UNDERSTANDING THE CAPABILITY APPROACH FOR OLDER ADULTS AND WALKING
A PROPOSED SURVEY STRATEGY

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Acknowledgements

Photos

Cover: Two senior citizens walking along a sidewalk in a small city downtown area of Princeton, NJ, courtesy of New Jersey Bicycle and Pedestrian Resource Center.

Page IV: Two older adults cross the street toward a New Jersey Transit rail station in South Orange, NJ , courtesy of New Jersey Bicycle and Pedestrian Resource Center.

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1. Introduction

This literature review concerns the capability approach, which is a framework of justice that focuses primarily on achieving equity through a just distribution of opportunities such that individuals can take advantage of the opportunities they individually value. This approach to justice confronts what its proponents identify as defects of other frameworks of justice, including egalitarianism and libertarianism. This report focuses on the theoretical underpinnings of the theory with the intent that they may be applied to transportation issues. More specifically, this review examines the capability approach through the lens of its applicability in exploring accessibility issues for older adults and their use of walking for transportation, exercise, and recreation.

Walking for older adults is a societal good, and transportation officials, engineers, researchers, and planners should be interested in removing barriers that reduce its positive impacts. Older adults who walk can maintain their health for longer, reducing health care costs. Additionally, a mode shift from driving to walking for short trips can reduce vehicle miles traveled, lowering fuel costs, vehicle maintenance costs, and congestion. Nevertheless, older adults experience barriers that inhibit them from walking more often. For some adults, the physical act of walking becomes too difficult as their health gradually deteriorates, but for others, the reasons they choose not to walk are entirely different.

1.1 Prior Work

The New Jersey Bicycle and Pedestrian Resource Center has completed multiple reports on related topics, starting in 2017. All of the relevant prior work remains accessible to the public on the New Jersey Bicycle and Pedestrian Resource Center website.

The Bicycle and Pedestrian Resource Center first explored the effects of crime on the amount of walking in neighborhoods in New Jersey (New Jersey Bicycle and Pedestrian Resource Center, 2017). The report explores the reasons for lower walking rates in certain neighborhoods which should otherwise be conducive to walking. Such features include a grid system, sidewalks, and nearby stores and other amenities. This study consists of street audits and intercept surveys which examined the association between police-reported violent crime and daily walking duration for recreation and transportation in a study area including parts of Newark City, Bloomfield Township, and Verona Township, New Jersey.

In 2018, the New Jersey Bicycle and Pedestrian Resource Center released a mail survey to explore the transportation needs of aging baby boomers. The baby boomer generation increased the share of the New Jersey population aged 55 and over. The study sought to comprehend the actual and perceived walking patterns, needs, and barriers of older adults in three different types of New Jersey neighborhoods and assess various aspects of health, well-being, and activity in older adults (New Jersey Bicycle and Pedestrian Resource Center, 2018a; New Jersey Bicycle and Pedestrian Resource Center, 2018b).

The study consisted of a randomized mail survey sent to older adults in specific New Jersey neighborhoods (2018a) and focus groups that supported the findings of the survey (2018b). The focus groups facilitated a conversation among seniors about walking with the intent of eliciting deeper insights into their unique walking experiences. Additionally, the focus groups aimed to collect a diverse set of views on a given topic and encourage participants to discuss the issues that they value. Focus groups can help researchers identify alternative priorities of the participants, some of which the investigators may not have considered to be vital to the topic.

1.2   Purpose of Literature Review and Survey

The purpose of this report is to tie in the capability approach as a framework into the behaviors of older adults, related to walking and crime. Prior literature on this topic describes these relationships in several ways. Capability approach literature describes specific functionings and capabilities that relate to transportation, mobility, and accessibility.

This literature review and survey aims to gain a clear understanding of the capability approach in order to better generate forthcoming research on the capabilities and functionings of older adults with respect to their walking habits. Walking for transportation, exercise, and recreation offer individual health benefits, and researchers intend to use the capability approach's methodologies to make recommendations to transportation agencies and other planning bodies on the behalf of older adults. The literature review below helps inform appropriate research questions for the survey and methodologies that can elicit meaningful information from participating subjects.

The capability approach specifically focuses on individual values and qualitative data, so collecting data via surveys is an appropriate methodology under the capability approach. The research team developed a survey to elicit information from individual older adults to understand their values and priorities when it comes to their walking behavior. The survey also aims to identify participants' perceived barriers to walking more, be they the lack of suitable infrastructure, personal health, lack of appropriate walkable routes, lack of attractive destinations, or other reasons.

This literature review will summarize multiple case studies which apply the capability approach in relevant topic areas. The summary intends to clarify the framework's purposes, methodologies, strengths, and weaknesses for the purposes of active transportation policy. Case studies range from examinations of infrastructure investments as changes to capability in cities to analyses of older adults and the concept of "aging well." This research project attempts to approach capability and its theoretical framework as a means of understanding the behavior of older adults with regards to their perceptions of safety from crime while walking. In addition, the appendices include a more in-depth literature review of the theoretical underpinnings of the capability approach outside of any specific or relevant case studies.

2.   Literature Review of Relevant Topics under the Capability Approach

Prior to any theoretical discussions of capability, it is important to bear in mind that justice is the primary goal of this research project and the theories it describes and to which it responds. There are many different approaches to how one may conceptualize justice, but Pereira & Banister (2017, p. 171) define it clearly to be a broad moral and political ideal relating to:

- The equitable distribution of benefits and burdens in society, also known as distributive justice,
- The fairness of the processes and procedures which make decisions and otherwise distribute benefits and burdens, also known as procedural justice, and
- The specific rights and entitlements which are to be recognized and enforced.

Justice varies depending on a given person's political and philosophical leanings. Pereira & Banister (2017, p. 172) summarize justice based on the above definition for various key theories of justice, including utilitarianism,

Table 1. Summary of key theories of justice.

Theories of justice	Distribution of what?	Guiding principle of distribution	The fairest distribution pattern	Key authors
Utilitarianism	Welfare, well-being, unity	The greatest good for the greatest number	Whichever distribution that maximizes aggregate welfare	Jeremy Bentham and John Stuart Mill
Libertarianism	Basic rights and liberties	Self-ownership	Absolute equality	Robert Nozick
Intuitionism	Different "whats," for example, resources, (food, money, etc.), services (health, education, etc.)	Particular distributive principles be applied to particular cases (rights, deserts, needs, expectations, procedural justice, etc.)	No clear distribution pattern	Brian Barry and David Miller
Rawl's Egalitarianism	Basic liberties	First principle (deontological justification)	Equal distribution	John Rawls
	Opportunities	Fair equality of opportunity as pure procedural justice	Equal distribution	
	Primary goods (rights and prerogatives of authority, income, and wealth)	Difference Principle	Maximin criterion: The distribution that maximizes, subject to constraints, the prospects of the least advantaged groups	
Capabilities Approach	Opportunities	Human dignity and equal respect	Equal distribution	Amartya Sen and Martha Nussbaum
	Central/basic capabilities		All should get above a minimum basic level	

Table 1. Summary table of key theories of justice, from (Pereira & Banister, 2017, p. 172)

libertarianism, intuitionism, Rawl's egalitarianism, and the capabilities approach, reproduced in Table 1 below. These ideas of justice vary in what specific things or qualities they aim to distribute; some, for example, aim to distribute goods or other concrete resources, while others aim to distribute less concrete qualities of life, such as well-being, rights, liberties, or opportunities.

Amartya Sen is a major voice and capability approach literature who, according to Robeyns (2005), criticizes utilitarianism. Sen suggests the capability approach as an alternative theory of justice. She argues, although happiness can be one of the evaluative dimensions, it should not be the only one. Similarly with income, Robeyns explains, "while income generally is an important means to well-being and freedom, it can only serve as a rough proxy for what intrinsically matters, namely people's capabilities" (p. 97).

Sen also criticizes Rawls for suggesting that interpersonal comparison should be made of primary goods because primary goods are means rather than being intrinsic ends. Robeyns (2005) paraphrasing Sen on Rawls' egalitarianism says, "If all persons were the same, then an index of primary goods would yield similar freedoms for all; but given human diversity, the comparisons in the space of social primary goods will fail to take note that different people need different amounts and different kinds of goods to reach the same levels of well-being or advantage" (p. 97). To this point, the focus of the capability approach should be on the ends rather than the means.

The capability approach is "generally understood as a conceptual framework for a range of evaluative exercises, including most prominently the following:

- the assessment of individual levels of achieved wellbeing and wellbeing freedom;
- the evaluation and assessment of social arrangements or institutions; and
- the design of policies and other forms of social change in society." (Robeyns, 2017, pp. 23-24)

This approach is, first and foremost, a framework to work towards justice in society, based on the equitable distribution of opportunities and capabilities (Pereira & Banister, 2017, p. 172). It is guided by the principles of human dignity and equal respect, in the sense that justice is achieved through governments' and society's realization thereof. Foundationally, society achieves justice under the capability approach by distributing opportunities equally and such that all members of society have above a minimum level of opportunities available to them.

For a more robust technical explanation of the theory and components of the capability approach, refer to the additi

2.1 Providing Transportation Options under the Capability Approach

Transportation has a clear connection to the capability approach. In the most basic sense, a location's accessibility reflects the capability of arriving there from a set of other locations. In the prescriptive interpretation of functionings under Nussbaum, accessibility aligns with integrity. Hananel & Berechman (2016) refer to Nussbaum's important functioning of integrity because it includes "being able to move freely and safely from place to place" (p. 80). Transportation is appropriately framed by the capability approach because of how it values not just outputs, such as goods and income, but moreso the needs and preferences of individuals.

Pereira & Banister (2017) contend that Sen raises an issue with distribution of resources or primary goods as an appropriate means of measuring well-being. They argue this is the case "because goods, services, or

income are not ends in themselves, but merely means to valued ends. Most of the time, a car or a bicycle is not something we value for its own sake, but only to the extent it helps us achieve our aspirations in symbolic, aesthetic, or practical terms." (p. 176)

In the same vein, disabilities including basic reductions in mobility that are common as people get older prove the inconsistency of income or direct distribution of goods as a means to success or improvements of well-being. Sen (1999b) says that an older person or a person with disability can be more disadvantaged even with a larger bundle of commodities. Intuitively, one can agree with Sen on his claim that not everyone's needs are the same and no lump sum of financial assistance is singularly appropriate to efficiently satisfy everyone's needs or even, at a smaller scale, everyone with similar characteristics.

When discussing transportation, the needs of older adults interact dynamically with their capabilities, and values. People with mobility disabilities have different needs, of course, in that they may need additional resources to achieve the transportation tasks they desire. Furthermore, the ability for certain individuals to walk a distance are impossible to quantify beyond the scale of a single individual; some individuals may be able to walk or travel in a wheelchair for a considerable distance, but any stairs make a trip prohibitively difficult. In a different sense, the capability approach also considers what an individual values, which in transportation may refer to what subset of destinations an individual decides to visit.

The needs of older adults go beyond simply getting to work or other income-producing destinations. The set of destinations for any person can include workplaces, shops to purchase necessities or other goods, schools for their or their children's education, and recreational spots. The capability approach suggests that all of these destinations and more should be made available to all people since they might deem them necessary destinations under their individual notions of value.

Persons with disabilities are also entitled to the quite enjoyment of the same set of destinations under the capability approach. Similarly, the Americans with Disabilities Act of 1990 makes a similar declaration, though outside the language and scope of the capability approach. Basta (2016) gives an example of older adults deprived of visiting parks despite parks being in vicinity when there is no one to take them there. It shows that just giving the park to a neighborhood is not enough. The park itself can be adapted for use by older adults in the public domain, but older adults may still need additional assistance from someone. The capability approach requires "synergies with other sectors of public policy and the related social services." (Basta, 2016, p. 204)

In direct reference to transportation, capabilities are the expected opportunities for travel and activities (i.e. one's wishes and expectations), and functionings are one's actual travel and activities (Cao & Hickman, 2019a). Hickman, et al, (2017) conflates capabilities with access and actual travel to functionings. They employ the methodology of the capability approach to evaluate aspects of accessibility in transportation network improvements. Specifically, in Cao & Hickman (2019b) they use the capabilities approach to examine the effect of the Jubilee Line Extension in London. Their work examines people's opportunities to travel and their actual travel to participate in actual activities. The work understands that barriers to accessibility are important, further suggesting the need for accessibility planning. In transportation, actual activity participation aligns with the capability approach's definition of functioning, whereas having the capability to participate is capability (Cao & Hickman, 2019b).

