Walkability in Northeast Bellevue

Livable City Year

City of Bellevue

Autumn 2018

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Permissions

City of Bellevue-Department of Transportation
City of Bellevue-Community Development Department
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Executive Summary

This project serves to look at mobility in Northeast Bellevue, Washington through the Livable City Year program, in conjunction with the University of Washington Urban Design and Planning department. This project is being done to analyze the general mobility, and specifically the walkability and bikeability of the neighborhood. The goal is to find a way to increase accessibility, safety, and efficiency of mobility in the neighborhood. Our research is being done in an effort to identify areas for improvement and create a list of implementations suggestions. This project works to satisfy the existing Bike and Pedestrian Plan for the City of Bellevue goals. Further, and instrumentally, this project serves as a way for citizen engagement on the topic to occur and be represented in the neighborhood, facilitating community-based planning in Bellevue, which is important when considering potential planning that will affect daily life for citizens.

Through the various kinds of research methods, this project provided insight to problems and solutions for mobility in Northeast Bellevue. The first portion of research was to look at the City of Bellevue's existing Bike and Pedestrian Plan, which provided background and context for what the City is already doing to plan for mobility. Next, a focus group was held to understand how residents of Northeast Bellevue feel about mobility and walkability in their neighborhood. This provided a great amount of insight to how the citizens interact with their local environment. The focus group participants highlighted the aspects of mobility they liked in their neighborhood. They emphasized the quiet, secluded feel of the neighborhood, and the location of the neighborhood relative to other areas of Bellevue. The participants also spoke to some aspects of mobility in their neighborhood that need improvement, highlighting the congestion along certain arterials and lack of safe and connected bike and pedestrian infrastructure.

The next element of research was to conduct a Gehl Analysis, which is a qualitative, human-scale analysis on the neighborhood, which aimed to provide a more experience-based perspective of the area. Three chosen study sites were analyzed on a scale of one to three based on twelve criteria of urban quality. We found that certain areas of the neighborhood are more friendly to pedestrians and bicyclists than others due to a variety of factors, including the presence of sidewalks, condition of infrastructure, street lighting, the surrounding natural environment, protection from traffic, and other urban design elements. The lowest-scoring site scored a 1.5 due to a lack of sidewalk connectivity on main arterials and side streets, lack of safe crosswalks at large intersections, and steep slopes. The second site scored a 2.2 due to the fact that there were some busy roads with limited pedestrian infrastructure, sidewalks, and limited lighting, but there were pedestrian-friendly trails in Tam O' Shanter Park that increased the overall score. The highest-scoring site, however, scored a 2.9 due to the wide sidewalks, access to green space and the natural environment surrounding the Tam O' Shanter Golf Course, and the consideration for accessible infrastructure.

Finally, using the information learned from the previous methods, we conducted a spatial analysis to provide a different perspective on mobility in Northeast Bellevue. Geographic Information Systems software was used to determine service areas for schools, parks, and places of worship. This analysis illustrates the areas of the neighborhood that are walkable within quarter- and half-mile radiuses along the street and trail networks. This research found that while most areas of the neighborhood are walkable to parks, there are many areas where

walking to school or a place of worship is not an option. Additionally, even if a destination is near by, it is not necessarily easy to walk to due to the complex street network.

The above results yield certain implementation suggestions and strategies for the City of Bellevue that work to best improve mobility in the Northeast Bellevue neighborhood while incorporating research and the existing Bike and Pedestrian Plan. Common threads inform our suggestions, which are listed below:

1) Provide connectivity of walking and biking paths via improved infrastructure.
2) Increase feelings of safety associated with mobility in Northeast Bellevue.
3) Normalize walking and biking as viable methods of transportation (made possible by infrastructure).
4) Ensure that suburban lifestyle can coexist with mobility measures.

These suggestions work to holistically address the issues present in the neighborhood while satisfying the needs and desires of the Bike and Pedestrian Plan, the Gehl Analysis, citizen engagement, and the City of Bellevue.

Intro

For this year's Livable City Year program, the organization partnered with the City of Bellevue to provide students the opportunity to work together with planning professionals on a real world urban planning problem. The following report focuses on one project that assesses walkability in the Northeast Bellevue neighborhood. Northeast Bellevue is located on the southern edge of the city of Redmond, home to Microsoft's headquarters, and borders the Crossroads neighborhood to the West. Northeast Bellevue is a single-family residential neighborhood characterized by significant tree coverage, multiple large parks, a loop and lollipop street plan, and edges defined by busy arterial streets. Because of these characteristics, many parts of the neighborhood are quiet and isolated, lending to a sense of seclusion that also makes residents car-dependent. This Livable City Year project grew from the City of Bellevue's concern with the astonishingly low Walk Score™ that the Northeast Bellevue neighborhood received, 32 out of 100. "The Walk Score™ tool provides a direct and replicable way of assessing geospatial, population and land use characteristics to benchmark walkability" (Gilderbloom et. al, 2015). To elaborate, WalkScore™ looks at proximity to nearby amenities, specifically identifying amenities that are 0.25 miles away from specific locations, and, thus, walkable (Walk Score Methodology, 2018). This measure is largely irrelevant to the NE Bellevue setting, which is predominantly residential and much further than 0.25 miles from amenities, leading to car dependency. Changing the WalkScore would require building new amenities, which would mean huge infrastructure changes and altering neighborhood character drastically. Thus, a project focused on improving walkability to amenities that already exist in the NE Bellevue neighborhood, as informed by holistic analysis and citizen input, would be a preferred alternative.

Prior to the industrial era, all cities were of necessity built around pedestrianism. But "Walkability" as an urban design principle only reemerged in the second half of the 20th century, thanks largely to Jane Jacobs and her arguments that the ideal neighborhood is designed to facilitate walkability. Gilderbloom et al. (2015) define walkability as, "Associated with suitability factors such as street width, the number of lanes, safe speeds, crossing improvements, the presence of trees, and other pedestrian level-of-service and suitability factors" (Gilderbloom et al., 2015). Others have emphasized the perception of safety, such as the fear of crime or heavy traffic (Southworth, 2005). Reflecting the above content, it is clear that walkability is the combination of conditions that encourage walking. In the context of NE Bellevue, walkability could improve health, social environment, equity, and inclusivity of the neighborhood. For instance, Richard Florida suggests that "medical research shows that walking can improve health outcomes in everything from heart disease and diabetes to improved mental and cognitive functions," in his 2014 article for CityLab. Research out of the University of New Hampshire suggests that increased walkability increases the occurrence of social interactions, connections, and capital, which improves the quality of life for residents in walkable neighborhoods (Rogers et. al, 2011).

Walkability is a concept generally promoted in dense urban settings, however this project aims to apply the principles of walkability in a suburban context. Some examples of retrofitting suburban areas for walkability include case studies that have been done in Mashpee Commons in Cape Cod, Belmar in Lakewood (by Denver), and Malta in upstate New York. Common challenges faced by all of the suburban areas that were retrofitting for walkability

include a need to consider scale/context of suburban lifestyle. For instance, if too much mixed-use retail is added to increase walkability of a suburban area, these business will be bound to fail due to low population and thus limited buying power (Green, 2014).

The City of Bellevue requested recommendations for where and why to make improvements to walkability in a single-family residential zone with limited existing sidewalks. City officials also requested that this project take on the perspective and desires of residents of the Northeast Bellevue neighborhood. To accomplish these objectives within the framework of a ten week project we decided to divide the project between a qualitative analysis of Northeast Bellevue and a more formal engagement with residents of the neighborhood. In order to make recommendations for improvement, it was first necessary to understand current walkability conditions. It is clear that NE Bellevue was not created to be walkable, as one of the attractants for residents is its secluded nature. Current walkability conditions are not supportive of walkability for transport, but rather for recreation. To suggest an implementation strategy that serves the desires of residents, it was important to understand the values of those residents. By understanding what is valued by residents, we can incorporate walkability measures that respect suburban lifestyle and values. Walkability is often seen as an inherently urban concept, associated with the negative aspects of urbanism as well. Thus, a main goal for our project was the ability to integrate the benefits of walkability without scaring residents away with negative associations.

This project combines observational analysis, spatial analysis, and direct citizen engagement to balance the goals of the City of Bellevue and the values of the people of Northeast Bellevue in improving walkability in the most meaningful, useful, and highly specific ways.

Methodology

Site Visits: Analysis

We found it vital to be in the field during the bulk of our work, as this most effectively informs analysis in which we are "thinking like citizens" while giving us the ability to be familiar with the space when talking to people that do live there.

1. **Familiarization with Space:** It was important that we understood the character of the neighborhood before we began analyzing the site, so we made a point of engaging with the area by walking through neighborhoods and parks in NE Bellevue. This laid a foundation that enabled us to begin studying the site.
2. **Gehl Assessment Site Visit:** During three site visits, we assessed three different areas of Bellevue using Gehl's Twelve Urban Quality Criteria (Twelve Quality Criteria, n.d.). The criteria allowed us to grade the area's sense of Enjoyment, Comfort and Protection based on a 1 (no) to 3 (yes) scale. This grading scale made it possible to understand vital aspects of the walkability of a given area in a more quantifiable sense. Surveying began on October 5th, ended on October 26th, and included:

    a. The area surrounding Tam O'Shanter Park and Bennett Elementary
    b. The area surrounding the Tam O'Shanter Golf and Country Club
    c. The area surrounding Ardmore Park

Site Visits: Citizen Engagement

Focus Group: We worked with Nicholas Matz to set up a focus group with several concerned citizens in the controlled setting of City Hall. This gave us a small sample of citizen concerns which will help guide our analyses and aid in the creation of suggestions for improvement of the area to increase walkability. Further, this allowed us to develop a better understanding of who lives in the neighborhood and how we could work to best serve them. We used the SWOT analysis method to lay out the present issues, see what implementation strategies are feasible, and what opportunities lie ahead for the neighborhood.

