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Comfort, Safety, Delight & Aesthetics:
An Evaluation of S Henderson Street's Pedestrian Realm

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Abstract

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What defines a successful, multimodal street? What elements must be incorporated into street design to provide those using non-motorized methods of transportation with a comfortable, safe, delightful, and aesthetically pleasing street experience? Today's public officials and urban planners are increasingly focused on creating urban street environments that are safe and welcoming for people using all forms of transportation – not just for those in automobiles. At the heart of this planning mindset is the “Complete Streets” movement, which rose to prominence in the early 21st century. Complete Streets are designed to serve pedestrians, bicyclists, transit riders, and drivers, while also considering the needs of people with disabilities, children, and the elderly. However, the Complete Streets movement focuses mostly on balancing the equity needs of user mobility, while neglecting other elements of street design.

This study addresses how urban design techniques can be harnessed to create a more comfortable, safer, enjoyable, and aesthetically pleasing pedestrian realm on S Henderson Street in Seattle's Rainier Beach neighborhood. The first step in this exploratory sequential research study was to conduct several unstructured interviews with Rainier Beach residents and Seattle Department of Transportation employees to gain a better understanding of how they think the street is currently functioning and to understand what the City of Seattle has done and plans to do to improve it. Next, I identified assessment measures to evaluate how well S Henderson Street's pedestrian right-of-way is currently functioning. Two sets of assessment measures were identified: 1) Jan Gehl's “12 Quality Criteria” from his book *Cities for People*, and 2) three criteria from Schulze + Grassov's “Parameters for Public Spaces in Copenhagen” manual. I used the 15 criteria to evaluate each pedestrian right-of-way block as “good,” “average,” or “poor.” Once I evaluated S Henderson Street using all 15 criteria, I converted it to a numerical format (poor=1; average=2; good=3). Collectively, S Henderson scored just below average (1.77), meaning the street is not performing well for pedestrians. From this initial exploration, I used relevant literature, the 2012 Rainier Beach Neighborhood Plan Update, and my current conditions scoring to analyze and add to the neighborhood's design visions for S Henderson Street. Recommendations included intersection redesigns and improvements, additional seating, sidewalk repairs, green street upgrades, and branding opportunities for the community.

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CHAPTER 1. INTRODUCTION

Today's urban planners and designers are increasingly focused on creating urban street environments that are safe and welcoming for people using all forms of transportation – not just for those in automobiles. The auto-centric streetscapes of 20th century America are often difficult to navigate for bicyclists and pedestrians, prompting planners and policymakers to use policy and physical interventions in the built environment to make sure streets are designed to meet the needs of all road users (Zaccaro & Atherton, 2017).

The North American “Complete Streets” movement, which rose to prominence in the early 21st century, is being executed in various cities across America using new urban design policies and their resulting streetscape elements. Complete Streets are designed to serve pedestrians, bicyclists, transit riders, and drivers, while also considering the needs of people with disabilities, children, and older people (McCann, Rynne & American Planning Association, 2010).

However, some argue that the ways in which Complete Streets narratives, policies, plans, and efforts are implemented may be systematically creating many of the urban spatial and social inequalities that have been taking place in American cities for the past century (Zavestoski & Agyeman, 2014). The Complete Streets movement focuses mostly on balancing the equity needs of user mobility (Gehl, 2010), while neglecting other elements of safe, inviting, and aesthetically pleasing street design. Sousa & Rosales (2010) argue that American planners should be designing “contextually” Complete Streets, meaning a multi-modal complete street that also considers context sensitivity and sustainability. This means understanding and

listening to resident populations and taking their desires into account throughout the design process.

This study addresses how urban design techniques can be harnessed to create a more comfortable, safer, enjoyable, and aesthetically pleasing pedestrian realm on S Henderson Street in Seattle's Rainier Beach neighborhood. The first step in this exploratory sequential research study was to identify and interview prominent Rainier Beach residents and Seattle Department of Transportation (SDOT) employees who are familiar with current conditions and improvement plans for S Henderson Street. The interviews provided valuable information on how the pedestrian right-of-way (ROW) is currently functioning for residents, in addition to information on SDOT's past, present, and future plans for street improvements.



Figure 1: S Henderson Street from MLK Jr Way S to Seward Park Avenue S. (Source: Bing Maps).

Next, I identified assessment measures for evaluating the comfort level, safety, enjoyability, and aesthetics of S Henderson Street's pedestrian realm. In this phase of the study, I identified

and used a defined set of criteria to collect data and evaluate the current state of S Henderson Street as a shared space. Two sets of assessment measures were identified: 1) Jan Gehl's "12 Quality Criteria" from his book *Cities for People*, and 2) three criteria from Schulze + Grasso's "Parameters for Public Spaces in Copenhagen" manual. I used these 15 criteria to evaluate each block as "good," "average," or "poor". Once I evaluated S Henderson Street using all 15 criteria, I converted it to a numerical format (Poor=1; Average=2; Good=3).

From this initial exploration, I used my unstructured interviews, relevant literature, the Rainier Beach Neighborhood Plan Update, and my current conditions scoring to analyze and add to the neighborhood's design visions for S Henderson Street. Unfortunately, time constraints did not allow me to do a thorough qualitative approach for this research topic. Future research should include a more thorough qualitative section, in which the researcher formally conducts a series of focus groups with both residents of the neighborhood and business owners and employees. Since there are two schools on the street (Rainier Beach High School and South Shore K-8), in addition to the Rainier Beach Community Center, it also would be helpful to conduct focus groups with children.

The first section of this thesis discusses relevant literature regarding the Complete Streets movements and its critiques. The literature review includes a history of street design in America, current approaches to street design, and Seattle's street design policies. Next, I cover my research methods for the study, including a breakdown of how and why I chose my criteria for the evaluation of S Henderson Street. Following the methods section, I summarize my findings on how S Henderson Street's pedestrian realm is currently performing, and I provide

design suggestions for future development. Finally, I will reflect on outcomes of the study and provide suggestions for additional research on the topic.

1.1 Why S Henderson Street?

The main question I seek to answer is how urban design techniques can be harnessed to create a more comfortable, safer, enjoyable, and aesthetically pleasing pedestrian realm on S Henderson Street in Seattle's Rainier Beach neighborhood. I chose to study this particular street in the Rainier Beach neighborhood for three main reasons: familiarity, equity, and diversity.

First, I have spent considerable time in the Rainier Beach neighborhood over the course of the past year doing green business outreach through my internship at Seattle Public Utilities, in addition to performing site checks on the City's public litter and recycling cans. I have grown to appreciate the diversity and strong sense of community in this part of South Seattle.

Community involvement and pride is evident based on the number of events in the area and the resident attendance rates at community forums and workshops. Also, because I live on the north side of Seattle, I spend most of my personal time there. I wanted to use this thesis project to explore a neighborhood I do not typically frequent in my day-to-day life.

I also wanted to locate my site in a lower income community that may lack the resources and funding that a wealthier neighborhood on the north side of the city would have access to.

According to the U.S. Census Bureau's 2012-2016 American Community Survey 5-year Estimates, the 98118 zip code (Rainier Valley and Columbia City) has a median household income of \$67,226 (U.S. Census Bureau, 2017). Meanwhile, the 98105 zip code (University District and Laurelhurst) has a median household income of \$125,729.

In addition, the residents of Rainier Beach make up one of the city's most ethnically diverse neighborhoods in Seattle. According to the Rainier Beach Action Coalition, Black/African-American households make up 30.8%, Asians 30.7%, Hispanic 13.2%, and Mixed Race 13.8% of the Rainier Beach population. Plus, it also has fewer people who speak only English (42%) than the rest of Southeast Seattle (53%) (n.d.). This diversity and variety of languages requires heightened sensitivity to cultural differences and language barriers. I appreciated engaging such a diverse community, and I learned a great deal about what they desire for their local streetscape design during our unstructured interviews.

My research question is important, because the Rainier Beach Neighborhood Plan highlights S Henderson Street as a road in need of major improvements. Primarily, the street needs safer intersections and upgraded pedestrian infrastructure. While Rainier Beach has good basic pedestrian infrastructure, with sidewalks along over 80% of its roadway, residents have suggested that improvements in the pedestrian environment would increase the number of people who choose to walk in the neighborhood and the frequency with which they do (City of Seattle, 2012). While Complete Streets guidelines are a good place to start to make the street safer, an improved street design must consider many socio-demographic factors, such as ethnic diversity and languages spoken. I also strongly believe that any major street improvements in the city must be as environmentally sound as possible, and they must incorporate green infrastructure elements when appropriate, such as permeable pavement, bioswales, planter boxes, and trees. I plan to use my compassion, curiosity, and love for the natural environment to develop design recommendations for S Henderson Street.

CHAPTER 2. LITERATURE REVIEW

2.1 History of Urban Street Design

The purpose of urban streets has long been contested. Who should streets serve? Should they just act as transitional spaces, or should they additionally serve as places of leisure, socialization, and recreation? According to American-Canadian author and activist Jane Jacobs, safe city streets must have three main qualities: 1) demarcation between public and private space, 2) eyes upon the street, and 3) continuous sidewalk use (Jacobs 1992, 35). While Jacobs' description of safe, effective city streets has been well received, her early 20th century predecessors long argued about the elements of good urban street design.

Two main urban design movements emerged in the early 20th century: The Garden City Movement and Modernism. While the Garden City Movement encouraged healthy living in a pastoral, garden setting, Modernism focused on standardization and called for design in which form followed function. Each has elements that led to particular street designs. Both movements encouraged the separation of land uses and were able to achieve their ends via “massive public initiatives and centralized ownership and design of land” (Jacobs 1995, 311). By the 1960s, critics, such as Jane Jacobs, started voicing how streets had become spaces only for automobiles. Public life and safety were secondary to motorized transit, prompting activists and critics to call for a new approach to urban street design.

In the late 19th century, American and European cities were struggling with poor urban living conditions. The 1879 New York City Tenement Housing Act, which required minimal light and air, did not meet its original expectations. Instead, it resulted in an 80 percent coverage of most

lots with narrow interior light shafts. With these conditions in mind, urban planners and theorists imagined design concepts that would improve upon the standard of living found in densely populated inner cities. For example, the Garden City Movement was a method of urban planning, initiated in 1898 by Ebenezer Howard of the United Kingdom, in which self-contained communities were surrounded by greenbelts with areas for residences, industry, and agriculture. He felt that the overcrowding and deterioration of cities, such as London, was one of the largest public health issues of the time. Howard's *Garden Cities of To-morrow*, first published in 1898, offered a slum-free vision in which residents could benefit from the opportunity, recreation, and social activities of the city, while also enjoying the fresh air, beauty, and low rent of the country. In the 1900s, long boulevards connected parks in the periphery and became a staple of residential areas. Likewise, street trees became associated as a major feature of residential areas instead of city and town centers (Kostof, 1991). Howard's vision eventually inspired development models in the U.S.

Modernism called for a design in which form followed function. Architect Le Corbusier is one of most prominent modernist visionaries of the 1920s and 1930s. In 1922, he introduced his idea for a "Contemporary City" for three million inhabitants (Guiton, 1981). The city would have a group of sixty-story cruciform skyscrapers set within large, green, open spaces. Le Corbusier felt that existing city streets "are old dirt roads that have been paved over with subways underneath. Modern streets will form a new organism: a sort of elongated workshop or warehouse where delicate and complex utility services can be easily installed and maintained. These services must be accessible at every point" (Guiton 1981, 98). At the center of his city would be a major transportation hub with levels for different modes of transportation: an

underground street for trucks; a ground-floor level for local traffic; and elevated highways 130 or 200-feet wide for rapid through traffic. In addition, Le Corbusier called for more planting along streets and a separation of the pedestrian circulation path from motorized modes of transportation. His modernist ideas were given a platform at the 1933 meeting of the International Congress on Modern Architecture (CIAM) in Athens, where a charter was created demanding a basic reform of urban planning (Guiton, 1981).

Today, many U.S. cities display remnants of both the Garden City and Contemporary City: winding, tranquil suburban roads, and specialized high-speed highways. While each early 20th century design movement was proposed and implemented to better both the health and efficiency of cities, their results did not encourage public life. By the 1960s, activists such as Jane Jacobs started voicing their concerns of how uncondusive modern U.S. cities were to promoting active social street lives. Standards, introduced by the U.S. government in the 1930s to control speculative developers resulted in curvilinear culs-de-sac and other street design patterns that often favored motorized forms of transportation over pedestrians and bicyclists (Southworth & Ben-Joseph 1995, 65). Over the years, other organizations and professionals would influence standards: The Urban Land Institute, the National Association of Home Builders, the Institute of Transportation Engineers, etc. Many of these groups have made it difficult to correct the street design patterns of the past which favored automobiles over pedestrians and bicyclists.

Jane Jacobs was the loudest voice in opposition to the modernist planning trends of the era. In her 1961 book *The Death and Life of Great American Cities*, Jacobs argues that modernist urban

planning rejects the city, because it destroys communities and innovative economies by creating isolated urban spaces with the separation of land uses (i.e. residential, industrial, commercial, etc.). Among other things, she advocated for mixed primary uses that would activate streets at varying times of the day, thereby allowing more eyes to be on the street. She also promoted short blocks, allowing high pedestrian permeability. From her point-of-view, the sidewalk is the stage for an “intricate ballet in which the individual dancers and ensembles all have distinctive parts which miraculously reinforce each other and compose an orderly whole” (Jacobs 1961, 50). A boisterous mixed use street, with a sprinkling of public spaces, bars, restaurants, and shops along the sidewalk is essential for a safe, socially enjoyable district.

Through her writings, Jacobs made many powerful enemies, such as Robert Moses, a New York City commissioner, and Lewis Mumford, a social historian whom she eviscerated in *The Death and Life of Great American Cities*. Her critics claimed she had no formal training in urban planning or design, and therefore had no credibility to be writing and hypothesizing on the topic. While her writings were not based on statistical research, other urban observers and theorists performed the necessary empirical research to back up many of her claims. One such urban observer was William Whyte, who wrote about urban spaces and street design in his 1980 book *The Social Life of Small Urban Spaces*. In 1970, Whyte formed a small research group, named “The Street Life Project,” with the aim of evaluating what makes public spaces well visited and effective. In particular, he observed New York City parks, playgrounds, and informal recreation areas. One of the first things that struck his research team was the lack of crowding in many of these areas. He mused, “What attracts people the most, it would appear, is other people” (Whyte 1980, 19). From his observation work, Whyte believed that public

space's relationship to the street "is integral, and it is far and away the critical design factor" (Whyte 1980, 54). He believed that we have a moral responsibility to design physical spaces that encourage civic engagement and community interaction. While working for the New York City Planning Commission, he observed the city at the human scale and walked the city streets for 16 years, collecting data on the meanderings of pedestrians. Whyte's years of data collection provided evidence that designing urban streets at the human scale is beneficial for social interactions.

Renowned urban designer and scholar, Allan Jacobs, similarly dedicated most of his professional life to researching and observing urban streets. His aim was to discover the world's best streets, and to uncover what physical, designable characteristics make them great. He provides information on street dimensions, plans, sections, and patterns of use, while also elaborating on the human and social details that bring streets to life. "First and foremost, a great street should help make community... A great street should be a most desirable place to be, to spend time, to live, to play, to work... Streets are settings for activities that bring people together" (Jacobs 1995, 8). Like Jane Jacobs and William White, Allen Jacobs was a proponent of multi-modal streets which balance a wide range of functions, including travel by foot and bicycle as well as transit and cars.

"For at least 60 years, city engineers have been anti-urban, anti-pedestrian and anti-mixed use. As a philosophy, they moved to segregate uses and then they moved to segregate people and cars under the guise of safety, with an emphasis on size — wider, larger — and this is anti-pedestrian," he muses (Project for Public Spaces, n.d.). Jacobs believed that existing standards

were not based on research, rather on queuing problems. “We’re told by traffic engineers that intersections where pedestrians and drivers get along together are dangerous, mostly because of the multiple turning points and complex interactions required. But this is the exact opposite of what real research and observation of existing great intersections tell us” (Project for Public Spaces, n.d.). With the help of empirical researchers, such as Allen Jacobs and William Whyte, Jane Jacobs’ argument for more human-scaled urban street design was validated.

2.2 Modern Approaches to Street Design

Mid-to-late twentieth century urban design standards left many U.S. streets favoring automobiles. By the 1970s, planners started heeding the words of Jane Jacobs and other social/urban activists and sought design approaches that created safe street environments for all users. The “Complete Streets” movement emerged as a transportation policy and design approach to allow for safe travel for all modes of motorized and non-motorized transportation. In 1971, Oregon enacted the first complete streets-like policy, requiring that new or rebuilt roads accommodate bicycles and pedestrians (National Conference of State Legislatures, 2007). At present, the U.S. Department of Transportation has included bicycle and pedestrian accommodations in their federal-aid transportation projects. They have also encouraged local and state governments to adopt similar policies (National Conference of State Legislatures, 2007).

Barbara McCann, former Executive Director of the National Complete Streets Coalition (founded in 2005), believes that redesigning streets is a good start, but to make truly successful multimodal streets, communities often need to upend the way transportation agencies operate

(McCann, 2013). She reasons that the Complete Streets movement is not just about street design. Rather, activists and practitioners need to transform the way projects are built by using three main strategies: 1) reframe the conversation; 2) build a wide-ranging base of political support; 3) and provide a clear path to a multi-modal process (McCann, 2013). McCann also helped develop a best policy and implementation practices guide for Complete Streets (McCann, 2010). Included in the manual are elements of complete streets, strategic points of intervention, planning for change and addressing problems, handling costs, design principles, and lessons learned from case studies. Today, the complete streets movement has gained rapid momentum, with over 1,140 agencies at the local, regional, and state levels having adopted Complete Streets policies, totaling over 12,000 policies nationwide (Smart Growth America, 2018).

The Complete Streets movement has been hailed by many as a revolution that aims to challenge the auto-normative paradigm by reversing the broader effects of an urban form shaped by the logic of keeping automobiles moving. However, some critics argue that streets should not be thought of as merely physical spaces, but as symbolic and social spaces. Stephen Zavestoski and Julian Agyeman question whether the ways in which Complete Streets narratives, policies, plans, and efforts are envisioned and implemented might be systematically reproducing many of the urban spatial and social inequalities and injustices that have characterized cities for the last century or more (Zavestoski & Agyeman, 2014).

Urban designer and theorist, Donald Appleyard, similarly argued that modern street life was seriously threatened by encroaching urban traffic. He proposed national and local programs to

reclaim “livable street” and “protected neighborhood” programs, which included traffic calming measures to reduce accidents and improve residential safety (Appleyard 1981, 9). “The protection and creation of livable streets is not simply a matter of increasing the comfort or safety of urban living,” explained Appleyard. “As the place where most children grow up, it is the crucial mediator between the home and the outside world, where the child learns to confront strangers and environments on his own” (Appleyard 1981, 9). He felt that children should be able to explore and play in streets without the fear of looming accidents or death. From his empirical research and data collection, Appleyard found that residents of streets with light traffic had, on average, three more friends and twice as many acquaintances as people living on streets with heavy traffic. His work provides rationale for the strategies of traffic calming and living streets.

Anne Vernez Moudon, a Professor Emeritus at the Department of Urban Design and Planning at the University of Washington, also examines streets as shared spaces in her book *Public Streets for Public Use* (Moudon, 1987). She invites 32 respected urban designers, planners, architects, and scholars to offer strategies for making, developing, and managing truly public streets in addition to addressing urban policy issues and environmental concerns. The book covers major topics, such as the evolution of “democratic streets,” which she explains incorporate some aspects of pedestrian and livable streets and is grounded in the notion of public use. “A democratic street is one that reflects the history as well as the social and economic diversity of the larger neighborhood of the city,” Moudon explains. “Friendly to pedestrians and livable for residents, it also reflects social justice, economic health, and ecological vitality. The democratic street does not exclude the automobilist but provides space for vehicles by striking a more

equitable balance with other street users, namely, pedestrians and bicyclists” (Moudon 1987, 28). Like livable streets, democratic streets stress safety and comfort, yet they also emphasize the access needs of many different peoples, provides opportunities for discovery, and encourages user manipulation, appropriation, and transformation.

New Urbanism is a planning and development approach based on the principles of walkable blocks and streets, housing and shopping in close proximity, and accessible public spaces (Congress for the New Urbanism, 2017). It focuses on human-scaled urban design, just like what Jane Jacobs and William Whyte had advocated for. New Urbanists prioritize placemaking and public space, viewing urban streets as places for people, rather than just cars. Jan Gehl, a prominent Danish architect and urban design consultant has spent much of his career focused on reorienting city design toward the pedestrian and cyclist. He argues that the Complete Streets movement too narrowly focuses on streets as just a space for transportation, rather than including various other recreational and leisurely activities (Gehl 2010, 91). According to Gehl, in the more than 50 years since cars seriously invaded cities, both car traffic and the accident rate have increased apace. Plus, as more cars have filled the streets, politicians and traffic planners have become increasingly focused on making room for even more car traffic and parking. Meanwhile, “conditions for pedestrians and cyclists have deteriorated as a result” (Gehl 2010, 91).

