Community Bike Shops as Youth Development Programs: Influences on Mobility & Accessibility of Youth Participants

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COMMUNITY BIKE SHOPS AS YOUTH DEVELOPMENT PROGRAMS:
INFLUENCES ON MOBILITY & ACCESSIBILITY
OF YOUTH PARTICIPANTS

A Thesis
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Master of City and Regional Planning

by
Adrienne Warren
May 2019

Accepted by:
Dr. Luis Enrique Ramos-Santiago, Committee Chair
Dr. Barry Nocks
Dr. Timothy Green
Abstract

Lack of mobility in low-moderate income neighborhoods can lead to mobility-based social exclusion and can contribute to a path of generational poverty, diminished quality of life, among other health and socio-economic disadvantages for residents. Community bike shops provide opportunities for youth residents in low-moderate income neighborhoods to learn new mechanical and riding skills through earn-a-bike programs in addition to providing access to a bicycle and facilitate group riding experiences. These new experiences can improve student’s mobility and accessibility and thus help alleviate mobility-based exclusion. A mixed methods case study of two community bike shops, Village Wrench in Greenville, South Carolina and Trips for Kids in Charlotte, North Carolina, was conducted to determine how these earn-a-bike programs influence their participants and advance their mission and vision statements. The study also documented bicycle travel behavior outside of the programs’ scheduled activities. Youth participants were surveyed, and program directors and a selection of mentors were interviewed. This led to a qualitative and quantitative analysis that resulted in two main themes: freedom and empowerment. The freedom and improved accessibility the bicycle gave the youth, together with new skills learned in the programs empowered them and contributed to a feeling of accomplishment. These community-based programs succeed in facilitating youth in low-moderate income neighborhoods with transformative experiences that help their development as individuals and contribute to
the betterment of their communities and society in general. Ways to support, replicate, and/or expand this type of grassroot youth-development initiative is warranted given the documented benefits in this study and their potential to contribute in other low-moderate income neighborhoods across the nation.
Acknowledgements

This thesis could never have been written without the help and guidance of my committee members: Dr. Luis Enrique Ramos-Santiago, Dr. Barry Nocks, and Dr. Timothy Green. Thank you for your extraordinary patience and insightful suggestions!
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Introduction

“Much of life for many people, even in the heart of the First World, still consists of waiting in a bus-shelter with your shopping for a bus that never comes” (Massey, 1994, p. 163).

Residents living and growing in low-moderate income neighborhoods do not enjoy the same level of mobility and access to socio-economic opportunities as compared to residents of higher income neighborhoods (Massey, 1994). Limited access to transportation makes it difficult for individuals to engage in critical socio-economic activities such as getting to work or work interviews, school, and the grocery store, among other locations. Furthermore, in the case of youth living in low-moderate income neighborhoods, these tend to face limited opportunities, increased violence and crime, and greater levels of stress and isolation within their home; they also appear to lack exposure to role models, leadership, mentorship, and quality education, among other opportunities and experiences believed to impact their well-being and future prospects (Southward, 2018).

While not all low-moderate income neighborhoods have these effects, the cost to society associated with under-development of children and thwarting of their full ability as citizens can be substantial (Leventhal, Brooks-Gunn, & Kamerman, 2008).
Youth in many low-moderate income neighborhoods are recorded as having fewer opportunities for education and jobs (Southward, 2018), lack of affordable transportation, and thus lower access to education and work opportunities that could negatively impact their development and diminish their ability to reach their full potential. Hence, a number of youth development programs have been created, implemented, and operate in numerous communities around the United States. Their efforts seek to empower youth in low-income neighborhoods, by providing a safe environment for them to learn, be mentored, and build healthy sustainable relationships.

To encourage participation in these youth development programs, bicycles have been incorporated to include physical activity and hands-on-skills. As a part of a youth development program, bicycles and bicycle-related skills may provide this special sub-population of youth in low-income neighborhoods with the opportunity to gain practical life and business skills where such opportunities are limited. Further, community bike shops may allow convenient access to bicycles which would provide an affordable and sustainable means of transportation (Kinnevy, Healey, Pollio, & North, 2008). Some programs promote not only access and know-how, but also ownership.

Several studies point to the benefits of the bicycle as related to health and well-being, encouraging an active lifestyle (Morris & Guerra, 2015; Veitch, et al., 2017). Other authors discuss the contributions and positive effects of bicycles in youth development programs, such as empowerment and hands-on-skills (Lerner & Lerner, 2010). However,
it appears that no study has explored the role and impacts that community bike shops might have on these youth programs and on participants' potential bicycle mobility and accessibility improvements outside of program’s scheduled activities. Thus, this author posits two research questions to clarify the role of community bike shops and potential effects on youth participants:

**RQ1. How do community bike shop programs influence youth participants and in which ways?**

**RQ2. What impact does community bike shops have on youth participants’ bicycle mobility and accessibility outside of the program’s scheduled activities?**

This research would contribute to a better understanding of the effects of community bike shops on youth participants. Insights into its effects and lessons derived from this study could inform future programs geared to improve quality of life through increased mobility, bicycle accessibility, and youth development in disadvantaged communities, potentially improving long-term benefits to young residents as they grow into adulthood. The present study also aims to understand how bicycle shops as a component of youth development programs help advance their more comprehensive institutional vision, immediate objectives, and long-term goals.
This thesis was originally based on documentation and examination of three case studies (N=3), where the bicycle shop is the main component of their youth development programs. One case is located in Charlotte, North Carolina and the other two in Greenville, South Carolina. The final multiple-case study design combines and compares data from two of the three cases given that for one of the cases data and participants access was delayed. The main proposition in this study hypothesizes that participation in a community bike shop would result in increased mobility and accessibility outside of the program’s scheduled activities, as afforded by earned-bicycles; it would also contribute to a better sense of well-being and individual development through acquisition of new skills and improved sense of self-worth. These new experiences, and the potentially improved mobility and accessibility could in turn better conditions and empower residents creating avenues to access more activities and opportunities such as jobs, schools, recreation, among others.

This thesis is organized as follows: first, a section discussing the review of pertinent literature is presented. This begins by defining a neighborhood and the impacts of neighborhoods on youth, followed by a discussion of community development programs and youth development programs. Definitions of accessibility and mobility in the transportation literature, transportation and equity themes, and the impacts of improved access and mobility on low-income communities and their youth are discussed. The literature review also explores the idea of the community bike shop as a grassroot solution to increase bicycle access and mobility in low-income
communities and improving the quality of life and well-being for youth. A better understanding of community bike shops, regarding their integration in youth development programs and on the community and impacts to it, was found by identifying their mission and vision statements and evaluating how these are potentially advanced in various community bike shops. Interviews to owners and organizers, surveys to youth participants, qualitative and quantitative data collection and analysis, and a literature review were considered in the analysis.

The research design was based on a multiple case-study framework of youth development programs that serve low-moderate income neighborhoods where community bike shops have been implemented and are the main or only component of the program. Cross case analysis of quantitative and qualitative results inform conclusions and recommendations to the community bike shops, together with an assessment of the limitations of this study.
Literature Review

Challenges Faced by Youth in Low-Moderate Income Neighborhoods

‘Neighborhood’ is a term that is frequently used but has multiple connotative meanings to different people. The general definition is a section of the city with a common identity (City of Vancouver Washington, 2018); neighborhoods have their own identity based on who lives there and the surrounding areas but can have fuzzy boundaries (Neighborhood, 2018). Also, neighborhoods can frequently be identified by signage and physical groupings of homes and are typically filled with like-minded people (What is a Neighborhood?, 2018). They are the basis for social relationships, have a history, and are differentiated by who can afford to live there (What is a Neighborhood?, 2018; City of Vancouver Washington, 2018). Ramos et al. (2014, p. 3) summarizes these ideas by defining a neighborhood as:

A neighborhood has identifiable physical limits, shared physical and urban-ecological history, and its propensity for harboring interpersonal interactions (i.e., sustained interpersonal relationships in communities, as explained by Lozano 1990). As such, it is considered a dual entity in tune with the social-ecological approach, containing physical as well as social attributes.

These definitions highlight the multi-dimensional nature of neighborhoods and introduce socio-economic characterizations that allow for an even more nuanced and complex understanding of this social-geographical phenomenon.
Low-moderate income neighborhoods are defined by the U.S. Department of Housing and Urban Development as composed of households whose income is equal to or less than 80 percent of the area’s median income. (Glossary of CPD Terms - L, 2018). Low-moderate income neighborhoods “are less likely to have the social support of a network of friends and family...increase parent’s stress and make it more difficult for them to be effective” (Southward, 2018, p. 85). In addition, low-moderate income families are more likely to change schools, which leads to higher rates of academic failure, behavior issues, and a higher likelihood of being a high school dropout (Southward, 2018; Leventhal, Brooks-Gunn, & Kamerman, 2008). Studies also show that low-moderate income residents tend to have a higher teenage motherhood rates and domestic abuse rates (Southward, 2018; Leventhal, Brooks-Gunn, & Kamerman, 2008). Together these factors lead to lower self-esteem and several studies correlate these set of factors with lower adult earnings (Southward, 2018). To help mitigate these circumstances, grassroots innovations have been developed across the nation (Nicolosi, Medina, & Feola, 2018).

Grassroots Innovations and Community Bike Shops

Grassroots innovations can be described in several ways including; “innovative product or process created at the bottom of the pyramid, usually due to necessity, hardships, and challenges” (Hilmi, 2012, p. 1) and “a novel solution to a social problem that is more effective, efficient, sustainable, or just, than existing solutions and for
which the value created accrues primarily to society as a whole rather than private individuals” (Ross, Mitchell, & May, 2012, p. 471). Grassroots innovations come in a variety of categories that Nicolosi defines as agriculture and provision, housing, transportation, economics, community enterprises and collectives, and digital commons (Nicolosi, Medina, & Feola, 2018). Alternative grassroot innovation transportation includes community bike shops. As an example, Focused Community Strategies, a non-profit organization in Historic South Atlanta that seeks to empower neighborhoods to thrive, has addressed several of these issues by developing a market, coffee shop, and community bike shop within the neighborhood. This provides opportunities for hyper-local employment that is defined as commuting less than one mile for residents (Delp, 2018). Providing jobs closer to home is an example of land use accessibility via proximity and a community bike shop providing bicycles is an example of increasing individuals’ mobility. Community bike shops can also be a part of a bigger and more complex initiative, such as a multi-component youth development program.

Youth Development Programs

Youth development programs aim to prepare youth for the challenges of adulthood, so they can achieve their full potential (National Alliance for Secondary Education and Transition, 2010). Positive youth development is defined by 4-H, with the “five C’s: competence, confidence, connection, character, and caring” (Lerner & Lerner,
2010), which encompasses psychological, behavioral, and social characteristics (Zarrett & Lerner, 2008).

Table 1. The Five C's of Positive Youth Development (Lerner & Lerner, 2010)

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<th>“C”</th>
<th>Definition</th>
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<tr>
<td>Competence</td>
<td>Positive view of one’s actions in specific areas, including social and academic skills.</td>
</tr>
<tr>
<td>Confidence</td>
<td>An internal sense of overall positive self-worth and self-efficacy.</td>
</tr>
<tr>
<td>Connection</td>
<td>Positive bonds with people and institutions that are reflected in exchanges between the individual and his or her peers, family, school, and community and in which both parties contribute to the relationship.</td>
</tr>
<tr>
<td>Character</td>
<td>Respect for societal and cultural norms, possession of standards for correct behaviors, a sense of right and wrong (morality), and integrity.</td>
</tr>
<tr>
<td>Caring</td>
<td>A sense of sympathy and empathy for others.</td>
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Developmental scientists believe that these five characteristics work together to develop a sixth characteristic, contribution (Zarrett & Lerner, 2008). Contribution includes three elements: to oneself, family, and community. Positive youth development is not only influenced by family assets, but also through the after-school programs that a student may participate in. Researchers found that students that spent their time in multiple after school activities, have a higher positive youth development score (Zarrett & Lerner, 2008). This peaked at four activities and after that, the results declined. These activities can include a variety of youth programs including, but not limited to 4-H, Big Brothers Big Sisters, Girl Scouts, and community bike shops.
As an example, 4-H completed a longitudinal study to determine the effects of their youth development programs. Their programs are multi-faceted and include out-of-school learning, leadership opportunities, and adult mentorship. The study began in 2002 and was continued for eight years, including more than 7,000 youth from across the United States. They followed a group of fifth graders until they completed high school and charted the impacts of 4-H. The inputs defined by 4-H include skill-building, long-term caring adult, and meaningful leadership. Additional youth development programs include community bike shops. Their missions correlate with that mentioned by 4-H and can be seen in Table 2.
Table 2. Youth Development Program Mission Statements from Five Programs in the U.S.

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<th>Program</th>
<th>Mission Statement</th>
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<td>4-H</td>
<td>The mission of 4-H is to assist youth, and adults working with those youth, to gain additional knowledge, life skills, and attitudes that will further their development as self-directing, contributing, and productive members of society. (Virginia Cooperative Extension, 2018)</td>
<td></td>
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<tr>
<td>Big Brothers</td>
<td>Provide children facing adversity with strong and enduring, professionally supported one-to-one relationships that change their lives for the better, forever. (Big Brothers Big Sisters, 2018)</td>
<td></td>
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<tr>
<td>Big Sisters</td>
<td></td>
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<tr>
<td>Momentum Bike Club</td>
<td>The mission of Momentum Bike Club is to transform the lives of young people through a comprehensive youth development program using the platform of cycling to foster and sustain mentoring relationships. (Taylor, Momentum Bike Clubs, 2018)</td>
<td></td>
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<tr>
<td>Village Wrench</td>
<td>To transform under-resourced communities by empowering others through bicycle repair, bike earning, and cycling educational opportunities. (Village Wrench, 2018)</td>
<td></td>
</tr>
<tr>
<td>Trips for Kids</td>
<td>To provide transformative cycling experiences through a network of chapters that promote healthy, recreational lifestyles, environmental awareness, and personal empowerment for young people of all communities, especially those most in need. (Glodowski, 2019)</td>
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These mission statements highlight the importance of the three different inputs defined by 4-H: they emphasize the importance of the leadership at the programs, the intentional relationships that they bring, and the skills that the participants can learn.