Tangible Report

1. **Written suggestions for improvement based on citizen input:** In our written suggestions for improvement, we make sure to take into consideration the various citizen input analyses we have conducted, the content we have received (i.e. the Bike

and Pedestrian Plan) and synthesize this information into a condensed, easy-to-understand format.

2. **Written suggestion for possible implementation strategies based on different analysis methods:** In our implementation strategies, we provided suggestion guidelines for how implementation can occur based on a synthesis of our findings. This written document outlines ideas and suggestions to improve the area, as guided by the knowledge we have gained from interaction citizens and our understanding of Gehl.

3. **GIS Layers presenting information above spatially:** We generated GIS layers based on our findings which could be used for future analysis and planning.

Assessment of Walkability

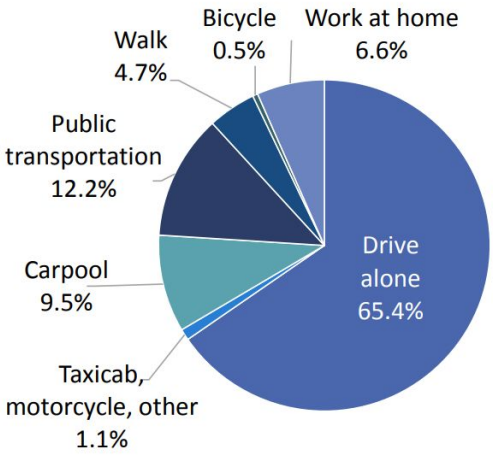
Existing Bellevue Bike and Pedestrian Plan:

It is important that we consider the existing Bike and Pedestrian Plan (2009) in an effort to utilize existing information that can increase walkability and bikeability of the NE Bellevue neighborhood while moving towards more holistic citywide goals outlined in the plan. This allows us to work towards both city and resident goals in our project. Without the assessment of the Bike/Ped Plan, our project would be focusing solely on resident goals. Bike/Ped Plan highlights are presented below:

Plan, design, build, and maintain an integrated, comprehensive network of pedestrian and bicycle facilities in collaboration with community stakeholders. In doing so, the City will advance the following objectives:

1) Transport by foot or bike between and within neighborhoods in Bellevue--Focus on/prioritize connected networks
2) Health/fitness
3) Mobility for all ages/abilities (paired with education)
4)Increase public transit use
5) Reduce pollution of all types
6) Support economic growth
7) Improve Neighborhood Livability (City of Bellevue, 2009)

Figure TR-2. Mode Used by Bellevue Residents to Commute to Work (2009-2013)



Source: American Community Survey - 2009-2013

Overall, The City of Bellevue is looking at a way to encourage citizens and residents to get out and use different forms of transportation. To do this, they believe the must provide better infrastructure for bikers and pedestrians. There is an emphasis on safety through the inclusion of the "Vision Zero" approach, which aims to eliminate traffic-related deaths . It is likely that this is highlighted as Bellevue drivers may not be familiar with sharing the road with bikers and pedestrians.

Focus Group Methods:

This project focuses largely on engagement with residents as a method for effective, meaningful planning. We found that a representative way of engaging residents of Northeast Bellevue was through the facilitation of a focus group. We worked with concerned residents of Northeast Bellevue and City Planner, Nicholas Matz, to set up a focus group meeting in the controlled setting of City Hall. Our goals for the focus group were to understand who it is we are serving, what their major concerns are regarding walkability, and what they hope to see change in their neighborhood. The focus group took place at City Hall Friday October 26th at 11:30am. The focus group lasted an hour, and we had four residents of Northeast Bellevue join us.

Our initial questions touched on the focus group member's neighborhood, i.e. a description of Northeast Bellevue paired with participant thoughts and feelings about the neighborhood. We wanted to show the residents that we cared about their neighborhood and cared about their neighborhoods, even as non-residents. These initial questions solidified a level of comfort between us and participants. This comfort soon changed the dynamic of the focus group as participants began to facilitate the conversation in a more natural way (rather than relying just on our questions). The main themes of the discussions that occurred revolved around how participants viewed their neighborhood, why they lived in the neighborhood, and what made them proud to live in the neighborhood. We chose to focus on these themes to remind the residents why they were at the focus group and to give us a better sense of what the residents thought about their neighborhood.

Conversation soon shifted from the overall sense of Northeast Bellevue into participant view of mobility throughout Northeast Bellevue. Here, we began facilitating the conversation in a stronger way, in order to effectively collect the information that week seeked.We focused on asking questions that would highlight areas of the neighborhood they were dissatisfied with paired with how they use the current mobility infrastructure throughout Northeast Bellevue. The guiding questions worked well to facilitate discussions between the residents and allowed us to get multiple point of views on specific areas of concern and themes throughout these concerns.

Focus Group SWOT Analysis:

Strengths: Based on what we learned from the 4 participants in the focus group, the most obvious characteristics of North East Bellevue are considered strengths by the residents. The high seclusion that's created by the cul de sacs structure (also referred to as loops and lollipops) creates a more	**Weaknesses:** The weaknesses identified by the participants of the focus group were mostly related to the accessibility and walkability in the neighborhood. Major arterials of Northeast Bellevue (e.g. NE 24th Ave) make it hard to travel in and out of the neighborhood, especially during rush hours.

intimate and quiet neighborhood - a characteristic that's actually considered a good thing and encouraged people to move there. In addition, recreational activities within NE Bellevue such as walking and biking are accessible. There are many parks in the area that residents are able to utilize for recreation, dog walking, personal exercise, etc. Some parks even offer work out machines. Due to the seclusion and quietness of the neighborhood, residents are able to accompany their kids outside when they might be playing on the streets. However, as discussed in the other section of this SWOT analysis, these strengths do come with certain limitations.	Most of that traffic is caused by Microsoft employees as well as parents picking up their kids from the local schools. This leaves the roads very congested, making it hard to even go from NE Bellevue to, for example, to Crossroads. Another big weakness identified by residents was the lack of infrastructure for biking and walking. While it is possible to bike/walk within the neighborhood for recreation, using these modes of transportation to get in and out of the neighborhood is extremely challenging. Another identified weakness in terms of mobility in NE Bellevue is the topography itself. Many streets in the neighborhood are very steep, making it physically challenging to move up and down these paths. An additional weakness of the infrastructure is a lack of accessible paths/lanes for biking, as well as a lack of street lights. This makes traveling by foot or bike especially uncomfortable and unsafe after sunset.
Opportunities: Most opportunities within NE Bellevue lay in improving the infrastructure for walking and biking in the neighborhood. Specifically, getting in an out of the neighborhood by these modes of transportation is incredibly challenging. The members of the focus group mentioned that, considering the congested roads that surround the neighborhood, crossing these edges/boundaries on foot or on a bike is unsafe and not encouraged. Some suggestions the focus group attendees offered to address these obstacles are building pedestrian sky bridges, making it possible to cross over the congested roads, as	**Threats:** While there are many opportunities to increase the accessibility and mobility within NE Bellevue, these changes would come with certain threats. For example, considering the amount of traffic around the neighborhood, if the connectivity would be improved, increased traffic within the neighborhood might disturb the quiet and secluded feeling of it. Another threat mentioned by the participants is dealing with growth of Bellevue and the NE neighborhood specifically. As the area is becoming more dense and, for example, with the new light rail station opening in the near future, the neighborhood will most likely experience

well as building bike lanes that encourage maneuvering alongside the cars.	heavier traffic. This is a threat because it could change the feeling in terms of the identified strengths of the area. More density and traffic will make the neighborhood less secluded and quiet, taking away aspects of the reason why residents moved of the neighborhood in first place.

Gehl Analysis:

Introduction:

The Gehl Analysis method uses 12 urban quality criteria to analyze the walkability of an area. This method works to look at walkability in the context of the user experience, and is thus citizen-focused (as is our project). The 12 criteria are present in Appendix I, though all criteria fall under the umbrella of **protection, comfort, and enjoymen**t of the site at hand. This is relevant to our project due to the fact that we are closely examining walkability in the context of citizen-centered engagement with the site.

While this method is most often used for urban areas, our use in a suburban area is a compelling, as it forces us to apply the criteria in the framework of a uniquely suburban engagement with the site. For instance, we are considering protection from fast cars on empty roads instead of protection from other people with intent of causing harm. We are looking at walkability in the mindframe of the space being used for recreation instead of for transport, with a desire to move towards a transportation focus in the area. This pushes us to engage with citizens and the analysis method fully, with a concrete understanding of citizen viewpoint when analysing the holistic walkability of the site using Gehl Analysis.

Through our interaction with Northeast Bellevue, in doing Gehl Analysis, we were able to understand various aspects of the neighborhood in depth. In our Gehl Analysis, we looked at three sites, which provided a representative sample of the character of the neighborhood. Using the 12 urban quality criteria, we looked at our three analysis sites two times (both between the hours of 12PM-3PM) each and analyzed according to all twelve criteria. Our three sites include:

1) The area surrounding Tam O'Shanter Park and Bennett Elementary
2) The area surrounding the Tam O'Shanter Golf and Country Club
3) The area surrounding Ardmore Park

- Aerial photos of each site as well as in-depth Gehl Analysis of each site are present in Appendix II.

