Walkability Assessment

Project Report
Participatory Action Research
Anthropology 454, Spring 2017

Report No. 17-05 June 2017

WESTERN
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Sustainable
Communities
Partnership

About SCP

Sustainable Communities Partnership

Western's SCP program focuses the energy and ideas of faculty and students upon the issues that cities face as our society transitions to a more sustainable future. SCP partners with one community each academic year, facilitating a program in which many Western courses complete service-learning projects that address problems identified by the partner.

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SCP is proud to partner with the City of Edmonds, Washington, during the program's inaugural year. Eleven courses at Western will tackle ten projects identified in collaboration with city staff.

Acknowledgment

The Association of Washington Cities (AWC) has provided invaluable assistance during the launch of the SCP program. AWC provided seed funding, guidance regarding program design, help with promotion of the program, and advice regarding selection of the inaugural partner.

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PREFACE

One component of the Sustainable Communities Partnership (SCP) program implemented by Western Washington University on behalf of the City of Edmonds was Anthropology 454, "Participatory Action Research," taught by Sean Bruna, PhD, Assistant Professor. The course teaches methodologies for developing and conducting research projects that directly benefit members of a community. An interdisciplinary group of 20 undergraduate students and 3 graduate students collaborated with community partners to conduct research on the "walkability" of 9 sites in Edmonds. The sites included:

1. Yost Park
2. Five Corners roundabout
3. Chase Lake Elementary
4. Westgate Elementary
5. West Village
6. Edmonds-Woodway High School
7. Swedish Hospital
8. Community Transit Swift Stop
9. Light Rail Stop (Future)

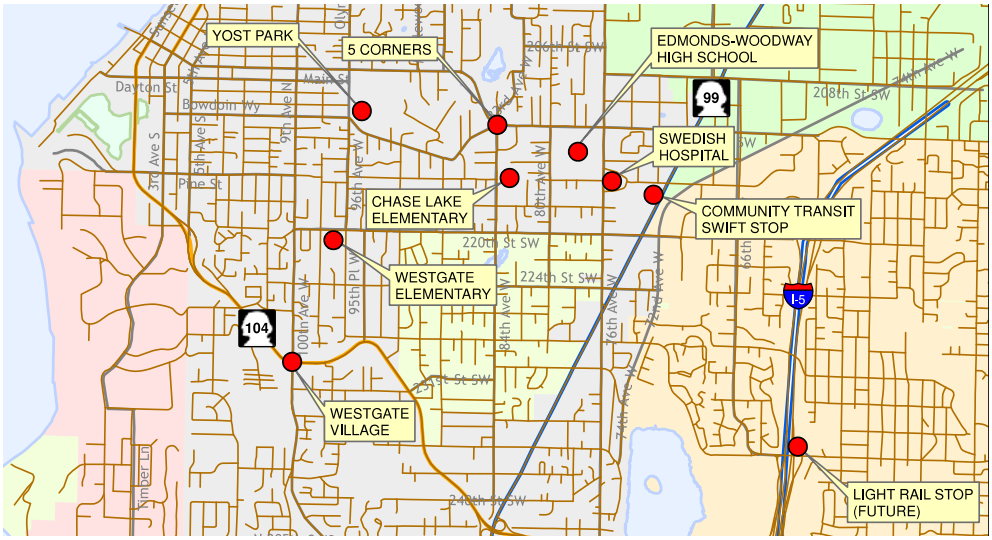

Figure 1: Anthropology 454 Research Sites

The students formed four teams to research the sites. The four teams designed, researched and drafted the final reports in this document. Aside from cataloguing the state of pedestrian assets in the target area discussed, the students interacted with residents to understand the human factors that influence peoples' decisions regarding walking. The course utilized a mix of qualitative and quantitative data collected during 6 weeks and 12 field site visits, and includes participant-observations, interviews, surveys, policy analysis, and public health/planning tools, to evaluate the built environment. The students visited Edmonds on June 9, 2017, to present their proposals to the public and to city officials.

The city officials that served as liaison to SCP were:

Brad Shipley, Associate Planner
Ryan Hague, Capital Projects Manager

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ACCESS AND PEDESTRIAN MOBILITIES AT THE SWEDISH EDMONDS MEDICAL CAMPUS

Photo 1: Swedish Hospital

Abstract

The barriers to pedestrian use of the Swedish Edmonds Hospital area are rooted in broad concerns about safety and a lack of stimulating infrastructure. Interviewees commented on pedestrian and bicyclist safety in relation to the high volume of traffic on 76th Avenue West, 220th Street SW, and Pacific Highway 99, citing them as the greatest determinant in deciding to walk, cycle, or drive. A secondary factor preventing pedestrian use of the area is the absence of sidewalks, paths, and a dedicated community space. These elements combine to create a perception of the Edmonds Swedish Hospital area as relatively inhospitable to pedestrian mobility. Community stakeholders recommended the creation of greenways and trails to link the campus to the nearby businesses. Residents also expressed desire for a publicly accessible space for socializing. Interviewees also recommended more bike lanes to address the high volume of vehicular traffic that bicyclists and pedestrians face.

Introduction

Located on the corner of 76th Ave W, and 215th St. SW, the Edmonds Swedish Hospital medical campus consists of five major institutes, including the Cancer Institute, the Digestive Health Network, the Heart & Vascular Institute, Neuroscience, and Orthopedic Institute. The campus is home to thirty-five general facilities serving the physical, medical, and behavioral needs of Edmonds' residents. Pursuant to the City of Edmonds interest in assessing and promoting walkability (henceforth referred to as mobility) outside the downtown core, this research analyzes the built environment and public use of the Edmonds Swedish Hospital campus.

Because built environment plays a crucial role in facilitating active travel in communities, this project has oriented itself towards a concept of "feelness," that is the affective impression of the area on pedestrians. Beyond insufficient infrastructure, such as bike lanes and serviceable sidewalks, a lack of greenery may also prevent a space from becoming a place of leisure activity and community engagement. Our research goal was to assess how the built environment and "feelness" of the Swedish Edmonds medical campus stimulates or inhibits pedestrian mobilities and whether the lack of nature settings (gardens, flowers, water features, etc.) is a significant factor in nonpatient use of the hospital grounds.

This community-based participatory research project bridges the gap between the documented health benefits of greenery on patients, and the affective response of non-patients when approaching and navigating the hospital grounds. By identifying patterns of pedestrian mobilities on and around Swedish Hospital, as well as conducting interviews with local stakeholders, this research provides insights into local perceptions of space and strategies to improve the pedestrian mobilities and community use of the target area.

Background and Theoretical Approach

According to Sallis, physical activity is usually done in specific types of places, referred to as physical activity environments. These include parks, trails, fitness centers, schools, and streets, all of which community health, urban planning, and leisure studies researchers have concentrated on as part of accessibility studies. The two main substrates of research have been focused on time and function; the time it takes to walk from one's home to a destination (such as a park), and use of leisure time (cycling, walking, rolling, etc). This body of research emphasizes those attributes of the built environment that contribute to the promotion of physical activity, and by extension, community health measures (Sallis, 2009). Assessing physical activity environments and pedestrian mobilities in urban spaces is inextricably tied to pressing health issues including obesity and diabetes (Creatore, 2016). The potential role of the built environment in mitigating the rise of these conditions means the study of pedestrian mobilities is vital not just to evaluating whether people can easily get from point A to point B, but also the potential health outcomes.

The integration of highways also plays an important role in fostering community health and safety. In the City of Rockville, Maryland, researchers developed a process for assessing and implementing safety measures related to traffic and pedestrian safety. In their proposal they stated that "Excessive traffic volume on residential streets, especially where neither the origin nor destination of that traffic lies within the neighborhood, is undesirable because it is a danger to life, limb, and property." Excessive traffic volume contributed to increased noise, vibration, air pollution, visual intrusion, and accelerated deterioration of the streets themselves (City of Rockville Report, 2011). Generating effective protocols for promoting safer driving behavior is not just a question of decreased speed limits, according to infrastructure engineer, Brian Emberg, who notes that the typical response to pedestrian safety is to decrease speed, increase stop signs, or increase speeding tickets. Emberg argues that most of these techniques are not very productive means of reducing speed because drivers "often speed up more aggressively after moving through the intersection to make up for lost time," (Emberg, 2015). Instead, he advocates increased community education and radar speed signs as an effective means of making drivers more alert. In the case of the City of Edmonds investigators have been made aware of 76th Avenue West, 220th Street SW, and Pacific Highway 99 as sites of interest.

Methods

Utilizing grounded theory, the research team employed qualitative methods to collect data on the built environment, patterns of use, and local perceptions of site and place. Our team utilized extensive participant observation as a principle method of investigation, visiting the Edmonds Swedish Hospital four times over three weeks, recording pedestrian presence and behavior. In addition to participant observation, semi-structured interviews were conducted with local stakeholders (n=2) with histories of active community engagement related to accessibility and mobility in the target area. These interviews were transcribed, coded, and deductively analyzed.

Findings

The barriers to pedestrian use of the Swedish Edmonds Hospital area are rooted in broad concerns about safety and a lack of stimulating infrastructure. Interviews cited concerns about pedestrian and bicyclist safety in relation to the high volume of traffic on 76th Avenue West, 220th Street SW, and Pacific Highway 99 as the greatest determinant in deciding to walk, cycle, or drive. A secondary factor preventing pedestrian use of the area is the absence of sidewalks, paths, and a dedicated community space. These elements combine to create a perception of the Edmonds Swedish Hospital area as relatively inhospitable to pedestrian mobilities.

The graph below depicts data compiled through key word usage from transcriptions. Both interview subjects had similar concerns, but the main concern was street safety surrounding the area, which they felt needed to be addressed. The bar graph is meant to show the similarity between both subjects' word use with their concerns and ideas about "feelness," street safety, and pedestrian use around Edmonds Swedish Hospital.

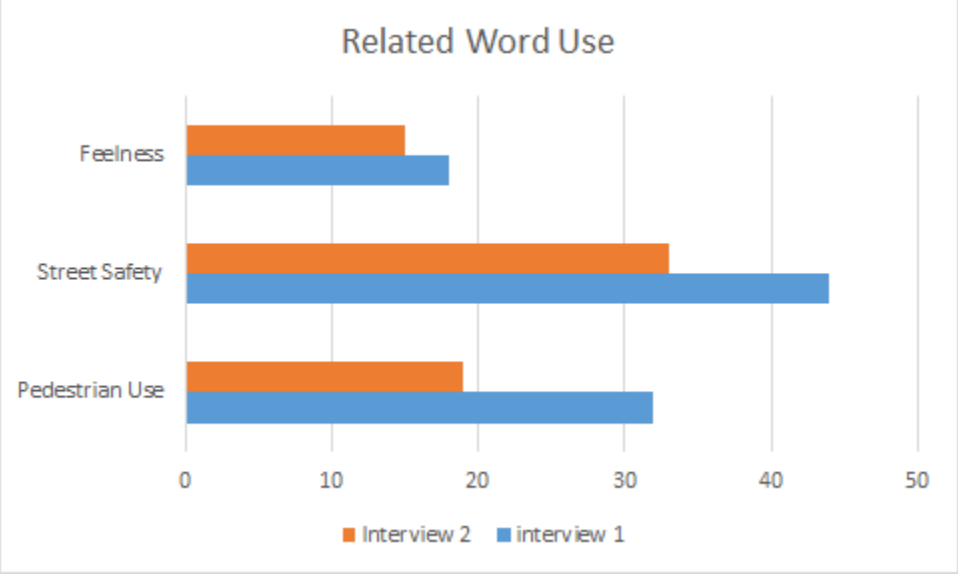

Figure 2: Word Frequency

"Feelness"

In developing a holistic picture of walkability, investigators incorporated the concept of "feelness" in the research process. Feelness refers to the affective impact of the built environment on the pedestrian. The emotional response that forms the perception of a place as welcoming or unwelcoming was of particular interest to investigators as a principle determinant to mobilities at the Swedish Edmonds hospital area. Participant observation and interviews suggest that the combined effect of the highway and lack of publicly accessible space on the campus creates an isolating atmosphere that inhibits pedestrian mobilities.

The west side of the medical campus is bordered by 76th Ave West, with Pacific Highway 99 on the east, both high traffic areas which create significant noise pollution. The high volume of vehicles - including public buses and semi-trucks - combined with the wind they create, inhibits relaxation and conversation. The constant noise means pedestrians on foot or wheels, are distracted by passing vehicles and unable to hear each other when using the sidewalks. Interviewees cited the auditory and high stress environment as "off putting."

In addition to the discomfort associated with passing traffic and noise, the lack of benches along 76th Ave West and Highway 99 creates an alienating atmosphere. A local resident expressed desire for a better balance between the "noise and traffic...with quiet," including outdoor seating, noting that the absence of sitting areas gives them the impression that the medical campus is not a "community hospital."

Pedestrian Use

Investigators did not observe significant pedestrian use of sidewalks around the Edmonds Swedish Hospital. Field notes and interviews reveal that employees of the hospital and nearby businesses either eat on site, or drive to lunch. This is in part due to vehicular traffic which makes walking undesirable (discussed in more detail in the next section), and concerns with time.
A staff member at the medical campus noted that preference for driving to lunch over walking may be psychological, saying "I don't think it's so much the distance that people don't want to walk - it's the time. If they think driving, at all, is faster - they're trying to get back to the office so quickly, that's their automatic choice. It's like 'do I want to spend 5 more minutes to walk this road trip when I could drive?' And they'll drive." The interviewee also noted that what employees considered "walking distance" varied, telling investigators that "a lot of the employees think anything more than 500 feet is too far to walk...when we used to go as an office group, and not just my office complex but we'd meet up with other friends from the main hospital - they would wanna drive. And it would be a block away. That's just, you know how it goes sometimes…" In contrast to this observation, the interviewee also told investigators that since the hospital remodel he'd seen more people walking during their lunch, that they would follow a loop, "just along the perimeter, and then they cut through" the campus grounds.

Participant observation and interviews suggest that staff and nearby residents largely utilize the medical campus as a "shortcut" to other destinations, such as WinCo, and Dick's Drive-In. At one point, the hospital facilitated this back and forth movement by leaving a service gate open. A local resident noted that the gate, "...was for the workers to have the convenience of going to Dick's [Drive-In] and getting something to eat or coming over [to Starbucks] and getting something, and it stayed open for a while and we just kept quiet because it was a nice secret way to get around."

Because the campus cuts off those in surrounding neighborhoods - 215th Street in particular - from restaurants and stores in the target area, the gate provided a shorter, safer route for community members to use. After the gate was locked, a representative from the community approached the hospital to "talk about the idea of building a gateway from [StarBucks] up into the parking areas." According to the informant, Edmonds Swedish Hospital declined to consider reopening the original service gate to community members or to designate a new one.