Cao & Hickman (2019a) similarly uses the capability approach to explore differences in capabilities and functionings in relation to a component of the transit system in Beijing. The results show that capabilities and

functionings differ based on individual socioeconomic characteristics and geographic location, indicating that both activities and participation in activities differ. They conclude that their case study shows females to have higher capability and functioning for several indicators, including grocery shopping, visiting friends and family, training and education, cultural activities, and leisure and recreation. Furthermore, in this case study, there is no gender difference regarding employment.

These case studies examine the capability approach as it applies to transportation. At the same time, the inherent structural multifaceted nature of the capability approach make difficult the analysis of results and interpretation of such analysis. Pereira & Banister (2017) concedes, "it is not always possible to tease out how much inequality in travel behavior arises from individuals' tastes and preferences (voluntary choice) and from contextual constraints outside individual control." (p. 177). They are correct, of course, that any attempt to measure and understand the full breadth of human behavior may be fraught in a large scale. For example, longer commutes may be because of inability to pay high cost of housing, but this does not suggest a preference for a longer commutes in these individuals. In other words, a focus on observed behavior overlooks unfulfilled needs.

Justice is usually not considered in transportation decision-making, and the capability approach is an alternative to utilitarianism (Hananel & Berechman, 2016). "The capabilities approach focuses on human capabilities as the relevant subject of justice principles" (p. 79). Most of the 20th century transport investment decisions were based on markets (demand and supply) and cost-benefit analysis. But things changed from the 1970s. Since then the three justice concerns have been affordability, accessibility, and personal/group mobility. Lack of affordability is defined in terms of money and travel time. Lack of accessibility prevents people from participating in activities. Personal and group mobility includes concerns related to age, race, ethnicity, health, and gender.

Within the broader topic of transportation justice and the discussion of capability, there is also the topic of accessibility in the alternative sense of the word. Pereira & Banister (2017) state, "from a justice perspective, accessibility can usefully be conceptualized as the ease with which persons can reach places and opportunities from a given location and be understood as the outcome of the interplay of characteristics of individuals, the transport system, and land use" (p. 177). Furthermore, they late argue against the conventional attributable conceptualization of accessibility as a quality of a place. They say that "because the capability approach is fundamentally concerned about individual freedom of choice and human agency, this approach requires that accessibility be understood as an attribute of individuals in their interaction with their environment, taking into account how personal characteristics (such as gender, age, social class, disabilities, and time budget) shape interpersonal differences in accessibility levels" (p. 183).

Hananel and Berechman (2016) explore travel behavior under the capability approach framework in Seattle, Washington in the United States. The document a explains that "the goal of transportation is mobility that connects people with opportunities, whether it is to school, work or play. The ability to safely and efficiency travel in King County is critical for creating an environment for people to thrive" (p. 83). Then it talks about public transit being subsidized for people with low income. Says many people live in the suburbs because they cannot afford to live in Seattle (they have been pushed out). The authors recommend identifying capabilities for these people and providing transportation so that their full potential is realized. They conclude by saying that people are watching King County for their next steps. They say that transportation has been concerned with what people use rather than what people need. They add that it is not enough to ask how to allocate resources. Rather on should ask how people's welfare will improve with transportation investment.

Beyazit (2011) uses the capability approach to highlight which areas of transport that need to be studied and

suggests a methodology to engage the capability approach in existing methods. It first suggests the capability approach as a method to identify gaps in social justice and then suggests it as an evaluation methodology to be implemented with other methods such as cost-benefit analysis. Di Ciommo & Shiftan (2017) review studies on transport equity, where two studies involving capability approach have been discussed. It talks about setting accessibility thresholds, etc. The two capability approach studies are (Pereira & Banister, 2017) and (Nahmias-Biran & Shiftan, 2020).

Nahmias-Biran & Shiftan (2020) used data obtained from a Tel Aviv activity-based model. Then they conducted a scenario analysis after making assumptions about "rich" and "poor." They suggest that the capability approach can examine employment capability, gender differences, and route choice. Hickman, Cao, Lira, Fillone, & Biona (2017) examine differences in access and travel based on gender, age, income, neighborhood travel mode, travel cost, health, physical and mental integrity, senses, imagination, and thoughts. They suggest that the capability approach is an appropriate framework to better understand social equity.

Smith, Hirsch, & Davis (2012) use the capability approach to assess transportation needs and costs of rural inhabitants by comparing them to urban inhabitants. It is part of a larger English study to figure out Minimum Income Standard (MIS) for rural people. The research says travel disadvantage can be measured by either accessibility or capability. This should be noted because Cao & Hickman (2019a), mentioned earlier, said accessibility is a measure of capability despite not being a perfect measure. However, Smith, et al. (2012) go on to say that accessibility and capability are interdependent. Their work also talks about basic minimum standard of accessibility.

Instead of setting transportation standard, Rural MIS sets income standards. Rural MIS first focuses on the capability to access opportunities and services and determines costs involved/required for transportation. According to their results, capability is determined by income required for a car, environmental accessibility, and personal characteristics (age and household composition). A problem in this kind of approaches is the difficulty in appropriately estimating how much a person should travel. If a surveyor were to ask the subjects, they would overstate. If you look at actual travel; however, that data is already based on environmental and personal factors, which brings back the issue of data being immeasurably impacted by the very issues the research attempts to quantify.

2.2 Self-Evaluation Based on Individual Values

A major facet of the capability approach is the necessary focus on individuals' preferences and the ability to pursue the capabilities they value to form their set of functionings. Within this concept lies the assumption that self-evaluation is a mandatory component of capability approach frameworks. Pereira and Banister (2017) note, "the capacity of each person to convert a particular resource into pursued ends depends heavily on his or her social context, preferences, skills, etc. Hence, what matters from the moral point of view is not so much the distribution of resources, but people's capacities to convert such resources into a good life made up of "functionings" (practices) according to their own preferences." (Distributive justice and equity in transportation, p. 176). Trani, Bakhshi, Bellanca, Biggeri, & Marchetta (2011) corroborate this notion. Their research discusses individual singularity in the capability approach. Disabled people need varying amounts of capability inputs—namely, policies, resources, infrastructure, and social changes.

Robeyns (2005) also agrees, suggesting that just because two individuals may, in a hypothetical example, have identical capability sets, their different choices and values will result in different achieved functionings. The achieved functionings may even be vastly different. She continues, "as a liberal philosophical framework, the

capability approach respects people's different ideas of the good life, and this is why in principle capability, and not achieved functioning, is the appropriate political goal" (p. 101). In other words, accessibility can mean different things to different people. Robeyns (2017) says Nussbaum was mainly responsible for this idea, also known as ethical individualism or normative individualism, within the capability approach. In defining normative individualism, she says it "postulates that individual persons, and only individual persons are the units of ultimate moral concern" (p. 57). In other words, when evaluating different social arrangements, the analysis is only interested in their direct or indirect effects on individuals.

2.3   Needs of Older Adults for Successful Aging

Stephens, Breheny, & Mansvelt (2015) conducted a study in New Zealand which attempted to apply the capability approach framework to address questions of disability and aging, specifically in older adults. Critics note that the study begins with "homogenizing" older adults and neglecting their realities. It is a capability approach study involving 145 older adults who were interviewed regarding their functionings. The six functionings in the methodology were physical comfort, social integration, contribution, security, autonomy, and enjoyment. The concept of healthy aging is introduced with reference to a World Health Organization report (Active Ageing : A Policy Framework, 2002).

Stephens, Breheny, & Mansvelt (2015) discuss successful aging. Age intersects with inequalities involving economic status, gender, and ethnicity (p. 716). Older people define their identity based on dominant discourse, that being that "older people living in restricted material circumstances and with poor health may be excluded from participating in society" (p. 716). The results showed that older people who do well believe they are better off because of their own merit whereas older people who do not do well blame their circumstances to personal failures.

It suggests resilience as an alternative to healthy aging and successful aging. It frames resilience within the capability approach, which involves asking questions to older people themselves. Their analysis suggests that the exclusion of older adults was not solely based on physical limitations. Instead, many were compelled to make choices that excluded them, including, for example, choices "between social integration and healthy diets" while others were simply excluded by lack of resources or transportation (Stephens, Breheny, & Mansvelt, 2015, p. 728)

According to Sen, the capability approach is concerned about an individual's own values. Thus it focuses on an older adult's capability to function in a way that is valued by the person herself. With that, the New Zealand case study sets out to understand how older adults value their own capability to achieve valued functionings. The interview participants were given leeway to discuss what they wanted to discuss. Some of the relevant observations from the interviews:

- People perceived they have more autonomy/freedom if they have money. Several participants said that, to be happy in life, you have to have enough money. Money is not everything, but if you don't have it, it limits you, it restricts your freedom.
- Loss of transport is also viewed as a serious restriction to autonomy.
- Health is seen as a big factor affecting freedom and (social and physical) activity participation (e.g., computer use).
- The study found that financial security is a highly valued functioning.

Adapted from (Stephens, Breheny, & Mansvelt, 2015).

Ryan, Wretstrand, & Schmidt (2015) completed research about young older adults in Stockholm, Sweden. It considers the perception of the ability to use public transit as the "capability" element and the actual use/non-use of public transit as the "functioning" element. They use the terms "mobility capability" and "mobility functioning." The idea is to connect mobility resources to mobility capability to mobility functioning, but only in the context of public transportation. The basic idea is to relate resources to functioning through the pathway of capability.

2.4   Conclusion

The capability approach has the potential to better understand the needs of older adults to allow them to walk more, be it for transportation, exercise, or recreation. The approach is good for qualitative data collection and analysis to identify patterns and for researchers to extrapolate based on the lessons learned. The capability approach can allow transportation researchers, planners, and engineers a better understanding of previously unforeseen barriers to walking. The qualitative investigations under the capability approach may identify physical barriers or other reasons, including resource-based and value-based reasons that older adults are opting not to walk.

The capability approach can give researchers the opportunity to quantify the perceived value of walking for older adults. New investigations under this framework may identify what can lead to increased walking for transportation or other purposes. Further research can help clarify the specific perspective of older adults when it comes to the positives and negatives of walking. Alternative research can identify how current conditions of the built environment—including transportation infrastructure, land use, and the provision of senior-friendly facility—can increase the value of walking for transportation and recreation.

Increasing walking in older adults has health and social benefits for individuals, and it reduces healthcare costs and other externalities on society. Allowing older adults an easy and accessible alternative to driving can also reduce traffic crashes. Older adults are among the highest risk of drivers to be involved in vehicle crashes, along with young drivers, so providing an easy way to avoid unnecessary driving for these groups reduces the likelihood of traffic crashes. Supporting a mode shift away from motor vehicles can safe transportation departments in the long-term due to less intense wear and tear of transportation facilities by heavy vehicles. Pedestrian infrastructure is also less expensive to design, construct, and maintain than vehicle travel lanes.

The capability approach provides researchers with a framework and a set of tools that can help demystify the intentions and values of individuals to help individuals willingly choose walking. Researchers can apply the capability approach with the intention to discover previously unforeseen misunderstandings of older adults' values and priorities, and with a clearer understanding, transportation facilities can better serve their interests and needs.

3.   Survey Implementation

The next round of surveys will be an intercept survey aimed at gaining a deeper understanding the capabilities and functionings of older adults in three separate communities in the state of New Jersey. The three communities are Newark, Edison, and Franklin Township. The three provide a representative sample of three types of built environments in the state. Together they will clarify both similarities in the capabilities and functionings of older adults across all three types of communities while also providing a point of contrast between residents in each community.

Implementation will consist of students conducting intercept surveys in locations where older adults are likely to be encountered. Locations would primarily consist of on-street locations in the selected communities. Additionally, locations can also include senior and community centers who are willing to cooperate.

3.1   Selected Communities

3.1.1 Newark, Essex County, New Jersey

The City of Newark, New Jersey is the largest city in the state, with a 2020 census population of 311,549. Newark was selected for intercept surveys because it is the largest and one of the most urban municipalities in the state of New Jersey. The City of Newark has a sufficient population of older adults, and it is the densest of the three selected communities. Newark is a transit hub with a variety of uses including a major central business district and dense residential areas. Transit facilities include a comprehensive bus network oriented around two of the largest NJ Transit rail hubs: Newark-Broad Street and Newark Penn Station. The Newark Light Rail serves various areas including the central business district, over two lines.