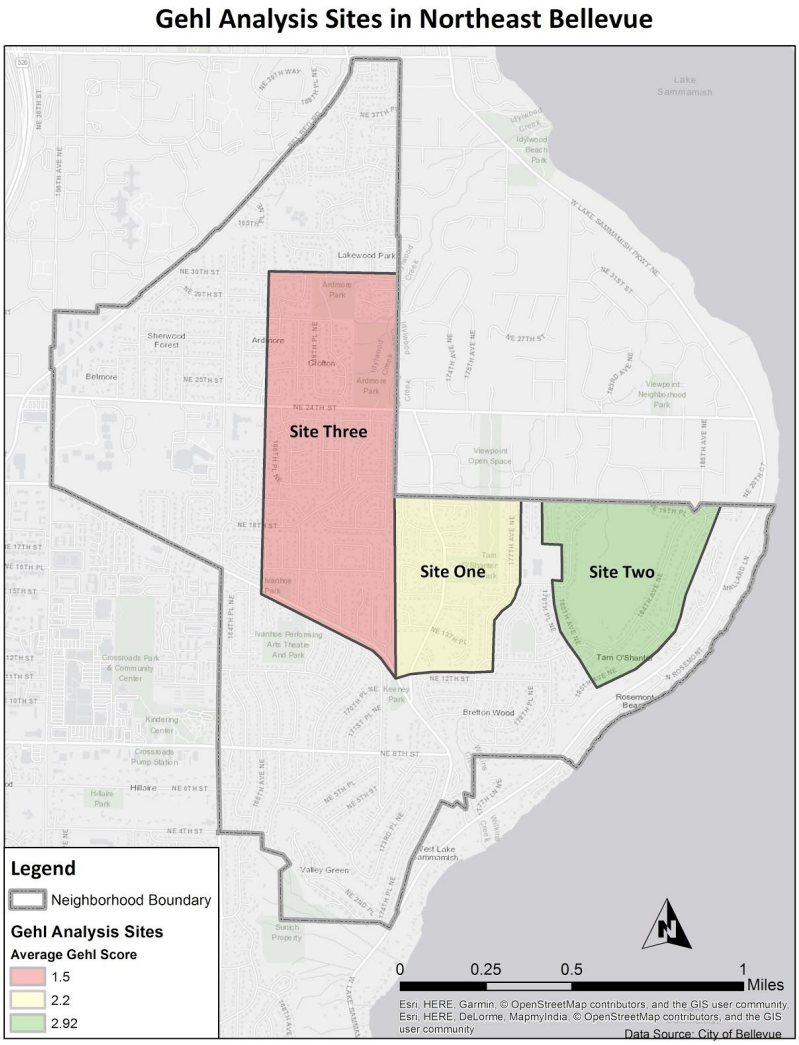


Figure 1: The three chosen study sites and their overall Gehl Analysis scores.

Discussion:

The Gehl Analysis provided a wealth of information about Northeast Bellevue and how people interact with it. Site Two scored the highest with an astonishing 2.92, while Site Three scored the lowest with 1.50. There are many reasons for these scores, and the following discussion explains the findings behind these scores by looking at the components of each site, and what this means for Northeast Bellevue as a whole.

Site One received an overall score of 2.20. The site scored relatively low in the protection facet, due to a lack of sidewalks, street lamps, and a presence of fast, loud cars on barrier-free streets. In protection, there was a sense of protection in the wooded areas, such as the protected trails that felt cozy and safe. Comfort scored pretty consistently around 2. This was due to the fact that visibility was good, there were standing and sitting places in and around the park trail areas as well as options for exercise. Things that lowered scores in this area included the presence of curved roads, construction sites, lack of wheelchair accessibility, and narrow shoulders. Mobility scored the lowest in this realm, as terrain was rough and there

was no accessibility options for differently-abled bodies. Enjoyment ranked the highest due to the fact that trails and small neighborhood areas made the site feel to be an appropriate human scale. Trails and natural aspects of the areas such as landscaping increased sensory experience and climate enjoyment.

Site Two received a remarkably high score of 2.92, being located near a country club. Protection ranked consistently at 3, due to the small feeling of the surrounding area, with little traffic, large sidewalks, eyes on the street, manicured lawns, ability for closeness to nature, and quiet sense of the place. Comfort ranked consistently in the 2's and 3's, due to accessibility of wide sidewalks and roads, and thus places to stand, sit, talk, play, and see. The area was safe for all ages, and this was represented in the presence of clean living and social space with children's toys and thought about the accessibility incorporated into the design. Protection ranked at 3 consistently. The scale of the neighborhood was human scale, ensuring a sense of place and comfort through design. The open layout, presence of lawns and ornamental plants, and view of the going-on's of the nearby school and country club created a wonderful place for people to enjoy the neighborhood, reflect, and slow down.

Site Three consistently scored the lowest with an overall score of 1.50. When considering protection, the site scored 1 across the boards. This was due to the absence of crosswalks and continuous sidewalks as well as lights, or protection from cars in the form of barriers or signs that increased visibility. A steep slope contributed to visibility issues and cars sped to a large degree at this site. In comfort, the general score was around 1.5, due to a lack of accessibility (because of steep slopes, gravel paths, no sidewalks, and narrow shoulders), loud construction activity, fast cars hugging tight curves, narrow shoulders, and lack of sitting areas all contributed to no sense of area for lingering, talking, playing or seeing. The portion of this site surrounding the closest area to Ardmore Park had the greatest sense of comfort, as it allowed more for play and relaxation in comparison to other parts of this site. Enjoyment scored around 1.5 consistently due to a feeling of smallness associated to large cars driving fast and big construction equipment being present. The area also feels rushed and devoid of much pleasant experiences such as landscaping or open space for play.

These ratings are directly related to mobility of the site, for pedestrians, bikers, and rollers. It is important to consider how perception of space is directly related to usage of the space by citizens. If spaces can be designed in a way that improves perception of the site, then more people will use the site for general activity as opposed to just recreation (a concept that will be further explored in other components of this report). This will aid in the fulfilling of the Bellevue Bike/Ped Plan goals of advancing transport by bike and foot within and between Bellevue neighborhoods, improving mobility for all, reducing pollution, enhancing health, and benefiting livability. Taking into account what certain areas are doing well and applying them to other areas within Northeast Bellevue, while considering citizen suggestion can greatly improve the mobility of the site.

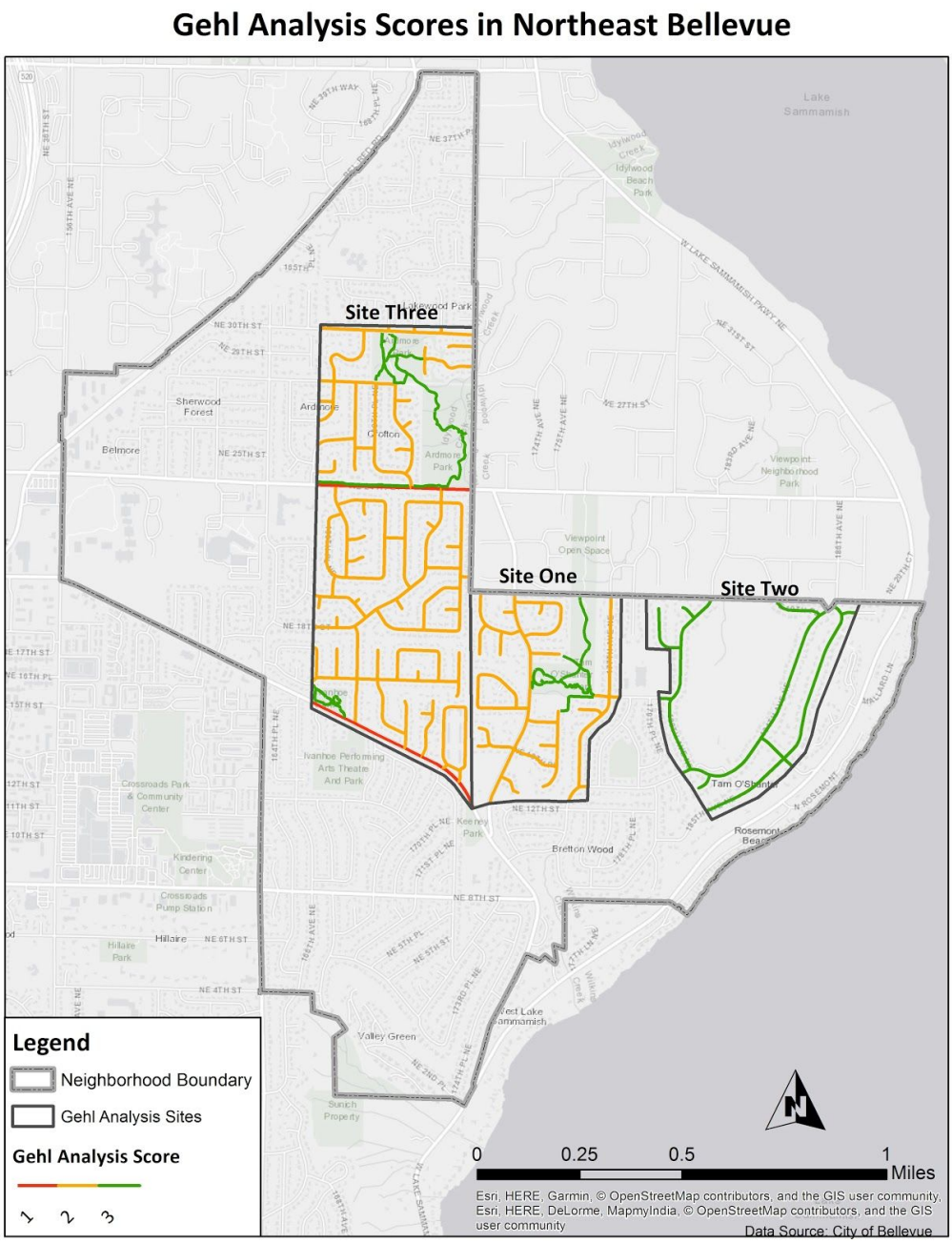


Figure 2: Gehl Analysis scores for the street and trail networks within the three study sites in NE Bellevue.