Gehl points to recent urban planning ideologies, derived from accident statistics, which contend that the risk of accidents can be reduced by mixing types of traffic in a “shared street” model. Drivers, bicyclists, and pedestrians travel side by side, with good eye contact and extra

vigilance. He explains that serious accidents rarely occur under such circumstances, pointing at examples such as the British “home zones,” Dutch “woonerfs,” and Scandinavian “sivegader” (Gehl 2010, 93). However, all travelers are not equal – the safety of pedestrians must be prioritized over all other modes of transportation, as they are the most vulnerable population on the street.

In order to better assess the quality of public spaces, Jan Gehl and Lars Gemzøe developed their “12 Quality Criteria” (See Figure 2). The criteria were developed to help evaluate the experiential quality of a space by evaluating its ability to provide features that are protective, comfortable, and enjoyable. The user surveys a public space and attaches a positive, negative, or neutral value to each criterion, thus developing a greater understanding of how effectively the public space functions.



Figure 2: Jan Gehl's "12 Quality Criteria." (Source: Gehl Institute; chart created by Kaylie Duffy).

According to Gehl, before any other deliberations are made, “it is crucial to ensure reasonable protection against risk, physical injury, insecurity, and unpleasant sensory influences” (Gehl 2010, 238). Next, he explains that high quality public spaces must offer good comfort and invite people to walk, stand, sit, see, talk, hear, and self-express. These offerings must be considered for daytime and evening use, as well as seasonal use. Finally, the umbrella concept of “delight” must be applied across all criteria to ensure a good human scale, opportunities to enjoy the positive aspects of the regional climate, and an aesthetically pleasing built and natural environment.

Similar to Gehl’s “12 Quality Criteria,” the Danish urban design firm Schulze + Grassov developed criteria for the assessment and programming of public spaces in Copenhagen (See Figure 3). In 2014, they created the “Parameters for Public Spaces in Copenhagen” toolbox, which is now used by technical staff at the municipality to analyze sites and help draft terms of reference for requests for proposals on projects involving work to public streets and open space. The toolbox is also being used by municipal staff working on neighborhood renewal initiatives during the citizen participation process. It is divided into two categories: 1) Location (evaluates the physical framework of a site), and 2) Stimuli (evaluates the site’s potential to fulfill the human need for stimuli). Each category is broken up into three subcategories with 18 criteria in total (See Table 4). According to the firm, the parameters can be used to evaluate pedestrian zones, promenades, connecting streets, and squares (Schulze + Grassov, 2014).

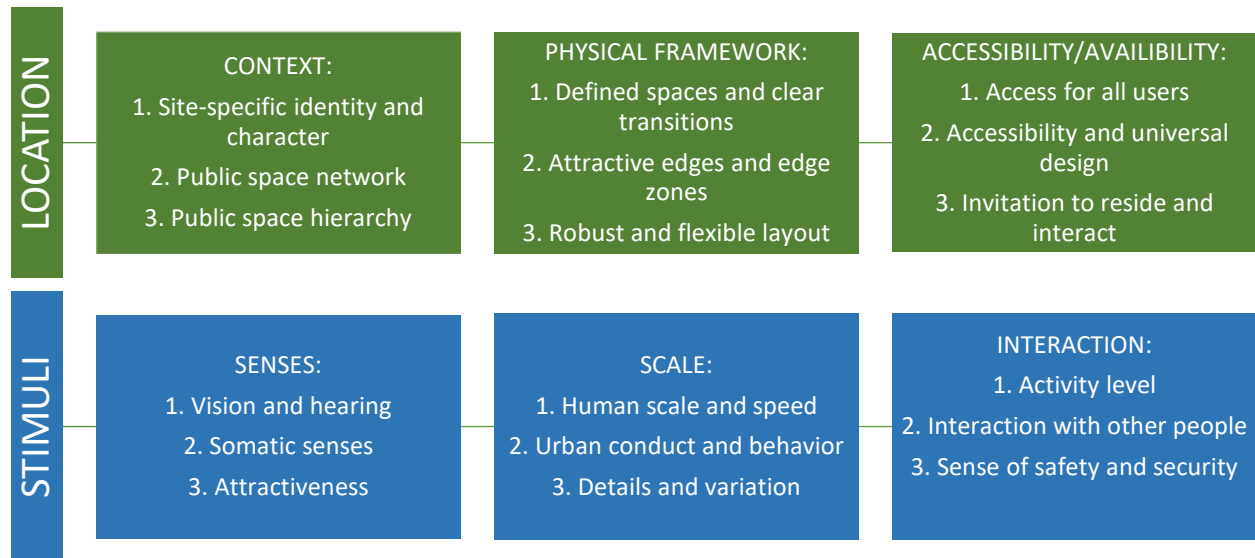


Figure 3: Schulze + Grassov's "Parameters for Public Spaces in Copenhagen." (Source: Schulze + Grassov; chart created by Kaylie Duffy).

2.3 Street Design Policy in Seattle Today

The Complete Streets movement is one of modern America's most widespread transportation policy and street design approaches. A team of researchers recently identified a few factors that have the potential to affect the rate of Complete Streets policy diffusion. They are rural/urban status, state obesity rate, state funding for transportation, state obesity prevention funding, percentage of people who walk or bike to work in the state, presence of state Complete Streets policy, and the number of bordering communities with Complete Streets policy (Moreland-Russell, Eyler, Barbero, Hipp & Walsh, 2013).

For the City of Seattle, Complete Streets policy groundworks have been in place since the 1994 Comprehensive Plan. Specific wording in the Plan includes, "provide a range of viable transportation alternatives, including transit, bicycling and walking," and "make the best use of the City's limited street capacity, and seek to balance competing uses" (Seattle Department of

Transportation, n.d.) The city's *2004-2024 Comprehensive Plan* explains that "Part of Seattle's growth strategy is to encourage people to use cars less than they do today. One way to do that is through the urban village strategy's goal of concentrating most new housing, jobs and services near one another in small areas, so that more trips can be made by walking, biking, or transit" (City of Seattle 2005, 5). The city's most recent *2015-2035 Comprehensive Plan* similarly has Growth Strategy and Transportation elements that seek to "promote development that will make walking, biking, and public transit viable options for more people so that they can be less reliant on automobiles—a major source of carbon emissions in this region" (City of Seattle 2006, 7).

Due to the city's desire to support safe travel for all road users, to promote active transportation, and to support healthy communities, a Complete Streets policy was developed in 2007. The Seattle Department of Transportation (SDOT) worked with the Mayor and City Council to codify the Complete Streets policy in Ordinance Number 122386, which explains that "SDOT will plan for, design and construct all new City transportation improvement projects to provide appropriate accommodation for pedestrians, bicyclists, transit riders, and persons of all abilities, while promoting safe operation for all users" (Seattle City Council, 2007). Over the past ten years, Seattle has evaluated more than 50 Complete Streets projects. The city has developed a Complete Streets Checklist with the aim of evaluating most major maintenance and construction projects. A variety of data is compiled in the checklist, including traffic volume, street classification and type; an inventory of sidewalk condition, crosswalks, transit facilities, and parking restrictions; and recommendations from existing neighborhood and

bicycle, pedestrian, transit, and freight plans. The checklist helps ensure that Seattle's streets are designed for all users of the public right-of-way – not just for those in automobiles.

In recent years, some U.S. cities, such as Seattle, Washington, have come to realize the benefits of multi-modal streets designed with pedestrians and bicyclists in mind, too. Not only has Seattle created a 2016 Pedestrian Master Plan, but they also have a 2014 Bicycle Master Plan, among other plans. The City's Department of Transportation created these 20-year blueprints with the aim of making Seattle's streets safe, comfortable, and accessible places for pedestrians and bicyclists of all ages and abilities.

Another Seattle tool that promotes pedestrian circulation is the city's Green Street land use code, which acts as an overlay to the street type assignment. The land use code originated in the City of Seattle 1985 Land Use and Transportation Plan for Downtown Seattle. Today, the Seattle Right-of-Way Improvements Manual, *Seattle Streets Illustrated*, explains treatments for how to design Green Streets that give priority to pedestrian circulation and open space over other transportation uses but ensure emergency response for public safety is not compromised (Seattle Department of Transportation 2017, Ch. 5.4). Treatments may include sidewalk widening, landscaping, traffic calming, and other pedestrian-oriented features. There are currently two types of Green Streets in Seattle:

1. Green Streets located in Downtown Seattle and defined and mapped in the Land Use Code; and
2. Neighborhood Green Streets that are designated through neighborhood plans or other City adoption processes (e.g. City Council Ordinance or Director's Rule).

The original Green Streets policy offered a developer bonus if an approved Green Street streetscape was created; however, the bonus was just limited to Downtown Seattle non-arterial, residential, or mixed use areas (Seattle Department of Transportation, n.d., Ch. 6) Since its origins, Seattle has allowed Green Streets to be designated in Neighborhood Plans outside of the Downtown core, but there are no developer incentives to do so (Seattle Department of Transportation 2017, Ch. 5.4). While the Green Streets land use code and Complete Streets policy have improved Seattle's street design, we must evaluate how the city is currently doing and how the city could better improve its streets for pedestrians. My interests lie particularly at the intersection of Complete Streets and Neighborhood Green Streets. I'd like to explore how S. Henderson Street's design can be improved to provide a safer, more enjoyable pedestrian experience, while at the same time emphasizing landscaping, historic character, and other unique features.

CHAPTER 3. METHODS:

The purpose of this exploratory sequential research study was to first conduct a series of unstructured interviews with residents that reside on or near S Henderson Street, in addition to interviews with employees at the City of Seattle. From the resident interviews, I collected data regarding perceived safety, sense of community, and the state of pedestrian and bicycle infrastructure on S Henderson Street.

I initially identified 10 nonprofits and businesses on or near S Henderson Street that I believed would have employees or owners with reputable knowledge of S Henderson Street's pedestrian

realm. In addition, I identified these nonprofits and businesses as leaders in the community and advocates for improvements on S Henderson Street. After reaching out to the 10 nonprofits and businesses via email and phone, I was able to schedule five interviews. Unfortunately, scheduling conflicts and lack of response limited the number of interviews I was able to conduct. Questions I asked included:

- Do you enjoy walking and/or biking along S Henderson Street?
- How could the pedestrian experience on S Henderson Street be improved? What infrastructural changes would need to happen to make these improvements?
- How could the bicycling experience on S Henderson Street be improved? What infrastructural changes would need to happen to make these improvements?
- How could the pedestrian experience be improved for children, the elderly, and the disabled?
- How safe do you feel when crossing intersections along S Henderson Street?
 - Which intersection(s) need the most improvement? How could they be improved (e.g. traffic calming measures, community crosswalks, etc.)?
- Are there any city resources or programs that you've identified that would benefit your neighborhood?
- Who do you frequently see using the street? Students, business owners, shoppers, residents?
- Is there a sense of community in and around S Henderson Street?
- Are there any areas where you feel unsafe crossing the street? What measures could be taken to improve this experience?
- The current speed limit along S Henderson Street ranges from 20-30 mph. Do drivers abide by this speed limit?

Table 1: List of questions for Rainier Beach residents.

The resident interviews provided insight on what infrastructural projects the community cares about and wants the city to invest in. Initially, I wanted to evaluate both pedestrian and bicycle infrastructure; however, upon speaking with locals, I determined that bicycle infrastructure is

not a priority for the community and that they would rather see the city invest in better pedestrian infrastructure. They all said that the current designated bicycle lanes on S Henderson Street were all the community needed or wanted.

From the SDOT employees, I collected information regarding past, present, and future infrastructural improvements to S Henderson Street. In addition, I asked whether there were any city resources or programs that they believed the community could benefit from.

I initially identified eight employees at various City of Seattle Departments, including the Seattle Department of Transportation, the Department of Neighborhoods, and the Office of Planning and Community Development. The employees I identified were involved in both community building and physical improvement projects in Rainier Beach and on S Henderson Street. However, I was only able to interview three City of Seattle employees due to scheduling conflicts, lack of response, or lack of availability. Questions I asked included:

- Does the Seattle Department of Transportation have any infrastructural changes or improvements planned for S Henderson Street in the next 1-5 years? In the next 5-10 years?
 - Are you aware of any other capital improvement projects for the street or surrounding neighborhood?
- Does King County Metro have any bus route or RapidRide changes planned for S Henderson Street in the next 1-5 years? In the next 5-10 years?
 - What routes currently run on S Henderson Street and what is their frequency?
- How could the pedestrian experience on S Henderson Street be improved? What infrastructural changes would need to happen to make these improvements?
- How could the bicycling experience on S Henderson Street be improved? What infrastructural changes would need to happen to make these improvements?
- How could the pedestrian experience be improved for children, the elderly, and the disabled?
- Which intersection(s) need the most improvement? How could they be improved (e.g. traffic calming measures, community crosswalks, etc.)?
- Are there any city or county resources or programs that you think would benefit the community?

Table 2: List of questions for SDOT employees.

The interviews with SDOT employees provided background information on what parts of S Henderson Street the city believes need the most improvement. They also informed me about portions of the pedestrian ROW that are most neglected by the city. The information I collected from both the Rainier Beach residents and SDOT employees helped me tailor the criteria I used to evaluate S Henderson Street.

Following the interviews, I assessed measures for best practices for designing comfortable, safe, enjoyable, and aesthetically pleasing multimodal corridors. Using assessment measures allowed me to determine the current state of the corridor and what is missing from it in terms of safety and livability. In this second phase of the study, I used a defined set of criteria to collect data

and evaluate the current state of S Henderson Street as a public space, specifically regarding the pedestrian ROW.

The first set of measures used were Jan Gehl's "12 Quality Criteria" for public space from his book *Cities for People* (2010). Gehl is a well-known Danish architect and urban design consultant whose career has focused on improving the quality of public urban life by improving shared spaces for pedestrians and cyclists. His "12 Quality Criteria" toolkit has been used by cities across the world to evaluate the quality of their public spaces (See Figure 2). The criteria include three categories: 1) Protection (protection against traffic and accidents; protection against crime and violence – feeling secure; and protection against unpleasant sensory experiences), 2) Comfort (opportunities to walk; opportunities to stand/stay; opportunities to sit; opportunities to see; opportunities to talk and listen; and opportunities for play and exercise), and 3) Delight (scale; opportunities to enjoy the positive aspects of climate; and positive sensory experiences). These three categories provided me with an almost comprehensive list with which to evaluate the pedestrian quality experience of S. Henderson Street. However, I felt that Gehl's list was missing a few important components, such as the upkeep and activation of edges and edge zones; the conduct and behavior between pedestrians, bicyclists, and those driving vehicles; and details and variation in the built form along the pedestrian ROW.

I also identified Schulze + Grassov's "Parameters for Public Spaces in Copenhagen" document as a great source for evaluating public spaces. The interdisciplinary urban planning and design firm was established by Oliver Schulze and Louise Grassov (former Gehl Institute employees) in

2013. While the criteria are similar to Gehl’s 12 Quality Criteria, there are a few additional measures that are beneficial for evaluating the quality of public spaces, primarily looking at edges and edge zones, urban conduct and behavior, and details and variation. The tables below (Tables 3 & 4) highlight similar criteria between the two documents. Each color corresponds to a comparable criterion for evaluating public space.

12 QUALITY CRITERIA				
		Good (3)	Average (2)	Poor (1)
1. Protection	a. Protection against traffic and accidents			
	b. Protection against harm by others			
	c. Protection against unpleasant sensory experience			
2. Comfort	a. Options for mobility			
	b. Options to stand and linger			
	c. Options for sitting			
	d. Options for seeing			
	e. Options for talking and listening/hearing			
	f. Options for play, exercise, and activities			
3. Enjoyment	a. Scale			
	b. Opportunities to enjoy the positive aspects of climate			
	c. Experience of aesthetic qualities and positive sensory experiences			

Table 3: Scorecard to evaluate Jan Gehl’s “12 Quality Criteria.” (Source: Gehl Institute; chart created by Kaylie Duffy).

PARAMETERS FOR PUBLIC SPACES				
Location: evaluates the physical framework of a site				
		Good (3)	Average (2)	Poor (1)
1. Context	a. Site-specific identity and character			
	b. Public space network			
	c. Public space hierarchy			
2. Physical Framework	a. Defined spaces and clear transitions			
	b. Attractive edges and edge zones			
	c. Robust and flexible layout			
3. Accessibility/Availability	a. Access for all users			
	b. Accessibility and universal design			
	c. Invitation to reside and interact			
Stimuli: evaluates the site's potential to fulfill the human need for stimuli				
		Good (3)	Average (2)	Poor (1)
1. Senses	a. Vision and hearing			
	b. Somatic senses			
	c. Attractiveness			
2. Scale	a. Human scale and speed			
	b. Urban conduct and behavior			
	c. Details and variation			
3. Interaction	a. Activity level			
	b. Interaction with other people			
	c. Sense of safety and security			

Table 4: Scorecard for Schulze + Grassov's "Parameters for Public Spaces in Copenhagen." In addition to Jan Gehl's "12 Quality Criteria," I also used the three bolded/highlighted criteria to evaluate S Henderson Street's pedestrian realm. I chose to leave out the Context categories, because they focused on larger scale networks rather than just the evaluation of a city block. I also chose to not use the "defined spaces and clear transitions" category, because it stressed the importance of arrival to a space and seemed better fitted to evaluating plazas rather than the pedestrian ROW. I also chose to leave out the "robust and flexible layout" category, because layouts change annually, and I was only able to evaluate S Henderson Street three times over the course of one week. Finally, I chose not to use the colored criteria, because they are already represented in Gehl's criteria. (Source: Schulze + Grassov; chart created by Kaylie Duffy).

With my 15 quality criteria in hand (12 from the Gehl Institute and three from Schulze + Grassov), I walked the approximately 0.68 miles of S Henderson Street from the Rainier Beach light rail station at Martin Luther King Jr. Way S to Seward Park Avenue S. I walked up and down the length of the street three times at varying times of the day and week to ensure that my

subjective results did not vary too much based on weather, personal encounters, or other inhibiting factors. Using each of my 15 criteria, I evaluated each block (both on the north and south sides of S Henderson Street) as “good,” “average,” or “poor”. The dates of my field work included:

- Tuesday, April 3rd (5-6:30pm)
- Wednesday, April 4th (9-10:30am)
- Saturday, April 7th (1-2:30pm)

The outcome of my exploratory field work provided grounds for assessment of the overall composition of the street, including how safe the infrastructure is and how comfortable a pedestrian would feel navigating it at varying times of the day. In addition, it also provided me with a sense for how often the street is used for leisure and enjoyment, or if it is just used as a transient space to get from point A to point B.

Upon completion of my field work on S Henderson Street using my 15 criteria, I converted it to a numerical format (Poor=1; Average=2; Good=3). Then, I took the average of each criterion to assign it a score, which I converted back to Poor, Average, or Good. This score helps determine how the pedestrian ROW functions on each street block and on S Henderson Street as a whole.

From this initial exploration, I used relevant literature, the Rainier Beach Neighborhood Plan Update, and my current conditions scoring to analyze and add to the neighborhood’s design visions for S Henderson Street. The literature I explored covered a variety of categories, primarily technical street design and development, elements of safe multimodal streets, benefits of safe, multimodal streets, and implementation practices for safe multimodal streets.

In addition, the 2012 Rainier Beach Neighborhood Plan update provided me with knowledge of how the residents and community envision a potential redesign of S Henderson Street and the surrounding neighborhood. I compared my evaluation of the corridor to their evaluation to see if there could be additional recommendations for improvement.

3.1 Limitations

Unfortunately, time constraints did not allow me to do a thorough qualitative approach for this research topic. While I was able to conduct five unstructured interviews with prominent Rainier Beach neighborhood residents at the onset of my study, future research should include a series of focus groups with both residents of the neighborhood and business owners and employees. Since there are two schools on the street (Rainier Beach High School and South Shore K-8), in addition to the Rainier Beach Community Center, it would also be helpful to conduct focus groups for children. Since students are a large user group of S Henderson Street, tapping into their opinions regarding how the street functions would be beneficial for improving the pedestrian infrastructure for youth.

Through my contacts at the City of Seattle, I was able to interview three employees from SDOT. They provided me with helpful information on the City's design visions for S Henderson Street, including past and future infrastructural improvement projects for pedestrians, bicyclists, public transit, and vehicles. However, time constraints meant I was not able to interview employees of King County Metro, the Department of Neighborhoods, or the Office of Planning and Community Development. Future researchers should consider conducting interviews with employees from these three entities. King County Metro could provide information on changes

to bus routes and the placement of new bus shelters, while the Department of Neighborhoods could offer information on community building initiatives and funding opportunities for neighborhood projects. Likewise, the Office of Planning and Community Development could provide data on growth patterns in Rainier Beach, design guidelines in the neighborhood, and future development projects.

Finally, if I had an additional quarter (10 weeks) to work on this project, I would have made this research project more comprehensive in terms of multimodality. Instead of just evaluating the pedestrian right-of-way and public spaces, I would have also developed criteria to evaluate public transit and bicycle infrastructure. For example, S Henderson Street currently has two designated bicycle lanes running east and west; however, the lanes are not protected. Exploring different options for protected bike lanes, including the use of bollards or planters would be a beneficial next step for this study.