Securing a route through the campus is not the only attempt community members have made to establish public space. Hospital staff and local residents worked in the past to create a pedestrian friendly area between the campus and local businesses. An Edmonds Swedish Hospital employee reported, "It was going to be really cool, we were going to do this 'S' shaped trail to Dick's [Drive-In], a little bit lower than where it is now, because it would be safer that way. And right now there's some trees and big bushes, so it's a security problem, I mean you could have somebody jump out of the bushes, right? So we were gonna clear the area, make it grassy, a few benches, a few picnic tables...and it fell apart. I couldn't get the support." The lack of public space and access is a source of frustration for both staff and residents, and does not reflect community expectations or statements made to locals about the possibilities for pedestrian use. As noted in one interview, hospital representatives would occasionally attend community meetings, "And they said 'well, we are gonna build this large building it'll be really cool and you know everyone will love it and people will show up and do stuff there,' and I'm going 'well, we'll see.'" Providing spaces for community engagement either on the campus grounds, or adjacent, does not appear to be a priority according to our research contacts.

Looking further into what the hospital employee reported about a trail that had been proposed, an online report pertaining to bikeability in Edmonds included a trail, like what the hospital employee described. This report was made through the Verdant Health Commission with the Cascade Bike Club. The club looked into how to improve biking conditions in certain areas through Edmonds in order to make it more bike friendly and to help make the community more active. The people who proposed these bike friendly areas specifically wanted there to be a connection between the Interurban Trail and the Swedish hospital campus along 216th Street SW, in order to provide direct connections to the hospital facilities as well as to Edmonds Woodway High School (Hauss, 2013). Looking at those who contributed to this report, the name of our interviewee appeared, so it is assumed that this is the project that the interviewee was referring too. Also, there were eighteen people included in the project other than our interviewee, showing that this project had many community members were engaged in the plan for the trail. The project was proposed on August 28, 2013, a couple of months after the hospital announced its plans to expand the campus, but what was proposed by the Cascade Bike Club was not included in the expansion plan, despite there being some community backing.

Investigators noted immediately the absence of anything in the built environment that promotes recreational use by pedestrians. The campus has neither dedicated green space, nor a complete walking route through the property, creating the overall impression that the site is restricted to patients and staff.

Street Safety

Concerns about the streets bordering the medical campus - 76th Avenue W, 220th Street SW, and Pacific Highway 99 - supersede concerns about the medical campus as a public space. Significant traffic, speeding, distracted drivers and the absence of cross walks at specific areas are significant

factors that impede walkability, enforcing the perception of increased vulnerability for those on two feet or wheels.

Local contacts observed that the opening of the hospital brought increased traffic to the area, and that the establishment of more businesses led to busier and more crowded streets. Local business and hospital employees, and students from Woodway High School, are thought to be contributing to an unsafe walking environment in the daily rush to school, work, and home. According to a local resident, "it's just craziness, because you know people are trying to get to work quickly either leaving from this area to go to work or coming in the area to come to work. You know there's been some real hairy crashes just along this area over here," and the problem may be growing, "...there's seems to be a slow escalation of the, you know, the degree of people just doing their crazy driving just to get to work on time."

When interviewing hospital staffer Steve Kaiser, he attributed some of the negative driving behavior to heightened emotion. Kaiser notes that when talking to patients and visitors, "... you realize - people are crying and there's, or somebody just died." People driving to the hospital for urgent medical attention, or responding to a loved-one's health emergency, may be more likely to speed, or be distracted.

The expansion of Pacific Highway 99 has raised concerns about the effect it has had on Edmonds' presumed houseless population. A local neighborhood advocate has made a connection between the supposed increase in the transient population arriving by bus, and public disturbances in the area. The interviewee stated that the budget motels along Pacific Highway 99, east of the medical campus, have become a regular layover for panhandlers and a site for criminal activity. According to the interviewee, many of those who are presumed to have stayed for the night are often seen later in the local newspaper, typically for causing some sort problem or disturbance on the highway, leading to arrest. He notes that residents in the area would, "like to see the motels disappear."

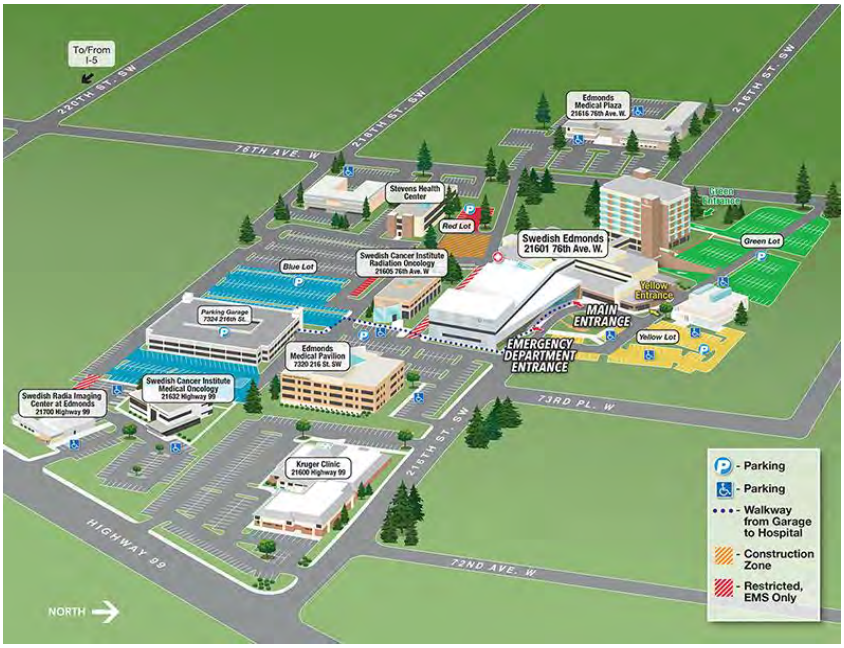

Figure 3: Rendering of the Hospital

Community Recommendations

Facilitating the safety of people using bike lanes or sidewalks abutting busy streets was the primary concern raised by interviewees. Steve Kaiser, a local biker and former employee of the hospital, surveyed co-workers, asking for the five main reasons people didn't want to bike or walk to work. "Most said they felt it wasn't safe. The traffic - that was the number one reason," (Kaiser, 2017). It's worth noting the precedent of community members working with the City of Edmonds to install a speed bump on 215th Street SW, where there is dense traffic and no sidewalks. Local resident Jim Underhill explained that what the neighborhood really wanted was a sidewalk to improve safety for walkers - but the speed bump at least helped to slow down traffic, making the route safer for pedestrians (Underhill, 2017). This small measure of success demonstrates the ability of the City of Edmonds to collaborate with community members in the promotion of pedestrian safety.

One way to address the vulnerability of pedestrians walking along busy streets is to introduce green buffers (a line of small trees) between the sidewalk and the street itself. A natural buffer would help mitigate noise pollution and give pedestrians a greater sense of security. More sidewalks, crosswalks, and streetlights are needed to make pedestrians feel comfortable accessing those routes. Sidewalks on 73rd Place W and 215th Street SW were also suggested by stakeholders. Radar speed screens in conjunction with properly delineated (with striping and signage) bike lanes, would address bicyclist concerns about speeding, and the hazard posed by distracted drivers.

Another major influence of mobility and accessibility in the Swedish Hospital node is the lack of publicly available space on or near the medical campus. Investigators noted there are not a lot of restaurants, cafes, bars, or social organizations in close proximity to the hospital. Underhill explained that the types of businesses that encourage pedestrianism are downtown, away from the target area. "We got a lot of things up [downtown], but we don't have those kind of things that lend themselves to socialization and meeting your friends after work," (Underhill, 2017). This sentiment was echoed by Kaiser who explained the expansion project on 212th Street SW, where the city developed a new bike lane and sidewalk. "It's rare you see walkers. You will occasionally, but there's really no place to walk there." When asked what would increase walking in the area, both interviewees suggested the need for an influx of activity - such as music, festivals, arts, and a farmers market. Underhill added, "I don't think people view the hospital as a place to come to for music, arts, crafts, that type of thing...To add value would be things like lunch time concerts...you know the after work mixing and brewing type of stuff…" This tells us that while safety is key for pedestrians to feel comfortable, there must also be places for them to go.

The City of Edmonds has had involvement with local festivals in the past, and according to Kaiser, employees of the hospital utilized shuttles to get from the hospital campus to the streets of vendors during community events. "Employees were walking from the hospital campus across the street to use the shuttle to go to the festival. That's great. We should do more things like that" (Kaiser, 2017). Based on this feedback, it is the recommendation of these investigators that the City of Edmonds increase opportunities for social events, which would give incentive to use public transit, sidewalks and bike lanes, improving the overall walkability of the area.

The establishment of a dedicated walking trail linking the campus to a well known nearby business would also address the needs of local residents who feel cut off from services, and promote greater mobility. Such a path would move pedestrians off the streets, away from traffic, and provide a quiet route on which to engage with one another. Both interviewees cited Dick's Drive-In as a focal point

for employees and hospital visitors go to eat lunch. Dick's Drive-In is also frequented by high school students and neighborhood locals.

It is strongly recommended that the City of Edmonds reopen a previous discussion about a trail that was once endorsed by the hospital, Dick's Drive-In, and WinCo. Kaiser explained that plans were in motion to connect an S-shaped trail from the campus to these locations, creating flexibility for walkers, promoting business for the restaurant and grocery store, and promoting health for both patients and non-patients. This plan was supported by the businesses and community members between June and August 2013, but dropped once the hospital began construction that same year.

These suggestions strongly emphasize the importance of safety, greenery, and off-road accessibility to increase walkability and mobility for staff members and neighborhood locals.

Executive Summary

- Expand sidewalks on 76th Avenue W, 220th Street SW, and Pacific Highway 99 to include a green buffer between pedestrians and traffic.
- Install sidewalks on 73rd Place W and 215th Street SW.
- Install radar speed screens on 220th Street SW and Pacific Highway 99.
- A dedicated public space on or within walking distance of the medical campus.
- A trail that connects the medical campus to a local business such as Dick's Drive-In.
- Revisit the Cascade Bicycle Club's Bikeability Tour Report for infrastructure recommendations.

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YOST PARK & FIVE CORNERS ROUNDABOUT WALKABILITY ASSESSMENT

Abstract

Partnering with the city of Edmonds, Western Washington University conducted research on the "walkability" of nine specific nodes. This paper focuses on the research conducted at Five Corners and Yost Park. The overall goal in mind when conducting this research was the idea of health and wellness in terms of how "walkable" these two nodes are, with emphasis on those visually, or otherwise impaired.

Introduction

As health concerns continue to rise around the globe, research and understanding of how to improve community health also rises. Health, both physically and mentally, is impacted by our ability to walk, travel, and interact with places (Godbey 2009). In the city of Edmonds, Washington, health and walking accessibility is a growing concern, especially as the city continues to grow. In order to address public health and meet a desire to plan an environment that promotes walking accessibility, we partnered with Edmonds staff to develop this report. Our research aims to answer three main questions regarding two locations, Yost Park and the Five Corners Roundabout: 1. *What is the built environment around these places?* 2. *How does the community interact with these places?* 3. *What are the community's perceptions and suggestions for these places?*

Literature Review

Health and Wellness as Related to Public Spaces

Yost Park

The literature states communities have a lesser chance of disease if they have a well-built area to engage in meaningful activities such as walking, bike riding, hiking, and other activities. "Low levels of walking are a major factor in today's widespread waste of the potential for health and well-being that is due to physical inactivity (N.H.S. Choices 2016)." A well-built community will attract the entire community to get out and enjoy their surroundings. "The more attractive and safe the environment is perceived to be, the more likely it will attract users (Godbey et al. 2005)." Finally, we have also found that short distances to parks will also increase usage. "They observed that the more convenient the location (usually within 10 minutes) the more likely they would walk or bike (Greenberg & Renne 2005)."

Roundabout

In recent years, the call for review of roundabout safety in relation to automobiles has significantly increased. Research findings indicate that crashes from T-bonings, head on collisions, and sideswipes have been greatly reduced. The Insurance Institute for Highway safety states that "roundabouts also improve traffic flow and cut down on idling, which reduces fuel consumption and emissions (IIHS 2017)." However, there are concerns regarding the safety of pedestrians and

bicyclists. With heavy traffic flow, most pedestrians do not view roundabouts as safe junctures. A study on the effects of roundabouts revealed that "pedestrian safety is also an issue of perceived vs. real risks. Even though pedestrian safety at roundabouts seems to be high (based on international experience and limited U.S. experience) many pedestrians do not perceive roundabouts to be safe (Stone et al. 2012)." Problems voiced also included those for at-risk populations such as the visually impaired. Suggestions to combat this include placing street crossings at points distant from the roundabout intersection, as well as installing sound/noise strips, because "even though the strip was not intended specifically to be an auditory aid . . . it acted as a useful tool in wayfinding (Apardian & Alam 2015)." While there is ample and increasing information on vehicle safety within roundabouts, such in depth research is more difficult to find regarding current health trends and concerns among pedestrians and bicyclists. Part of our research was to help identify and analyze these problems at Five Corners.

Physical Aspects of Parks and Public Spaces

Yost Park

The literature states it is important to make walking to parks inviting to residents by creating a visually appealing and clean environment, and developing off-road trail access (NRPA 2015). In multiple studies, NRPA found that park users engage in higher levels of physical activity in parks that have playgrounds, sports facilities and trails. Also, parks that have paved or unpaved trails and wooded areas are seven times more likely to be used for physical activity than parks that do not have these features. In addition, they found that having attractive environmental features in and around parks is a powerful motivator for physical activity (Maroko et al. 2009). Research has shown that having multiple access points to parks can help pedestrian get to the park more easily. While many homes "may be in short linear distance to parks, pedestrian access to park entrances often results in longer walking distances due to the limited number of entrances due to fencing and other barriers" (NRPA 2013, 6). The U.S. Department of Transportation states that an ideal sidewalk is five to seven feet wide (FHWA 2010) and adding mode-separation boundaries can help with pedestrian safety. Street trees can slow traffic and improve safety for pedestrians. Trees add visual interest to streets and narrow the street's visual corridor, which may cause drivers to slow down (BPMP 2012). Therefore, "physical separation of sidewalks from curbs and parking areas reinforces a safer environment for pedestrians" (NRPA 2015, 6). Although stakeholders may identify a route as safe, the community's perception of safety may differ. Perceived safety is defined as the community interpretation and assessment of whether routes to parks are safe (Maroko et al. 2009). There is little to no research on the community's assessment of whether routes to Edmonds parks are safe. So, part of our research involved conducting interviews with residents on their thoughts about the routes to Yost Park and the physical aspects of the park.

