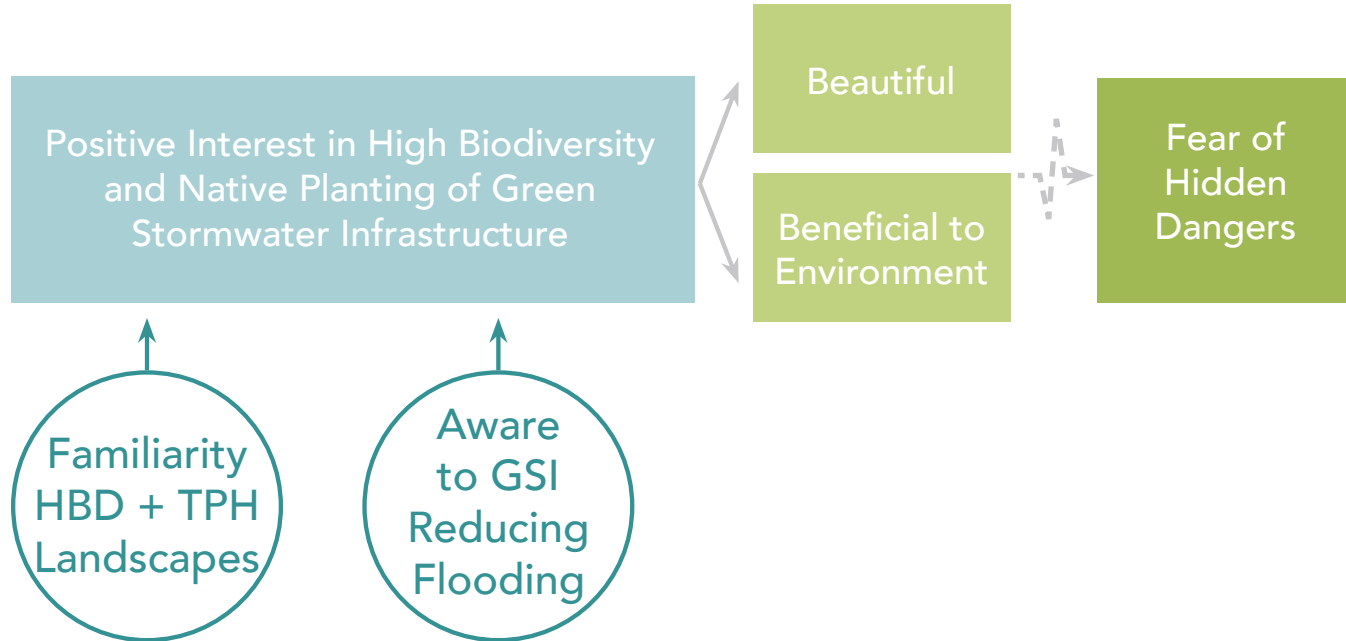


Figure 26: North Town Fork Creek Associations - Effect of Familiarity and Environmental Awareness on Aesthetic Appreciation of Biodiversity and Native Plantings in the Landscape

ASSOCIATIONS BETWEEN STUDY VARIABLES IN MARLBOROUGH COMMUNITY COALITION

FAMILIARITY

Interestingly, familiarity to high biodiversity resulted in responses that were associated without interest in the low biodiversity of traditionally-manicured landscapes but showed positive associations with the high biodiversity of green stormwater infrastructure ($\beta = 0.671$, $p\text{-value} < 0.001$). It also showed positive responses towards liking the native plants ($\beta = 0.687$, $p\text{-value} < 0.001$) and can be attributed to respondents believing native plants are both “beautiful” ($\beta = 0.777$, $p\text{-value} < 0.001$) and “beneficial to the environment” ($\beta = 0.431$, $p\text{-value} < 0.050$). Finally, familiarity to high biodiverse landscapes is associated with feeling safe around green stormwater infrastructure ($\beta = 0.369$, $p\text{-value} < 0.050$; see Figures 27 and 28).

Unlike in North Town Fork Creek, familiarity to high biodiverse landscapes was associated with neighborhood satisfaction. Overall, when residents are familiar with high biodiversity in their landscapes, it is negatively associated with their neighborhood satisfaction ($\beta = -0.505$, $p\text{-value} < 0.005$), including the neighborhood’s appearance, maintenance, variety of landscapes, and safety ($\beta = -0.598$, $p\text{-value} < 0.001$). This may be attributed to Hahn and Kellam’s study (2016) which yielded results from Marlborough Community Coalition residents with concerns about maintenance practices (see Figure 27).

These results show the importance of familiarity and exposure on influencing the environmental awareness, aesthetic preferences, and feelings of safety people hold for the landscapes in their neighborhood. The more familiar people are with their environment, the more appreciation they will have for it. These findings are in line with the findings of Herzog, Kaplan & Kaplan (1976) and Martin et al. (2003).

ENVIRONMENTAL AWARENESS

The variables for environmental awareness in the Marlborough Community Coalition are the same as in North Town Fork Creek, 1) the latent variable including six images of green stormwater infrastructure that “reduce flooding potential” in the neighborhood (Cronbach’s $\alpha = 0.936$), 2) understanding the environmental importance of “high plant diversity”, and 3) understanding the importance of “native plant species”. Similar to the results of familiarity to highly biodiverse landscapes, understanding that green stormwater infrastructure may reduce the risk of localized flooding in the neighborhood is associated to not preferring the variety of plants in traditionally-manicured landscapes ($\beta = -0.422$, p-value < 0.050) and preferring the variety of plants in green stormwater infrastructure ($\beta = 0.758$, p-value < 0.001).

Also, similar to familiarity, environmental awareness shows positive associations with “preferring the types of plants” in green stormwater infrastructure ($\beta = 0.634$, p-value < 0.001) and is associated with respondents believing the native plants are both “beneficial” ($\beta = 0.655$, p-value < 0.001) and “beautiful” ($\beta = 0.731$, p-value < 0.001). Residents also indicated that they felt safe around green stormwater infrastructure if they knew the importance of native plants in the environment ($\beta = 0.567$, p-value < 0.001 ; see Figure 27). Respondents do not feel that the native plants are too tall ($\beta = -0.395$, p-value < 0.050) or enclosing ($\beta = -0.484$, p-value < 0.050) nor are they afraid of any insects ($\beta = -0.395$, p-value < 0.050) that may be attracted to the plants in green stormwater infrastructure (see Figure 28).

Just as in North Town Fork Creek, having environmental awareness is strongly associated with showing preferences for high biodiversity, native planting, and feeling safe around green stormwater infrastructure and their design characteristics.

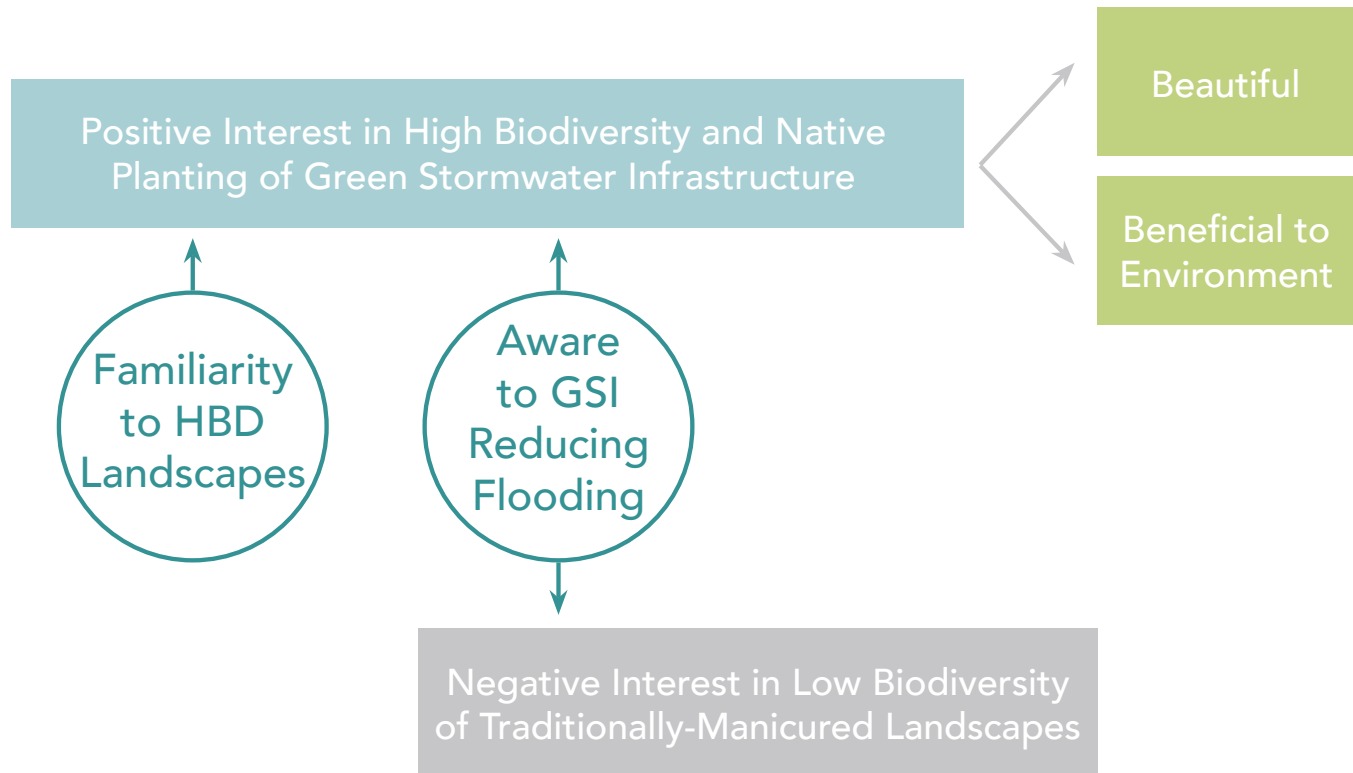


Figure 27: Marlborough Associations - Effect of Familiarity and Environmental Awareness on Aesthetic Appreciation of Biodiversity and Native Plantings in the Landscape

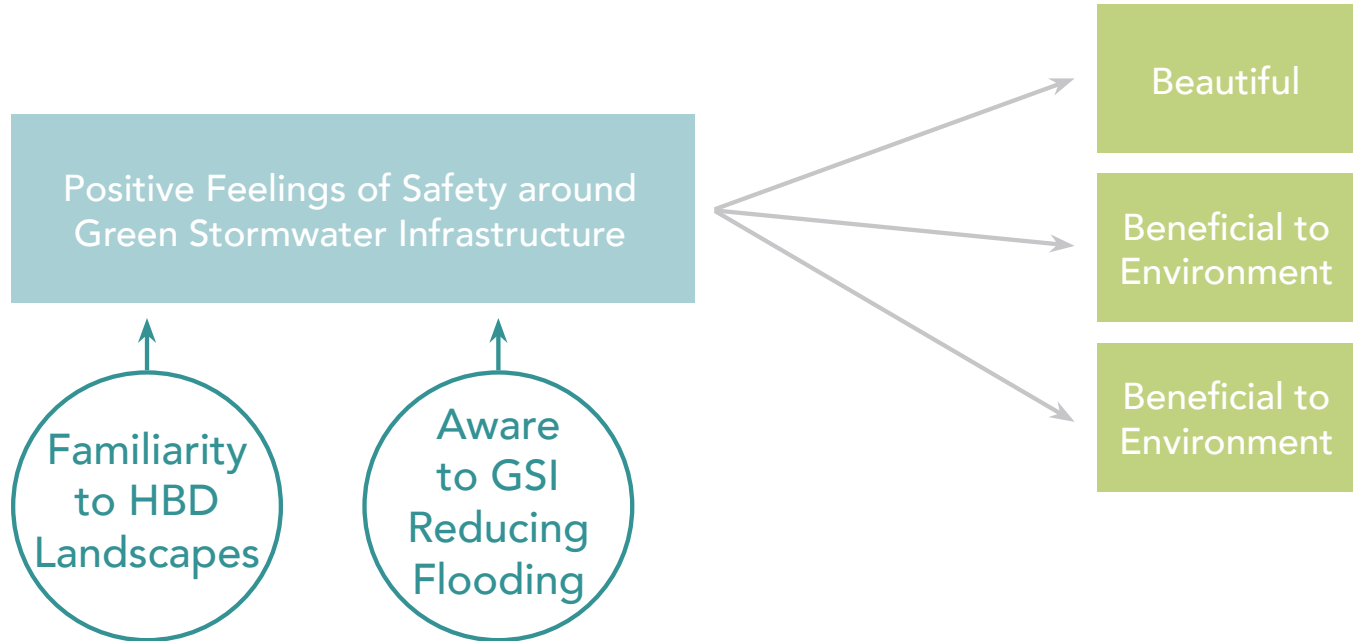


Figure 28: Marlborough Associations - Effect of Familiarity and Environmental Awareness on Feelings of Safety in the Landscape

DESIGN APPLICATION

CHAPTER 5

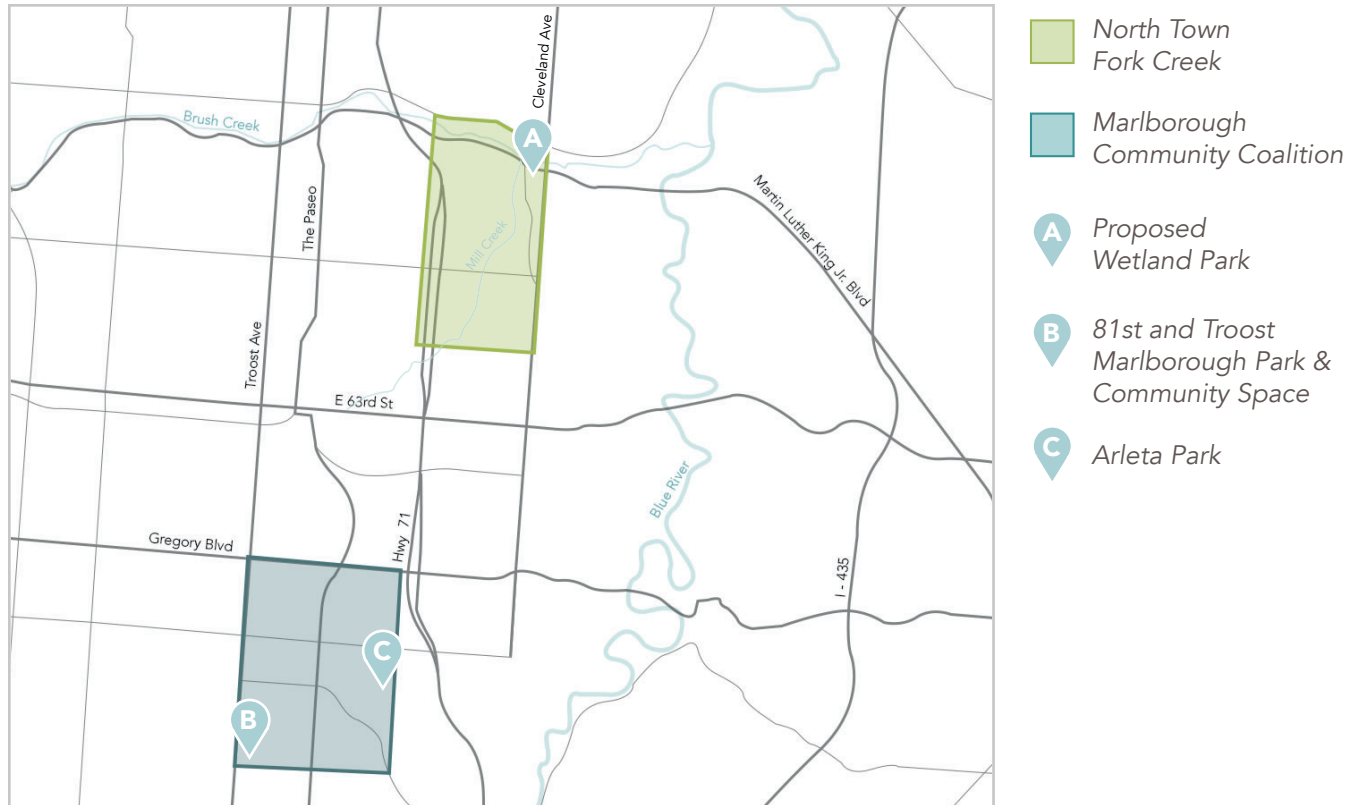


Figure 29: Locations of Design Interventions

DESIGN APPLICATION

INTRODUCING GREEN STORMWATER INFRASTRUCTURE TO COMMUNITIES

North Town Fork Creek has high flood potential and water contamination because of Mill Creek being the outflow for the city's combined sewer system. The neighborhood, therefore, is a great candidate to receive green stormwater infrastructure as mitigation measures to flooding and water contamination. The results from North Town Fork Creek indicate that residents who are not familiar with green stormwater infrastructure and are more familiar with unmaintained and traditionally-manicured landscapes show preference to high biodiversity in their landscapes, but prefer the "clean" form associated with traditional "cues to care". These "cues to care" include cut grass and lower plant heights as well as less dense planting to limit any "hidden dangers". Residents also understand the importance of high biodiversity and native plantings in their landscapes and this is associated with interest in native plants in their landscapes.

CONSTRUCTED WETLAND: PROPOSED WETLAND PARK IN NORTH TOWN FORK CREEK

This study found that increased familiarity, environmental awareness, and education about the landscape increases respondent's aesthetic preferences towards the landscape. Therefore, to introduce green stormwater infrastructure into neighborhoods similar to North Town Fork Creek, landscape architects and planners should consider adding projects incrementally. This will help residents gradually become more familiar and aware to the physical benefits the landscape is providing to their neighborhood. The form residents indicated highest preference to is the constructed wetland in a park setting (see Figure 30). This form of green stormwater infrastructure has the high biodiversity and native plants that are preferred by residents while having a more traditionally-manicured look with shorter plant heights and less plant density than what is normally seen in green stormwater infrastructure.



Figure 30: Constructed Wetland in Park

An area of land in the north-east corner of the North Town Fork Creek neighborhood (see Figure 29, Site A and Figure 31) was identified as a suitable site to develop a constructed wetland and park. The 7-acre vacant site sits within the FEMA AE flood zone and is owned by the City of Kansas City, Missouri. Currently, the area is planted with a cut-grass lawn and is sloped to the north-east corner of the site, causing flooding in the intersection of Martin Luther King Jr. Boulevard and Cleveland Avenue.



Figure 31: Suitable Area for Wetland Park

By regrading 16,771 cubic yards of earth into hills and swales, Wetland Park was designed to direct water into a half-acre detention pond that may hold up to 300,000 gallons of stormwater (see Figure 32). Cut and fill are balanced so that all moved earth remains on site to keep costs low and reduce environmental impact off site. Stormwater will be held and cleansed on site, which keeps it from entering the combined sewer system, prevents flooding, and returns it to the natural watershed.

In addition to stormwater management, Wetland Park's programming includes 0.25 miles of permeable ADA trails and 0.15 miles of gravel trails that winds through native prairie and over the wetland pond with a boardwalk. Informative signs are included along the trail to educate park visitors about the importance of stormwater infrastructure using easy to read diagrams and interactive activities. Trails intersect at a community gathering space and a nature playground. A cut-grass lawn provides area for flexible neighborhood recreation and play. See Figure 33 for the master plan of Wetland Park.