CHAPTER 4. FINDINGS

4.1 Interviews

The first step of my research methods was to conduct a series of interviews with Rainier Beach residents that frequent S Henderson Street regularly and with SDOT employees that are knowledgeable about City infrastructure projects on the street. I brought a list of questions to each interview (See Tables 1 & 2); however, I conducted them in an unstructured, conversational manner. The interviews varied in length from one to three hours, during which I took notes.

The Rainier Beach residents and employees I interviewed are employees, volunteers, or representatives of the following organizations:

- o **Rainier Beach Action Coalition:** A nonprofit that works to implement the Rainier Beach Neighborhood Plan and promote a safe, thriving, sustainable community.
- o **Seattle Neighborhood Group:** A nonprofit that educates, organizes, and collaborates with residents, businesses, government entities, and other organizations to create safe communities through equitable engagement, with a focus on underserved populations.
- o **Rainier Beach Link2Lake Open Space Steering Committee:** A committee of Rainier Beach residents with a vision to create a lively, safe, and beautiful neighborhood corridor from Rainier Beach light rail station to Lake Washington. The committee is currently undergoing a community-driven process to create schematic redesigns of Be'er Sheva Park.
- o **HomeSight:** A South Seattle-based nonprofit that works to preserve and promote economically and culturally-diverse communities through affordable homeownership, business development, and community advocacy.
- o **Somali Community Services:** A Rainier Beach-based nonprofit which works for the success of Somali refugees to undergo a smooth transitional process and attain self-sustainable status in their new country.

My goal for each interview was to collect background information on how residents feel S Henderson Street is functioning and whether the corridor needs improvements. The themes from my interviews (See Table 5) informed which criteria I used to evaluate the street.

- **Desire for Improved Sidewalks and Planting Strip Upkeep**
 - Improving bicycle infrastructure is not a priority for residents; current designated bicycle lanes are adequate
 - Many yard edges and planting strips are overgrown
 - Sidewalks in some locations could be widened and improved
- **Desire for Safer Intersections**
 - Intersection of Rainier Avenue S and S Henderson Street is intimidating and dangerous to cross
 - Intersection of MLK Jr Way S and S Henderson Street is intimidating and dangerous to cross
 - Desire for a crossing gate to prevent vehicles or pedestrians from accidentally getting hit by Sound Transit light rail vehicles
 - Most drivers respect the posted speed limit due to the presence of school children
- **Desire for Better Visibility**
 - Desire for better lighting
 - However, there is a general feeling of safety along S Henderson Street
- **Desire for more Places to Stay/Linger**
 - Desire for more seating, perhaps under the shade of trees
 - Desire to further activate plaza spaces along S Henderson Street
- **Desire to Beautify and Clean the Street**
 - Desire to work with local artists to add public artwork along S Henderson Street
 - Annoyance at repeated incidents of illegal dumping and littering

Table 5: Themes from the Rainier Beach resident interviews.

The SDOT employees I interviewed included:

- **Senior Transportation Planner/Formal Associate Civil Engineer, Seattle**

Department of Transportation: Program manager of “Your Voice Your Choice: Parks & Streets.” Works with Department of Neighborhood on the Neighborhood Matching Program and serves as the SDOT liaison to the Seattle Pedestrian Advisory Board. Leads the Community Crosswalk and Painted Intersection programs.

- **Assistant Transportation Planner, Seattle Department of Transportation:** Member of SDOT's Vision Zero planning, which aims to eliminate serious injuries and fatalities as a result of traffic on our city's streets by 2030. Involved with updating SDOT's Bike Master Plan Implementation Plan, working directly with internal and external stakeholders to compile a bicycle facilities project list for implementation over the next 5 years.
- **Senior Transportation Planner, Seattle Department of Transportation:** SDOT liaison for the Seattle Bicycle Advisory Board. Manages Safe Routes to School Mini Grant Program.

My goal for each of the City of Seattle government employees was to collect information on SDOT infrastructural improvements in the next 10 years. I also sought information on other capital improvement projects in the neighborhood, in addition to King County Metro route changes and other City or County resources the community could benefit from. The themes collected from my interviews with the three SDOT employees are shown in Table 6.

- **S Henderson Street Has Had a Number of Recent Infrastructural Upgrades**
 - A Safe Routes to School project was recently completed at 53rd Ave S and S Henderson Street
 - There are painted curb extensions and wayfinding signs
 - Renton Ave S was recently repaved
 - The Chief Sealth Trail went in about 10 years ago
 - There are designated bicycle lanes on S Henderson Street running east and west
 - Flashing crosswalk signs have been added along Henderson in the past five years
- **Planned and Proposed Future Upgrades to S Henderson Street**

- In the next couple years, the Vision Zero program will reconfigure Rainier Avenue S
- There have been talks at SDOT to add green bike paint crossings over Rainier Avenue S
- King County Metro’s Route 7 will become the Rainier RapidRide Line in 2021
- In 2016, SDOT created the “S Henderson St Improvements” document, detailing three potential intersection upgrades along Henderson
 - While the design proposals have been shelved at the conceptual level, they could be revisited by SDOT at any time
- The Rainier Valley Neighborhood Greenway is currently under construction in the neighborhood
- **Seattle Has a Number of Grants & Funding Options for Neighborhood Projects**
 - Seattle has a “Your Voice, Your Choice” program which funds community projects under \$100,000
 - Seattle’s Neighborhood Street Fund funds projects between \$100,000 to \$1,000,000
 - The Seattle Department of Neighborhoods has a Neighborhood Matching Fund which provides matching dollars for neighborhood improvement, organizing, or projects that are developed and implemented by community members
- **Miscellaneous Upgrades**
 - General opinion that a unified design would better S Henderson Street (i.e. landscaping, seating, and signature lighting)
 - General opinion that the addition of a buffer between the bicycle lanes and vehicle traffic would make bicycling along S Henderson Street more accessible for all ages

Table 6: Themes from SDOT employee interviews.

4.2 Field Work

The study area ran the approximately 0.68 miles of S Henderson Street from the Rainier Beach light rail station at Martin Luther King Jr. Way S to Seward Park Ave S. Over the course of a week in April, I walked both sides of S Henderson Street three times at varying times of the day and week. I carried a clipboard with printouts of my criteria checklist, in addition to my phone

to take photos of the street. I also downloaded a decibel meter app to record noise levels on each block.

Below is a progression through the findings of the 15 criteria (12 from Gehl and three from Schulze + Grasso) for the evaluation of my study area. Each criterion is scored and explained for both S Henderson Street as a whole and for sections of the street. The street is divided into eight sections based upon land use of the adjacent parcels (i.e. commercial, residential, academic institution). While each section is not entirely one single use, they each have a predominant use. The sections are shown in white in Figure 4. Each criterion has a chart outlining how well each section of street performed on the 1-3 scale.



Figure 4: Map of S Henderson Street. The street is divided into 8 sections based on land use. (Source: Bing Maps).

The sum average of all the pedestrian ROW block scores from the three visits combined is 1.77, meaning the pedestrian ROW on S Henderson Street is performing just below average.

1. Protection against Traffic and Accidents:

1 (Poor) – No sidewalk and barrier/planting strip; chance of getting hit by a car

2 (Average) – Sidewalk, but no grassy planting strip; trees spaced out by cement strip

3 (Good) – Sidewalk and grassy planting strip

Average Score for Entire Street: 2.6 (Good)

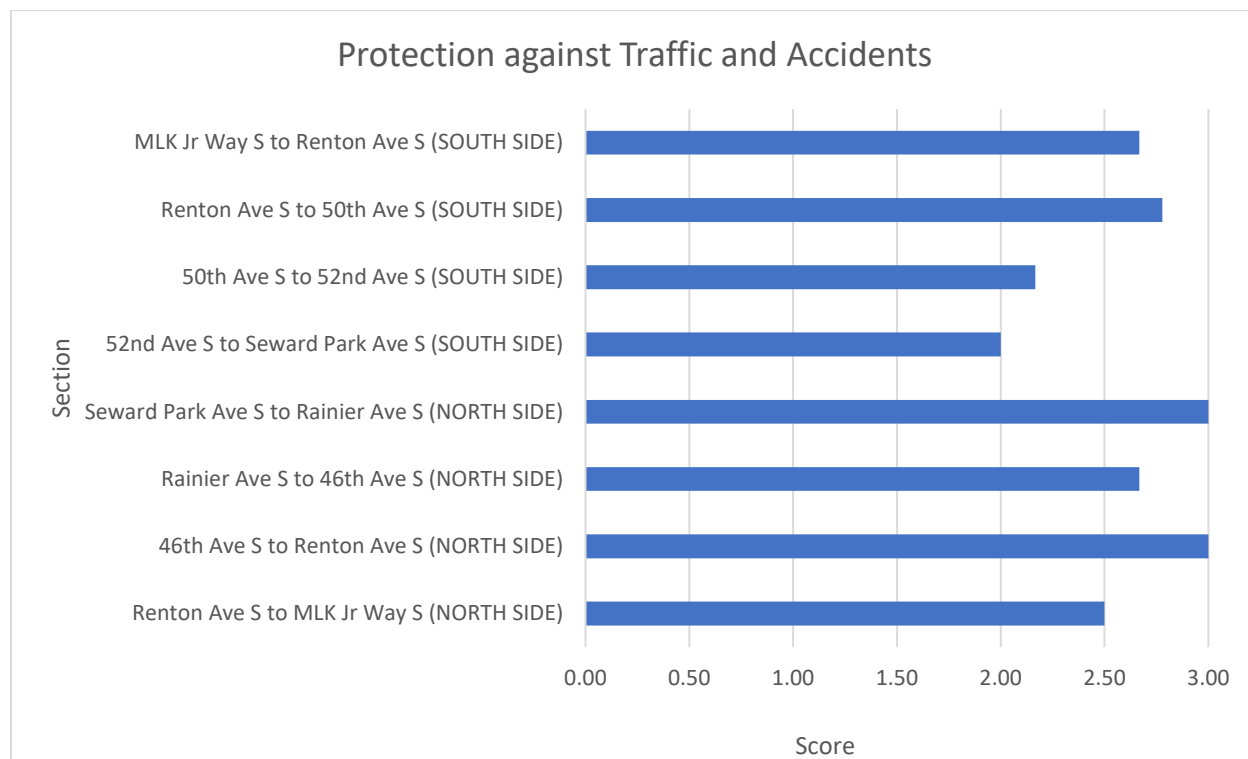


Figure 5: This chart shows how the eight sections of S Henderson Street’s pedestrian ROW performed in the "Protection against Traffic and Accidents" category. (Source: Kaylie Duffy).

Protection against traffic and accidents is one of the most important factors for pedestrian safety. Buffer zones between sidewalks and traffic (i.e. planting strips) provide both a physical and perceived sense of safety for pedestrians (Institute of Transportation Engineers, n.d., Ch.8). When there is no sidewalk or planting strip, pedestrians often feel a heightened sense of fear and anxiety. S Henderson Street as a whole received one of only two “Good” ratings in this

category, largely because all of the blocks had sidewalks and many had planter strips acting as a buffer between pedestrians and vehicles/bicyclists.



Figure 6: This stretch of pedestrian ROW is on the north side of S Henderson Street, between 52nd Ave S and Rainier Ave S. The sidewalk is 10-feet wide and is accompanied by a planting strip. (Source: Kaylie Duffy).



Figure 7: This stretch of pedestrian ROW is on the south side of S Henderson Street, between 46th Ave S and 48th Ave S. The sidewalk is separated from a parking lane by a planting strip. (Source: Kaylie Duffy).



Figure 8: The sidewalks on the north side of S Henderson Street, between 48th Ave S and 46th Ave S, are 12-feet wide and are accompanied by an extra wide planting strip. (Source: Kaylie Duffy).



Figure 9: This sidewalk is on the north side of S Henderson Street, between Renton Ave S and Chief Sealth Trail. While the sidewalk is 6-feet wide, the overgrown planting strip and yard edges make it appear smaller. (Source: Kaylie Duffy).

2. Protection against Harm by Others

1 (Poor) – No feeling of safety; no lights; a desire to leave the area immediately

2 (Average) – Comfortable enough to move through the area, but no comfortable being there after dark; some lighting

3 (Good) – Feeling completely safe; would spend time there in the daytime or nighttime; lots of street lighting

Average Score for Entire Street: 2.3 (Average)

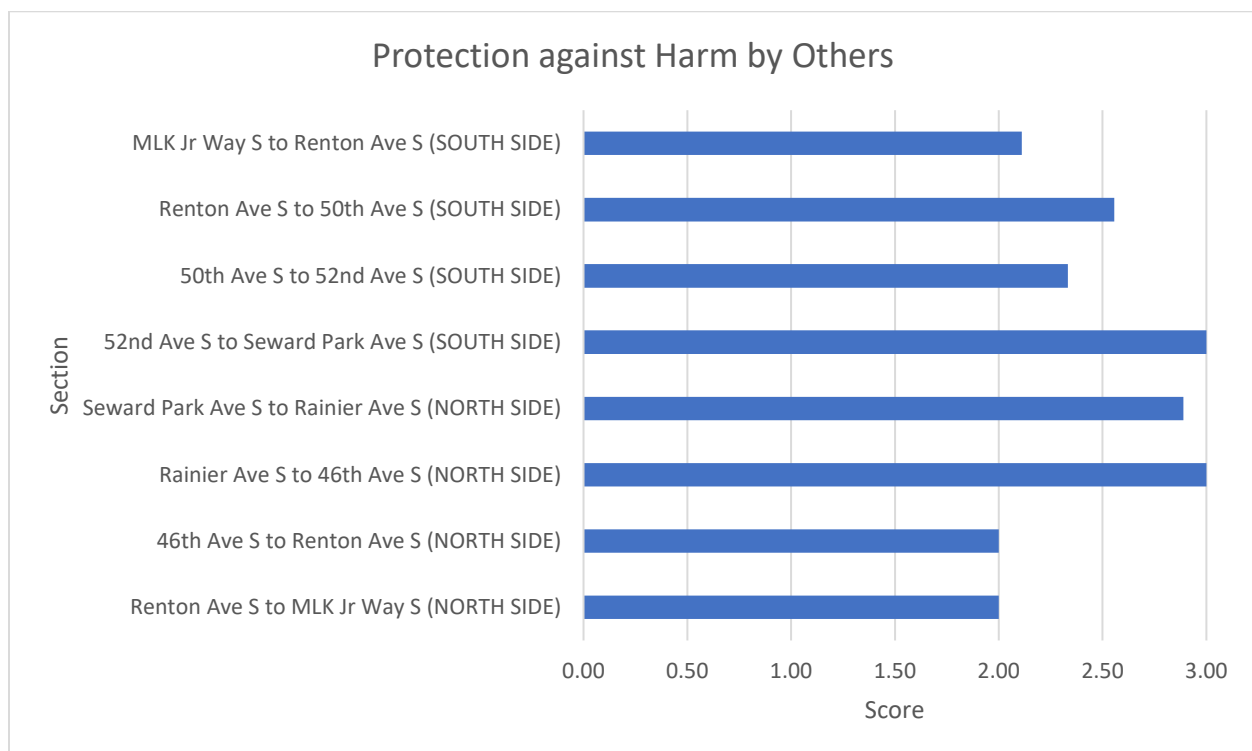


Figure 10: This chart shows how the eight sections of S Henderson Street's pedestrian ROW performed in the "Protection against Harm by Others" category. (Source: Kaylie Duffy).

A sense of safety against violence and harm by others fosters lively and enjoyable streetscapes. Reoccurring instances of physical or emotional violence in the public realm discourage residents and visitors from spending extended periods of time in the pedestrian right-of-way or in nearby parks and plazas (Gehl Architects 2013, 67). A perceived sense of safety from crime and violence also varies between daytime and nighttime.

According to the FBI's uniform crime reports for 2016, Rainier Beach has one of the highest crime rates in Seattle (Federal Bureau of Investigation, 2017). While Seattle has a rate of 6,101 crimes per 100,000 people, Rainier Beach has an estimated rate of 6,614 crimes (655 violent crimes and 5,949 property crimes) per 100,000 people. However, according to most of the residents I interviewed, Rainier Beach has become much safer in the past decade and is misunderstood by many Seattle residents that reside outside of Rainier Beach.

After visiting S Henderson Street during the morning, afternoon, and evening on varying days of the week, my composite score for protection against harm by others is "average." I did not find the street to be that intimidating, especially because there are two schools (Rainier Beach High School and South Shore K-8) and the Rainier Beach Community Center. The presence of school age children, families, and interspersed lighting made me comfortable traversing most parts of the street. However, there were a few stretches of pedestrian ROW next to chain-linked fences with barbed wire, abandoned buildings, and overgrown empty lots that made me feel a bit uneasy, especially in the evening (See Figure 12). My weekday visits in the evening and morning scored the lowest at 2.5, while my weekend afternoon visit scored the highest at 2.6.



Figure 11: Tall overhead street lights are staggered approximately every 125 to 150-feet over the length of the S Henderson Street. Shorter, more human scale lights are attached to the larger light poles in some locations. (Source: Kaylie Duffy).



Figure 12: The vacant, overgrown lot located across from South Shore K-8 is considered a blight by some community members. (Source: Kaylie Duffy).



Figure 13: Fences abutting the pedestrian ROW on the south side of S Henderson Street between Renton Ave S and 46th Ave S create an unwelcomed feeling for pedestrians. (Source: Kaylie Duffy).

3. Protection against Unpleasant Sensory Experiences

1 (Poor) – Over 85 decibels ambient noise; strong industrial or unpleasant scents; cannot understand each other

2 (Average) – Between 70-85 decibels ambient noise; having to speak up to understand each other

3 (Good) – Below 70 decibels; able to use your normal conversational voice

Average Score for Entire Street: 2.0 (Average)

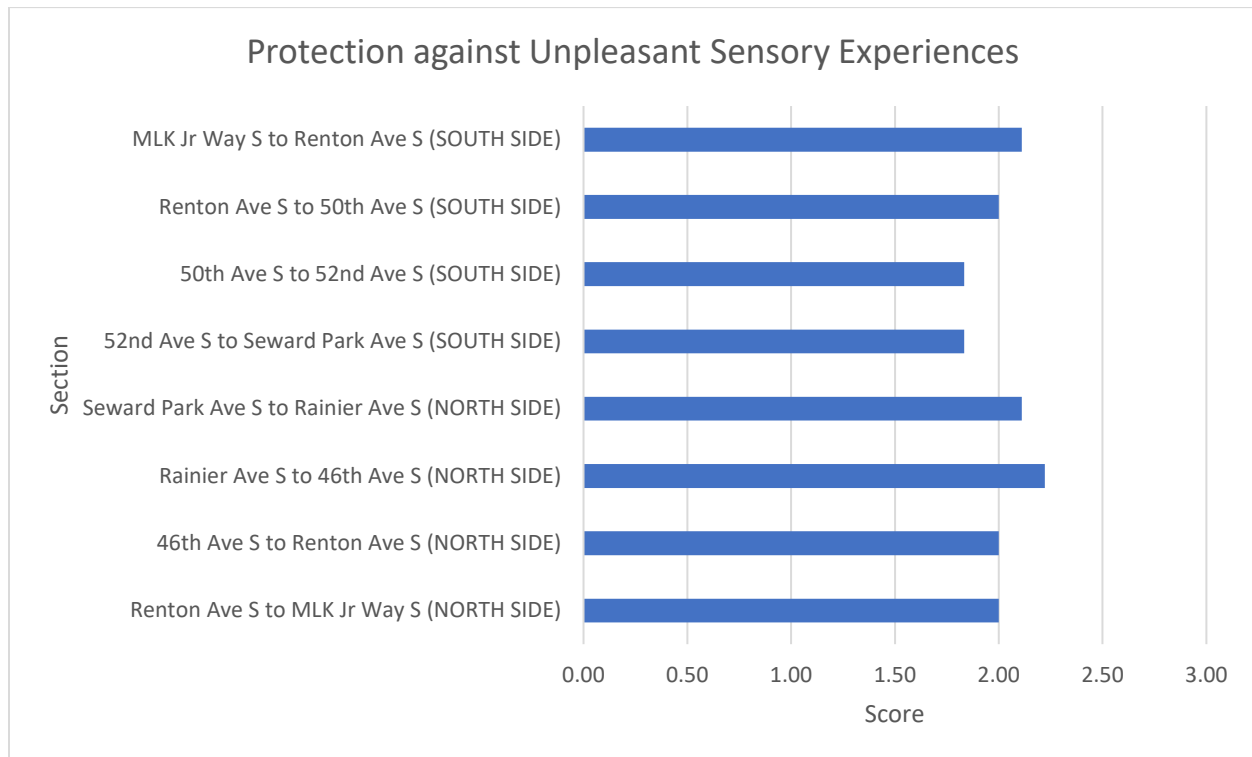


Figure 14: This chart shows how the eight sections of S Henderson Street’s pedestrian ROW performed in the "Protection against Unpleasant Sensory Experiences" category. (Source: Kaylie Duffy).