The leadership, relationships, and skills they provide to the youth are crucial as many of the students lack stable role models and households (Southward, 2018).
The Unexplored Accessibility and Mobility Effects of Community Bike Shops on Youth Participants

While ample literature on the benefits of youth development programs and cycling exists in relation to health impacts and well-being, no study has yet to assess the impacts of community bike shops as part of a youth improvement program in terms of transportation related phenomena such as mobility and accessibility. As noted earlier, these factors can have significant impacts on youth and adults’ development and opportunities in reducing mobility-based exclusion. This study seeks to shed light on this issue in the context of community bike shops as part of a youth development program, and how this in turn might contribute to the larger program vision.

The terms “accessibility” and “mobility” are frequently used interchangeably, without distinction. However, accessibility is defined as “the ability to reach desired goods, services, activities and destinations” (Litman, 2011, p. 5). As such accessibility encompasses both mobility and land use patterns (i.e. proximity). On the other hand, mobility is defined as the “efficient movement of people or goods” (Barter, 2018, p. 1), or more basically the ability to move. Similarly, Handy defines it as “capable of moving or of being moved readily from place to place” (Handy S., 2002, p. 3).

Land use patterns reflect the location of a variety of services and activities. Efficient mobility in conjunction with compact land use patterns (i.e. proximity) increases accessibility (Litman, 2011). Inefficient or lack of mobility can have detrimental
effects on low-moderate income residents because without proper mobility they can have less access or no-access to affordable food, goods, and services necessary to maintain their households (Clifton, 2004).

Cass et al. (2005) define four key dimensions of accessibility: financial, physical, organizational, and temporal and elaborates on the difficulties as related to low-moderate income residents. The authors start with financial accessibility, stating that every form of transportation requires some form of expenditure. If one is driving a vehicle, there is a need to purchase gas and a car, but even if one is walking, there is a need for a decent pair of shoes. Physical accessibility involves both the health and physical abilities of the resident as well as the physical surroundings. Low-moderate income neighborhoods might not have the infrastructure necessary to encourage walking or cycling and these residents tend to have more health issues that would inhibit this behavior (Southward, 2018).

Organizational accessibility is the organization of various types of public and private transits including bus route directions, bus route stops, and service window (hours of operation). Cass contrasts the organization of the travel-rich versus the travel-poor based on availability, options, safety, and price. Also, low-moderate income residents are less likely to have the social network to be able to get lifts from neighbors (Cass, Shove, & Urry, 2005; Southward, 2018). The travel-poor are disadvantaged, and this is continued in the last accessibility principle, temporal. Low-moderate income
residents are more likely to work the second or third shift where public transportation is unavailable (Cass, Shove, & Urry, 2005).

Having a bicycle can help mitigate some of these concerns for the dimensions of accessibility. A bicycle is a cheaper form of transportation. Moreover, when there is the possibility of ‘free’ acquisition through an earn-a-bike program. While there are some physical limitations to riding a bike, especially with the organizational accessibility of the connected paths or lack of adequate infrastructure, a bicycle does have the option to be ridden 24/7 to meet the needs of the second or third shift workers. The bicycle may not be the perfect answer, but it increases the options. This scenario serves as an example of the concept of mobility-related exclusion, which is further discussed in the following section.

Social Access and Mobility Related Exclusion

When communities and societies are built with the assumption of high mobility, people are often excluded from participation in economic, social, and political aspects of society due to insufficient mobility. This exclusion due to lack of limited access or mobility can affect the opportunities, services, and social networks that one can achieve within and beyond their immediate community. This process is formally defined as mobility-related exclusion (Keynon, Lyons, & Rafferty, 2002). This condition leads to further issues of limited social access for low-moderate income residents. As noted by Southward (2018), the lack of mobility in low-moderate income neighborhoods is a
detriment to the residents, including both physical and economic mobility. With greater access comes greater opportunity for success, while lack of access leads to a path of generational poverty (How Housing Matters Editorial, 2015). As such, youth-improvement programs that aim to reduce mobility-based exclusion could improve the conditions of participants who live in disadvantaged low-moderate income communities.

The Bicycle as a Strategy to Thwart Mobility-Related Exclusion

The bicycle can be both a recreational and a utilitarian mode of transportation. It has positive impacts on mobility and access to socio-economic opportunities, as well as quality of life. On the economic side, cycling is the only transportation option for many, especially for riders who cannot afford a car and where public transit does not run effectively for third-shift workers (Hoffman M., Are Bike Lanes White Lanes?, 2018). Bicycling is also known for numerous benefits, from making one healthier to reducing vehicle pollution (Hoffman M., Bike Lanes Are White Lanes: Bicycle Advocacy and Urban Planning, 2016). There are also other benefits as “bicyclists often report the calmness and happiness they feel bicycling, leading to fewer stress-laden commuters on the road.” (Hoffman M., Bike Lanes Are White Lanes: Bicycle Advocacy and Urban Planning, 2016).

Morris and Guerra did a study that also supports Hoffman’s statement that bicycling is the happiest mode of transportation, although in their study they did not
look at recreational cycling (Morris & Guerra, 2015). Handy et al. challenges this idea, that bicycling is the happiest mode of transportation, by stating “bicycle ownership appears to depend solely on individual attitudes towards bicycling” (Handy, Xing, & Buehler, 2010, p. 978). This is saying that the only people that own bicycles are those that enjoy cycling and continues to suggest that positive attitudes toward bicycling could be encouraged through promotional programs.

Veitch et al. completed a study in Australia on youth’s active transportation in disadvantaged neighborhoods (Veitch, et al., 2017). This study surveyed the mothers of youth and the youth to examine changes in youth’s mobility over two years. The students reported their mode of transportation to and from school during a typical week via six modes of transportation. Their options included: walking, riding a bike, skateboard/scooter/rollerblade, public transport/school bus, family car, and carpool. This survey was conducted to 184 students age ranging from eight to fifteen, with an average age of twelve. Overall, 43.5% of students used active transportation, in at least one direction, on their school travels (Veitch, et al., 2017). Similar to the findings from Morris and Guerra (2015), and Hoffman (2016), Veitch et al. found that, “children's enjoyment of walking/cycling activities has important associations with independent mobility on the school journey.” (Veitch, et al., 2017, p. 107). This study also found that the level of safety concerns by the mother had a direct effect on the type of transportation their child was allowed to partake in when traveling to and from school.
Timperio et al. also completed a study in Australia that compares neighborhood perceptions to walking and cycling amongst youth (Timperio, Crawford, Telford, & Salmon, 2004). The study included 1,210 students, 291 were between the ages of five and six and 919 were between the ages of ten and twelve and one parent. The students that ranged from ten to twelve and the parents were surveyed, a different method was used for the students aged five to six. They were asked how many times they walked or biked to a list of places including bike or walking tracks, friend’s houses, parks/ovals/playgrounds, the postbox, public transport, school, shops, and sport venues. The parents were asked of their perception of their neighborhood in conjunction with how far they will let their child walk in minutes converted to kilometers, such as “1/2 km takes around 10 mins (to walk)” (Timperio, Crawford, Telford, & Salmon, 2004, p. 41). The results of this study agreed with those from Veitch et al., that the parental perceptions of the environment correlated with the frequency of the students walking and cycling. Thus, it is important that this study captures the parents’ perceptions if the researcher wants to assess the impact of community bike shops on youth participants mobility and accessibility.

Page et al. completed a comparable study in the United Kingdom. This study looked at the youth’s independent mobility and how that compared to their perceptions on the built environment under three different dependent variables: outdoor play, structured exercise/sport, and active commuting (Page, Cooper, Griew, & Jago, 2010). Page et al. studied a wide range of independent variables including local independent
mobility, area independent mobility, aesthetics, nuisance, personal safety, traffic safety, and access. With all of these factors and the results from 1,307 youth, the study drew the conclusion that gender plays an important role and so does the physical activity contexts (Page, Cooper, Griew, & Jago, 2010). Local independent mobility is related to increased likelihood for outdoor play, structured exercise/sport and active commuting for boys, however it is only highly related in active commuting for girls. Thus, distinguishing gender is an important factor when creating the survey. The independent and dependent variables used in this study are used to help define the survey to both youth and adults.

While the number of surveyed participants will be difficult to replicate in this study, their survey questions and analysis inform the methodology of this study. The five major themes and factors gathered from these studies that are considered in this investigation include: enjoyment, frequency, activity types, parental control, and neighborhood conditions. The impacts that neighborhoods conditions have on the youth and how parents are more protective of their children if they believe they live in an unsafe neighborhood is not something mentioned in other studies and is a key factor to recognize. The Australian studies focus on regular travel without the influence of an outside program. For this study, youth development programs with a bicycle shop component are the focus.
Community Bike Shops

Community bike shops differ from a typical bicycle shop because they are “dedicated to self-empowerment and building community through the bicycle”; they “offer an alternative to consumer culture’s reliance on others to satisfy needs, seeking to empower cyclists to become more self-reliant in undertaking bicycle repair.” (Arnold, 2013, p. 139). Community bike shops are more than just a shop, they can offer classes and assistance to educate riders. They also help mitigate the concerns of affording a bike by offering earn-a-bike programs (Strömberg & Karlsson, 2016). It is important to note that not all community bike shops are alike and take different forms around the country.

Kalihi Valley Instructional Bike Exchange Program (K-VIBE) is located in Kalihi Valley, Hawaii. They built a bike shop as part of a greater organization for youth and family services (Hamamoto, Derauf, & Yoshimura, 2009). The goals of K-VIBE include an innovative prevention program, hands-on skills, vocational training, caring staff and role models. They have a bicycle repair shop and a bicycle recycling program and have refurbished 2000 bicycles in the past four years. Overall, to make their program successful they learned to invest energy where there is community traction. Not all of their programs within youth and family services were successful and K-VIBE decided to cut programs that the community did not actively participate in. They also noted the importance of good leadership and staffing as participants often look up and
feel welcomed by the staff. Without this nurturing and respectful relationship between participants and staff the community bike shop can have difficulty succeeding.

Recycle-A-Bicycle is a non-profit community bike shop in New York City that has been around for 24 years (Jose, 2012). They utilize the bicycle as a resource to foster youth development, environmental education, community engagement, and healthy living. Recycle-A-Bicycle wrote a book, *Tools for Life: A Start-Up Guide for Youth Recycling & Bicycling Programs*, that outlines how to start a program. This book includes minimum start-up costs, the importance of effective leadership and mentorship, and the liability that bike shops face (Jose, 2012). Similar to K-VIBE, Recycle-A-Bicycle integrates a variety of programs including, “Earn-A-Bike, Green Jobs Training Programs, High School Internships, Recycled Arts Workshops, Summer Youth Employment Program, and Kids Ride Club.” (Jose, 2012, p. 40).

BicycleWORKS is an earn-a-bike program in Portland, Maine. They “help children develop principles of empowerment and achievement to help create a sustainable future” (Kinnevy, Healey, Pollio, & North, 2008, p. 34). BicycleWORKS teaches participants how to build and repair bicycles. They have a point system that allows participants to earn a bicycle through own contribution. This system encourages continued education and promotes self-empowerment. Kinnevy et al., did a study to examine the effectiveness of this program on high-risk youth. They conceptualized the benefits of the program into three categories: 1- self-esteem, 2-ability to work well with others, 3-problematic behaviors. They then divided the participants into three
categories: 1-graduates of the program, 2-those currently enrolled, 3-those on the wait-list to begin the program (Kinnevy, Healey, Pollio, & North, 2008). Each participant completed a pre and post survey in addition to participating in a focus group. There were 21 total participants. There were no statistical conclusions from the quantitative study, but the qualitative study yielded more information. The conclusion from the study was that BicycleWORKS participants enjoyed the safe place under the provision of adult mentors (Kinnevy, Healey, Pollio, & North, 2008). However, this study does not address mobility nor accessibility outcomes.

Neighborhood Bike Works is a non-profit in Philadelphia, Pennsylvania that has a community cycling initiative (Hoffman, Hayes, & Napolitano, 2014). Their mission is to, “inspire youth and strengthen Philadelphia communities by providing equitable access to bicycling and bike repair through education, recreation, leadership and career-building opportunities” (Neighborhood Bike Works, 2018). Neighborhood Bike Works has an earn-a-bike program in which students can attend a series of classes in bicycle repair and maintenance, safety, and health and nutrition. Hoffman et al. (2014), conducted a qualitative study on the youths’ experiences and perceptions of the cycling program. They completed focus group entrance and exit interviews for 32 youth ranging in ages from 7-14. They recorded each interview and then transcribed it verbatim. Then three coders looked for themes within the dialogue to define the key concepts from the participants. The major themes noted were benefits, barriers, and knowledge of cycling as well as self-efficiency and meeting new people (Hoffman, Hayes, & Napolitano, 2014).
Overall, Hoffman et al. were pleased with the success of their study, but they noted three main limitations to their study, 1- lack of long term effects information, 2- the participants only self-reported, 3- a majority of the participants were male African Americans (Hoffman, Hayes, & Napolitano, 2014).

Although the programs and studies discussed shed some light in different aspects of community bike shops, none have assessed the impacts of their program in relation to mobility and accessibility effects and thus, its potential to thwart mobility-related exclusion as part of the overall goal of improving their well-being.
Research Design

Mixed-Methods Multiple Case Study

In seeking to answer the lead research questions posed by this author a case study methodology was proposed. Case study is an ideal approach to explore complex contemporary phenomenon and for answering “how” and “what” questions that are difficult to measure or quantify (Yin, 2009); case studies are also used to better understand a real-world case and to use these understandings to apply to other cases (Yin, 2018). Multiple case studies can be used to draw a single set of conclusions from analyzing multiple cases and compare convergence and/or divergence in process and outcomes and are stronger than single case studies, because they take in more variables and set of circumstances. However, multiple case studies have the challenge of needing to be replicated and the researcher needs to make sure the circumstances in each case are set up so there is no bias between the cases. Thus, selection criteria are important to consider.

A more specific type of case study is a mixed-methods case study. Mixed-methods includes the collection and analysis of both quantitative and qualitative data (Creswell, 2014). Mixed-methods could allow the evidence collected to be stronger and richer and permits the researcher to analyze more complicated research questions (Yin, 2014). This study analyzes two distinct phenomena: 1- bicycle mobility and accessibility
impacts, which are measurable phenomena; 2- other processes and effects related to youth development and well-being and the potential achievement of the overall program mission and vision, which are more difficult to measure quantitatively as they relate to individual perceptions. Mixed-methods allows for both phenomena to be studied and possibly correlated via a compare-contrast analysis. Hence, case study and mixed-methods is combined to form a mixed-methods multiple case study. Figure 1 demonstrates the multiple mixed-methods case study as described by Yin (2014) and as designed for this study.