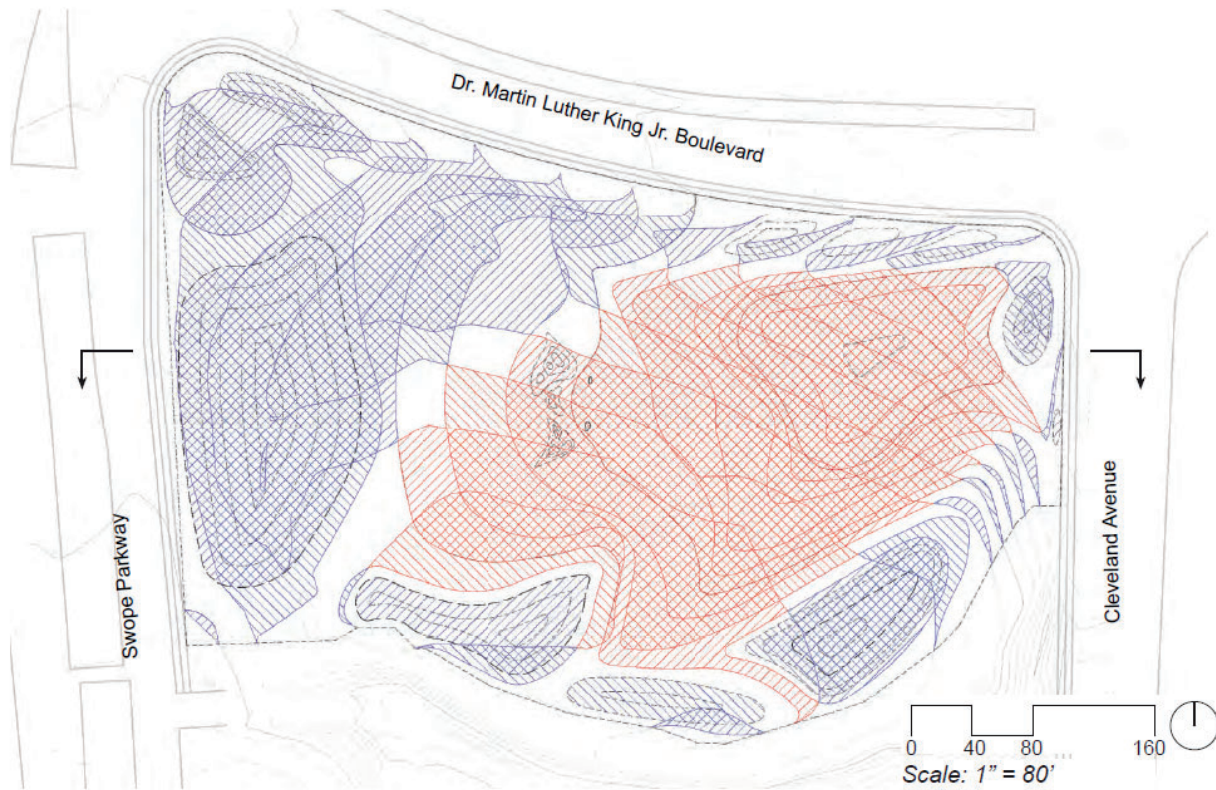


Figure 32: Proposed Earthwork for Wetland Park

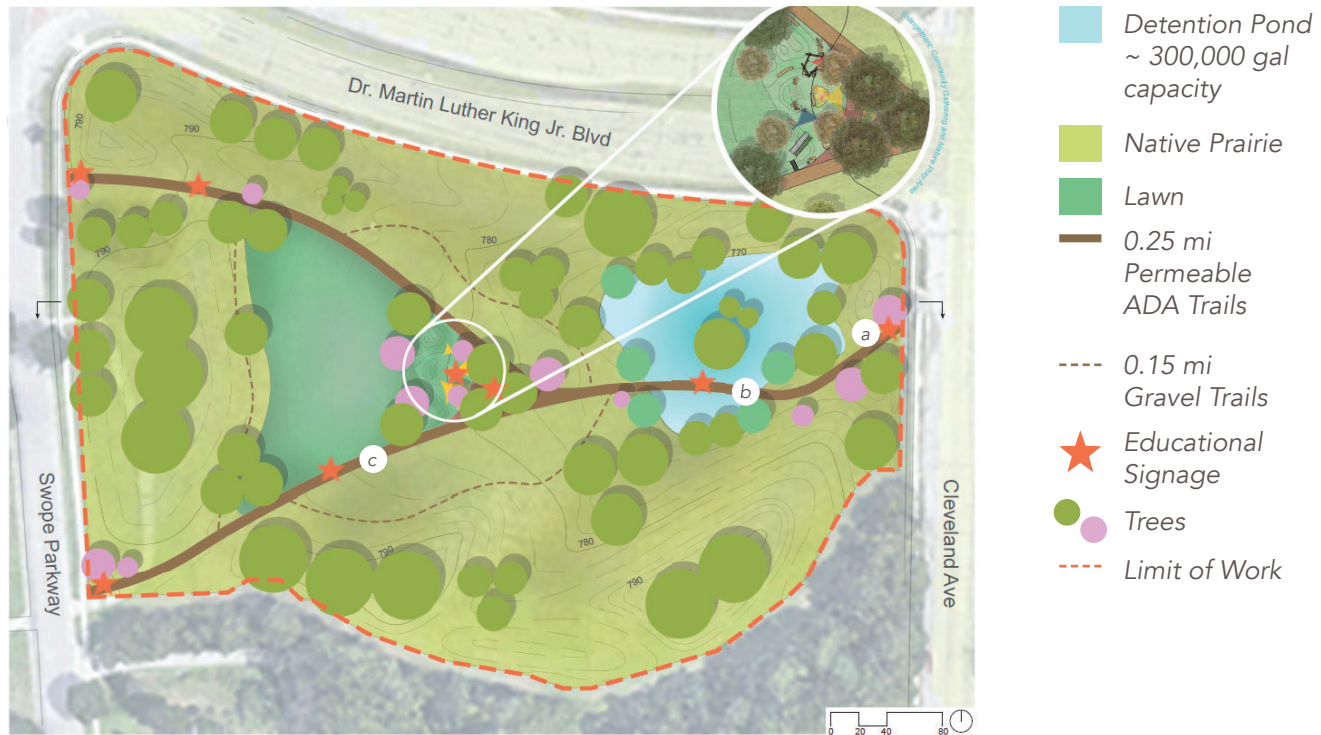


Figure 33: Master Plan of Wetland Park



a: Wetland Pond



b: Boardwalk over Wetland Pond



c: Native Vegetation at Wetland Park

Figure 34: Views in Wetland Park

RIGHT-OF-WAY BIOSWALES: PROTOTYPES FOR NORTH TOWN FORK CREEK

Building a constructed wetland is a very expensive endeavor and can cost upwards of \$1,000,000 per acre (Morton Arboretum n.d., Rottle 2012, Shannon et al. 2016). A less expensive alternative form of green stormwater infrastructure to explore is a right-of-way bioswale which can cost \$60,000 per acre (Hahn & Kellams 2016). While North Town Fork Creek residents did not show preference to this form of green stormwater infrastructure, similar planting strategies can be used in a right-of-way bioswale. Throughout North Town Fork Creek, there are several opportunities along the public right-of-way to implement bioswales. By creating prototypes, bioswales may be designed appropriately for different road classifications, contextual land uses, and slope conditions (see Figure 35). The unique environmental characteristics and affordances define the design and plant selection of the bioswale prototypes.

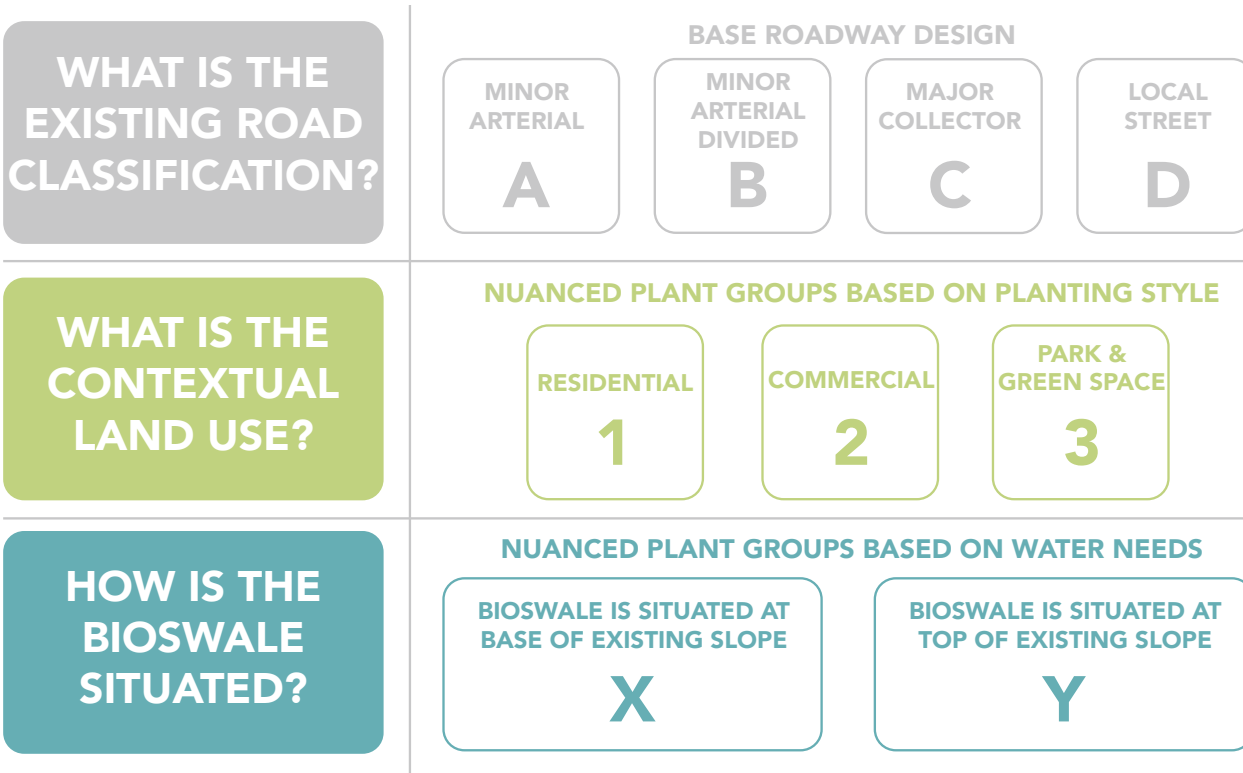


Figure 35: Bioswale Prototype Design Considerations

The bioswale prototypes begin with understanding the base road design and road classification. Four existing road classifications are identified throughout North Town Fork Creek including: Minor Arterial, Minor Arterial – Divided, Major Collector, and Local Street. Based on roadway conditions, design strategies are applied to add bike lanes, on-street parallel parking, and right-of-way bioswale medians. Design interventions for the base designs are diagrammed in Figures 36 and 37.

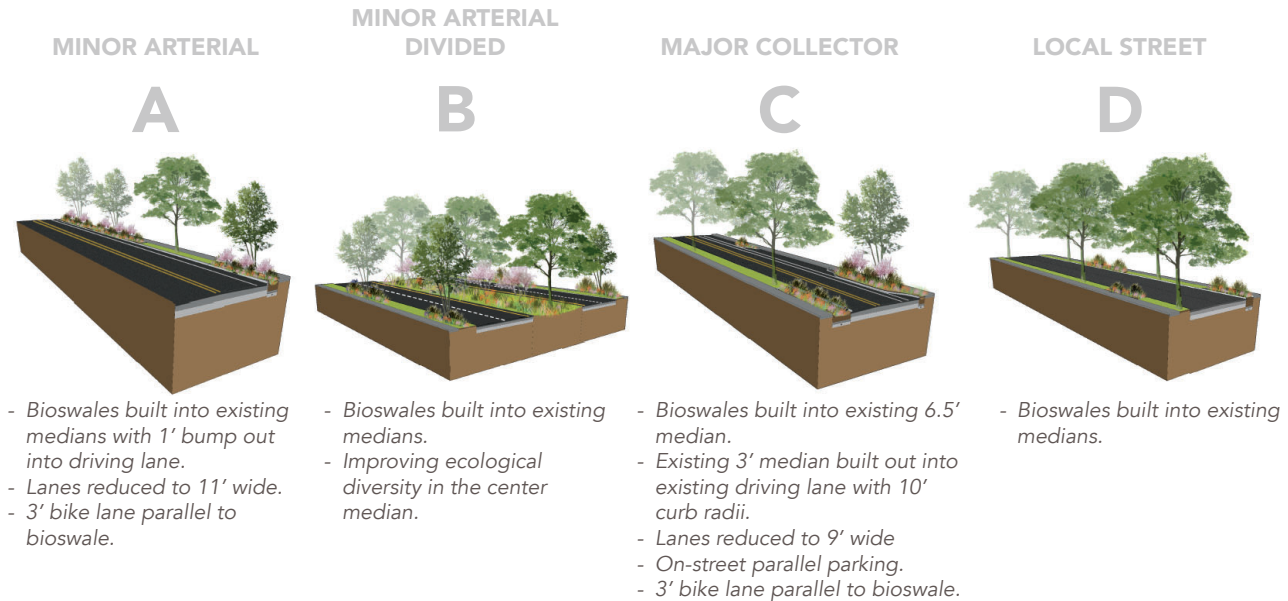


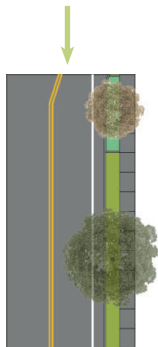
Figure 36: Bioswale Prototypes Base Designs

MINOR ARTERIAL

A

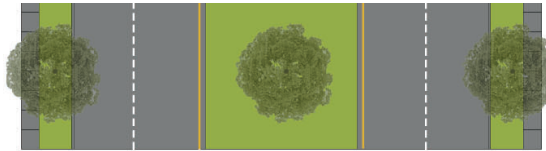


- 13' lanes
- 3' median
- 4' sidewalk

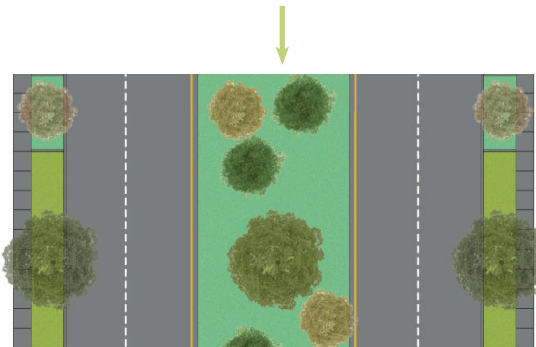


MINOR ARTERIAL DIVIDED

B

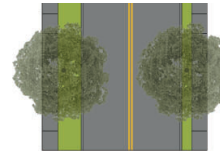


- 17' lanes
- 39' center median
- 9' side medians
- 5' sidewalks



MAJOR COLLECTOR

C

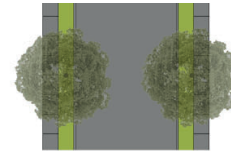


- one 9' lane
- one 16' lane
- on-street parking
- one 6.5' median
- one 3' median
- 4' sidewalks

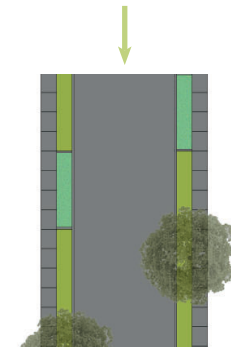


LOCAL STREET

D



- 13' lanes
- on-street parking
- 4.5' medians
- 4' sidewalks



BEFORE

AFTER

Figure 37: Before & After - Bioswale Prototypes Base Designs

Once a base design is established for the bioswale, the next existing condition to consider is the contextual land use. The land uses in North Town Fork Creek include residential, commercial, or park and green space contexts. By identifying the adjacent land use to the bioswale, an appropriate plant palette may be specified with varying levels of plant heights and density. In more residential settings, based on the findings of the study, a shorter and less dense plant palette should be considered to create a more “ordered” look while maintaining a high level of biodiversity (see Figure 38). After the contextual land use has been identified, the plant palette must be further nuanced to meet water needs based on how the proposed bioswale is situated on a slope. If the bioswale sits at the top or on the slope, water will drain out, creating a drier environment. Therefore, plants that are tolerant of drought should be specified. Bioswales situated at the base of a slope will collect water. Therefore, plants that have higher water needs should be specified. In any case, the right-of-way bioswale will be situated adjacent to a road. Specified plants must be tolerant of salts and other leached pollutants that are common in a roadway condition. See Figure 39 and Table 8 for nuanced plant groups that would be suitable to specify in North Town Fork Creek bioswales based on land use context and slope.



Figure 38: Orderly Planted Right-Of-Way Bioswale

CONTEXTUAL LAND USE	RESIDENTIAL 1	COMMERCIAL 2	GREEN SPACE 3
MEDIUM - WET PLANT PALETTE (BASE OF SLOPE) X	<i>Betula nigra</i> <i>Clethra alnifolia</i> <i>Hemerocallis</i> sp. <i>Hypericum kalmianum</i> <i>Iris sibirica</i> <i>Iris virginica</i> <i>Itea virginica</i> <i>Liatris spicata</i> <i>Liriope muscari</i> <i>Panicum virgatum</i>	<i>Hemerocallis</i> sp. <i>Hypericum kalmianum</i> <i>Iris sibirica</i> <i>Iris virginica</i> <i>Itea virginica</i> <i>Liatris spicata</i> <i>Liriope muscari</i> <i>Nyssa sylvatica</i> <i>Panicum virgatum</i>	<i>Aronia melanocarpa</i> <i>Betula nigra</i> <i>Carex grayi</i> <i>Carex muskingumensis</i> <i>Hibiscus moscheutos</i> <i>Iris virginica</i> <i>Juncus spicata</i> <i>Liatris spicata</i> <i>Panicum virgatum</i> <i>Taxodium distichum</i>
DRY - MEDIUM PLANT PALETTE (TOP OF SLOPE) Y	<i>Betula nigra</i> <i>Hemerocallis</i> sp. <i>Hypericum kalmianum</i> <i>Liatris spicata</i> <i>Liriope muscari</i> <i>Oenothera speciosa</i> <i>Panicum virgatum</i> <i>Quercus shumardii</i> <i>Schizachyrium scoparium</i> <i>Sedum 'Autumn Joy'</i>	<i>Bouteloua curtipendula</i> <i>Hemerocallis</i> sp. <i>Hesperaloe parviflora</i> <i>Hypericum kalmianum</i> <i>Liriope muscari</i> <i>Panicum virgatum</i> <i>Quercus shumardii</i> <i>Rhus aromatica 'Gro-Low'</i> <i>Schizachyrium scoparium</i> <i>Sedum 'Autumn Joy'</i>	<i>Betula nigra</i> <i>Bouteloua curtipendula</i> <i>Hesperaloe parviflora</i> <i>Liatris spicata</i> <i>Liriope muscari</i> <i>Oenothera macrocarpa</i> <i>Oenothera speciosa</i> <i>Panicum virgatum</i> <i>Schizachyrium scoparium</i> <i>Sedum 'Autumn Joy'</i>

Figure 39: Nuanced Plant Palette Suitable for Bioswale Prototypes in North Town Fork Creek

Table 8: Plant Species Suitable for North Town Fork Creek (Adapted: KCMO 2018)

BOTANIC NAME	COMMON NAME	PLANT TYPE	MATURE HEIGHT	MATURE SPREAD	WATER REQUIREMENTS
<i>Aronia melanocarpa</i>	Black Chokeberry	Shrub	2 - 3 feet	4 - 5 feet	Med
<i>Betula nigra</i>	River Birch	Tree	40 - 70 feet	20 - 30 feet	Dry - Wet
<i>Bouteloua curtipendula</i>	Sideoats Grama	Grass	1 - 1.5 feet	1 - 1.5 feet	Dry
<i>Carex grayi</i>	Gray's Sedge	Sedge	2 - 3 feet	2 - 3 feet	Med - Wet
<i>Carex muskingmensis</i>	Palm Sedge	Sedge	2 - 3 feet	2 - 3 feet	Med - Wet
<i>Clethra alnifolia</i>	Summersweet	Shrub	2 - 4 feet	3 - 5 feet	Med - Wet
<i>Heemerocallis</i> sp.	Daylily	Forb	1.5 - 2.5 feet	1.5 - 2.5 feet	Med
<i>Hesperaloe parviflora</i>	Red Yucca	Shrub	2 - 3 feet	2 - 3 feet	Dry
<i>Hibiscus moscheutos</i>	Rose Mallow	Shrub	3 - 8 feet	3 - 8 feet	Med - Wet
<i>Hypericum kalmianum</i>	St. John's Wort	Shrub	2 - 3 feet	1 - 2 feet	Med

Table 8: Plant Species Suitable for North Town Fork Creek (Continued)

BOTANIC NAME	COMMON NAME	PLANT TYPE	MATURE HEIGHT	MATURE SPREAD	WATER REQUIREMENTS
<i>Iris sibirica</i>	Siberian Iris	Forb	3 - 4 feet	2.5 - 3 feet	Med - Wet
<i>Iris virginica</i>	Blue Flag Iris	Forb	1 - 3 feet	1 - 3 feet	Med - Wet
<i>Itea virginica</i>	Virginia Sweetspire	Shrub	1.5 - 2 feet	2 - 2.5 feet	Med - Wet
<i>Juncus effusus</i>	Soft Rush	Grass-Like	2 - 4 feet	2 - 4 feet	Wet
<i>Liatris spicata</i>	Marsh Blazing Star	Forb	2 - 4 feet	2 - 4 feet	Med
<i>Liriope muscari</i>	Lilyturf	Forb	1 - 2 feet	1 - 2 feet	Med
<i>Nyssa sylvatica</i>	Blackgum	Tree	30 - 50 feet	20 - 30 feet	Med - Wet
<i>Oenothera macrocarpa</i>	Missouri Evening Primrose	Forb	0.75 - 1 feet	1 - 1.5 feet	Dry - Med
<i>Oenothera speciosa</i>	Pink Evening Primrose	Forb	0.75 - 2 feet	1 - 1.5 feet	Dry - Med
<i>Panicum virgatum</i>	Switchgrass	Grass	4 - 6 feet	2 - 2.5 feet	Med - Wet