Roundabout

We conducted research on how people use the Five Corners roundabout (walking, biking or driving through the area) now that it has been there over two years. Are people walking and biking more? Do they perceive the roundabout as safe? We also researched effects on nearby businesses; Have the businesses in the area seen an increase in volume of customers? Are there new businesses near the roundabout? Businesses in the area surrounding roundabouts have been observed to have an increased volume of customers (AARP 2017). Roundabouts are becoming more prevalent due to their high efficiency in comparison to a four-way intersection with stop signs or a traffic light—with

a roundabout, there is slower movement, but it is continuous, and therefore more efficient (Meiller 2012). Modern roundabouts improve traffic safety by slowing the speed and directing the flow of traffic in a single counterclockwise circle, reducing deaths and injuries significantly. As pedestrians and roundabouts continue to interact, the physical structure of the roundabouts has an impact on this relationship.

Previous Studies & Methodologies

Yost Park

Getting people active through their local parks has become increasingly important at local, regional, and national levels. A national project called "Healthy Parks Healthy People" is an initiative geared towards shaping national parks to encourage public health and wellness as well as places to learn about environmental conservation (NPS; Schmalz et al. 2013). Although this initiative primarily involves well-educated experts, it can serve as a guide for more locally-oriented projects. The City of Bellingham, WA, provides an excellent example of involving local people in their plan to increase pedestrian accessibility (BPMP 2012). Citizens were engaged through public workshops and surveys, which were used by city planners to define relevant issues for improving pedestrian access and mobility in Bellingham (BPMP 2012). An increasing number of studies have included the local community, because community-based participatory research (CBPR) has become more popular in academia. Many studies have shown that proximity to parks and green spaces has a positive impact on the mental and physical health of people (Floyd et al. 2008; Sturm & Cohen 2014; de Vries et al. 2003). These studies involved the community as research participants, important stakeholders, and as sources for ideas for improving park areas (Mowen et al. 2009).

Roundabout

Understanding how a community interacts with and perceives streets, especially roundabouts, is key to understanding how they view the walkability of such infrastructure. Relevant literature and case studies continues to grow; many cities have begun to implement structural changes, and then research how the community perceives the modified infrastructure. Guth et al. (2005) implemented human-subject experiences experiments to simulate the factor of safety perceived by the participants walking in a roundabout. Additionally, Candappa et al. (2014), implemented a survey to gather community perceptions and observations regarding interactions with crosswalks that were the subject of study. In Sun et al. (2015), where they studied the perception of walking at a local university, they also utilized an online survey to gather the community's perception of the area and walking accessibility. Furthermore, the City of Bellingham has begun to implement changes focused on walking accessibility and mobility of individuals in the community. The City of Bellingham's master plan provides insight on how the needs of the community were identified through public workshops, surveys, and reviewing established built infrastructures and policies (BPMP 2012). Surveys, participant observations, photographs with visual analysis, and structured and semi-structured interviews were therefore utilized in this study to gather community perceptions and recommendations on the walking accessibility at Yost Park and the Five Corners Roundabout.

Methods

Online Survey

An online survey was created using Qualtrix, with a mixed format of ranked-order and open-ended responses. The online survey was distributed through City of Edmonds social media accounts such as Facebook and Twitter to gather more information and understanding from the community. Due to the short timeline of this research process, the online survey was only distributed and available for two weeks. Once the survey closed, analysis of the answers was conducted. Completion of the survey provides some insight on how the community utilized and perceived Yost Park and the roundabout.

Visual Analysis

Photographs of the park and roundabout were used in this study. We took photos of the landscape of the park (e.g. playground, tennis court, basketball court, swimming pool, and hiking trails). We also took photos of the perimeter of the roundabout and used the photos as only a reference to our notes. None of the photos at Yost Park or the roundabout include people that can be identified.

Participant Observation

Participant observation was used in this study as a method to observe how people used the space in the park and in the roundabout. We used SOPARC (System for Observing Play and Recreation in Communities) to directly observe park users' physical activity, characteristics of individuals (age, sex, ethnicity) and collect information on aspects of the park's environment, such as accessibility, usability, and organization (McKenzie & Cohen 2006). Along with direct observation, we asked park users simple informal questions such as "What do you come here to do?"

Results

Online Survey

After distributing the survey online for a week, there were 123 responses. It is important to note that the discussion of results derived from the survey does not reflect the entire population of the City of Edmonds, which has a population of 39,709 2010 (US Census 2010).

For the Yost Park analysis, the most frequent response given by survey users was that they typically visit the park once per year. The second and third most frequent responses were "monthly" and "daily" (Appendix Survey Results Q4). People most frequently (74% of respondents) visit with their family, followed by visiting with dogs (33%), with friends (28%), by themselves (28%), and "other" (4%) (Appendix Survey Results Q5). When survey takers were asked what influences their decision to go or not go to the park, users responded "other" (47%), "distance to park" (40%), "pedestrian safety" (28%), and "traffic" (8 %) (Appendix Survey Results Q6). With respect to which activities users engage in at the park, walking, nature viewing, and play (which included tennis, playgrounds, and free play) were the most common responses (Appendix Survey Results Q7). 63 responders knew that the park was a nature preservation park, while 58 responders did not (Appendix Survey

Results Q8). When asked to rate the accessibility and walkability of Yost Park's trails using a scale of 1 being inaccessible and 5 being accessible, responders answered 3 (37%), 4 (26%), 5 (19%), and 2 (18%) (Appendix Survey Results Q9). Using the same ranking scale, responders were asked to rate the walkability/accessibility of pedestrian facilities to get to the park, and the results were 3 (36%), 4 (25%), 5 (21%), 2 (15%), and 1 (3%) (Appendix Survey Results Q10). When asked to rank Yost Park's visual appearance on a scale of 1 being not great and 5 being great, participants responded with 4 (40 %), 5 (26%), 3 (22%), and 2 (12%) (Appendix Survey Results Q11). Using the same ranking scale, participants were asked to rate their overall satisfaction with the park, and the results were 4 (42%), 3 (28%), 5 (22%), and 2 (8%) (Appendix Survey Results Q12). The final choice-selection survey question was "what are some improvements for the park," and most commonly answered was more accessible and better bathrooms. Other responses, in rank order, were more accessible trail maps, more trails to the park, increased disabled-accessible trails, and increased benches (Appendix Survey Results Q13).

With respect to frequency of use of the Fiver Corners roundabout, 72.13% responded Very Often, followed by 19.67% Somewhat Often, 7.38% Rarely, and 0.82% Never. Virtually everyone (121 out of 122) had used the roundabout at some point (Appendix Survey Results Q14). The next three survey questions address safety of Pedestrians, Bikers, and Drivers traversing the roundabout. These questions use a rating scale as follows: 1 = not safe, 3 = neutral, and 5 = very safe. Each respondent was asked to rate the safety of each type of user, so, for instance, a person who always drives through the roundabout nevertheless offered an opinion about the safety of bikers and pedestrians.

For the Pedestrian safety question (Appendix Survey Results Q15), combining the Safe categories 4 & 5, 44.54% said the roundabout is safe, while 24.37% said the roundabout is not safe (combining not safe categories 1 & 2), and 31.09% were neutral. The ratio of Safe-to-Not-Safe is thus 1.83 (excluding the neutral category). Performing an identical analysis of the responses regarding Bikers (Appendix Survey Results Q16), 43.59% of responses were neutral, 36.75% (combining the not safe categories 1 & 2) were unsafe, and 19.66% (combining the safe categories 4 & 5) were safe, resulting in a Safe-to-Not-Safe ratio of just 0.54. For the Drivers safety question (Appendix Survey Results Q17), using the identical analysis, a Safe-to-Not-Safe ratio of 2.76 was observed (based on responses of 57.02% safe, 20.66% unsafe, and 22.32% neutral).

Summary of safety ratios (which exclude neutral responses)

Pedestrians safety ratio	1.83
Bikers (bicycles) safety ratio	0.53
Drivers safety ratio	2.76

The Bikers Safe-to-Not-Safe ratio is cause for concern or action, perhaps by education of users or changes to the roundabout that address biker safety.

Commentary Analysis – Yost Park

After analysis of the free-form comments submitted regarding the park, we settled upon five general categories of responses: Safety, Physical Aspects, Facilities, Trails and Education (Table 1). Of the 64 comments submitted by the 123 people that took the online survey, these were the topics community members mostly mentioned.

Comment Category	# of Comments	% of Comments
Safety	15	~23
Physical Aspects	16	25
Facilities	22	~34
Trails	7	~10
Education	4	~6
123 Surveys	64 Comments	~52% had comments

Table 1: Coded Comments for Park

Comment Category	# of Comments	% of Comments
Two-Tiered		
Safety & Trails	3	~35%
Facilities & Physical Aspects	3	~35%
Three-Tiered		
Safety, Facilities & Physical Aspects	1	~12%
Trails, Facilities & Physical Aspects	1	~12%
123 Surveys	8 of 64 Comments	~14% of 64 Comments

Table 2: Multi-Tiered Park Comments

Multi-Tiered Comments about Yost Park

Overall there is varying complexity to the comments about Yost Park. Some respondents submitted comments that touched upon two or more of the five main categories, so we established Multi-Tiered and Single-Tiered comments. Table 2 presents a breakdown of our coding process regarding the multi-tiered comments. It is worth noting that these complex comments comprised only 8 of 64 comments. Given that the total number of surveys submitted was 123, you could expect more complex commentary from the public given a larger sample size. Multi-tiered comments included:

Two-Tiered:

Safety and Trails

Participants voiced a need for access to Yost from the northwest, an example being the top of Main St. There is a call for more sidewalks in the surrounding area, stating specifically that "Maplewood Drive is very dangerous for pedestrians, who are forced to walk in the busy street."

Facilities and Physical Aspects

Comments centered around improved playground area such as: expanded playground for toddlers, better maintained trails, permanent bathrooms, clearly marked parking spaces/trail entrances, and a specified off leash dog area.

Three- Tiered:

Safety, Facilities and Physical Aspects

Another request imploring trails be friendlier to those handicapped and with strollers. A participant voiced that ". . .the water trails are very steep and the railings are dated, if any. I would love to see hand railings put in. I often walk with my jogging stroller and wish I could go through the trails with that instead of my baby carrier. That also would apply to handicap accessibility for at least part of the beautiful trails."

Trails, Facilities, and Physical Aspects

A request for linking Yost Park and Pine Ridge Park.

Single-Tiered Comments about Yost Park

The following collections are based on responses that pertained to only one aspect of Yost Park. As noted in Table 1, the comments fall into five categories.

Safety

About 23% of the comments from our online survey were solely about safety. A notable expression about Yost being ". . .I visit Pine Ridge and Boeing Creek frequently, but something about Yost just seems eerie and filled with coyotes." Many participants cited feeling unsafe being alone in the park, day or night. Most notably, the reason being homeless population, related crime and drugs, local assault cases, and a recent tragic event in Meadowdale Park. Having such a beautiful park in Edmonds is a pride for its residents, some have called it ". . .the jewel of Edmonds" while also questioning ". . .are the trails safe? They scare me!"

Physical Aspects

Of the 64 comments received, 25% had comments pertaining to just the physical aspects of Yost Park. Negative comments being: more stroller friendly trails, maintained trails, boardwalk updated for wet conditions, and overall some 'tender loving care.' Comments that stood out, ". . .stairs on the steeper portions would make me more inclined to use them in the winter. I generally don't go down into the valley because I assume I'd end up sliding down the hill on my bum" and "Pine Ridge Park is better because it has a lake." On the positive side participants were very eager to share their love for Yost. People enjoy the trails, nature preserve, and pool; one person stating they had been visiting for "over 40 years!" Yost Park really seems to be well embedded within the community, and it shows through its enthusiastic community members.

Facilities

Participants request playground upgrades, renovation of the pool locker rooms and entrance; most of all, a call for year-round bathrooms, even when the pool is not open. With about 34% of park comments pertaining to the facilities at Yost, a few did voice a want for the pool to be year-round ". . .with a winter season bubble." Overall responses were very positive, with community members having engaged at Yost Park for decades and across generations.

Trails

Comments solely concerning the trails indicate a want for more publicity; specifically regarding connecting trail routes. There was mentions of connecting Pine Ridge,

involving an unused corridor. One participant eagerly requests signage, paved roads for cyclists and pedestrians.

Education

About 6% of respondents would like amenities such as a designated walkable map, descriptive signs portraying types of flora/fauna and history. A particularly memorable comment asking for more information on Yost states ". . . I didn't know you could access it from trails other than the parking area near the pool. Silly, I now realize, but I haven't been adventurously exploring. Now that I know this, I will seek these access trails out. But I still don't know what to expect or what I will find. Muddy trails? Waterfalls? Bigfoot?"

Noteworthy Comments

"It's a fabulous, safe to access, neighborhood park that I've enjoyed with kids of every age for almost 2 decades."

"We have loved the outdoor pool for years --my kids grew up doing swim team. It is a unique and irreplaceable recreational resource for Edmonds and the surrounding community."

"My favorite experience in Edmonds has been at Yost having my 2.5 y/o son learn that water rolls downhill, that woodpeckers eat bugs, and what owls (and woodpeckers) sound like. Love this park."

Commentary Analysis – Roundabout

The comments from the online survey were analyzed using a coding process. After reading all the comments, we settled upon five categories to break the information down into a more manageable system. 57 comments were submitted regarding the Five Corners roundabout, touching upon 73 topics (given that some comments touched upon multiple topics). Table 3 shows how the topic responses fall within the five categories.

Safety	16 responses	23%
Physical	12 responses	16%
Information and Education on Roundabout	12 responses	16%
General Negative Comment	12 responses	16%
General Positive Comment	21 responses	29%
	Total = 73 responses	**100%**

Table 3: Coded Comments for Five Corners Roundabout

Safety:

Residents strongly feel that non-yielding drivers are a huge problem and that they will cause accidents in the roundabout. There were many comments fearing for the safety of pedestrians and bicyclists in and around the roundabout and many feel that there is a general lack of understanding of the rules of roundabout operation, which could cause potential accidents. "The roundabout is an improvement from the old stop signs. A little difficult for pedestrians (kids) to know when they can walk since they don't know traffic rules and no white walker symbol to tell them to go." Many residents commented about disliking the roundabout and avoiding it altogether.

Physical:

Many residents commented that the roundabout center piece was of poor design and too large, causing safety concerns. "The giant sculpture in the middle prevents you from seeing what is on the other side until you are there. Pedestrians can't see oncoming cars and cars don't see pedestrians until they're almost of top of them." Many residents are also concerned about the need for more sidewalks in these specific locations: 82nd Avenue W all the way to 236th, and sidewalks at 82nd Avenue W between 204th SW and 208th SW. Also, commenters stated the need for a sidewalk on the steep sloped block of 208th SW between 82nd and 83rd, along with a stop sign. The requests for sidewalks were written in such a way as to imply the need for safety.

Information and Education:

There were many comments saying that the roundabout is a vast improvement from the five stop signs previously at Five Corners. Many residents commented on how they enjoyed using the roundabout, but there were just as many comments leaning towards the need for more signage to support the rules of the roundabout, the need for re-education on the use of a roundabout, roundabout safety hazards, and how to avoid them.

Overall:

Taking all categories into account, 71% of responses expressed negativity, leaving 29% expressing positivity.