Mapping Comparison with Existing Bike-Ped Plan:

In order to understand the Gehl Analysis findings within the context of the City of Bellevue's existing Bike-Ped Plan, a comparison was made between the location of planned projects to improve pedestrian and bicycling infrastructure with the Gehl Analysis scores. The City of Bellevue's GIS data for planned projects was used, which also includes attribute information on the planned projects for what specifically the city plans to do in the future. This data allowed us to analyze the areas within our study sites that were already being addressed by the city, and to understand the areas that lacked attention in the existing Bike-Ped Plan. As

shown in Figure 3, there were four roads within the three Gehl Analysis sites that are being addressed by the plan and have proposed projects.

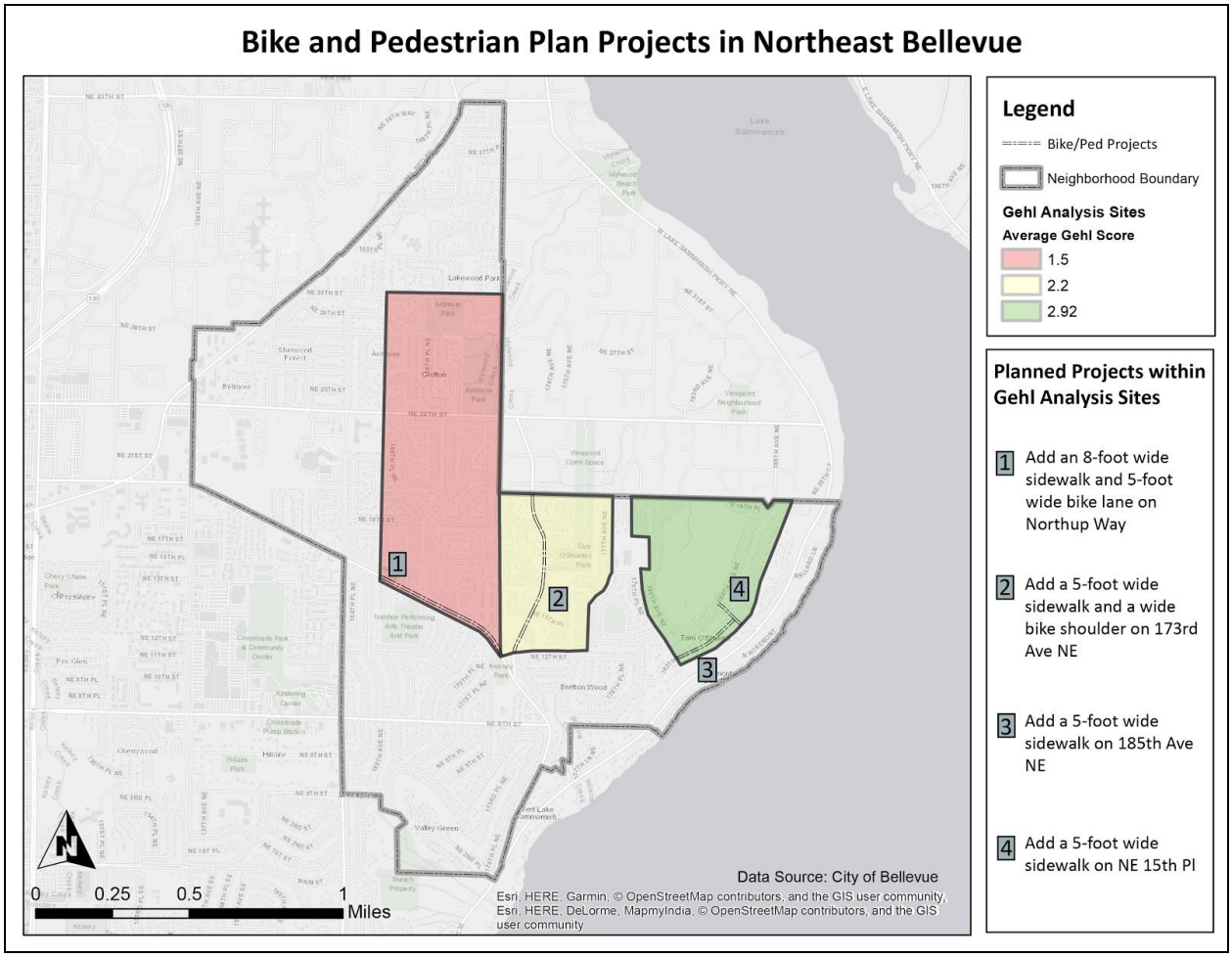


Figure 3: A comparison between the Bike and Ped Plan Projects in NE Bellevue with overall Gehl Analysis scores within each study site.

Discussion:

Overlaying the GIS layers for proposed projects and the Gehl Analysis scores illustrates how the different areas of the neighborhood are being addressed by the Bike and Ped Plan. As shown in Figure 3, there are four roads being addressed in the plan: Northup Way, 173rd Avenue NE, 185th Avenue NE, and NE 15th Place. The distribution of these projects reveals that there appears to be an even distribution of projects across the neighborhood, as there is at least one project proposed in each site.

Within Site One, there is one road that is being addressed in the Bike and Ped Plan, which is along 173rd Ave NE. Because this site received a score of 2.2, it is somewhat important that the more major roads within this area are addressed by the plan to improve the score. While this road is only proposed to have a wide bike shoulder rather than a dedicated bike lane,

it is still an improvement to the area that is welcomed for a location that was determined to need infrastructure improvements.

Within Site Two, there are two streets with proposed projects: 185th Ave NE and NE 15th Place, which are both proposed locations for new sidewalks. Comparing this to the Gehl Analysis scores, it is interesting that the site identified as the highest-scoring area has the most proposed projects to improve pedestrian infrastructure. However, there are no plans to improve biking infrastructure in this area, but this is most likely not necessary due to the existing infrastructure within the site.

As for Site Three, the area with the lowest Gehl Analysis Score of 1.5, there is only one road where there are proposed projects. In the City's Bike and Ped Plan, there are two planned projects on this road: to add an 8-foot sidewalk and a 5-foot bike lane. Northup Way has been identified as an unsafe/unpleasant arterial for walkability in both the previous Gehl Analysis as well as the focus group, so it makes sense that the city would propose a project along that road for both pedestrian and bicycling infrastructure. Additionally, it makes sense that this area has the most significant planned projects since it is one of the few roads that scored a one in the Gehl Analysis. However, there is another major road within this site that scored a one, which is NE 24th. Through both the Gehl Analysis as well as the focus group, this street has been identified as a street that needs big improvements for mobility because it is such a busy and important arterial in the neighborhood. While there are planned projects along other sections of NE 24th going west outside of the neighborhood, it is important to recognize that the problems extend through to our defined site and therefore, these projects should extend to include all of the sections of road that need improvements.

Although it is not included in the Bike and Ped Plan, one major planned project to also consider is the new light rail station to open near the northern end of the neighborhood. The light rail station will both positively and negatively affect walkability in the area. For example, it will produce positive benefits because it provides a new place for residents to walk to that can open up opportunities outside of the neighborhood, and can reduce car dependency. However, it might also have negative impacts in terms of traffic to the station from outside of the neighborhood. To conclude, looking at where the city plans to add new pedestrian and bicycling infrastructure, as well as transit infrastructure, is important for understanding qualitative analyses of pedestrian experience.

Resident Engagement

Introduction:

Given the broad project goal of thinking like residents of Northeast Bellevue, we thought it wise to immerse ourselves in the neighborhood while also trying to interact with as many residents as possible in hopes of gaining a better understanding of the needs of the residents. As a group we went on three site visits spanning much of the Northeast Bellevue neighborhood for close to

2 hours each time. Our observational visits were conducted on October 5th, October 19th, and October 26th. As a trend, we found that there was limited use of the streets and existing sidewalks by pedestrians or non-motorized modes of transportation. Each person we encountered walking or biking was doing so for recreation purposes, rather than to reach a specific destination.

October 5th-Our goals in our first site visit was to become generally familiar with the layout of the neighborhood and to visit some of the more major sites in the area such as schools, churches, parks. As we visited these locations we found some similarities throughout the area. First we noted that there were very few sidewalks and many roads we walked on had no shoulder. This was not a very comfortable place to walk. A significant portion of the Northeast Bellevue landscape is what the planning profession would refer to as "loops and lollipops", in other words winding streets with a significant number of cul-de-sacs. This layout reduces sightlines and made it difficult to spot people outside walking around. On this first visit we encountered one resident of the area sitting on the sidewalk outside of Tam O'shanter Park. This resident drew a mental map for us and spoke at length about how he enjoys the greenery Northeast Bellevue has to offer while enjoying walking and biking purely for recreation purposes. He noted that he works at Microsoft and chooses to drive 10-15 minutes rather than bike due to the large hill on NE 24th St.