Table 8: Plant Species Suitable for North Town Fork Creek (Continued)

BOTANIC NAME	COMMON NAME	PLANT TYPE	MATURE HEIGHT	MATURE SPREAD	WATER REQUIREMENTS
<i>Quercus shumardii</i>	Shumard Red Oak	Tree	40 - 60 feet	30 - 40 feet	Dry - Med
<i>Rhus aromatica</i> 'Gro-Low'	Gro-Low Fragrant Sumac	Shrub	1.5 - 2 feet	6 - 8 feet	Dry - Med
<i>Schizachyrium scoparium</i>	Little Bluestem	Grass	2 - 3 feet	1 - 2 feet	Dry
<i>Sedum</i> 'Autumn Joy'	Autumn Joy Sedum	Forb	1 - 1.5 feet	1 - 1.5 feet	Dry - Med
<i>Taxodium disticum</i>	Baldcypress	Tree	40 - 50 feet	20 - 30 feet	Dry - Wet



a. *Itea virginica*



b. *Carex muskingumensis*



c. *Oenothera speciosa*

Figure 40: Plant Species Suitable for North Town Fork Creek

PROTOTYPE 1

Road Class: Minor Arterial

Context: Park & Green Space

Situation: Top of Slope

A - 3 - Y

Street trees to be placed every 30' on street frontage within 10 feet of ROW

3' wide bike lane

"wild" planting style appropriate for contextual land use

Place lower height plants closest to curb and sidewalk edges with taller/looser form plants in the middle of bioswale

driving lane narrowed to accommodate bike lane

1' bump out for ROW bioswale

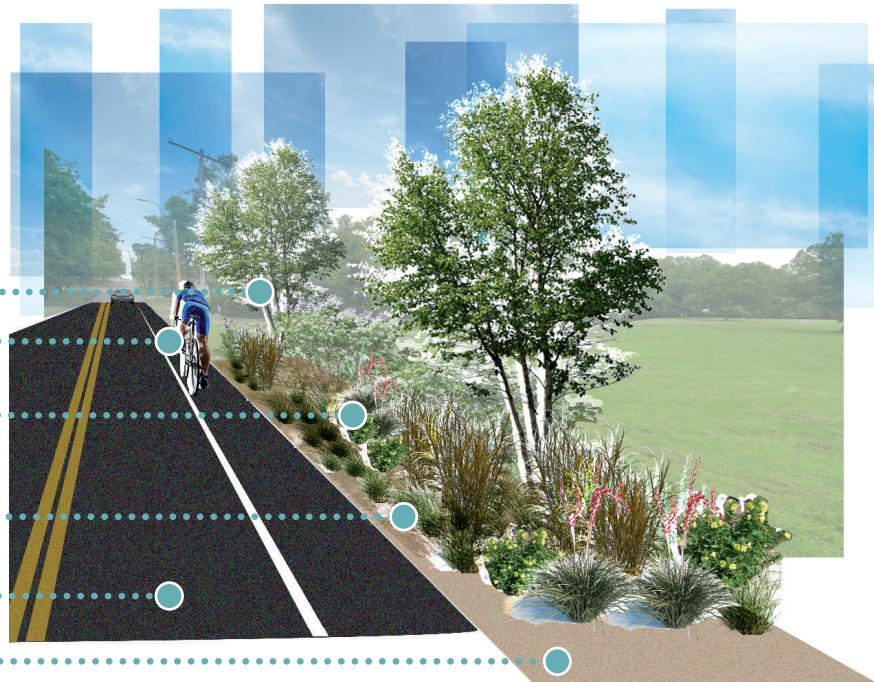


Figure 41: Bioswale Prototype 1

PROTOTYPE 2

Road Class: Minor Arterial - Divided

Context: Commercial

Situation: Base of Slope

B - 2 - X

Street trees to be placed every 30' on street frontage within 10 feet of ROW

"ordered" plant style appropriate for contextual land use

Place lower height plants closest to curb and sidewalk edges with taller/looser form plants in the middle of bioswale

increased biodiversity in center median

Bioswale built into existing median



Figure 42: Bioswale Prototype 2

PROTOTYPE 3

Road Class: Major Collector

Context: Residential & Green Space

Situation: Top of Slope

C - 1+2 - Y

3' wide bike lane

driving lane narrowed to
accommodate bike lane

Place lower height plants closest to curb
and sidewalk edges with taller/looser
form plants in the middle of bioswale

Street trees to be placed every 30' on
street frontage within 10 feet of ROW

"ornamental" and "ordered"
planting style appropriate for
contextual land use

on-street parallel parking
with 10' curb radius

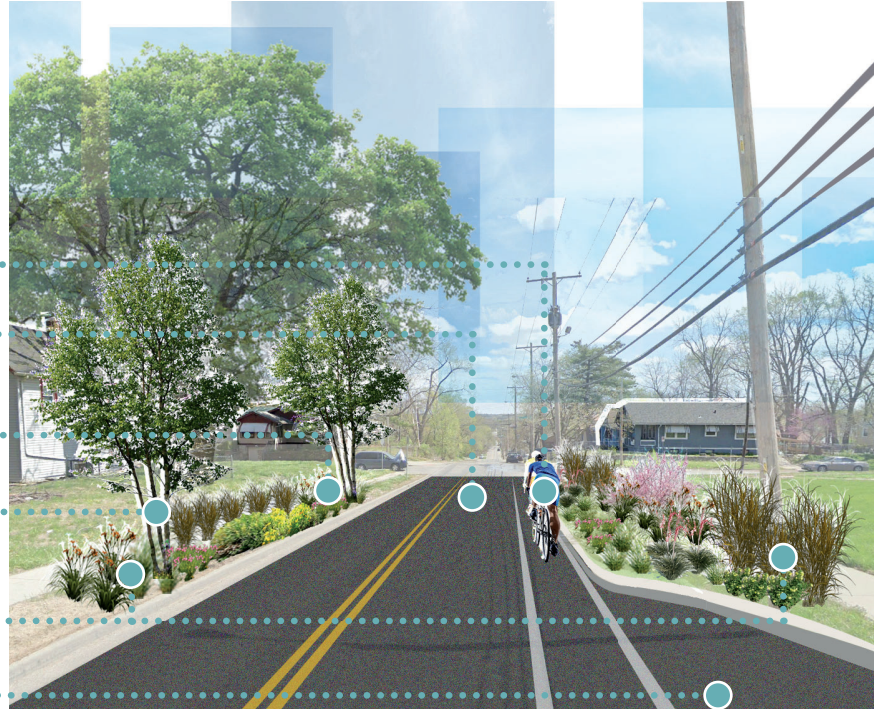


Figure 43: Bioswale Prototype 3

PROTOTYPE 4

Road Class: Local Street
Context: Residential
Situation: Base of Slope

D - 1 - X

Street trees to be placed every 30' on
street frontage within 10 feet of ROW

"ornamental" plant style appropriate
for contextual land use

Place lower height plants closest to curb
and sidewalk edges with taller/looser
form plants in the middle of bioswale

Bioswale built into existing median



Figure 44: Bioswale Prototype 4

EDUCATION ABOUT GREEN STORMWATER INFRASTRUCTURE

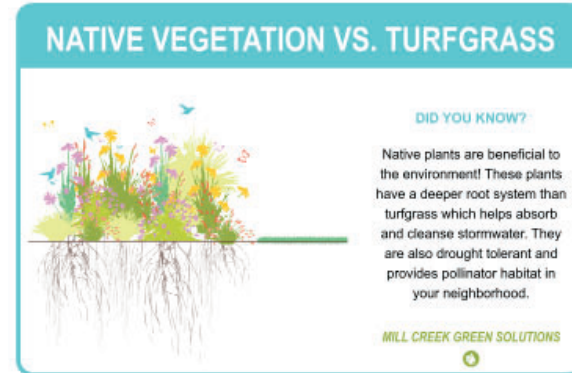
A strategy to improve familiarity and environmental awareness about the benefits of green stormwater infrastructure is to implement educational signage in conjunction with the landscape. The Marlborough Community Coalition's green stormwater infrastructure projects are clearly labeled and provide education about the landscape and how it works (see Figure 45). This may be a contributing factor as to why residents in this area tend to have more environmental awareness than the residents in North Town Fork Creek. Therefore, educational signage should be designed to accompany the proposed green stormwater infrastructure project when introducing it to a new audience. Educational signs should be inviting to read with easy-to-understand language and graphic diagrams. See Figure 46 for examples of educational signage.



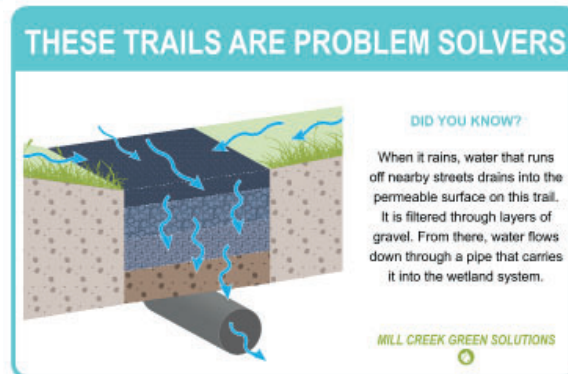
Figure 45: Educational Sign in Marlborough Community Coalition



a: Native Vegetation at Your Home



c: Native Vegetation vs. Turfgrass



b: These Trails are Problem Solvers

Figure 46: Designed Educational Signage



d: Welcome to the Wetland Park



f: Wetland Park: A Rain Ready Site



e: Native Vegetation Scavenger Hunt

Figure 46: Designed Educational Signage (Continued)

IMPROVING GREEN STORMWATER INFRASTRUCTURE IN COMMUNITIES

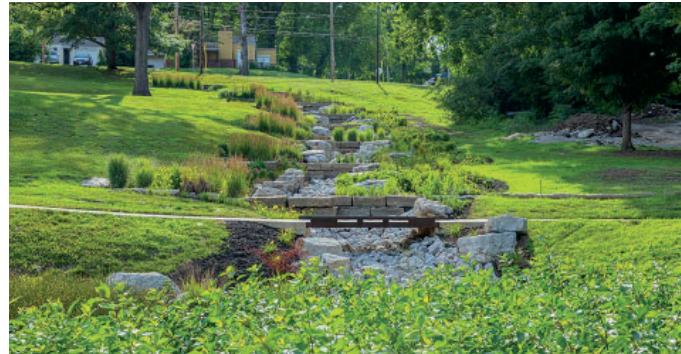
The Marlborough Community Coalition has had green stormwater infrastructure present in their neighborhood for nearly 10 years. Residents of the area should be relatively aware of its presence and its environmental importance. Although respondents were not as familiar with the landscape or did not recognize it in their day-to-day lives through presented photos, they did show environmental awareness to its function of reducing flood potential and the benefits of high biodiversity and native planting. Marlborough Community Coalition residents preferred the high biodiversity and taller heights of native plants that are already present in their community. They recognize them “not as weeds” and “beneficial to the environment”. Residents feel safe around all forms of green stormwater infrastructure and around the native species.

Residents of Marlborough Community Coalition indicated that they were not interested in the types of plants associated with traditionally-manicured landscapes, primarily short cut grass. Many of the parks present in Marlborough include constructed wetlands, such as at the 81st Street and Troost Avenue Marlborough Park and Community Space (see Figure 29, Site B), or bioswales, such as at Arleta Park (see Figure 29, Site C; see Figure 47), but also include a vast amount of a cut lawn. Not only is the grass not native to the region, it also requires supplemental irrigation and extensive maintenance practices, such as mowing and edging. Park programming requires some lawn for play and recreation; however, the entire park does not have to be cut grass entirely. To improve parks and represent the preferences of neighborhood residents, sections of the lawn may be overseeded with native short-grass prairie plants that are drought tolerant but also provide water holding and

cleansing capabilities among other environmental benefits (Canfield et al 2018a). Short-grass prairies also require minimal supplemental maintenance practices throughout the year. Overseeding is proposed at both the 81st and Troost Avenue Marlborough Park and Community Space (2 acres; see Figure 48) and at Arleta Park (1 acre; see Figure 49). See Table 9 for a list of species that would be suitable for creating a short-grass prairie in the Marlborough Community Coalition.



a: 81st and Troost Avenue Marlborough Park & Community Space



b: Arleta Park

Figure 47: Green Stormwater Infrastructure in Parks



*Figure 48: 2-acre overseeding of native short-grass prairie plants at 81st and Troost
Marlborough Park & Community Space*



Figure 49: 1-acre overseeding of native short-grass prairie plants at Arleta Park

Table 9: Native Plant Species Suitable for Marlborough Community Coalition (Adapted: KCMO 2018)

BOTANIC NAME	COMMON NAME	PLANT TYPE	MATURE HEIGHT	MATURE SPREAD	WATER REQUIREMENTS
<i>Asclepias tuberosa</i>	Butterfly Milkweed	Forb	1 - 2.5 feet	1 - 1.5 feet	Dry - Med
<i>Bouteloua curtipendula</i>	Sideoats Grama	Grass	1 - 1.5 feet	1 - 1.5 feet	Dry
<i>Bouteloua gracilis</i>	Blue Grama	Grass	1 - 2 feet	1 - 2 feet	Dry - Med
<i>Carex pensylvanica</i>	Pennsylvania Sedge	Sedge	0.5 - 1 feet	0.5 - 1 feet	Dry - Med
<i>Eragrostis spectabilis</i>	Purple Love Grass	Grass	1 - 2 feet	1 - 2 feet	Dry - Med
<i>Monarda bradburiana</i>	Eastern Beebalm	Forb	1 - 2 feet	1 - 2 feet	Dry - Med
<i>Oenothera macrocarpa</i>	Missouri Evening Primrose	Forb	0.75 - 1 feet	1 - 1.5 feet	Dry - Med
<i>Oenothera speciosa</i>	Pink Evening Primrose	Forb	0.75 - 2 feet	1 - 1.5 feet	Dry - Med
<i>Pycnanthemum tenuifolium</i>	Slender Mountain Mint	Forb	2 - 3 feet	2 - 3 feet	Dry - Med
<i>Redbeckia fulgida</i>	Black-Eyed Susan	Forb	2 - 3 feet	1 - 2 feet	Dry - Med

Table 9: Native Plant Species Suitable for Marlborough Community Coalition (Continued)

BOTANIC NAME	COMMON NAME	PLANT TYPE	MATURE HEIGHT	MATURE SPREAD	WATER REQUIREMENTS
<i>Schizachyrium scoparium</i> 'Blaze'	Blaze Little Bluestem	Grass	2 - 3 feet	2 - 3 feet	Dry
<i>Sedum</i> 'Autumn Joy'	Autumn Joy Sedum	Sedum	1 - 1.5 feet	1 - 1.5 feet	Dry - Med
<i>Solidago speciosa</i>	Showy Goldenrod	Forb	2 - 3 feet	2 - 3 feet	Dry - Med
<i>Sporobolus heterolepis</i>	Prairie Dropseed	Grass	2 - 3 feet	2 - 3 feet	Dry - Med
<i>Symphyotrichum oblongifolium</i>	Aromatic Aster	Forb	1 - 3 feet	1 - 3 feet	Dry - Med



a: *Bouteloua curtipendula*



b: *Schizachyrium scoparium*



c: *Solidago speciosa*

Figure 50: Native Species Suitable for Marlborough Community Coalition

CONCLUSION

CHAPTER 6

CONCLUSION

STUDY IMPLICATIONS AND CONTRIBUTIONS

In this new age of urbanism and with the rise of climate change affecting the satisfaction of people's basic needs, the implementation of green stormwater infrastructure is highly important to protect natural resources and safety within neighborhoods. By understanding how familiarity and environmental awareness impact aesthetic preferences, feelings of safety, and neighborhood satisfaction, city officials, planners, and landscape architects will have better strategies as they continue to shape the urban fabric of our cities. These strategies will confront the increasing battles of flooding and contamination in our water systems and could better engage local communities as they develop and maintain such infrastructure.

This study contributes to the body of research and knowledge regarding the impact of green stormwater infrastructure on the community beyond its physical functions. While there is a comparative study that looked at the preferences of green infrastructure and green stormwater infrastructure between design professionals and laypeople (Suppatkitssaporn et al. 2019a), this study has examined how familiarity and environmental awareness of residents affects their preferences and feelings of safety towards green stormwater infrastructure as well as their overall neighborhood satisfaction.

The literature has suggested familiarity and environmental awareness impact how people perceive their landscape. This study found that familiarity and environmental awareness do in fact play an important role in shaping the aesthetic preferences people hold for their environment, particularly preferences about the landscape's level of biodiversity and native plant species. When residents are more familiar with, exposed to, and aware of the environmental benefits of green stormwater infrastructure, they tend to prefer high plant diversity and native plant species while also showing lower preference toward the low biodiversity and exotic plant species of traditionally-manicured landscapes. This finding can be attributed to an increased education from existing green stormwater infrastructure projects, education programs, and signage. However, implementation must be done incrementally. People who are not as exposed to green stormwater infrastructure tend to have greater preference to the traditionally-manicured forms of cut grasses and low biodiversity, even though they may understand the importance, of high biodiversity and native planting. Therefore, green stormwater infrastructure can be introduced, but based on the community's feedback, constructed wetlands in parks and right-of-way bioswales should be designed with a diverse array of native plants that are "ordered" and low in height and density. Over time, more density and taller plants may be introduced as well as other forms of green stormwater infrastructure as residents become comfortable with the landscape and come to prefer these design characteristics.

PROJECT LIMITATIONS

It should be acknowledged that this study is focused on a small sample size, and the selection of the participants may be biased because the researcher only recruited residents who were spending time in public spaces. This study relies on the convenience sampling of a narrow target population of 95 participants as a result of the time limitation to complete the research. The limitations of the sample size narrow the confidence interval (respondents' margin of error) and lower the generalizability of the study, especially since it included two different target populations.

FUTURE RESEARCH

Due to the limited sample size of the population and limited time to conduct this study, further research is needed to confirm these findings. The study highlighted the value of long-term exposure to green stormwater infrastructure and environmental awareness as important factors in changing people's aesthetic preferences and sense of safety towards native planting and biodiversity at neighborhood level over time. This could serve as a foundation to dig deeper into people's attitudes towards green stormwater infrastructure characteristics at a more refined scale such as block level to examine the extent to which living on the blocks with and without elements of green stormwater infrastructure would be associated with preferences for native planting and biodiversity as well as sense of safety, wellbeing, and neighborhood satisfaction. The findings of future research are expected to strengthen the position that familiarity and environmental awareness do impact the aesthetic preferences and feelings of safety people hold for their environment as well as continue to shape community engagement and design strategies and city policy involving green stormwater infrastructure into the future.

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CHAPTER 7

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FIGURES

Figure 1: Seagrist, E. (2021). *Circa 1980s Brush Creek Flood on Blue Parkway* [photograph]. Sourced from Community Builders of Kansas City.

Figure 2: Seagrist, E. (2022). *Study Process* [diagram].

Figure 3: Seagrist, E. (2021). *Combined Sewer System and Water Contamination* [diagram].

Figure 4: Seagrist, E. (2021). *How Green Stormwater Infrastructure Works* [diagram].

Figure 5: Unknown. (n.d.). *Midwest Regional Cues to Care* [photograph]. Courtesy of PxHere. Retrieved from: <https://pxhere.com/en/photo/569321>

Figure 6: tducas5000 (2017). *Spring in my Front Yard* [photograph]. Courtesy of Flickr. Retrieved from: <https://flic.kr/p/Tgp9sZ>

Figure 7: Seagrist, E. (2021). *Study Area in the Context of the Kansas City Metropolitan Region* [map]. Adapted from ArcGIS Earth.

Figure 8: Seagrist, E. (2021). *Mill Creek and Overflow Outfall for Combined Sewer System into Mill Creek in North Town Fork Creek* [collage].

Image a: Seagrist, E. (2021). *Mill Creel in North Town Fork Creek, Kansas City, MO* [photograph].

Image b: Seagrist, E. (2021). *Overflow Outfall for Combined Sewer System into Mill Creek in North Town Fork Creek, Kansas City, MO* [photograph].

FIGURES (CONTINUED)

Figure 9: Seagrist, E. (2022). *GSI 43* [photograph].

Figure 10: Seagrist, E. (2022). *Types of Urban Greening Present in Study Areas* [collage].

Image a: Seagrist, E. (2021). *UM 16* [photograph].

Image b: Seagrist, E. (2021). *TM 2* [photograph].

Image c: Seagrist, E. (2021). *GSI 17* [photograph].

Figure 11: Seagrist, E. (2022). *Study Variables* [diagram].

Figure 12: Seagrist, E. (2022). *North Town Fork Creek Participants' Demographics* [graph].