**Figure 1.** Multiple Mixed-Methods Case Study Diagram

The school and the neighborhood icons in Figure 1, represent the importance of the school and the community settings to these programs. School and neighborhood relations and their respective attributes could be a critical contextual aspect of this
study as they could influence youth travel behavior as noted in the literature review (Southward, 2018; Leventhal, Brooks-Gunn, & Kamerman, 2008). Also, some of these programs are organized around specific neighborhoods and/or schools and as such the data and participants are geographically nested.

This mixed-methods multiple case study is used to help evaluate the program’s effectiveness in achieving their stated mission and vision. Patton defines a summative evaluation as, “summing up judgments about a program to make a major decision about its value” (2002, p. 214). For this study, the final case programs are Village Wrench in Greenville, South Carolina; and Trips for Kids in Charlotte, North Carolina. Access to data and participants for the third case, Momentum Bike Club in Greenville, South Carolina, did not occur with enough time to incorporate to the study. The major decisions about the programs’ value is determined by how they advance the program’s mission and vision as well as the impacts they have on the youth participant’s bicycle mobility and accessibility. This technique is ideal for determining a program’s effectiveness (Patton, 2002).

Unit and Sub-Unit of Analysis and Data Gathering Techniques

The main focus of this investigation is on youth development, and mobility and accessibility impact on youth participants, which are the key sub-unit of analysis embedded within a community bike shop, the main unit of analysis. These in turn are nested within a neighborhood and schools. Content analysis of in-depth interviews with
mentors and directors is used to address the qualitative question that seeks to explore and describe how the program influences youth participants and advance their stated mission and vision. Surveys to youth participants is used to answer both quantitative and qualitative questions that focus on potential bicycle mobility and accessibility effects outside of the programs’ scheduled activities, and their overall experience as participants in the programs.

This method was selected because both qualitative and quantitative data collection by themselves have their weakness and the combination of both compensate this limitation (Creswell, 2014), as well as help advance a more holistic understanding of the phenomenon of interest, youth development. Quantitative studies can lack gathering the full story, they confine participants to the answer choices given, whilst qualitative studies can lack structure and can be difficult to categorize responses. To mitigate these weaknesses youth participants were given a quantitative survey with a free response section, and the adults were interviewed. Due to the time constraints, interviewing directors, mentors, students, and parents would be impossible. A such, only directors and some mentors were interviewed, and the youth participants had a free response section within the survey.

Case selection criteria were identified to help in the selection of the potential cases for this study, and these are discussed below.
Case Study Selection and Descriptions

Selection Criteria

To identify which comparable case studies would be selected, the following criteria were defined:

1. Youth development program with bicycle component as the main or only component; the bicycle component is crucial to this study as it is the phenomenon of interest in this investigation.

2. Have been operating for more than 5 years; Operating for at least five years allows the community bike shop to have established a presence in the community with the neighborhood, schools and youth participants. It also allows for the directors, mentors, and youth to have a firm understanding about what this program is about and to experience the struggles of establishing a new program as well as the success, or not, of having a sustainable program.

3. Significant number of participants to feed statistically significant quantitative analysis; a significant number of participants are needed for meaningful quantitative results and comparative analyses.

4. Serve low-moderate income community; serving low-moderate income communities is crucial as this study focuses on the impacts of bicycle mobility and accessibility on mobility-related exclusion.
5. Geographic convenience factor; nearby to researcher home/work location makes it feasible to engage and acquire data; this is important as this research was conducted in a limited time frame and easy access to the community bike shops and participants is necessary.

This search process began with reaching out to known community bike shops and asking for their permission and if they knew of any other community bike shops that focused on youth. The process also included internet searches for key words such as ‘community bike shops’, ‘youth bike clubs’ or ‘earn-a-bike’ programs. Through both of these methods and referencing the selection criteria, three community bike shops were identified. These included: Village Wrench and Momentum Bike Club in Greenville, South Carolina and Trips for Kids in Charlotte, North Carolina. Momentum Bike Club met all five criteria, while Village Wrench and Trips for Kids met all of them but a significant number of participants. This criterion was sacrificed, so there would be multiple case studies to compare for this analysis.

Case Study #1: Village Wrench

Village Wrench has five locations across Greenville, South Carolina.
In these shops they offer bicycle training, earning, and repairs. Their main program is 6-cycle. This is a youth program that focuses on character strengths and bike-building, which leads to bike earning. Each week during this six-week program students focus on a different character strength. Over the course of the program the students cover: grit, optimism, self-control, gratitude, social intelligence, and curiosity.

If youth do not want to complete the program, they also have the opportunity to earn a bike through volunteer hours. Youth can submit a volunteer service log with signatures noting their completion of hours in exchange for a bicycle. Village Wrench also hosts monthly repair workshops on Saturdays. These are events that allow the community to come together and bond over food and servicing bikes.

With this in mind, Village Wrench follows the Bearing Bike Shop model, a notably sized community bike shop in Atlanta, Georgia that they reached out to when developing Village Wrench:

Give a kid a bike, and he will simply ride it wherever he goes, but let him earn the bike, and you can make him a part of the community. Make him a contributing member of his family and community, and you have the makings of a confident, responsible, and healthy child who has a significantly less chance of falling into a life of crime and violence and the
support of a community that values his contribution. (O'Mara & O'Mara, 2018).

It is more than just a bike shop; it is a place to encourage community development. The process of how a student earns a bike and learns a variety of skills can be seen in Figure 3.

**Figure 3.** Earn-A-Bike Diagram (O'Mara & O'Mara, 2018)

Along with the earn-a-bike program, upon graduation from 6-cycle, students become eligible to apply for a part-time paid mechanic position.
Case Study #2: Trips for Kids

Trips for Kids is an international organization with almost fifty locations throughout the United States and Canada.

This research is in partner with their Charlotte, North Carolina chapter. This chapter started in 1999 and has steadily grown over the past two decades. With this growth, they have added additional programs such as the re-cyclery and the earn-a-bike program and have worked with over 3,500 students.

The earn-a-bike program is intended for students aging 9-15 who come from fragile neighborhoods and environments (Glodowski, 2019). Before entering the program, students are encouraged to know how to ride a bike. If they do not know how, Trips for Kids partners with Learn to Ride, to teach people of all ages how to ride bikes. Each student that completes the earn-a-bike program goes home with not only a bicycle, but also a helmet, lock, and safety lights, all for free.
In addition to earn-a-bike, they also have mountain riding programs, where students can meet early on Saturday mornings to go for longer rides with instructors and peers. The rides are rewards for youth with good grades and behavior from Title 1 schools, non-profits, and community groups (Glodowski, 2019). Trips for Kids divides up the groups based on skill level and as the students improve, they are able to ride more difficult trails.

Case Study #3: Momentum Bike Club (note: this case retracted from this study and the researcher was not able to collect data)

Momentum Bike Club in Greenville, South Carolina takes a different spin on the community bike shop.

![Momentum Bike Clubs Logo](Taylor, Momentum Bike Clubs, 2018)

**Figure 5.** Momentum Bike Clubs Logo (Taylor, Momentum Bike Clubs, 2018)

They have bike clubs for both middle school and high school students for a total of 14 clubs in ten different schools (Taylor, Momentum Bike Clubs, 2018). The middle school youth go on weekly after-school bike rides and the high school students go on longer bi-monthly Saturday rides. Unlike community bike shops where youth earn a bike, these youth rent bikes. They are assigned a number and that is their bike while they are in the program, but once they complete the program, it is no longer theirs. If the youth
express interest in owning their own bike, Momentum Bike Clubs works with local community bike shops to get that participant their own bike.

They used to give bikes to the youth, but frequently found their bikes in pawn shops where they were sold to help pay the bills that month or support a family member’s addiction (Taylor, Momentum Bike Clubs, 2018). Up to 95% of the youth that participate in Momentum Bike Clubs live in poverty (Taylor, Momentum Bike Clubs, 2018). With this in mind, the guiding principles of Momentum Bike Clubs are to encourage bicycling to improve physical, mental, and emotional health in conjunction with longitudinal mentoring (Taylor, Momentum Bike Clubs, 2018).

Momentum Bike Clubs also offers paid internships with job skill experience at Mill Village Farms during the summer. The first students to go through this program are currently seniors in college and the program keeps in contact with them and even offers scholarships to those who complete the program. They currently have 200 participants and 50 mentors.
Research Questions and Methodology

Qualitative

Research question one is:

RQ1. How do community bike shops influence youth participants and in which ways?

This question takes a qualitative approach that seeks to explore, understand, and describe the processes that may lead to successful achievement of the programs’ mission and vision. It aims to capture the directors’ and mentors’ experiences and perceptions as key adult members in charge of direction and implementation of their respective programs. As noted by Yin, qualitative research can be used to enlighten “situations in which the intervention being evaluated has no clear, single set of outcomes” (2018, p. 18). In this study, the researcher analyzed the influence of the community bike shop on youth participants. There are a wide variety of potential outcomes and qualitative research can help identify and understand these outcomes.

Case Mission and Vision Statements

The qualitative study begins with the analysis of the mission and vision statements based on readily accessible documents and data sources. These are
registered in Table 3 and Table 4 to better understand the purpose of the community bike shop. Then interviews and survey questions were developed to ask directors, mentors, and youth participants to see how they think it is influencing the youth participants.

Table 3. Case Study Mission Statements

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<tr>
<td>To transform under-resourced communities by empowering others through bicycle repair, bike earning, and cycling educational opportunities.</td>
<td>The mission of Momentum Bike Club is to transform the lives of young people through a comprehensive youth development program using the platform of cycling to foster and sustain mentoring relationships.</td>
<td>To provide transformative cycling experiences through a network of chapters that promote healthy, recreational lifestyles, environmental awareness, and personal empowerment for young people of all communities, especially those most in need.</td>
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Momentum Bike Club’s mission statement emphasizes that the program focuses on the mentoring relationships. They want to build that bond between the youth participants and the mentors especially since youth in low-moderate income neighborhoods can lack a consistent role model (Southward, 2018). While Village Wrench and Trips for Kids do
not specifically mention mentoring relationships, they mention empowerment and overcoming challenges.

Both Village Wrench and Trips for Kids use “empower” in their mission statement. Village Wrench wants to empower others while Trips for Kids wants personal empowerment for young people. Both also mention specifically wanting to assist with youth and communities that are under-resourced and most in need.

All three programs use the word “transform”. For example, Village Wrench’s mission is to “transform under-resourced communities by empowering others” (Compton, 2019, p. 1), Momentum Bike Club hopes to “transform the lives of young people” (Taylor, 2012, p. 1), and Trips for Kids desires for the students to have “transformative cycling experiences” (Glodowski, 2019, p. 1). While they all use the word “transform”, they all have different implications. Momentum Bike Club and Trips for Kids want to transform the students and Village Wrench has the broader goal of having a deeper impact by transforming the community.

These shops might not have identical mission statements, but they have the similar overarching goals as registered in the vision statements. This is further examined in Table 4.
Table 4. Case Study Vision Statements

<table>
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<th>Village Wrench</th>
<th>Momentum Bike Club</th>
<th>Trips for Kids</th>
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<tr>
<td>For under-resourced communities to thrive by developing leaders in our community who value hard work and social responsibility.</td>
<td>MBC seeks to model longitudinal mentoring; beginning with a strong connection to a bike club in middle school, youth have the opportunity to participate in internships, trips, youth development seminars and college prep resources in high school. Young people who move on to college are offered an annual scholarship, as well as ongoing mentoring support.</td>
<td>We envision a world where kids from all walks of life have the opportunity to know the joy of riding a bike and the freedom to explore the natural world on two wheels.</td>
</tr>
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When comparing the visions, all three programs share an overall goal of improving the well-being of youth participants from low-income communities yet display different strategies on how to achieve it. Village Wrench has a broader community-wide scope and focus on creating leaders. On the other hand, Trips for Kids has a narrower individual scope that focus on facilitating the joy of riding in natural environments. In relation to cycling, Trips for Kids is the only program to explicitly mentions bicycle riding; Momentum Bike Club only mentions the hope for “a strong connection to a bike club” (Taylor, 2012, p. 1) and Village Wrench does not mention bicycles at all. Despite these
differences, they all have the same general aim of improving the well-being of youth participants through transformative experiences with bicycles and mentorship.

It is important to note that their stated program missions and visions do not mention dealing with mobility-based exclusion nor improvement on bicycle accessibility outcomes (i.e. facilitating access to more and diverse activities in neighborhoods). As such, socio-economic disadvantages experienced by youth participants related to mobility-based exclusions may not be presently addressed by the programs. This research can provide useful insights into this aspect.

With this in mind, the interview and survey questions were tailored to access the three main goals of these programs: 1-getting kids active, 2-positive mentoring relationships, 3-development of soft and hard skills. The potential quantitative outcomes related to purpose #1 ‘getting kids active’ is further documented and explored as the focus of this study. Specifically, mobility and accessibility of youth participants’ bicycle ridership outside of the programs’ scheduled activities (see Quantitative section in this proposal).

Interviews with Directors and Mentors

After selecting the case studies and identifying the key actors to be interviewed (directors, mentors, youth participants), the researcher elaborated an interview questionnaire and applied for Institutional Review Board (IRB) approval. Eventually,
informed consent was sought and obtained from prospective interviewees. Interviews were conducted via phone, recorded, and transcribed. These were conducted with the mentors and directors of the youth development programs to help answer one of the two leading research questions: How do community bike shops influence youth participants and in which ways?

The director of Village Wrench and the director of Trips for Kids were interviewed as well as a sample of the mentors from each case. While interviewing all of the mentors would be ideal, there were time constraints, so three mentors were interviewed from each community bike shop. The selection criteria for choosing the mentors includes:

1. Have served with the community bike shop for at least three years;
   This is to identify the mentors with adequate experience.

2. A balance of female and male mentors; Female and male youth participants could have very different program experiences. They may also establish stronger bonds with mentors of their gender.