Visual Analysis

Yost Park

The trails at the park exhibited steep grades (incline or decline, depending on the direction of travel) and a mix of well-established trails to muddier or less established trails. The inner part of the Cedar loop trail could be explored because it wasn't completely packed with trees and vegetation as in other areas. There was only one portable toilet available at the park (*photo below*). The tennis courts are well lit and useable, but some areas on the courts have "dead spots" where the balls were unable to bounce and the current lines on the court are hard to see. The playground area was very clean but only had one picnic bench to sit on (*photo below*).

Photo of portable toilet

Photo of Playground

Roundabout

The group members observed people using the flashing lights to cross safely while cars waited. When the flashing lights came on, though, there was no auditory cue to let you know when to cross. The cars seemed to have no trouble using the roundabout because the lines on the road and crosswalks can be clearly seen when driving. We noticed that many of the drivers drove quickly through and seldom stopped for pedestrians. Because of the lack of pedestrians and bikers, we did not collect observations using SOPARC forms

Participant Observations

Yost Park

On April 16, four group members visited Yost Park for preliminary observations. Once we got to the park, we drove through the parking lot looking for a handicapped spot (one of our group members has a disability) and were unable to find one. After walking into the park, we found a handicapped spot close to the pool and the dilapidated basketball court, but it was inaccessible because there was a locked gate blocking the road to it. We walked down the paved main trail, service road, and a little into the connecting trails (see map) to get a preliminary view of the area. Yost Park is a habitat park, so there is a lot of greenery, unpaved trails, and wildlife that we could observe. We talked to a few people to ask what they used the park for, and they said they frequently came to walk their dogs and birdwatch, and one mentioned that they would like it if there were more bathrooms available other than the portable toilet.

On May 7, five group members visited Yost Park and the roundabout to make formal observations. We used SOPARC coding forms to note traits about people that we observed in the park: their gender, age group, ethnicity, and activity level. We had a list of general questions to ask park-goers. Since we split the park into five sections to save time (see Figure 4), one section per person to observe, there is overlap in the people that we interviewed, so the total number of responses we gathered (74) is not indicative of the number of respondents. A more accurate number would be around 20-30 park-goers. Visitors to the park were typically there to walk or hike the trails, with a few people jogging, biking, or walking their dog. Conversations held with some visitors show that many people enjoy the park, as it is peaceful and easily accessible.

Upper Left Trails: These trails are a mix of well managed or unkempt and steep or level paths with several boardwalks or bridges and one bench. 9% of the park-goers observed were seen here and were walking or jogging alone or in small groups. One individual spoke to the observer saying that he comes to Yost on most weekends to walk the trails and visit the playground because it is a nice area to get away from the city and that he lives close by so he walked there.

Upper Right Trails: These trails are a mix of well managed or unkempt and steep or level paths with a few bridges and two benches. 29% of the park-goers observed were seen here and were mostly

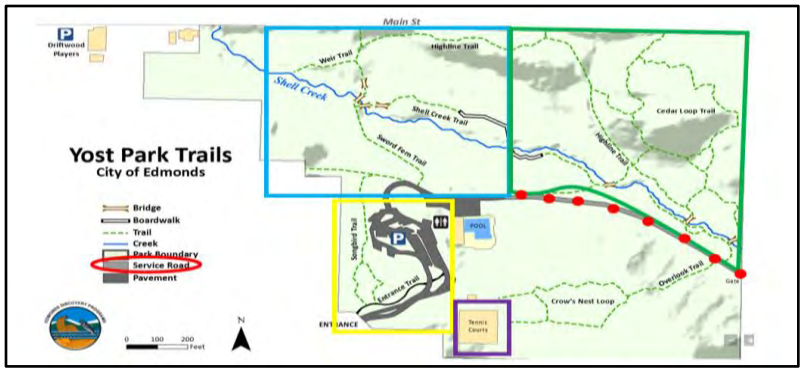

Figure 4: Five sections of park; Upper Left Trails (blue box), Upper Right Trails (green box), Parking Lot (yellow box), Pickleball Court (purple box), and Service Road (red dots).

families (one with a dog) walking the trails together and two individuals sitting together on a bench. One individual spoke to the observer saying that he comes to the park 2-3 times a week to bird watch and exercise and that he enjoys the area because of the peacefulness and access to nature.

Parking Lot: This area has sidewalks, bike racks, and a small playground and the pool near it. 16% of the park-goers were observed here and were walking towards the trails or were in the playground. Five individuals spoke to the observer, four were new or relatively new to the park and one often walks through. They came to walk, hike, bird watch, and enjoy the sunshine, nature and scenery. They liked to visit because it isn't too far away from home, is small enough that it doesn't take all day and that they can't get lost, it's pretty, but they would like if there was information about the trails somewhere. Three of them drove and two walked to the park.

Pickleball Court: None of people using this facility were from Edmonds. They visit the park because this court is the outdoor court that is most often available for them to play pickleball. 18% of the park-goers were observed here, and they had several suggestions to improve the area, such as more routine maintenance and better parking.

Service Road: This area is a paved path that leads to a housing area with a gate to prevent cars from entering. 27% of the park-goers were observed here, many were family or small groups walking, walking their dog, running, or biking together. One individual spoke to the observer saying that he comes here about two times a week to jog, walk, or bike because he lives nearby and really enjoys the park overall.

After completing the participant observations, the attributes about park visitors recorded on the SOPARC coding form were compiled for analysis. Pie charts of each attribute were made to visualize the data to disseminate the results of the research in an easily understandable way for multiple audiences (Figures 6, 7, 8, 9). Ethnicity, age, and sex information were compared to Edmonds census data (2010). In comparison to this data, the ratios of perceived sex, age group, and ethnicity are roughly similar to those from the 2010 US Census, making the numbers from our participant observation fairly reliable (Figures 7, 8, 9).

	People Observed at Park	
Sex	**Female**	49%
	Male	51%
Age Group	**Child**	15%
	Teen	1%
	Adult	69%
	Senior	15%
Ethnicity	**Latinx**	14%
	Black	0%
	White	70%
	Other	16%
Activity Level	**Sedentary**	3%
	Walking	62%
	Vigorous	35%

Table 5. Attributes of Park Visitors

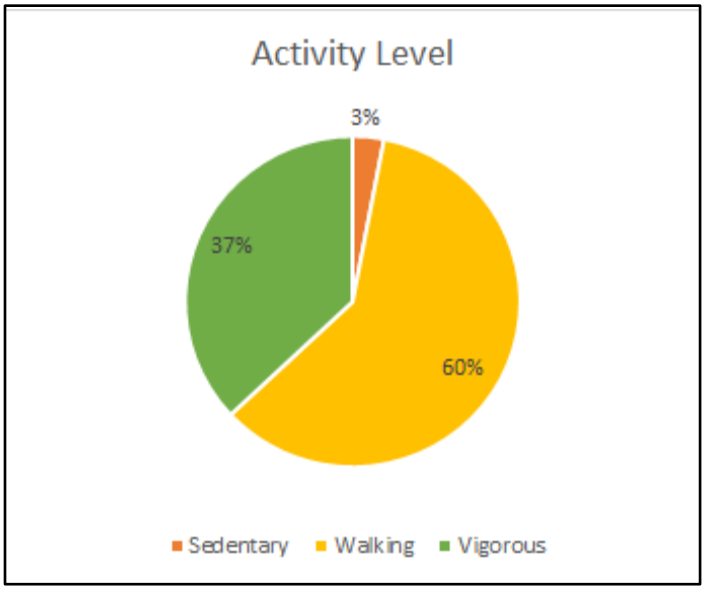

Figure 6: Combined observed activity levels chart

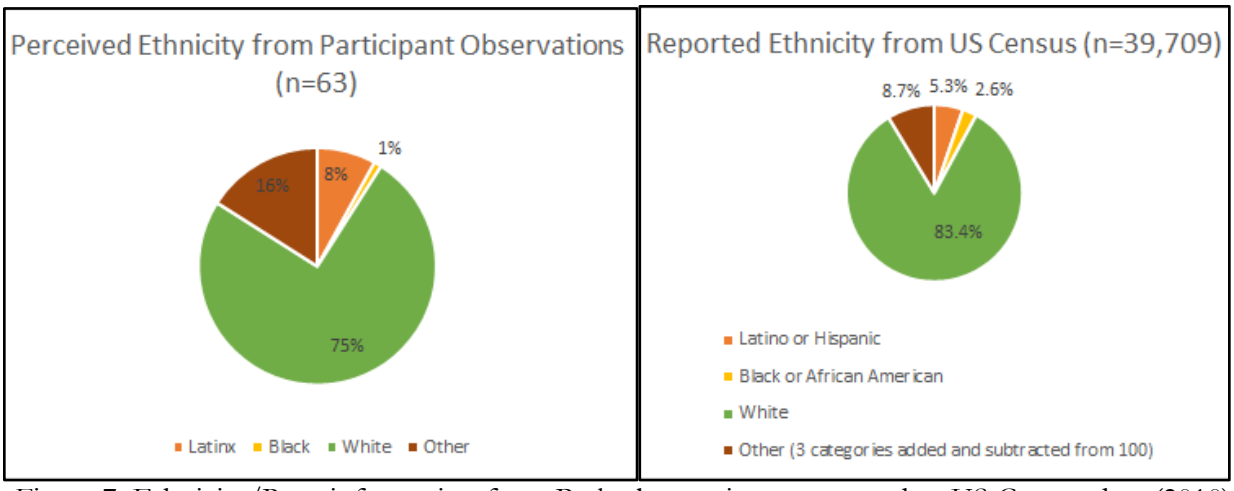

Figure 7: Ethnicity/Race information from Park observations compared to US Census data (2010).

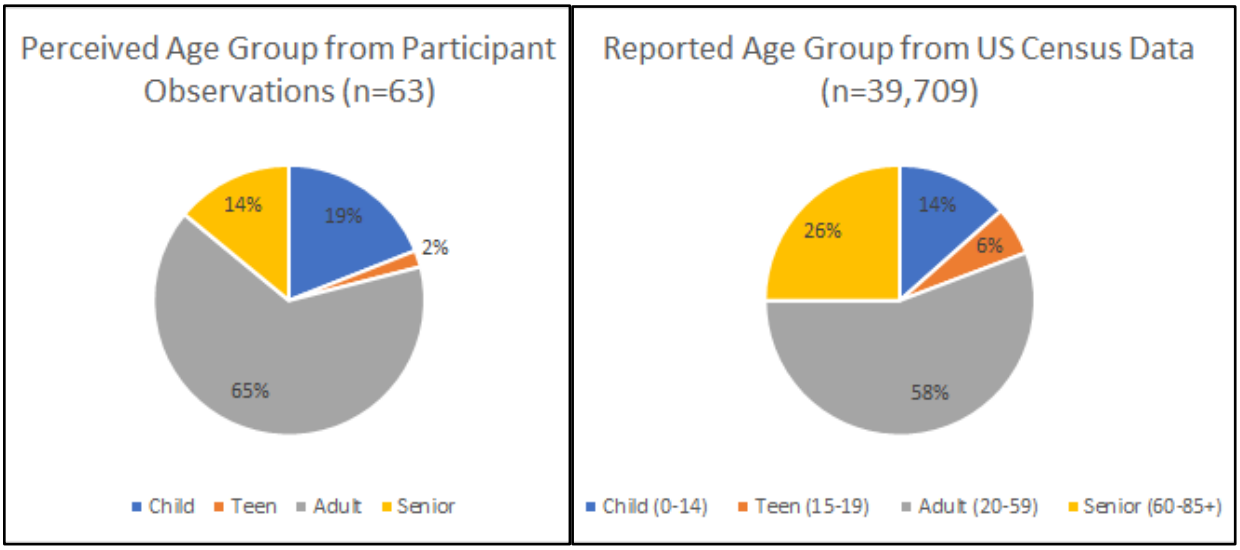

Figure 8: Age information from Park observations compared to US Census data (2010).

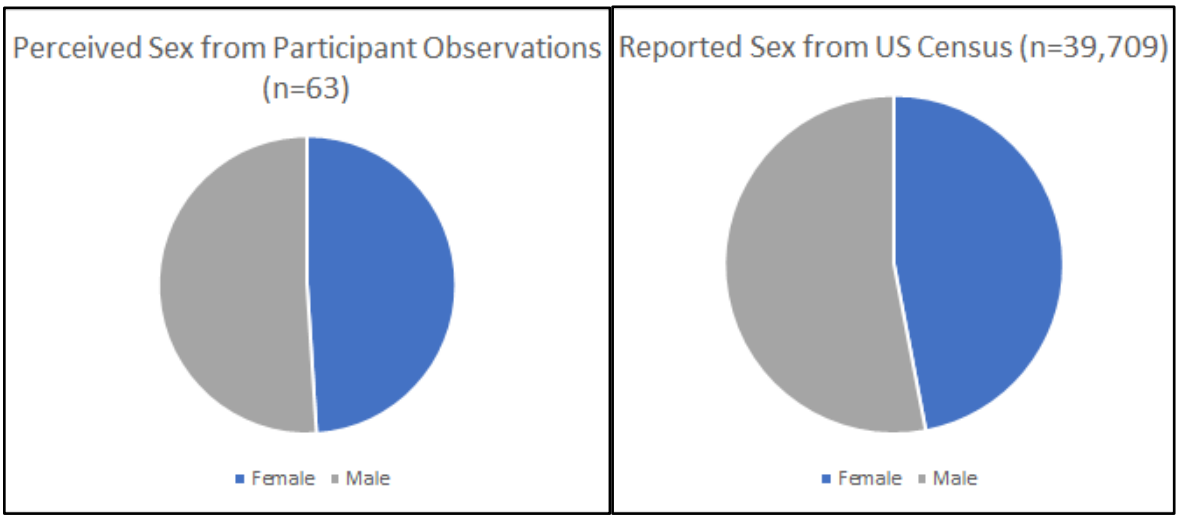

Figure 9: Sex information from Park observations compared to US Census data (2010).

Discussion & Conclusions

After conducting an online survey, visual analysis, and analyzing participant observations, we believe safety, physical attributes, and facilities around Yost Park and the Five Corners Roundabout influence and impact the perceptions of the community members who utilize these two locations.