Figure 13: Seagrist, E. (2022). *Marlborough Community Coalition Participants' Demographics* [graph].

Figure 14: Seagrist, E. (2022). *Traditionally-Manicured Landscapes in Vacant Lots* [collage].

Image a: Seagrist, E. (2021). *TM 4* [photograph].

Image b: Seagrist, E. (2021). *TM 12* [photograph].

Figure 15: Seagrist E. (2021). *Not as Familiar Right-Of-Way Bioswale* [photograph].

Figure 16: Seagrist, E. (2021). *TM 13* [photograph].

FIGURES (CONTINUED)

Figure 17: Seagrist, E. (2022). *Unmaintained Sidewalk Landscapes* [collage].

Image a: Seagrist, E. (2021). *UM 16* [photograph].

Image b: Seagrist, E. (2021). *UM 21* [photograph].

Figure 18: Seagrist, E. (2022). *Right-Of-Way Bioswales* [collage].

Image a: Seagrist, E. (2021). *GSI 17* [photograph].

Image b: Seagrist, E. (2021). *GSI 19* [photograph].

Figure 19: Seagrist, E. (2021). *TM 26* [photograph].

Figure 20: Seagrist, E. (2021). *UM 29* [photograph].

Figure 21: Seagrist, E. (2022). *Summary of General Description Findings – Familiarity, Biodiversity, Native Planting, and Feelings of Safety* [collage].

Image a: Seagrist, E. (2021). *TM 4* [photograph].

Image b: Seagrist, E. (2021). *GSI 7* [photograph].

Image c: Seagrist, E. (2022). *NTFC: Familiarity* [graph].

Image d: Seagrist, E. (2021). *TM 13* [photograph].

FIGURES (CONTINUED)

Image e: Seagrist, E. (2021). *GSI 7* [photograph].

Image f: Seagrist, E. (2022). *NTFC: Biodiversity* [graph].

Image g: Seagrist, E. (2021). *TM 26* [photograph].

Image h: Seagrist, E. (2021). *UM 29* [photograph].

Image i: Seagrist, E. (2022). *NTFC: Native Planting* [graph].

Image j: Seagrist, E. (2021). *TM 37* [photograph].

Image k: Seagrist, E. (2021). *UM 41* [photograph].

Image l: Seagrist, E. (2022). *NTFC: Feelings of Safety* [graph].

Image m: Seagrist, E. (2021). *GSI 11* [photograph].

Image n: Seagrist, E. (2022). *MCC: Familiarity* [graph].

Image o: Seagrist, E. (2021). *GSI 17* [photograph].

Image p: Seagrist, E. (2021). *UM 21* [photograph].

Image q: Seagrist, E. (2022). *MCC: Biodiversity* [graph].

Image r: Seagrist, E. (2021). *GSI 30* [photograph].

FIGURES (CONTINUED)

Image s: Seagrist, E. (2021). *TM 32* [photograph].

Image t: Seagrist, E. (2022). *MCC: Native Planting* [graph].

Image u: Seagrist, E. (2021). *GSI 42* [photograph].

Image v: Seagrist, E. (2021). *UM 41* [photograph].

Image w: Seagrist, E. (2022). *MCC: Feelings of Safety* [graph].

Figure 22: Seagrist, E. (2022). Summary of General Description Findings – Environmental Awareness & Neighborhood Satisfaction [collage].

Image a: Seagrist, E. (2022). *NTFC and Environmental Awareness* [graph].

Image b: Seagrist, E. (2022). *MCC and Environmental Awareness* [graph].

Image c: Seagrist, E. (2022). *NTFC and Neighborhood Satisfaction* [graph].

Image d: Seagrist, E. (2022). *MCC and Neighborhood Satisfaction* [graph].

Figure 23: Seagrist, E. (2022). *Photo Cluster "famil_HBD_TPH" for North Town Fork Creek* [collage]. Generated by IBM SPSS, version 28.

Image a: Seagrist, E. (2021). *GSI 3* [photograph].

Image b: Seagrist, E. (2021). *UM 5* [photograph].

FIGURES (CONTINUED)

Image c: Seagrist, E. (2021). *GSI 6* [photograph].

Image d: Seagrist, E. (2021). *GSI 11* [photograph].

Figure 24: Seagrist, E. (2022). *Photo Cluster "famil_HBD" for Marlborough Community Coalition* [collage]. Generated by IBM SPSS, version 28.

Image a: Seagrist, E. (2021). *GSI 3* [photograph].

Image b: Seagrist, E. (2021). *TM 4* [photograph].

Image c: Seagrist, E. (2021). *UM 5* [photograph].

Image d: Seagrist, E. (2021). *GSI 6* [photograph].

Image e: Seagrist, E. (2021). *GSI 7* [photograph].

Figure 25: Seagrist, E. (2022). *North Town Fork Creek Associations - Effect of Familiarity on Aesthetic Appreciation of Biodiversity and Native Plantings in the Landscape* [diagram].

Figure 26: Seagrist, E. (2022). *North Town Fork Creek Associations - Effect of Familiarity and Environmental Awareness on Aesthetic Appreciation of Biodiversity and Native Plantings in the Landscape* [diagram].

Figure 27: Seagrist, E. (2022). *Marlborough Associations - Effect of Familiarity and Environmental Awareness on Aesthetic Appreciation of Biodiversity and Native Plantings in the Landscape* [diagram].

FIGURES (CONTINUED)

Figure 28: Seagrist, E. (2022). *Marlborough Associations - Effect of Familiarity and Environmental Awareness on Feelings of Safety in the Landscape* [diagram].

Figure 29: Seagrist, E. (2022). *Locations of Design Interventions* [map]. Adapted from ArcGIS.

Figure 30: Seagrist, E. (2021). *GSI 7* [photograph].

Figure 31: Seagrist, E. (2021). *Suitable in North Town Fork Creek for Constructed Wetland* [diagram]. Adapted from Google Earth.

Figure 32: Seagrist, E. (2021). *Proposed Earthwork for Wetland Park* [diagram].

Figure 33: Seagrist, E. (2021). *Master Plan of Wetland Park* [diagram].

Figure 34: Seagrist, E. (2021). *Views of Wetland Park* [collage].

Image a: Seagrist, E. (2021). *Wetland Pond* [rendering]. Lumion version 12.0.2.

Image b: Seagrist, E. (2021). *Boardwalk Across Wetland Pond* [rendering]. Lumion version 12.0.2.

Image c: Seagrist, E. (2021). *Native Prairie at Wetland Park* [rendering]. Lumion version 12.0.2.

Figure 35: Seagrist, E. (2021). *Bioswale Prototype Design Considerations* [diagram].

Figure 36: Seagrist, E. (2021). *Bioswale Prototypes Base Design* [diagram].

Figure 37: Seagrist, E. (2021). *Before and After: Bioswale Prototypes Base Designs* [diagram].

FIGURES (CONTINUED)

Figure 38: Seagrist, E. (2021). *GSI 17* [photograph].

Figure 39: Seagrist, E. (2022). *Nuanced Plant Palette Suitable for Bioswale Prototypes in North Town Fork Creek* [diagram].

Figure 40: Seagrist, E. (2022). *Native Species Suitable for North Town Fork Creek* [collage].

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Figure 41: Seagrist, E. (2021). *Bioswale Prototype 1* [diagram].

Figure 42: Seagrist, E. (2021). *Bioswale Prototype 2* [diagram].

Figure 43: Seagrist, E. (2021). *Bioswale Prototype 3* [diagram].

Figure 44: Seagrist, E. (2021). *Bioswale Prototype 4* [diagram].

Figure 45: Seagrist, E. (2021). *Educational Signage at Wetland Park at 81st and Troost Avenue in Marlborough Community Coalition, Kansas City, MO* [photograph].

FIGURES (CONTINUED)

Figure 46: Seagrist, E. (2022). *Designed Educational Signage* [collage].

Image a: Seagrist, E. (2021). *Native Vegetation at Your Home* [diagram].

Image b: Seagrist, E. (2021). *These Trails are Problem Solvers* [diagram].

Image c: Seagrist, E. (2021). *Native Vegetation vs. Turfgrass* [diagram].

Image d: Seagrist, E. (2021). *Welcome to the Wetland Park* [diagram].

Image e: Seagrist, E. (2021). *Native Vegetation Scavenger Hunt* [diagram].

Image f: Seagrist, E. (2021). *Wetland Park: Rain Ready Site* [diagram].

Figure 47: Seagrist, E. (2022). *Green Stormwater Infrastructure in Parks* [collage].

Image a: Seagrist, E. (2021). *GSI 42* [photograph].

Image b: Unknown. (n.d.). *Arleta Park 4* [photograph]. From: Target Green East Marlborough Green Infrastructure Improvements. Courtesy of Burns & McDonnell. Retrieved from <https://www.burnsmcd.com/projects/target-green-east-marlborough-green-infrastructure>.

Figure 48: Seagrist, E. (2022). *Proposed Overseeding at 81st & Troost Avenue* [diagram]. Adapted from Google Earth.

Figure 49: Seagrist, E. (2022). *Proposed Overseeding at Arleta Park* [diagram]. Adapted from Google Earth.

FIGURES (CONTINUED)

Figure 50: Seagrist, E. (2022). *Native Species Suitable for Marlborough Community Coalition* [collage].

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Image c: Seagrist, E. (2021). *Middle Blue River Basin Green Solutions Pilot Project, 81st & Lydia, Kansas City, MO* [photograph].

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TABLES (CONTINUED)

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Table 6: Seagrist, E. (2022). North Town Fork Creek “Familiarity” Photo Cluster Correlations. Generated in IBM SPSS, version 28.

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Table 8: Seagrist, E. (2022). Native Plant Species Suitable for North Town Fork Creek. Adapted from City of Kansas City, Missouri.

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Table 9: Seagrist, E. (2022). Native Plant Species Suitable for Short-Grass Prairie in Marlborough Community Coalition. Adapted from City of Kansas City, Missouri.

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GLOSSARY

APPENDIX A

GLOSSARY

AESTHETIC

Of, or relating to, or dealing with aesthetics or the beautiful (Merriam-Webster n.d.).

BEST MANAGEMENT PRACTICE (BMP)

A practice, or combination or practices, that is determined to be an effective and practical (including technological, economic, and institutional considerations) means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals (North Carolina Forest Service 2017).

BIODIVERSITY

Biological diversity in an environment as indicated by numbers of difference species of plants and animals (Merriam-Webster n.d.).

BIOSWALE

A long, channeled depression or trench that receives rainwater runoff (as from a parking lot) and has vegetation (such as grasses, flowering herbs, and shrubs) and organic matter (such as mulch) to slow water infiltration and filter out pollutants (Merriam-Webster n.d.)

CLIMATE CHANGE

A significant and long-lasting change in the Earth's climate and weather patterns (Merriam-Webster n.d.).

COMBINED SEWER SYSTEM

Sewers that are designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe (Environmental Protection Agency 2017).

CONSTRUCTED WETLAND

Highly engineered wetlands designed to either retain (as a wet pond) or detain (as a dry pond) water on site (Strom, Nathan, & Woland 2009).

CUES-TO-CARE

Actions taken by humans that indicate a landscape is well cared for and meets cultural expectations for maintenance (Nassauer, 1995).

ECOSYSTEM

The complex of a community of organisms and its environment functioning as an ecological unit (Merriam-Webster n.d.).

ENVIRONMENTAL PROTECTION AGENCY (EPA)

An independent agency in the executive branch charged with controlling and abating environmental pollution (Merriam-Webster, n.d.).

EXOTIC PLANT SPECIES

Introduced from another country: not native to the place where found (Merriam-Webster, n.d.)

GREEN INFRASTRUCTURE

Strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services (European Commission, n.d.)

GREEN ROOF

Use plants to improve a roof's performance and/or its appearance (Snodgrass & McIntyre 2010).

GREEN STORMWATER INFRASTRUCTURE (GSI)

A subcategory of Green Infrastructure that specifically looks at managing stormwater (Suppakittpaisarn et al. 2017).

IMPERVIOUS

Not allowing entrance or passage (Merriam-Webster, n.d.)

INFILTRATION PLANTER

Structures that often sit in the right-of-way beside roadways with open bottoms to allow stormwater to slowly infiltrate into the ground (City of Portland, Oregon 2006).

LANDSCAPE ARCHITECT

A person who develops land for human use and enjoyment through effective placement of structures, vehicular, and pedestrian ways, and plantings (Merriam-Webster n.d.).

NATIVE PLANT SPECIES

Grown, produced, or originating in a particular place or in the vicinity (Merriam-Webster n.d.).

PERMEABLE

Having pores or openings that permit liquids or gases to pass through (Merriam-Webster n.d.).

PLANNER (CITY PLANNER)

One whose job is to create a comprehensive or systematic plan or design of streets, parks, business areas, and residential areas within a city (Merriam-Webster n.d.).

RAIN GARDEN

Water is directed into these gardens and is absorbed by the plants' root system (K-State Research and Extension n.d.).

RIGHT OF WAY

A legal right of passage over another person's ground (Merriam-Webster n.d.).

URBANIZATION

The quality or state of being urbanized or the process of becoming urbanized (Merriam-Webster n.d.).

WASTEWATER

Water that has been used, as in a manufacturing process (Merriam-Webster n.d.).

WASTEWATER TREATMENT PLANT (WWTP)

A facility designed and constructed to receive, treat, or store wastewater from public sewer systems and for the reduction and handling of solids removed from such wastes (Law Insider n.d.).

WATER CONTAMINATION

To make unfit for use by the introduction of unwholesome or undesirable elements (Merriam-Webster n.d.).

WATERSHED

A region or area bounded peripherally by a divide and draining ultimately to a particular watercourse or body of water (Merriam-Webster n.d.).

STUDY TIMELINE

APPENDIX B

STUDY TIMELINE

Phasing	September				October					November				December				
	20 - 4	5 - 11	12 - 18	19 - 25	26 - 2	3 - 9	10 - 16	17 - 23	24 - 30	31 - 6	7 - 13	14 - 20	21 - 27	28 - 4	5 - 11	12 - 18	19 - 25	26 - 1
Phase 1: Proposal																		
Task 1: Literature Notes																		
Task 2: Literature Review																		
Task 3: Committee Members																		
Committee Member Search																		
Email Committee Members																		
Finalize Committee Members																		
Task 4: Proposal																		
Project Statement																		
Abstract																		
Submit to CELA					Initial												Final	
CELA Revisions																		
Outline																		
Preliminary Proposal																		
Preliminary Reviews																		
Final Proposal																		
Final Proposal Revisions																		
Phase 2: Masters Report																		
Task 1: Report																		
Preliminary Master's Report																		
Preliminary Master's Report Revisions																		
Substantial Completion Draft																		
Substantial Completion Reviews																		
Final Master's Report																		
Task 2: Methods & Data Collection																		
Take Photos																		
Survey Design																		
Pilot Study																		
IRB Submission																		
IRB Approval																		
Contact Neighborhood Associations																		
NTEC - Becky Forest																		
NTEC - Lisa Ray																		
MCC - Diane Hershberger																		
Data Collection																		
Travel to KC																		
MCC Neighborhood Meeting																		
Data Compilation																		
Data Analysis																		
Task 3: Book																		
Preliminary Design																		
Substantial Completion																		
Final Revisions																		
Final Printing																		
Phase 3: Defense																		
Task 1: Final Defense Slides																		
Task 2: Practice Presentations																		
Task 3: Final Defense																		
Task 4: Final Ballots Due																		
Phase 4: Graduation																		
Task 1: Commencement Exhibit																		
Poster																		
Task 2: Commencement																		

Phasing	January				February				March				April				May		
	2 - 8	9 - 15	16 - 22	23 - 29	30 - 5	6 - 12	13 - 19	20 - 26	27 - 5	6 - 12	13 - 19	20 - 26	27 - 2	3 - 9	10 - 16	17 - 23	24 - 30	1 - 7	8 - 14
Phase 1: Proposal																			
Task 1: Literature Notes																			
Task 2: Literature Review																			
Task 3: Committee Members																			
Committee Member Search																			
Email Committee Members																			
Finalize Committee Members																			
Task 4: Proposal																			
Project Statement																			
Abstract																			
Submit to CELA																			
CELA Revisions																			
Outline																			
Preliminary Proposal																			
Preliminary Reviews																			
Final Proposal																			
Final Proposal Revisions																			
Phase 2: Masters Report																			
Task 1: Report																			
Preliminary Master's Report																			
Preliminary Master's Report Revisions																			
Substantial Completion Draft																			
Substantial Completion Reviews																			
Final Master's Report																			
Task 2: Methods & Data Collection																			
Take Photos																			
Survey Design																			
Pilot Study																			
IRB Submission																			
IRB Approval																			
Contact Neighborhood Associations																			
NTFC - Becky Forest																			
NTFC - Lisa Ray																			
MCC - Diane Hershberger																			
Data Collection																			
Travel to KC																			
MCC Neighborhood Meeting																			
Data Completion																			
Data Analysis																			
Task 3: Book																			
Preliminary Design																			
Substantial Completion							Report	Review						Initial	Final ETDR				
Final Revisions															Order				
Final Printing																			Hard
Phase 3: Defense																			
Task 1: Final Defense Slides																			
Task 2: Practice Presentations																			
Task 3: Final Defense																			
Task 4: Final Ballots Due																			
Phase 4: Graduation																			
Task 1: Commencement Exhibit																			
Poster																			
Task 2: Commencement																			

IRB EXEMPT LETTER

APPENDIX C

ORIGINAL SUBMISSION



TO: Sara Hadari
Landscape Architect & Comm Plan

Proposal Number: IRB-10931

FROM: Rick Scheidt, Chair
Committee on Research Involving Human Subjects

DATE: 11/12/2021

RE: Proposal Entitled, "Green Stormwater Infrastructure and Neighborhood Satisfaction: A Comparison Study on Preferences and Degrees of Comfort."

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written - and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §104(d), category: Exempt Category 2 Subsection ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

Electronically signed by Rick Scheidt on 11/14/2021 9:08 AM ET

MODIFICATION



Electronic Signatures

Signed by Rick Scheidt (rscheidt@k-state.edu)

Reason: Chair

Signed at 12/28/2021 11:19 AM ET

TO: Sam Hadavi
Landscape Archit & Comm Plan

FROM: Rick Scheidt, Chair
Committee on Research Involving Human Subjects

DATE: 12/22/2021

RE: Proposal #IRB-10931, entitled "Green Stormwater Infrastructure and Neighborhood Satisfaction: A Comparison Study on Preferences and Degrees of Comfort."

MODIFICATION OF IRB PROTOCOL #IRB-10931, ENTITLED, "Green Stormwater Infrastructure and Neighborhood Satisfaction: A Comparison Study on Preferences and Degrees of Comfort"

EXPIRATION DATE: Exempt

The Committee on Research Involving Human Subjects (IRB) has reviewed and approved the request identified above as a modification of a previously approved protocol. **Please note that the original expiration remains the same.**

All approved IRB protocols are subject to continuing review at least annually, which may include the examination of records connected with the project. Announced in-progress reviews may also be performed during the course of this approval period by a member of the University Research Compliance Office staff. Unanticipated adverse events involving risk to subjects or to others must be reported immediately to the Chair of the IRB, and / or the URCO

It is important that your human subjects activity is consistent with submissions to funding / contract entities. It is your responsibility to initiate notification procedures to any funding / contract entity of any changes in your activity that affects the use of human subjects.

DATA COLLECTION TOOL

APPENDIX D

Dear Participant:

My name is Eliza Seagrist and I am a graduate student at Kansas State University. This survey is part of my graduate study "Green Stormwater Infrastructure and Neighborhood Satisfaction: A Comparison Study on Aesthetic Preferences and Feelings of Safety".

Your participation in this survey will be extremely helpful for the completion of my graduate work. Your participation is voluntary and completely anonymous. No personal information, including your name or contact information, will be collected with this survey. You may withdraw from participation at any time and skip any question you prefer not to respond. The total survey should approximately take you 10 minutes.

If you have any questions regarding this survey or research project, please contact me at my email: ecs11999@ksu.edu.

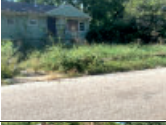
Thank you for participating.

A handwritten signature in black ink, appearing to read 'Eliza Seagrist', with a stylized, flowing script.

Eliza Seagrist

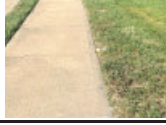
Read the following statement. For each image below, identify how you agree or disagree with the statement.

"I see many scenes similar to this image nearby my home."

1 = Strongly Disagree	2 = Disagree	3 = Neutral	4 = Agree	5 = Strongly Agree
1 2 3 4 5		1 2 3 4 5		
1 2 3 4 5		1 2 3 4 5		
1 2 3 4 5		1 2 3 4 5		
1 2 3 4 5		1 2 3 4 5		
1 2 3 4 5		1 2 3 4 5		
1 2 3 4 5		1 2 3 4 5		

Read the following statement. For each image below, identify how you agree or disagree with the statement.