3. Diverse races; Similar to gender, youth participants may identify more with mentors of a similar race.

Once the interviewees (N=8) were identified, they were contacted to schedule an interview at their convenience, within a pre-determined deadline. Ideally these interviews would have been administered face-to-face, but a phone call was used for convenience.
The interviews were semi-structured and followed the interview protocol established by IRB. The interviewees were asked for their consent and then asked for their permission to record the interview. Recording increased the accuracy as the researcher was able to transcribe them verbatim, this occurred for most of the interviews (N=5). For the interviews in which permission to record was not granted (N=3), the researcher was able to take detailed notes. The interview questions include:

1. For how long have you participated in the youth development program?

2. What is your role in the youth development program?

3. Have you had any special education or training to work with youth in the program?

4. What do you think have been the impacts of the bicycle shop on the participants?

5. What do you think the main goal of the program is? How do you see the community bike shop in advancing, or not, the program vision?

6. Have you noticed any changes in the youth participants behavior before, during, and/or after they have entered the program?

7. Do you think there is room for improvement?

8. What do you think are the travel/mobility impacts of the bicycle shop program on youth participants, beyond the scheduled and routine bike rides associated with [the program]?
These questions were designed to help gain insights into the programs’ processes from the perspective of the adults in leadership roles at the organizations, in understanding how the bike shop contributes in advancing the program’s mission and vision, and potentially informing the researcher about potential bicycle mobility and accessibility outcomes outside of the programs’ scheduled activities. The interviews on average lasted thirty minutes.

Analytical Strategy

The analytical strategy for the interviews is based on content analysis and begins with transcribing the interviews from the directors and mentors and looking for common themes and potential convergence and divergence in their perceptions of how the program contributes to the achievement, or not, of the mission and vision and how it might have influenced the mobility and accessibility levels of youth participants beyond those associated to scheduled bicycle ride activities sponsored by the program. Other issues related to other goals of the programs (self-reliance; self-esteem; academic performance; etc.) were also explored but are not the focus on this investigation.

This analysis includes word choice and general framework of the answers. The researcher used In Vivo coding for the initial round of coding. In Vivo coding is also known as “literal coding”. Saldana states that this coding is great for researchers that are beginning to code and to “prioritize and honor the participant's voice” (Saldana, 2009, p. 74). The codes were then grouped together by themes (Saldana, 2009). These
themes were broken out by groups in the results section. This provides insight into what the different groups identified as important factors and impediments to implementation of the youth improvement program and into the effect of the community bike shop component on youth’s bicycle mobility and accessibility.

The same analytical strategy was also used to code and analyze the free response questions from the youth participant survey. They are discussed in more detail in the ‘Qualitative Findings from Youth Participant Free Response Questions’ section.

Quantitative

A survey was administered to a sample of youth participants and used to gather mostly quantitative data and answer the question:

**RQ2. What impact do community bike shops have on youth participants’ bicycle mobility and accessibility outside of the program’s scheduled activities?**

Quantitative research can be conducted through administering surveys and comparative analysis (Creswell, 2014). Survey research “provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population” (Creswell, 2014, pp. 41-42). The survey for this study was developed to answer the question regarding potential improvements in bicycle accessibility and mobility. For this study, accessibility is defined as “the ability [and ease] to reach desired
goods, services, activities and destinations” (Litman, 2011, p. 5), and mobility is defined as “capable of moving or of being moved readily from place to place” (Handy S., 2002, p. 3). The first concept, accessibility, is operationalized by counting the number of distinct destinations and activities engaged by the survey respondent while using a bicycle, and by registering a Likert scale for factors that contribute or not to ease of access. The second concept, mobility, is mostly capture by the frequency of trips made by bicycle during a typical week to a diverse set of destinations.

Administration of Survey to Youth Participants

The survey was administered in person via paper to the youth participants at the community bike shops. Every participant over the age of seven was asked to complete the survey. The researcher visited Village Wrench and Trips for Kids and administered the surveys in person. Students that participated in the study were sent home with a statement to their parents about how they participated in the study, per IRB protocol.

In the case of Momentum Bike Club, the survey was to be administered to participants by their mentor at a future undetermined date. However, that has not yet taken place and data from this case does not inform the analysis and insights of this study.
Youth Participants Survey

The survey was divided into seven parts: 1- physical activity; 2- local independent mobility (measuring number of locations visited); 3- accessibility (measuring the number and types of activities engaged); 4- neighborhood; 5- safety (aimed at capturing the youth and parent’s perception of safety to crime and traffic in their neighborhoods); 6- free response questions; and 7- individual demographic questions. The survey structure and content are informed by the literature review; key explanatory factors and constructs were identified and are addressed in each of the seven parts of the survey.

The quantitative portion of the survey was asked twice based on their travel behavior during the week (structured) activities and on the weekend (un-structured) activities. The type and structure for data collection allows the researcher to document bicycle travel behavior outside of programmed youth improvement program activities, whilst capturing perceptions from children of neighborhood conditions that might also influence their travel decisions (i.e. safety).

To help regulate answers, priming was used at the beginning of this section. Youth were asked to vision their cycling activities during a typical week during school session on a warm Spring day. This season was chosen, as students are more likely to bicycle during nice weather and schedules are more consistent when students are in school.

The physical activity portion of the survey consists of six questions. This section is to gauge how much physical activity the youth participates in. The assumption is that
youth that enjoy more physical activity are more likely to use their bicycle. The questions for this section can be seen in Table 5.

**Table 5. Participant Survey: Physical Activity**

<table>
<thead>
<tr>
<th>How often do you play outside in a week?</th>
<th>Not at All</th>
<th>1-3 times</th>
<th>3-5 times</th>
<th>5-7 times</th>
<th>7 or more times</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you normally exercise or play sports in a week?</td>
<td>Not at All</td>
<td>1-3 times</td>
<td>3-5 times</td>
<td>5-7 times</td>
<td>7 or more times</td>
</tr>
<tr>
<td>From Monday through Friday, in a typical week, how often do you ride your bike outside of the program?</td>
<td>Not at All</td>
<td>1-3 times</td>
<td>3-5 times</td>
<td>5-7 times</td>
<td>7 or more times</td>
</tr>
<tr>
<td>On Saturday and Sunday, in a typical week, how often do you ride your bike outside of the program?</td>
<td>Not at All</td>
<td>1-3 times</td>
<td>3-5 times</td>
<td>5-7 times</td>
<td>7 or more times</td>
</tr>
<tr>
<td>Do you have a bicycle at home?</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you like riding bicycles?</td>
<td>Not at All</td>
<td>Slightly</td>
<td>Moderately</td>
<td>Very</td>
<td>Extremely</td>
</tr>
</tbody>
</table>

Local independent mobility is another important factor, because youth typically have mobility restrictions set in place by their parent or guardian for safety reasons (Timperio, Crawford, Telford, & Salmon, 2004). The local independent mobility portion of the survey consists of three questions. The first question is asking if they can travel without an adult on a bicycle. This question was asked in regard to ten locations:
grocery store, post office, laundromat, gas station, school, park/pool/playground, friend’s house, after-school programs, work, and church. The second question asked if their parents have a bicycle?, followed by: If yes, how many times a week do they ride with you? This helped determine if their parents or adults in their household promote cycling.

The next portion of the survey focused on accessibility. Like the local independent mobility section, students were asked about the same ten locations. First, they were asked: How easy or difficult is it to get to the following places? Then they were asked the same two questions, one in regard to weekdays/structured activities and the second in regard to the weekend/un-structured activities. These questions are as follows:

1. **During a typical warm Spring week, how many activities do you participate in Monday through Friday using your bicycle?**
2. **During a typical warm Spring week, how many activities do you participate in on Saturday and Sunday using your bicycle?**

For the second and third question the answer options were consolidated into six categories. The answer options for these questions include errands, school, social and recreational, after-school programs, work, and church. These questions allowed the
researcher to better understand how accessible these locations are to the youth participant.

The fourth section of the survey included neighborhood questions. In this section, the youth participants were able to select yes or no to a list of features their neighborhood might have. This list includes sidewalks/trails, bike lanes, speed bumps, stop signs, and traffic lights. This is to better understand the physical nature of the neighborhood and whether it promotes cycling, or not.

The fifth section of this survey was their opinion of safety within their neighborhood. The participant had seven statements in which they could answer on a five-point scale from strongly disagree to strongly agree. These statements include:

1. I feel safe during the day in my neighborhood.
2. I feel safe at night in my neighborhood.
3. There are areas of my neighborhood I avoid.
4. There is bullying in my neighborhood.
5. I often see scary strangers in my neighborhood.
6. There are scary dogs in my neighborhood.
7. There is heavy traffic in my neighborhood.
These questions were included to determine the youth participants’ perception of safety in their neighborhood as safety is a key factor that affects cycling frequency (Hoffman, Hayes, & Napolitano, 2014).

The sixth section was a free response section. This allowed the students to answer more freely and to gain insights about their experiences in the program that were not captured quantitively. There are five free response questions:

1. What is your favorite thing about riding bikes?
2. What would you miss the most, if you could never bike again?
3. How do you feel when you are at the bicycle shop?
4. What is the most interesting thing you learned in the bicycle shop?
5. What do you like most about the bicycle shop?

The final portion of the survey included some quick demographic questions:

1. How old are you?
2. What is your gender?
3. Who lives with you in your household?
4. How many siblings do you have?
5. How many siblings are older than you?
6. How long have you been part of the bike club?
7. What school do you attend?

This demographic information was used in analyzing the information gathered and for better understanding youth participants’ bicycle travel behavior.

Analytical Strategy

The survey quantitative responses were used to calculate descriptive statistics. The data collected helps in comparing the ages, gender, locations, and outcomes of the survey data per case and individually. Frequency of trips helps assess mobility, while count of activities per week help assesses accessibility.

Data Sources and Management: Anonymity, Privacy, and Safety

When designing this study, it was important to protect the human subjects, especially the youth participants, as they are vulnerable. With this, the researcher must first gain informed consent. This was completed in a verbal manner for those that are met face-to-face or over the phone and was written for those completing a paper survey. The language was age appropriate.

To further protect the participants, they are not identifiable by name. The qualitative data presented in the final report is presented in aggregate, relying on similar answers from multiple individuals. Responses are not attributed to individual respondents, but rather discussed in terms of the general themes and categories that
emerge from the respondents as a whole. Each participant was assigned an alpha-numeric code by which individual results were organized and kept distinct. The information regarding the identity of individual respondents does not appear on results.

The key to identifying individual respondents by alpha-numeric code remained on a password locked dual authenticated online drive, and destroyed following data collection. The same process applied to audio recordings of the interviews. Only the primary and co-investigator had access to raw data which was stored on the same password locked dual authenticated online drive. Raw data was deleted following the completion of the study. Paper responses were scanned into the drive and then hardcopies were shredded.

Mixed-Methods Analytical Strategy

Themes from the interviews’ coding and the quantitative results from the surveys were compared to look for patterns, similarities, and differences between cases, students, mentors, and directors’ perspectives. The findings focused on the components of the youth development programs and on the overall perception of how the programs are advancing, or not, their stated mission and vision. This was especially the case for the qualitative questions that all three parties were asked.

The interview questions that directors and mentors were asked on mobility and accessibility of youth participants were also compared to the quantitative mobility and
accessibility questions asked in the student survey in search of convergence and/or divergence and any other pattern that may emerge.

A similar protocol was then conducted between the two sampled cases in search of convergence and/or divergence that could provide further insights with the larger multiple case sample of youth participants, mentors and directors.

A final section in the study discusses quantitative results, qualitative findings, and insights from both that may help illuminate and improve our understanding of how youth development programs, that include a community bike shop component, influence and impact, if at all, youth participants bicycle mobility and accessibility, as well as their overall effectiveness in advancing stated missions and visions.

Validity

Validity issues may occur under a few scenarios. Construct validity is “identifying correct operational measures for the concepts being studied” (Yin, 2018, p. 42).

Concepts like mobility, accessibility, and safety were gaged using typical measures from the transportation science literature and include frequency measures as well as Likert scales. These measures and methods were used to better capture the travel behaviors and phenomena of interests given the resources available to this researcher. However, the researcher recognizes that there are more valid ways to capture mobility and accessibility levels (i.e. GIS tracking; Google mapping; buffer zones to capture number of destinations in a neighborhood, etc.), yet due to limited research resources (i.e. money
and time) these were not feasible for this study. Priming was used to help the youth paint a picture of them riding a bicycle and the destinations that they travel to. A selection of ten locations, referenced from other studies (Timperio, Crawford, Telford, & Salmon, 2004), were used to help the youth more easily gauge where they ride their bicycle. These methods were used to increase the construct validity.

To increase qualitative research validity, the researcher interviewed and surveyed relevant categories of stakeholders within the community bike shop, including program directors, mentors, and youth participants. This was to better understand the diverse perspectives and potential impacts from various points of view. If only one stakeholder was used to gather information, there would be a higher risk of bias. Also, data triangulation, use of multiple methods or data sources (Patton M. Q., 1999), was sought to better sustain the qualitative analyses and insights, and test validity through “convergence of information from different sources” (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014, p. 545). A diverse set of sources were used in this study and include case administrative policies accessible on-line, in-depth semi-structured interviews, and surveys with free response questionnaires.

The survey was also written to best grasp the impacts of accessibility and mobility by including both multiple choice responses and free response question. This allows the youth participants to share thoughts in their own word and creates a triangulation. This increases the trustworthiness of the findings as many of the stakeholders were able to share their opinions in an open-ended format.
To prevent internal validity issues from arising when coding the qualitative results, it was important to use a systematic process when coding the interviews from the mentors and directors. This was achieved by looking at the words that occurred most frequently in the transcribed interviews. Themes and quotes were also highlighted during the transcribing process. Internal validity issues could have also occurred through the misinterpretation or analysis of the quantitative data.

External validity was important to consider when conducting this research. External validity begins with the research questions. The research questions needed to be specific enough to allow for generalizations and conclusions within the cases studied (Yin, 2018). This was exemplified in this study by having two questions, both “how” and “what”, instead of a “why”. Case studies do not afford the same generalizability as some other research methods (Yin, 2014). Since this research was based only on two specific locations within the Appalachian regional context, the results and recommendations from this study may not be generalized.

The hope with this research is that it can help other youth development programs with a bicycle component use the findings and the literature review as a starting point for analysis on potential bicycle accessibility and mobility effects and its ability to thwart mobility-based exclusion outside of the programs’ scheduled activities.