Older adults residing in Newark experience an urban pedestrian environment, including wide urban roads with congestion, urban freeways and on-ramps, and truck and bus traffic. Wide and busy roads can present an access and safety issue and can influence perceptions of safety. Additional barriers can include curb cut issues and walk-up apartment buildings. Intercept surveys may indicate the specific capabilities and functionings of older adults in an urban environment.

3.1.2 Edison, Middlesex County, New Jersey

The Township of Edison in Middlesex, New Jersey has a population of 107,588 according to the 2020 Census. Edison is majorly suburban with large residential areas and commercial centers with large parking lots. Edison has a NJ Transit rail station and a few suburban bus lines connecting to other Middlesex County transportation facilities. Edison has multiple senior and assisted living communities oriented towards older adults.

Older adults in Edison will have a suburban perspective that intercept surveys could clarify in terms of walking behavior. Survey responses will help to understand the impacts of the suburban built environment on attitudes towards walking, especially in older adults, some of whom may have mobility issues that affect how, where, and when they decide to walk, if at all.

3.1.3 Franklin Township, Somerset County, New Jersey

The Township of Franklin in Somerset County, New Jersey has a 2021 estimated population of 68,431. Franklin is the most rural of the three selected communities, with large portions of the township being zoned and dedicated to farmland. Much of the residential development of Franklin Township exists as parts of denser residential subdevelopments. Included in these subdevelopments are large senior residential communities, which makes Franklin Township a unique rural-suburban place to solicit responses from older adults via intercept surveys.

Older adults in Franklin Township will experience some of the specific effects of senior living and rural land use which may impact walking for transportation and recreation. Intercept surveys can provide insight into the capabilities and functionings of older adults living in these separated communities, which is increasingly common for older adults.

Appendices

Appendix A: Review of Theoretical Literature on the Capability Approach

The capability approach is a theory which focuses on framing the well-being of individuals based on their ability to live life in a way which allows them to be fulfilled. This approach is informed primarily on literature led by Amartya Sen and Martha Nussbaum, who originated it, as well as other academics who offer responses, critiques, and expansions to it.

A.1 Understanding Capabilities and Functionings

The capability approach focuses on the distribution of opportunities and capabilities to all members of society. Unlike other theories of justice which aim to directly distribute tangible resources such as goods and services, or intangible qualities of life such as freedoms or rights, the capability approach focuses on the distribution of opportunities and central capabilities. In this sense, the capability approach stands apart from other theories of justice in that it acknowledges the essential fact that individuals make different choices based on different preferences; thus, it is ideal to distribute opportunities equally and let people choose to take advantage of the subset of opportunities that they prefer.

Hananel and Berechman (2016) say that the capability approach combines freedom, welfare, and equity. Justice under the capability approach aims to enable each individual to live their life in the way that suits them personally. Essentially, the capability approach asks, "What are people really able to do and what kind of person are they able to be? It asks what people can do and be (their capabilities) and what they are actually achieving in terms of beings and doings (their functionings)" (Robeyns, 2017, p. 9).

This approach makes an important distinction between the opportunities afforded to a given individual and the smaller subset of actions that the individual chooses to take. The capability approach defines these, respectively as capabilities and functionings. Robeyns (2005) explains that the distinction between functionings and capabilities is that functionings are realized—acted upon—whereas a capability is effectively possible. It is essential under this framework to distinguish these two concepts because both have valuable indications to the quality of society and its individuals. Oosterlaken (2009) explains, "One of the crucial insights of the capability approach is that the conversion of goods and services into functionings is influenced by personal, social, and environmental conversion factors; and that it should not be taken for granted that resource provision leads to increased capabilities or functionings" (p. 92). Figure 1 below shows a diagram of the interaction of various factors, including social context, personal preferences, and resources in the realization of achieved functionings.

Governments, as an acting force on individuals' well-being within a society, have a tremendous impact on the environment in which people use goods and services. Within the framework of the capability approach, a person's environment "[enhances] or [restricts] the set of opportunities that are available for [them] to choose. [The capability approach] takes into account not only the diversity of individuals' characteristics (e.g.
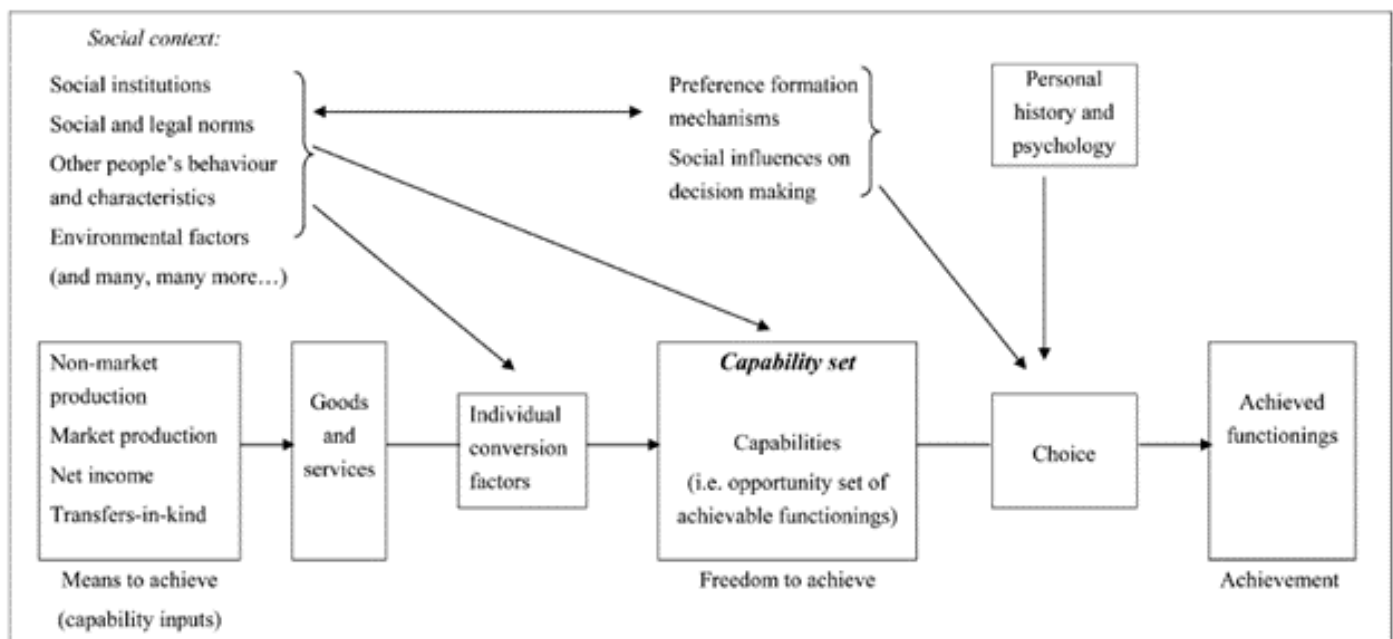
Figure 1. A stlized non-dynamic representation of a person's capability set and her social and personal context, from (Robeyns, 2005, p. 98)

preferences, values, needs, and abilities), but also the societal structures and constraints affecting individuals' capacities to convert resources and opportunities into functionings" (Nussbaum, 2011; Robeyns, 2005 in Pereira & Banister, 2017, p. 176).

Other authors define capabilities and functionings in slightly different ways which marginally change the understanding of the terms; however, the framework of the capability approach maintains the integrity of its structure across all definitions. Functionings essentially describe the qualities and actions that people can be, do, and achieve within the context of their health, resources, and environment, whereas capabilities are the set of practical opportunities people have available to them to choose from (Beyazit, 2011; Trani, Bakhshi, Bellanca, Biggeri, & Marchetta, 2011; Dubois & Trani, 2009). Robeyns (2000) goes on to say that capability is closely related to the idea of opportunity or advantage, but that Sen warns that they are not quite the same because capabilities are about freedom, which has a broader definition than opportunity.

Hananel and Berechman (2016) define functionings as compilation of goods and services a person would like to consume or undertake. As a contrast to Robeyns (2005) and Ryan, Wretstrand, & Schmidt (2015), they do not say the person has to consume or undertake. On the other hand, capabilities represent "actual combination of functions that the person can accomplish." In such a global definition of capabilities and functionings, the functionings are no longer a subset of capabilities but rather the full set of actions, goods, and services that an individual wants to have available to them, whereas their set of capabilities are the subset that they realistically have access to. Ultimately, the cross-section of the capabilities and functionings an individual identifies would be the choice opportunities of which they take advantage.

According to (Nahmias-Biran & Shiftan, 2020), the capability approach is about individuals' capability to achieve the outcomes they value. Capabilities are freedoms to take real opportunities, and capacity depends on actual capability. A person is to use conversion factors to transform resources to valuable functioning. Nussbaum developed the concept of "basic capability" that is needed to lead a minimally decent life. Robeyns (2017) agrees and gives an example:

"Capabilities are a person's real freedoms or opportunities to achieve functionings. Thus, while travelling is a functioning, the real opportunity to travel is the corresponding capability. A person who does not travel may or may not be free and able to travel; the notion of capability seeks to capture precisely the fact of whether the person could travel if she wanted to." (Robeyns, 2017, p. 39)

Robeyns (2000) equates capability to a commodity to present an example of the use of a bicycle. She says we want a bike because it has use; it can take us to places faster than walking. Thus, she says, the characteristics of the bike leads to functionings (using the bike). "…the bike enables the functioning to be mobile, to move oneself freely and more rapidly than walking by foot" (p. 5). She goes on to say that the conversion of the commodity to achieve "being and doing" requires two conversion factors. The first conversion factor pertains to personal characteristics. For example, a person with specific mobility-related disabilities cannot use the bike. The second conversion factor pertains to social characteristics. Her examples of social characteristics include discrimination, infrastructure, public policies, etc. Regarding her bike example, she mentions that people cannot bike if there are no roads or if laws prohibit, for example, women to bike without the accompaniment of a male family member. Robeyns (2000) continues, "knowing the goods a person owns or can use is not enough to know which functionings she can achieve; therefore we need to know much more about the person and the circumstances in which she is living" (Robeyns, 2000, pp. 5-6).

With the various nuanced definitions of capabilities and functionings, it is important to understand that the distinctions between capabilities, as in itemized or otherwise specific functionings within a set, and the broader concept of capability. Gasper (2007) discusses the confusion: "Capability is the full set of attainable alternative lives that face a person…" whereas "'Capabilities'… conveys a more concrete focus on specific attainable functionings in a life…"

An essential component of the capability approach is the notion that each person should have the opportunity to choose the actions and qualities that align with the preferences which support their happiness. The framework asserts that justice requires all individuals the freedom to choose the functionings that they prefer. As an extension of the freedoms provided by a just distribution of capabilities, Oosterlaken (2009) briefly discusses agency freedom and wellbeing freedom under the capability approach. Wellbeing freedom is the freedom to benefit oneself towards the pursuit of one's own personal betterment. Agency freedom acknowledges that individuals "may also choose to pursue other ends..." beyond their own well-being, such as "for example, the well-being of others, living up to religions ideals, or following moral norms" (p. 92).

The measurement of capabilities under the capability approach is a means to identify a methodology for determining well-being. The framework accepts that individuals should have the capabilities to pursue their own well-being and happiness. Sen (1985) said happiness is of direct relevance to well-being, but it is inadequate as a sole measure of well-being. (Gasper, 2007, p. 342). Happiness is subjective and difficult to define under a specific and universal set of functionings, but that does not make it impossible to evaluate. Sen argues, therefore, that it is a helpful metric, when taken in consideration of other measurements, to quantify well-being.

A.2   Analyzing the Factors and Subcomponents of the Capability Approach

The central goals of applying the capability approach as have been established in the first section of this research are well-being and justice. Within the framework of the capability approach, such goals and their properties "are regarded in a comprehensive and integrated manner, and much attention is paid to the links between material, mental and social well-being, or to the economic, social, political and cultural dimensions

of life." (Robeyns, 2005, p. 96). The capability approach acts as a theoretical basis of a concept of justice parallel to Rawl's egalitarianism and libertarianism (Pereira & Banister, 2017, p. 172). This section addressing competing arguments for and against formalization of the subcomponents of the theory.