Researchers have discovered that people who are exposed to noise levels at 85 decibels or higher for extended periods of time are at a much higher risk for hearing loss. According to the National Institute on Deafness and Other Communication Disorders (NIDCD), noise-induced hearing loss (NIHL) can be caused by a one-time exposure to an intense “impulse” sound, such as an explosion, or by continuous exposure to loud sounds for extended periods of time, such as noise created at a car mechanic shop (National Institute of Deafness and Other Communication Disorders, 2018).

While normal conversation usually falls at 60 decibels, noise from heavy city traffic can reach 85 decibels. The composite score for S Henderson Street was 2.0 (average), meaning the noise

level along the pedestrian ROW usually was between 70 to 85 decibels. While this decibel range is not necessarily harmful to one's hearing, it makes it difficult to have a long conversation on or near the pedestrian ROW.



Figure 15: The intersection of S Henderson Street and Rainier Ave S. (Source: Kaylie Duffy).



Figure 16: The intersection of S Henderson Street and Rainier Ave S. (Source: Kaylie Duffy).

4. Options for Mobility

- | | |
|----------------------|---|
| 1 (Poor) | – No sidewalk provided; lack of pedestrian-oriented space |
| 2 (Average) | – Standard sidewalk space (5-6 feet) |
| 3 (Good) | – Extra wide sidewalk (6+ feet) |

Average Score for Entire Street: 2.5 (Good)

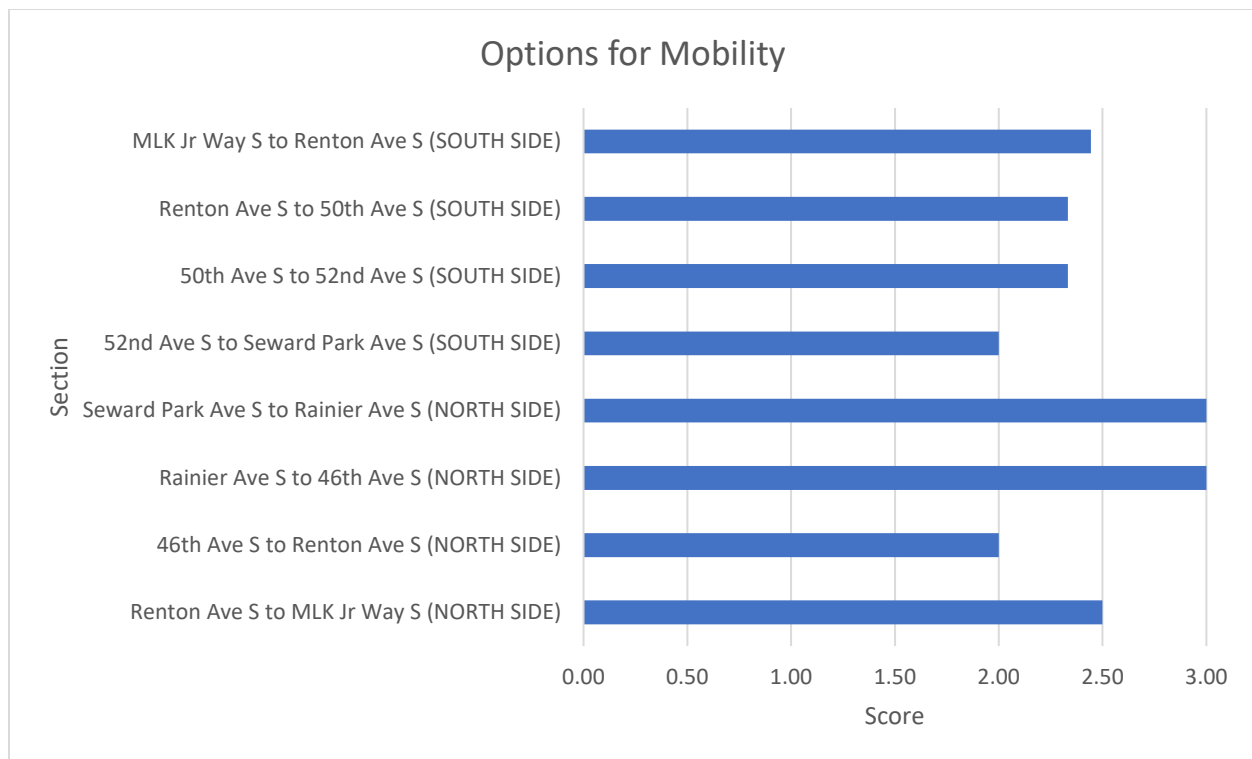


Figure 17: This chart shows how the eight sections of S Henderson Street’s pedestrian ROW performed in the "Options for Mobility" category. (Source: Kaylie Duffy).

According to the City of Seattle’s *Pedestrian Master Plan*, approximately 26 percent of blockfaces citywide are missing sidewalks (Seattle Department of Transportation, 2017). Due to limited resources, SDOT created a prioritization framework to narrow the focus of the City’s investments in an equitable way. What many property owners don’t know is that they are responsible for maintaining part of the public right-of-way next to their property, including the sidewalk and planting strip. According to Seattle Municipal Code, Title 15.72, property owners must repair cracks and other damage to the sidewalk as well as ensure that snow and ice does not pose a danger to pedestrians (Seattle Department of Transportation, 2017). This unawareness regarding owner responsibility has led to many sidewalks falling into disrepair. SDOT is currently conducting a Sidewalk Condition Assessment which evaluates Seattle’s

sidewalk conditions based on uplifts, surface conditions, obstructions, and cross slope. Figure 18 shows how SDOT ranked S Henderson Street's sidewalk conditions.



Figure 18: SDOT's evaluation of S Henderson Street's sidewalk conditions. (Source: SDOT).

Options for mobility, similar to the category of “protection from traffic and accidents,” received a “good” score. All of the blocks had sidewalks, and many of them were wider than a standard 5-foot wide sidewalk.



Figure 19: The stretch of sidewalk in front of Rainier Beach High School is about 10-feet wide and has relatively few uplifts.
(Source: Kaylie Duffy).



Figure 20: The stretch of sidewalk in front of Rainier Beach High School is about 10-feet wide and has relatively few uplifts. (Source: Kaylie Duffy).

5. Options to Stand & Linger

1 (Poor) – Narrow sidewalk and no standing/sitting/leaning space

2 (Average) – A few informal options for standing/sitting/leaning space (i.e. bollards, large rocks, fences, a façade)

3 (Good) – Many opportunities for standing/sitting/leaning, both informal and formal

Average Score for Entire Street: 2.1 (Average)

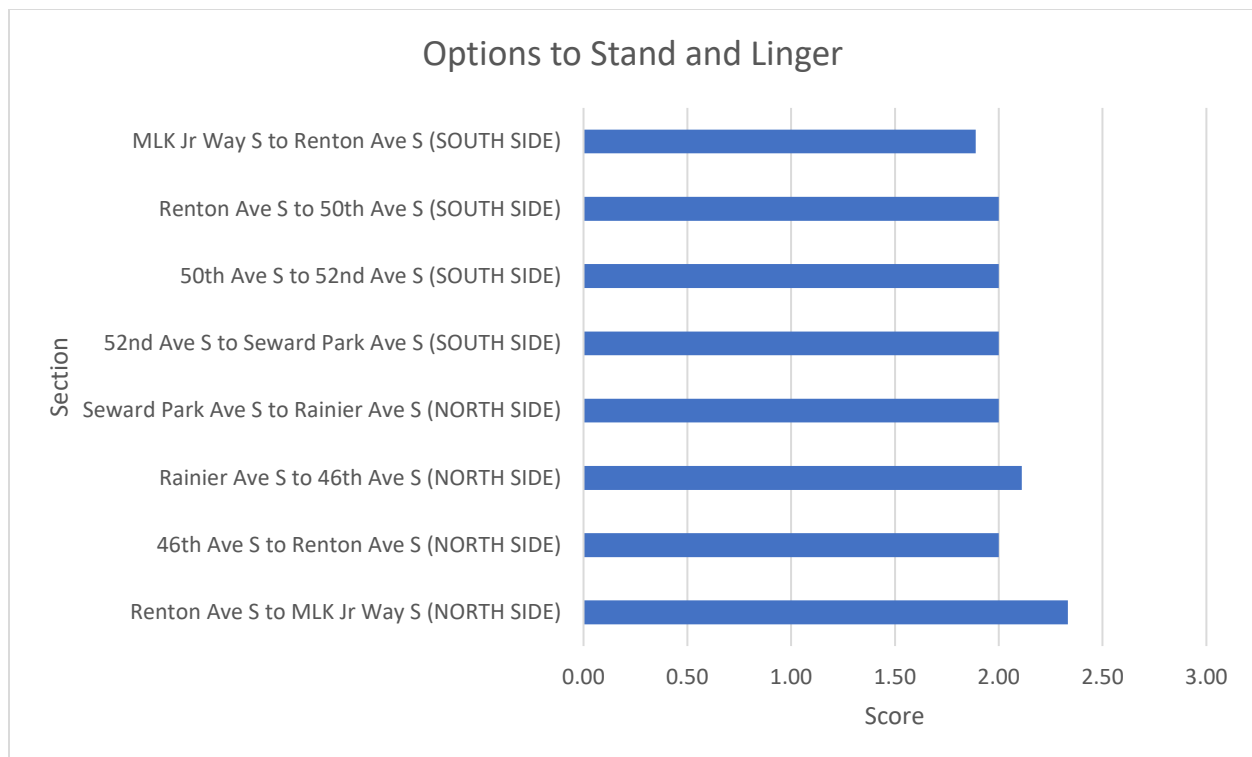


Figure 21: This chart shows how the eight sections of S Henderson Street’s pedestrian ROW performed in the "Options to Stand and Linger" category. (Source: Kaylie Duffy).

A space that has a variety of options to stand and linger, whether it be a façade, bench, or a small ledge, invites community members to enjoy the public realm. According to urban activist Jane Jacobs, more “eyes on the street” provides informal surveillance of the urban environment, thus creating safer neighborhoods (Jacobs 1961, 35). When people have greater options to stand and linger, they will have more opportunities to engage each other and develop a sense of community (Gehl 2010, 134-136).

S Henderson Street has a mix of commercial businesses, residences, and schools. The businesses are mostly clustered around the high traffic intersections at MLK Jr Way S, Renton Ave S, and Rainier Ave S. Many of the residences along the street have fences that sit right up against the pedestrian ROW, thus providing an informal opportunity to lean and linger. While

there isn't much formal seating along the street, there are a variety of informal seating/leaning objects, such as bollards, rocks, planting beds, and bike racks. Therefore, S Henderson Street received an "average" score for options to stand and linger.



Figure 22: The bollards on both sides of the Chief Sealth Trail provide places for pedestrians to lean or sit on. (Source: Kaylie Duffy).



Figure 23: The bollards in the parking lot in front of Rite Aid provide places for pedestrians to lean or sit on. (Source: Kaylie Duffy).



Figure 24: S Henderson Street has various places for leaning and standing, such as the single bike rack at the northeast corner of Renton Ave S and S Henderson Street. (Source: Kaylie Duffy).

6. Options for Sitting

1 (Poor) – No sitting space provided whether formal or informal

2 (Average) – One to two informal or formal sitting spaces (i.e. bollards, rocks, bus stops)

3 (Good) – More than two spaces for sitting whether formal or informal; welcomes all citizens

Average Score for Entire Street: 1.7



Figure 25: This chart shows how the eight sections of S Henderson Street’s pedestrian ROW performed in the "Options for Sitting" category. (Source: Kaylie Duffy).

Similar to “Options to Stand and Linger,” a variety of seating options provides opportunities to bring more eyes on the street. Community members can sit and exchange conversation for extended periods of time. Plus, frequent public seating options provide a rest from joint pain for the elderly or those with mobility issues. S Henderson Street has a few formal spots for seating (i.e. Mapes Creek Plaza, Beer Sheva Park, Rainier Beach Community Center, and the Rainier Beach Station Plaza). However, the main form of seating comes in the form of bus

shelters and informal objects, such as bollards and small ledges. There are long stretches of pedestrian ROW with no places to sit, especially in front of residences and commercial businesses. Thus, the category for seating options received an “average” score.



Figure 26: The Rainier Beach Station Plaza provides both formal and informal seating options. (Source: Kaylie Duffy).



Figure 27: King County Metro bus stops provide some of the only sheltered seating along S Henderson Street. (Source: Kaylie Duffy).



Figure 28: The Mapes Creek Plaza at 52nd Ave S and S Henderson Street provides a formal seating option for Rainier Beach residents. (Source: Kaylie Duffy).



Figure 29: Taqueria Costa Alegre is a taco bus in the strip mall parking lot across from Rainier Beach High School. Outdoor picnic benches help activate the space and provide opportunities for community interaction. (Source: Kaylie Duffy).

7. Options for Seeing

1 (Poor) – No view, nothing to see; no lighting; obstructed corridors

2 (Average) – Slightly hindered views; some lighting; normal views

3 (Good) – Reasonable viewing distances and unhindered views; interesting views; frequent lighting

Average Score for Entire Street: 2.8 (Good)

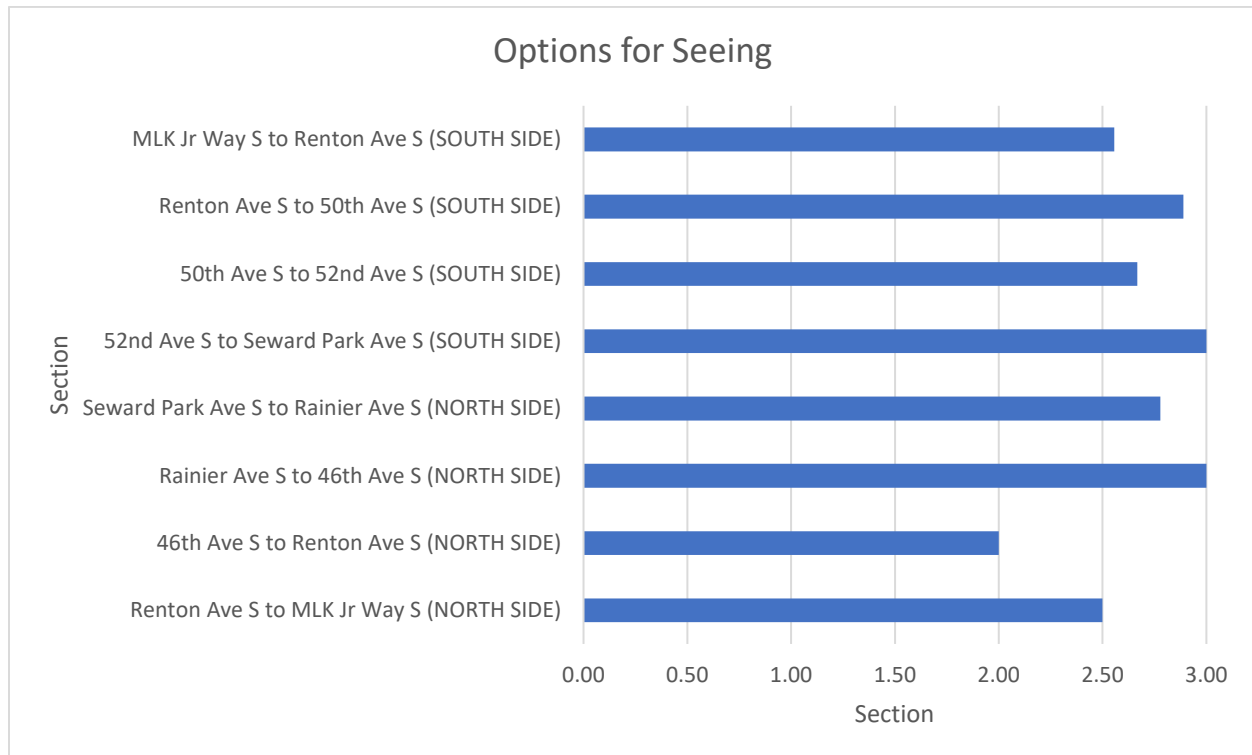


Figure 30: This chart shows how the eight sections of S Henderson Street’s pedestrian ROW performed in the "Options for Seeing" category. (Source: Kaylie Duffy).

According to Seattle’s 2012 *Pedestrian Lighting Citywide Plan*, “lighting for pedestrians is an integral part of Seattle becoming the most walkable city in the nation” (Seattle Department of Transportation, 2012). The Plan details how lighting helps pedestrians to safely navigate sidewalks and pathways; provides visibility and security at all hours; extends the hours that a business district is active; encourages walking as part of an active lifestyle; and improves access to transit and other services.

S Henderson Street has both tall overhead street lights and lower-set lighting that is more accommodating to the human scale. While the tall overhead street lights are staggered every 125 to 150-feet over the entire length of the street, the lower-set lighting isn't as frequently present. The human scale street lights are present as stand alone units in front of Rainier Beach High School, but they are mostly found attached to the tall overhead lights along the rest of the street. Due to the frequent presence of lighting, the "options for seeing" category received a "good" score.



Figure 31: There is a very clear view of the Cascade Mountain Range from the intersection of Rainier Ave S and S Henderson Street. There is also tall overhead lighting along the entire length of S Henderson Street. (Source: Kaylie Duffy).

8. Options for Talking & Listening/Hearing

1 (Poor) – High noise levels, 85 decibels or above; no furniture welcoming conversation

2 (Average) – Must raise voice to compensate for noise levels; area to have conversation, but no furniture to sit/stay and talk

3 (Good) – Low noise levels; street furniture that provides opportunities to sit/stay and talk

Average Score for Entire Street: 2.0 (Average)

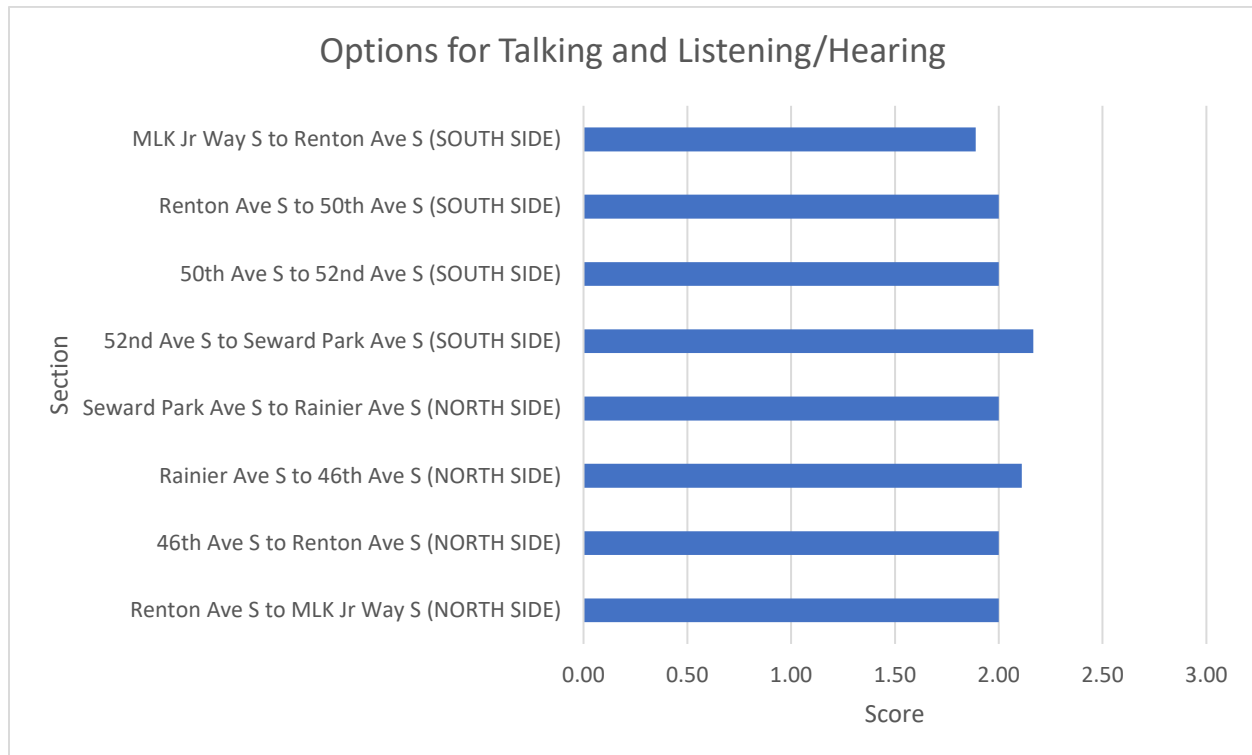


Figure 32: This chart shows how the eight sections of S Henderson Street's pedestrian ROW performed in the "Options for Talking and Listening/Hearing" category. (Source: Kaylie Duffy).

From MLK Jr way S to Rainier Ave S, S Henderson Street is designated as an Urban Village Main Street Type, meaning it is a principle arterial with high intensity retail, moderate intensity commercial and office, and low to mid-rise residential ("Seattle Streets Illustrated," 2017). Urban Village Main Streets must accommodate high rates of vehicle traffic, in addition to bicyclists, pedestrians, and public transit – thus increasing noise levels in the surrounding area.