Reliability of this study could be altered due to the number of youth participants surveyed as well as the number of interviews to directors and mentors. Surveys always have some form of reliability issues as they may not have the clearest instructions and
the entire population is not likely to be surveyed. This study had the additional factor of working with youth participants which makes it more difficult to repeat.
Data and Findings

Detailed Program Characteristics

Case Study #1: Village Wrench

Village Wrench meets in two locations in Greenville, South Carolina. On Mondays from 6:00-7:30 they meet in the Village Wrench Workshop in West Greenville. On Wednesdays from 6:00-7:30 they meet at Mountain Goat Greenville; this location is unique in the fact that it is both a coffee shop and a bike shop. They meet for six weeks and each week is paired with a character trait as well as a part of the bicycle. This structure allows for them to teach key characteristics essential for success in life, while also teaching them the inner-workings of the bicycle. An example schedule can be seen in Table 6 below.

<table>
<thead>
<tr>
<th>Week</th>
<th>Character Strength</th>
<th>Bicycle Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Grit</td>
<td>Introduction/Wheels</td>
</tr>
<tr>
<td>2</td>
<td>Self-Control</td>
<td>Wheels (continued)/Headsets/Forks</td>
</tr>
<tr>
<td>3</td>
<td>Gratitude</td>
<td>Brakes</td>
</tr>
<tr>
<td>4</td>
<td>Optimism</td>
<td>Bottom Brackets/Pedals/Chains</td>
</tr>
<tr>
<td>5</td>
<td>Zest</td>
<td>Derailleurs/Shifting/Final Adjustments</td>
</tr>
<tr>
<td>6</td>
<td>Curiosity</td>
<td>Riding/Graduation Day</td>
</tr>
</tbody>
</table>

Prior to the first class, each student is paired with a mentor. This person is an adult or an older student that has successfully completed the program. Their mentor
attends every class with them and helps them one-on-one in the repair of their bike. At
the first class, the students are also paired with a bicycle. This bicycle is one that has
been donated to the shop and is in need of repair. Over the course of six weeks the
students and their mentor work together to get it in riding condition.

At the beginning of the class they discuss their weekly homework assignment on
the character strength for that week and have one-on-one time with their mentor. Then
they go into a bicycle lesson with the head mechanic. The mechanic gives a broad
overview of the subject of that day and then they get to practice these skills on their
own bike with their mentor. This is a chance for them to practice these hand-on skills
and have the experience of their mentor. Their weekly class agenda can be seen in

**Figure 6** below.

![Figure 6. Village Wrench Weekly Agenda](image)
The survey was administered to the Wednesday night youth participants during the second week of programing and to the Monday night youth participants during the third week of programming.

Case Study #2: Trips for Kids

Trips for Kids has a workshop just outside of downtown Charlotte, North Carolina. Their earn-a-bike program meets for three weeks from 6:00-8:00 on Mondays. Each week they learn about proper riding etiquette on a bike such as turn signals, weaving, power pedal, and gears. Each week they meet at the shop and then walk their bicycles to a greenway that is two blocks from the shop. Here the students are able to ride and go over skill drills.

Prior to the student’s first class, the students submit an application that includes their height. This information is used to pick out a bicycle suitable to their needs. These bicycles have already been repaired by mechanics at the shop and are ready to ride. They also receive helmets during this class and learn the proper way to fit it.

At the beginning of the class, they start with an ABC Quick Check. This allows the students to check their bikes to make sure they are in riding condition. A is for air. B is for brakes. C is for cranks and chain. Quick is for quick releases. Check is for check it over. After this, they are able to begin their ride and practice their riding and safety skills. During this time, they have the earn-a-bike instructor and the program director on site. The earn-a-bike instructor is able to lead the class and the program director is there
for extra support. This is especially important if a student is struggling with a certain skill. The program director can take them aside and work with them one-on-one.

![Figure 7. Trips for Kids Participants in Class](image)

The survey was administered to the Trips for Kids participants at the beginning of the third week of programming. This is also their last week of programming and the students received their bicycles and had a mini graduation at the end of the class.

Case Study #3: Momentum Bike Club

Unfortunately, scheduling with Momentum Bike Club did not work out for the data to be included in this version of the study. However, meeting with them and discussing their program brought insights into this study. Momentum Bike Club is not an
earn-a-bike program like Village Wrench and Trips for Kids, instead they led weekly bike rides with the students as an after-school program. It would have been nice to compare the accessibility and mobility of these youth participants with the participants of the more traditional earn-a-bike program. Momentum Bike Club also serves a larger population of students and this would have allowed for a more nuanced statistical regression analysis, as the survey was designed to feed this type of quantitative model. Hopefully, this data can be analyzed in a future occasion.

Qualitative Findings from Director and Mentor Interviews

Overall Impression

Trips for Kids is recently under new leadership. Their executive director since they were founded in 1999 recently retired and a new director took her place this year. With this in mind, they are undergoing several changes to the program and are completing a self-evaluation on how they can improve in the years to come. Similarly, the director of Village Wrench started her job in the fall of 2018, and they are also undergoing notable changes. Village Wrench never had one person hold this position, so with this comes a steep learning curve and wanting to create more organization for the programs. It was interesting to see that both of the case studies were under new leadership within the past year. With this in mind, they were more self-reflective on the changes they wanted to see brought to the program.
Out of the staff interviewed at Trips for Kids, most were past participants of the program or a similar program. This gave an intriguing outlook because they were not only able to speak from the view of their current role in the program, but also as a youth participant that earned their bike from the program. One interviewee started at the shop at 14, got their first job at the shop, and is now the head mechanic. Similar stories came from other employees. Trips for Kids is more than just a bike shop, it is more like a community.

Village Wrench had a different outlook. While those at Village Wrench are just as passionate about bicycles, these mentors are typically not one’s that have gone through the program, but those just wanting to give back to their community with something they love: bicycles. There is a technical/mechanical emphasis within the program, and this is shown by having bicycle mechanics lead the majority of the class.

With the different emphasis on the programs, it poses the opportunity to see how the didactic focus of the programs is reflected in the youth’s survey responses. The three main takeaways from visiting the bike shops can be seen in Table 7.

**Table 7. Three Main Program Comparisons**

<table>
<thead>
<tr>
<th>Take Away</th>
<th>Trips for Kids</th>
<th>Village Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Different program emphasis</td>
<td>Riding skills</td>
<td>Mechanical/technical skills with character traits</td>
</tr>
<tr>
<td>2. Mentor variation</td>
<td>One instructor with an assistant</td>
<td>One-on-one mentoring</td>
</tr>
<tr>
<td>3. Same program strategy</td>
<td>Earn-a-bike</td>
<td>Earn-a-bike</td>
</tr>
</tbody>
</table>
These comparisons were used when assessing the effectiveness of the program in relation to their mission and vision statements. It is also interesting to note the differences in the youth’s accessibility and mobility survey responses with the different program emphasis.

When analyzing the interviews via content analysis five themes emerged and can be seen in Table 8.

Table 8. Themes from Director and Mentor Interviews

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Empowerment</td>
</tr>
<tr>
<td>2.</td>
<td>Freedom and Accessibility/Mobility</td>
</tr>
<tr>
<td>3.</td>
<td>Equity and Accessibility/Mobility</td>
</tr>
<tr>
<td>5.</td>
<td>Hands-On-Skills and Cognitive Development</td>
</tr>
<tr>
<td>6.</td>
<td>Long-Term Follow-Up and Relationships</td>
</tr>
</tbody>
</table>

Each of these themes emerged from multiple interviews and the mission and vision statements of each case, despite differences on trained skills from both programs.
Theme #1: Empowerment

**Table 9.** Empowerment Director and Mentor Interview Quotes

<table>
<thead>
<tr>
<th>Interview</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Interview 1: TFK]</td>
<td>“I think the main thing is the overall comfort about their bike and even just self-esteem.”</td>
</tr>
<tr>
<td>[Interview 3: TFK]</td>
<td>“Learning how to fix their bike, like just changing the wheel or changing the tire. Being able to take on something like that, having a skill like that at a young age, gives them a lot of strength in knowing that, I can go and learn whatever I want to now. Like maybe I don’t want to stick around the bike shop and do this for the rest of my life, but like I’ve learned this skill and mastered something new, so you kind of take that pride with you and share it with others and see if you can apply it to anything else in their lives.”</td>
</tr>
<tr>
<td>[Interview 5: VW]</td>
<td>“The main goal, first and foremost, to empower youth.”</td>
</tr>
<tr>
<td>[Interview 7: VW]</td>
<td>“That sense of empowerment and building relationships.”</td>
</tr>
</tbody>
</table>

As mentioned in the literature review, other case studies, and further emphasized by these quotes from Trips for Kids and Village Wrench, empowerment is crucial to these youth (Southward, 2018; Zarrett & Lerner, 2008). As the focus on these programs is youth from low-income areas that do not have the resources of the middle class, empowerment is crucial for their well-being (Southward, 2018). This allows the youth to understand that they are capable of learning new skills and working with their hands. It is so much more than confidence riding a bike or repairing a flat. This gives youth the chance to understand that they are able to learn something new.
Theme #2: Freedom and Accessibility/Mobility

Table 10. Freedom and Accessibility/Mobility Director and Mentor Interview Quotes

| Interview 3: TFK | “You take your bike and if you were able to start riding places and finding that new freedom. You don’t really know where it is going to take you.” |
| Interview 4: TFK | “The goal of this program is to give kids access to bikes, but also access with the proper responsibility that comes with that freedom.” |
| Interview 5: VW | “Getting a bicycle is their first bit of freedom. They don’t have to rely on parents to get from A to B. You were free to get wherever you wanted to. It’s the idea of something you cherish. It much more than the simplicity of riding a bicycle.” |
| Interview 6: VW | “Our impact on him was not only through the riding and the fact that he was able to ride his bike eight miles to the shop whenever he wanted, so he felt he had that freedom.” |

Freedom was first mentioned in the Trips for Kids vision statement saying they hope to give students “the freedom to explore the natural world on two wheels” (Glodowski, 2019, p. 1). The term freedom was also mentioned several times throughout the interviews. This freedom is a form of independence for these youth. It is the opportunity for them to have access to more destinations without the need of a ride from an adult. This freedom opens the doors to opportunities. The opportunity to find work that is further, visit friends that are further, join an after-school program, and even have a more efficient means of transportation to destinations they already have access to.

Having increased opportunities through the freedom afforded by the earned bicycle gives the youth a greater chance of reaching their full potential (Southward,
The mentors and directors feel very strongly about this power of freedom through access of the bicycle, even when “freedom” is absent from Village Wrench’s mission and vision statements.

Theme #3: Equity and Accessibility/Mobility

<table>
<thead>
<tr>
<th>Table 11. Equity and Accessibility/Mobility Director and Mentor Interview Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Interview 1: TFK] “One kid that just took our class and got him on a ride in the summer and he took our earn-a-bike class because he didn’t have a bike, and there was a day where he missed the bus and he had to walk, and it took him like two hours to get to school, and he was really excited about getting a bike so he could actually ride places and get places.”</td>
</tr>
<tr>
<td>[Interview 3: TFK] “As far as the mobility aspect, in the neighborhoods that we are surrounding, there are a lot of low-income families and kids ride their bikes everywhere and so do some adults. We are able to put a lot of bikes out there to be used and I see it every day. We try to get everyone riding.”</td>
</tr>
<tr>
<td>[Interview 5: VW] “Mobility should be free for everybody or the option for it should be free or available.”</td>
</tr>
<tr>
<td>[Interview 5: VW] “Some people have a car, can afford to have a car, but how about the people that can’t afford that? The demographic of people that don’t support it or don’t have the means to afford it? Those that have to take light rail or a bus? Even though we are getting there, and our public transportation is getting better, there are still parts of the city that do not have adequate access. The parts of the city that are undesirable.”</td>
</tr>
<tr>
<td>[Interview 7: VW] “One goal is providing the people of West Greenville with a reliable means of transportation.”</td>
</tr>
</tbody>
</table>

The accessibility and mobility components really came out if the interviewee was someone that had been through the program or someone that had been through a similar program. These interviewees were not just passionate about riding bicycles and
getting youth on bicycles, these interviewees also mentioned that they used the bicycle as their main form of transportation when the researcher was visiting the programs.

Many of these answers are also part of a larger success story. Students that stayed at the bicycle shop long after earning their bike and truly grasped the power of the bicycle.

Both of the bicycle shops mention in their mission and vision statements that they focus on low-income and youth in under-served neighborhoods. This theme also came up in the interviews. The programs are aware that the bicycle and alternative cheaper forms of transportation are crucial for these youth. The theme of mobility-related exclusion was mentioned in the literature review and the directors and mentors understand that this is real (Clifton, 2004; Cass, Shove, & Urry, 2005; Keynon, Lyons, & Rafferty, 2002). Not everyone has access to a car or a reliable form of transportation. This is a struggle that many of these youth are facing, and they live in areas where even bicycle infrastructure is not set up for the youth to be able to safely ride their bicycle as noted by the directors and mentors in interviews.
Theme #4: Hands-On Skills and Cognitive Development

**Table 12.** Hands-On Skills and Cognitive Development Director and Mentor Interview Quotes

<table>
<thead>
<tr>
<th>Interview 1: TFK</th>
<th>“One was a pretty avid rider and he graduated and became a car mechanic. I think a little bit of that idea of riding and working with your hands has transferred over.”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview 5: VW</td>
<td>“Usually just basic stuff, like fixing flats. Helps with their hand-eye coordination. Anything that helps them work with their hands, versus computer based. It gives them the opportunity to learn muscle memory, using another part of the brain, that deals with creativity.”</td>
</tr>
<tr>
<td>Interview 7: VW</td>
<td>“For the one’s that work in the shop, not only are they learning job skill training, but I think they find a sense of home and kind of a family. They are given a professional feel, but in an environment that’s great, where there are going to be consequences if you don’t show up to work or your late but it’s fun and a chance to hangout.”</td>
</tr>
</tbody>
</table>

While Trips for Kids focused on riding a bike and less on the hands-on-skills, both bicycle shops mentioned how students learn these skills and use it to gain employment after the earn-a-bike program. Along with internships and other mechanic positions at the community bike shops, these students are also able to gain employment at for-profit bicycle shops around town. Having the opportunity to learn job skills and gain employment opportunities is something many of these youth might not have had without the community bike shop and other grassroots programs (Nicolosi, Medina, & Feola, 2018).
Theme #5: Long-Term Follow-Up and Relationships

**Table 13.** Long-Term Follow-Up and Relationships Director and Mentor Interview Quotes

<table>
<thead>
<tr>
<th>Interview</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Interview 1: TFK]</td>
<td>“Do we just want to be a one day, yeah you come and ride or do we want to look at developing even longer partnerships with kids and having a greater impact on their life?”</td>
</tr>
<tr>
<td>[Interview 2: TFK]</td>
<td>“Most of the youth, once we give them a bicycle, we do not have a great relationship with them. We have had a number of them come back and volunteer in our shop.”</td>
</tr>
<tr>
<td>[Interview 4: TFK]</td>
<td>“I think that’s definitely where we can improve the most, because we don’t necessarily have a good follow up with our past participants.”</td>
</tr>
<tr>
<td>[Interview 7: VW]</td>
<td>“The reason we are doing this is about building relationships with the students. And if the mentors and the mentees really hit it off, they are encouraged to continue that relationship.”</td>
</tr>
<tr>
<td>[Interview 8: VW]</td>
<td>“It’s about building relationships with them.”</td>
</tr>
</tbody>
</table>

Throughout the interviews with Trips for Kids’ director and mentors they were asked about the impacts on the youth and were able to share a few success stories, but many admitted that they did not have long-term follow-up with the youth participants. Once the youth received their bicycle, they did not continue to reach out to them. They understand that this is a weakness of the program and hope to make improvements in the future. While Village Wrench was not able to discuss the success of these relationships throughout the interviews, it was mentioned as a goal of the program. Strong and reliable relationships are imperative for youth, especially in low-moderate income neighborhoods (Southward, 2018).
Summary of Director and Mentor Interview Qualitative Findings

As noted from the content analysis of directors and mentors’ perspectives, the programs promote participants’ perception of self-worth and improve mobility and accessibility through a sense of freedom of mobility and from the acquisition of new skills. Also, they perceive that participants gain a sense of empowerment by way of access to a bicycle and this in turn contributes to the overall transformation of participants self-worth and well-being.