The built environment around Yost Park is minimal aside from the facilities such as the pool, playground, and tennis courts. The majority of this area is green lawn, forest-like, and unpaved trails. The lack of built environments and the nature-focused "feel" draws more community members to visit this park. As one survey participant commented "Appreciate that it is not overdeveloped in the ravine, maintaining urban access to a natural setting." The community most commonly uses the park to walk and view nature. However, despite viewing the park as a nature-focused area, the community ranked the trails within the park as only somewhat accessible. Additionally, the safety, trail system, and facilities around Yost Park were identified to be areas to be improved. Many community members commented on feeling unsafe when visiting the park. Ranging between comments that show concern for homeless, lack of safe trails especially when the trails are muddy, and concerns for crimes in the area, safety was the top priority, and the area of improvement the community would most like to see addressed. The most requested improvement is an increased number of accessible restrooms. Participant observations and visual analysis revealed that there is one portable toilet that is not always maintained, and not easily accessible to those who are disabled. Other recommendations from the community include more accessible trail maps, safety signs, increased number of benches, more trails or pathways to get to the park, and more disability-friendly trails. Based on these findings, to increase the walkability and accessibility of Yost Park, we would recommend improvements aimed at increasing the safety of the park, an increased number of restrooms, and small improvements around the park to inform/educate users and to make the park more accessible for community members. Additional recommendations include more maintenance of the already existing facilities and perhaps provision of more areas for sedentary activities such as sitting at picnic tables.

The Five Corner's Roundabout is surrounded by small retail shops and restaurants. In the center of the roundabout is an artistic centerpiece. Around the roundabout, there are bright crosswalk painted sections, and hawkeye light-up pedestrian crossing signs. Overall, the lights at the Five Corner roundabout work and people seem to use them when they need to cross. The roundabout is very clean and cars come to a complete stop when pedestrians cross. The most common interaction that the community has with this location is to drive through, however, there was a small population that was observed to walk through the roundabout. When asked to rank the safety of pedestrians walking around the roundabout, the majority of survey respondents ranked the safety as average/neutral to very safe. Yet, the majority of respondents felt that the roundabout was not safe for bicyclists. Planners could consider making changes to the roundabout to address bicyclists' safety. Another recommendation is to provide an auditory cue to let you know when you can cross. Additionally, an increased amount of signage about the speed limits and general information to improve community knowledge of how to navigate and drive in the roundabout is recommended.

Limitations of the Study

Given the short timeline of the research, this study was only able to connect and engage with a small subset of community members. In the future, this study could be expanded to engage with more community members to get a more holistic and representative insight and understanding of the City of Edmonds. We recommend more ways to interact and collaborate with community members, such as conducting semi-structured interviews or focus groups. This study can be expanded to include more areas of interest and to gather more data to obtain more in-depth results and recommendations from the community.

Another critique of our methods relates to the forms we used for the participant observations, which were designed to directly and systematically observe activity levels in public spaces to get objective data about physical activity levels of people, without having to rely on survey data, which is often skewed (Cohen et al. 2011). For the most part, the form was very helpful, as it allowed us to easily note contextual attributes about park-goers and their activity levels in a standardized way, but there were some problems. As we only observed these people, and did not ask them their sex, age group, and ethnicity, the results are not exact, but we wanted to at least show that there is diversity in sex, ethnicity, and age within the park. We found that observing ethnicity was the most problematic, as judging someone's ethnicity by how they look is difficult, and because the form had only four sections for ethnicity: Latinx, Black, White, and Other. We assumed "Other" to mean any ethnicity that is not Latinx, Black, or White, which is also problematic in that it does not recognize other ethnicities specifically as the form does with others. For future research, we recommend modifying the form to be more inclusive by listing more ethnicities, or to develop a way to ask the ethnicity of park visitors that we observe in a non-intrusive way.

Appendix:

Survey Results:

Q1 - Please specify your age:

Age	%	Count
18-24 years old	1.64%	2
25-34 years old	16.39%	20
35-44 years old	28.69%	35
45-54 years old	28.69%	35
55-64 years old	15.57%	19
65-74 years old	7.38%	9
75 years or older	1.64%	2

Q2 - Please specify your race/ethnicity:

Ethnicity	%	Count
White	95.08%	116
Hispanic or Latino	0.00%	0
Black or African American	0.00%	0
Asian or Pacific Islander	1.64%	2
Native American or American Indian	0.00%	0
Other	3.28%	4

Q3 - Please specify your gender:

Gender	%	Count
Male	23.97%	29
Female	76.03%	92

Q4 - How frequently do you visit Yost Park?

Frequency of Visits	%	Count
Daily	3.28%	4
Weekly	23.77%	29
Monthly	30.33%	37
Yearly	36.89%	45
Never	5.74%	7

Q5 - If you go to Yost Park, who do you go with? Select all that apply:

Visits with:	%	Count
Family	73.68%	84
Friends	28.07%	32
Dog	33.33%	38
Alone	28.07%	32
Other	4.39%	5

Q6 - What influences your decision to go or to not go to Yost Park? Select all that apply:

Influence	%	Count
Traffic	8.40%	10
Pedestrian Safety	27.73%	33
Distance to the Park	39.50%	47
Other	47.06%	56

Q7 - What do you like to do when you go to Yost Park? Select all that apply:

Preferred Activity	%	Count
Walk	61.21%	71
Play (playground, tennis courts, pool, and free play)	27.59%	32
Picnic	6.03%	7
Bike	3.45%	4
Nature viewing	41.38%	48
Other	11.21%	13

Q8 - Did you know that Yost Park is a habitat preservation park?

Preservation Park	%	Count
Yes	52.07%	63
No	47.93%	58

Q9 - How would you rate the accessibility/walkability of the Yost Park trails? Where 1 = no accessible or hard to access, 3 = neutral, and 5 = easily accessible

Accessibility of Trails	%	Count
1	0.00%	0
2	17.54%	20
3	36.84%	42
4	26.32%	30
5	19.30%	22

Q10 - How would you rate the accessibility/walkability of pedestrian paths to get to Yost Park? Where 1 = no accessible or hard to access, 3 = neutral, and 5 = easily accessible

Accessibility of Paths	%	Count
1	2.68%	3
2	15.18%	17
3	35.71%	40
4	25.00%	28
5	21.43%	24

Q11 - How would you rate the visual appearance of Yost Park? Where 1 = not appealing, 3 = neutral, 5 = very appealing

Visual Appearance	%	Count
1	0.00%	0
2	12.39%	14
3	22.12%	25
4	39.82%	45
5	25.66%	29

Q12 - How would you rate your overall satisfaction of Yost Park? Where 1 = not great, 3 = neutral, 5 = great

Satisfaction	%	Count
1	0.00%	0
2	7.83%	9
3	27.83%	32
4	42.61%	49
5	21.74%	25

Q13 - What would you like to see improved at Yost Park, if anything? Select all that apply:

Improvements	%	Count
Better bathrooms or more accessible ones	41.96%	47
More benches	15.18%	17
More disability friendly trails	18.75%	21
Accessible trail maps	30.36%	34
More trails to get to the park	26.79%	30
Other	17.86%	20
=	100%	112

Q14 - How frequently do you use the Five Corners Roundabout?

Roundabout Use Frequency	%	Count
Very often	72.13%	88
Somewhat often	19.67%	24
Rarely	7.38%	9
Never	0.82%	1

Q15 - How would you rate the safety of pedestrian in the Five Corners Roundabout? Where 1 = not safe, 3 = neutral, and 5 = very safe

Pedestrian Safety	%	Count
1	7.56%	9
2	16.81%	20
3	31.09%	37
4	29.41%	35
5	15.13%	18

Q16 - How would you rate the safety of bikers in the Five Corners Roundabout? Where 1 = not safe, 3 = neutral, and 5 = very safe

Safety at Roundabout	%	Count
1	15.38%	18
2	21.37%	25
3	43.59%	51
4	13.68%	16
5	5.98%	7

Q17 - How would you rate the safety of drivers in the Five Corners Roundabout? Where 1 = not safe, 3 = neutral, and 5 = very safe

Driver Safety	%	Count
1	5.79%	7
2	14.88%	18
3	22.31%	27
4	36.36%	44
5	20.66%	25

SOPARC Coding Form:

SOPARC PATH CODING FORM Page ___ of ____

DATE:_____ PARK ID:_____ OBSERVER_____

TARGET AREA:_____ START TIME:_____ END TIME:_____

Person	Gender		Age Group				Ethnicity				Activity Level		
	Female	Male	Child	Teen	Adult	Senior	L	B	W	O	S	W	V
1													
2													
3													
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(McKenzie & Cohen 2006)

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ACCESSIBILITY OF ROUTES TO SCHOOLS

Abstract

The accessibility and ease of mobility (e.g. walking, biking, driving, busing, etc.) in a particular community has important connections to health and wellness. Therefore, it is important to understand how community members perceive their transportation and route options. In particular, routes to school are an important health and safety concern for communities. Due to variables such as increased car ownership, lack of sidewalks, and unsafe roadways, transit to school has shifted over the last half century. Unfortunately, there is a lack of qualitative data to understand the consequences of this shift and the results of efforts used to address it. In partnership with the City of Edmonds, we gathered information from the community regarding their perceptions of current routes to Edmonds-Woodway High School, Chase Lake Elementary, and Westgate Elementary. In order to gather this information, we conducted phone interviews, walking interviews, online surveys, and focus groups with parents and teachers involved with these schools.

Introduction

Our specific group investigated the safety and accessibility of routes to and from school. We examined Edmonds-Woodway High School, Chase Lake Elementary, and Westgate Elementary. Our investigation utilized multiple qualitative research methods, including walking interviews, telephone interviews with parents and faculty, online surveys, and a focus group conducted with a PTA group. Our research aimed to gauge the degree of safety perceived by parents and faculty for kids busing, biking, walking, and driving to school. Our qualitative data will then inform the recommendations we make to Edmonds city planners, with the hope that they will help maximize security and convenience for kids, families, and school staff when commuting to and from school. In summary, this sub-project seeks to answer the following question: To what degree do parents and teachers perceive that students have safe and accessible routes to school and what are their recommendations, if any, to improve accessibility in the area?

Background and Theoretical Approach

Schools are important communal gathering points that possess a wide range of resources to promote health and wellness. Schools often have pre-existing facilities to facilitate programs for children and community members, often through shared use agreements made through the municipality and the school which allows the use of facilities during non-school hours (Omura et al. 2017, S53). Often these agreements only cover a part of the school's facilities. Outdoor facilities are more likely to be accessible due to the ease of making them available whereas indoor facilities require a lock-up beyond the normal operating hours (Omura et al. 2017, S54). Inclement weather may block the use of outdoor activities. Joint indoor and outdoor facility usage broadens the range of recreational activities and is the most accessible.

One of the main problems concerning shared use agreements is that often the facilities remain unused for a majority of the time. Carlton et al. explores the usage of rural North Carolina schools participating in a shared use agreement, "87% of the time these facilities are empty after the school day, on weekends and during the summer" (2017, S12). The level at which these spaces go unused is

significant, as they require resources to stay open during these times. Times when school is not traditionally in session change the usage, as "residents may perceive schools to be prohibitive to non-school affiliated use of facilities" (Carlton et al. 2017, S13). Furthermore, transportation for students to use these resources and facilities is not provided by districts outside of school hours. Therefore, understanding the accessibility of current routes to school may help inform the use of school resources outside of instruction time.

Transit to school has largely shifted over the last half century, changing from 47.7% walking or biking in 1969 to 45.3% being driven in 2009 (McDonald et al. 2011, 148). This change is due to multiple variables, such as increased car ownership, lack of sidewalks, and unsafe roadways due to speed and traffic volume. The federal government addressed this change with the Safe Routes to School (SRTS) program which lasted from 2006-2012 and has since been absorbed into the Moving Ahead for Progress in the 21st Century (MAP-21) federal funding program (National Center for Safe Routes to School 2017). The SRTS programs generated growth in the number of students walking to and from school. An analysis of SRTS programs show that "At schools with SRTS programs, 18% of students walked or bicycled prior to the start of the program. Schools with four or more years of SRTS participation had active travel rates greater than 30%" (McDonald et al. 2014, 159). These programs are further supported by the notion that changes in accessible infrastructure do affect walking and biking.

Research shows that the perceived safety of walking and biking routes is important to parents. A report on the SRTS program in California revealed, "unsafe intersections and crossings; high traffic speeds, large amounts of traffic, and violence or crime along route; and lack of sidewalks or pathways, crossing guards, and adults to bike or walk with" were all significant concerns related to walking to school (Chaufan, Yeh, and Fox 2012, 1). While fixing these conditions may lead to more parents allowing their children to walk to school, reservations still remain: "although parental consent for active commuting grew with each increasing grade, peaking at sixth grade, a significant proportion of parents reported feeling uncomfortable with it at any grade" (Chaufan, Yeh, and Fox 2012, 1). The majority of the data collected by these sources is quantitative and having to do with policy considerations. Therefore, while one can infer that the peak at sixth grade represents a possible rite of passage between elementary and middle school, the qualitative data does not exist to support this conclusion. These studies reveal a lack of qualitative data that would inform a better understanding of the outcomes of SRTS programs and overall safety and accessibility of routes to school.

One of the major problems with the SRTS program was its fluctuating status as a governmental program. While it remained a free-standing program between 2006-2012, "federal funding has not provided stable support for the program" (McDonald 2015, 4). However, research has shown that these programs are not only effective, but also efficient at saving money by cutting down on bussing programs. McDonald et al. found that, "The elimination of hazard bussing through infrastructure investment can reduce the pupil transportation costs by an estimated $100–$500 million per year" (2014, 172). Proper infrastructure can significantly reduce the amount of money spent upon the transportation of students via bus.

Our study utilizes applied anthropology, specifically the use of community based participatory research (CBPR) methods. In collaboration with planners from the City of Edmonds, we collected and analyzed qualitative data regarding the community's perceptions of current routes to school. We collaborated with several community members to translate this data into recommendations for the City of Edmonds. This approach allowed us and our key partners in Edmonds to better understand the community's thoughts regarding accessibility of routes to schools.

Research Context

The City of Edmonds, located 15 miles north of Seattle in Snohomish County, was originally home to the Snohomish tribe, with the shores of Puget Sound a source of fish, oysters, and clams (City of Edmonds 2017). Although the Snohomish tribe still has a presence in the community, the City of Edmonds is described by the municipality as having grown out of a homestead and logging operation, which began after pioneers bought land and settled in Snohomish territory (City of Edmonds 2017). The City of Edmonds was incorporated in 1890. Until the 1940s, shingle production was the primary industry in the city (City of Edmonds 2017). With the completion of I-5 and the continued growth of the Puget Sound region, Edmonds began to focus more on residential expansion and less on the retail operations located in the downtown area (City of Edmonds 2017). There is also an active ferry terminal in the community (City of Edmonds 2017).

As of 2015, the population of Edmonds is 40,689, with a median age of 47.7 (U.S. Census Bureau, 2015). Table 1 shows the racial breakdown of Edmonds according to the 2010 U.S. Census. The city's median household income is around $75,000 and approximately 8.3% of the population lives below the poverty level (U.S. Census Bureau, 2010).