According to the *Seattle Streets Illustrated* Street Types Map, the stretch of S Henderson Street from Rainier Ave S to Seward Park S is designated as an Urban Village Neighborhood Street Type, meaning it's located within an Urban Village but is considered a Minor or Collector Arterial. Moderate intensity retail, low intensity office, and low to mid-rise residential is often found along these streets. Urban Village Neighborhood Streets provide a transition to low volumes and speed, which was evidenced by the quieter streetscapes east of Rainier Ave S. S Henderson Street received an “average” score for this category, because noise levels tended to remain between 70-85 decibels along most of the pedestrian ROW, and street furniture was minimal.



Figure 33: The Rainier Beach Community Center provides seating close to its entrance and away from the noisy intersection of Rainier Ave S and S Henderson Street. (Source: Kaylie Duffy).



Figure 34: The Mapes Creek Plaza is a quiet place to sit and talk with plenty of bench seating for larger groups of people.
(Source: Kaylie Duffy).

9. Options for Play, Exercise & Activities

- | |
|---|
| 1 (<i>Poor</i>) – No public open space adjacent to pedestrian ROW |
| 2 (<i>Average</i>) – Areas for informal exercise; grassy areas adjacent to pedestrian ROW |
| 3 (<i>Good</i>) – Provided area for exercise, playfields, or spaces for performance |

Average Score for Entire Street: 1.7 (Average)

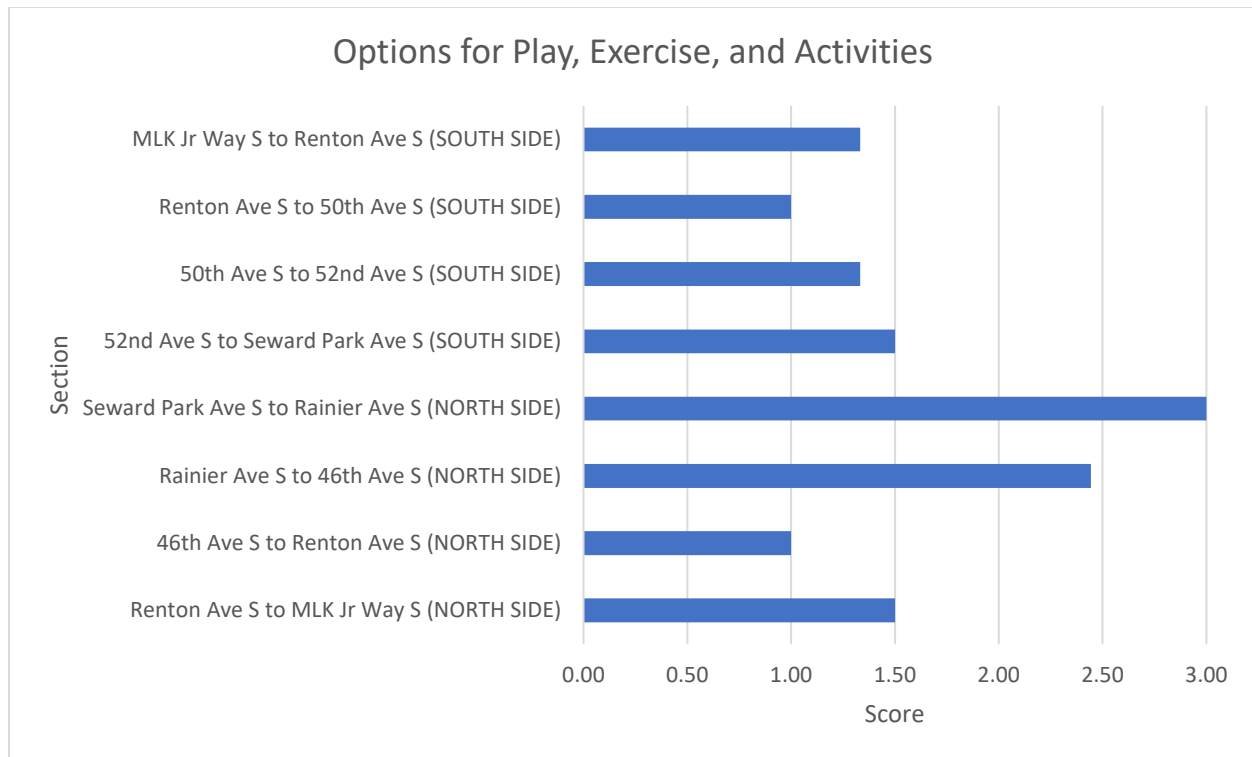


Figure 35: This chart shows how the eight sections of S Henderson Street's pedestrian ROW performed in the "Options for Play, Exercise, and Activities" category. (Source: Kaylie Duffy).

According to Gehl, the invitation to people to express themselves, play, and exercise in a city space is an important aspect of creating lively, healthy cities (Gehl, 2010). Because there is only one park directly adjacent to S Henderson Street, I chose to evaluate whether there was informal/formal open space adjacent to the pedestrian ROW, which could be used by children to play games or for adults to stretch and/or exercise.

Beer Sheva Park is located just east of S Henderson Street and features waterfront views, a children's play area, picnic tables, and restrooms. However, the rest of S Henderson Street is devoid of parks and green spaces, aside from those found in front of schools, near the Chief Sealth Trail, and the Rainier Beach Community Center. Many of the residential properties have

fences directly abutting the pedestrian ROW, therefore the options for play, exercise, and activities criterion received an “average” score.



Figure 36: Beer Sheva Park, located on the eastern end of S Henderson Street, has a children's play area, picnic tables, abundance of open space, and restrooms. (Source: Kaylie Duffy).



Figure 37: There is grassy open space in front of Rainier Beach High School at the northwest corner of Seward Park Ave S and S Henderson Street. (Source: Kaylie Duffy).



Figure 38: There is abundant, grassy open space along the Chief Sealth Trail. (Source: Kaylie Duffy).

10. Scale

1 (Poor) – Completely transit orientated spaces (i.e. large parking lots in front of buildings); not human scale

2 (Average) – Integration of some mid and low-rise buildings; perhaps have unwelcoming, blank walls; some inactivated spaces; series of fences abutting pedestrian ROW

3 (Good) – Buildings and spaces designed to human scale throughout area

Average Score for Entire Street: 1.7 (Average)

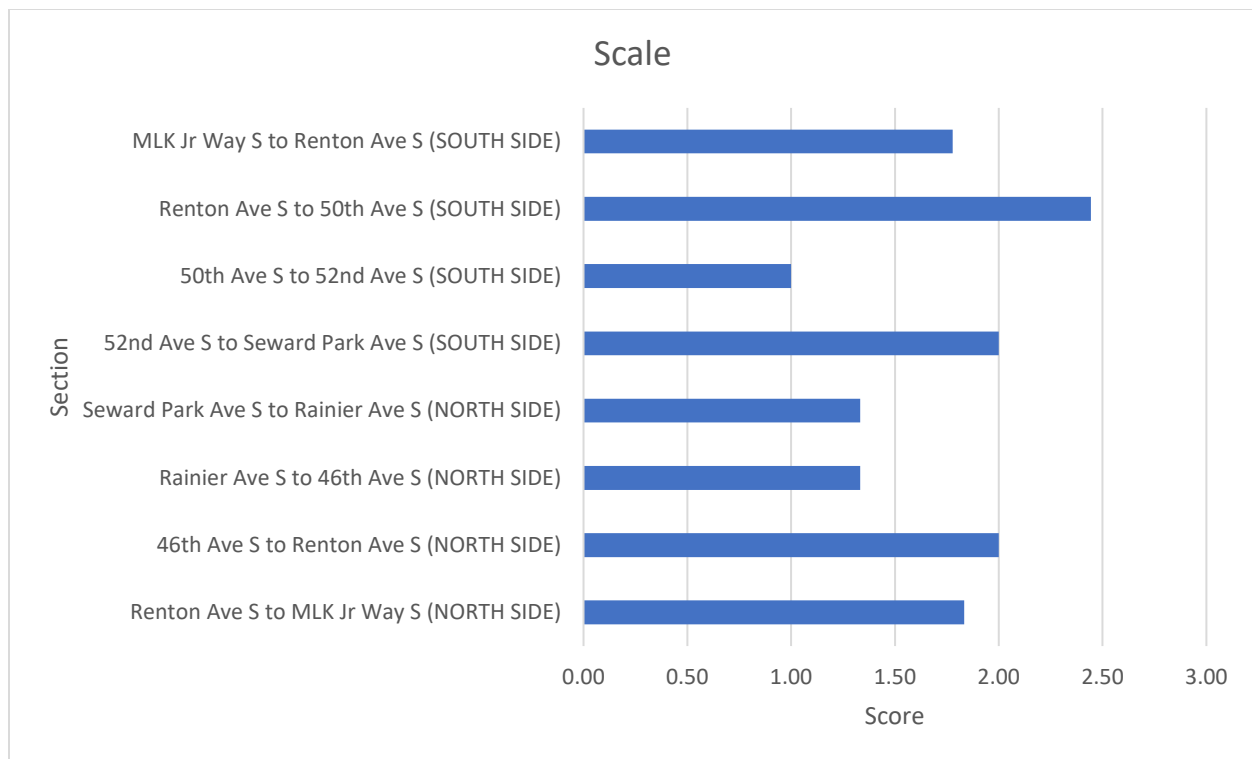


Figure 39: This chart shows how the eight sections of S Henderson Street’s pedestrian ROW performed in the "Scale" category. (Source: Kaylie Duffy).

According to the nonprofit Project for Public Spaces, the “human scale” can be defined in a few ways. In its simplest definition, “creating a human scale environment means making sure that the objects that we interact with every day are of a size and shape that is reasonable for an average person to use” (Burke, 2016). However, the human scale can also mean how individuals perceive a city, and each community perceives the human scale differently. For example, a 10-story building may be perceived as human scale in downtown Seattle, while along S Henderson Street, it may be perceived as monumental.

Gehl explains that tall buildings create a disconnect between street life and those residing on the higher stories (Gehl 2010, 42). Above five stories, details cannot be seen, and people on the ground cannot be recognized nor contacted. Seattle’s Generalized Zoning Map (See Figure 40)

shows that S Henderson Street is a mix of low rise, neighborhood commercial, and single family homes (Seattle Department of Construction & Inspections, 2017). Many of the homes and apartment buildings along the street are no higher than two stories. In fact, the largest buildings along the Street are South Shore K-8, the Rainier Beach Community Center, and Rainier Beach High School.

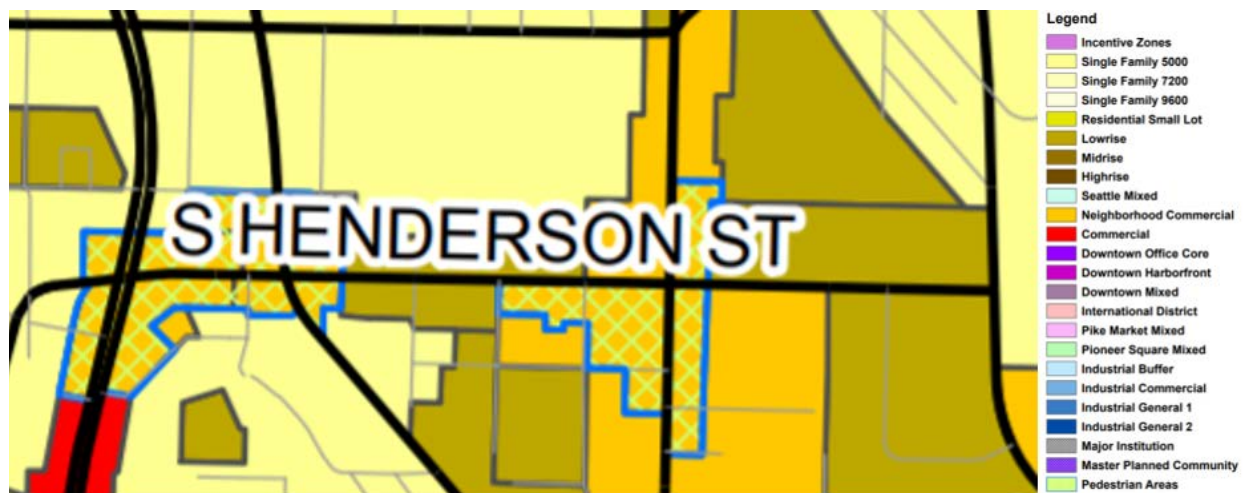


Figure 40: Seattle's Generalized Zoning Map. (Source: Seattle Department of Construction & Inspections).

While many of the buildings along S Henderson Street are lowrise, many are not welcoming to passersby. Many residential properties have fences abutting the pedestrian ROW, which feels unwelcoming to passersby. Further, large parking in front of the commercial and academic establishments along the street are not perceived as human scale. Particularly, the strip mall parking lot at the southeast corner of Rainier Ave S and S Henderson Street is not only dangerous to traverse, but it is also unattractive to look at.



Figure 41: Fences line many of the residential properties along S Henderson Street. (Source: Kaylie Duffy).



Figure 42: The large parking lot in front of the strip mall at the southeast corner of Rainier Ave S and S Henderson Street is not conducive to the human scale. (Source: Kaylie Duffy).

Finally, there are a few parcels along S Henderson Street that are vacant or have boarded up buildings. For example, the Seattle Housing Authority owns two parcels of land at the corner of S Henderson Street and 50th Ave S which have been vacant for years. In addition, the northern block of S Henderson Street between Renton Ave S and 46th Ave S is also home to an empty, fenced off lot and boarded up buildings. The lack of activation and empty, fenced off,

overgrown spaces are unappealing to the human eye. Due to the large amount of fencing, vast parking lots, and overgrown lots, S Henderson Street received an “average” rating for scale.



Figure 43: The vacant apartment building on the north side of S Henderson Street, between 46th Ave S and Renton Ave S is unwelcoming and inactivated. (Source: Kaylie Duffy).



Figure 44: The empty lot on the north side of S Henderson Street between 46th Ave S and Renton Ave S is fenced off from the public. (Source: Kaylie Duffy).

11. Opportunities to Enjoy the Positive Aspects of Climate

1 (Poor) – No shelter to provide reprieve from negative aspects of climate

2 (Average) – Informal shelter (i.e. building awning)

3 (Good) – Provided shelter (i.e. park shelter, bus shelter, etc.)

Average Score for Entire Street: 1.6 (Average)

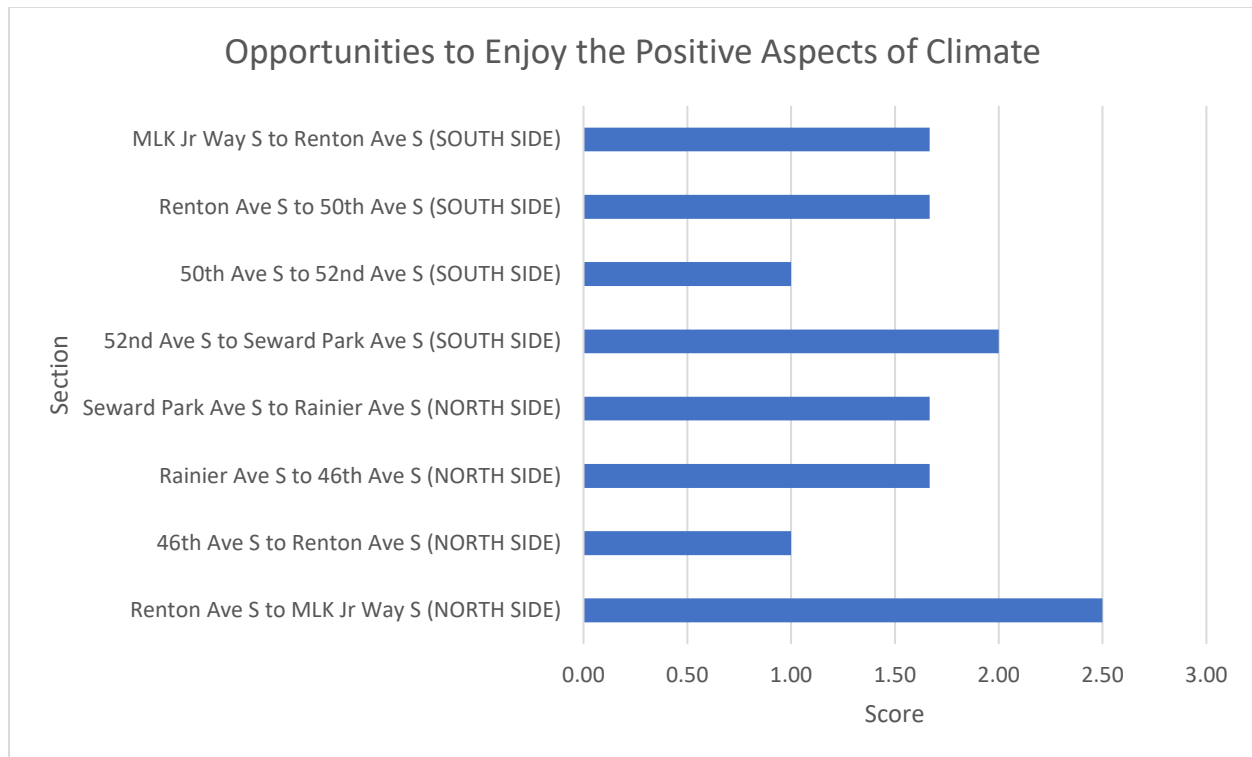


Figure 45: This chart shows how the eight sections of S Henderson Street’s pedestrian ROW performed in the "Opportunities to Enjoy the Positive Aspects of Climate" category. (Source: Kaylie Duffy).

Gehl believes that weather is one of the most important criteria for assuring the ease of people’s movement in cities (Gehl 2010, 168). He explains that it’s important to provide shade from heat and shelter from inclement weather. Shelter could come in the form of an awning, niche in a building wall, or a bus shelter. S Henderson Street does not offer much protection from inclement weather, because many of the commercial businesses are separated from the pedestrian ROW by parking lots or don’t have awnings. The main source of protection from precipitation or intense heat along S Henderson Street are bus shelters. In fact, I sought shelter under various bus stop shelters a few times during my visits to Rainier Beach. Spring weather in Seattle is often unpredictable, and it is nice to have shelter options when caught in an

unexpected downpour. S Henderson Street received an “average” score for this category due to its lack of awnings and shelters, aside from at bus stops.



Figure 46: Bus stops, such as the one at northeast corner of S Henderson St & Rainier Ave S, provide shelter from inclement weather. (Source: Kaylie Duffy).



Figure 47: Building awnings, such as the one at the northwest corner of Renton Ave S and S Henderson Street, provide shelter from inclement weather. (Source: Kaylie Duffy).

12. Experience of Aesthetic Qualities & Positive Sensory Experiences

1 (Poor) – No trees, plants, or water; poor design and detailing; no views

2 (Average) – Designed thoughtfully but lack of detail and/or lack of interesting views

3 (Good) – Good design and detailing; fine views; separation from traffic; a sense of the natural world

Average Score for Entire Street: 1.8 (Average)



Figure 48: This chart shows how the eight sections of S Henderson Street’s pedestrian ROW performed in the "Experience of Aesthetic Qualities and Positive Sensory Experiences" category. (Source: Kaylie Duffy).

The aesthetic qualities of the pedestrian ROW and adjacent buildings and open space directly affect how long people want to spend time in the public realm. Gehl believes that “beautiful space, carefully planned details, and genuine materials provide valuable experiences on their own merits and as a valuable extra layer to the other qualities the city has to offer” (Gehl 2010,

178). For this category I chose to evaluate whether the pedestrian realm had attractive trees and landscaping and good views.

S Henderson Street has very little elevation change. The elevation at Seward Ave S and S Henderson Street is 27-feet, while the elevation at MLK Jr Way S and S Henderson Street is 63-feet. Due to the small elevation change, one can see the Cascade Range from MLK Jr Way S. The straight east to west layout of S Henderson Street makes for a pleasant view corridor.

Unfortunately, the landscaping along the corridor is often lacking appropriate maintenance.

While most blockfaces have planting strips with trees, some have been overgrown by weeds or are littered with trash. While the pedestrian ROW and planting strips appear to have been designed thoughtfully, the lack of ownership and maintenance in a few areas has earned this category an “average” score.



Figure 49: Some of the planting strips and trees/vegetation along S Henderson Street are not well maintained. (Source: Kaylie Duffy).



Figure 50: Some of the planting strips along S Henderson Street are unmaintained. (Source: Kaylie Duffy).