These insights and findings correlate with evidence found on the literature review as related to the effectiveness and positive outcomes associated with community bike shops and the sense of freedom and empowerment they create.

It is also important to note the absence of any direct reference from directors and mentors to the program’s potential to ameliorate mobility-based exclusion with bicycle use. It is also absent in their mission and vision statements and constitutes a notable gap in the programs’ content and potential to further improve the well-being of youth participants.

Qualitative Findings from Youth Participant Free Response Questions

When analyzing the free response questions from the 20 out of 22 youth that completed this portion of the youth participant survey three themes emerged and can be seen in Table 14.
Table 14. Themes from Youth Participant Free Response Questions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Freedom</td>
<td></td>
</tr>
<tr>
<td>2. Accessibility/Mobility</td>
<td></td>
</tr>
<tr>
<td>3. Hands-On-Skills and Cognitive Development</td>
<td></td>
</tr>
</tbody>
</table>

While the student responses were not as elaborate as the interview responses from the directors and mentors, these themes were still identified via content analysis.

Theme #1: Freedom

When the students were asked what their favorite thing about riding bikes was, several of them mentioned freedom. The responses varied from “freedom” to some of the more elaborate responses in Table 15.

Table 15. Freedom Youth Participant Survey Quotes

<table>
<thead>
<tr>
<th>Participant C: TFK</th>
<th>“It’s freeing and a good way to spend my time.”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant D: TFK</td>
<td>“The way where I can feel like I have total control and I can be free.”</td>
</tr>
<tr>
<td>Participant O: VW</td>
<td>“The freedom of going anywhere without paying for gas.”</td>
</tr>
<tr>
<td>Participant T: VW</td>
<td>“Being free riding with my friends.”</td>
</tr>
</tbody>
</table>

These responses from the youth participants reiterate those from directors and mentors, where freedom is also an emerging theme shared by all key stakeholders.

Freedom was also an answer when the students were asked what they would miss the most if they could never bike again.
Theme #2: Accessibility/Mobility

While the student survey responses did not specifically mention accessibility and mobility, when asked what they would miss the most, if they could never ride again, several of the student responses included this theme. Their responses can be seen below in **Table 16**.

**Table 16. Mobility/Accessibility Youth Participant Survey Quotes**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>F: TFK</td>
<td>“Seeing the different parts of my city.”</td>
</tr>
<tr>
<td>G: TFK</td>
<td>“Being able to get quickly to places.”</td>
</tr>
<tr>
<td>J: VW</td>
<td>“Long rides with friends.”</td>
</tr>
<tr>
<td>S: VW</td>
<td>“Feeling mobile.”</td>
</tr>
<tr>
<td>T: VW</td>
<td>“I can explore new places. Meet new people.”</td>
</tr>
<tr>
<td>V: VW</td>
<td>“The wind and traveling easier than walking.”</td>
</tr>
</tbody>
</table>

These responses clearly indicate that the students use the bicycle for mobility and accessibility to different kinds of activities, have pleasurable experiences, and value it for those reasons. By riding their bicycles more frequently they can improve their overall health, mentally and physically, which can lead to an increase in general happiness (Hoffman M., Are Bike Lanes White Lanes?, 2018; Morris & Guerra, 2015).

Furthermore, by riding their bicycle to more and diverse destinations and activities they are ameliorating the effect of mobility-based exclusion that they may have been experiencing prior to entering the programs.
Theme #3: Hands-On Skills and Cognitive Development

Hands-on-skills have also influenced the after-high-school-plans for some of these youth. Youth participants are able to experience the joy of working with their hands and want to continue that for their career. It is worthwhile to note that several students have transitioned into technical school and jobs in the automotive industry. While many of the students did not give quotes specifically about the hands-on-skills, like the examples in Table 17, many students listed learning and the work as their favorite thing about the bicycle shop.

<table>
<thead>
<tr>
<th>Table 17. Hands-On Skills Youth Participant Survey Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Participant C: TFK] “How to change a tire.”</td>
</tr>
<tr>
<td>[Participant D: TFK] “I feel uneducated about bikes, but it makes me want to learn more.”</td>
</tr>
<tr>
<td>[Participant E: TFK] “I think it’s a fun place where I can learn and soon be given the opportunity to do work.”</td>
</tr>
<tr>
<td>[Participant N: VW] “I feel pride in my work.”</td>
</tr>
</tbody>
</table>

It is also interesting to note the differences in how the participants answered:

What is the most interesting thing you learned in the bicycle shop? All responses included a hands-on skill versus a lesson in character traits or riding skills. The Trips for Kids participants mainly noted the ABC Quick Check, while the Village Wrench participants noted a variety of specific parts of a bicycle from bearings to wheels to overhauling the suspension.
Summary of Youth Participant Qualitative Findings

The youth participants were eager to note the hands-on skills they learned, but none mentioned specific riding skills (Trips for Kids) or character strengths (Village Wrench), emphasized by their respective program. Only one participant from Village Wrench mentioned that what they liked most was the mentor. However, numerous participants mentioned the freedom and accessibility/mobility that the bicycle gives them. These are the strongest themes from this portion of the survey.

Quantitative Findings from Youth Participant Surveys

The following survey responses from the youth participants sheds light on bicycle mobility and accessibility patterns outside of bicycle-shop program’s scheduled activities.
Demographics

The participant survey was completed by 22 participants: eight from Trips for Kids, six from the Monday night Village Wrench class, and eight from the Wednesday night Village Wrench class. While all students that were a part of the program that were in attendance were asked to complete the survey, some refrained. The sample that chose to respond from each case can be seen in Figure 8.

![Survey Sample](image)

**Figure 8. Participants Survey Sample**

The average age of the participants is 14.6, with 14 being males and the other eight females. The average age of a Trips for Kids participant is 13.1, while Village Wrench had an average, over two years higher, of 15.4. (Figure 9)
21 of the participants had bicycles at home and one participant was earning their first bicycle. 16 of the participants have only participated in the program since the beginning of their earn-a-bike class, three weeks. Six of the responses are from participants that have been part of the program one year or more.

Physical Activity

The first portion of the survey asked youth participants about their physical activity. This information was captured to see if the weekly physical activity of a participant might be related to their cycling as seen in similar case studies (Veitch, et al.,...
The average student plays outside 4.45 times a week and exercise or play sports 4.64 times a week. (Figure 10)

Figure 10. Average Physical Activity Scores (Full Sample)

The average student rides their bike exactly one more time, Monday through Friday at 3.36 times, versus the 2.36 times on Saturday and Sunday. Figure 11 below compares the physical activity responses between the two bicycle shops.
Village Wrench youth participants spend more time playing outside, playing sports, and exercising during a typical week, while Trips for Kids participants ride their bicycle more frequently outside of the program. This is both during the week and on the weekends. This trend coincides with their program focus, riding versus mechanical skills.

**Figure 11.** Physical Activity Score Comparison per Week by Community Bike Shop

**Figure 12** below highlights each youth participant’s physical activity score. This score was calculated by adding all the responses the student answered in the physical activity portion of the survey. These summed scores can range from 0 to 32. The scores were also separated by general physical activity and cycling. Each score, physical activity and cycling is represented in the same bar with different shades.
Figure 12. Youth Participant Physical Activity Scores

The average score for all participants is 14.8. Youth participant D is a visual outlier, this participant is an 18-year-old female. This participant was interested in earning her bike so she would have a means of transportation to and from work, so she might not be as interested in the idea of playing outside and other high levels of physical activity. Work could also consume most of her time, not leaving the opportunity for additional recreational activities. Youth Participant R is also a visual outlier, this
participant is a 13-year-old female. This participant did not give any indicators to why their score is the highest, she must enjoy playing outside and riding her bike.

There is also a suggestive visual correlation between higher outside activities and higher cycling frequency. This relationship also appears in the literature review, participants that enjoy cycling and physical activity are more likely to ride more (Morris & Guerra, 2015; Hoffman, Hayes, & Napolitano, 2014).

When comparing the youth participants that have been in the program longer than a year versus those that just started, the average number of times they play outside a week and how often they normally exercise was substantially higher for those that had been part of the program longer (Figure 13). Thus, this suggests that a longer time spent in the program seems to have an impact on activity and riding levels outside of the scheduled activities. However, more nuanced and detailed statistical analysis is needed to corroborate this relationship.
Figure 13. Physical Activity Scores per Week by Duration in Program

However, it is interesting to note that those that just started the program ride their bikes more on the weekends. Maybe this is when they are free to practice and spend time riding with their friends and/or the novelty effect.

Local Independent Mobility and Access to Destinations

The results from Part 2, Local Independent Mobility can be seen in Figure 14 below. For this question, participants were asked where they can travel without an adult on a bicycle. Having locations to travel to in proximity and being able to travel without a parent was a large concept within the literature review (Veitch, et al., 2017). Parental control is a large factor for youth, because they still live at home and must abide by the
rules of their guardians (Timperio, Crawford, Telford, & Salmon, 2004). This was a notable factor in other cases as mentioned in the literature review.

The measure of local independent mobility captures the degree of independence from direct supervision allowed by youth participant parents as well as the level of accessibility afforded by access to a bicycle measured as the sum of total activities engaged per week and the count of unique activities engaged per week. **Figure 14** shows the total number of students “yes” responses for each location.

![Local Independent Mobility Scores (Full Sample)](image)

**Figure 14.** Local Independent Mobility Scores (Full Sample)

The results from this question are not unexpected. Park/pool/playground and the friend’s house are the most likely to be visited without an adult on a bicycle. These
might be closer locations and locations where the parent might know the supervising adult. Laundromat and post office were the lowest. These locations are more like to involve errands and thus the age group surveyed probably does not visit these locations alone. The average number of destinations a participant could visit without an adult on a bicycle is 5.32 per week.

**Figure 15** compares the results between the two community bike shops. The data for this graph was calculated as percentages by adding the total responses per location and then dividing it by the number of responses per case. This was done to compare the bike shops even though they have different number of responses. Each bar represents the percent of students from each bike shop that can travel to each location on a bicycle without an adult.

![Local Independent Mobility Comparison by Community Bike Shop](image)

**Figure 15.** Local Independent Mobility Comparison by Community Bike Shop
Youth participants at Village Wrench travel to more locations. There is a more notable difference for laundromat, gas station, work, and church. The more places a student can travel without a parent could be age-related because the average age of Village Wrench participants is two years older than those from Trips for Kids. However, the freedom to travel to after-school programs, park/pool/playground, and friend’s homes remains the same in both programs. This further suggests the importance of having a supervising adult at the destination.

To complete the age-related analysis, in Figure 16, the participants were divided into three groups: the first eight students are aged 10 to 13 and fall under the middle school age range, the next seven students are 14 to 16 and fall under the freshman and sophomore age range, and the last seven students are 17 and 18 and fall under the junior and senior age range. These age ranges were chosen due to the different responsibility levels between middle and high school students and then the difference between being able to drive to school during junior and senior years.
Figure 16. Local Independent Mobility Age Comparison

In this figure, each age range can average attending at least one more destination.

Middle schoolers can average 4.25 destinations, freshman and sophomores can average 5.29 destinations, and juniors and seniors can average 6.57 destinations. This suggests a trend in mobility that increases with age, rather than being a static behavior.

To determine which destinations each age group could travel to independently, the percent “yes” responses were broken down by destination in Figure 17.
Laundromat and post office were the two lowest scoring categories overall. Yet disaggregate analysis by age highlights that laundromat gets a slightly higher score as the youth get older, however, post office does not show an age-related pattern. This could be due to the proximity of the post offices in relation to each participant’s neighborhood. Seven out of then ten categories have more participants being able to travel to them as they get older, the exceptions are post office, friend’s house, and after-school programs. As youth get older, their friendships may become more spaced out, eventually exceeding cycling distance and the same trends can occur in after-school programs, this is further analyzed in the accessibility (summed local independent

Figure 17. Local Independent Mobility Comparison by Age
mobility – destinations) results. **Figure 18** breaks down these results even further and shows them by survey response.

![Youth Participant Summed Local Independent Mobility Scores (Number of Destinations)](image)

**Figure 18.** Youth Participant Summed Local Independent Mobility Scores

This break down of the results can help determine outliers in the survey responses. There are two outliers and they are participant Q and V. Participant Q does not have a bicycle at home, which makes the responses to this question difficult, strongly limiting their mobility. Participant V did not have any indicators in their survey response to why their local independent mobility is low. Participant V is a 14-year-old male that is home schooled and may have parental limitations that far exceed those of his peers.
Participant J, 14-year-old male, and Participant M, 16-year-old male, are both public school attendees. This might give them more freedom and thus, fewer parental limitations.