Race and Hispanic Origin by Number of People	
White alone	32,990
Black or African American alone	818
American Indian and Alaska Native alone	311
Asian alone	3,774
Native Hawaiian and Other Pacific Islander alone	76
Some Other Race alone	627
Two or More Races	2,093
Hispanic or Latino (of any race)	2,000
White alone, Not Hispanic or Latino	31,844

Table 1: Breakdown of the population of Edmonds by race (U.S. Census Bureau 2010)

Due to this study's focus on public schools, it is important to understand in more detail the population these schools serve. According to U.S. Census data, 14.2% of the city's population is between the ages of 5 and 19. Edmonds School District serves the communities of Brier, Edmonds, Lynnwood, Mountlake Terrace, Woodway, and parts of unincorporated Snohomish County (Edmonds School District 2017). Statistics regarding the students served in Edmonds specifically are not widely available, but the district has published demographic information about the student body as a whole. In total, 20,628 students are enrolled in Edmonds School District. Of those students, 50% are white, 20% are Hispanic/Latino, 13% are Asian, 10% are Multi-Racial, 6% are Black or African American, 0.7% are Native Hawaiian or other other Pacific Islander, and 0.5% are American Indian or Alaskan Native (Edmonds School District 2017).

The annual operating budget for the district is $260, 245, 483. The school district maintains 55 playgrounds and 33 sports fields (Edmonds School District 2017). The district provides bus transportation for all students that live over a mile away from their assigned school. On an average day, all school buses combined travel 10,500 miles (Edmonds School District 2017). On their website, the school district provides safety tips for students that walk and bike to school (Edmonds School District 2017). In the past, the school district has held "Walk to School Day," which encourages students and their parents to walk to school instead of driving. From information available through literature and the district webpage, it is not clear which method of transportation most students choose to take to school on an average day and how accessible these routes are. This study seeks to better understand how parents and students use and perceive the routes from their homes to the schools. We focus on three schools within city limits: Edmonds-Woodway High School, Chase Lake Elementary, and Westgate Elementary.

Methodology

The methodology employed grounded theory analysis, and followed the perspective of community-based participatory research (CBPR). Due to both the short amount of time available to gather data and the nature of school schedules, a variety of rapid qualitative methods were used, including photographs (1-3), interviews with community members (2), and surveys posted in an online interest group for mothers in Edmonds (54).

Photographs

In order to provide all members of the research team with a visual of the school sites to refer to throughout data collection and analysis, several photographs were taken of each school site. Pictures were taken of the school grounds, sidewalks that lead to school, general infrastructure that supports alternative transportation (e.g. bike racks, crosswalks, and signage), and traffic flow during school drop-off and pick-up times. Photographers avoided taking pictures that identify individuals.

Interviews

Participants of the interviews were selected using purposive sampling. We conducted phone interviews with community members involved with the schools of interest. telephone and walking interviews with school staff and additional parents. For example, we conducted a phone interview with the school district's transportation coordinator. These interviews were analyzed and coded using Excel and Google Drive, so that all team members could review the codes and agree on how statements were categorized. We use a color coding system, which is displayed below.

Accessibility
Transportation\Bus system
Boundaries
Ridership
Bus stops
Sidewalks and shoulders
Walking routes
Parental attitude
Environmental Factors

Student Populations
Special education
Homeless students

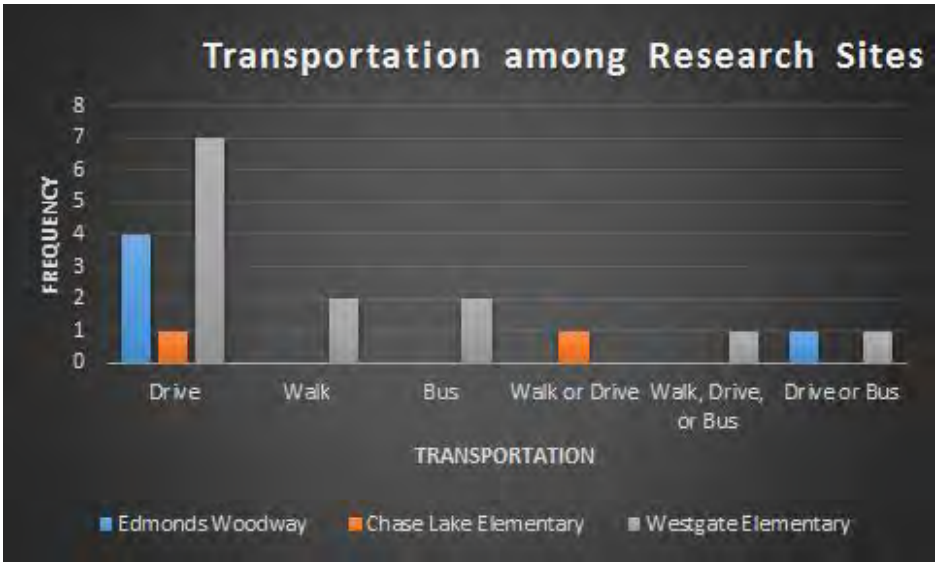
Getting to School
Bus
Biking
Walking
Drive to school
Drop off

Surveys

In order to capture the perceptions of parents in the district, we posted a survey in an online group, which provides information and resources to mothers of students in the district. We received 54 responses. Due to the size of this district, we received multiple responses from parents with children in other schools within the district. In total, we received 21 surveys from parents of students that attend the schools of interest, which are Chase Lake Elementary, Westgate Elementary, and Edmonds-Woodway High School. The surveys sought both qualitative and quantitative information regarding topics such as how far they live from the schools their children attend, how their children get to school, and any concerns related to commuting to the schools. Quantitative information was placed in Excel for analysis, where we created graphs from the data. Qualitative answers were analyzed using the same coding system as above.

Results

The data from the survey shows that most parents and students drive to school. Regarding Edmonds-Woodway High School, every respondent drives to school except for one that utilizes the bus occasionally. Parents of elementary-school students also drive their children to school, however, Westgate seems to show the greatest variety in transport with children walking, taking the bus, or a combination of all three transport categories. Because the research is focused on just three schools, only 21 of the 54 responses could be quantitatively analyzed. Even so, there is an overwhelming preponderance of respondents using their personal vehicles to drive their children (or the children driving themselves) to school.



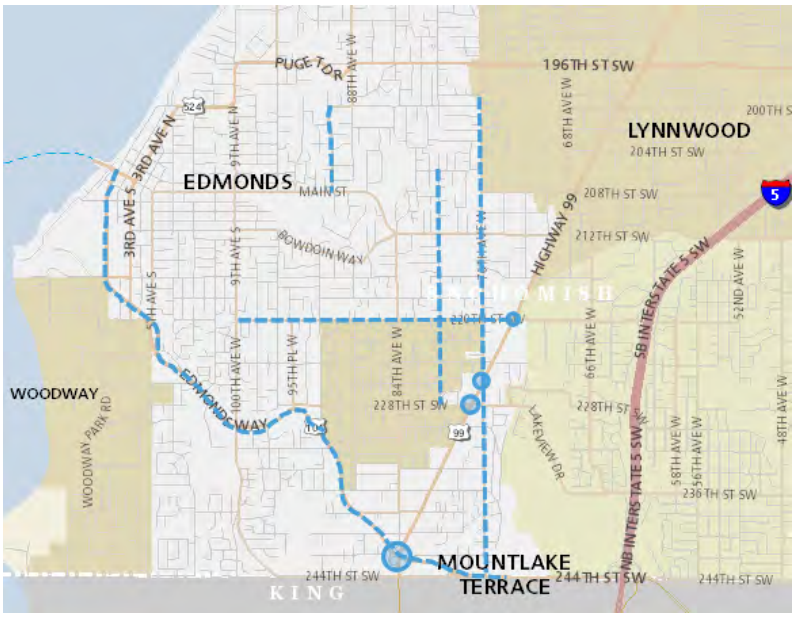
Graph showing the method of transportation used, by school

When asked what participants thought made a safe walking and biking route, perceptions regarding sidewalks were the dominant factor: 32 out of 54 respondents mentioned the importance of sidewalks. These responses referred to the width of sidewalks, the separation of sidewalks from road lanes, and how clear the sidewalks need to be. Examples of responses included "enough area on the sidewalk to walk or ride and not feel like a car is going to hit you" and "there are trees and bushes

covering the sidewalks." Other common responses included how crosswalks and bike lanes dramatically affect the safety of walking and biking routes. Participants also mentioned having slower speed limits and more signs to indicate pedestrian crossing and school zones. Participants responses included "slow down signs for school buses leaving the school" and "ped x-ing signs, school zone/bus stop signs." Having a well lit walkway was another consistently mentioned factor that was thought to make these routes safer. Some respondents believed that daylight was the only time they could safely take these routes, while other respondents stated that street lights and lit crosswalks were necessary for a safe walking and biking route, implying that night-time use was acceptable. Other responses included the need for crossing guards, the presence of other children traveling along the same route, and an overall populated area in general. Many responses also mentioned the need for more policing in order to feel safer along these routes and enforce many of these above concerns.

The need for sidewalks was a prevalent answer among the short answer portion of the survey. Over half of the respondents (12 out of 21) reported that more or wider sidewalks would make walking and biking routes to school safer. For example, one survey respondent wrote that, "A short strip of our route has no sidewalk. I don't feel safe walking with 4 little kids on that strip. Too narrow and cars drive too fast." Other significant suggestions, reflected by the number of repeat answers, were the addition of more crosswalks and slower speed limit signs. When asked about areas that parents avoid, or tell their children to avoid, 220th Street and 84th Street were often mentioned. Many responses included comments about congestion, like "really hit or miss depending on traffic" and "too many cars."

Below is a map highlighting community members' areas of concern—the dotted blue lines indicate some of the problem areas that survey participants mentioned. Photos of areas of concern are also provided.



Map showing areas and roads of concern in the community

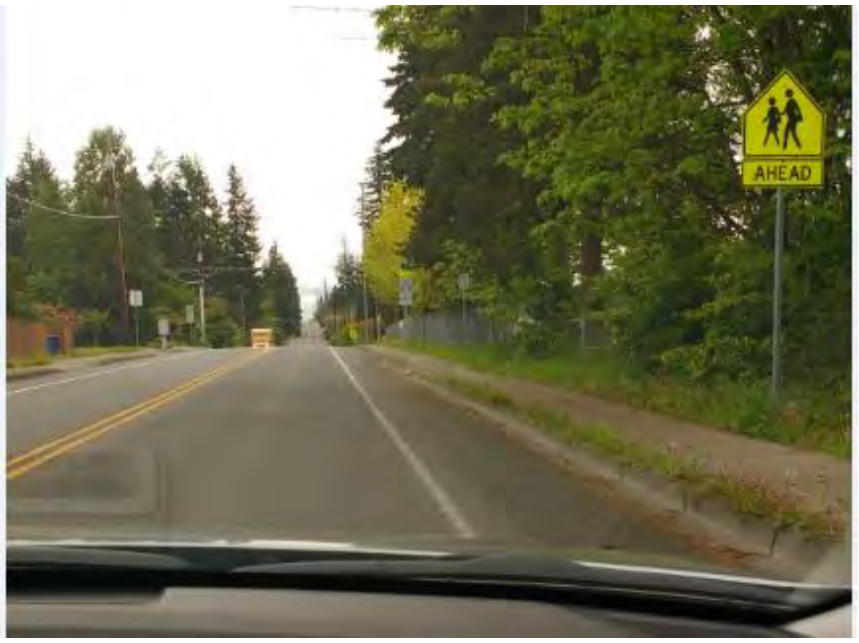


Image 1: This image looks east on 220th St on the north side of Westgate Elementary. The picture shows a crosswalk sign, a clear bike lane, and the start of the school zone. The picture also shows the sidewalk on the South side of the road, which is perceived to be "too narrow." Not shown is the electronic speed limit sign to the west, or the hill that one has to drive up to get to this spot.

Image 2: This image taken from the northeast corner of 220th St. and 96th Ave provides an excellent focus on the pedestrian situation in front of Westgate Elementary. The crosswalk on the west side of the intersection is a blinking crosswalk, perceived to be safe, but crossing 220th to get to Westgate was a concern among parents.

Image 3: This image is looking East on 216th street towards the intersection of 216th and 76th Ave, on the south side of Edmonds-Woodway High School. In particular the parked cars on the side of the road take up much of the road making biking difficult in the area. Parents specifically identified the feeling of being unsafe when too many cars are in the area, particularly for biking.

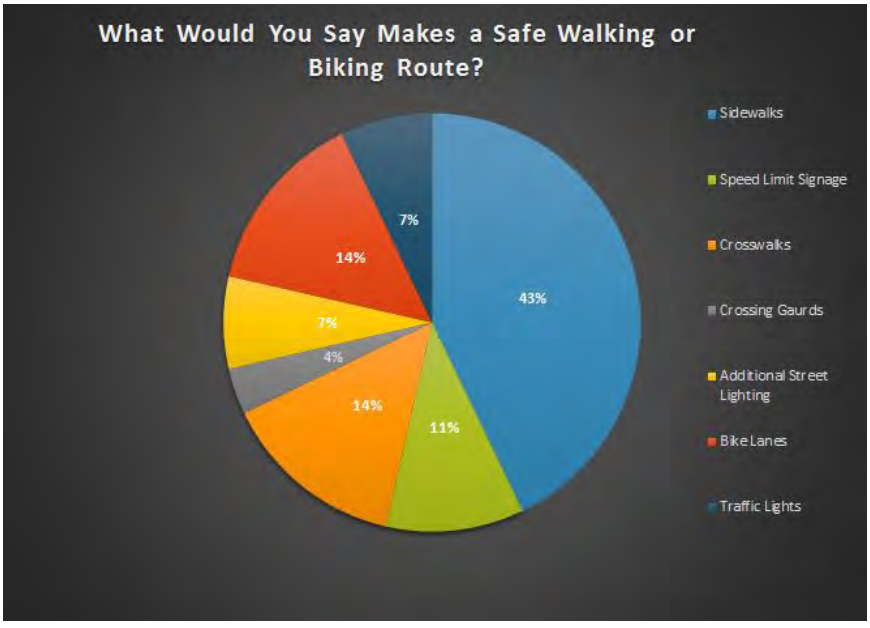
Some of our qualitative data revealed insight into why many parents choose to drop their students off at school. Some interview and survey participants revealed infrastructure and environmental factors as reasons that their students/children do not walk or bike to school. For example, one respondent discussed how high school students must be at school by 7:20 am, which in the winter means that they are commuting in the dark. The participant indicated that they felt that this was unsafe and that parents felt more comfortable with their students driving or getting dropped off. Another environmental factor inhibiting students from walking or biking to school and their bus stops is rain. Overall, however, physical barriers such as lack of sidewalks and safe crossways were the most common concerns inhibiting students from getting to school or their bus stops.

In one interview an individual expressed that, "parents' attitudes about walking is the biggest barrier...it has nothing to do with any of the physical characteristics." It remains that being driven and dropped off by parents is the most common form of transportation to and from school, particularly for children in the elementary schools. For high school students, a large percentage of them drive themselves. It was also found that the bus ridership percentage in the high schools remains significantly lower than the bus ridership percentage in the elementary schools. Recall that students are only provided bus transportation if they live over a mile away, which leaves students in the less-than-mile range to find other means of transportation. Qualitative interviews indicated that of the 20,000 students in the Edmonds school district about 7,000 of them receive transportation through the school. About 60% of those children eligible to ride bus transportation do so.