October 19th- On our second site visit we had high hopes due to an unseasonably warm day of around 70 degrees with few clouds in the sky. We were only able speak with two older women who were friends out walking their dogs. These two residents had more of an environmental focus when we asked them about walking in their neighborhood. One of the walkers mentioned she would like better sidewalks but the second walker countered her saying she doesn't need curbs and gutters and would prefer swails to better deal with surface water runoff. The two did agree that would like to see improved trash can availability on major arterials to address litter. We also had a couple of near misses where we noticed people crossing the street multiple times in order to avoid having to interact with us.

October 26th- Our final visit followed suit with the previous two and gave us a new perspective. We were able to literally chase down one older gentleman who was jogging, and while cordial he refused to slow his pace during our chat. Fortunately, his sentiments were concise. He felt the road network worked well for his exercise purposes and he was against any new sidewalks as he deemed them unnecessary. It was after this particular exchange that it occurred to us that our site visits would only be reaching those residents who already felt comfortable walking or biking in the neighborhood, so their feedback was likely to be positive about the status quo.

We found this direct engagement useful in identifying consistencies with those currently walking and biking in Northeast Bellevue. There was a general consensus that walking was for recreation and exercise, not transportation. It was also informative to hear directly from residents that they thought their neighborhood was perfectly walkable for their needs. Much of the field engagement feedback coincides with our findings in the focus group.

Network Analysis:

To supplement the qualitative methodologies focused on pedestrian experience, we conducted a network analysis on the neighborhood to analyze walkability from a more quantitative and objective perspective. This analysis looks at schools, churches/places of worship, and parks, as Northeast Bellevue residents have expressed that those are the places they most frequently walk to. It is important to analyze walkability in the context of the actual built networks, rather than simply looking at distance between places, because it provides a better understanding of where pedestrians can actually walk. This is especially important in lower density neighborhoods such as Northeast Bellevue because of the long, winding streets and prevalence of culs-de-sac that may make walking routes longer or more complicated.

Methodology:

Using Geographic Information Systems (GIS) software and geospatial data provided by the City of Bellevue, we were able to analyze the service areas of defined destinations along a street network. Layers of data were input into GIS, including the street networks, trails, neighborhood boundaries, schools, and parks. Because the inputs for a network analysis must be point facilities, a point layer was created of the vertices for the park polygon layer. This means that walkability to a park was defined as walkability to any corner of the park, rather than to the center of the park or park entrances. Because we also decided to look at walkability to places of worship, since they are important landmarks in the neighborhood, a layer was created using data from Google Maps. Though most places of worship are not in the neighborhood itself, they are close enough to the neighborhood border that they are still very important to the residents of the area.

This analysis used the street network, rather than the sidewalk network, because hardly anywhere in the neighborhood would be defined as walkable if pedestrians could only walk on the sidewalk. Additionally, the actual experience of the residents is that they are willing to walk on the shoulder of a road. However, residents have also expressed that they like to walk through the parks on trails, so the network was created using both the City's street layer as well as the trail assets layer. The network dataset was then used to create the walkable buffers for each type of destination at two distance intervals. The distances chosen were a quarter-mile and a half-mile, which was also informed by the experiences of the focus group participants.

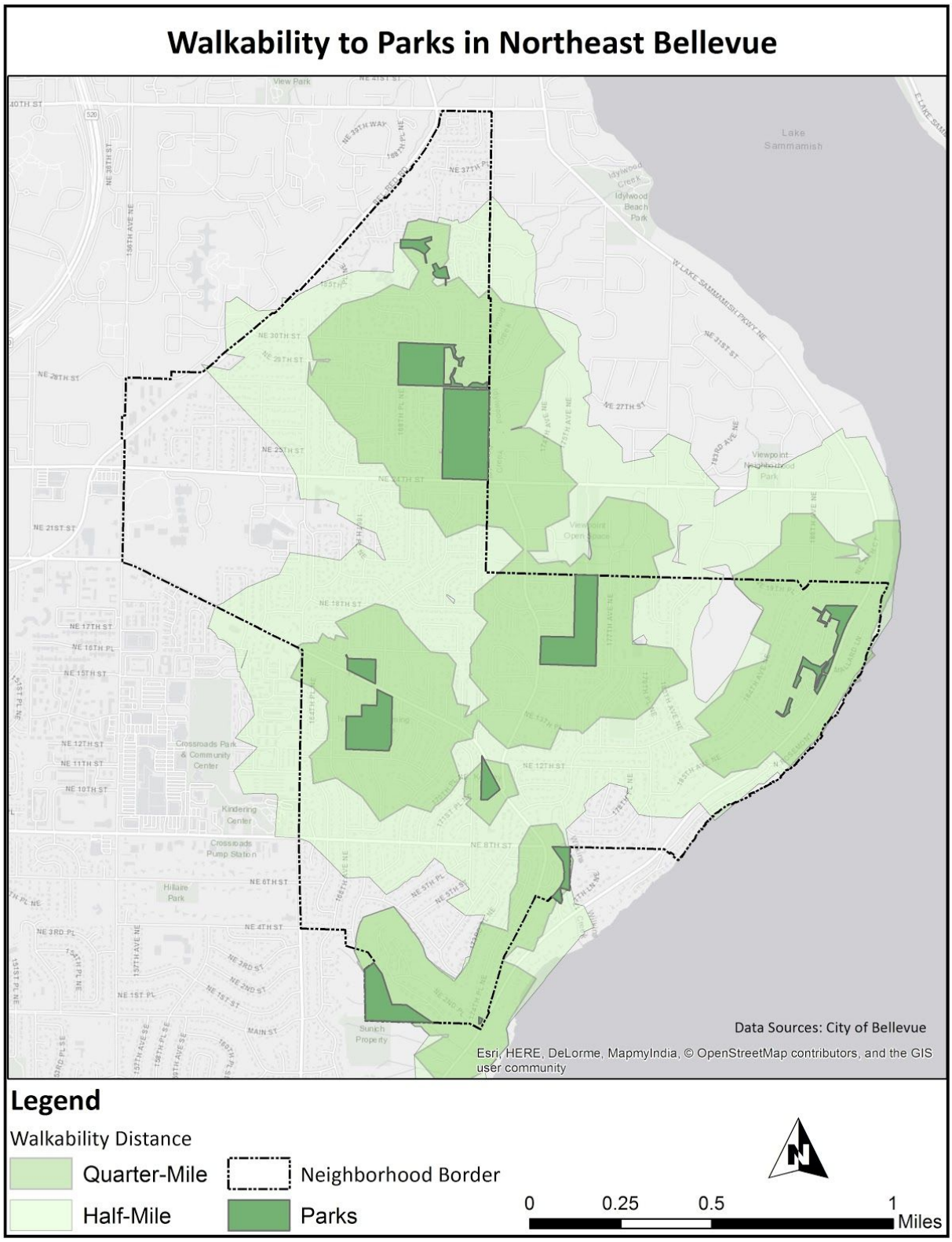


Figure 4: Map illustrating walksheds along street networks to parks in NE Bellevue.

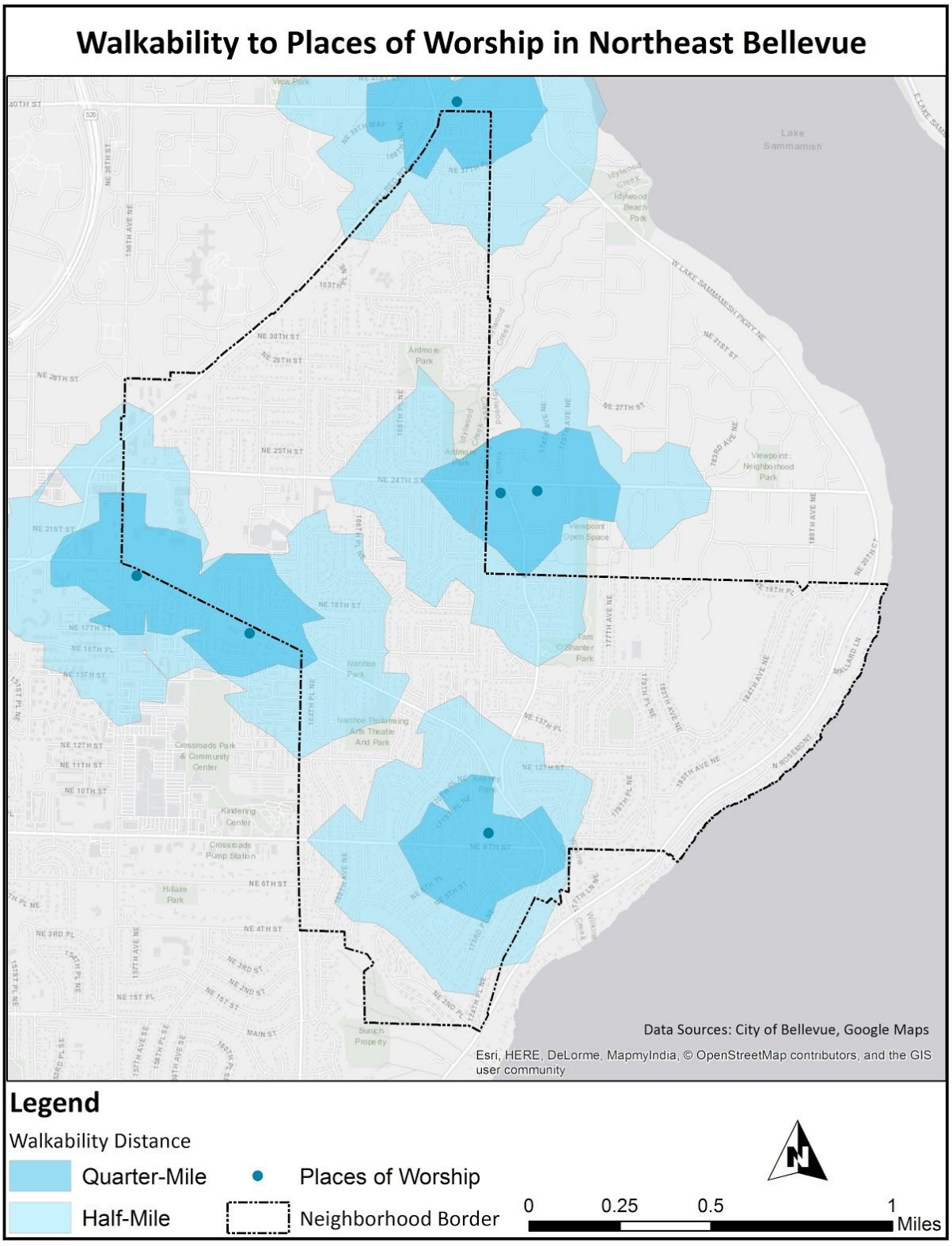


Figure 5: Map illustrating walksheds along street networks to places of worship in NE Bellevue.