When looking to compare the data by gender, the average age of the eight females is 16.75, whereas the average age of the 14 male participants is 13.36. With this large age difference, any notable differences in gender could also be attributed to the three-year average age difference. However, it is interesting to note that most of the participants in the program are either younger males or older females. High school males could be more likely to be involved in sports and this would limit their participation in the program.

Program duration was a large factor in the accessibility score. The youth participants were divided into those who had been in the program for over a year (N=6) versus under a year (N=16). The average number of destinations the youth could travel to when being part of the program for over a year was 7.66 compared to the 4.43 destinations of the youth that recently started the program. Longer time in the program gives the students more familiarity with riding skills, thus they can travel to more destinations. However, it is important to note that the average age of the youth participants that have been in the program for over a year is 17.16. While it is expected for the participants that have been in the program longer to be older, this large age difference compared to the average age of 14.6, could cause a significant skew in the results.
Accessibility [Ease of Access]

The next portion of the survey focused on accessibility measured as ‘ease of access’ on a Likert scale. As stated in the literature review, accessibility is defined as “the ability [and ease] to reach desired goods, services, activities, and destinations” (Litman, 2011, p. 5). The participants were asked how easy or difficult it is to get to the following places. They were able to rank it from “very difficult” (1) to “very easy” (4) with the option of “I don’t go here”. This was translated into a numeric score of one to four. The higher the score, the easier it is for the participants to get there on a bicycle. (Figure 19)

![Ease of Accessing Destinations Scores (Full Sample)](image)

**Figure 19.** Ease of Accessing Destinations Scores (Full Sample)
The locations with the highest accessibility score included park/pool/playground, followed by friend’s house and after-school programs. Figure 20 compares the average accessibility scores between the two programs.

![Ease of Access Comparison by Community Bike Shop](image)

**Figure 20. Ease of Access Comparison by Community Bike Shop**

Both programs had similar accessibility scores. The sum for Trips for Kids is 26.08 and Village Wrench is 27.87. The comparison by age group is found in Figure 21.
All three age groups have easy access to the park/pool/playground, these are likely located in or near their neighborhood. Older youth participants have easier access to gas stations, this correlates with the responses from the local independent mobility section. Only four out of the ten categories highlighted the trend of having easier access as the students aged. These categories included: gas station, park/pool/playground, after-school programs, and church. Work highlighted an interesting trend of being the most difficult to access with the older youth. This could be because the younger youth participants are working locally such as mowing the lawn for their neighbor and the older students are traveling further for work. Hence, as noted from other studies

**Figure 21. Ease of Accessing Destinations Comparison by Age**
(Veitch, et al., 2017; Timperio, Crawford, Telford, & Salmon, 2004), age seems to be an important factor in mobility and accessibility levels by bicycle, where older participants seem to enjoy more independence from parents and thus experience higher levels of mobility and accessibility.

**Figure 22** shows each participant’s overall ease of access, which consist of the sum of all scores from all possible destinations.

![Youth Participant Ease of Access Score by Youth Participant](image)

**Figure 22.** Youth Participant Ease of Access Score by Youth Participant

The average score is 20.3. Youth Participant Q is a visual outlier with an ease of access score of zero. This is the participant that does not have a bicycle; therefore, they were
not able to rank ease of access to destinations on a bicycle. Youth Participant J is also a visual outlier with an ease of access score of 36. This participant is a 14-year-old male, who just started at the community bike shop and may be more physically active or perhaps lives in a neighborhood with many nearby amenities and destinations. This participant may also live in a central location relative to these activities.

When comparing the ease of access scores from those who have been a part of the program for over a year and those under a year, the difference is minor. Those who have been part of the program longer have an average accessibility score of 3.26 out of 4 and those shorter have an average score of 2.65 out of 4. This score was calculated by averaging the accessibility scores from all categories and all students within their respective category. While there is an increase in ease of access to those that have been in the program longer, these students are also significantly older. A ranked list of destinations comparing the mobility and accessibility scores from highest to lowest can be seen in Table 18.
Table 18. Local Independent Mobility and Accessibility Rankings (Full Sample)

<table>
<thead>
<tr>
<th>Local Independent Mobility</th>
<th>Accessibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Park/Pool/Playground</td>
<td>1-Park/Pool/Playground</td>
</tr>
<tr>
<td>2-Friend's House</td>
<td>2-Friend's House</td>
</tr>
<tr>
<td>3-Grocery Store</td>
<td>3-After-School Program</td>
</tr>
<tr>
<td>3-Gas Station</td>
<td>3-Gas Station</td>
</tr>
<tr>
<td>4-School</td>
<td>4-Work</td>
</tr>
<tr>
<td>5-After-School Program</td>
<td>5-School</td>
</tr>
<tr>
<td>6-Work</td>
<td>6-Grocery Store</td>
</tr>
<tr>
<td>7-Post Office</td>
<td>8-Church</td>
</tr>
<tr>
<td>8-Laundromat</td>
<td>9-Laundromat</td>
</tr>
</tbody>
</table>

The top two in both categories are park/pool/playground and friend’s house and the bottom three in both categories are church, post office, and laundromat. This suggests that social activities are more important and convenient to youth than other more utilitarian activities, although church services are typically limited on weekends and thus the scores might reflect this scheduling constraint as compared to other destinations and activities.

Neighborhood

The fourth portion of the survey was neighborhood characteristics. In this portion, students were able to quantify the number of different features in their neighborhood that are considered supportive to bicycling according to the literature. This series of questions was asked to determine how cycling friendly and traffic calming their neighborhood is to see if the youth participant’s neighborhood promoted more
cycling. For this portion of the survey there were only 21 responses, because one participant noted that he did not live in a neighborhood and skipped these questions. Figure 23 highlights the different bicycle-friendly features that students might have in their neighborhood. Each participant was able to use their own definition of a neighborhood.

![Neighborhood Safety Features (Full Sample)](image)

**Figure 23. Neighborhood Safety Features (Full Sample)**

19 out of the 21 students or 90% said they had sidewalks or trails in their neighborhood. This is a high percent, but through personal experience, sidewalks are a common feature in neighborhoods. 10 out of 21 or 48% of the youth participants said they had bike lanes in their neighborhood. This was a surprise, because through personal experience, it is uncommon to see bicycle lanes in neighborhoods. 14 out of 21 or 67%
of youth participants said they had speed bumps in their neighborhood. 100% of the students said they had stop signs in their neighborhood. This is probably the most common traffic calming feature and is not surprising to have 100% of the respondents say they have this in their neighborhood. 11 out of 21 or 52% of the youth participants said they had traffic lights in their neighborhood. These neighborhood characteristics are features that would promote cycling. They are traffic calming measures as well as enhanced safety features. The most common feature in a neighborhood, per these results, is a stop sign, followed by sidewalks and trails. Figure 24 compares the breakdown by bicycle shop.

**Figure 24. Neighborhood Characteristics Comparison by Community Bike Shop**
The comparison between bike shops shows Trips for Kids has a total “yes” average of 78%, while Village Wrench is 68%. This is an average score per bike shop from all five categories. Trips for Kids participants do have more speed bumps, traffic lights, and bike lanes than Village Wrench participants, and this may also contribute to them registering a higher rate of bicycle trips. **Figure 25** breaks it even further down, by youth participant.

**Figure 25. Total Neighborhood Safety Features by Youth Participant**

The average number of safety features in each participant’s neighborhood is 3.4 out of 5. The reason there could be so much variability by participant, is that each participant
could use their own definition of a neighborhood, or youth participants in each case live in distinct neighborhoods with distinct physical features. It is interesting to see the consistency in the numbers from the participants at Trips for Kids, while the participants from Village Wrench had a much higher range in responses.

While it cannot be confirmed with the available data, Trips for Kids participants are more likely to live in an area surrounding the bicycle shop, while the Village Wrench students come from around Greenville, South Carolina due to the youth participants at Trips for Kids walking to class and the participants at Village Wrench were dropped off.

When comparing the youth participant’s neighborhood features to the number of times a week they ride, there were no salient visual trends. (Figure 26)
Figure 26. Number of Neighborhood Features vs Number of Weekly Bike Rides by Youth Participant

Based on this limited dataset it is plausible to consider that the safety features and traffic calming measures in the participant’s neighborhoods have a weak or no relationship on their riding. This variability could be to their definition of a neighborhood, because they could be in close proximity to a greenway or cycling friendly path, they may not consider this part of their neighborhood.
Safety

Part five of the survey was Safety. The safety factor was included because it was a major factor identified in the literature review as being determinant of bicycle ridership, and this author wanted to determine if this was a limitation in cycling for the cases in this study. The participants were able to rank different statements on a five-point scale of “strongly disagree” to “strongly agree”. In order to graph this data, the statements “There are scary dogs in my neighborhood.”, “I often see scary strangers in my neighborhood.”, “There is bullying in my neighborhood.”, and “There are areas of my neighborhood I avoid.” were ranked “strongly agree” (1) to “strongly disagree” (5). The statements, “I feel safe at night in my neighborhood.” and “I feel safe during the day in my neighborhood” were ranked “strongly agree” (5) to “strongly disagree” (1). Thus, the higher the number, the safer the neighborhood. The graph can be seen below in Figure 27.
The highest scores with a three-way tie of 4.14 include heavy traffic, bullying, and safety during the day. While, the largest area of concern is the areas in the neighborhood that students avoid, followed by safety at night. Figure 28 compares the safety scores between the two community bike shops.
This is an interesting graph because Village Wrench has a higher safety score in every category, especially in “There are areas of my neighborhood I avoid.” While this could be because the students feel safer in Greenville, South Carolina versus Charlotte, North Carolina, this could also be due to the average age of the participants. The older students could feel safer in their neighborhoods.

This proposition was considered in Figure 29.
While this graph does not have strong visual pattern, the middle schoolers had the highest safety score in four out of seven of the categories and the juniors and seniors had the lowest safety score in six out of the seven categories. This relationship could be due to older students being more aware of their surroundings compared to the naivety of the middle schoolers. Figure 30 breaks this down and compares by survey response. The scores were calculated by adding all of the safety scores for each survey response. These survey responses could range from 7 to 35.
Figure 30. Safety Score by Youth Participant

The average survey response was 26.2. Participant Q has a score of zero because they did not complete this portion of the survey. This was not used to calculate the average survey response. The lowest response was Participant G. This was an 18-year-old female which matched the patterns in the previous figure that older students had a lower safety score.

Figure 30 also shows high variability between the survey responses. This could also be due to the personal nature of the feeling of safety and how even two people living in the same household could feel varying degrees of safety. The safety scores were
also compared to the participant’s accessibility and local independent mobility scores. There did not appear to be a visual correlation in these responses.

Quantitative, Qualitative, and Case Cross Analyses

Director and Mentor Interview and Youth Participant Free Response Cross Analysis

Freedom through accessibility and mobility is a theme that was strongly mentioned in both the interviews with the directors and mentors and with the youth participants in their free response survey questions. While freedom is not mentioned in either program’s mission statements, it is mentioned in the Trips for Kids vision statement as “the freedom to explore the natural world on two wheels” (Glodowski, 2019, p. 1). It is one of the strongest correlated themes between the adults and the youth, and with the literature review on other cases across the globe (Kinnevy, Healey, Pollio, & North, 2008; Southward, 2018). The freedom cycling gives the youth participants through the opportunity to cycle more (mobility) and travel to more destinations (accessibility) leads to the sense of empowerment and confidence, and empowerment is the expansion of freedom (Poverty Reduction Group, 2002).

Empowerment was a theme mentioned by directors and mentors of both programs; however, empowerment was not mentioned frequently amongst the student survey responses, but one student did mention that their favorite part about the bicycle shop was the “feeling of accomplishment” [Participant U]. This concept is specifically
Empowerment is also a strong theme throughout the literature review in key definitions and in findings from other earn-a-bike programs (Kinney, Healey, Pollio, & North, 2008; Arnold, 2013; Southward, 2018).

Youth in low-income neighborhoods tend to lack self-esteem and empowerment through youth development programs can address these issues and instill confidence in these youth (Southward, 2018; Lerner & Lerner, 2010). Arnold even uses empowerment to define a community bike shop saying, they are “dedicated to self-empowerment and building community through the bicycle”; they “offer an alternative to consumer culture’s reliance on others to satisfy needs, seeking to empower cyclists to become more self-reliant in undertaking bicycle repair.” (2013, p. 139).

Empowerment and confidence are not specifically mentioned by the youth participants, and this could be due to the timing of the survey for the Village Wrench participants or because of the age and stage of development of the youth participants where more complex concepts related to social stratification, power structures, and political asymmetries may not yet be clear in their minds. Hence it may reflect on a limited vocabulary and lack of understanding of more complex concepts such as “empowerment”. Additionally, the survey was administered closer to the start of the program and the impacts might not be apparent in the participants.
Equity through accessibility and mobility was strongly mentioned by the director and mentor interviews and in the mission and vision statements of the community bike shops. Village Wrench’s mission is “to transform under-resourced communities” and their visions is “for under-resourced communities to thrive” (Compton, 2019, p. 1). Trips for Kids mission states, “especially for those most in need” and their vision says, “we envision a world where kids from all walks of life...” (Glodowski, 2019, p. 1). While the youth participants were not able to confirm their low-moderate income status in the survey responses, they did mention the accessibility and mobility opportunities they were able to have with their bicycle. They also emphasized the importance of being able to ride with friends. The theme of equity through accessibility and mobility is one that should be further researched with more time and larger sampling.

Hands-on-skills and cognitive development were mentioned by the director and mentor interviews from both Trips for Kids and Village Wrench. These skills were strongly emphasized as services that could turn into job opportunities. However, this is only mentioned in Village Wrench’s mission and vision. They specifically mention the “bicycle repair” and “developing leaders” (Compton, 2019, p. 1).

Several of the youth participant survey responses also reflected these skills, but most of those responses were from Village Wrench participants, where the program emphasizes manual skills as compared to riding skills in Trips for Kids. The participants mentioned these practical skills and the opportunity to apply them into their first job.
However, both community bike shops shared testimonies of previous students that had taken these skills to work at other local bicycle shops or even to further their technical education in auto mechanics. This theme of hands-on-skills and cognitive development is heavily emphasized in the Village Wrench mission and vision, and program emphasis and is reflected in their youth participant survey responses.