"I like the variety of plants in this scene."

1 = Strongly Disagree	2 = Disagree	3 = Neutral	4 = Agree	5 = Strongly Agree
1 2 3 4 5		1 2 3 4 5		
1 2 3 4 5		1 2 3 4 5		
1 2 3 4 5		1 2 3 4 5		
1 2 3 4 5		1 2 3 4 5		
1 2 3 4 5		1 2 3 4 5		
1 2 3 4 5		1 2 3 4 5		

There are four (4) statements per image. For each image, identify how you agree or disagree with the statement.

1 = Strongly Disagree	2 = Disagree	3 = Neutral	4 = Agree	5 = Strongly Agree
-----------------------	--------------	-------------	-----------	--------------------

- 1 2 3 4 5 "I like the types of plants in this scene."
 1 2 3 4 5 "The plants in this scene look like weeds to me."
 1 2 3 4 5 "These plants in this scene are beneficial to the environment."
 1 2 3 4 5 "These plants in this scene look beautiful to me."



- 1 2 3 4 5 "I like the types of plants in this scene."
 1 2 3 4 5 "The plants in this scene look like weeds to me."
 1 2 3 4 5 "These plants in this scene are beneficial to the environment."
 1 2 3 4 5 "These plants in this scene look beautiful to me."



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 1 2 3 4 5 "These plants in this scene look beautiful to me."



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 1 2 3 4 5 "The plants in this scene look like weeds to me."
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 1 2 3 4 5 "These plants in this scene look beautiful to me."



- 1 2 3 4 5 "I like the types of plants in this scene."
 1 2 3 4 5 "The plants in this scene look like weeds to me."
 1 2 3 4 5 "These plants in this scene are beneficial to the environment."
 1 2 3 4 5 "These plants in this scene look beautiful to me."



There are four (4) statements per image. For each image, identify how you agree or disagree with the statement.

1 = Strongly Disagree	2 = Disagree	3 = Neutral	4 = Agree	5 = Strongly Agree
-----------------------	--------------	-------------	-----------	--------------------

- 1 2 3 4 5 "I like the types of plants in this scene."
 1 2 3 4 5 "The plants in this scene look like weeds to me."
 1 2 3 4 5 "These plants in this scene are beneficial to the environment."
 1 2 3 4 5 "These plants in this scene look beautiful to me."



- 1 2 3 4 5 "I like the types of plants in this scene."
 1 2 3 4 5 "The plants in this scene look like weeds to me."
 1 2 3 4 5 "These plants in this scene are beneficial to the environment."
 1 2 3 4 5 "These plants in this scene look beautiful to me."



- 1 2 3 4 5 "I like the types of plants in this scene."
 1 2 3 4 5 "The plants in this scene look like weeds to me."
 1 2 3 4 5 "These plants in this scene are beneficial to the environment."
 1 2 3 4 5 "These plants in this scene look beautiful to me."



- 1 2 3 4 5 "I like the types of plants in this scene."
 1 2 3 4 5 "The plants in this scene look like weeds to me."
 1 2 3 4 5 "These plants in this scene are beneficial to the environment."
 1 2 3 4 5 "These plants in this scene look beautiful to me."



For each image, identify how you agree or disagree with each statement.

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

- 1 2 3 4 5 "I would feel safe spending time in this scene."
 1 2 3 4 5 "The plants in this scene are too tall and restrict views."
 1 2 3 4 5 "I am afraid of hidden dangers in this scene."
 1 2 3 4 5 "I would feel too enclosed in this scene."
 1 2 3 4 5 "This landscape attracts insects I am afraid of."



- 1 2 3 4 5 "I would feel safe spending time in this scene."
 1 2 3 4 5 "The plants in this scene are too tall and restrict views."
 1 2 3 4 5 "I am afraid of hidden dangers in this scene."
 1 2 3 4 5 "I would feel too enclosed in this scene."
 1 2 3 4 5 "This landscape attracts insects I am afraid of."



- 1 2 3 4 5 "I would feel safe spending time in this scene."
 1 2 3 4 5 "I would feel too exposed in this scene."



- 1 2 3 4 5 "I would feel safe spending time in this scene."
 1 2 3 4 5 "I would feel too exposed in this scene."



- 1 2 3 4 5 "I would feel safe spending time in this scene."
 1 2 3 4 5 "The plants in this scene are too tall and restrict views."
 1 2 3 4 5 "I am afraid of hidden dangers in this scene."
 1 2 3 4 5 "I would feel too enclosed in this scene."
 1 2 3 4 5 "This landscape attracts insects I am afraid of."



There are several statements per image. For each image, identify how you agree or disagree with the statement.

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

- 1 2 3 4 5 "I would feel safe spending time in this scene."
 1 2 3 4 5 "The plants in this scene are too tall and restrict views."
 1 2 3 4 5 "I am afraid of hidden dangers in this scene."
 1 2 3 4 5 "I would feel too enclosed in this scene."



- 1 2 3 4 5 "I would feel safe spending time in this scene."
 1 2 3 4 5 "I would feel too exposed in this scene."



- 1 2 3 4 5 "I would feel safe spending time in this scene."
 1 2 3 4 5 "The plants in this scene are too tall and restrict views."
 1 2 3 4 5 "I am afraid of hidden dangers in this scene."
 1 2 3 4 5 "I would feel enclosed in this scene."
 1 2 3 4 5 "This landscape attracts insects I am afraid of."



- 1 2 3 4 5 "I would feel safe spending time in this scene."
 1 2 3 4 5 "The plants in this scene are too tall and restrict views."
 1 2 3 4 5 "I would feel too enclosed in this scene."
 1 2 3 4 5 "This landscape attracts insects I am afraid of."



Read the following statement. For each image below, identify how you agree or disagree with the statement.

"I understand that this landscape may reduce flooding potential in my neighborhood."

1 = Strongly Disagree	2 = Disagree	3 = Neutral	4 = Agree	5 = Strongly Agree
1 2 3 4 5		1 2 3 4 5		
1 2 3 4 5		1 2 3 4 5		
1 2 3 4 5		1 2 3 4 5		

Read the following statement. Identify how you agree or disagree with the statement.

1 = Strongly Disagree	2 = Disagree	3 = Neutral	4 = Agree	5 = Strongly Agree
-----------------------	--------------	-------------	-----------	--------------------

I understand that high plant diversity is beneficial to the environment.

1 2 3 4 5

I understand native plants provide more benefits for the environment than non-native plants.

1 2 3 4 5

Please answer the following questions with your ranking.

How satisfied are you with your neighborhood in terms of the following?

- 1 2 3 4 5 Overall appearance
- 1 2 3 4 5 Appearance of public roadside landscapes
- 1 2 3 4 5 Maintenance of public roadside landscapes
- 1 2 3 4 5 Appearance of public parks and green space
- 1 2 3 4 5 Maintenance of public parks and green space
- 1 2 3 4 5 Appearance of vacant landscapes
- 1 2 3 4 5 Maintenance of vacant landscapes
- 1 2 3 4 5 Variety of different landscapes
- 1 2 3 4 5 Safety for walking during the day
- 1 2 3 4 5 Safety for walking at night

1 = not at all satisfied
2 = a little
3 = somewhat
4 = quite a bit
5 = very satisfied

Please complete the following demographic information with a checkmark

What is your gender? ☐ Male ☐ Female Other: _____

What is your age? ☐ 0 - 17 ☐ 18 - 45 ☐ 46 - 64 ☐ 65 +

Do you have children in your household? ☐ Yes ☐ No

How long have you lived in your neighborhood? _____ Years _____ Months (If less than a year)

What is your ethnicity?

- ☐ Caucasian ☐ African American
- ☐ Asian ☐ Latino or Hispanic
- ☐ Pacific Islander ☐ Native American
- ☐ Multi-Ethnic ☐ Other/Unknown

What is your highest education level?

- ☐ No High School ☐ Some College
- ☐ High School or Equivalent ☐ Bachelor's Degree
- ☐ Technical Degree ☐ Post-Graduate Degree

What is your current employment status?

- ☐ Employed Full Time ☐ Unemployed, Seeking Work
- ☐ Employed Part Time ☐ Unemployed, Not Seeking Work
- ☐ Homemaker ☐ Retired

What is your annual household income?

- ☐ Less than \$25,000 ☐ \$25,000 - \$49,999 ☐ \$50,000 - \$99,999 ☐ \$100,000 or more

What is your dominant mode of transportation?

- ☐ Personal Motor Vehicle ☐ Walking ☐ Bus
- ☐ Bicycle / Scooter ☐ Other: _____

PHOTO CLUSTERS

APPENDIX E

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

UNMAINTAINED LANDSCAPE - FAMILIARITY



1: N-UM-SW-LBD-CPH-LPD-BGT-TN-WN



5: N-UM-VH-HBD-MPH-MPD-GF-TN-WN



8: N-UM-SW-MBD-CPH-LPD-BGT-TN-WN



10: N-UM-SW-LBD-CPH-HPD-GST-TY-WY

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

UNMAINTAINED LANDSCAPE - BIODIVERSITY



14: N-UM-SW-MBD-TPH-MPD-GST-TY-WN



16: N-UM-SW-HBD-MPH-HPD-GS-TY-WN



21: N-UM-SW-MBD-TPH-HPD-BGT-TY-WN



23: N-UM-V-HBD-TPH-HPD-GST-TN-WY

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

UNMAINTAINED LANDSCAPE - NATIVE PLANTING



25: N-UM-SW-HBD-TPH-HPD-GT-TN-WN



29: N-UM-SW-HBD-TPH-HPD-GST-TY-WN



31: N-UM-SW-HBD-MPH-HPD-GST-TN-WN

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

UNMAINTAINED LANDSCAPE - FEELINGS OF SAFETY



34: N-UM-SW-HBD-MPH-HPD-GT-TY-WN



39: N-UM-SW-MBD-LPH-MPD-GT-TN-WN



41: N-UM-V-HBD-TPH-HPD-GST-TN-WN

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

TRADITIONALLY-MANICURED LANDSCAPE - FAMILIARITY



2: M-TM-SW-MBD-CPH-LPD-GST-TN-WN



4: N-TM-V-MBD-CPH-LPD-GT-TN-WN



9: N-TM-P-LBD-CPH-LPD-GT-TN-WN



12: N-TM-V-MBD-CPH-HPD-GST-TN-WN

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

TRADITIONALLY-MANICURED LANDSCAPE - BIODIVERSITY



13: N-TM-P-LBD-CPH-LPD-GT-TN-WN



18: N-TM-SW-LBD-CPH-LPD-G-TN-WN



20: N-TM-SW-LBD-CPH-LPD-G-TY-WN



22: N-TM-V-MBD-CPH-LPD-GS-TN-WN

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

TRADITIONALLY-MANICURED LANDSCAPE - NATIVE PLANTING



26: N-TM-SW-LBD-CPH-LPD-GT-TN-WN



28: N-TM-SW-MBD-CPH-MPD-GT-TN-WN



32: N-TM-SW-LBD-CPH-LPD-GT-TN-WN

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

TRADITIONALLY-MANICURED LANDSCAPE - FEELINGS OF SAFETY



36: N-TM-SW-LBD-CPH-LPD-GT-TN-WN



37: N-TM-SW-MBD-CPH-MPD-GT-TN-WN



40: N-TM-P-LBD-CPH-LPD-GT-TN-WN

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

GREEN STORMWATER INFRASTRUCTURE - FAMILIARITY



3: M-GSI-SW-HBD-TPH-HPD-GF-TN-WN



6: M-GSI-SW-MBD-LPH-MPD-GF-TN-WN



7: M-GSI-P-HBD-TPH-MPD-GF-TN-WY



11: M-GSI-SW-HBD-MPH-MPD-GF-TN-WN

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

GREEN STORMWATER INFRASTRUCTURE - BIODIVERSITY



15: M-GSI-SW-HBD-MPH-MPD-GFT-TN-WN



17: M-GSI-SW-HBD-MPH-HPD-GFS-TN-WN



19: M-GSI-SW-HBD-LPH-MPD-GF-TN-WN



24: M-GSI-P-HBD-TPH-HPD-GF-TN-WN

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

GREEN STORMWATER INFRASTRUCTURE - NATIVE PLANTING



27: M-GSI-SW-MBD-TPH-HPD-GF-TN-WN



30: M-GSI-SW-HBD-MPH-HPD-GF-TY-WN



33: M-GSI-SW-HBD-LPH-HPD-GF-TN-WN

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

GREEN STORMWATER INFRASTRUCTURE - FEELINGS OF SAFETY



35: M-GSI-SW-HBD-MPH-HPD-GF-TN-WN



38: M-GSI-SW-MBD-MPH-MPD-GF-TN-WN



42: M-GSI-P-HBD-MPH-MPD-GSFT-TN-WY

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

GREEN STORMWATER INFRASTRUCTURE - ENVIRONMENTAL AWARENESS



43: M-GSI-P-HBD-MPH-MPD-
GSFT-TN-WY



44: M-GSI-SW-HBD-MPH-
MPD-GFT-TY-WN



45: M-GSI-SW-HBD-MPH-HPD-
GF-TN-WN

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

PRE-SURVEY CLUSTERS

GREEN STORMWATER INFRASTRUCTURE - ENVIRONMENTAL AWARENESS



46: M-GSI-SW-HBD-LPH-HPD-
GF-TN-WN



47: M-GSI-SW-HBD-TPH-HPD-
GF-TN-WN



48: M-GSI-SW-HBD-TPH-HPD-
GF-TN-WN

Codes

Neighborhood

N - North Town Fork Creek

M - Marlborough Community Coalition

Landscape Type

UM - Unmaintained

TM - Traditionally-Manicured

GSI - Green Stormwater Infrastructure

Context

SW - Sidewalk

P - Park

VH - Vacant with House

V - Vacant without House

Biodiversity

LBD - Low

MDB - Medium

HBD - High

Plant Height

CPH - Cut

LPH - Low

MPH - Medium

TPH - Tall

Plant Density

LPD - Low

MPD - Medium

HPD - High

Plant Types

B - Bare

G - Grass

F - Forbs

S - Shrub

T - Tree

Trash Presence

TY - Yes

TN - No

Water Presence

WY - Yes

WN - No

PHOTO CLUSTERS

TABLE 1: LATENT VARIABLES FOR NORTH TOWN FORK CREEK

Latent Variable	p-value	Cronbach's α	Photos				
famil_HBD_TPH	< 0.001	0.780	GSI-3	UM-5	GSI-6	GSI-11	
biodiv_UM	< 0.001	0.769	UM-16	UM-23			
biodiv_TY	< 0.001	0.773	UM-14	TM-20	UM-21		
biodiv_GSI	< 0.001	0.673	GSI-17	GSI-19	GSI-24		
natplnt_1_UM	< 0.001	0.712	UM-25	UM-29			
natplnt_1_TM	< 0.001	0.507	TM-28	TM-32			
natplnt_1_GSI	< 0.001	0.814	GSI-27	GSI-30	GSI-33		
natplnt_2_UMTM	< 0.001	0.755	TM-28	UM-29	UM-31	TM-32	
natplnt_2_GSI	< 0.001	0.694	GSI-27	GSI-30	GSI-33		
natplnt_3_UMTM	< 0.001	0.799	TM-28	UM-29	UM-31	TM-32	
natplnt_3_GSI	< 0.001	0.745	GSI-27	GSI-30	GSI-33		
natplnt_4_UMTM	< 0.001	0.776	UM-25	TM-28	UM-29	UM-31	TM-32
natplnt_4_GSI	< 0.001	0.741	GSI-27	GSI-30	GSI-33		
safety_1_TMCSI	< 0.001	0.784	TM-36	TM-37	TM-40	GSI-42	
safety_2_GSI	< 0.001	0.671	GSI-35	GSI-38	GSI-42		
safety_3_UM	< 0.001	0.656	UM-34	UM-41			
safety_4			No Factors Formed				
safety_5	< 0.001	0.715	UM-34 UM-39	GSI-35 TM-40	TM-36 UM-41	TM-37 GSI-42	GSI-38
envaware_flood	< 0.001	0.833	GSI-43	GSI-44	GSI-45		
			GSI-46	GSI-47	GSI-48		

PHOTO CLUSTERS

TABLE 2: LATENT VARIABLES FOR MARLBOROUGH COMMUNITY COALITION

Latent Variable	p-value	Cronbach's α	Photos				
famil_HBD	< 0.001	0.854	GSI-3	TM-4	UM-5	GSI-6-11	GSI-11
biodiv_UM	< 0.001	0.806	UM-14	UM-16	UM-21	UM-23	
biodiv_TM	< 0.001	0.794	TM-18	TM-20	TM-22		
biodiv_GSI	< 0.001	0.864	GSI-15	GSI-17	GSI-19	GSI-24	
natplnt_1_TM	< 0.001	0.797	TM-28	TM-32			
natplnt_1_GSI	< 0.001	0.662	GSI-27	GSI-30	GSI-33		
natplnt_2_UMTM	< 0.001	0.808	TM-28	UM-31	TM-32		
natplnt_2_GSI	< 0.001	0.745	GSI-27	GSI-30	GSI-33		
natplnt_3_UMTM	< 0.001	0.725	UM-25	TM-28	UM-29	UM-31	
natplnt_3_TM	< 0.001	0.888	TM-26	TM-33			
natplnt_3_GSI	< 0.001	0.635	GSI-27	GSI-30	GSI-33		
natplnt_4_UMTM	< 0.001	0.720	UM-25	TM-28	UM-29	TM-32	
natplnt_4_GSI	< 0.001	0.752	GSI-27	GSI-30	GSI-33		
safety_1_GSI	< 0.001	0.745	GSI-35	GSI-38	GSI-42		
safety_2_GSI	< 0.001	0.767	GSI-38	GSI-42			
safety_3_UM	< 0.001	0.748	UM-34	UM-39	UM-41		
safety_4_TM	< 0.001	0.831	TM-36	TM-37			
safety_4_GSI	< 0.001	0.674	GSI-35	GSI-38	GSI-42		
safety_5	< 0.001	0.912	UM-34 UM-39	GSI-35 TM-40	TM-36 UM-41	TM-37 GSI-42	GSI-38
envaware_flood	< 0.001	0.936	GSI-43 GSI-46	GSI-44 GSI-47	GSI-45 GSI-48		

RAW DATA ANALYSIS RESULTS

APPENDIX F

NORTH TOWN FORK CREEK

DESCRIPTIVES

FAMILIARITY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I see many scenes similar to this image nearby my home." - Photo 1_N_UM_SW_LBD_CPH_LPD_BGT_TN_WN	55	1	5	3.16	1.488	-.361	.322
"I see many scenes similar to this image nearby my home." - Photo 2_M_TM_SW_MBD_CPH_LPD_GST_TN_WN	55	1	5	3.16	1.371	-.306	.322
"I see many scenes similar to this image nearby my home." - Photo 3_M_GSI_SW_HBD_TPH_HPD_GF_TN_WN	54	1	5	2.98	1.473	-.077	.325
"I see many scenes similar to this image nearby my home." - Photo 4_N_TM_V_MBD_CPH_LPD_GT_TN_WN	54	1	5	3.43	1.253	-.573	.325

NORTH TOWN FORK CREEK

DESCRIPTIVES

FAMILIARITY

Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
						Statistic	Std. Error
"I see many scenes similar to this image nearby my home." - Photo 5_N_UM_VH_HBD_MPH_MPD_GF_TN_WN	54	1	5	3.39	1.446	-.411	.325
"I see many scenes similar to this image nearby my home." - Photo 6_M_GSI_SW_MBP_LPH_MPD_GF_TN_WN	55	1	5	3.02	1.254	-.094	.322
"I see many scenes similar to this image nearby my home." - Photo 7_M_GSI_P_HBD_TPH_MPD_GF_TN_WY	52	1	5	2.25	1.356	.752	.330
"I see many scenes similar to this image nearby my home." - Photo 8_N_UM_SW_MBD_CPH_LPD_BGT_TN_WN	51	1	5	3.12	1.211	-.023	.333

NORTH TOWN FORK CREEK

DESCRIPTIVES

FAMILIARITY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I see many scenes similar to this image nearby my home." - Photo 9_N_TM_P_LBD_CPH_LPD_GT_TN_WN	53	1	5	3.43	1.169	-.398	.327
"I see many scenes similar to this image nearby my home." - Photo 10_N_UM_SW_LBD_CPH_HPDP_GST_TY_WY	54	1	5	2.91	1.336	.225	.325
"I see many scenes similar to this image nearby my home." - Photo 11_M_GSI_SW_HBD_MPH_MPD_GF_TN_WN	53	1	5	2.49	1.339	.271	.327
"I see many scenes similar to this image nearby my home." - Photo 12_N_TM_V_MBD_CPH_HPDP_GST_TN_WN	54	1	5	3.19	1.333	-.204	.325