> *"Basic capabilities are a subset of all capabilities; they refer to the freedom to do some basic things" (Robeyns, 2000, p. 7).*

Amartya Sen and Martha Nussbaum—the two major developers of the capability approach—disagree in how formal or standardized the framework should be in an off-the-shelf sense. Nussbaum (2007) established a specific list of central capabilities which she argues are essential to human well-being and akin to human rights. While Nussbaum comes up with a well-defined list of important capabilities, Sen refuses to endorse one well-defined list of capabilities (Oosterlaken, 2009, p. 93). Sen disagrees with a formalization of capabilities in such specific terms, arguing that capabilities should be defined and established through reasoning (Robeyns, 2000).

Robeyns (2000) sees problem with selecting capabilities based on an "act of reasoning". She says such exercises could be biased, depending on the person selecting the capabilities, and standardizing functionings is difficult because people experience varying circumstances. Furthermore, since the central goal of the capability approach is justice, it is a tenuous notion to consider current decisionmakers as the best people to understand and reason a set of capabilities that benefits those who are currently disadvantaged or subject to bias. In a male-dominated society, for example, reasoning may adversely affect women.

It is important to note that while it appears that Nussbaum and Sen may have been diametrically opposed on this issue, Nussbaum and Sen have different goals in the application of the capability approach. Nussbaum wants "a central list of capabilities" to be guaranteed by each constitution. Sen's contributions started in development economics in the 1980s and his focus was on poverty and destitution. Robeyns remarks, "Sen's work on the capability approach is closer to economic reasoning than Nussbaum's and is more attuned to quantitative empirical applications and measurement " (p. 104). Sen's work is more closely associated with formal economics and measurement. He essentially suggested capabilities because of his dissatisfaction with utility and Rawlsian resources or primary goods, and their notion corresponds with aspects of social choice theory.

Robeyns (2005) continues, "Nussbaum's work, on the other hand, is much closer to traditions in the humanities, such as narrative approaches." Her work engages different literary and poetic texts to understand people's motivations and decision-making, including their hopes, desires, and aspirations. Categorically, her approach and Sen's approach make sense to differ in how they argue for the analysis of the capability approach. She further asserts, "Nussbaum's notion of capability pays more attention to people's skills and personality traits as aspects of capabilities." (p. 104)

Capability from Nussbaum's perspective treats personality traits and personal skills as aspects of capabilities, and Robeyns (2005) outlines how she described various categories of capabilities based on their level of innateness:

- Basic capabilities, as in abilities that are fully innate to humans, generally speaking
- Internal capabilities, states of a person allowing them to exercise a specific capability
- Combined capabilities (internal capabilities combined with external provisions so that the person can exercise the capability)

Among all capabilities, Nussbaum specifies a number of capabilities which she considers to be most important. Hananel & Berechman (2016) describe Nussbaum's ten "most important" capabilities with brief descriptions, as outlined in Frontiers of Justice (Nussbaum, 2006):

- Life – Being able to live to the end of the normal length of human life.
- Health – Being able to have good health, including reproductive powers, nutrition and shelter.
- Integrity – Being able to move freely from place to place; to be secured from violence.
- Senses, Imagination, and Thought – Being able to use one's senses, to imagine, think, and reason, and to do so in a 'truly human' way.
- Emotions – Being able to maintain attachments to things and people outside oneself.
- Political Reason – Being able to form a conception of the good and to engage in critical reflection regarding the planning of one's life.
- Affiliation –
  ○ Being able to live with others and to engage in various forms of social interactions.
  ○ Enjoying the social foundations of self-respect and non-humiliation.
- Other Species – Being able to live with concern for and in relation to animals, plants, and the world of nature.
- Play – Being able to laugh, to play, to enjoy recreational activities.
- Control over One's Environment –
  ○ Political Control – Being able to participate effectively in political choices that govern one's life; having the right of political participation together with the protections of free speech and association
  ○ Material Control – Being able to hold property and have property rights on an equal basis with others; having the right to seek employment on an equal basis with others.

In addition to discussing her ten most important capabilities, Nussbaum also identifies three types of conversion factors. Conversion factors consider the existing conditions that impact how an individual interacts with goods and services (Robeyns, 2005). They are the lens through which resources become applicable to the individual. This is important for the conceptual framework of the capability approach because it adds a layer which defines how the available goods, resources, and services can be transferred into choices—capabilities—that become the set of options. When discussing how the government provides services and distributes resources, conversion factors are important for equitably distributing capabilities.

Here Robeyns (2005) talks about three conversion factors that transfer goods and services to capabilities and, eventually, functionings:

- Personal conversion factors – metabolism, intelligence, skills
- Social conversion factors – social norms, public policies, discrimination, power relations
- Environmental conversion factors – geographic location, climate, roads

Personal conversion factors are perhaps the most directly related to a layperson's understanding of personal abilities. They are, essentially, those qualities of an individual which affect how they can apply resources. This would include physical abilities and stamina, such as their ability and the extent to which they can walk distances. Additionally, this includes learned and retained skills, such as the ability to drive, ride a bike, play a sport, speak one or more given languages, etc. As an extension of learned skills is the quality of one's ability to learn new skills or their ability to think critically, solve problems, or otherwise apply intelligence to new situations. It is important to note that personal conversion factors are not entirely innate; many personal conversion factors are skills that can be learned, and which a person's ability level will fluctuate over the course of their life.

Social conversion factors are those things that impact one's ability to take advantage of resources because of stigma, social norms, or other explicit or implicit rules. Manners and stigma play into this category. For example, if taking public transit has a stigma around it which associates bus riders with poverty or a lower class, many people may unnecessarily avoid the bus, even for trips where it is the best option. Public policy also has a major role in how people take advantage of resources. If, for example, walking for transportation is made less attractive because driver behavior at intersections makes being a pedestrian dangerous, more people will drive short trips they may otherwise choose to walk.

Also included under social conversion factors are various interpersonal and governmental constraints on relationships. This includes socially engrained power relations and discrimination (Robeyns, 2005). These power dynamics have major impacts on how individuals interact with the world and the resources that may technically be available to them.

The third type of conversion factors that Robeyns (2005) describes is environmental conversion factors. Environmental conversion factors are those which come from the conditions in the physical world, be they natural or the built environment. Spatial factors are a major type of environmental factor, such as geographic location and topography. Climate and weather are major factors as well. Consider how intense heat or precipitation will impact the availability of resources. Inclement weather will, for example, essentially eliminate
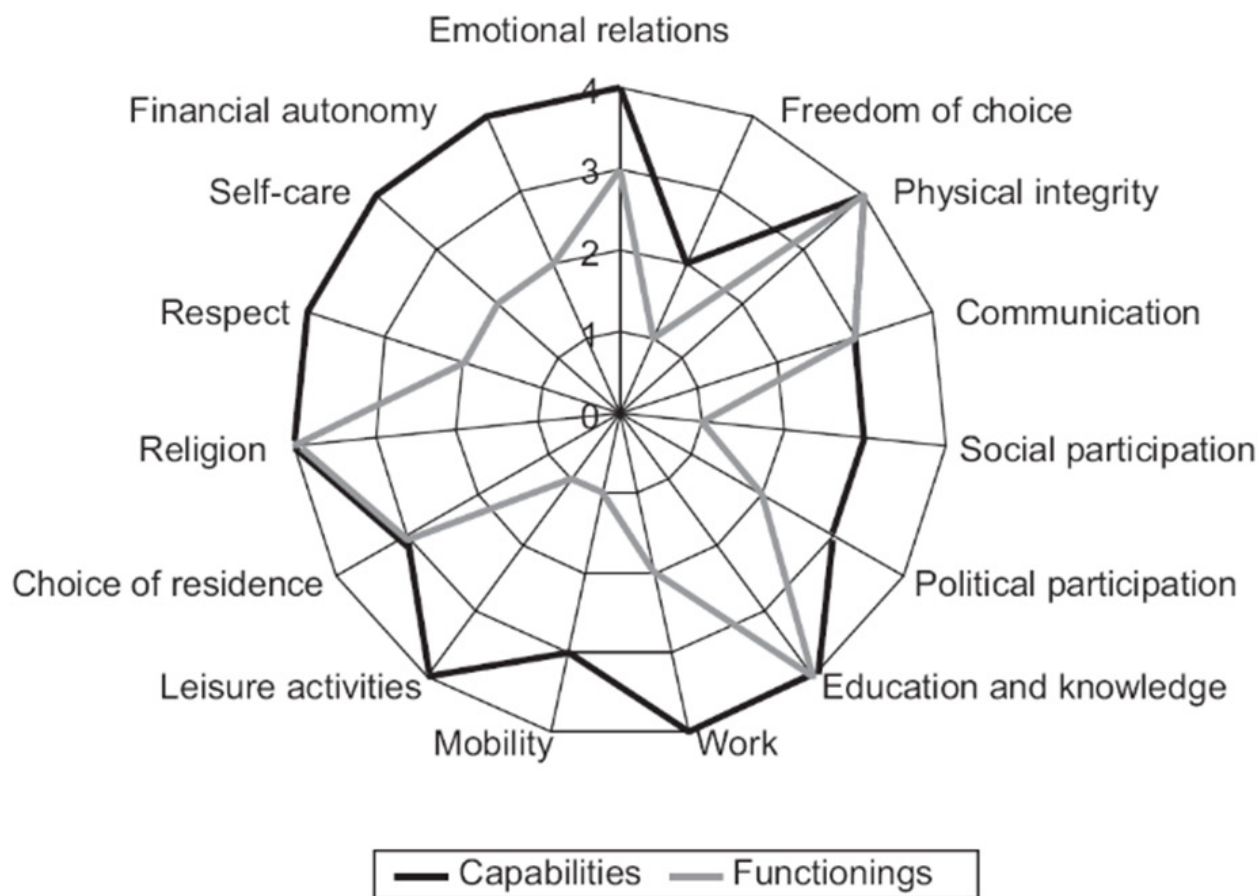
Figure 2. Illustration of the relationship for an example individual between a set of capabilities and functionings, from (Trani, Bakhshi, Bellanca, Biggeri, & Marchetta, 2011)

the capability to walk a medium to long distance.

Beyond the natural environment, environmental conversion factors also include the built environment. Roads are a major conversion factor. For example, if there is no right-of-way available to connect two places, there is little to no capability for an individual to make a trip between them. It is important to consider that all factors have interrelated importance in creating a set of available capabilities. For example, even if there is a bridge across a river, the capability of walking over the bridge is also reliant on there being a safe footpath, as well as acceptable weather conditions or protection from the elements, among other conditions.

According to Trani, et al. (2011), public policies help to convert resources and commodities to capabilities. For people with disabilities, capabilities often depend on other persons because they help to convert resources to capabilities. Capability approach outcomes are evaluated based on the expansion of the capabilities set, various combinations of functionings, and the enhancement of freedoms. Figure 2 illustrates that functionings are located within capabilities and the gap between the two is the conceptual distance between a capability and functioning. Trani, et al., asked subject individuals questions about 21 well-being indicators, as shown in the figure. Their methodology focuses on the gap between capabilities and functionings.

Whereas a functioning is sometimes defined by its value as a person attributes it, Robeyns (2017) suggests that this is a mistake (p. 43). She suggests that the specifications of the capability approach should not be too refined with unrealistic assumptions (Robeyns, 2000). Robeyns (2017) then goes on to say that capabilities and functionings should be value-neutral. While basic functionings may be uncontroversial, such as poor health, poor sanitation, lower literacy, poor nutrition, social exclusion, etc., other functionings can be contentious and therefore subject to bias from those in power. An example of a controversial functioning, according to Robeyns would be sex workers making money. She contends that formalization of the capability approach is important if it is to have any practical value (2000).