13. Attractive Edges & Edge Zones

1 (Poor) – Has no animated building edge; edge provides no opportunities for interaction; perhaps buildings are separated from pedestrian ROW by a large parking lot; zones are unkempt

2 (Average) – Has edges that allow for interaction but are unkempt; edge zone of transition is not legible; tidy yard but fenced off from pedestrian ROW

3 (Good) – Has attractive edges and building facades with ground floors that provide the possibility for interaction and transparency; legible and activated edge zones of transition between public and private space

Average Score for Entire Street: 1.4 (Poor)

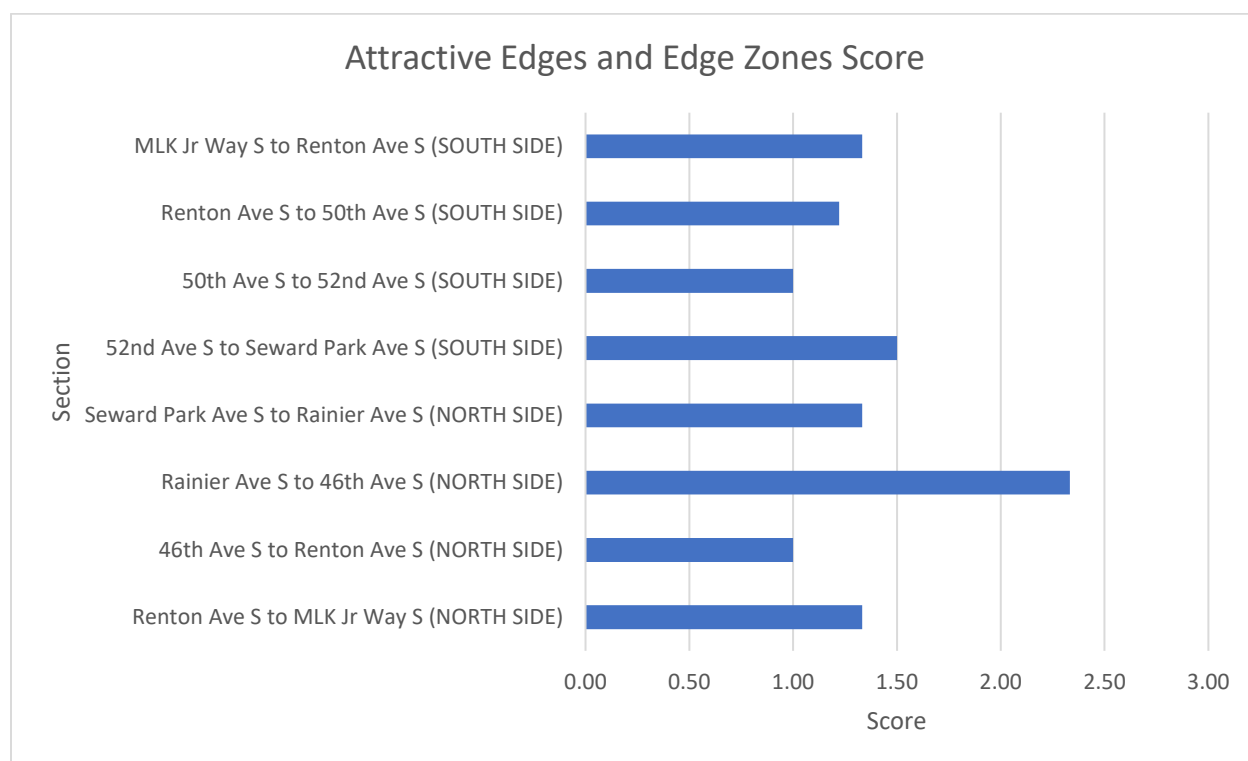


Figure 51: This chart shows how the eight sections of S Henderson Street’s pedestrian ROW performed in the "Attractive Edges and Edge Zones" category. (Source: Kaylie Duffy).

According to Schulze + Grasso, “efforts towards creating opportunities and space for the ground floor to take advantage of the transition zone between the building and the sidewalk, allows the ground floor to be animated and activated” (Schulze + Grasso, 2014). The firm

explains that successful streets will have attractive edges and building facades with ground floors that provide the possibility for interaction and transparency. This could come in the form of outdoor cafes and seating or storefronts that display their wares adjacent to the pedestrian ROW. S Henderson Street has almost no activated edge zones. While some of the edge zones were well maintained (i.e. mowed and landscaped), there was no public seating or opportunities to linger or shop. I realize this may have been a reflection of the time of year that I visited the street, as it was raining many of the times I visited Rainier Beach; however, the large parking lots separating a few of the businesses prevented any edge zone activation. For these reasons, S Henderson Street received a “poor” score for this criterion.



Figure 52: The edge zone on the north side of S Henderson Street between Renton Ave S and Chief Sealth Trail is overgrown and unmaintained. (Source: Kaylie Duffy).



Figure 53: There is no physical barrier between the strip mall parking lot at the southeast corner of Rainier Ave S and S Henderson Street and the sidewalk. (Source: Kaylie Duffy).



Figure 54: The edge zone in front of a vacant lot on the north side of S Henderson Street, between Renton Ave S and Chief Sealth Trail, is overgrown and unmaintained. (Source: Kaylie Duffy).

14. Urban Conduct & Behavior

1 (Poor) – Layout does not encourage interaction between users; does not invite good urban behavior (i.e. bicyclists/cars don't stop to let pedestrians cross streets in designated crosswalks); no sense of ownership or respect/negotiation

2 (Average) – Layout encourages some interaction between users; invites good urban behavior, such as respect and negotiation, but responsibility and ownership may be lacking

3 (Good) – Invites good urban behavior (i.e. bicyclists/cars allowing pedestrians to cross street at designated crosswalks), including responsibility and ownership and respect and negotiation, rather than conflict and aggression; layout encourages and ensures interaction between users

Average Score for Entire Street: 2.1 (Average)

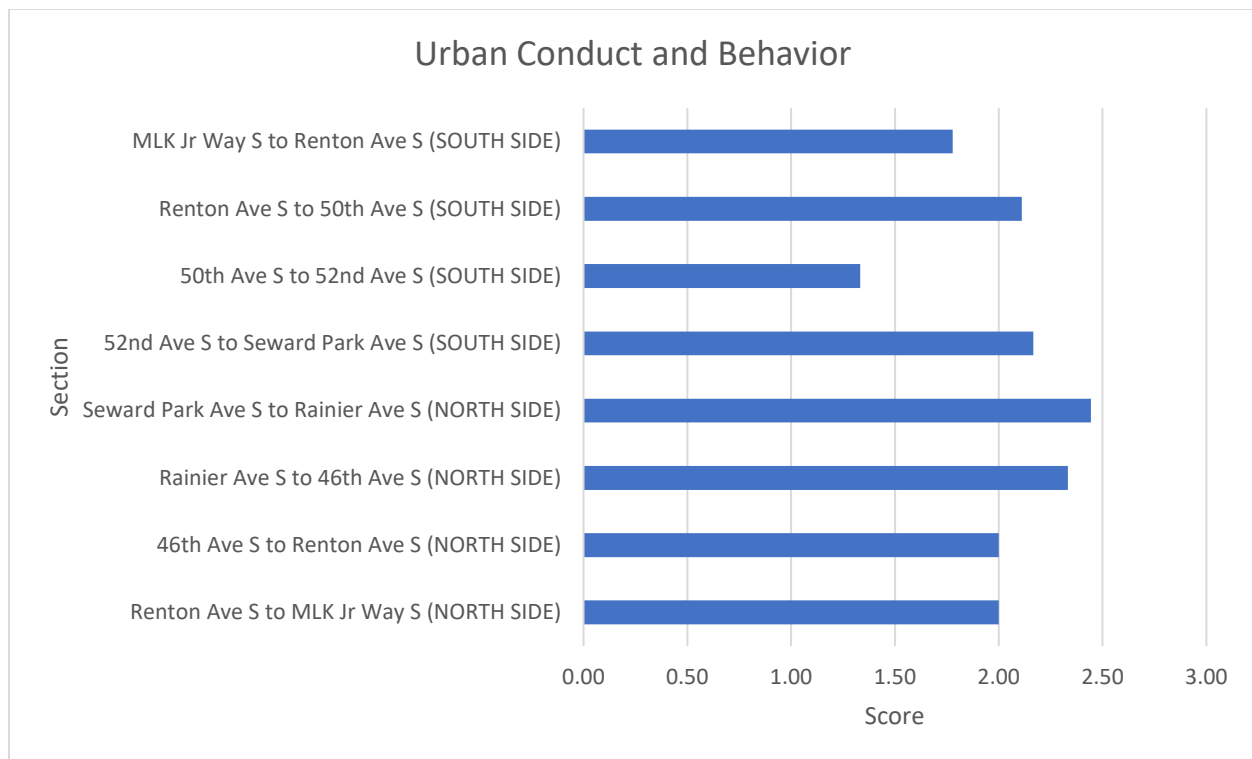


Figure 55: This chart shows how the eight sections of S Henderson Street’s pedestrian ROW performed in the "Urban Conduct and Behavior" category. (Source: Kaylie Duffy).

All the Rainier Beach residents that I interviewed explained that drivers tend to obey the posted speed limits due to the large number of students in the area. The sense of community and concern for the safety of children has created a feeling of respect and vigilance while driving on the street. In fact, the community has voiced their concerns for increased pedestrian safety, and the SDOT has listened. Within the last five years, a series of upgrades have been made on the street, most notable are a few corner and mid-block crosswalks with flashing lights to alert drivers of pedestrians crossing.



Figure 56: A flashing crosswalk sign hangs above the pedestrian crosswalk at 52nd Ave S and S Henderson Street. (Source: Kaylie Duffy).



Figure 57: A pedestrian crosswalk with optional flashing lights is located at the intersection of 50th Ave S and S Henderson Street. (Source: Kaylie Duffy).



Figure 58: The intersection of 46th Ave S and S Henderson Street has a pedestrian crosswalk with optional flashing lights. (Source: Kaylie Duffy).



Figure 59: In 2016, SDOT finished construction on a Safe Routes to Schools project by installing a painted curb bulb at S Henderson St and 53rd Ave S near the Rainier Beach High School. (Source: Kaylie Duffy).

The street also has two designated bicycle lanes running east and west along S Henderson Street, which at points transition into sharrows. There is also a Neighborhood Greenway that cuts over S Henderson Street at 46th Ave S. Neighborhood Greenways are safer, calm residential streets, designed to improve safety, keep speeds low, and help people cross busy streets. Although I didn't see many people biking on S Henderson Street during my visits, the well-marked bicycle paths and sharrows appear to make bicycling a safe activity in the neighborhood.

The largest complaint I received from my Rainier Beach interviewees regarding urban conduct and behavior was about how drivers conduct themselves at major intersections along S Henderson Street, particularly at MLK Jr Way S and Rainier Ave S. I agree that these intersections are unsafe for pedestrians and bicyclists, as I was almost hit twice during my visits by vehicles trying to make right turns onto Rainier Ave S when I was crossing the street as a pedestrian. In fact, the safety concerns of residents prompted SDOT to produce three design improvement scenarios along S Henderson Street as part of the 2016 *Levy to Move Seattle (S Henderson St Improvements, 2016)*. In November 2015, voters approved the 9-year, \$930 million levy to improve safety for all travelers, maintain streets and bridges, and invest in reliable, affordable travel options for a growing city.

The S Henderson Street improvement scenarios were submitted to the Neighborhood Street Fund program, a collaboration between the Seattle Department of Neighborhoods' District Neighborhood Councils and SDOT. The projects totaled \$1,293,060 and were focused on redesigning three portions of the street: A) S Henderson Street and Rainier Ave S, B) S Henderson Street and 52nd Ave S, and C) S Henderson Street between MLK Jr Way S and Rainier Ave S (See Figure 60). Unfortunately, the S Henderson Street improvement scenarios were not selected for funding. However, the committee selected them as a project to fill in if any project funds become available, either because projects come in under budget or if other projects become unfeasible or funded elsewhere.

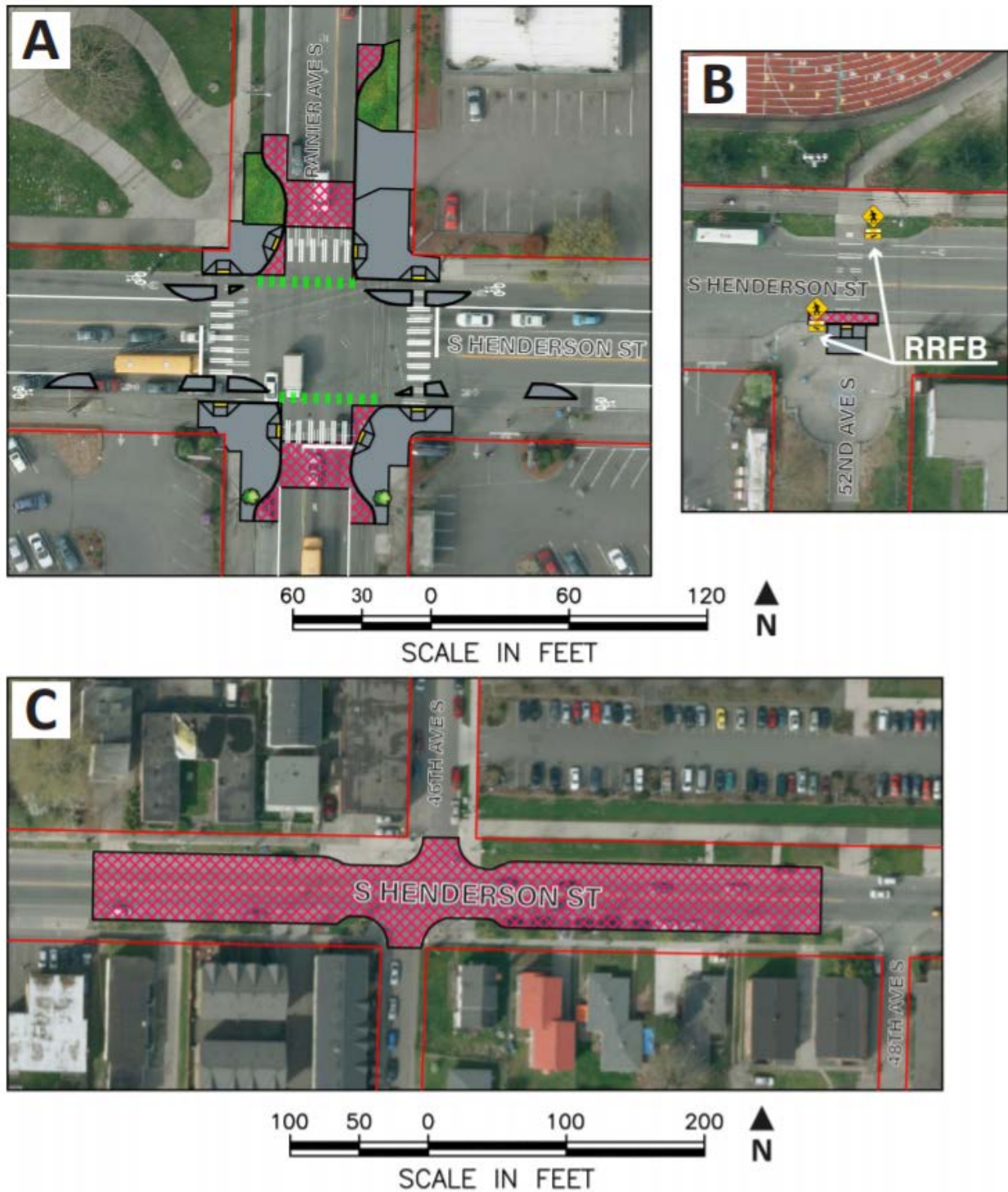


Figure 60: SDOT's S Henderson Street improvement concepts. (Source: SDOT).

Although SDOT has made a few upgrades to S Henderson Street, such as the designated bicycle lanes and upgraded crosswalks with flashing lights, they still could implement safety

improvements to the street’s high traffic intersections (i.e. Rainier Ave S, MLK Jr Way S, and Renton Ave S). For these reasons, the category for urban conduct and behavior received an “average” score.

15. Details & Variation

1 (Poor) – Has low level of detail in facades, materials, and street furniture; buildings look unkempt or decrepit; has no adapted rhythms in the façade (i.e. no variations every 20 to 60 feet); vacant, unkempt lots; no street furniture

2 (Average) – Has an average level of detail in facades, materials, and street furniture; perhaps there is a high level of detail in facades but no level of detail in street furniture and other materials; has adapted rhythms in the façade every 60 to 80 feet; perhaps no buildings present but has high level of detail in landscaping

3 (Good) – Has a high level of detail in facades, materials, and street furniture; has adapted rhythms in the façade (i.e. variations every 20 to 60 feet)

Average Score for Entire Street: 1.4 (Poor)



Figure 61: This chart shows how the eight sections of S Henderson Street’s pedestrian ROW performed in the "Experience of Aesthetic Qualities and Positive Sensory Experiences" category. (Source: Kaylie Duffy).

According to Schulze + Grasso, “A good building edge is one that feels interesting to move alongside. It does not interfere with our route but stimulates us through variation and details that increases its attractiveness” (Schulze + Grasso, 2014). The firm believes cities should be experienced through the human scale and that human individuals should be stimulated while moving through the urban realm. Unfortunately, S Henderson Street does not feature a high level of façade detail and has almost no street furniture. While the homes and some of the apartment buildings feature varying types of materials, a few of them are not well maintained or have overgrown yards.

While some of the larger structures on S Henderson Street, such as South Shore K-8 and the recently remodeled (2013) Rainier Beach Community Center, feature a variety of materials and good attention to detail, other large buildings have repetitious detail and little variation. For example, the strip mall at the southeast corner of S Henderson Street and Rainier Ave S has the same material used on the façade of every store (See Figure 42), and the large Lake Washington Apartments complex features repetitive façade design (See Figure 62).



Figure 62: The Lake Washington Apartments complex across from Rainier Beach High School has well maintained landscaping; however, the building design features little variation. (Source: Kaylie Duffy).

Due to the low level of detail in facades, materials, and street furniture, S Henderson Street received a “poor” score in this category.

CHAPTER 5. RECOMMENDATIONS

When the collective scores from all three visits to S Henderson Street were averaged, the corridor received a score of 1.77—just below average. The score indicates that the street is not performing well for pedestrians. While some criteria were evaluated using my subjective feelings (e.g. protection against harm by others), others were based on resources that are physically present (e.g. protection against traffic and accidents). From this initial exploration, I used relevant literature, the 2012 Rainier Beach Neighborhood Plan Update, and my current conditions scoring to analyze and add to the neighborhood’s design visions for S Henderson Street.

The 2012 Rainier Beach Neighborhood Plan Update articulates key priorities and strategies, developed by the community, for the future growth and development of the neighborhood. The document’s vision clearly outlines the desire for improved infrastructure, open space, and community gathering spaces.

Rainier Beach is rich with cultural and physical resources. It has a thriving and interconnected community that contains a rich mix of households including minority and immigrant residents. The community is supported by strong social and cultural institutions and services that provide stability during changing times. The neighborhood

provides access to resources necessary for people to live a healthy life. The neighborhood's parks, open spaces, roads, and other physical assets are in good condition and provide for a healthy community (2012, 7).

With this community-developed vision in mind, I have developed a series of six recommendations to create a more comfortable, safer, enjoyable, and aesthetically pleasing pedestrian realm on S Henderson Street.

5.1 Rainier Ave S & S Henderson Street Intersection Upgrade

S Henderson Street has sidewalks along every north and south block, making the pedestrian ROW very safe. However, some of its intersections are intimidating for pedestrians to cross. I felt particularly unsafe crossing Rainier Ave S. In fact, I was almost hit twice at this intersection by vehicles trying to make a quick right turn from S Henderson Street onto Rainier Ave S. Every community member I interviewed remarked that this intersection needs upgrades to improve safety and the pedestrian experience. In addition, the 2012 Rainier Beach Neighborhood Plan Update prioritizes the improvement of this intersection through a focused and comprehensive effort. The 2017 Seattle Pedestrian Master Plan also highlighted S Henderson Street as a “Priority Investment Network” (PIN). The PIN is comprised of streets that serve as key pedestrian routes to kindergarten through 12th grade public schools and frequent transit stops. Schools and transit stops are among the most important pedestrian destinations in Seattle, and the Pedestrian Master Plan aims to prioritize funding to improve conditions along-the-roadway and crossing-the-roadway to the streets within this network (Seattle Department of Transportation, 2017).

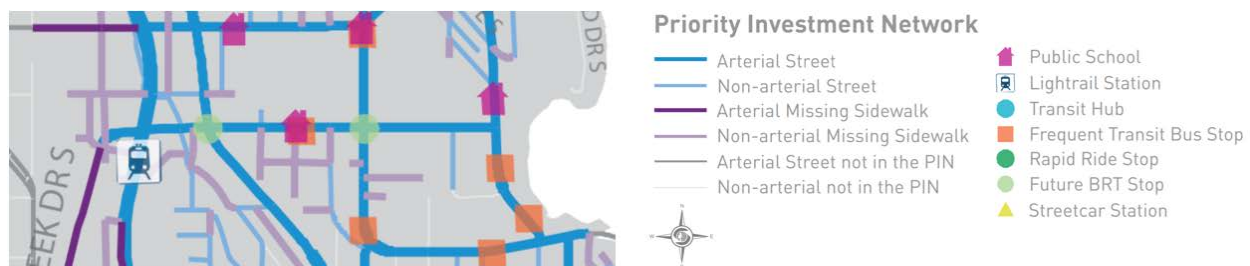


Figure 63: The 2017 Seattle Pedestrian Master Plan lists S Henderson Street as part of its Priority Investment Network. (Source: 2017 Seattle Pedestrian Master Plan).