With respect to walking, Highway 99 was considered a barrier to access of Chase Lake, however bus transportation was available for some of the kids. There was a desire for more sidewalks and shoulders, but for the most part bus stops were placed near to where the kids live. Promotion of

alternative transportation, such as biking, was left to each school's discretion. Most schools have walking maps available with minimal walking barriers, however perceived safety seemed to be the real issue: "it has nothing to do with any of the physical characteristics, it's just… I had a principal tell me that her parents believe that they're bad parents if they let their kids walk to school." In addition, it was discovered through interviews that special education and homeless students are exceptions when it comes to bus transportation policies that would normally classify them ineligible. The school district provides door-to-door transportation services for special education students and also has 16 buses that are specifically for transporting homeless students, from West Seattle up to Burlington.

Survey and interview participants gave multiple suggestions for how to improve routes to school. Among the most common ones were better signage, more crosswalks, better lighting, enforcing and lowering the speed limit, and more and better maintained sidewalks. For example, one survey participant wrote that, "Maplewood Drive is unsafe; walking to the bus stop on Maplewood Drive is hazardous. There are trees, bushes, and parked cars pushing walkers into the street. Very dangerous at all hours, and doubly dangerous during winter darkness." This statement is a strong representation of our findings, as it displays the common concerns regarding sidewalks, infrastructure, and environmental factors such as darkness. The same respondent suggested that action should be taken to, "make Maplewood Drive safe for walkers by getting rid of trees, bushes, and parked cars that are in the walkway -- and then install sidewalks and walking lanes. This is a popular walking street and needs to be safe." In general, the suggestions for improvements reflected the concerns that were shared through interviews and surveys.



Pie chart displaying suggested ways to improve accessibility and safety

Discussion

Based on personal conversations with staff from the City of Edmonds, it is clear that the city has been experiencing increased levels of urban growth for several decades (Personal Communication, City of Edmonds 2017). As a result, social and environmental consequences associated with this development have emerged. More and more families are living in close proximity to one another, some even choosing to build on property owned by the city in order to increase land availability. Increased roadway usage has made intersections and corners dangerous for pedestrians, and the rate of homelessness has steadily increased with urban growth. Thus, at the start of our study, we expected to find that community members have concerns with the accessibility of routes to school. We also expected to find that the concerns would vary depending on individuals' proximity to the schools**.** Finally, we believed that due to our collaborators personal experiences with the schools in Edmonds, they would have ideas for improvements they would like to see implemented. Overall, our findings met our expectations. Survey and interview participants expressed concerns related to accessibility to school. The main concerns were related to infrastructure challenges, environmental factors, maintenance of sidewalks, and traffic flow. Participants had multiple suggestions for how to improve upon these concerns. The most common suggestions were related to expanding upon sidewalks.

The limitations associated with our sample influence the applicability of our study. We received only 21 responses (out of 54 total) from parents or grandparents associated with our target schools, and 13 of those responses were related to Westgate Elementary. A similar assessment could benefit other parts of the district that participated in the survey, including Beverly Elementary (n=3), Madrona K-8 (n=3), Maplewood K-8 (n=5), Sherwood Elementary (n=10), and College Place Middle School, (n=4). Based on the responses we received from the parents regarding the accessibility of these other nodes, future research could be conducted. In addition, interviews revealed particular challenges with transportation for specific student populations, such as those with special needs and homeless youth. This is a subject that could use further research and analysis.

Conclusion

Members of the Edmonds community have concerns regarding accessibility of routes to school, but they also have many ideas for how to address the issues they raised. From the data we collected, we recommend:

- Increased attention to walking paths, especially for students that are not provided bus transportation;
- Increased lighting in areas that have students walking without sidewalks;
- Increased signage enforcing speed limits;
- Increased signage indicating that pedestrians are sharing the spaces;
- Traffic flow management at school drop-off times;
- Construction of more bike lanes

These recommendations are based on the concerns expressed by the populations we spoke with, but more research would be beneficial. Some areas that would benefit from further research include:

- Assessing the accessibility and safety of routes to school for Sherwood Elementary;
- Assessing the ability of specific populations including special education and homeless students in getting to school

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PUBLIC TRANSPORTATION & PEDESTRIAN INFRASTRUCTURE

Abstract

With a focus on community-based participatory research, which is research that equitably involves community members and residents as well as organizational representatives, we have used relevant research methodologies in hopes to potentially change and/or improve the pedestrian environment around the public transit areas in the city of Edmonds, Washington, including the area in which a potential future light rail stop will be located. Using a primarily qualitative anthropological approach, we interviewed various residents of the city and examined how residents use the public transportation system.

Introduction

Public transit in Edmonds, with a specific focus on the Swift stations and the future light-rail location, was our research focus. Through participant observation and various interviews we were able to compile a large amount of qualitative data that leads to a distinct variety of realizations not only about how these spaces are perceived, but how transportation is experienced in the city of Edmonds in general. We gathered this data first by visiting the locations and riding the buses around the city, and later by conducting interviews with locals who frequent these spaces and utilize public transportation on a regular basis.

Literature Review

"Understanding attitudes towards public transport and private car," is a qualitative study of attitudes surrounding use of public transportation that elucidates many ideas that we may want to investigate ourselves. The study was conducted in Porto, Portugal, which has about 20 times the population of Edmonds, Washington. The culture in the two places is also likely different enough to significantly change a qualitative study. However, the questions that were asked were useful. (Beirao 2007)

A well designed public transit system which gets people out of their cars and onto their bikes or a bus has clear health and economic benefits. A report by the Transit Cooperative Research Program specifically outlines the cost and benefits of each system, and uses quantitative data from research conducted on multiple low- to middle-class neighborhoods. Edmonds, especially the areas in and around our nodes, are roughly comprised of citizens of a similar or slightly higher economic standing, so the TCRP report may be highly relevant for our research. More research will need to be done, possibly on site, to determine current levels of immobility, and how that may affect unemployment or access to local health systems (Lingwood 1999).

Public transportation has a myriad of important and positive effects on the health of communities. Some of these are more obvious, such as the link between public transportation and increased physical activity (Litman 2013). In fact, in terms of pure walking time, there is an increase of daily walking of 8.3 minutes per day for those who use public transportation (James et al 2014). The issue is more complex than this, however. One study found that in a single year, 3.2 million children in the United States were not able to see a health care provider due to transportation issues. Access to

safe and reliable public transportation, as well as easily traversed infrastructure to reach it, also has been found to have a positive influence on the cognitive ability of older individuals by granting them the ability to walk, with the aid of the bus, instead of driving. Additionally, accessible public transportation can have a profound effect on the levels of stress experienced by commuters by reducing traffic. One study found that, in cities with a developed transportation system, 10 – 30% less people drove on a regular basis. (Litman 2013)

Though outside the scope of our research, two important aspects to consider when analyzing why people use public transportation are route availability and cost. One study, performed in Boston, found these two factors have the largest impact on an individual's decision to ride the bus. An increase in driving also, predictably, leads to not only greater economic burden being placed on individuals, but an increase in air pollution. Furthermore, the risk of receiving a fatal injury is 23 times greater when driving than when using public transportation (James et al 2014). This, combined with the previously mentioned detrimental effects brought about by lack of public transportation, gives strong evidence of the importance of public transportation to the health of communities.

Methodology

To better understand the challenges and advantages that the residents of Edmonds have when using their public transit system and the surrounding areas, our research was broken into different phases. The first phase consisted of choosing our sample of research participants by reaching out to community members with already established connections. The second phase involved interviewing the residents of Edmonds on their experiences with the public transit system and the area surrounding it, as well as making on-site observations of the public transit system facilities, including the two key transit centers, buses, and areas with high traffic that lack bike lanes. The last phase of our methodology included transcription of interviews and thorough analysis. Mainly open-ended interviews were conducted in order to better understand the perceptions, attitudes, and concerns of selected participants. We asked questions that addressed why participants chose to use or not to use their public transit system, and also asked for their input on how the system could be improved. On-site participant observations revealed a variety of safety and aesthetic features such as sidewalks, pedestrian crossings, stairways, police call boxes and artwork.

Results & Analysis

One 27-year-old woman with an income under $50,000 per year depends on public transit exclusively for her transportation. She explained in detail that she felt that the transit system can be slow and frustrating to use when the buses don't run on time. In particular, it is the East-West routes that are most lacking in service. This sentiment was later repeated in an interview with another participant in our research. The individual, a 23-year-old male who lives and regularly uses the transit system in Edmonds to commute to work, expressed frustration about the lack of consistency in the arrival of the buses. Additionally, he commented on how it was also frustrating when attempting to visit friends in Seattle, as the local service seemed less consistent than the buses further south.

During her interview, the 27-year-old woman described the Mountlake Terrace Park & Ride by saying "I feel like it is underrated". She went on to explain that "You can go anywhere from that spot", including Lake City, Downtown Seattle, and Everett. She used words like "Super helpful" to

describe it. Later, when asked what would make the system easier to use, she expressed a desire for arrival boards "…so you know what buses are going by and when". Speaking in more detail, she would go on to express how helpful this would be because "It's real time… so you know immediately" if you missed a bus and have to re-plan your trip.

Though much of our research focused on the locations as places, it should be noted that these places exist within a greater cultural context. For many individuals, these spaces exist within both their personal and professional lives; this is a fact that should be considered when analyzing what improvements could be made to the locations. Though it is understood that the timeliness of the buses is something that may be out of the control of the city when making physical improvements to the locations, consideration could be given to attempting to improve the image the transit system has in regards to it. Other transit locations employ automatically updated arrival boards that give real time information as to when the next bus will arrive. Improvements such as these could go a long way in improving perceptions and interactions with these spaces in a time-sensitive commuting context.

During our interview with the 23-year-old male participant, we asked his opinion on the surroundings of Edmonds Park & Ride or the various Park & Ride locations in the vicinity. He said that he would love to see more maps, some bike racks and more lighting for when it gets dark. When asked if he felt safe to leave his bike at a Park & Ride in Edmonds, he responded with a shrug and said, "Yeah. I honestly don't think my bike would get stolen. I personally think it's a pretty safe area."

This participant mentioned that more maps and signage would help around these Park & Ride locations for individuals who do not know where they are headed or are lost, since he has had that experience before.

> "It can get really confusing sometimes… But I feel like that goes for all public transportation. You sorta have to check on the website or kinda just hope for the best." – T.P.

Furthermore, the Mountlake Terrace Transit Center was brought up and he said that he liked how spacious it was and how safe it felt.

> "A lot of people use Mountlake Terrace. I think it's a pretty popular place." – T.P.

Since this participant mentioned that he used his bike often, the question was asked whether he felt safe to leave his bike there and he responded with, "most definitely."

When this participant was asked what would make him want to use the transit system more often, he mentioned a few of the same things he had mentioned earlier in the interview. He made a few references to the routing system, maps, and overall safety of the transit stations/areas, saying that using the public transit system to get to work can be unreliable at times. More maps would make it easier for people to navigate, and more information would help in general.

> "If I had another option to get to work I would definitely use that instead of taking the bus 'cause it's sorta unreliable. Hopefully the bus routes will be more on time and a lot less confusing to navigate." – T.P.

> "Honestly I would like to see more lighting... I feel like that would also just make it seem a lot safer for other people especially at night, you know?" – T.P.

Two important points came out of these interviews. The first and most important was that the lack of paper transfers punishes the poorest people. The required five-dollar minimum balance on an Orca card also punishes the poorest people—the people who need public transit the most. This can mean the difference between keeping and losing a job. It should be noted that during the earlier interview with the 27-year-old woman, she voiced the exact same sentiment as the 23-year-old male regarding the five-dollar minimum, and how this punishes the people who need public transit the most. Both made the statement that this can mean the difference between keeping and losing a job.

The second is the importance of readily available information regarding the transit system itself. It was expressed that the transit system can often be confusing, and that more easily available signage, as well as the information they can provide, could go a long way in improving the way people view and interact with the transit stops and stations. It should be noted that while safety did not seem to be an issue for these places, it was mentioned on several occasions in a positive light. While this would indicate that it is not perceived as an issue, the fact that it was mentioned would indicate its importance. This, in concert with the other suggestions we have provided, gives a partial view of what should be considered when improving and designing these spaces.

Accessibility is also an important aspect to consider while implementing changes or designing transit locations. We interviewed a visually impaired gentleman in an attempt to gain insight into this, and there were several key factors that were identified as being essential to the construction of safe and convenient transit spaces. The first of these is perhaps the least apparent, but one of the most important for creating an accessible space: symmetry and consistency. The Swift stations were viewed favorably in this regards, as every stop was perceived as being "exactly the same" in regard to the placement of the ticket vending machines and benches, and the symmetrical lay out of the shelters. Though this symmetry may be largely due to the nature in which the stations are produced (built from kits), this has the effect of making the stops and stations easily navigated for those that are visually impaired. The consistency of this symmetry is important, as it easily allows individuals to navigate every stop, regardless of its location.

There were problems expressed regarding the consistency of these stops however. One prominent comment was in regards to the ordering of stops at the freeway transit station. The numbering of the stops does not follow a set pattern at one point, and is a feature that can be disorienting to those who are visually impaired. When patterns are not established for the spaces in a logical and meaningful way, it can be difficult to navigate for individuals, and create unnecessary confusion when attempting to utilize the transit system. Though the locations in which the transit centers and stops are built may make it difficult to create a symmetrical and consistent system, there are steps that can be taken to alleviate this difficulty and promote the accessibility of the sites. Specifically, the accessibility of information regarding the sites themselves.

Our research found that a major shortcoming of many of the transit centers not just in Edmonds, but much of King County, was a lack of accessible information regarding the layouts of the sites. Often, maps are placed in inconvenient locations such as in elevators, where the individual is forced to stand in front of the buttons or other inconvenient locations where people are trying to pass. These maps for visually impaired individuals should be featured in prominent, easily accessible, and safe locations. Furthermore, the use of guiding tactile strips to facilitate the locating of these maps (as well as elevators, exits, and other important locations) should be implemented in any future transit centers. It should be noted that these tactile strips, while appearing clean, may sometimes gather dirt and become ineffective without cleaning.

Sound is another important factor in the accessibility of transit centers. Elevators, which should be featured prominently and easily located, should have an audio component that allows the visually impaired to hear if they are going up or down. Also, tones for opening and closing doors are important, especially in the places where individuals are boarding and exiting transit vehicles. As with the physical spaces themselves, these audio cues should be consistent across all of the transit centers and stops in the city.