While Nussbaum and Sen may disagree on the appropriate level of predetermined analysis of the capability approach, it remains clear that the unformalized portions of the framework are what provide it with the broad range of applicability. Robeyns (2000) argues, in a similar sense, "that the 'comparative advantage' of the capability approach compared to other evaluative approaches lies in its informational richness and its possibility to account for social constraints and diversity among individuals." (p. 14)

A.3   Poverty as a Disability

> *"It is not enough to ask how to allocate or distribute available resources; the relevant question is, instead, what can one do with these resources to improve welfare of individuals, especially the disadvantaged." (Hananel & Berechman, 2016, p. 80)*

The logical extension of the capability approach is to establish a framework for addressing the needs of individuals with various types of disabilities. The purpose of this literature review is to explore the capability approach and its relation to older adults' walking behaviors. As people age, the scope of their abilities shifts in various ways. Generally, increased age comes with a diminishing ability to walk longer distances; however, walking is a common recreational activity for older adults, given its health benefits.

Under the capability approach, physical impairment is not the only disability type. Dubois and Trani (2009) broadly define disability as "a lack of capability, due to restriction in the range of opportunities available in a

given context" (p. 198). With this broad definition in mind, poverty belongs to a category of disabilities based on the restriction of economic capability. Mitra (2006) begins by saying that disability may result from three types of factors: the individual's personal characteristics (e.g., impairment, age, race, gender), the individual's resources, and the individual's environment (physical, social, economic, and political).

She continues, "functioning is the achievement of the individual, what he or she actually achieves through being and doing. Here, disability can be understood as a deprivation in terms of capabilities or functionings that results from the interaction of an individual's (a) personal characteristics (e.g., age, impairment) and (b) basket of available goods (assets, income) and (c) environment (social, economic, political, cultural)" (pp. 236-237). Poverty also ties into all three of these factors well. The historical impacts of racism, sexism, and ageism have all arguably impacted the opportunities available to individuals in contemporary society. Secondly, lack of resources is the most traditional harbinger of poverty. Finally, the physical environments that individuals are set into–be it economically depressed neighborhoods or areas without access to services–create barriers to advancement and are known to contribute significantly to persistent poverty.

Sen refers to poverty as a capability deprivation rather than insufficient income (Sen, 2009, p. 233, in (Beyazit, 2011)). The end is more important than the means to Sen such that it is not solely an insufficient income that contributes to poverty conditions, moreso poverty arises from many factors, which may include insufficient income. Beyazit quotes Sen to say that the capability approach focuses on human life rather than detached objects of convenience such as incomes and commodities. That is, it focuses on the outcome rather than the means.

Therefore, justice under the capability approach contends that the elimination of poverty must focus more on eliminating poverty and the outcomes brought on by poverty conditions. According to the capability approach, "enhancing people's capability thus becomes directly related to reducing the consequences of disability by increasing opportunities for people with disabilities and allowing them to choose among various opportunity sets" (Dubois & Trani, 2009, p. 198). This approach to justice requires more in-depth and personal understanding of the factors that contribute to any disability, including poverty, and such understanding informs the best way to overcome the disability's externalities. Dubois & Trani continue, "the fact that each individual is asked about the level of difficulty he/she experiences in functioning in the various dimensions of well-being makes it easier to assess the disabling situation in a comprehensive manner. On this basis, appropriate policies intended to enhance people's capability can be designed by referring to people's needs, values and choices."

Robeyns (2017) argues for beginning the analyses of the capability approach with the ends rather that with the means (p. 48). First, people differ in their ability to convert means to ends. Since ends are what ultimately matter, focusing on means does not tell us anything about wellbeing or quality of life. Second, there are some "vitally important" ends that do not require "material means." (p. 49) For example, friendship and a supportive environment, are important ends but require no means. The distinction between means and ends is blurry for things like literacy and health because they can be both means and ends. Being healthy allows people to achieve things that could not have been possible. Similarly, literacy can open the door for opportunities that could not have been possible without it, such as employment and earnings.

In Robeyns (2000, p. 7) she says that attention to basic capabilities is important to identify the cut-off point for deprivation or poverty. says the concept is important not only in developing countries but also in developed countries because evaluation of other things is important in such countries. She continues, "as the capability approach could best be seen as a framework of thought, the relevance of either basic capabilities or all capabilities depends on the issue at hand. But it is important to acknowledge that the capability approach is

not restricted to poverty and deprivation analysis, or development studies, but can also serve as a framework for, say, project or policy evaluations or inequality measurement in rich communities" (p. 8).

She also mentions that the term "basic capabilities" has been used differently by different people, including Nussbaum. Sen mentioned the term simply to mean capabilities, but Nussbaum used it to define innate capabilities such as the ability to hear, see, or reason. So Robeyns says she would use the term "fundamental capabilities." She says fundamental capabilities include "housing and spatial living conditions; health and physiological well-being; education and knowledge; social relations and interactions; emotional and psychological well-being; safety and bodily integrity" (Robeyns, 2000, p. 9).

Stevens, et al. (2015) conducted a survey under the framework of the capability approach to gauge people's conceptualization of autonomy and freedom. The survey avoided directly referencing the jargon of the capability approach and attempted to measure personal values. Several respondents opined that people have more autonomy/freedom if they have money and that to be happy in life, having enough money is important. While money is not everything, not having sufficient money feels limiting and restrictive.

Sen (1999b) critiqued current policy perspectives on poverty and wealth and how they are treated as a proxy for success. He argues that "the role of income and wealth. . . has to be integrated into a broader and fuller picture of success and deprivation" (p. 20). In other words, both success and deprivation can be experienced by the individual. Atkinson (2003) gives the following example: people with low income may have only low education or both low education and poor housing. One approach is to link union and intersection to the social welfare function, whereas the other approach is the counting approach that involves counting the number of dimensions in which people are deprived. A person's deprivation score is -3 if he is deprived on three dimensions, -2 if deprived on two dimensions, -1 if deprived on one dimension, and 0 otherwise.

In summary, the capability approach as a framework allows for poverty or fiscal deprivation to act as a sort of disability. Whereas many frameworks and policy perspectives treat income and/or poverty as a proxy for a level of success, this is not fully representative of the full scope of understanding. Intuition supports this. Consider that in the aggregate, policymakers and planners consider area median income and other figures as metrics for local levels of wealth, but at the same time, such a numerical figure does not tell a full story. On a regional level, the cost of living varies enough to warp one's perception of a specific median income as poor, average, or affluent. At the same time, the area median income does not fully illustrate the conditions of poverty in an area.

A.4   Avoiding Aggregate Data for Qualitative Data

The capability approach is a refutation of aggregate methodology governing societal well-being and the distribution of services and resources in the name of welfare. Such aggregate frameworks

Sen (2008) begins with a good description of the limitations of utilitarianism. For a long time, utilitarianism was akin to welfarism because there was no alternative theory or approach to judge human welfare. Sen discusses the aggregation of utilities, such that it does not care whether one has one-hundred and the other has two or each has 51. In addition, he also talks about adaptation by the underdogs to be happy under any circumstance.

Beyazit (2011) and Basta (2016) mention that the capability approach cannot be implemented with aggregate data, something Sen also found out. Sen's capability approach is a comparative approach rather than a transcendental approach. Beyazit (2011) mentions that according to Sen (Sen, 1999a), the capability approach

requires data from actual behavior, response to questionnaires, and/or non-market observation of personal status. Aggregate data cannot be used because the capability approach is about individuals. Valuation of functionings differ from person to person. Based on this, a national level analysis employing the capability approach is not feasible based on conventional assumptions.

A.5   Applicability of the Capability Approach

The question surrounding this review of the capability approach remains: How is this theoretical framework realistically applicable? This section of the literature review describes the existing literature which makes the case for when the capability approach is appropriate for us in public policy decision-making.

Robeyns (2000) approaches criticisms of the capability approach as established by Amartya Sen. She begins by saying that some of the criticisms of Sen's capability approach were based on misinterpretations. Some of the critiques are based on the reading of one or two pieces of Sen's writing, although Sen's theoretical development of the capability approach has evolved organically through many books and articles written in journals of different disciplines. Robeyns chooses to discuss the capability approach based on Sen's original writings. She continues that she wants to reconcile and demonstrate that the capability approach has practical use many disciplines.

According to Robeyns (2000), the capability approach can be interpreted in three ways: (1) As a framework of thought; (2) as a critique on other approaches to welfare evaluation; and (3) as a formula to make interpersonal comparisons of welfare (Robeyns, 2000, p. 3). Robeyns deals with only (1) and (3) because Sen has written enough on (2). She adds that Sen is least interested in (3) which suggests that without interpersonal comparison, government policies cannot be directed to anyone because government policies need mechanisms for collection and distribution.

She remarks, "The capability approach is a framework offering a way to think about normative issues and make evaluations. It provides a framework to analyze a variety of social issues, such as well-being and poverty, liberty and freedom, development, gender bias and inequalities, justice and social ethics" (Robeyns, 2000, pp. 3-4). Thus, according to Robeyns, the most important aspects of the approach's applicability are its malleability and qualitative nature—two qualities which allow the thought process to focus on the important information to make a judgment. To that same extent, the capability approach rejects other alternative approaches which it considers "normatively inadequate."

Nussbaum argues—with the support of some others, that without a list of capabilities to consider, the capability approach has little value. However, Sen has continued to maintain that capabilities should be chosen by public reasoning and democratic processes in each specific circumstance (Robeyns, 2005). In contrast, Nussbaum suggests that the capability approach starts with a list of essential capabilities and make them more specific in each circumstance. In criticizing Nussbaum, she says, "Most of Nussbaum's capabilities are at such a high level of generality that undemocratic local decision-making can lead to problematic lists" (p. 106).

When it comes to applicability of the capability approach, the question rests mostly on three critical issues which shape how the framework is applied. The three critical issues in Robeyns (2006) are: (1) choice between focusing on functionings and capabilities, (2) the selection of capabilities, and (3) the weighting of capabilities. The focus on capabilities instead of functionings comes from a liberal thinking. However, there is also an emphasis on each person making responsible decisions. Robeyns calls it responsibility-sensitive principle. On

the other hand, there is no agreement as to whether responsibility-sensitivity is an appropriate consideration.

Robeyns (2017) describes how capabilities and functionings play different roles in different types of analyses. In a Quality of Life (QOL) measurement, for example, capabilities and functionings are social indicators that reflect a person's quality of life. Whereas in descriptive analysis, capabilities and functionings form a part of a narrative about quality of life but can also be about seemingly irrational behavior. In philosophy, capabilities and functionings are often foundations for a just society. Capabilities and functionings are the dimensions by which interpersonal comparisons of well-being or "advantage" are made.

The aim of public policy should be to remove the constraints that reduce the gap between capabilities and functionings. Currently governments do not consider capabilities and functionings when applying conventional methods for implementing public policy through investment in services or infrastructure. Dubois & Trani (2009) tells how the capabilities of people with disabilities are to be assessed. They note, "achieved functionings are easily measured through cross-sectional surveys" (Dubois & Trani, 2009, p. 192), whereas Beyazit (2011) states that measuring capabilities is complex. Using cost-benefit alone may lead to outcomes with only one type of project. Alternatively, using the capability approach may lead to multiple project types with different objectives because it involves participatory processes to understand people's valuation.

A.6   Strengths and Weaknesses

"But I still think, when I make interpersonal comparisons (as, for instance, when I am deciding between claims affecting the satisfactions of two very spirited children), that my judgments are more like judgments of value than judgments of verifiable fact" (Robbins, 1938, p. 640).

This final section of the literature review evaluates the capability approach's strengths and weaknesses according to its proponents and critics. The opinions vary widely on its applicability and the strength of the analyses that such applications bring about. Essentially, the most important strengths of the capability approach surround the uniqueness of the approach's capacity to understand interpersonal comparison.

Conceptually, the capability approach is arguably simple enough, but at the same time, it is obscured by a complicated framework filled with technical jargon. Hickman & Cao comment that "the concept of capabilities is difficult to understand and may not lend itself to being measured by surveys." (2019a, p. 55) But it is perhaps not, as a concept, difficult to understand; there is arguably nothing unintuitive about the concept of a set of abilities each person has and the subset thereof which they value. Yet, in consuming the literature and attempting to make sense of all of its components, the theoretical terms and specifications bog down the aspects of humanity that should be universally intuitive.

Beyazit (2011) conducted a strengths, weakness, opportunities, and threats (SWOT) analysis to get a comprehensive understanding of the strengths, weaknesses, opportunities, and threats related to the capability approach. The analysis shows that the capability approach's two main strengths are its holistic and participatory nature. Robeyns (2000) also praises the flexibility of the framework's conversion factors, lauding the approach's ability to "account for interpersonal variations in conversion of the characteristics of the commodities into functionings. These interpersonal variations in conversion can be due to either individual or social factors" (Robeyns, 2000, p. 6). Individual characteristics, such as eyesight can be distinguishing factors between individuals. However, social characteristics can also be important. She gives many examples of such social characteristics which may apply in a given society, including race, gender, or caste.