SDOT’s “Vision Zero” plan has the aggressive goal to eliminate deaths and serious injuries on Seattle streets by 2030. In September 2016, SDOT released its “City of Seattle Bicycle and Pedestrian Safety Analysis” as part of Vision Zero. The analysis highlighted the intersection of Rainier Ave S and S Henderson Street as a ‘hot spot’ for bicycle and pedestrian crashes (Seattle Department of Transportation, 2016).



Figure 64: This map from the Seattle Bicycle and Pedestrian Safety Analysis shows that the Intersection of Rainier & Henderson is in the top 20% of roadways that need safety upgrades. (Source: SDOT).

It is obvious from my interview with both Rainier Beach residents and SDOT employees that the intersection of Rainier Ave S and S Henderson Street needs safety upgrades. The applicant solution section of SDOT’s 2016 “S Henderson St Improvements” document proposes raised crosswalks along all sides of the intersection to increase the safety and comfort of people

crossing the street. In addition, raised crosswalks also help enforce the speed limit for vehicles that are turning. I absolutely agree that raised crosswalks would benefit the neighborhood and slow down vehicles trying to make right turns; however, there are many Metro trolley buses that run through this intersection, and the trolleys are not compatible with raised crosswalks.

Instead, SDOT proposed a conceptual design for a protected intersection which would only be possible if Rainier Ave S is rechannelized from five lanes down to three. As part of Vision Zero, SDOT actually launched the Rainier Ave S Corridor Improvements Project in 2014 to review safety conditions along Rainier Ave S between S Alaska Street and S Henderson Street. They completed Phase 1 of this project in 2015 by redesigning Rainier Ave S between S Alaska Street and S Kenny Street to have three lanes instead of the original four. SDOT is planning to start construction on Phase 2 between S Kenny Street and S Henderson Street as soon as fall 2018. Through the design, SDOT will maintain on-street parking with a dedicated parking lane, add a center left-turn lane, and provide a northbound dedicated business access and transit lane.

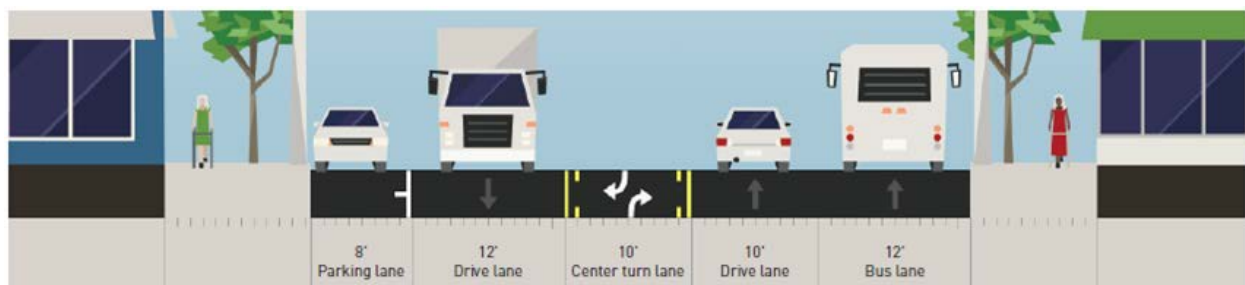


Figure 65: A cross-section illustrating the new street design for Rainier Ave S between S Kenny St and S Henderson Street. (Source: SDOT).

Unfortunately, because the re-channelization will have four lanes of traffic (two drive lanes, one center turn lane, and one bus lane), SDOT will not be able to go forward with its protected intersection conceptual design, which included curb bulbs on all four corners of the intersection

(See Figure 60, Concept A). However, I do recommend that SDOT paint green bicycle lanes over Rainier Ave S to bring visibility to the bicyclists. In addition, the City could include small pedestrian crossing islands on the sides of the bicycle lanes facing vehicle traffic. This tactic will shorten the amount of time pedestrians spend crossing vehicle traffic, in addition to providing another layer of protection for bicyclists. SDOT's long term plan is to add bicycle lanes to Rainier Ave S (See Figure 66).

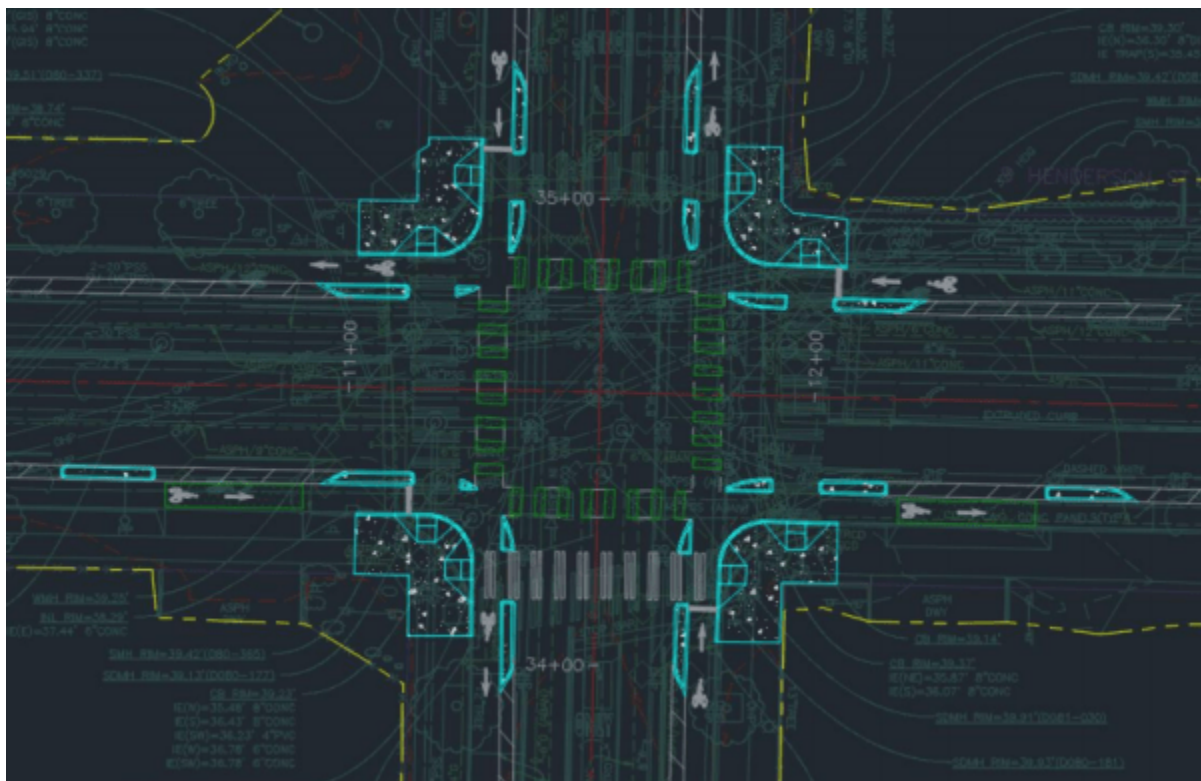


Figure 66: SDOT's long term vision is to add bicycle lanes to Rainier Ave S. (Source: SDOT via The Urbanist).

According to SDOT, the intersection redesign is still under consideration; however, it won't be implemented within the Rainier Ave S Phase 2 timeline. Due to complexities with the overhead bus trolley wire system at Rainier Ave S and S Henderson Street, they'll need some time to work on a design and identify funding to make this concept a reality.



Figure 67: A map of SDOT's Rainier Ave S Corridor Improvements project. (Source: SDOT).

Finally, painting the crosswalks using a pattern or series of colors that reflect the community would help build a sense of identity in the neighborhood. In fact, the community specifies their desire for “distinctive crosswalk paving” in the 2012 Rainier Beach Neighborhood Plan Update (2012, 17). A great example of this is the raised crosswalk with red, black, green, and white striping on MLK Jr Way S next to Powell Barnett Park.



Figure 68: The Pan-African flag crosswalk on MLK Jr Way S near Powell Barnett Park. (Source: Seattle Bike Blog).

5.2 MLK Jr Way S & S Henderson Street Intersection Upgrade

The intersection of MLK JR Way S and S Henderson Street not only experiences a lot of vehicle traffic, but Sound Transit’s Rainier Beach Light Rail Station is located just south of this intersection. The light rail train runs down the center of MLK Jr Way S, therefore the station is situated between the north and southbound lanes of vehicle traffic. Another major complaint I

received from my interviews with Rainier Beach residents was that there are no crossing gates to prevent vehicles or pedestrians from accidentally getting hit by Sound Transit light rail vehicles. I advocate for crossing gates on either side of S Henderson Street to prevent cars from accidentally getting hit by the train. In addition, I think it would be wise to invest in pedestrian crossing gates or magnetic automatic gates on the Rainier Beach Station platform (See Figure 71). The Sound Transit light rail system has experienced a few pedestrian and vehicle collisions since its opening, and because the Rainier Beach Station is at-grade, I believe extra safety precautions should be put in place. A good example of existing crossing gates for traffic is at the intersection of S Lander Street and the Sound Transit light rail line in Seattle's SODO neighborhood.



Figure 69: The crosswalk over S Henderson Street near the Rainier Beach Station. (Source: Kaylie Duffy).



Figure 70: A southbound Sound Transit light rail vehicle arrives at the Rainier Beach Station. Note the lack of crossing gates on the station platform. (Source: Kaylie Duffy).



Figure 71: A sign on the Rainier Beach Station platform warns pedestrians to "Look Both Ways." (Source: Kaylie Duffy).

5.3 Additional Seating along S Henderson Street

S Henderson Street scored poorly on the “Options for Sitting” criteria—receiving a 1.4 out of 3. In fact, the only formal locations for sitting are at the Mapes Creek Plaza at 52nd Ave S and S Henderson Street and the Rainier Beach Station plaza at the northeast corner of MLK Jr Way S and S Henderson Street. The rest of the pedestrian ROW has a few informal options for sitting (i.e. bollards, raised planters, and large rocks) and bus shelters with benches. The lack of publicly accessible spaces dedicated for groups of people to sit and socialize discourages community building and “getting to know your neighbor.” I suggest combining public art and

seating to build community identity. An example of public art seating would be the bench in downtown New Orleans designed to look like a local streetcar (See Figure 72).



Figure 72: A public art bench in New Orleans's French Quarter is shaped like a streetcar. (Source: Kaylie Duffy).

I suggest strategically placing seating off to the side of the public ROW along S Henderson Street. For example, the entrance pathway to the Rainier Beach Community Center could use a couple benches to encourage community members to stop and socialize (See Figure 33). I would also encourage the installation of public seating on long stretches of pedestrian ROW adjacent to extra wide planting strips. For example, the northside planting strip between 46th Ave S and 48th Ave S could easily accommodate bench seating for residents to sit and socialize or for parents to wait at while their children to get let out of school at South Shore K-8 (See

Figure 8). Finally, there is a small grassy area across the street from Rainier Beach High School, in front of the Lake Washington Apartments (See Figure 73). Perhaps SDOT or the Department of Neighborhoods could partner with the Lake Washington Apartments to install a couple benches. The community could apply to the Seattle Department of Neighborhoods' Neighborhood Matching Fund or from the Seattle Office of Arts & Culture grant program.



Figure 73: The open grassy space in front of the Lake Washington Apartments would be an excellent location for public seating. (Source: Kaylie Duffy).

5.4 Add Green Streets Elements Where Feasible

In 2014, Seattle Public Utilities (SPU), in partnership with Seattle Parks and Recreation, began a project to reroute Mapes Creek from entering a storm drain pipe and instead take it in its own pipe to Beer Sheva Park and Lake Washington in support of salmon habitat (See Figure 74).

Several hundred feet of pipe were installed under the 52nd Ave walkway and S Henderson Street. A new natural creek was also developed in the park where the pipe could release the water to flow into the lake. The initiative was a joint project with SPU's 52nd Ave S Combined Sewer Overflow Reduction Project. SPU's new combined sewer line runs from Rainier Ave S north along 52nd Ave S (Mapes Creek Walkway) and then east along S Henderson Street to the King County Pump Station at the southwest corner of S Henderson Street and Seward Ave S.



Figure 74: 52nd Ave S and the Mapes Creek Walkway Project. (Source: Seattle Public Utilities).

While, the new combined sewer line will hopefully reduce overflows of combined sewage into Lake Washington during heavy rain events, I believe more could be done to reduce stormwater runoff. Since S Henderson Street's eastern edge runs perpendicular to Beer Sheva Park and Lake Washington, I recommend that the street adopt some Green Street elements in the form of trees and natural vegetation. According to the Environmental Protection Agency, green streets protect water quality in rivers and streams by removing up to 90% of pollutants. They also replenish groundwater supplies, absorb carbon, improve air quality and neighborhood aesthetics, and reduce peak stormwater flows (EPA, 2017). I recommend that S Henderson Street invest in more street trees and natural landscaping vegetation in planting strips, beginning at Rainier Ave S and heading east toward Seward Park Ave S. In particular, the south side of S Henderson Street is devoid of a planting strip almost the entire stretch of S Rainier Street to Seward Ave S. While there are a few trees, they are separated by slabs of cement. The addition of more vegetation would not only beautify the stretch of street, but it would also help absorb excess rainwater and improve pedestrian comfort.

Unfortunately, the portion of S Henderson Street east of Rainier Ave S is in a liquefaction zone, with a groundwater table near the surface. Situations where infiltration is concentrated is not recommended or infiltration will not occur. Conducting an evaluation of groundwater table levels is not within the scope of this report; however, it must be conducted before adding permeable pavement, bioswales, or other infiltrating tactics to the immediate area. According to the SPU Director's Rules on Green Stormwater Infrastructure, an important feasibility consideration is that there must be a minimum vertical separation of three feet from the facility bottom to the seasonal high groundwater elevation, bedrock, or other impermeable layer..."

(2012, B-3). SDOT also requires that voluntary bioretention systems be placed in planting strips on non-arterial streets, meaning S Henderson Street would not be a candidate (“Voluntary Curbside Bioretention,” 2016).



Figure 75: The stretch of S Henderson Street that is east of Rainier Ave S is in a moderate to high liquefaction zone. (Source: City of Seattle Department of Construction and Inspections).

5.5 Improvements to Pedestrian ROW & Planting Strips

The National Association of City Transportation Officials (NACTO) remind us in their *Urban Street Design Guide* that transportation engineers can work flexibly within the building envelope of a street (2013, 5). Street design changes include moving curbs, changing alignments, daylighting corners, and redirecting traffic where necessary. As cities evolve and technology progresses, infrastructure must also change and adapt to new needs. Street space can also be used for new purposes, such as bike shares, traffic calming, and parklets.

I believe that S Henderson Street’s pedestrian ROW could be enhanced through a few key infrastructure changes. While all of the blockfaces along S Henderson Street have sidewalks, not all of them are accompanied by a planting strip to separate pedestrians from moving traffic.

The sidewalks directly adjacent to parking lanes or traffic lanes are uncomfortable for pedestrians and do not provide a sense of safety. Urban arterial abutting the pedestrian realm should always be buffered in some capacity, whether it's by a planting strip, parking lane, or a street furniture zone.

From MLK Jr Way S to Rainier Ave S, S Henderson Street is designated as an Urban Village Main Street Type, and the stretch of S Henderson Street from Rainier Ave S to Seward Park S is designated as an Urban Village Neighborhood Street Type. According to *Seattle Streets Illustrated*, both street types require a pedestrian clear zone of 6-feet minimum. Street furniture, plantings, and other fixed items should not protrude into the pedestrian travel route. During my visits to S Henderson Street it became apparent that not all of the sidewalks were 6-feet wide. In fact, some were as narrow as 5-feet wide with overgrown yards and planting strips taking over parts of the pedestrian ROW. NACTO explains that if a sidewalk is directly adjacent to the roadway, 2-feet should be added to the absolute minimum clear path width to ensure that there is sufficient storage space for roadside hardware and snow storage (2013, 40).

According to NACTO, sidewalks should be at minimum 6-feet wide. Therefore, I suggest that the neighborhood sidewalks along S Henderson Street that are less than 5-feet should be redesigned to provide a wider pedestrian through zone and street furniture zone whenever feasible. Fortunately, tree roots disrupting sidewalks were not much of an issue, and most of the pedestrian ROW was relatively flat and traversable.

During my interviews with Rainier Beach residents, I was told that speeding was not much of a problem on S Henderson Street. This is due, in part, to a few traffic calming measures (i.e.

midblock pinchpoints and curb extensions) located at Chief Sealth Trail, 46th Ave S, 48th Ave S, 50th Ave S, 52nd Ave S, and Seward Park Ave S. In addition, there is a temporary curb extension at 53rd Ave S where the parking lane is painted the colors of Rainier Beach High School and bordered by white bollards. Since there is a high volume of children crossing the street at this location, it would be beneficial for the City of Seattle to construct a permanent curb extension at this location when funds become available. The community could also apply to the City's "Your Voice, Your Choice" program to receive funding for an upgrade (Seattle Department of Neighborhoods, n.d.)



Figure 76: The painted curb bulb on the north side of 53rd Ave S and S Henderson Street. (Source: Kaylie Duffy).

5.6 Building Neighborhood Identity

The over 5,000 residents of Rainier Beach make up one of the city's most ethnically diverse neighborhoods in Seattle. According to the Rainier Beach Action Coalition, Black/African-American households make up 30.8%, Asians 30.7%, Hispanic 13.2%, and Mixed Race 13.8% of the population. According to the 2012 Rainier Beach Neighborhood Plan update, this diversity is something that the community wants to preserve and support (2012, 8). I believe that the community can celebrate and brand itself through the built environment in a number of ways. As I stated earlier in this report, the community can apply to the City of Seattle's Community Crosswalks program, which is funded by the Neighborhood Matching Fund, and is designed to showcase a community's unique culture and history or liven up an intersection with beautiful art. Renton Ave S was recently repaved in the summer of 2016 and would make an ideal location for Community Crosswalks. Not only is the intersection of S Henderson Street and Rainer Ave S half a block away from Somali Community Services of Seattle, but it is half a block east of MLK Jr Way S, making it a gateway of sorts to the S Henderson Street neighborhood. The crosswalks could be painted to reflect the African immigrant communities prominent in the neighborhood.

Another tactic the community could undertake to build community identity and improve safety would be to invest in specialized, human scale lighting. According to Project for Public Spaces, a nonprofit organization dedicated to helping people create and sustain public spaces that build strong communities, "light fixtures should be conceived of as part of a coordinated line of amenities - not pieced together from a variety of incongruous components. They should appear compatible with litter receptacles and other street furniture" (Project for Public Spaces, 2008).

As mentioned earlier in this report, tall overhead street lights are staggered every 125 to 150-feet from MLK Jr Way S to Seward Ave S; however the lower-set, human scale lighting isn't as frequently present. The human scale street lights are present as stand alone units in front of Rainier Beach High School, but they are mostly found attached to the tall overhead light poles along the rest of the street. In particular, I'd like to see human scale lighting placed from MLK Jr Way S to Renton Ave S, as it is currently largely absent. Because this is the entrance to S Henderson Street, it would be beneficial to brand this stretch of the street through the use of specialized, human scale street lighting. Seattle City Light maintains street lighting throughout the city, and they have a limited number of light fixtures to choose from. This will limit the design and branding options; however, the presence of human scale lighting will create a greater sense of safety for those walking east along S Henderson Street from the Rainier Beach Station. The City should also make an effort to make the street light design compatible with the existing wayfinding signs, banners, and litter receptacles. The 2012 Rainier Beach Neighborhood Plan Update does a good job of displaying their vision for creating a safe, distinctive walking corridor (See Figure 77).



Figure 77: The 2012 Rainier Beach Neighborhood Plan Update's proposed upgrades to S Henderson Street. (Source: 2012 Rainier Beach Neighborhood Plan Update).

Finally, I heard a resounding desire from my Rainier Beach resident interviews for more art in the public realm along S Henderson Street. Suggestions for art placement included in Beer Sheva Park and in front of the Rainier Beach Community Center, which I agree would be great locations. Community members wanted to engage local artists to design pieces that reflected the culture and history of the neighborhood. Currently, there is a sculpture at the Rainier Beach Station plaza at the northeast corner of S Henderson Street and MLK Jr Way S, mosaics on the benches at the Mapes Creek Plaza at 52nd Ave S, and a painted bus stop on the corridor. I also think that temporary installations would help build community pride. The Seattle Office of Arts & Culture offers a few grants that could make temporary art installations a reality, such as the Neighborhood & Community Arts grant, the Work Readiness Arts Program grant, and the Arts in Parks Program.



Figure 78: The sculpture at the Rainier Beach Station plaza, titled *Parable* by Buster Simpson, is set in an orchard-like setting. The sculpture resembles a bowl of pears and wrecking balls, morphed into one. It provides an allegorical reference to the ordered urban landscape and dynamically changing city. (Source: Kaylie Duffy).



Figure 79: An art piece hangs on an electrical pole at the northwest corner of S Henderson Street and Seward Park Ave S. The informal piece of artwork is outside the Rainier Beach High School. (Source: Kaylie Duffy).