NORTH TOWN FORK CREEK

DESCRIPTIVES

BIODIVERSITY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the variety of plants in this scene." - Photo 13_N_TM_P_LBD_BPH_LPD_GT_TN_WN	53	1	5	3.49	1.353	-.584	.327
"I like the variety of plants in this scene." - Photo 14_N_UM_SW_MBD_TP_H_MPD_GST_TY_WN	55	1	5	2.56	1.424	.386	.322
"I like the variety of plants in this scene." - Photo 15_M_GSI_SW_HBD_MP_H_MPD_GFT_TN_WN	53	1	5	2.91	1.319	.023	.327
"I like the variety of plants in this scene." - Photo 16_N_UM_SW_HBD_MP_H_HPD_GS_TY_WN	55	1	5	2.56	1.475	.338	.322
"I like the variety of plants in this scene." - Photo 17_M_GSI_SW_HBD_MP_H_HPD_GFS_TN_WN	53	1	5	3.30	1.324	-.482	.327

NORTH TOWN FORK CREEK

DESCRIPTIVES

BIODIVERSITY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the variety of plants in this scene." - Photo 18_N_TM_SW_LBD_CP H_LPD_G_TN_WN	54	1	5	3.26	1.200	-.321	.325
"I like the variety of plants in this scene." - Photo 19_M_GSI_SW_HBD_LP H_MPD_GF_TN_WN	55	1	5	3.20	1.268	-.222	.322
"I like the variety of plants in this scene." - Photo 20_N_YM_SW_LBD_CP H_LPD_G_TY_WN	53	1	5	2.94	1.117	.029	.327
"I like the variety of plants in this scene." - Photo 21_N_UM_SW_MBD_TP H_HBD_BGT_TY_WN	52	1	5	2.58	1.319	.467	.330
"I like the variety of plants in this scene." - Photo 22_N_TM_V_MBD_CPH_ LPD_GS_TN_WN	53	1	6	3.21	1.150	-.030	.327

NORTH TOWN FORK CREEK

DESCRIPTIVES

BIODIVERSITY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the variety of plants in this scene." - Photo 23_N_UM_V_HBD_TPH_HPD_GST_TN_WN	54	1	5	2.81	1.442	.141	.325
"I like the variety of plants in this scene." - Photo 24_M_GSI_P_HBD_TPH_HPD_GF_TN_WN	53	1	5	2.94	1.379	.059	.327

NORTH TOWN FORK CREEK

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 25_N_UM_SW_HBD_TP H_HPD_GT_TN_WN	50	1	5	2.88	1.423	.131	.337
"The plants in this scene look like weeds to me." - Photo 25_N_UM_SW_HBD_TP H_HPD_GT_TN_WN	50	1	5	3.38	1.413	-.356	.337
"These plants in this scene are beneficial to the environment." - Photo 25_N_UM_SW_HBD_TP H_HPD_GT_TN_WN	46	1	5	3.22	1.281	-.361	.350
"These plants in this scene look beautiful to me." - Photo 25_N_UM_SW_HBD_TP H_HPD_GT_TN_WN	47	1	5	2.77	1.371	.285	.347

NORTH TOWN FORK CREEK

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 26_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	49	1	5	3.82	1.131	-.705	.340
"The plants in this scene look like weeds to me." - Photo 26_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	48	1	5	2.08	1.381	1.058	.343
"These plants in this scene are beneficial to the environment." - Photo 26_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	48	1	5	3.63	1.299	-.470	.343
"These plants in this scene look beautiful to me." - Photo 26_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	47	1	5	3.77	1.127	-.656	.347

NORTH TOWN FORK CREEK

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 27_M_GSI_SW_MBD_TP H_HPD_GF_TN_WN	52	1	5	3.25	1.297	-.207	.330
"The plants in this scene look like weeds to me." - Photo 27_M_GSI_SW_MBD_TP H_HPD_GF_TN_WN	48	1	5	2.96	1.487	.115	.343
"These plants in this scene are beneficial to the environment." - Photo 27_M_GSI_SW_MBD_TP H_HPD_GF_TN_WN	48	1	5	3.35	1.246	-.168	.343
"These plants in this scene look beautiful to me." - Photo 27_M_GSI_SW_MBD_TP H_HPD_GF_TN_WN	47	1	5	3.06	1.358	-.066	.347

NORTH TOWN FORK CREEK

DESCRIPTIVES

NATIVE PLANTING

Descriptive Statistics							
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 28_N_TM_SW_MBD_CP H_MPD_GT_TN_WN	50	1	5	2.54	1.313	.191	.337
"The plants in this scene look like weeds to me." - Photo 28_N_TM_SW_MBD_CP H_MPD_GT_TN_WN	50	1	5	2.64	1.191	.219	.337
"These plants in this scene are beneficial to the environment." - Photo 28_N_TM_SW_MBD_CP H_MPD_GT_TN_WN	48	1	5	2.92	1.182	.006	.343
"These plants in this scene look beautiful to me." - Photo 28_N_TM_SW_MBD_CP H_MPD_GT_TN_WN	47	1	5	2.57	1.211	.202	.347

NORTH TOWN FORK CREEK

DESCRIPTIVES

NATIVE PLANTING

Descriptive Statistics							
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 29_N_UM_SW_HBD_TP H_HPD_GST_TY_WN	50	1	5	1.84	1.201	1.351	.337
"The plants in this scene look like weeds to me." - Photo 29_N_UM_SW_HBD_TP H_HPD_GST_TY_WN	50	1	5	3.28	1.565	-.288	.337
"These plants in this scene are beneficial to the environment." - Photo 29_N_UM_SW_HBD_TP H_HPD_GST_TY_WN	48	1	5	2.27	1.333	.602	.343
"These plants in this scene look beautiful to me." - Photo 29_N_UM_SW_HBD_TP H_HPD_GST_TY_WN	47	1	5	1.81	1.173	1.403	.347

NORTH TOWN FORK CREEK

DESCRIPTIVES

NATIVE PLANTING

Descriptive Statistics							
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 30_M_GSI_SW_HBD_MP H_MPD_GF_TY_WN	51	1	5	3.27	1.266	-.421	.333
"The plants in this scene look like weeds to me." - Photo 30_M_GSI_SW_HBD_MP H_MPD_GF_TY_WN	50	1	5	2.72	1.262	.240	.337
"These plants in this scene are beneficial to the environment." - Photo 30_M_GSI_SW_HBD_MP H_MPD_GF_TY_WN	48	1	5	3.21	1.110	-.043	.343
"These plants in this scene look beautiful to me." - Photo 30_M_GSI_SW_HBD_MP H_MPD_GF_TY_WN	47	1	5	3.00	1.302	.185	.347

NORTH TOWN FORK CREEK

DESCRIPTIVES

NATIVE PLANTING

Descriptive Statistics							
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 31_N_UM_SW_HBD_MP H_HPDP_GST_TN_WN	47	1	5	2.26	1.206	.724	.347
"The plants in this scene look like weeds to me." - Photo 31_N_UM_SW_HBD_MP H_HPDP_GST_TN_WN	47	1	6	3.04	1.503	.085	.347
"These plants in this scene are beneficial to the environment." - Photo 31_N_UM_SW_HBD_MP H_HPDP_GST_TN_WN	45	1	5	2.64	1.209	.251	.354
"These plants in this scene look beautiful to me." - Photo 31_N_UM_SW_HBD_MP H_HPDP_GST_TN_WN	44	1	5	2.32	1.216	.650	.357

NORTH TOWN FORK CREEK

DESCRIPTIVES

NATIVE PLANTING

Descriptive Statistics							
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 32_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	51	1	5	2.71	1.285	.286	.333
"The plants in this scene look like weeds to me." - Photo 32_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	46	1	5	2.80	1.222	.163	.350
"These plants in this scene are beneficial to the environment." - Photo 32_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	45	1	5	2.87	1.272	.330	.354
"These plants in this scene look beautiful to me." - Photo 32_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	45	1	5	2.62	1.211	.704	.354

NORTH TOWN FORK CREEK

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 33_M_GSI_SW_HBD_LP H_HPD_GF_TN_WN	50	1	5	3.20	1.212	-.329	.337
"The plants in this scene look like weeds to me." - Photo 33_M_GSI_SW_HBD_LP H_HPD_GF_TN_WN	46	1	5	2.85	1.414	.183	.350
"These plants in this scene are beneficial to the environment." - Photo 33_M_GSI_SW_HBD_LP H_HPD_GF_TN_WN	46	1	5	3.17	1.235	-.050	.350
"These plants in this scene look beautiful to me." - Photo 33_M_GSI_SW_HBD_LP H_HPD_GF_TN_WN	46	1	5	3.20	1.293	-.253	.350

NORTH TOWN FORK CREEK

DESCRIPTIVES

FEELINGS OF SAFETY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I would feel safe spending time in this scene." - Photo 34_N_UM_SW_HBD_MP H_HPD_GT_TY_WN	49	1	5	2.27	1.319	.904	.340
"The plants in these scene are too tall and restrict views." - Photo 34_N_UM_SW_HBD_MP H_HPD_GT_TY_WN	46	1	5	3.24	1.463	-.124	.350
"I am afraid of hidden dangers in this scene." - Photo 34_N_UM_SW_HBD_MP H_HPD_GT_TY_WN	46	1	5	3.20	1.485	-.182	.350
"I would feel too enclosed in this scene." - Photo 34_N_UM_SW_HBD_MP H_HPD_GT_TY_WN	46	1	5	3.11	1.433	-.010	.350
"This landscape attracts insects I am afraid of." - Photo 34_N_UM_SW_HBD_MP H_HPD_GT_TY_WN	45	1	5	3.29	1.502	-.225	.354

NORTH TOWN FORK CREEK

DESCRIPTIVES

FEELINGS OF SAFETY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I would feel safe spending time in this scene." - Photo 35_M_GSI_SW_HBD_MP H_HPD_GF_TN_WN	48	1	5	3.27	1.284	-.345	.343
"The plants in these scene are too tall and restrict views." - Photo 35_M_GSI_SW_HBD_MP H_HPD_GF_TN_WN	46	1	5	2.93	1.254	.057	.350
"I am afraid of hidden dangers in this scene." - Photo 35_M_GSI_SW_HBD_MP H_HPD_GF_TN_WN	45	1	5	2.73	1.116	.354	.354
"I would feel too enclosed in this scene." - Photo 35_M_GSI_SW_HBD_MP H_HPD_GF_TN_WN	46	1	5	2.57	1.167	.405	.350
"This landscape attracts insects I am afraid of." - Photo 35_M_GSI_SW_HBD_MP H_HPD_GF_TN_WN	46	1	5	2.91	1.330	.284	.350

NORTH TOWN FORK CREEK

DESCRIPTIVES

FEELINGS OF SAFETY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I would feel safe spending time in this scene." - Photo 36_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	49	1	5	3.71	1.354	-.765	.340
"I would feel too exposed in this scene." - Photo 36_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	45	1	5	2.31	1.221	.462	.354
"I would feel safe spending time in this scene." - Photo 37_N_TM_SW_MBD_CP H_MPD_GT_TN_WN	49	1	5	4.16	1.087	-1.150	.340
"I would feel too exposed in this scene." - Photo 37_N_TM_SW_MBD_CP H_MPD_GT_TN_WN	46	1	5	2.17	1.338	.714	.350

NORTH TOWN FORK CREEK

DESCRIPTIVES

FEELINGS OF SAFETY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I would feel safe spending time in this scene." - Photo 38_M_GSI_SW_MBD_MP H_MPD_GF_TN_WN	49	1	5	2.86	1.275	.027	.340
"The plants in these scene are too tall and restrict views." - Photo 38_M_GSI_SW_MBD_MP H_MPD_GF_TN_WN	46	1	5	2.83	1.338	.332	.350
"I am afraid of hidden dangers in this scene." - Photo 38_M_GSI_SW_MBD_MP H_MPD_GF_TN_WN	46	1	5	2.76	1.268	.337	.350
"I would feel too enclosed in this scene." - Photo 38_M_GSI_SW_MBD_MP H_MPD_GF_TN_WN	46	1	5	2.54	1.206	.331	.350
"This landscape attracts insects I am afraid of." - Photo 38_M_GSI_SW_MBD_MP H_MPD_GF_TN_WN	46	1	5	2.96	1.316	.144	.350

NORTH TOWN FORK CREEK

DESCRIPTIVES

FEELINGS OF SAFETY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I would feel safe spending time in this scene." - Photo 39_N_UM_WE_MBD_LP H_MPD_GT_TN_WN	49	1	5	2.71	1.354	.390	.340
"The plants in these scene are too tall and restrict views." - Photo 39_N_UM_WE_MBD_LP H_MPD_GT_TN_WN	45	1	5	2.47	1.290	.376	.354
"I am afraid of hidden dangers in this scene." - Photo 39_N_UM_WE_MBD_LP H_MPD_GT_TN_WN	45	1	5	2.67	1.261	.032	.354
"I would feel too enclosed in this scene." - Photo 39_N_UM_WE_MBD_LP H_MPD_GT_TN_WN	45	1	5	2.40	1.214	.364	.354
"I would feel safe spending time in this scene." - Photo 40_N_TM_P_LBD_CPH_LPD_GT_TN_WN	48	1	5	3.67	1.209	-.749	.343
"I would feel too exposed in this scene." - Photo 40_N_TM_P_LBD_CPH_LPD_GT_TN_WN	45	1	5	2.56	1.341	.468	.354

NORTH TOWN FORK CREEK

DESCRIPTIVES

FEELINGS OF SAFETY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I would feel safe spending time in this scene." - Photo 41_N_UM_V_HBD_TPH_HPD_GST_TN_WN	48	1	5	1.92	1.366	1.307	.343
"The plants in these scene are too tall and restrict views." - Photo 41_N_UM_V_HBD_TPH_HPD_GST_TN_WN	47	1	5	3.70	1.614	-.754	.347
"I am afraid of hidden dangers in this scene." - Photo 41_N_UM_V_HBD_TPH_HPD_GST_TN_WN	46	1	5	3.57	1.530	-.577	.350
"I would feel too enclosed in this scene." - Photo 41_N_UM_V_HBD_TPH_HPD_GST_TN_WN	45	1	5	3.31	1.690	-.309	.354
"This landscape attracts insects I am afraid of." - Photo 41_N_UM_V_HBD_TPH_HPD_GST_TN_WN	45	1	5	3.44	1.673	-.417	.354

NORTH TOWN FORK CREEK

DESCRIPTIVES

FEELINGS OF SAFETY

Descriptive Statistics							
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I would feel safe spending time in this scene." - Photo 42_M_GSI_P_HBD_MPH_MPD_GFS_TN_WY	48	1	5	3.56	1.303	-.624	.343
"The plants in these scene are too tall and restrict views." - Photo 42_M_GSI_P_HBD_MPH_MPD_GFS_TN_WY	46	1	5	1.96	1.210	1.187	.350
"I would feel too enclosed in this scene." - Photo 42_M_GSI_P_HBD_MPH_MPD_GFS_TN_WY	46	1	5	2.00	1.054	.714	.350
"This landscape attracts insects I am afraid of." - Photo 42_M_GSI_P_HBD_MPH_MPD_GFS_TN_WY	46	1	5	2.15	1.095	.429	.350

NORTH TOWN FORK CREEK

DESCRIPTIVES

ENVIRONMENTAL AWARENESS

Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I understand that this landscape may reduce flooding potential in my neighborhood." - Photo 43_M_GSI_P_HBD_MPH_MPD_GFST_TN_WY	48	1	5	3.44	1.236	-.415	.343
"I understand that this landscape may reduce flooding potential in my neighborhood." - Photo 44_M_GSI_P_HBD_MPH_MPD_GFT_TY_WN	47	1	5	2.96	1.268	-.051	.347
"I understand that this landscape may reduce flooding potential in my neighborhood." - Photo 45_M_GSI_SW_HBD_MP_H_HPD_GF_TN_WN	48	1	5	2.92	1.334	-.122	.343

NORTH TOWN FORK CREEK

DESCRIPTIVES

ENVIRONMENTAL AWARENESS

Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
						Statistic	Std. Error
"I understand that this landscape may reduce flooding potential in my neighborhood." - Photo 46_M_GSI_SW_HBD_LP H_HPD_GF_TN_WN	46	1	5	2.83	1.288	-.053	.350
"I understand that this landscape may reduce flooding potential in my neighborhood." - Photo 47_M_GSI_SW_HBD_TP H_HPD_GF_TN_WN	46	1	5	3.24	1.303	-.404	.350
"I understand that this landscape may reduce flooding potential in my neighborhood." - Photo 48_M_GSI_SW_HBD_MP H_HPD_GF_TN_WN	46	1	5	2.87	1.376	-.023	.350

NORTH TOWN FORK CREEK

DESCRIPTIVES

ENVIRONMENTAL AWARENESS

Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
						Statistic	Std. Error
"I understand that high plant diversity is beneficial to the environment."	43	1	5	3.79	1.146	-.365	.361
"I understand native plants provide more benefits for the environment than non-native plants."	43	1	5	3.65	1.131	-.188	.361

NORTH TOWN FORK CREEK

DESCRIPTIVES

NEIGHBORHOOD SATISFACTION

Descriptive Statistics							
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"How satisfied are you with your neighborhood appearance -- overall appearance"	47	1	5	3.02	1.073	-.374	.347
"How satisfied are you with your neighborhood appearance -- appearance of public roadside landscapes"	48	1	5	2.67	1.098	.108	.343
"How satisfied are you with your neighborhood appearance -- maintenance of public roadside landscapes"	47	1	5	2.47	1.158	.300	.347
"How satisfied are you with your neighborhood appearance -- appearance of public parks and green space"	48	1	5	3.15	1.167	-.379	.343
"How satisfied are you with your neighborhood appearance -- maintenance of public parks and green space"	48	1	5	2.96	1.148	-.268	.343

NORTH TOWN FORK CREEK

DESCRIPTIVES

NEIGHBORHOOD SATISFACTION

Descriptive Statistics							
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"How satisfied are you with your neighborhood appearance -- appearance of vacant landscapes"	48	1	5	2.50	1.353	.296	.343
"How satisfied are you with your neighborhood appearance -- maintenance of vacant landscapes"	47	1	5	2.30	1.267	.545	.347
"How satisfied are you with your neighborhood appearance -- variety of different landscapes"	47	1	5	2.96	1.179	.002	.347
"How satisfied are you with your neighborhood appearance -- safety for walking during the day"	48	1	5	3.33	1.191	-.295	.343
"How satisfied are you with your neighborhood appearance -- safety for walking at night"	48	1	5	2.81	1.424	.115	.343
Valid N (listwise)	45						

NORTH TOWN FORK CREEK

DESCRIPTIVES

DEMOGRAPHICS

Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
						Statistic	Std. Error
"What is your gender?"	49	1	2	1.47	.504	.127	.340
"What is your age?"	49	2	5	2.73	.730	.797	.340
"Do you have children in your household?"	47	1	2	1.53	.504	-.132	.347
"How long have you lived in the neighborhood?"	47	1	5	3.15	1.335	.231	.347
"What is your ethnicity?"	47	1	8	2.79	1.933	1.862	.347
"What is your highest education level?"	49	1	6	3.06	1.391	.226	.340
"What is your current employment status?"	49	1	6	2.65	2.156	.692	.340
"What is your annual household income?"	45	1	4	2.31	.973	-.057	.354
"What is your dominant mode of transportation?"	49	1	4	1.39	.909	2.086	.340
survey format taken	55	1	2	1.09	.290	2.926	.322
participant's neighborhood	55	1	1	1.00	.000	.	.