While it is not mentioned in Trips for Kids’ mission and vision, nor is it a class emphasis, the program does expose youth participants to hands-on-skills that translate into job opportunities. Hands-on-skills and leadership opportunities that can translate into job skills were also highlighted in the literature review as giving youth participants in low-income neighborhoods better means at reaching their full potential and getting off the path of generational poverty (How Housing Matters Editorial, 2015; Southward, 2018).

Long-term follow-up and relationships differed greatly by the community bike shop. Village Wrench has a much stronger emphasis on these relationships and does this by pairing each student with a mentor for the duration of the program, in hopes they will continue this relationship upon completion of the program. The data collected from Village Wrench participants did not reflect on these relationships, but this could be due to the timing of the survey administration. The participants might not have had time to foster these relationships. The students did mention the friendliness and the welcoming vibe of the community bike shops. While it is a strong emphasis within the Village
Wrench program, relationships are not mentioned in their mission and vision statements.

Trips for Kids admitted that they did not have good follow-up with past participants and that unless the student stayed around to learn mechanical skills, they never saw them again. Through this research process, their eyes were opened to this weakness and they hope to work on this in the future. Trips for Kids also does not mention relationships in their mission and vision statements. The theme of mentorship and someone the youth can look up to and trust was a theme that was heavily mentioned throughout the literature review (Southward, 2018) and one that these programs should emphasize more.

Quantitative and Qualitative Cross Analysis

The survey results emphasized the mobility and accessibility components of the programs. Most every student used their bicycle to travel to their friend’s house and to the local park/pool/playground. The students felt safe in their neighborhoods and the neighborhoods offered a variety of traffic calming measures to promote cycling, even though this was not reflected in the student’s ridership. Trips for Kids promoted riding skills in their classes and their students had a higher average riding score. While this could be due to the selection of students surveyed (N=8 out of N=10), it is worth noting that the emphasis on riding skills promoted more riding.
The participants that noted feeling “freedom” in their opened ended questions came from both community bike shops and had the same average accessibility and mobility scores as the full sample. They were also evenly split by gender and had a similar average age as the full sample. While this does not note that one factor or group feels more “freedom”, it does note that the full range of participants experience freedom.

Empowerment seems to be related to age across the board. The older youth participants are allowed to travel to more destinations per week. Overall, it seems that local independent mobility (allowing to go) correlates with age. The youth participants that have been part of the community bike shops longer also have a higher number of destinations; it is important to remember that these youth are also significantly older than the newer participants. Both community bike shops seem to empower the same levels of mobility.

Generally, the quantitative and qualitative results support each other, especially in the case of the students that have spent over a year with the community bike shop. These youth participants tend to play outside more, exercise more, and ride more on the weekdays. These participants also had a higher local independent mobility score averaging access to three more destinations than those who recently started the program. While accessibility and mobility are not specifically mentioned in the mission and vision statements of the programs, Trips for Kids does hope to “promote healthy, recreational lifestyles” (Glodowski, 2019, p. 1). They are succeeding in this achievement
with the students they can continue to work with after the completion of the three-week program.
Conclusions

The goal of this study was to better understand how community bike shops as youth development programs impact participants and assess any bicycle mobility and accessibility effects on youth participants.

To fully grasp the impacts of these community bike shops, both qualitative and quantitative methods were used. Qualitative methods, through interviews to directors and mentors and free response questions on youth participant surveys, were used to better understand how the programs influence the youth participants and how it advances the program’s mission and vision. Quantitative methods, through a youth participant survey, was used to better understand the youth participant’s mobility and accessibility outside of the program’s scheduled activities.

Initially, this study was designed to be completed with three case studies, however in the final version of this report only two bicycle shops are included due to the unexpected retraction of one case. Due to the limited survey responses and only analyzing two community bike shops, these statements may not be applicable to every community bike shop. Still, the study and conclusions here presented hope to give a better understanding and provide insights about the experience of the 22 youth that participated in these programs. This in turn, may serve to inform both existing community bike shops and those yet to be established.
In relation to the two research questions that were posited to guide the study, the main conclusions are summarized below.

**RQ1. How do community bike shops influence youth participants and in which ways?**

By creating a setting that promoted a sense of freedom and empowerment of youth participants both programs seem to advance part of their stated mission and visions. (Table 19)

| Table 19. Mission and Vision Statement in Relation to Empowerment and Freedom |
|-------------------------|------------------|------------------|
| **Mission**             | **Vision**       |
| **Village Wrench**      | “by empowering others” | No mention of freedom or empowerment. |
| (Compton, 2019)         |                  |
| **Trips for Kids**      | “personal empowerment for young people” | “the freedom to explore the natural world” |
| (Glodowski, 2019)       |                  |

These results echo the findings of previous studies on other cases cited in the literature (Veitch, et al., 2017; Page, Cooper, Griew, & Jago, 2010). By enabling transformative experiences through bicycle repair, earning, and riding Trips for Kids advance their mission and vision. Village Wrench does not include “freedom” in their mission or vision and the results of this study emphasize how important this sense of freedom is to their youth participants. Not including freedom in their mission or vision is
a missed opportunity to clearly communicate and understand what their potential strategy and real goal is.

This freedom looks different on different youth, depending if this allowed them to ride with their friends or use their bicycle and the skills they learned as an opportunity to earn money. As noted in the literature review this new sense of freedom is also a form of empowerment. The youth participants can accomplish more, travel more to a more diverse set of activities, and know more about their bicycles through these earn-a-bike programs. The students also seemed interested in learning the different bicycle skills and in this process begin to thwart any mobility-based exclusion they may experience in their communities.

While measuring retention of bicycle skills was outside the scope of this study, and thus it is unknown how much the participants remember once scheduled programming concludes, when interviewed, they expressed excitement to learn about gears, brakes, and ‘all of the tiny moving pieces’. Through these lived experiences youth participants are excited about riding their bicycles and learning more.

Village Wrench’s mission, vision, and program emphasis on hands-on-skills and developing leaders is also advanced as noted by the youth participants free response answers. While Trips for Kids did not emphasize hands-on-skill in their mission and vision, they had participants use these skills to inspire career aspirations.

Village Wrench does not mention mentoring relationships in their mission and vision, even though it is a strong program emphasis. These relationships and the value
of having a mentor was only mentioned in one of the participant responses. This is another missed opportunity for Village Wrench to embrace their emphasis and incorporate it more clearly in their mission and vision. This could also be more strongly encouraged as the participants are meeting with their mentors during scheduled programming. For example, safe places for mentors and youth to meet once programing concludes can be advised or even the encouragement for exchanging contact information.

Overall, both programs are advancing most of their respective mission and vision. The programs overall goal to improve well-being of youths in low-income communities is mostly achieved through transformative experiences of freedom and empowerment via bicycle mechanical training, bicycle riding skills, group riding experiences, and improved mobility and accessibility outside of the program’s scheduled activities. Thus, their experiences both within and outside of the program are important in advancing the programs' mission and vision. The community bike-shop as a grassroot initiative to improve youth’s well-being appears to be an effective strategy in low-income communities.

RQ2. What impact do community bike shops have on youth participants’ bicycle mobility and accessibility outside of the program’s scheduled activities?
While the participants’ survey did not determine the student’s bicycle mobility and accessibility before and after they started the program, it does note where (accessibility) and how much (mobility) the students travel. Participants average riding their bicycle six times a week outside of scheduled programming. The older the youth participant, the more freedom they had traveling to destinations and the more diverse destination and activates they engaged. Learning specific riding skills did promote more riding for the participants at Trips for Kids versus those at Village Wrench.

Overall, the skills learned in both programs and the access gained to a bicycle through earn-a-bike programs do seem to increase and/or sustain the youth participant’s mobility and accessibility outside of the program’s scheduled activities. However, neither program explicitly address nor leverage these mobility and accessibility outcomes and their potential to thwart larger mobility-based exclusion that may be experienced by youth participants in their communities. This is a missed opportunity as both programs specifically work with low-income youth that could currently or prospectively experience this issue.

Recommendations

Case Study Recommendations

As these programs move forward, the information and findings gathered in this study would surely be valuable to both. There are lessons that each of the bicycle shops
can learn from the other. For instance, when it comes to riding skills, this is a component emphasized in Trips for Kids. Village Wrench may want to consider adding at least one class offering and thus incorporate this component. It would be beneficial for the youth participants, even if not as in-depth, to have a basic knowledge of riding. This would help encourage the participants to ride more frequently.

Village Wrench promotes the relationships of the youth with their mentors by providing the youth with one-on-one assistance throughout the course of the program. While one-on-one mentorship may not be feasible, increasing the student-teacher ratio might allow for the students to build better connections with the instructors (Southward, 2018). This might also be helpful if the instructors are diverse through gender and race to build those relationships. While the success of the relationships through Village Wrench was not analyzed in this study, it could be something to analyze moving forward.

Freedom is a strong theme from this study, and it is only incorporated into the Trips for Kids vision. This is a missed opportunity for Village Wrench as this freedom is a key transformative experience that contributes to their mission, vision, or program emphasis.

General Recommendations

Based on this study, positive elements have been found in these programs that society could benefit from by extending, and/or replicating them. As more community
bike shops may be implemented and as more of those are integrated into youth
programs these general recommendations can be applied:

<table>
<thead>
<tr>
<th>Table 20. General Recommendations</th>
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<tbody>
<tr>
<td>1. Continuing participant relationships post program completion</td>
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<tr>
<td>2. Incorporating both riding and mechanical skills</td>
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<tr>
<td>3. Having a higher student-teacher ratio</td>
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<tr>
<td>4. Developing more youth-focused community bike shops</td>
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</table>

Both community bike shops in this study are successful and effective in
advancing the goal of improving the life of youth in low-moderate income
neighborhoods. They could work on continuing the relationships after the program. This
could be done by inviting past participants to monthly bike rides and outings. This would help students stay up to date on their cycling skills and would be able to continue meeting with their mentors in a safe programmed setting.

Youth in these low-income neighborhoods lack consistent adults in their life (Southward, 2018). Only having a mentor for a few weeks does not satisfy this need for a stable relationship. Having long-term relationships with the participants may also lead to increased physical activity scores, and this in turn increases their general health and overall well-being.

Riding and mechanical skills are both important for the youth and certainly contribute to the competence and confidence, attributes that are sought after in the program’s mission and vision. The riding skills promote the riding of the bicycle and lead
to more accessibility and mobility. The mechanical skills of the programs allow the students to work on their hands-on-skills and cognitive development. These skills also translate well into internship opportunities at the community bike shop, job opportunities at other local for-profit bicycle shops, or even serve as inspiration to go to technical school post-high school graduation. Together these skills can help alleviate mobility-related exclusion.

Higher student-teacher ratios are also recommended as they increase the opportunity for the youth participant to be able to bond and form a connection with their instructor. They can find an adult that they can view as a role-model and build a healthy, sustainable relationship with outside of the program. These relationships are crucial to youth development, especially those in low-income neighborhoods (Southward, 2018).

Yet another recommendation is to establish more community bike shops for the youth in low-income neighborhoods and provide them with earned access to personal transportation. This is a service that other youth development programs do not provide. Replicating these programs in other grassroots and service organizations (i.e. churches) can help alleviate the threat of mobility-related exclusion.

Having more programs provide earn-a-bike classes also promotes awareness of this issue. Youth-focused bicycle shops are not common. This means these opportunities are not as readily available as they should be. With alternative transportation on the rise and the promotion of bike lanes and other cycling safety features, this should be an
opportunity for every youth, whether from low-moderate or middle-high income neighborhoods, and perhaps be included as a permanent component of educational curricula from elementary to high-school.

Cycling and the freedom that it gives the youth along with the sense of empowerment, health, and psychological benefits is crucial for their development in society. Cycling is also an effective tool to thwart mobility-based exclusion and the diminished socio-economic opportunities experienced by youth in low-moderate income neighborhoods.

Limitations

Finding community bike shops that work with youth and would allow access to survey a good sample of participants proved to be quite difficult. Throughout this process thirteen community bike shops were contacted. Through further conversations, most were ruled out due to not focusing on youth or having not having earn-a-bike classes/programming that aligned with the research schedule. Also, most of the earn-a-bike programs started in late spring and early summer. This caused delay in research gathering and eliminated some programs from being included in the study. This was an unexpected logistical problem the researcher encountered after the main case dropped-out of the study.

Three programs initially agreed to the research and two programs did not work out. One program retracted after initially accepting participation and to administer over
100 surveys to youth participants, which would have allowed for a more nuanced regression analysis and hypothesis testing as originally planned for this research.

A third limitation was not being able to gather data of where the participants had access to prior to their participation in these programs. This information would have allowed for a stronger comparison of the mobility and accessibility of the youth before, during, and after they completed the earn-a-bike program.

Each week students were taught skills that incorporated character traits, riding ability, and mechanical skills. There is no way to assess the retention of this knowledge upon graduation from the program. This also leads to the issue of measuring long term effects on mobility and accessibility, because this is a cross-sectional study. To better access these learned skills and the impact they have on the youth participants, this would have to be a longer study.

The literature review emphasized the importance of parents. This included parent perceptions of the neighborhood, parent perceptions of physical activity, income levels, and the role they had in their child’s life. Not being able to survey them and gather their opinions left a gap in the data collected. These answers would have allowed for a more complete analysis as parents tend to have a notable impact on the mobility of their children.

Finally, the lack of a control group is another limitation worth noting. A control group comprised of youth that do not participate in a bike shop, would have allowed the information collected from the youth participants in the bike shops to be compared.
especially regarding mobility and accessibility outcomes. A diachronic study or a single-time study performed, for instance yearly, would allow for an in-depth analysis of the mobility and accessibility of youth as they age.

Final Comments

Despite limitations related to case and data accessibility, this study reveals important and positive impacts that community bike-shops, as youth development programs have on participants from low-moderate neighborhoods. The value of these grassroot initiatives to individuals, their communities, and to society in general is underappreciated and merit more attention and support from the public and private sectors, and other community-based organizations.

The multiple social and environmental challenges faced by society in this 21st century require a transformation of our mobility patterns toward more sustainable transportation modes, and the reduction of increasing social and economic inequalities. Interestingly, community bike shops can contribute to both and to the betterment of youth, their mobility and accessibility levels, and reduce the negative effects of mobility-based exclusion.
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