All of these points related to accessibility, while seemingly concerned with *convenience*, are actually matters of *safety*. When designing these spaces these considerations should be viewed as such, and consideration should be given to the layout of these spaces in relation to this idea. For example, at one Transit Center (in the greater Seattle area), there is a sign placed immediately in front of the handrail, which actually injured one of the individuals we interviewed. Though objects like this can sometimes seem as though they are just procedure, they are often used by individuals who can be vulnerable to planning that does not take them into account. This should be of the utmost concern when attempting to create spaces that are accessible and safe for everyone.

Our last interviewee is 21, earns under $25,000 a year, and lives two miles north of the site in Lynnwood. She uses the public transportation every day for work, as well as when she travels outside of her local neighborhood. She frequently uses the Mountlake Terrace transit center, as it's where she transfers between buses during her commute. Her use of the Edmonds Park & Ride is limited, but she also uses Swift while going to Seattle or Everett.

She had great things to say about the Mountlake Terrace transit center, but one of her main complaints was that there is no public water fountain. She said that, "What would probably help would be if they had more rest areas. Not like soda machines or snacks, but just like water fountains." Another concern was shaded areas, especially out by the stops by the parking lot, situated such that you don't have to worry about missing a bus. One more thing she critiqued was people who park in the Park & Ride and then don't even use the bus. She said, "Yeah people if they work in the area will park their car there and then walk somewhere else -- I don't know if they could make it so people could pay for it, or if just making more spots would help." The main reason this is an issue is because it is a very popular transit center and spots can often fill up. During my time there between the hours of 8:00 and 9:30 a.m. on a Monday, I noted that there were less than thirty available spots across both parking lots, and most of them were on the roof. At one point there was no handicap spot available in the parking garage.

Generally though, she felt the center was very good. She highlighted the signs which constantly update incoming buses, and liked that they are always accurate and let you know how long you are going to wait. Reliability was something she frequently stressed, and she felt that since the signs were installed, it no longer feels as if the buses arrive at random.

In regards to the buses and routes, she didn't like the fact that the 112 bus route had been cancelled. She said, "Yeah they got rid of that route but then they added the 130 and then the 113, I think, and then you know it just made it a longer route. Instead of having the 112 that would take you everywhere, like to Edmonds or the mall." I looked up the 130 and it does reach Lynnwood from Edmonds, but the route is very long and stops frequently.

She also noted the double-edged sword of letting people on the bus who can't pay. These individuals get on almost every other stop, and are at risk of receiving a big fine, but often they simply don't have the money to pay. Transit police were then brought up, and she liked that they could be there to mitigate a situation, but also as someone who has had to use the bus without paying, she can

empathize with people who have to get off a route early to avoid an officer, or risk a $150 fine. She also gets annoyed at drivers who are too lenient with people who can't pay or are obnoxious, such as people who she described as "creepy," or people who smoke or vape on the bus. Again, she did say that she understands that these people need this system, but felt that transit police and drivers needed to take these issues more seriously.

Finally, as a rider of the transit system in the area for six years, she felt things have changed a lot, mostly for the better. She stressed that, "Being someone who is too paranoid to drive, I love having the transit system around because it helps people who can't, who don't have their own cars. So yeah I like using it, it's a benefit towards me." Her enthusiasm for the transit system was clear, as she mentioned multiple times that she didn't feel much needed to be changed. She also often had a hard time pinning down specific problems.

The biggest takeaways from this interview and observations are that the transit system really does work for most people, and that with each year it continues to improve. One of major issues is that the poorest people who need to use the system the most often cannot pay or don't have Orca cards. My interviewee talked about her own experience jumping off of buses miles from her destination to avoid transit police. This stuck out as an issue that disproportionately affects those who are both impoverished and disabled. Unfortunately, issues with homelessness run much deeper than public transit, but reduction of costs for those who have proof of being on assistance programs could be a way to lessen the amount of non-payers. As mentioned earlier, the minimum balance required on Orca cards seems to play a large role in this.

Another issue we noticed was the lack of parking, especially for the handicapped. With only five total handicapped spots available at 9 a.m., and all of them being in the outdoor lot across the street from the freeway, the next handicapped individual who came to ride the bus may have to park far away from the station. This could result in a missed bus, or on a busier day, no way at all to get out of their car in the lot. Although there doesn't appear to be much room to expand parking spots, the station may become even more crowded as the light-rail gets installed and the surrounding neighborhood expands. More spots will somehow need to be added eventually.

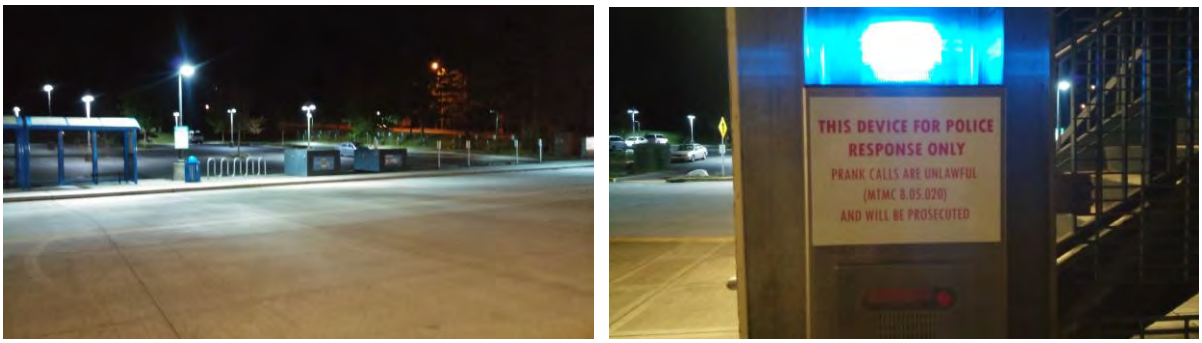
The Edmonds Park & Ride, which wasn't touched on much in the interview, was observed in person after rush hour. It was noted that more than half the lot was empty, which may or may not be of concern. The area is surrounded by apartment complexes, so it may be assumed that many of the station's users simply walk over from their home. With that said, use of the site is fairly low in comparison to the Mountlake Terrace location. After spending twenty minutes there, it was noticed that no one caught a single bus, and only one bus arrived. The site is directly behind Swedish hospital, and is within walking distance of the nearby high school, so arrival usage may be higher than departing usage, hence the lack of motor vehicles.

This final interview, as well as the on-site observations of the locations, provides an image of the locations themselves, as well as another largely favorable account of the transit system in general. Sufficient space for commuters, and their vehicles, should be of concern when considering how to design the future station, and what to prioritize when updating the currently used locations. Though the Swift stop received largely positive reviews, the importance of automatically updated arrival boards was expressed in almost all of the interviews. Consideration should be given to the accessibility of these boards for the visually impaired as well, as they operate solely on visual cues.

Our Participant Observation included touring both the Mountlake Terrace Park & Ride and Edmonds Park & Ride during the day and night. We used the buses to get around in the area. It is

important to note that even though these facilities are only about two miles apart, there is no bus that directly links them. Also, notably, there are only two buses that serve the Edmonds Park & Ride directly.

Since our emphasis is on the health and well being of the people using these facilities, the features shown are ones that contribute to the safety and comfort of the people who use them.



Photos 1 & 2 - Mountlake Terrace Park & Ride

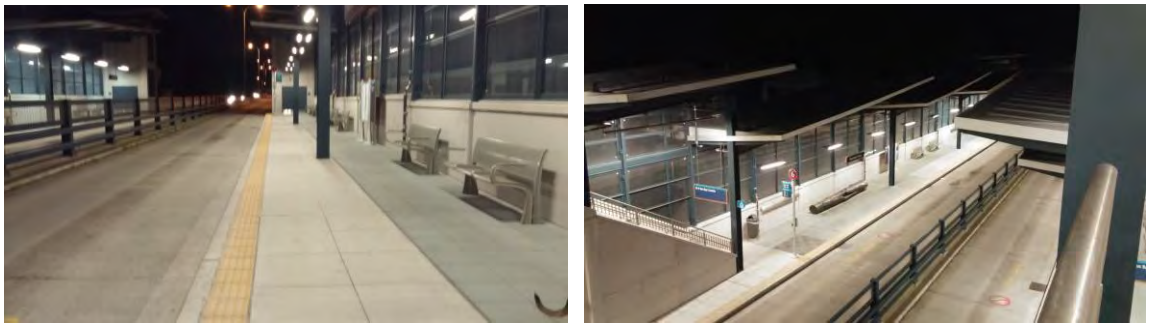
Photo 1 taken at 11:53 pm on a Saturday night facing South East. It shows that the area is well lit. This photo also shows bicycle lockers (the short green boxes in the center of the photo). These boxes allow bicycles to be stored safely. They cost $60 per year with a $50 deposit. They are available on a first come first served basis. *Photo 2*, taken at 11:54 pm, at Mountlake Terrace Park & Ride, shows a police call box next to a stairway adjacent to Bays 1 and 2. The police station is a bit more than a half a mile away or a 3 minute drive. We assume that the response to a call would be fast considering that short distance. We didn't test it for obvious reasons.

Photos 3 & 4- Mountlake Terrace Park & Ride

Photo 3, taken at 11:57 pm shows a security camera. This is the only camera that is apparent. This camera is located near the bridge that spans the freeway, and its line of site likely includes the first half of that span. It is not known if this camera is monitored or who is watching. Directly opposed to photo 3, *Photo* 4, taken at 11:57 pm shows an arrivals board at the entrance to the freeway bridge. Interesting to note that at 11:57 on a Saturday night there is a bus due to arrive going south in 17 minutes and a northbound bus due to arrive in 32 minutes. At the bottom of the picture is the first span of the bridge that crosses to the freeway station from the parking structure.

Photos 5 & 6 - Mountlake Terrace Park & Ride

Photos 5 and 6 taken at 11:59 pm and 6:34 pm respectively. These show the contrast from night to day of the view from the freeway bridge. The left side of the photo shows the parking structure that provides most of the parking for the people who use this facility. It should be noted that there are parts of that structure that are not as well lit as others at night. *Photo 6*, shows the view of the freeway from the bridge that spans it on the way to the station, which is situated between the north and southbound freeway lanes. These photos are looking south at northbound traffic.



Photos 7 & 8 - Mountlake Terrace Freeway Station

Photo 7, taken at 12:01 am shows Bay 7. There is a notable lack of a police call box. Perhaps having one here would be a good idea. *Photo 8*, taken at 12:00 am. This photo shows the view of the freeway station from the top of the stairwell to Bay 7. Bays 6 & 7 are very well lit.

Photo 9 - Mountlake Terrace Park & Ride

Photo 9, taken at 12:05am. This glass panel art lines the walkway from the freeway bridge to the stairs that lead to Bays 1-5. Each panel is unique. They are situated at eye level.

Photo 10 - Mountlake Terrace Park & Ride

Photo 10, taken at 6:38 pm shows Bays 2 & 4. The bus to the left side is a Metro Transit bus. Only a single Metro route goes to the Mountlake Terrace Park & Ride. In the center is one of many green spaces that are built into this Park & Ride. The aesthetic of this Park & Ride is one that feels like it was carved out of the surrounding woods.

Photo 11 & 12 - Mountlake Terrace Park & Ride

Photo 11, taken at 8:42am shows more green space at Mountlake Terrace Park & Ride. *Photo 12* taken at 8:42 am, shows a walking and biking trail, a back entrance to the Mountlake Terrace Park & Ride through Veterans Memorial Park. It's a shortcut to and from the Park & Ride and the local library. It has no signage indicating where the trail leads. Also, it was really muddy and not very walkable. Perhaps better maintenance of the trail would lead to more utilization by the population.

Photo 13 - near Mountlake Terrace Park & Ride

Photo 13, taken at 9:12 am is the Arbor village apartments. At less than half a mile distant, it is well within walking distance to the Mountlake Terrace Park & Ride. These apartments situated above commercial space are a marked contrast to surrounding single family homes. In the future, with the arrival of the light rail station, there will be a greater demand for this type of housing. Perhaps this is the future look of the surrounding area.


Photo 14 & 15 - Edmonds Park & Ride

Photo 14, taken at 12:28 am. Pictured here are bike lockers in the foreground and bus stop shelters in the background. The pedestrian areas of this Park and Ride are also very well lit. *Photo 15*, taken at 12:30 am. A rarity in this day and age, a pay phone, which did have a dial tone. This, apparently, is taking the place of a police call box.

The Mountlake Terrace Park & Ride has a lot of aesthetic and safety features that are generally helpful. Some of these features could certainly be improved upon. The Edmonds Park & Ride has a lack of aesthetic consideration. However, the free newspaper box is a nice feature, since it is likely that the wait at this stop would be longer than normal because of the lack of service.

Recommendations and Conclusion

Recommended improvements

- Automatically-updated Arrival Boards
- Easier access to Route Maps
- Additional Bike Lockers
- Improved lighting at bus-stops
- Water Fountains

Considerations towards accessibility:

- Symmetry and consistency in stops and stations
- Tactile strips (leading to exits and elevators)
- Easier access to information regarding stations and stops
- Raised text that can be felt for information about stops (ie. BAY 1)
- Auditory cues for elevator direction and boarding of light-rail
- An increased number of handicap parking spaces

Other considerations

- Reduction / elimination of minimum Orca card balance

Though it may be tempting to view transportation sites as singular locations, they must be considered within the wider context of the lives of individuals who utilize them. Unlike many of the locations studied, these places exist in relation to the professional lives of people, and must be viewed within this context. Though there are definitely improvements to be made in regards to the accessibility of these locations, these changes share a common focus. Primarily, these locations must be viewed as a places that facilitate, through their direct relationship to travel, the ability of community members to engage in their everyday lives. The suggested improvements we have

outlined will not only work to increase the usability of these locations, but facilitate an improved perception of these locations.

While it is tempting to view our qualitative data only in relationship to commuting or generalized travel, it is important to view it in relationship to the health of the community as well. As outlined in our preliminary research, access to reliable public transportation has a real and measured impact on the health of the community. The ability to travel has an important link to the ability of individuals to receive proper health care. The act of using public transportation, in-of-itself, has been linked to a decrease in pollution and an increase in the amount of exercise community members engage in on a regular basis.

Though we recognize that our recommendations regarding the Orca card are outside the initial scope of our research, we felt it was meaningful, and should be included in our final analysis. Though this is a more difficult issue to tackle, and possibly outside the immediate control of the city of Edmonds, it should be given consideration. Many individuals who utilize the public transportation system are economically disadvantaged, and changes to the way balances and deposits are handled with the Orca card would not only be beneficial to those who are victimized as a direct result of the current practices, but to those who ride the bus on a regular basis as well.

The improvements that we have suggested will not only improve the accessibility, usability, and public perception of these spaces, but be beneficial to the health and well-being of the community members who utilize the transportation system. Our research has shown that individuals place a greater emphasis on utilitarian factors when expressing how they feel about transit stops and stations. Aesthetic factors received almost no mention, and were not at the forefront of individuals minds when viewing these spaces. This indicates that these spaces exist in direct relation to their use. This, more than anything, should be the primary concern when deciding what improvements or designs should be implemented when developing and improving these places.

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