Robeyns (2000) says the capability approach is an opportunity-based approach rather than being an outcome-based approach. Choice has a central place, and she continues, "the theory belong to the class of "opportunity-based" theories instead of "outcome-based" theories" (p. 10). Then she says it is more difficult to measure opportunity than outcome. The main reason is that functionings and outcomes are observable, but capabilities and opportunities are unobservable. Secondly, functionings are "being and doing" but capabilities are "potential being and doing." Because of these reasons, empirical work on the capability approach consists of studies on functionings instead of capabilities. Robeyns says Sen suggested "refined functioning" as a measure, where the concept also includes the reasons for an outcome. For example, the reasons for why someone is starved may vary, such as by choice during fasting or by lack of resources.

The purposes and applications of the capability approach are important to understand its value. Such an approach stems from Sen's original wish for welfare economics "to join other social and human sciences (including health sciences) in looking at objective well-being, not merely at the economic inputs to living or at subjective well-being" (Gasper, 2007, p. 339). As a measurement, subjective well-being continued to appear less sufficient for addressing factors like adaptive preferences and other framing factors. Adaptive preferences refers to one's tendency to take conditions of luxury or hardship for granted. Framing factors vary between persons and come from various life experiences during one's development, as early as from infancy. As one gets older, preferences may become more fixed, though this is not a consistent occurrence. Gasper continues, "The dissatisfaction applies therefore even for reflectively reasoningly discursively self-assessed SWB, not only for directly experienced happiness, even if less so."

The stated objective in (Gasper, 2007) is to show issues encountered in operationalization of the capability approach. The article talks about the dangers of overly vague interpretation which can result in misleading results. Sen's original motive in the 1980s was to present an alternative to the measurement of income, expenditure, and satisfaction. Gasper raises an issue with the capability approach's boundaries in that they are ambiguous.

Ultimately, what matters is objective well-being because subjective well-being includes the utilitarian outcomes such as happiness. For Sen (2008), capability means access to objective well-being despite the need for individuals to define its parameters. Objective well-being is normative, such that only a person knows what is important to him. At the end, the capability approach is about access of an individual to potential functionings they value in a sense that it positively impacts their personal definition well-being.

Beyazit (2011) suggests that the capability approach's primary weakness is that it is expensive in terms of resource and time requirement. Gasper (2007) agrees, remarking that it is difficult to operationalize Sen's conceptualization of capability, noting that "major simplifications may be required in operationalization" (p. 357). Stephens, Breheny, & Mansvelt (2015) say that their functionings should not be generalized because Sen opposes the use of a definitive set of functionings. If this prescription is followed, there can be no generalizations, and the capability remains inefficient.

An operationalization problem in the capability approach remains the inherent interdependencies of choices. Although opportunities may be available for one person, the his combination of choices reduces the choice options for person a second person (Robeyns, 2000, p. 22). Robeyns provides multiple criticisms of the capability approach, including:

- It is not a realistic alternative to the measurement of income, or cost-benefit analysis because there is so much disagreement among reasonable people about the nature of good life.

- The capability approach does not say when one person's capabilities are better or richer than that of another person.

At issue here is the number of dimensions. Critics want a formalization that is unidimensional, but the capability approach is intrinsically multi-dimensional. Unidimensional approaches, such as the controversial Roemer's Law, are highly formalized algorithms, but "Sen has chosen to do justice to the multidimensional, fuzzy and ambiguous character of well-being" (Robeyns, 2000, p. 22). She says, however, that when one considers heterogeneity among individuals in a population, the unidimensional approach falls apart as it is not robust enough.

Some suggest that application of the capability approach would impose too much government on people. Robeyns (2000) says this criticism is unfounded. She says there are two elements to this critique: paternalism and redistribution. She refutes that there is anything inherently over-paternalistic about the capability approach, saying, "a critique of paternalism is inherent to any objective account of interpersonal comparisons of well-being." (p. 27) She further notes that almost all societies, with the exception of the each-against-all world of Hobbes, rely on paternalistic considerations to form some social arrangements.

The selection of functionings for evaluation could lead to disagreements that can be resolved by deliberations. One could adopt a bottom-up technique and, in a sense, let the data speak. Yet, she acknowledges that surveys could be biased and that care is needed. She argues, "first, strictly speaking the capability approach does not make any recommendations for redistribution; it only claims that the space of functionings and capabilities is the most appropriate and relevant for evaluative exercises of well-being." (Robeyns, 2000, p. 22) In other words, redistributing accessibility, as described by Martens & Golub (2010) is not consistent with original thoughts in the capability approach. Critics say that governments adopting the capability approach would tell people how to be happy in marriage. Robeyns disagrees, saying that this is not a product of a capability approach, but rather, that a government should perhaps be aware that unemployment causes stress in marriage.

Appendix B: Complete Survey Text and Consent Form

Alan M. Voorhees Transportation Center
Edward J. Bloustein School of Planning and Public Policy
Rutgers, The State University of New Jersey
33 Livingston Avenue
New Brunswick, New Jersey 08901

Dear Neighbor:

I am writing to request your help in understanding the walking patterns, barriers, and needs of older adults in New Jersey. Your thoughts and opinions will help our research team identify ways to improve walking in New Jersey.

We have randomly selected a small number of residents aged 55 years or older to participate in this survey. **If more than one resident in your household is 55 years or older, please have the survey completed by the person with the most recent birthday.**

By taking a few minutes to complete this survey you will be providing valuable insight into the walking needs of older adults living in New Jersey. **You may enter your name at the end of the survey for a chance to win <u>one of three</u> $100 gift cards.**

If you want to save time, you can complete the survey online at www.English.yyy. If you want to complete the survey in Spanish, visit www.Spanish.yyy. If you don't have access to internet or smartphone, please mail the completed survey to us in the postage-paid envelope included with this survey. No stamps are needed.

We thank you for your time and look forward to receiving your responses. Sincerely,

Leigh Ann Von Hagen, Principal Investigator
Senior Researcher
Alan M. Voorhees Transportation Center
Rutgers, The State University of New Jersey

Please ONLY complete this survey if you are 55 years or older

New Jersey Older Adults Walking Needs

The Alan M. Voorhees Transportation Center (VTC) at Rutgers, The State University of New Jersey, invites you to participate in a study for the New Jersey Department of Transportation. The purpose of this research is to identify opportunities to promote safe walking for older adults. Your participation will influence recommendations for new policies to promote safe walking throughout New Jersey.

This survey should take you approximately 15 minutes to complete. Your participation in the survey is completely voluntary and there are no risks to participation. You may skip any questions you are not comfortable answering. If at any time you wish to stop participating you are free to exit the survey with no penalty to you. This research is confidential. Confidential means that the research records will include some information about you. However, the research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see the full set of data.

Please note that by completing the survey you can enter into a drawing for a chance to win one of three $100 gift cards. To qualify for the drawing, you must provide your contact information at the end of the survey.

If you have questions at any time about the research or the procedures described above, or if you need assistance in completing the survey, you may contact the study principal investigator:

Leigh Ann Von Hagen, Principal Investigator
848-932-2899
bikeped@ejb.rutgers.edu

If you have any questions about your rights as a participant in this study, you may contact the Rutgers University Arts and Sciences Institutional Review Board at Tel: 732-235-2866, or the Rutgers Human Subjects Protection Program at Tel: 973-972-1149, or e-mail: humansubjects@ored.rutgers.edu.

Please ONLY complete this survey if you are 55 years or older

Informed Consent

❑ Yes, I consent to take the survey. [Begin survey on next page]
❑ No, I do not consent. **[STOP: This survey may not be taken without consent]**

For the purpose of this study, "walking" includes walking with and without the use of all mobility assistance devices such as canes, walkers, crutches, wheelchairs, and rollators.

Questions 1-8 are about walking for fun or exercise.

1. **How important is it for you to have the freedom/ability to walk for fun or exercise? (Select one)**
   - ❑ Very important
   - ❑ Somewhat important
   - ❑ Neither important nor unimportant
   - ❑ Somewhat unimportant
   - ❑ Very unimportant

2. **Considering your health and ability, how easy is it for you to walk for fun or exercise? (Select one)**
   - ❑ Very easy
   - ❑ Somewhat easy
   - ❑ Neither easy nor difficult
   - ❑ Somewhat difficult
   - ❑ Very difficult

3. **On average, how many minutes PER DAY do you spend walking for fun and exercise? (Select one)**
   - ❑ Less than 10 minutes
   - ❑ 10-19 minutes
   - ❑ 20-29 minutes
   - ❑ 30-59 minutes
   - ❑ 60-89 minutes
   - ❑ 90 minutes or more

4. **If you wanted to walk in the following places for fun or exercise, how easy is it to get there by WALKING ONLY?**

	Very easy	Somewhat easy	Neither easy nor difficult	Somewhat difficult	Very difficult	Don't know
Park	❑	❑	❑	❑	❑	❑
Sidewalk	❑	❑	❑	❑	❑	❑
Neighborhood road	❑	❑	❑	❑	❑	❑
Walking trail/path	❑	❑	❑	❑	❑	❑
Gym/fitness center	❑	❑	❑	❑	❑	❑
Shopping mall	❑	❑	❑	❑	❑	❑
Grocery store	❑	❑	❑	❑	❑	❑
School track/playground	❑	❑	❑	❑	❑	❑
Parking lot	❑	❑	❑	❑	❑	❑
Other (Specify _____)	❑	❑	❑	❑	❑	❑

5. **If you wanted to walk in the following places for fun or exercise, how easy is it to get there by ANY MEANS, including cars, buses, and other transportation? (Select one in each line)**

	Very easy	Somewhat easy	Neither easy nor difficult	Somewhat difficult	Very difficult	Don't know
Park	❑	❑	❑	❑	❑	❑
Sidewalk	❑	❑	❑	❑	❑	❑
Neighborhood road	❑	❑	❑	❑	❑	❑
Walking trail/path	❑	❑	❑	❑	❑	❑
Gym/fitness center	❑	❑	❑	❑	❑	❑
Shopping mall	❑	❑	❑	❑	❑	❑
Grocery store	❑	❑	❑	❑	❑	❑
School track/playground	❑	❑	❑	❑	❑	❑
Parking lot	❑	❑	❑	❑	❑	❑
Other (Specify _____)	❑	❑	❑	❑	❑	❑

6. Please select the places where you walk for fun or exercise, indicating whether you go to the location by <u>walking only</u> or by <u>some other means</u>, such as car, bus, etc. (Select all that apply in both columns)

Going there by walking	Going there by some other means
❑ Park	❑ Park
❑ Sidewalk	❑ Sidewalk
❑ Neighborhood road	❑ Neighborhood road
❑ Walking trail/path	❑ Walking trail/path
❑ Gym/fitness center	❑ Gym/fitness center
❑ Shopping mall	❑ Shopping mall
❑ Grocery store	❑ Grocery store
❑ School track/playground	❑ School track/playground
❑ Parking lot	❑ Parking lot
❑ Other (Specify _____)	❑ Other (Specify _____)
❑ **None of the above**	❑ **None of the above**

7. On average, how often do you walk in the following for fun or exercise? (Select one in each line)

	Never	Once/week	Two times/ week	Three times/ week	Four times/ week	Five or more times/week
Park	❑	❑	❑	❑	❑	❑
Sidewalk	❑	❑	❑	❑	❑	❑
Neighborhood road	❑	❑	❑	❑	❑	❑
Walking trail/path	❑	❑	❑	❑	❑	❑
Gym/fitness center	❑	❑	❑	❑	❑	❑
Shopping mall	❑	❑	❑	❑	❑	❑
Grocery store	❑	❑	❑	❑	❑	❑
School track/playground	❑	❑	❑	❑	❑	❑
Parking lot	❑	❑	❑	❑	❑	❑
Other (Specify _____)	❑	❑	❑	❑	❑	❑