NORTH TOWN FORK CREEK

LINEAR REGRESSION

FAMILIARITY

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.036	1	24.036	19.032	<.001 ^b
	Residual	61.885	49	1.263		
	Total	85.922	50			

a. Dependent Variable: biodiv_UM_NTFC

b. Predictors: (Constant), famli_HBD_TPH_NTFC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.732	.462		1.583	.120					
	famli_HBD_TPH_NTFC	.644	.148	.529	4.363	<.001	.529	.529	.529	1.000	1.000

a. Dependent Variable: biodiv_UM_NTFC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.467	1	8.467	8.472	.005 ^b
	Residual	47.969	48	.999		
	Total	56.436	49			

a. Dependent Variable: biodiv_TY_NTFC

b. Predictors: (Constant), famli_HBD_TPH_NTFC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.525	.413		3.696	<.001					
	famli_HBD_TPH_NTFC	.386	.133	.387	2.911	.005	.387	.387	.387	1.000	1.000

a. Dependent Variable: biodiv_TY_NTFC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.946	1	9.946	11.171	.002 ^b
	Residual	43.627	49	.890		
	Total	53.573	50			

a. Dependent Variable: biodiv_GSI_NTFC

b. Predictors: (Constant), famli_HBD_TPH_NTFC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.911	.388		4.925	<.001					
	famli_HBD_TPH_NTFC	.414	.124	.431	3.342	.002	.431	.431	.431	1.000	1.000

a. Dependent Variable: biodiv_GSI_NTFC

NORTH TOWN FORK CREEK

LINEAR REGRESSION

FAMILIARITY

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.595	1	8.595	8.881	.005 ^b
	Residual	39.679	41	.968		
	Total	48.274	42			

a. Dependent Variable: natpInt_2_GSL_NTFC

b. Predictors: (Constant), faml_TM_NTFC

Coefficients ^a										
Model		Unstandardized Coefficients		Standardized Coefficients		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	VF
1	(Constant)	4.747	.560		8.479	<.001				
	faml_TM_NTFC	-.484	.162	-.422	-2.989	.005	-.422	-.422	-.422	1.000

a. Dependent Variable: natpInt_2_GSL_NTFC

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.581	1	4.581	6.332	.016 ^b
	Residual	26.047	36	.724		
	Total	30.628	37			

a. Dependent Variable: natpInt_4_UMTM_NTFC

b. Predictors: (Constant), faml_TM_NTFC

Coefficients ^a										
Model		Unstandardized Coefficients		Standardized Coefficients		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	VF
1	(Constant)	1.030	.548		1.880	.069				
	faml_TM_NTFC	.391	.155	.387	2.516	.016	.387	.387	.387	1.000

a. Dependent Variable: natpInt_4_UMTM_NTFC

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.789	1	4.789	5.222	.028 ^b
	Residual	33.926	37	.917		
	Total	38.715	38			

a. Dependent Variable: natpInt_3_UMTM_NTFC

b. Predictors: (Constant), faml_TM_NTFC

Coefficients ^a										
Model		Unstandardized Coefficients		Standardized Coefficients		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	VF
1	(Constant)	1.369	.696		2.161	.037				
	faml_TM_NTFC	.394	.172	.352	2.285	.028	.352	.352	.352	1.000

a. Dependent Variable: natpInt_3_UMTM_NTFC

NORTH TOWN FORK CREEK

LINEAR REGRESSION

FAMILIARITY

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.146	1	9.146	7.655	.008 ^b
	Residual	52.572	44	1.195		
	Total	61.717	45			

a. Dependent Variable: natpnt_1_TM_NTFC

b. Predictors: (Constant), faml_TM_NTFC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.990	.614		1.612	.114					
	faml_TM_NTFC	.496	.179	.385	2.767	.008	.385	.385	.385	1.000	1.000

a. Dependent Variable: natpnt_1_TM_NTFC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.799	1	4.799	5.345	.026 ^b
	Residual	37.707	42	.898		
	Total	42.505	43			

a. Dependent Variable: safety_2_GSI_NTFC

b. Predictors: (Constant), faml_TM_NTFC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.406	.538		2.611	.012					
	faml_TM_NTFC	.362	.156	.336	2.312	.026	.336	.336	.336	1.000	1.000

a. Dependent Variable: safety_2_GSI_NTFC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.637	1	6.637	4.379	.042 ^b
	Residual	63.658	42	1.516		
	Total	70.295	43			

a. Dependent Variable: safety_3_UM_NTFC

b. Predictors: (Constant), faml_HBD_TPH_NTFC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.360	.545		4.330	<.001					
	faml_HBD_TPH_NTFC	.355	.170	.307	2.093	.042	.307	.307	.307	1.000	1.000

a. Dependent Variable: safety_3_UM_NTFC

NORTH TOWN FORK CREEK

LINEAR REGRESSION

ENVIRONMENTAL AWARENESS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.866	1	3.866	4.277	.046 ^b
	Residual	32.536	36	.904		
	Total	36.402	37			

a. Dependent Variable: neighst_app_maint_var_safety_NTFC

b. Predictors: (Constant), envaware_flooding_NTFC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3.790	.496		7.648	<.001					
	envaware_flooding_NTFC	-.318	.154	-.326	-2.068	.046	-.326	-.326	-.326	1.000	1.000

a. Dependent Variable: neighst_app_maint_var_safety_NTFC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.316	1	15.316	20.529	<.001 ^b
	Residual	27.607	37	.746		
	Total	42.923	38			

a. Dependent Variable: natpnt_1_UMTM_NTFC

b. Predictors: (Constant), envaware_flooding_NTFC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.297	.449		2.892	.006					
	envaware_flooding_NTFC	.632	.139	.597	4.531	<.001	.597	.597	.597	1.000	1.000

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.111	1	6.111	6.943	.012 ^b
	Residual	33.445	38	.880		
	Total	39.556	39			

a. Dependent Variable: bindu_05L_NTFC

b. Predictors: (Constant), envaware_flooding_NTFC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.788	.483		3.701	<.001					
	envaware_flooding_NTFC	.391	.149	.393	2.635	.012	.393	.393	.393	1.000	1.000

a. Dependent Variable: bindu_05L_NTFC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.929	1	5.929	6.368	.017 ^b
	Residual	29.793	32	.931		
	Total	35.722	33			

a. Dependent Variable: natpnt_2_UMTM_NTFC

b. Predictors: (Constant), envaware_flooding_NTFC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	4.409	.602		7.324	<.001					
	envaware_flooding_NTFC	-.469	.186	-.407	-2.524	.017	-.407	-.407	-.407	1.000	1.000

a. Dependent Variable: natpnt_2_UMTM_NTFC

NORTH TOWN FORK CREEK

LINEAR REGRESSION

ENVIRONMENTAL AWARENESS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.009	1	7.009	9.388	.004 ^b
	Residual	26.132	35	.747		
	Total	33.141	36			

a. Dependent Variable: natpaint_3_GSI_NTFC

b. Predictors: (Constant), envaware_flooding_NTFC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.948	.452		4.313	<.001					
	envaware_flooding_NTFC	.429	.140	.460	3.064	.004	.460	.460	.460	1.000	1.000

a. Dependent Variable: natpaint_3_GSI_NTFC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.556	1	8.556	12.920	<.001 ^b
	Residual	23.841	36	.662		
	Total	32.396	37			

a. Dependent Variable: safety_1_TMOSI_NTFC

b. Predictors: (Constant), envaware_natpaint

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3.857	.475		8.121	<.001					
	envaware_natpaint	-.442	.123	-.514	-3.594	<.001	-.514	-.514	-.514	1.000	1.000

a. Dependent Variable: safety_1_TMOSI_NTFC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.113	1	11.113	14.543	<.001 ^b
	Residual	25.217	33	.764		
	Total	36.330	34			

a. Dependent Variable: natpaint_3_GSI_NTFC

b. Predictors: (Constant), envaware_flooding_NTFC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.298	.473		2.746	.010					
	envaware_flooding_NTFC	.571	.150	.553	3.814	<.001	.553	.553	.553	1.000	1.000

a. Dependent Variable: natpaint_3_GSI_NTFC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.127	1	13.127	11.844	.002 ^b
	Residual	38.792	35	1.108		
	Total	51.919	36			

a. Dependent Variable: safety_3_UM_NTFC

b. Predictors: (Constant), envaware_natpaint

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.733	.568		3.052	.004					
	envaware_natpaint	.510	.148	.503	3.441	.002	.503	.503	.503	1.000	1.000

a. Dependent Variable: safety_3_UM_NTFC

NORTH TOWN FORK CREEK

LINEAR REGRESSION

NEIGHBORHOOD SATISFACTION

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1					
Regression	3.930	1	3.930	4.268	.044 ^b
Residual	34.989	38	.921		
Total	38.919	39			

a. Dependent Variable: enaware_flooding_NTFC

b. Predictors: (Constant), neighsat_app_maint_var_safety_NTFC

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1										
(Constant)	3.937	.467		8.435	<.001					
neighsat_app_maint_var_safety_NTFC	-.330	.160	-.318	-2.066	.046	-.318	-.318	-.318	1.000	1.000

a. Dependent Variable: enaware_flooding_NTFC

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1					
Regression	6.136	1	6.136	6.540	.015 ^b
Residual	34.714	37	.938		
Total	40.849	38			

a. Dependent Variable: natplot_2_UNTM_NTFC

b. Predictors: (Constant), neighsat_overall

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1										
(Constant)	1.802	.503		3.581	<.001					
neighsat_overall	.398	.156	.388	2.557	.015	.388	.388	.388	1.000	1.000

a. Dependent Variable: natplot_2_UNTM_NTFC

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

FAMILIARITY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I see many scenes similar to this image nearby my home." - Photo 1_N_UM_SW_LBD_CPH_LPD_BGT_TN_WN	40	1	5	3.12	1.453	-.228	.374
"I see many scenes similar to this image nearby my home." - Photo 2_M_TM_SW_MBD_CPH_LPD_GST_TN_WN	40	1	5	3.08	1.228	-.062	.374
"I see many scenes similar to this image nearby my home." - Photo 3_M_GSI_SW_HBD_TPH_HP_D_GF_TN_WN	40	1	5	2.95	1.501	-.006	.374
"I see many scenes similar to this image nearby my home." - Photo 4_N_TM_V_MBD_CPH_LPD_GT_TN_WN	39	1	5	2.95	1.191	.005	.378

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

FAMILIARITY

Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
						Statistic	Std. Error
"I see many scenes similar to this image nearby my home." - Photo 5_N_UM_VH_HBD_MPH_MPD_GF_TN_WN	40	1	5	2.98	1.405	-.070	.374
"I see many scenes similar to this image nearby my home." - Photo 6_M_GSI_SW_MBP_LPH_MPD_GF_TN_WN	40	1	5	3.05	1.239	-.099	.374
"I see many scenes similar to this image nearby my home." - Photo 7_M_GSI_P_HBD_TPH_MPD_GF_TN_WY	40	1	5	2.95	1.377	-.030	.374
"I see many scenes similar to this image nearby my home." - Photo 8_N_UM_SW_MBD_CPH_LPD_BGT_TN_WN	40	1	5	2.82	1.107	.006	.374

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

FAMILIARITY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I see many scenes similar to this image nearby my home." - Photo 9_N_TM_P_LBD_CPH_LPD_GT_TN_WN	40	1	5	2.72	1.109	.107	.374
"I see many scenes similar to this image nearby my home." - Photo 10_N_UM_SW_LBD_CPH_HPDP_GST_TY_WY	39	1	5	2.54	1.354	.249	.378
"I see many scenes similar to this image nearby my home." - Photo 11_M_GSI_SW_HBD_MPH_MPD_GF_TN_WN	40	1	5	2.20	1.203	.898	.374
"I see many scenes similar to this image nearby my home." - Photo 12_N_TM_V_MBD_CPH_HPDP_GST_TN_WN	40	1	5	2.85	1.167	.001	.374

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

BIODIVERSITY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the variety of plants in this scene." - Photo 13_N_TM_P_LBD_BPH_LPD_GT_TN_WN	39	1	5	3.41	1.163	-.247	.378
"I like the variety of plants in this scene." - Photo 14_N_UM_SW_MBD_TP_H_MPD_GST_TY_WN	39	1	5	2.26	1.251	.675	.378
"I like the variety of plants in this scene." - Photo 15_M_GSI_SW_HBD_MP_H_MPD_GFT_TN_WN	39	1	5	3.36	1.135	-.200	.378
"I like the variety of plants in this scene." - Photo 16_N_UM_SW_HBD_MP_H_HPD_GS_TY_WN	37	1	5	1.95	1.079	1.095	.388
"I like the variety of plants in this scene." - Photo 17_M_GSI_SW_HBD_MP_H_HPD_GFS_TN_WN	39	1	5	3.67	1.305	-.536	.378

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

BIODIVERSITY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the variety of plants in this scene." - Photo 18_N_TM_SW_LBD_CP H_LPD_G_TN_WN	39	1	5	2.56	1.429	.434	.378
"I like the variety of plants in this scene." - Photo 19_M_GSI_SW_HBD_LP H_MPD_GF_TN_WN	39	1	5	3.69	1.454	-.729	.378
"I like the variety of plants in this scene." - Photo 20_N_YM_SW_LBD_CP H_LPD_G_TY_WN	39	1	5	2.44	1.252	.450	.378
"I like the variety of plants in this scene." - Photo 21_N_UM_SW_MBD_TP H_HBD_BGT_TY_WN	39	1	5	1.85	1.113	1.164	.378
"I like the variety of plants in this scene." - Photo 22_N_TM_V_MBD_CPH_LPD_GS_TN_WN	39	1	5	2.67	1.364	.187	.378

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

BIODIVERSITY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the variety of plants in this scene." - Photo 23_N_UM_V_HBD_TPH_HPDP_GST_TN_WN	39	1	5	2.72	1.521	.175	.378
"I like the variety of plants in this scene." - Photo 24_M_GSI_P_HBD_TPH_HPDP_GF_TN_WN	39	1	5	3.33	1.420	-.398	.378

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 25_N_UM_SW_HBD_TP H_HPD_GT_TN_WN	33	1	5	3.00	1.275	.096	.409
"The plants in this scene look like weeds to me." - Photo 25_N_UM_SW_HBD_TP H_HPD_GT_TN_WN	31	1	5	3.26	1.290	-.020	.421
"These plants in this scene are beneficial to the environment." - Photo 25_N_UM_SW_HBD_TP H_HPD_GT_TN_WN	30	1	5	3.13	1.042	.109	.427
"These plants in this scene look beautiful to me." - Photo 25_N_UM_SW_HBD_TP H_HPD_GT_TN_WN	30	1	5	2.80	.887	.102	.427

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I like the types of plants in this scene." - Photo 26_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	33	1	5	2.82	1.380	-.109	.409
"The plants in this scene look like weeds to me." - Photo 26_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	30	1	4	1.70	.915	1.237	.427
"These plants in this scene are beneficial to the environment." - Photo 26_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	31	1	5	3.13	1.522	-.050	.421
"These plants in this scene look beautiful to me." - Photo 26_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	31	1	5	3.10	1.300	-.191	.421

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 27_M_GSI_SW_MBD_TP H_HPD_GF_TN_WN	33	1	5	3.97	1.311	-.916	.409
"The plants in this scene look like weeds to me." - Photo 27_M_GSI_SW_MBD_TP H_HPD_GF_TN_WN	30	1	5	1.93	1.081	1.194	.427
"These plants in this scene are beneficial to the environment." - Photo 27_M_GSI_SW_MBD_TP H_HPD_GF_TN_WN	30	1	5	3.73	1.015	-.691	.427
"These plants in this scene look beautiful to me." - Photo 27_M_GSI_SW_MBD_TP H_HPD_GF_TN_WN	30	2	5	4.17	.986	-1.051	.427

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I like the types of plants in this scene." - Photo 28_N_TM_SW_MBD_CP H_MPD_GT_TN_WN	32	1	4	2.25	1.136	.317	.414
"The plants in this scene look like weeds to me." - Photo 28_N_TM_SW_MBD_CP H_MPD_GT_TN_WN	31	1	5	3.10	1.350	.074	.421
"These plants in this scene are beneficial to the environment." - Photo 28_N_TM_SW_MBD_CP H_MPD_GT_TN_WN	31	1	5	2.65	1.082	-.063	.421
"These plants in this scene look beautiful to me." - Photo 28_N_TM_SW_MBD_CP H_MPD_GT_TN_WN	31	1	5	2.45	1.261	.330	.421

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 29_N_UM_SW_HBD_TP H_HPD_GST_TY_WN	33	1	5	2.33	1.242	.564	.409
"The plants in this scene look like weeds to me." - Photo 29_N_UM_SW_HBD_TP H_HPD_GST_TY_WN	31	1	5	3.84	1.214	-.986	.421
"These plants in this scene are beneficial to the environment." - Photo 29_N_UM_SW_HBD_TP H_HPD_GST_TY_WN	31	1	5	3.06	.964	-.135	.421
"These plants in this scene look beautiful to me." - Photo 29_N_UM_SW_HBD_TP H_HPD_GST_TY_WN	31	1	4	1.94	.964	.613	.421

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 30_M_GSI_SW_HBD_MP H_MPD_GF_TY_WN	33	1	5	4.00	1.323	-1.207	.409
"The plants in this scene look like weeds to me." - Photo 30_M_GSI_SW_HBD_MP H_MPD_GF_TY_WN	30	1	5	2.13	1.383	1.002	.427
"These plants in this scene are beneficial to the environment." - Photo 30_M_GSI_SW_HBD_MP H_MPD_GF_TY_WN	30	2	5	4.03	.890	-.383	.427
"These plants in this scene look beautiful to me." - Photo 30_M_GSI_SW_HBD_MP H_MPD_GF_TY_WN	31	1	5	3.97	1.169	-.872	.421

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 31_N_UM_SW_HBD_MP H_HPD_GST_TN_WN	32	1	5	2.53	1.414	.407	.414
"The plants in this scene look like weeds to me." - Photo 31_N_UM_SW_HBD_MP H_HPD_GST_TN_WN	31	1	5	3.77	1.334	-.727	.421
"These plants in this scene are beneficial to the environment." - Photo 31_N_UM_SW_HBD_MP H_HPD_GST_TN_WN	31	1	4	3.00	.894	-.896	.421
"These plants in this scene look beautiful to me." - Photo 31_N_UM_SW_HBD_MP H_HPD_GST_TN_WN	31	1	5	2.26	1.182	.755	.421

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 32_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	33	1	5	1.97	1.237	1.115	.409
"The plants in this scene look like weeds to me." - Photo 32_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	31	1	5	3.39	1.202	-.331	.421
"These plants in this scene are beneficial to the environment." - Photo 32_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	31	1	4	2.58	1.089	-.221	.421
"These plants in this scene look beautiful to me." - Photo 32_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	30	1	5	1.77	1.073	1.399	.427

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

NATIVE PLANTING

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I like the types of plants in this scene." - Photo 33_M_GSI_SW_HBD_LP H_HPD_GF_TN_WN	33	1	5	3.73	1.329	-.907	.409
"The plants in this scene look like weeds to me." - Photo 33_M_GSI_SW_HBD_LP H_HPD_GF_TN_WN	31	1	5	2.35	1.253	.788	.421
"These plants in this scene are beneficial to the environment." - Photo 33_M_GSI_SW_HBD_LP H_HPD_GF_TN_WN	31	1	5	3.77	1.023	-.511	.421
"These plants in this scene look beautiful to me." - Photo 33_M_GSI_SW_HBD_LP H_HPD_GF_TN_WN	31	1	5	3.61	1.256	-.704	.421

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

FEELINGS OF SAFETY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I would feel safe spending time in this scene." - Photo 34_N_UM_SW_HBD_MP H_HPD_GT_TY_WN	32	1	5	2.94	1.390	-.112	.414
"The plants in these scene are too tall and restrict views." - Photo 34_N_UM_SW_HBD_MP H_HPD_GT_TY_WN	30	1	5	3.33	1.269	-.358	.427
"I am afraid of hidden dangers in this scene." - Photo 34_N_UM_SW_HBD_MP H_HPD_GT_TY_WN	30	1	5	3.00	1.287	.104	.427
"I would feel too enclosed in this scene." - Photo 34_N_UM_SW_HBD_MP H_HPD_GT_TY_WN	30	1	5	2.77	1.382	.114	.427
"This landscape attracts insects I am afraid of." - Photo 34_N_UM_SW_HBD_MP H_HPD_GT_TY_WN	30	1	5	2.70	1.368	.327	.427

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

FEELINGS OF SAFETY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I would feel safe spending time in this scene." - Photo 35_M_GSI_SW_HBD_MP H_HPD_GF_TN_WN	32	2	5	3.84	1.019	-.447	.414
"The plants in these scene are too tall and restrict views." - Photo 35_M_GSI_SW_HBD_MP H_HPD_GF_TN_WN	30	1	5	2.30	1.119	.620	.427
"I am afraid of hidden dangers in this scene." - Photo 35_M_GSI_SW_HBD_MP H_HPD_GF_TN_WN	30	1	4	2.17	1.020	.271	.427
"I would feel too enclosed in this scene." - Photo 35_M_GSI_SW_HBD_MP H_HPD_GF_TN_WN	30	1	4	1.83	.950	.872	.427
"This landscape attracts insects I am afraid of." - Photo 35_M_GSI_SW_HBD_MP H_HPD_GF_TN_WN	30	1	5	2.20	1.215	.579	.427

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

FEELINGS OF SAFETY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I would feel safe spending time in this scene." - Photo 36_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	32	1	5	3.91	1.058	-1.022	.414
"I would feel too exposed in this scene." - Photo 36_N_TM_SW_LBD_CP H_LPD_GT_TN_WN	30	1	5	2.07	1.202	1.142	.427
"I would feel safe spending time in this scene." - Photo 37_N_TM_SW_MBD_CP H_MPD_GT_TN_WN	32	1	5	3.94	1.243	-1.166	.414
"I would feel too exposed in this scene." - Photo 37_N_TM_SW_MBD_CP H_MPD_GT_TN_WN	30	1	4	2.17	1.262	.437	.427