Figure 80: The Mapes Creek Plaza at 52nd Ave S and S Henderson Street has benches designed with mosaics. (Source: Kaylie Duffy).



Figure 81: The bus stop at S Henderson Street & Rainier Ave S was painted by students. (Source: Kaylie Duffy).

CHAPTER 6. CONCLUSION

6.1 Lessons Learned

The purpose of this study was to evaluate the current state of the pedestrian right-of-way on S Henderson Street in Seattle's Rainier Beach neighborhood and to explain how urban design techniques can be harnessed to create a more comfortable, safer, enjoyable, and aesthetically pleasing pedestrian realm. As urban planners, it is often easy to prescribe upgrades to pedestrian ROWs based on best practices and industry standards; however, we sometimes overlook context sensitivity and sustainability. We must always listen to resident populations and take their desires into account throughout the design and planning process. Speaking with

both residents of Rainier Beach and SDOT employees allowed me to gain a deeper understanding of how S Henderson Street has transformed over the past few years and of the community's desires for future improvements.

The in-person interviews I conducted helped me tailor my research topic and evaluation criteria. Not only did I learn that bicycle infrastructure improvements were not a high priority for the community—I also learned that improvements to the pedestrian ROW and crosswalks were a high priority. Therefore, I decided to put all my effort into evaluating the pedestrian ROW and providing holistic design recommendations for the street. Overall, S Henderson Street received a score of 1.77, meaning its pedestrian ROW is currently below average. Of course, there were a few limitations to the study, including lack of time to conduct extensive focus groups with Rainier Beach community members, business owners on S Henderson Street, and students at Rainier Beach High School and South Shore K-8. Any infrastructural design changes should be presented to the community and thoroughly discussed.

Overall, the 15 criteria used were successful in evaluating the current state of S Henderson Street's pedestrian ROW. While not perfect, Gehl and Schulze + Grassov's criteria allowed me to evaluate a space and provide credibility to my design recommendations. The practice of using a defined set of criteria to evaluate a space also provides a method for developing future standards by which to design. Because part of S Henderson Street is a principle arterial (MLK Jr Way S to Rainier Ave S) and the other part is a minor arterial (Rainier Ave S to Seward Park Ave S), there are a few major limitations to how the street can be redesigned, including what kind of traffic calming measures and green stormwater infrastructure can be implemented. Also, King

County Metro's Route 7 will become the Rainier RapidRide Line in 2021, running from Rainier Ave S to the Rainier Beach Station. Rider volumes, travel frequency, and future RapidRide stops could also alter infrastructural redesigns of the pedestrian ROW and crossings. Despite these limitations, there are a few design upgrades that could add to the pedestrian realm, including intersection redesigns and improvements, additional seating, sidewalk repairs, green street upgrades, and branding opportunities for the community.

Finally, this research project could have been more comprehensive if I had also evaluated the streets that feed onto S Henderson Street. SDOT's sidewalk evaluation map (See Figure 18) shows that many of the side streets have gravel/unimproved sidewalks. If I had had the time to evaluate the side streets, in addition to S Henderson Street, it would have provided insight into who else was living in the neighborhood and whether S Henderson is physically accessible to them.

6.2 Lessons for Practice

Thankfully, the City of Seattle has developed documents and standards to help guide future improvements to the pedestrian ROW, including the *Seattle Pedestrian Master Plan* (PMP), a 20-year blueprint to achieve Seattle's vision of becoming the nation's most walkable and accessible city, and the *Seattle Right-of-Way Improvements Manual*, an online resource to help property owners, developers, and architects involved with the design, permitting, and construction of Seattle's street right-of-way. The City even enlisted a Seattle Pedestrian Advisory Board (SPAB) as advisors to review and refresh the PMP's policy framework. It is also important to note that the City has a Priority Investment Network that it uses to make the

difficult decisions about where to focus new sidewalk investments ("Sidewalk Development Program," n.d.). Seattle's Complete Streets Checklist is another tool SDOT uses to collect data and information about the status of the street and surroundings, as well as the details of the project, with a goal of identifying improvements that can be incorporated into the project to balance the needs of all users (Seattle Department of Transportation, 2017). These City of Seattle standards and checklists are an important method for improving and designing more safe and beautiful streets and pedestrians realms.

However, each community and street in Seattle is unique, and I believe it's important to remember that not all streets require the same remedies. In 2017, 14 SDOT interns walked 2,323 miles of City sidewalks to evaluate their conditions by locating cracks, uplifts, and obstructions and then assigning an overall score (i.e. good, fair, poor). While this is a great place to start for evaluating the pedestrian realm, I believe the City needs to expand beyond evaluating just mobility. Seattle should develop a classification system for pedestrian ROWs, similar to how streets are currently classified as arterials, non-arterials, etc. Once the classification system is put in place, the City can create a criteria checklist, such as the one I used for this thesis, for each classification type. A classification system and series of accompanying checklists will make future redesigns of the pedestrian realm more tailored and efficient. In addition, the City of Seattle must continue to engage residents, whether it be through their Community Liaison program, public meetings, or focus groups, when considering upgrades and improvements to the public realm. Residents can provide valuable insight into how well their pedestrian ROWs are functioning and what elements may have been missing or overlooked during the criteria evaluation process.

Finally, I noticed that pedestrian infrastructure component of the Seattle Complete Streets Checklist is heavily focused on basic pedestrian infrastructural needs, such as making sure sidewalks are in good condition and that there are curb ramps in the project area. There is no focus on elements which encourage pedestrians to stay and linger, such as shelter from inclement weather, seating, or standing space. Documents such as the *Seattle Pedestrian Master Plan* and the *Seattle Right-of-Way Improvements Manual* provide strategies to improve the pedestrian ROW, yet they hardly touch on topics such as strategies to encourage pedestrians to stay and socialize. I believe that streets, such as S Henderson Street, which are surrounded by residential, commercial, and academic institutions, should provide opportunities for community members to gather together in the pedestrian realm. I suggest expanding the *Seattle Pedestrian Master Plan* and *Seattle Right-of-Way Improvements Manual* to include a placemaking toolkit which includes a pedestrian ROW classification system and criteria to evaluate each classification type. Evaluation of the entire street environment, rather than just movement, is key to improving the pedestrian realm.

APPENDIX A: Average Criteria Score from Visit #1 on 4/3/18, 5pm-6:30pm

12 QUALITY CRITERIA (3 Themes) + 3 Schulze + Grassov Parameters		
		Score
1. Protection	a. Protection against traffic and accidents	2.7
	b. Protection against harm by others	2.5
	c. Protection against unpleasant sensory experience	2.1
2. Comfort	a. Options for mobility	2.4
	b. Options to stand and linger	2.1
	c. Options for sitting	1.8
	d. Options for seeing	2.7
	e. Options for talking and listening/hearing	2.0
	f. Options for play, exercise, and activities	1.7
3. Enjoyment	a. Scale	1.8
	b. Opportunities to enjoy the positive aspects of climate	1.7
	c. Experience of aesthetic qualities and positive sensory experiences	1.8
Schulze + Grassov Parameters	<i>Attractive edges and edge zones</i>	1.5
	<i>Urban conduct and behavior</i>	1.9
	<i>Details and variation</i>	1.4
Average Score		2.01

APPENDIX B: Average Criteria Score from Visit #2 on 4/4/18, 9am-10:30am

12 QUALITY CRITERIA (3 Themes) + 3 Schulze + Grasso Parameters		
		Score
1. Protection	a. Protection against traffic and accidents	2.4
	b. Protection against harm by others	2.3
	c. Protection against unpleasant sensory experience	1.7
2. Comfort	a. Options for mobility	2.1
	b. Options to stand and linger	1.5
	c. Options for sitting	1.2
	d. Options for seeing	1.8
	e. Options for talking and listening/hearing	1.8
	f. Options for play, exercise, and activities	1.5
3. Enjoyment	a. Scale	1.4
	b. Opportunities to enjoy the positive aspects of climate	1.5
	c. Experience of aesthetic qualities and positive sensory experiences	1.8
Schulze + Grasso Parameters	<i>Attractive edges and edge zones</i>	1.5
	<i>Urban conduct and behavior</i>	1.6
	<i>Details and variation</i>	1.3
Average Score		1.69

APPENDIX C: Average Criteria Score from Visit #3 on 4/7/18, 1pm-2:30pm

12 QUALITY CRITERIA (3 Themes) + 3 Schulze + Grassov Parameters		
		Score
1. Protection	a. Protection against traffic and accidents	2.4
	b. Protection against harm by others	1.9
	c. Protection against unpleasant sensory experience	1.5
2. Comfort	a. Options for mobility	2.1
	b. Options to stand and linger	2.0
	c. Options for sitting	1.1
	d. Options for seeing	2.1
	e. Options for talking and listening/hearing	1.8
	f. Options for play, exercise, and activities	1.6
3. Enjoyment	a. Scale	1.2
	b. Opportunities to enjoy the positive aspects of climate	1.5
	c. Experience of aesthetic qualities and positive sensory experiences	1.6
Schulze + Grassov Parameters	<i>Attractive edges and edge zones</i>	1.3
	<i>Urban conduct and behavior</i>	1.5
	<i>Details and variation</i>	1.3
Average Score		1.65

APPENDIX D: Average Criteria Score of All Three Site Visits

12 QUALITY CRITERIA (3 Themes) + 3 Schulze + Grassov Parameters		
		Final Score
1. Protection	a. Protection against traffic and accidents	2.5
	b. Protection against harm by others	2.1
	c. Protection against unpleasant sensory experience	1.8
2. Comfort	a. Options for mobility	2.2
	b. Options to stand and linger	1.9
	c. Options for sitting	1.4
	d. Options for seeing	2.2
	e. Options for talking and listening/hearing	1.9
	f. Options for play, exercise, and activities	1.6
3. Enjoyment	a. Scale	1.5
	b. Opportunities to enjoy the positive aspects of climate	1.6
	c. Experience of aesthetic qualities and positive sensory experiences	1.8
Schulze + Grassov Parameters	<i>Attractive edges and edge zones</i>	1.4
	<i>Urban conduct and behavior</i>	1.7
	<i>Details and variation</i>	1.3
Average Score		1.77

REFERENCES

- Appleyard, Donald, Gerson, M. Sue, and Lintell, Mark. *Livable Streets*. Berkeley: University of California Press, 1981.
- Burke, Stephen. "Placemaking and the Human Scale City." Project for Public Spaces. January 11, 2016. Accessed May 05, 2018. <https://www.pps.org/article/placemaking-and-the-human-scale-city>.
- City of Seattle. *Rainier Beach Neighborhood Plan Update*. Report. Seattle, WA: City of Seattle, 2012.
<https://www.seattle.gov/Documents/Departments/OPCD/OngoingInitiatives/RainierBeach/RainierBeachNeighborhoodPlanUpdate.pdf>.
- City of Seattle. *Seattle 2035 Comprehensive Plan: Managing Growth to Become an Equitable and Sustainable City 2015–2035*. Report. Seattle, WA: City of Seattle, 2016.
<http://www.seattle.gov/Documents/Departments/OPCD/OngoingInitiatives/SeattlesComprehensivePlan/SeattleComprehensivePlanCouncilAdopted2016.pdf>.
- City of Seattle. "Seattle City Council Bills and Ordinances." Seattle Municipal Archives. Accessed December 08, 2017. <http://clerk.ci.seattle.wa.us/~scripts/nph-brs.exe?d=CBOR&s1=115861.cbn.&Sect6=HITOFF&l=20&p=1&u=/~public/cbor2.htm&r=1&f=G>.
- City of Seattle. *Seattle Comprehensive Plan: A Plan for Managing Growth 2004-2024*. Report. Seattle, WA: City of Seattle, 2005.
<https://www.seattle.gov/Documents/Departments/OPCD/OngoingInitiatives/SeattlesComprehensivePlan/ComprehensivePlanReadersGuide.pdf>.
- Congress for the New Urbanism. "What Is New Urbanism?" Congress for the New Urbanism. July 05, 2017. Accessed May 26, 2018. <https://www.cnu.org/resources/what-new-urbanism>.
- EPA. "Learn About Green Streets." United States Environmental Protection Agency. December 11, 2017. Accessed June 04, 2018. <https://www.epa.gov/G3/learn-about-green-streets>.
- Federal Bureau of Investigation. "Crime in the U.S. 2016." FBI. May 08, 2017. Accessed April 29, 2018. <https://ucr.fbi.gov/crime-in-the-u.s/2016/crime-in-the-u.s.-2016>.
- Gehl Architects. *Downtown Seattle: Public Spaces and Public Life*. Report. Seattle, WA: Gehl Architects, 2009.
https://www.seattle.gov/dpd/cs/groups/pan/@pan/documents/web_informational/s048430.pdf
- Gehl, Jan. *Cities for People*. Washington, DC: Island Press, 2010.

- Guiron, Jacques. *The Ideas of Le Corbusier on Architecture and Urban Planning*. New York: G. Braziller, 1981.
- Howard, Ebenezer. *Garden Cities of To-morrow*. Adelaide: University of Adelaide Library, 2010.
- Institute of Transportation Engineers. "Designing Walkable Urban Thoroughfares: A Context Sensitive Approach - Chapter 8: Streetside Design Guidelines." Institute of Transportation Engineers. Accessed May 27, 2018. <https://www.ite.org/css/online/DWUT08.html>.
- Jacobs, Allan B. *Great Streets*. 1st MIT Press Pbk. ed. Cambridge, Mass.: MIT Press, 1995.
- Jacobs, Jane. *The Death and Life of Great American Cities*. Vintage Books ed. New York: Vintage Books, 1992.
- Kostof, Spiro. *The City Shaped: Urban Patterns and Meanings through History*. London: Thames and Hudson, 1991.
- McCann, Barbara. *Completing Our Streets: The Transition to Safe and Inclusive Transportation Networks*. Washington: Island Press, 2013.
- McCann, Barbara, Rynne, Suzanne, and American Planning Association. Planning Advisory Service, Issuing Body. *Complete Streets: Best Policy and Implementation Practices*. Report (American Planning Association. Planning Advisory Service) ; No. 559. Chicago: American Planning Association, 2010.
- Moreland-Russell, Sarah, Amy Eyler, Colleen Barbero, J Aaron Hipp, and Heidi Walsh. "Diffusion of Complete Streets Policies Across US Communities." *Journal of Public Health Management and Practice : JPHMP* 19, no. 3 Suppl 1 (2013): S89-96.
- Moudon, Anne Vernez. *Public Streets for Public Use*. New York: Van Nostrand Reinhold, 1987.
- National Association of City Transportation Officials, Author. *Urban Street Design Guide*. Washington: Island Press, 2013.
- National Conference of State Legislatures. "Complete Streets." News release, November/December 2007. Accessed November 10, 2017. <http://www.ncsl.org/documents/transportation/completestreets.pdf>.
- National Institute of Deafness and Other Communication Disorders. "Noise-Induced Hearing Loss." National Institute of Deafness and Other Communication Disorders. January 16, 2018. Accessed April 29, 2018. <https://www.nidcd.nih.gov/health/noise-induced-hearing-loss>.
- Project for Public Spaces. "Lighting Use & Design." Project for Public Spaces. December 31, 2008. Accessed June 04, 2018. <https://www.pps.org/article/streetlights>.
- Project for Public Spaces. "Placemaking Heroes: Allan Jacobs." Project for Public Spaces. Accessed May 05, 2018. <https://www.pps.org/article/ajacobs>.

Rainier Beach Action Coalition. "Demographics." Rainier Beach Action Coalition. Accessed May 05, 2018. <http://www.rbcoalition.org/neighborhood-information/demographics/>.

Schulze + Grasso. "Parameters for Public Spaces in Copenhagen." SCHULZE + GRASSOV. 2014. Accessed April 06, 2018. <https://www.schulzeplusgrasso.com/byrumsparemetre>.

Seattle Department of Construction & Inspections. "City of Seattle Generalized Zoning." Map. Seattle, 2017, November.

Seattle Department of Neighborhoods. "Your Voice, Your Choice." City of Seattle. Accessed June 04, 2018. <https://www.seattle.gov/neighborhoods/programs-and-services/your-voice-your-choice>.

Seattle Department of Transportation. "5.4 Green Streets." Seattle Streets Illustrated. Accessed December 05, 2017. <http://streetsillustrated.seattle.gov/urban-design/green-streets/>.

Seattle Department of Transportation. "Chapter 6: Streetscape Design Guidelines - Right-of-Way Improvements Manual." Seattle Department of Transportation. Accessed May 26, 2018. http://www.seattle.gov/rowmanual/manual/6_2.asp.

Seattle Department of Transportation. *Complete Streets Checklist*. Report. Seattle, WA: Seattle Department of Transportation, 2017. https://www.seattle.gov/Documents/Departments/SDOT/PlanningProgram/CompSt_Checklist.pdf.

Seattle Department of Transportation. "Pedestrian Lighting Citywide Plan." June 2012. Accessed April 30, 2018. <http://www.seattle.gov/Assets/Documents/Departments/SDOT/About/DocumentLibrary/PedMasterPlan/PedLightingFINAL.pdf>.

Seattle Department of Transportation. "Pedestrian Master Plan." Seattle Department of Transportation. June 2017. Accessed April 29, 2018. <https://www.seattle.gov/Documents/Departments/SDOT/About/DocumentLibrary/SeattlePedestrianMasterPlan.pdf>.

Seattle Department of Transportation. "SDOT Client Assistance Memo." Sidewalk Maintenance and Repair. December 08, 2017. Accessed April 30, 2018. <https://www.seattle.gov/Documents/Departments/SDOT/CAMs/CAM2208.pdf>.

Seattle Department of Transportation. "Seattle Bicycle and Pedestrian Safety Analysis." Seattle Department of Transportation. September 30, 2016. Accessed May 12, 2018. https://www.seattle.gov/Documents/Departments/SeattleBicycleAdvisoryBoard/presentations/BPSA_Draft_Public_093016.pdf.

Seattle Department of Transportation. "Seattle Pedestrian Master Plan." Seattle Department of Transportation. June 2017. Accessed May 12, 2018. <https://www.seattle.gov/transportation/document-library/modal-plans/pedestrian-master-plan>.

- Seattle Department of Transportation. "Seattle Streets Illustrated." Seattle Department of Transportation. June 27, 2017. Accessed May 02, 2018. <http://streetsillustrated.seattle.gov/>.
- Seattle Department of Transportation. *S Henderson St Improvements*. Report. Seattle, WA: Seattle Department of Transportation, 2016. <https://www.seattle.gov/Documents/Departments/SDOT/NSF/2016097.pdf>.
- Seattle Department of Transportation. "Sidewalk Development Program." Seattle Department of Transportation. Accessed May 28, 2018. <https://www.seattle.gov/transportation/projects-and-programs/programs/pedestrian-program/sidewalk-development-program>.
- Seattle Department of Transportation. "Voluntary Curbside Bioretention." Seattle Department of Transportation. December 29, 2016. Seattle, WA. Accessed May 12, 2018. <https://www.seattle.gov/Documents/Departments/SDOT/PublicSpaceManagement/CAM2309.pdf>.
- Seattle Department of Transportation. "Why Seattle Has a Complete Streets Policy." Seattle Department of Transportation. Accessed May 26, 2018. <https://www.seattle.gov/transportation/projects-and-programs/programs/urban-design-program/complete-streets-in-seattle/why-seattle-has-a-complete-streets-policy>.
- Seattle Public Utilities. "Directors Rule on Green Stormwater Infrastructure to the Maximum Extent Feasible for SFR and Parcel Based Projects." Seattle Public Utilities. December 5, 2012. Accessed May 12, 2018. <http://www.seattle.gov/dpd/codes/dr/DR2012-15.pdf>.
- Smart Growth America. "National Complete Streets Coalition." Smart Growth America. May 21, 2018. Accessed May 21, 2018. <https://smartgrowthamerica.org/program/national-complete-streets-coalition/>.
- Sousa, Lindsey R. R., and Jennifer Rosales. "Contextually Complete Streets." *Green Streets and Highways 2010: An Interactive Conference on the State of the Art and How to Achieve Sustainable Outcomes - Proceedings of the Green Streets and Highways 2010 Conference* 389 (2010): 94-106.
- Southworth, Michael, and Eran Ben-Joseph. "Street Standards and the Shaping of Suburbia." *Journal of the American Planning Association* 61, no. 1 (1995): 65-81.
- US Census Bureau. "2012-2016 ACS 5-year Estimates." American Community Survey (ACS). December 12, 2017. Accessed June 04, 2018. <https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2016/5-year.html>.
- Whyte, William H. *The Social Life of Small Urban Spaces*. Washington, D.C.: Conservation Foundation, 1980.
- Zaccaro, Heather N, and Emiko Atherton. "Bright Spots, Physical Activity Investments That Work—Complete Streets: Redesigning the Built Environment to Promote Health." *British*

Journal of Sports Medicine, 2017, Bjsports-2017-097717-2017-097717v1.

Zavestoski, Stephen., and Agyeman, Julian. *Incomplete Streets : Processes, Practices and Possibilities*. Routledge, Equity, Justice, and the Sustainable City Series. London ; New York: Routledge, Taylor & Francis Group, 2015.