8. How long does it take you to <u>walk</u> to the following places from home (one way)? (Select one in each line)

	0 minutes	1-4 minutes	5-9 minutes	10-14 minutes	15-19 minutes	20 or more minutes	Don't know
Park	❑	❑	❑	❑	❑	❑	❑
Sidewalk	❑	❑	❑	❑	❑	❑	❑
Neighborhood road	❑	❑	❑	❑	❑	❑	❑
Walking trail/path	❑	❑	❑	❑	❑	❑	❑
Gym/fitness center	❑	❑	❑	❑	❑	❑	❑
Shopping mall	❑	❑	❑	❑	❑	❑	❑
Grocery store	❑	❑	❑	❑	❑	❑	❑
School track/playground	❑	❑	❑	❑	❑	❑	❑
Parking lot	❑	❑	❑	❑	❑	❑	❑
Other (Specify _____)	❑	❑	❑	❑	❑	❑	❑

9. **How important is it for you to have the freedom/ability to walk wherever you want to go? (Select one)**

    ❏ Very important   ❏ Neither important nor unimportant   ❏ Very unimportant

    ❏ Somewhat important   ❏ Somewhat unimportant

10. **Considering the possibility of going there from home BY WALKING ONLY, how easy is it for you to get to the following? (Select one in each line)**

	Very easy	Somewhat easy	Neither easy nor difficult	Somewhat difficult	Very difficult	Don't know
Grocery store	❏	❏	❏	❏	❏	❏
Drug store	❏	❏	❏	❏	❏	❏
Neighborhood store	❏	❏	❏	❏	❏	❏
Specialty store/boutique	❏	❏	❏	❏	❏	❏
Restaurant/café	❏	❏	❏	❏	❏	❏
Doctor/dentist	❏	❏	❏	❏	❏	❏
Senior center	❏	❏	❏	❏	❏	❏
Bank/post office	❏	❏	❏	❏	❏	❏
Place of worship	❏	❏	❏	❏	❏	❏
Friend/family	❏	❏	❏	❏	❏	❏
Library	❏	❏	❏	❏	❏	❏
Theater/movie theater	❏	❏	❏	❏	❏	❏
Bus stop	❏	❏	❏	❏	❏	❏
Train station	❏	❏	❏	❏	❏	❏
Work location (if applicable)	❏	❏	❏	❏	❏	❏

11. **Considering the possibility of going there from home BY ANY MEANS, including cars, buses, and other transportation, how easy is it for you to get to the following?**

	Very easy	Somewhat easy	Neither easy nor difficult	Somewhat difficult	Very difficult	Don't know
Grocery store	❏	❏	❏	❏	❏	❏
Drug store	❏	❏	❏	❏	❏	❏
Neighborhood store	❏	❏	❏	❏	❏	❏
Specialty store/boutique	❏	❏	❏	❏	❏	❏
Restaurant/café	❏	❏	❏	❏	❏	❏
Doctor/dentist	❏	❏	❏	❏	❏	❏
Senior center	❏	❏	❏	❏	❏	❏
Bank/post office	❏	❏	❏	❏	❏	❏
Place of worship	❏	❏	❏	❏	❏	❏
Friend/family	❏	❏	❏	❏	❏	❏
Library	❏	❏	❏	❏	❏	❏
Theater/movie theater	❏	❏	❏	❏	❏	❏
Bus stop	❏	❏	❏	❏	❏	❏
Train station	❏	❏	❏	❏	❏	❏
Work location (if applicable)	❏	❏	❏	❏	❏	❏

12. On average, how frequently do you go to the following from home by <u>WALKING ONLY</u>? (Select one in each line)

	Never	Once/week	Two times/ week	Three times/ week	Four times/ week	Five or more times/week
Grocery store	❑	❑	❑	❑	❑	❑
Drug store	❑	❑	❑	❑	❑	❑
Neighborhood store	❑	❑	❑	❑	❑	❑
Specialty store/boutique	❑	❑	❑	❑	❑	❑
Restaurant/café	❑	❑	❑	❑	❑	❑
Doctor/dentist	❑	❑	❑	❑	❑	❑
Senior center	❑	❑	❑	❑	❑	❑
Bank/post office	❑	❑	❑	❑	❑	❑
Place of worship	❑	❑	❑	❑	❑	❑
Friend/family	❑	❑	❑	❑	❑	❑
Library	❑	❑	❑	❑	❑	❑
Theater/movie theater	❑	❑	❑	❑	❑	❑
Bus stop	❑	❑	❑	❑	❑	❑
Train station	❑	❑	❑	❑	❑	❑
Work location (if applicable)	❑	❑	❑	❑	❑	❑

13. How long does it take you to <u>walk</u> to the following places from home (one way)? (Select one in each line)

	0 minutes	1-4 minutes	5-9 minutes	10-14 minutes	15-19 minutes	20 or more minutes	Don't know
Grocery store	❑	❑	❑	❑	❑	❑	❑
Drug store	❑	❑	❑	❑	❑	❑	❑
Neighborhood store	❑	❑	❑	❑	❑	❑	❑
Specialty store/boutique	❑	❑	❑	❑	❑	❑	❑
Restaurant/café	❑	❑	❑	❑	❑	❑	❑
Doctor/dentist	❑	❑	❑	❑	❑	❑	❑
Senior center	❑	❑	❑	❑	❑	❑	❑
Bank/post office	❑	❑	❑	❑	❑	❑	❑
Place of worship	❑	❑	❑	❑	❑	❑	❑
Friend/family	❑	❑	❑	❑	❑	❑	❑
Library	❑	❑	❑	❑	❑	❑	❑
Theater/movie theater	❑	❑	❑	❑	❑	❑	❑
Bus stop	❑	❑	❑	❑	❑	❑	❑
Train station	❑	❑	❑	❑	❑	❑	❑
Work location (if applicable)	❑	❑	❑	❑	❑	❑	❑

Questions 14-23 are about walking safety.

14. On a scale of 0 to 10, how afraid are you of being a victim of traffic collision when you think about walking in your neighborhood <u>in the daytime</u>?

(0) (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

← Not afraid at all   Very afraid →

15. On a scale of 0 to 10, how afraid are you of being a victim of traffic collision when you think about walking in your neighborhood <u>after dark</u>?

(0) (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

← Not afraid at all   Very afraid →

16. On a scale of 0 to 10, how afraid are you of being a victim of robbery/mugging when you think about walking in your neighborhood <u>in the daytime</u>?

(0) (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

← Not afraid at all   Very afraid →

17. On a scale of 0 to 10, how afraid are you of being a victim of robbery/mugging when you think about walking in your neighborhood <u>after dark</u>?

(0) (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

← Not afraid at all   Very afraid →

18. On a scale of 0 to 10, how afraid are you of being harassed by others when you think about walking in your neighborhood <u>in the daytime</u>?

(0) (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

← Not afraid at all   Very afraid →

19. On a scale of 0 to 10, how afraid are you of being harassed by others when you think about walking in your neighborhood <u>after dark</u>?

(0) (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

← Not afraid at all   Very afraid →

20. On a scale of 0 to 10, how often do people walk in your neighborhood <u>in the daytime</u>?

(0) (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

← Never   Always →

21. On a scale of 0 to 10, how often do people walk in your neighborhood <u>after dark</u>?

(0) (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

← Never   Always →

22. **Have you or any of your family members been a victim of crime when walking in your neighborhood? (Select one)**
   - ❑ No
   - ❑ Yes, me alone
   - ❑ Yes, me and a family member
   - ❑ Yes, only family member

23. **Which of the following in your neighborhood are you most threatened by? (Select all that apply)**
   - ❑ Neglected property
   - ❑ Vandalism/graffiti
   - ❑ Poor lighting
   - ❑ Youth hanging out
   - ❑ Homeless people
   - ❑ Gang activity
   - ❑ Drug/alcohol use
   - ❑ Drug dealing
   - ❑ Theft
   - ❑ Sexual Assault/harassment
   - ❑ Assault
   - ❑ Kidnapping
   - ❑ Dogs or other animals

Questions 24 and 25 are about your recommendations to improve the walking environment.

24. **To improve the safety of walkers from traffic in your neighborhood, which of the following would you recommend? (Select all that apply)**
   - ❑ More traffic lights at intersections
   - ❑ More stop signs at intersections
   - ❑ More crosswalks
   - ❑ Better crosswalks
   - ❑ More streetlights
   - ❑ More sidewalks
   - ❑ Better sidewalks
   - ❑ More speed bumps
   - ❑ More visible police presence
   - ❑ More crossing guards
   - ❑ More ticketing of speeding drivers
   - ❑ More radar speed signs indicating speed to drivers
   - ❑ Lower posted speed limit for cars
   - ❑ Other (Specify _____)

25. To reduce the chances of walkers being victims of crime in your neighborhood, which of the following would you recommend? (Select all that apply)

- ❑ More visible police presence
- ❑ More community-oriented policing
- ❑ More organized group walking
- ❑ More cameras in private buildings

- ❑ More cameras in public places
- ❑ More streetlights
- ❑ More opportunities for indoor walking, such as gyms
- ❑ Other (Specify _____)

Questions 26-33 are about your overall well-being.

26. How confident are you that you can do each of the following? (Select one in each line)

	Not at all sure	A little sure	Pretty sure	Very sure
Walk regularly (3 times a week for 20 minutes)	❑	❑	❑	❑
Walk when you are feeling tired	❑	❑	❑	❑
Walk when you are under pressure to get things done	❑	❑	❑	❑
Walk when you are feeling down or depressed	❑	❑	❑	❑
Walk when you have too much to do at home	❑	❑	❑	❑
Walk when there are other more interesting things to do	❑	❑	❑	❑
Walk when your family or friends do not provide any support	❑	❑	❑	❑
Walk when you don't really feel like it	❑	❑	❑	❑
Walk when you are away from home (e.g., vacation)	❑	❑	❑	❑

27. How much do you agree or disagree with the following statements? (Select one per line)

	Strongly disagree	Somewhat disagree	Slightly disagree	Neutral	Slightly agree	Somewhat agree	Strongly agree
In many ways my life is close to ideal	❑	❑	❑	❑	❑	❑	❑
The conditions of my life are excellent	❑	❑	❑	❑	❑	❑	❑
I am satisfied with my life	❑	❑	❑	❑	❑	❑	❑
So far, I have gotten the important things I want in life	❑	❑	❑	❑	❑	❑	❑
If I could live my life again, I would change almost nothing	❑	❑	❑	❑	❑	❑	❑
Walk when there are other more interesting things to do	❑	❑	❑	❑	❑	❑	❑
Walk when your family or friends do not provide any support	❑	❑	❑	❑	❑	❑	❑
Walk when you don't really feel like it	❑	❑	❑	❑	❑	❑	❑
Walk when you are away from home (e.g., vacation)	❑	❑	❑	❑	❑	❑	❑

28. How would you rate your overall physical health? (Circle one)

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

←— Very poor   Very good —→

29. How difficult is it for you to go up and down stairs without help? (Circle one)

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

←— Very difficult   Not at all difficult —→

30. How difficult is it for you to concentrate? (Circle one)

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

←— Very difficult   Not at all difficult —→

31. Taking everything into consideration, how anxious do you usually feel? (Circle one)

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

←— Very anxious   Not at all anxious —→

32. How satisfied are you with your social ties or relationships? (Circle one)

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

←— Not at all satisfied   Very satisfied —→

33. Do you use any of the following devices some or all of the time? (Select all that apply)

❏ Walking stick/cane   ❏ Wheelchair/scooter   ❏ Orthotic devices
❏ Walker   ❏ Crutches   ❏ Prosthetic devices

Questions 34-42 are about you.