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

FEELINGS OF SAFETY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I would feel safe spending time in this scene." - Photo 38_M_GSI_SW_MBD_MP H_MPD_GF_TN_WN	32	2	5	3.78	.975	-.420	.414
"The plants in these scene are too tall and restrict views." - Photo 38_M_GSI_SW_MBD_MP H_MPD_GF_TN_WN	29	1	4	1.97	.981	.803	.434
"I am afraid of hidden dangers in this scene." - Photo 38_M_GSI_SW_MBD_MP H_MPD_GF_TN_WN	30	1	4	1.90	.923	.773	.427
"I would feel too enclosed in this scene." - Photo 38_M_GSI_SW_MBD_MP H_MPD_GF_TN_WN	30	1	4	1.83	.834	.715	.427
"This landscape attracts insects I am afraid of." - Photo 38_M_GSI_SW_MBD_MP H_MPD_GF_TN_WN	30	1	5	2.13	1.137	.778	.427

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

FEELINGS OF SAFETY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I would feel safe spending time in this scene." - Photo 39_N_UM_WE_MBD_LP H_MPD_GT_TN_WN	32	1	5	2.75	1.164	.393	.414
"The plants in these scene are too tall and restrict views." - Photo 39_N_UM_WE_MBD_LP H_MPD_GT_TN_WN	29	1	5	2.97	1.375	.066	.434
"I am afraid of hidden dangers in this scene." - Photo 39_N_UM_WE_MBD_LP H_MPD_GT_TN_WN	29	1	5	3.38	1.049	-.254	.434
"I would feel too enclosed in this scene." - Photo 39_N_UM_WE_MBD_LP H_MPD_GT_TN_WN	29	1	5	2.79	1.013	.004	.434
"I would feel safe spending time in this scene." - Photo 40_N_TM_P_LBD_CPH_LPD_GT_TN_WN	32	1	5	3.78	1.184	-.790	.414
"I would feel too exposed in this scene." - Photo 40_N_TM_P_LBD_CPH_LPD_GT_TN_WN	30	1	5	2.23	1.194	.557	.427

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

FEELINGS OF SAFETY

	Descriptive Statistics						
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"I would feel safe spending time in this scene." - Photo 41_N_UM_V_HBD_TPH_HPD_GST_TN_WN	32	1	4	2.41	1.103	.177	.414
"The plants in these scene are too tall and restrict views." - Photo 41_N_UM_V_HBD_TPH_HPD_GST_TN_WN	30	1	5	3.77	1.194	-.817	.427
"I am afraid of hidden dangers in this scene." - Photo 41_N_UM_V_HBD_TPH_HPD_GST_TN_WN	30	1	5	3.50	1.408	-.595	.427
"I would feel too enclosed in this scene." - Photo 41_N_UM_V_HBD_TPH_HPD_GST_TN_WN	30	1	5	3.40	1.133	-.269	.427
"This landscape attracts insects I am afraid of." - Photo 41_N_UM_V_HBD_TPH_HPD_GST_TN_WN	30	1	5	3.10	1.423	-.188	.427

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

FEELINGS OF SAFETY

Descriptive Statistics							
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
"I would feel safe spending time in this scene." - Photo 42_M_GSI_P_HBD_MPH_MPD_GFS_TN_WY	32	3	5	4.59	.615	-1.269	.414
"The plants in these scene are too tall and restrict views." - Photo 42_M_GSI_P_HBD_MPH_MPD_GFS_TN_WY	30	1	5	1.53	.900	2.330	.427
"I would feel too enclosed in this scene." - Photo 42_M_GSI_P_HBD_MPH_MPD_GFS_TN_WY	30	1	5	1.73	1.081	1.981	.427
"This landscape attracts insects I am afraid of." - Photo 42_M_GSI_P_HBD_MPH_MPD_GFS_TN_WY	30	1	5	1.87	1.074	1.176	.427

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

ENVIRONMENTAL AWARENESS

Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
						Statistic	Std. Error
"I understand that this landscape may reduce flooding potential in my neighborhood." - Photo 43_M_GSI_P_HBD_MPH_MPD_GFST_TN_WY	31	2	5	4.19	.910	-.977	.421
"I understand that this landscape may reduce flooding potential in my neighborhood." - Photo 44_M_GSI_P_HBD_MPH_MPD_GFT_TY_WN	31	2	5	3.97	1.048	-.675	.421
"I understand that this landscape may reduce flooding potential in my neighborhood." - Photo 45_M_GSI_SW_HBD_MP_H_HPD_GF_TN_WN	31	2	5	3.68	1.137	-.180	.421

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

ENVIRONMENTAL AWARENESS

Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
						Statistic	Std. Error
"I understand that this landscape may reduce flooding potential in my neighborhood." - Photo 46_M_GSI_SW_HBD_LP_H_HPD_GF_TN_WN	31	2	5	3.87	1.088	-.227	.421
"I understand that this landscape may reduce flooding potential in my neighborhood." - Photo 47_M_GSI_SW_HBD_TP_H_HPD_GF_TN_WN	31	1	5	4.19	1.046	-1.347	.421
"I understand that this landscape may reduce flooding potential in my neighborhood." - Photo 48_M_GSI_SW_HBD_MP_H_HPD_GF_TN_WN	31	1	5	3.58	1.285	-.241	.421

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

ENVIRONMENTAL AWARENESS

Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
						Statistic	Std. Error
"I understand that high plant diversity is beneficial to the environment."	30	3	5	4.70	.596	-1.906	.427
"I understand native plants provide more benefits for the environment than non-native plants."	30	2	5	4.50	.820	-1.608	.427

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

NEIGHBORHOOD SATISFACTION

Descriptive Statistics							
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"How satisfied are you with your neighborhood appearance -- overall appearance"	47	1	5	3.02	1.073	-.374	.347
"How satisfied are you with your neighborhood appearance -- appearance of public roadside landscapes"	48	1	5	2.67	1.098	.108	.343
"How satisfied are you with your neighborhood appearance -- maintenance of public roadside landscapes"	47	1	5	2.47	1.158	.300	.347
"How satisfied are you with your neighborhood appearance -- appearance of public parks and green space"	48	1	5	3.15	1.167	-.379	.343
"How satisfied are you with your neighborhood appearance -- maintenance of public parks and green space"	48	1	5	2.96	1.148	-.268	.343

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

NEIGHBORHOOD SATISFACTION

Descriptive Statistics							
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
"How satisfied are you with your neighborhood appearance -- appearance of vacant landscapes"	48	1	5	2.50	1.353	.296	.343
"How satisfied are you with your neighborhood appearance -- maintenance of vacant landscapes"	47	1	5	2.30	1.267	.545	.347
"How satisfied are you with your neighborhood appearance -- variety of different landscapes"	47	1	5	2.96	1.179	.002	.347
"How satisfied are you with your neighborhood appearance -- safety for walking during the day"	48	1	5	3.33	1.191	-.295	.343
"How satisfied are you with your neighborhood appearance -- safety for walking at night"	48	1	5	2.81	1.424	.115	.343
Valid N (listwise)	45						

MARLBOROUGH COMMUNITY COALITION

DESCRIPTIVES

DEMOGRAPHICS

Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness	
						Statistic	Std. Error
"What is your gender?"	31	1	3	1.74	.575	.042	.421
"What is your age?"	31	2	4	2.52	.626	.809	.421
"Do you have children in your household?"	31	1	2	1.77	.425	-1.379	.421
"How long have you lived in the neighborhood?"	31	1	5	2.68	1.376	.794	.421
"What is your ethnicity?"	30	1	6	1.53	1.137	2.705	.427
"What is your highest education level?"	30	2	6	4.50	1.280	-.529	.427
"What is your current employment status?"	30	1	6	1.70	1.643	2.217	.427
"What is your annual household income?"	28	1	4	2.89	.832	-.205	.441
"What is your dominant mode of transportation?"	30	1	2	1.03	.183	5.477	.427
survey format taken	40	1	2	1.58	.501	-.315	.374
participant's neighborhood	40	2	2	2.00	.000	.	.

MARLBOROUGH COMMUNITY COALITION

LINEAR REGRESSION

FAMILIARITY

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.283	1	6.283	5.596	.024 ^b
	Residual	40.419	36	1.123		
	Total	46.702	37			

a. Dependent Variable: bioidx_TM_MCC

b. Predictors: (Constant), famli_HBD_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3.755	.519		7.235	<.001					
	famli_HBD_MCC	-.384	.162	-.367	-2.366	.024	-.367	-.367	-.367	1.000	1.000

a. Dependent Variable: bioidx_TM_MCC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.495	1	13.495	9.264	.005 ^b
	Residual	39.333	27	1.457		
	Total	52.828	28			

a. Dependent Variable: neighsat_overall

b. Predictors: (Constant), famli_HBD_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	5.145	.622		8.273	<.001					
	famli_HBD_MCC	-.593	.195	-.505	-3.044	.005	-.505	-.505	-.505	1.000	1.000

a. Dependent Variable: neighsat_overall

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.150	1	2.150	4.578	.041 ^b
	Residual	13.620	29	.470		
	Total	15.771	30			

a. Dependent Variable: safhty_1_GSI_MCC

b. Predictors: (Constant), famli_HBD_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.617	.351		7.460	<.001					
	famli_HBD_MCC	-.231	.108	-.369	-2.140	.041	-.369	-.369	-.369	1.000	1.000

a. Dependent Variable: safhty_1_GSI_MCC

MARLBOROUGH COMMUNITY COALITION

LINEAR REGRESSION

FAMILIARITY

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.810	1	10.810	15.581	<.001 ^b
	Residual	19.452	28	.695		
	Total	30.262	29			

a. Dependent Variable: neighst_at_app_maint_var_safety_MCC
b. Predictors: (Constant), famli_HBD_MCC

Coefficients^a

Model	Unstandardized Coefficients			Standardized Coefficients		t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta					Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	4.617	.427			10.820	<.001					
	famli_HBD_MCC	-.521	.132	-.588		-3.945	<.001	-.588	-.588	-.588	1.000	1.000

a. Dependent Variable: neighst_at_app_maint_var_safety_MCC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.963	1	8.963	14.380	<.001 ^b
	Residual	17.453	28	.623		
	Total	26.416	29			

a. Dependent Variable: enmaware_flooding_MCC
b. Predictors: (Constant), famli_HBD_MCC

Coefficients^a

Model	Unstandardized Coefficients			Standardized Coefficients		t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta					Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.507	.404			6.202	<.001					
	famli_HBD_MCC	.474	.125	.582		3.782	<.001	.582	.582	.582	1.000	1.000

a. Dependent Variable: enmaware_flooding_MCC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.209	1	2.209	7.458	.011 ^b
	Residual	7.998	27	.296		
	Total	10.207	28			

a. Dependent Variable: enmaware_biody
b. Predictors: (Constant), famli_HBD_MCC

Coefficients^a

Model	Unstandardized Coefficients			Standardized Coefficients		t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta					Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3.975	.280			14.176	<.001					
	famli_HBD_MCC	.242	.088	.465		2.731	.011	.465	.465	.465	1.000	1.000

a. Dependent Variable: enmaware_biody

MARLBOROUGH COMMUNITY COALITION

LINEAR REGRESSION

FAMILIARITY

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.312	1	17.312	26.762	<.001 ^b
	Residual	19.407	30	.647		
	Total	36.719	31			

a. Dependent Variable: natpnt_1_GSI_MCC

b. Predictors: (Constant), faml_HBD_MCC

Coefficients ^a											
Model	Unstandardized Coefficients			Standardized Coefficients		Sig.	Correlations			Collinearity Statistics	
	B	Std. Error		Beta	t		Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.913	.411		4.657	<.001					
	faml_HBD_MCC	.656	.127	.687	5.173	<.001	.687	.687	.687	1.000	1.000

a. Dependent Variable: natpnt_1_GSI_MCC

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.704	1	14.704	41.080	<.001 ^b
	Residual	9.664	27	.358		
	Total	24.368	28			

a. Dependent Variable: natpnt_4_GSI_MCC

b. Predictors: (Constant), faml_HBD_MCC

Coefficients ^a											
Model	Unstandardized Coefficients			Standardized Coefficients		Correlations				Collinearity Statistics	
	B	Std. Error		Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.015	.317		6.352	<.001					
	faml_HBD_MCC	.621	.097	.777	6.409	<.001	.777	.777	.777	1.000	1.000

a. Dependent Variable: natpnt_4_GSI_MCC

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.741	1	2.741	5.923	.022 ^b
	Residual	12.033	26	.463		
	Total	14.774	27			

a. Dependent Variable: natpnt_3_GSI_MCC

b. Predictors: (Constant), faml_HBD_MCC

Coefficients ^a											
Model	Unstandardized Coefficients			Standardized Coefficients		Correlations				Collinearity Statistics	
	B	Std. Error		Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.983	.377		7.918	<.001					
	faml_HBD_MCC	.276	.113	.431	2.434	.022	.431	.431	.431	1.000	1.000

a. Dependent Variable: natpnt_3_GSI_MCC

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.887	1	20.887	29.427	<.001 ^b
	Residual	25.553	36	.710		
	Total	46.441	37			

a. Dependent Variable: bioldiv_GSI_MCC

b. Predictors: (Constant), faml_HBD_MCC

Coefficients ^a											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.428	.413		3.460	.001					
	faml_HBD_MCC	.700	.129	.671	5.425	<.001	.671	.671	.671	1.000	1.000

a. Dependent Variable: bioldiv_GSI_MCC

MARLBOROUGH COMMUNITY COALITION

LINEAR REGRESSION

ENVIRONMENTAL AWARENESS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.762	1	15.762	18.775	<.001 ^b
	Residual	22.666	27	.839		
	Total	38.428	28			

a. Dependent Variable: faml_HBD_MCC
b. Predictors: (Constant), envaware_flooding_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-.143	.740		-.193	.849					
	envaware_flooding_MCC	.786	.181	.640	4.333	<.001	.640	.640	.640	1.000	1.000

a. Dependent Variable: faml_HBD_MCC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.059	1	5.059	4.611	.037 ^b
	Residual	27.345	26	1.052		
	Total	32.404	27			

a. Dependent Variable: safety_5_LUMGSI_MCC
b. Predictors: (Constant), envaware_flooding_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	4.130	.828		4.967	<.001					
	envaware_flooding_MCC	-.455	.207	-.395	-2.193	.037	-.395	-.395	-.395	1.000	1.000

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.353	1	3.353	7.965	.009 ^b
	Residual	10.945	26	.421		
	Total	14.298	27			

a. Dependent Variable: safety_4_GSI_MCC
b. Predictors: (Constant), envaware_biodiv

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	4.492	.963		4.667	<.001					
	envaware_biodiv	-.576	.204	-.484	-2.822	.009	-.484	-.484	-.484	1.000	1.000

a. Dependent Variable: safety_4_GSI_MCC

MARLBOROUGH COMMUNITY COALITION

LINEAR REGRESSION

ENVIRONMENTAL AWARENESS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.633	1	7.633	6.077	.020 ^b
	Residual	35.167	28	1.256		
	Total	42.800	29			

a. Dependent Variable: biode_TM_MCC

b. Predictors: (Constant), enware_ biody

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	6.579	1.654		3.978	<.001					
	enware_ biody	-.861	.349	-.422	-2.465	.020	-.422	-.422	-.422	1.000	1.000

a. Dependent Variable: biode_TM_MCC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.328	1	6.328	5.298	.030 ^b
	Residual	29.858	25	1.194		
	Total	36.185	26			

a. Dependent Variable: natpht_L_OSI_MCC

b. Predictors: (Constant), enware_flooding_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.716	.905		1.897	.069					
	enware_flooding_MCC	.517	.225	.418	2.302	.030	.418	.418	.418	1.000	1.000

a. Dependent Variable: natpht_L_OSI_MCC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.060	1	21.060	37.764	<.001 ^b
	Residual	15.615	28	.558		
	Total	36.675	29			

a. Dependent Variable: biode_OSI_MCC

b. Predictors: (Constant), enware_flooding_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.009	.592		.015	.988					
	enware_flooding_MCC	.898	.146	.758	6.145	<.001	.758	.758	.758	1.000	1.000

a. Dependent Variable: biode_OSI_MCC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.277	1	14.277	18.850	<.001 ^b
	Residual	21.208	28	.757		
	Total	35.485	29			

a. Dependent Variable: natpht_1_OSI_MCC

b. Predictors: (Constant), enware_flooding_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.940	.690		1.362	.184					
	enware_flooding_MCC	.739	.170	.634	4.342	<.001	.634	.634	.634	1.000	1.000

a. Dependent Variable: natpht_1_OSI_MCC

MARLBOROUGH COMMUNITY COALITION

LINEAR REGRESSION

ENVIRONMENTAL AWARENESS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.030	1	6.030	18.044	<.001 ^b
	Residual	8.021	24	.334		
	Total	14.051	25			

a. Dependent Variable: natpint_3_GSL_MCC

b. Predictors: (Constant), envaware_flooding_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.812	.486		3.726	.001					
	envaware_flooding_MCC	.519	.122	.655	4.248	<.001	.655	.655	.655	1.000	1.000

a. Dependent Variable: natpint_3_GSL_MCC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.355	1	12.355	28.715	<.001 ^b
	Residual	10.756	25	.430		
	Total	23.111	26			

a. Dependent Variable: natpint_4_GSL_MCC

b. Predictors: (Constant), envaware_flooding_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.083	.539		2.011	.055					
	envaware_flooding_MCC	.731	.136	.731	5.359	<.001	.731	.731	.731	1.000	1.000

a. Dependent Variable: natpint_4_GSL_MCC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.667	1	4.667	13.245	.001 ^b
	Residual	9.866	28	.352		
	Total	14.533	29			

a. Dependent Variable: safety_1_GSL_MCC

b. Predictors: (Constant), envaware_biodiv

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	5.097	.876		5.818	<.001					
	envaware_biodiv	-.673	.185	-.567	-3.639	.001	-.567	-.567	-.567	1.000	1.000

a. Dependent Variable: safety_1_GSL_MCC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.844	1	2.844	4.635	.041 ^b
	Residual	15.341	25	.614		
	Total	18.185	26			

a. Dependent Variable: safety_2_GSL_MCC

b. Predictors: (Constant), envaware_biodiv

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	4.230	1.166		3.628	.001					
	envaware_biodiv	-.533	.248	-.395	-2.153	.041	-.395	-.395	-.395	1.000	1.000

a. Dependent Variable: safety_2_GSL_MCC

MARLBOROUGH COMMUNITY COALITION

LINEAR REGRESSION

NEIGHBORHOOD SATISFACTION

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.832	1	13.832	15.184	<.001 ^b
	Residual	24.595	27	.911		
	Total	38.428	28			

a. Dependent Variable: famtl_HBD_MCC

b. Predictors: (Constant), neighsat_app_mainlvar_safsh_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	5.046	.559		9.023	<.001					
	neighsat_app_mainlvar_safsh_MCC	-.677	.174	-.600	-3.897	<.001	-.600	-.600	-.600	1.000	1.000

a. Dependent Variable: famtl_HBD_MCC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.133	1	8.133	8.529	.007 ^b
	Residual	26.697	28	.953		
	Total	34.830	29			

a. Dependent Variable: natpinl_L_GSL_NTFC

b. Predictors: (Constant), neighsat_app_mainlvar_safsh_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	5.378	.562		9.574	<.001					
	neighsat_app_mainlvar_safsh_MCC	-.501	.172	-.483	-2.921	.007	-.483	-.483	-.483	1.000	1.000

a. Dependent Variable: natpinl_L_GSL_NTFC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.936	1	5.936	4.485	.043 ^b
	Residual	37.660	28	1.324		
	Total	43.596	29			

a. Dependent Variable: bioldh_TM_MCC

b. Predictors: (Constant), neighsat_app_mainlvar_safsh_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.215	.662		1.836	.077					
	neighsat_app_mainlvar_safsh_MCC	.428	.202	.372	2.118	.043	.372	.372	.372	1.000	1.000

a. Dependent Variable: bioldh_TM_MCC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.624	1	6.624	7.179	.013 ^b
	Residual	17.465	28	.624		
	Total	24.089	29			

a. Dependent Variable: natpinl_L_GSL_NTFC

b. Predictors: (Constant), neighsat_app_mainlvar_safsh_MCC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	5.086	.488		10.421	<.001					
	neighsat_app_mainlvar_safsh_MCC	-.408	.152	-.472	-2.679	.013	-.472	-.472	-.472	1.000	1.000

a. Dependent Variable: natpinl_L_GSL_NTFC