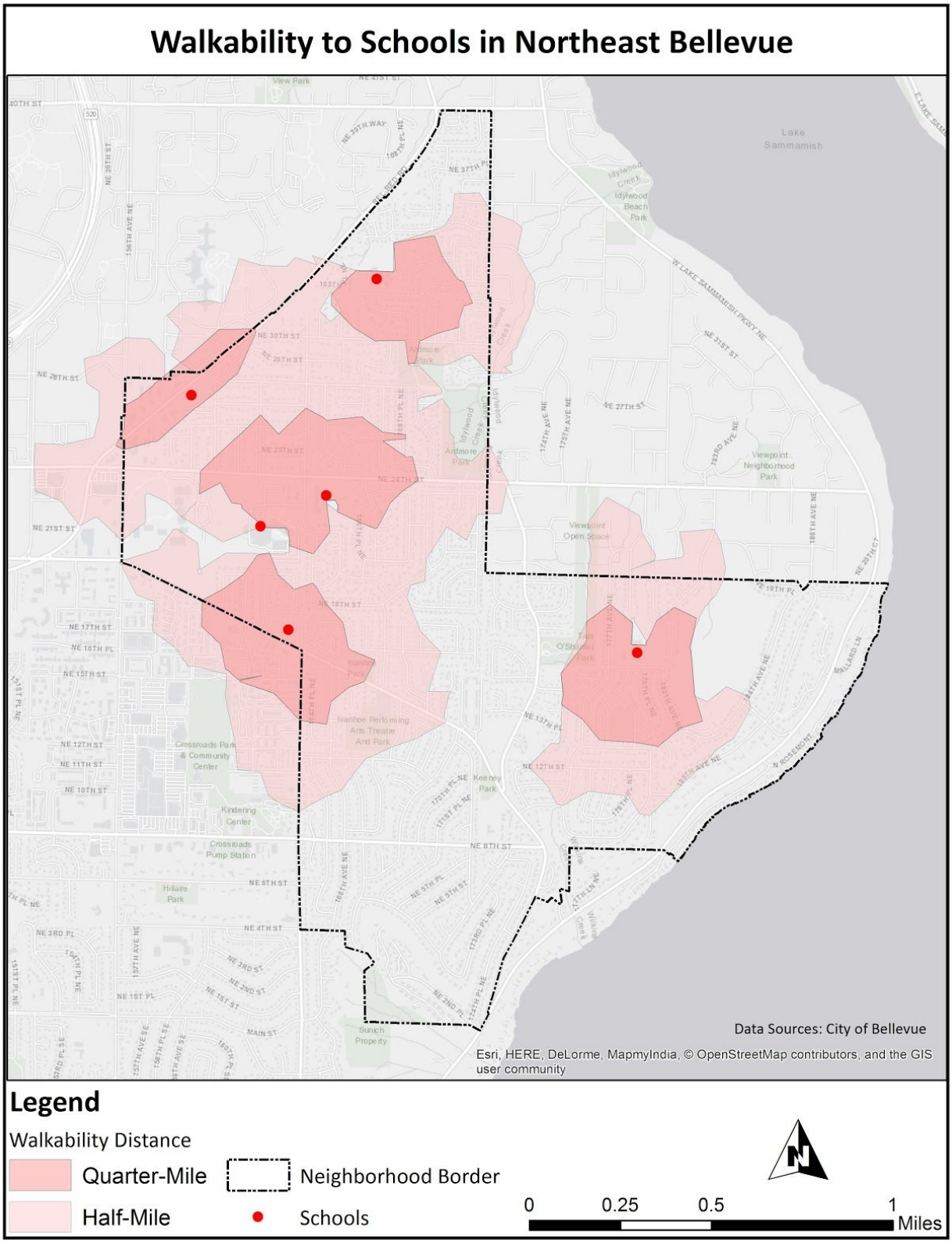


Figure 6: Map illustrating walksheds along street networks to schools in NE Bellevue.

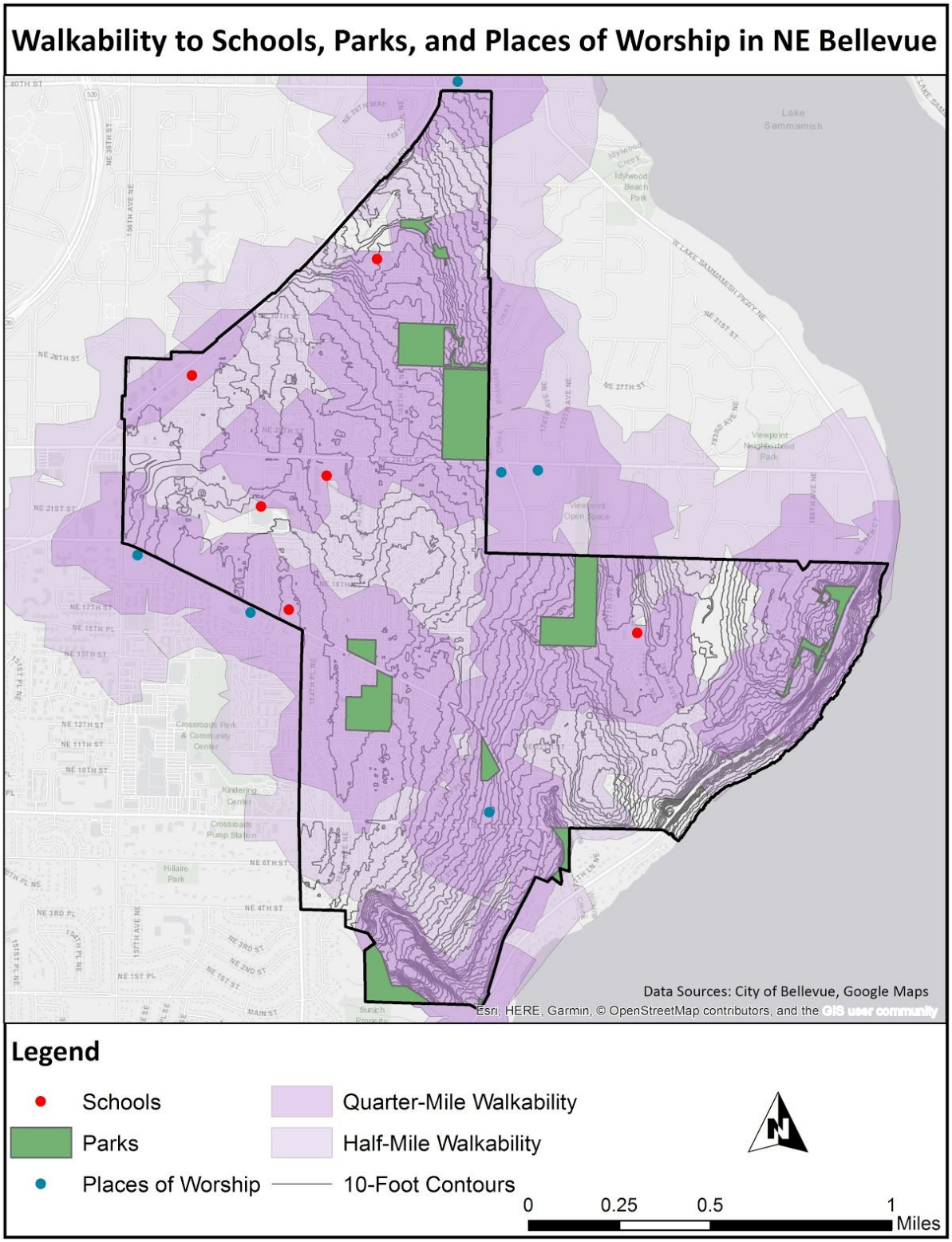


Figure 7: Map illustrating the composite walkshed to schools, parks, or places of worship in NE Bellevue, overlayed with topographic contours.

***Discussion**:*

The network analysis provides a more objective and visual representation of walkability in the neighborhood. It does not consider the environment, the actual state of infrastructure, topography, or sidewalk connectivity. Rather, it paints a simplified picture of where in the neighborhood can people get to by walking a short distance along street and trail networks.