34. What is your age? (Select one)

❏ 55 to 59   ❏ 65 to 69   ❏ 75 to 79   ❏ 85 to 89
❏ 60 to 64   ❏ 70 to 74   ❏ 80 to 84   ❏ 90 or above

35. What is your sex? (Select one)

❏ Male   ❏ Female   ❏ Other

36. What is the highest level of education you attained? (Select one)

❏ Some high school   ❏ Some college   ❏ Bachelor's degree
❏ High school   ❏ Associate degree   ❏ Postgraduate degree

37. What is your current occupation? (Select one)

❏ Employed full time   ❏ Retired   ❏ Volunteer   ❏ Other (Specify
❏ Employed part time   ❏ Home maker   ❏ Unemployed   _____)

38. What is your race? (Select one)

❏ White   ❏ Asian or Pacific Islander   ❏ Multi-racial
❏ Black or African American   ❏ American Indian or Alaskan Native   ❏ Other

39. Are you Hispanic or Latino? (Select one)

❏ Yes   ❏ No

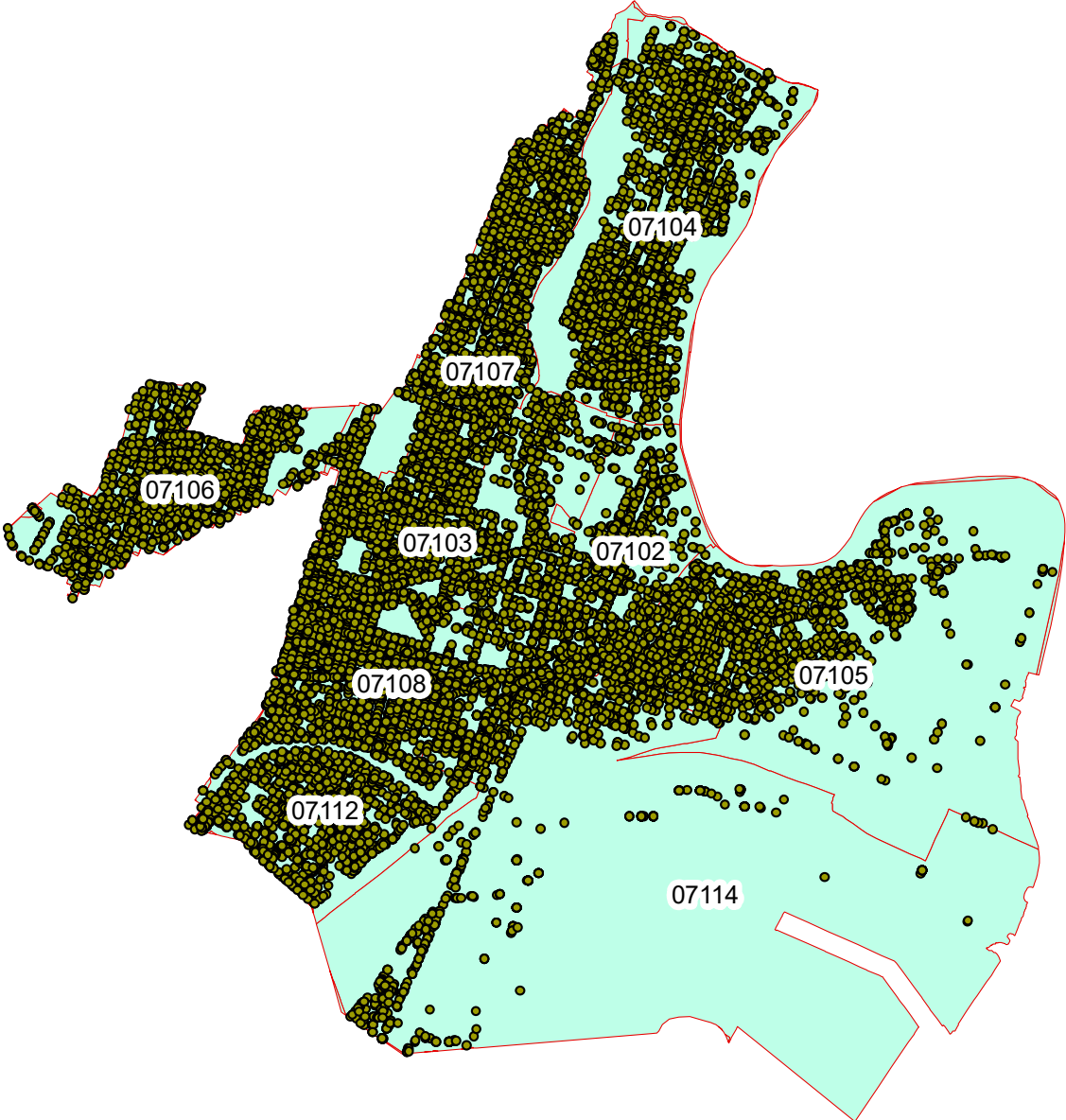**40. How many cars do you have in your household? (Select one)**
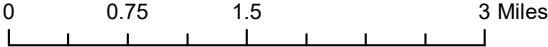
❏ None   ❏ One   ❏ Two   ❏ Three or more

Appendix C: GIS Crime Data for Selected Communities
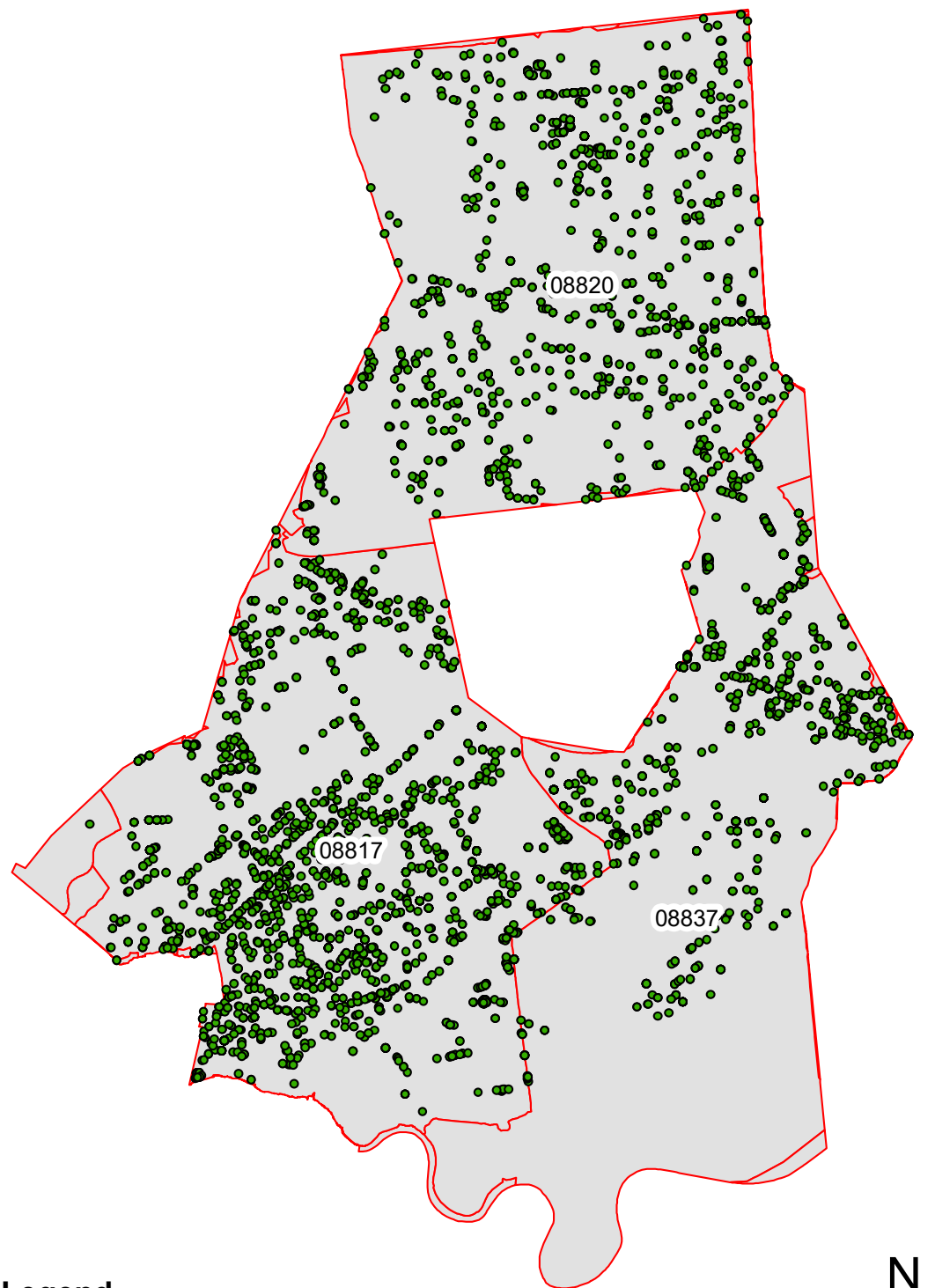
Newark Crime Event Map

Legend

- Crime Events
- Zipcode map

0   0.75   1.5   3 Miles

N

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Edison Crime Event Map

08820

08817

08837

Legend

● Edison_ExcelFinal_clipped

▢ Zipcode map

N

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Franklin Township Crime Event Map

08873

08823

08540

Legend

- Crime Events
- ZIP code Map

0   1   2   4 Miles

N
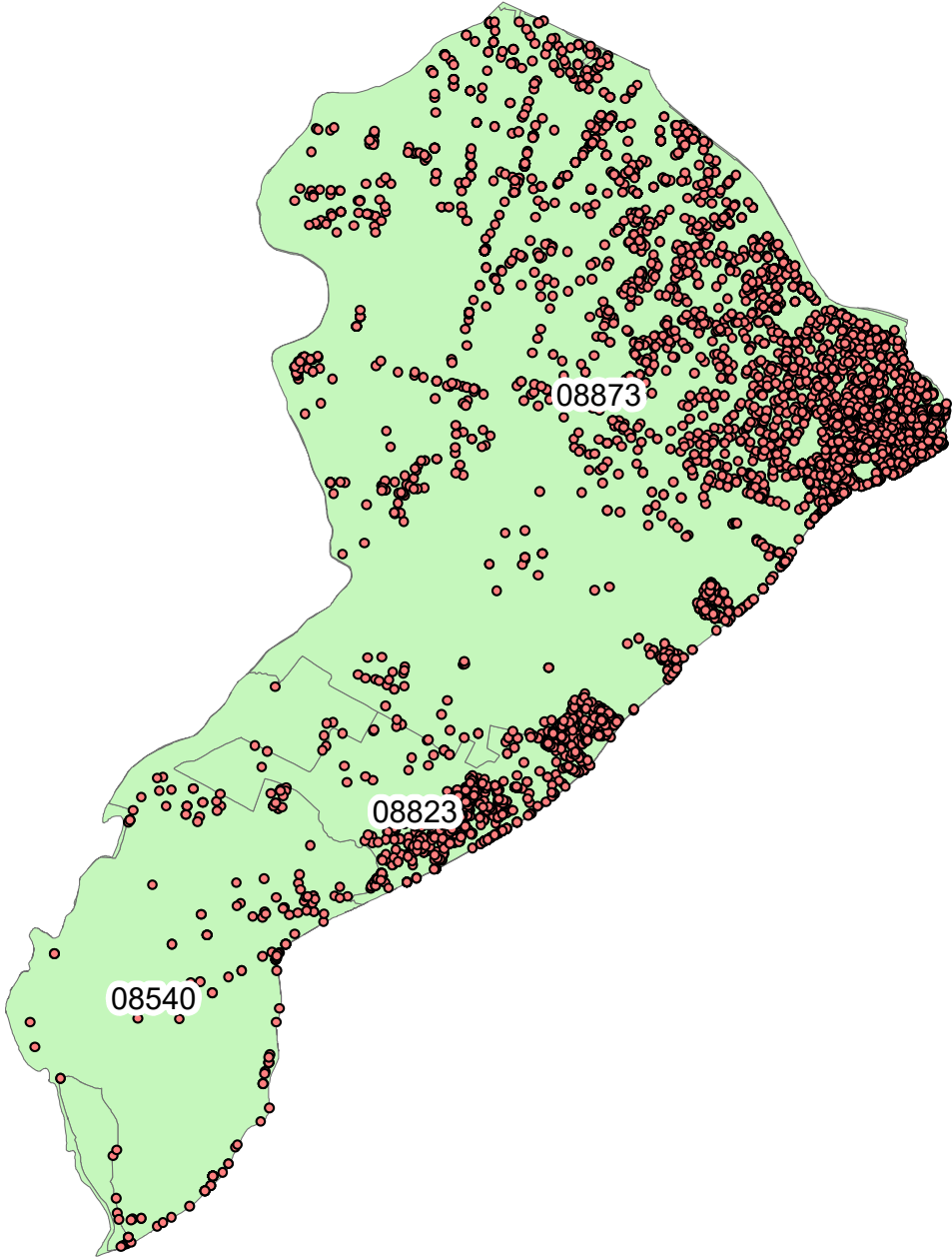
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