By looking at Figure 4, it is evident that most places in the neighborhood are walkable to parks. The central areas of the neighborhood, especially near the Bellevue-Redmond boundary, and areas such as Crofton, Ardmore, and Tam O'Shanter, are shown as more walkable to parks. Parks in the neighborhood are a relatively good size and well dispersed throughout the neighborhood, which makes them more accessible to different areas of the neighborhood. However, there are still areas such as the western border of the neighborhood that are not served as well to city parks. Figure 5 illustrates walkability to places of worship in the area. It is evident that most areas of the neighborhood are not very walkable to places of worship, especially on the eastern border near Tam O'Shanter and the northern areas such as Sherwood Forest. However, some areas are served well, especially along Northup Way. Figure 6 represents the walkability to schools in the neighborhood. This is an important map because children need walkable networks to their schools, and need safe spaces to walk on their own. The northern area of the neighborhood is served fairly well, specifically around Lakewood Park. However, the southern area of the neighborhood is not very walkable at all for schools, in part because there are no schools in the area.

Figure 7 illustrates walkability to parks, schools, and places of worship in one composite walkshed to demonstrate the areas of the neighborhood are walkable to any one of the locations. The map shows that nearly every place in the neighborhood, with the exception of Tam O' Shanter Golf Course, is walkable to at least one type of location. However, this map also includes 10-foot contour lines to illustrate what areas of the neighborhood have steep slopes that may inhibit walkability, as people are generally less likely to walk in hilly areas. As shown in the map, some areas are determined as walkable along street networks, but have steep slopes. This is especially apparent in the southern and eastern parts of the neighborhood, where it would be necessary to walk up a steep hill in order to walk to anywhere else in the neighborhood.

People are generally not willing to walk more than a half-mile (unless for leisure or recreation), so using any longer distance in this analysis was not necessary. Another aspect of this analysis to consider is that we only chose to focus on schools, churches and places of worship, and parks because those are the places that residents will walk to. While it might be interesting to analyze the walkability to everyday places such as grocery stores, retail, libraries, or other locations, we chose not to because those facilities are located mainly outside of the neighborhood boundary. Additionally, the residents that we have interacted with have stated that they are not willing to walk that far to a grocery store when it is much more convenient to drive.

Because this analysis does not take into consideration the actual pedestrian experience with the streets, these maps can only tell us so much. For example, Figures 5 and 6 show high walkability for areas along Northup Way, NE 24th Street, and Bel-Red Road. However, residents have expressed that they would prefer not to walk along this road, as it can be unsafe for pedestrians during certain times. In reality, these areas deemed "walkable" in the analysis may

not necessarily be very walkable at all if the infrastructure itself is not pedestrian friendly. Additionally, this analysis does not show the location of the future light rail station. Residents have expressed that they may or may not walk to the new light rail station, depending on how close they live to the station. However, it will still have an affect on walkability in the neighborhood, especially the northern end of the neighborhood, as people may be willing to walk farther to get to the light rail than they would to get to a bus stop, for example. It may also have an impact on street safety and traffic influx, as people from around the area will drive to and park near the future station. While these maps can reveal a lot about walkability in the neighborhood, new transportation infrastructure and the pedestrian experience in general are important things to consider as the neighborhood continues to change.

Implementation Strategies/Suggestions

The following implementation strategies and suggestions are guided by our background research as well as our study of the site. The existing City of Bellevue Bike and Pedestrian Plan provides the context for our strategies and suggestions; our work is supplementary and citizen-focused.

The existing Bike/Pedestrian Plan outlines key priorities that help guide our recommendations.

Priorities of the Bike and Pedestrian Plan are as follows:

1. Increase walking, biking, public transit
2. Improve facilities that support these actions
3. Increase health
4. Reduce pollution

We also incorporate the City of Bellevue's following priorities:

1. Increased understanding of citizen priorities to better inform planning decisions
2. Working to engage citizens with the concept of walkability in their neighborhood
3. Ensuring that people feel safe in their neighborhood and satisfied with mobility options

We move from city-wide planning goals to resident-specific goals that are informed by our research below.

The Focus Group and Participant Observation highlight the following priorities:

1. Walking and biking within the neighborhood is possible/done for recreation
2. Parks within the the neighborhood are accessible
3. Main arterials (often congested) that surround the neighborhood make entering and exiting the area on a bike or on foot challenging and unsafe
4. Infrastructure improvements such as sky bridges over the main areterials or dedicated bike lanes would encourage these modes of transportation in/out of NE Bellevue
5. Spotty sidewalk coverage as well as lack of lighting after dark makes walking or bicycling uncomfortable and/or unsafe

We move from resident-specific goals to analysis-based goals that assess protection, comfort, and enjoyment of the site.

*Our Gehl Analysis inform the following **infrastructure improvements**:*

1. Increase presence of sidewalks, crosswalks, bike lanes, and planted strips in an effort to create a sense of protection from automobiles
2. Improve connectivity between mobility sites such as sidewalks

3. Make NE Bellevue more accessible for those that are not able-bodied (i.e. narrow shoulders, broken sidewalks, gravel sidewalks etc.)
4. Create spaces for talking, playing, sitting, and appreciating surroundings
5. Provide street/sidewalk lighting
6. Highlight speed limits through better signage

We can combine/reconcile these priorities and improvements in the following ways. We realize that implementations must have multiple benefits. Different planning strategies can satisfy the desires of citizens and the city of Bellevue (including the existing Bike and Pedestrian Plan) while still working to make the neighborhood more accessible and connected, which reduces pollution and increases health outcomes.

Considering all of this, our final suggestions and implementation strategies are as follows:

1. Provide connectivity of walking and biking paths via improved infrastructure.
    a. Flashing crosswalks to facilitate crossing of main arterials could occur on streets such as 24th and Northup. This would increase visibility and make walking for transportation a more viable option.
    b. Widen sidewalks and bike lanes on both main arterials and side streets. Widening sidewalks and bike lanes is costly in time and money, though it could improve walkability for people that are not able-bodied, as well as ensure that people are not walking close to high speed cars, creating a physical separation.
    c. Use paint to highlight areas for bike lanes. Paint can increase visibility, while being a low-cost infrastructure improvement. This clearly promotes Bike/Ped Plan goals of increasing biking for transport.
    d. Provide connectivity between mobility features such as sidewalks will improve desire to walk as well as the ability to get from one location to another. Currently, there are many sidewalks that are cut off at nondescript locations, this decreases walking accessibility and safety of walking. Connecting existing sidewalks (and infrastructural improvement) will improve walkability of NE Bellevue.
2. Increase feelings of safety associated with mobility in Northeast Bellevue.
    a. Implementing medians (such as concrete medians along major roads, and planters and small roundabouts along side streets) will create a safety barrier between pedestrians and vehicles.
    b. Providing pedestrian-scale lighting along sidewalks and paths could increase pedestrian safety without encouraging increased car speeds or changing the quiet character of the neighborhood.
    c. Flashing speed limit signs on main arterial roads could encourage reduced car speeds and make drivers aware of pedestrians on busy roads.
3. Normalize walking and biking as viable methods of transportation (made possible by infrastructure).

   a. Increase social normalcy of walking for transportation purposes. This can be influenced by making walking paths from homes to parks/schools/churches. Creating new walking paths to connect sidewalks and pedestrian-friendly streets could bridge the gap between physical proximity to locations of interest and the actual walkable pedestrian networks. As more people walk in the neighborhood, this can increase the social normalcy of walking, causing more people to engage in the activity.
   b. Introducing a walking school bus can create an organized example of how walking is a viable option for transport, while reducing traffic associated with getting children to school. This provides a powerful example of the benefits of walking as a form of transport.
4. Ensure that suburban lifestyle can coexist with mobility measures
   a. Providing connectivity to commercial areas and businesses that the residents of the neighborhood utilize will encourage a bolstering of the local economy, which is clearly outlined in the existing Bike and Ped plan.
   b. Implementing incentives for walking or biking to work and school would encourage increased use of alternative mobility and pedestrian/bicycling infrastructure.
   c. Providing opportunities for conversation through community engagement efforts to help residents understand how mobility infrastructure can be utilized for their own needs, as well for the City of Bellevue to understand where there could be further improvements to mobility infrastructure.

Conclusion

In the initial steps of this project we worked to familiarize ourselves with the NE Bellevue neighborhood. Once familiar, we decided to assess research strategies that would help us understand how we could assess the walkability of the area through the medium of a Gehl analysis, a focus group, and GIS spatial analysis. After executing our methods of assessing the walkability / bikeability in NE Bellevue, we can conclude that there is extensive room for improvement of the overall mobility of the neighborhood.

While residents enjoy the peaceful living environment the secluded structure of the neighborhood provides, they are dissatisfied with the lack of options of using modes of transportation aside from cars. Walking within the neighborhood for personal recreation is possible, but anything relating to walking/biking in order to run errands, travel in and out of the neighborhood, or simply going on a longer bike ride quickly becomes uncomfortable and/or unsafe. This is due to the lack of infrastructure for these modes of transportation, as well as the constant congestion of the main arterial roads that surround the NE Bellevue neighborhood. Biking in heavy traffic is dangerous due to the lack of bike lanes, shoulders/medians, and crossing opportunity. Similarly, in terms of walking, not having the opportunity to cross the streets in a safe manner discourages the residents of NE Bellevue from even considering traveling in and out of the neighborhood on foot.

Looking ahead, there are possible improvements to the infrastructure that could change the current mindset and transform discouragement into encouragement. For example, painting clearly defined bike lanes, implementing flashing crosswalks, more street lights, and reiterating speed limits with obvious signs are among the possible changes that would change the mobility and accessibility of NE Bellevue. As we learned during the focus group, the residents of NE Bellevue envision a future of their neighborhood to be a transformation into a place where cars are not the main mode of transportation. Instead, they dream of a place where walking and biking is not only encouraged, but possible in a safe and comfortable manner during both day and night. Based on our research and the focus group, implementing a variety of our suggestions would be a step in the right direction to achieve this vision.

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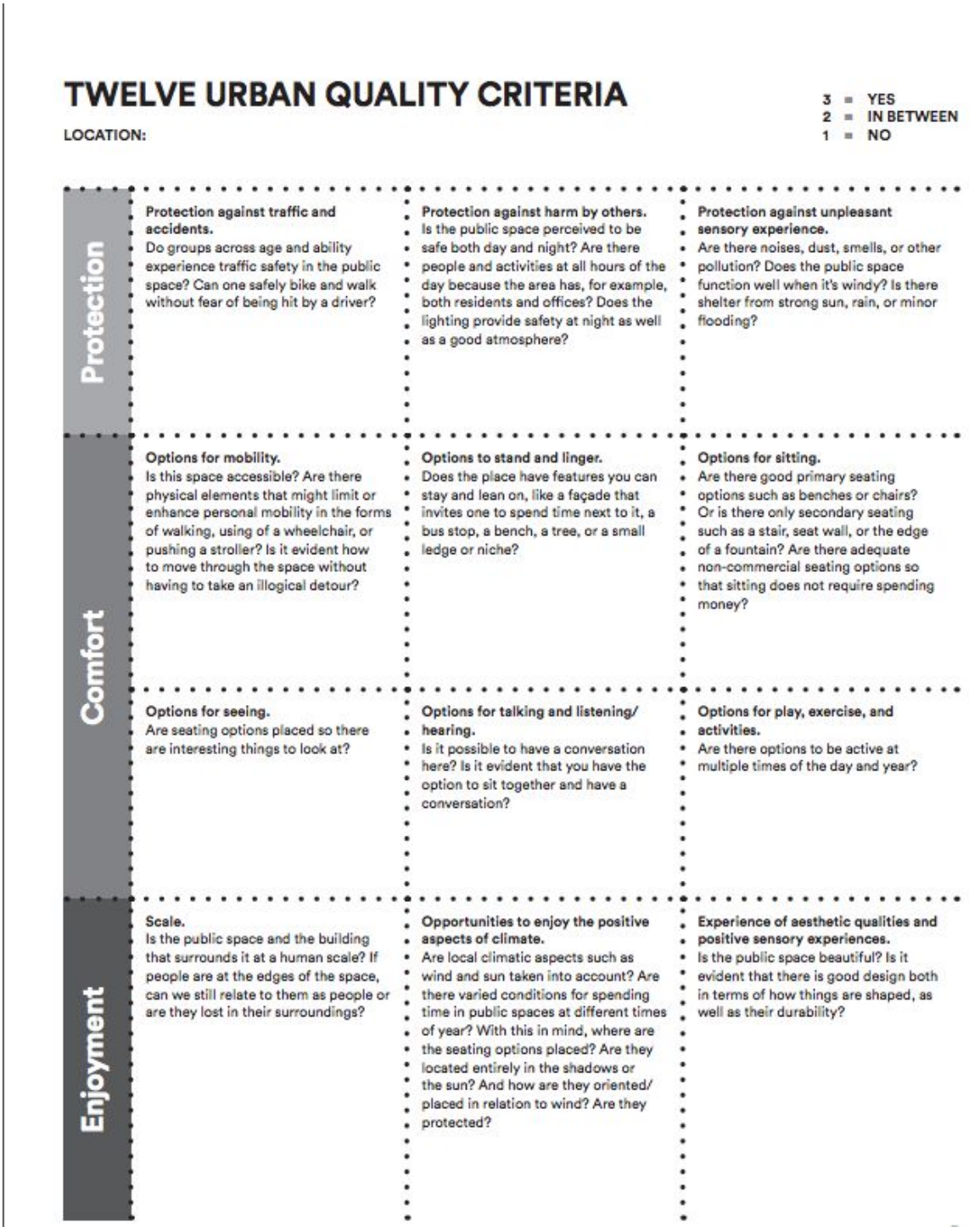
Appendices

Appendix I.
Gehl Criteria Chart



TWELVE URBAN QUALITY CRITERIA

LOCATION:

3 = YES
2 = IN BETWEEN
1 = NO

Protection	**Protection against traffic and accidents.** Do groups across age and ability experience traffic safety in the public space? Can one safely bike and walk without fear of being hit by a driver?	**Protection against harm by others.** Is the public space perceived to be safe both day and night? Are there people and activities at all hours of the day because the area has, for example, both residents and offices? Does the lighting provide safety at night as well as a good atmosphere?	**Protection against unpleasant sensory experience.** Are there noises, dust, smells, or other pollution? Does the public space function well when it's windy? Is there shelter from strong sun, rain, or minor flooding?
Comfort	**Options for mobility.** Is this space accessible? Are there physical elements that might limit or enhance personal mobility in the forms of walking, using of a wheelchair, or pushing a stroller? Is it evident how to move through the space without having to take an illogical detour?	**Options to stand and linger.** Does the place have features you can stay and lean on, like a façade that invites one to spend time next to it, a bus stop, a bench, a tree, or a small ledge or niche?	**Options for sitting.** Are there good primary seating options such as benches or chairs? Or is there only secondary seating such as a stair, seat wall, or the edge of a fountain? Are there adequate non-commercial seating options so that sitting does not require spending money?
	Options for seeing. Are seating options placed so there are interesting things to look at?	**Options for talking and listening/ hearing.** Is it possible to have a conversation here? Is it evident that you have the option to sit together and have a conversation?	**Options for play, exercise, and activities.** Are there options to be active at multiple times of the day and year?
Enjoyment	**Scale.** Is the public space and the building that surrounds it at a human scale? If people are at the edges of the space, can we still relate to them as people or are they lost in their surroundings?	**Opportunities to enjoy the positive aspects of climate.** Are local climatic aspects such as wind and sun taken into account? Are there varied conditions for spending time in public spaces at different times of year? With this in mind, where are the seating options placed? Are they located entirely in the shadows or the sun? And how are they oriented/ placed in relation to wind? Are they protected?	**Experience of aesthetic qualities and positive sensory experiences.** Is the public space beautiful? Is it evident that there is good design both in terms of how things are shaped, as well as their durability?

Appendix II
Gehl Analysis Findings:

Site One was the area surrounding Tam O'Shanter Park and Bennett Elementary.

	Protection	Traffic 1	Harm From Others 2	Unpleasant Sensory Experience 2
	Comfort	Mobility 1	Places to Stand and Linger 2	Area for Sitting 2
	Comfort	Options for Seeing 2	Options for Talking/Listening 2	Options for exercise and play 3
t	Enjoymen	Scale 3	Opportunity to Enjoy Climate 3	Aesthetic + Positive Sensory Experience 3

Site One Overall Score: 2.20
Protection: 1.60
Comfort: 2
Enjoyment:3

Site Two was the area surrounding Tam O'Shanter Golf and Country Club.

	Protection	Traffic 3	Harm From Others 3	Unpleasant Sensory Experience 3
	Comfort	Mobility 3	Places to Stand and Linger 3	Area for Sitting 2
	Comfort	Options for Seeing 3	Options for Talking/Listening 3	Options for exercise and play 3
t	Enjoymen	Scale 3	Opportunity to Enjoy Climate 3	Aesthetic + Positive Sensory Experience 3

Site 2 Overall Score: 2.92
Protection: 3
Comfort: 2.80
Enjoyment: 3

Site Three was the area surrounding Ardmore Park.

Protection	Traffic 1	Harm From Others 2	Unpleasant Sensory Experience 1
Comfort	Mobility 1.5	Places to Stand and Linger 1	Area for Sitting 1
Comfort	Options for Seeing 2	Options for Talking/Listening 1	Options for exercise and play 2
Enjoyment	Scale 1.5	Opportunity to Enjoy Climate 2	Aesthetic + Positive Sensory Experience 2

Site 3 Overall score: 1.50
Protection: 1.33
Comfort:1.42
Enjoyment:1.83

Appendix III . Focus Group

10/26/18 - Walkability Focus Group Outline

Introductory Questions:

1. When you think of Northeast Bellevue, what comes to mind to describe your neighborhood?
2. How long have you lived in the Northeast Bellevue neighborhood?
3. What major changes have occured in the neighborhood, either physically or socially, in recent years?
4. What aspects (places, landmarks, etc.) of the neighborhood do you identify most closely with?
5. What makes you most proud about living in Northeast Bellevue?

Mobility Questions:

1. How do you get around your neighborhood?
2. How welcoming/accessible do you find the current infrastructure in Northeast Bellevue to different forms of mobility (i.e. walking, biking)?
3. Are there things you are dissatisfied with? What would you like to see changed?
4. What is an area in which mobility should be improved?
5. How many times a week do you walk in Northeast Bellevue?
    a. Where do you walk to?
    b. Do you walk for recreation or for transportation?
    c. Are there areas you don't feel safe walking in Northeast Bellevue? Why?
        i. Does the time of the day affect this?
6. How many times a week do you bike in Northeast Bellevue?
    a. Where do you bike to?
    b. Do you bike for recreation or for transportation?
    c. Are there areas you don't feel safe biking in Northeast Bellevue? Why?
        i. Does the time of the day affect this?
7. Do you have any children? Do you feel safe having them:
    a. Walk/play outside?
    b. Walk/bike to school?
8. Big picture: How do you envision your neighborhood to look ten years from now?