

A New Direction for Bellevue: From Cars to People and a Livable Community

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Abstract

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Urban Design and Planning

Downtown Bellevue is a thriving area that is expected to grow and densify rapidly over the next several decades. However, worsening traffic congestion and a street environment that is largely inhospitable towards pedestrians are major issues that need to be resolved if downtown Bellevue is to be a high-functioning urban center. Encouraging walking, cycling, and the use of public transportation will address these issues and create a more livable downtown Bellevue. Doing so in the right way will also come with other social, economic, and environmental benefits for the area.

This thesis presents a concept for a highly-walkable and livable core of downtown Bellevue. The concept is comprised of several elements, pedestrian paths and the street crossings linking them, and public open spaces. Each element serves a purpose in reaching the goal of creating a walkable core of downtown Bellevue with improved appeal and accessibility for all residents and visitors.

Table of Contents

7	Part 1 - Introduction
7	1.1 Explaining Walkability
8	1.2. Value of Walkability
8	1.2.a. Social Benefits
10	1.2.b. Economic Benefits
11	1.2.c. Environmental Benefits
13	1.3 About this project
14	1.4 The need for this project
19	Part 2 - Downtown Bellevue
19	2.1 History of Downtown Bellevue
21	2.2 Downtown Bellevue's Regional Role, the Edge City
22	2.3 Organization and Land Use
27	2.4 Demographics
28	2.5 The Issues: Walking in Downtown Bellevue
36	Part 3 - Remedial approach
36	3.1 The basic elements for a walkable community
38	3.2 Consistency with City Plans
39	3.3 A Note on Bicycles
40	Part 4 - The Design
43	4.1 The Importance of Adjacent Buildings
44	4.2 The Paths
44	4.2.a The Corridor
51	4.2.b The Alleys
56	4.3 The Crossings
61	4.4 Open Space
61	4.4.a. The Square
67	4.4.b. The Grove
70	Part 5 - Conclusion
70	5.1 Making it work
71	5.2 Next Steps
73	5.3 Final remarks
74	Bibliography

List of Figures

15	Figure 1.1. East Link extension
16	Figure 1.2. Downtown Station map
18	Figure 1.3. Commute survey results
19	Figure 2.1. 1926 map
20	Figure 2.2. Chamber of Commerce brochure
22	Figure 2.3. Downtown districts
23	Figure 2.4. Eastside Center District
24	Figure 2.5. Employment and population in downtown Bellevue
24	Figure 2.6. Key features of downtown Bellevue
26	Figure 2.7. Transit ridership map
29	Figure 2.8. Sidewalk along Bellevue Way
29	Figure 2.9. Sidewalk along 106th Ave NE
31	Figure 2.10. Sidewalk along NE 8th St
32	Figure 2.11. Incomplete city map
33	Figure 2.12. Pedestrian corridor
34	Figure 2.13. View from a bench along the pedestrian corridor's "street as plaza" segment
34	Figure 2.14. View from a bench along the pedestrian corridor's "garden hill climb" segment
35	Figure 2.15. Segments of the pedestrian corridor
36	Figure 3.1. Benefit of denser path networks
37	Figure 3.2. Examples of rich and dull urban sensory experiences
41	Figure 4.1 Overall concept diagram
42	Figure 4.2. Existing conditions
47	Figure 4.3. Corridor location
48	Figure 4.4. Corridor plan
49	Figure 4.5. Corridor section
50	Figure 4.6. Corridor elevation
52	Figure 4.7. Alley locations
53	Figure 4.8. Alley plan
54	Figure 4.9. Alley section
55	Figure 4.10. Alley elevation
57	Figure 4.11. Mode Priorities of downtown streets
59	Figure 4.12. Crossing locations
60	Figure 4.13. Crossing plan
64	Figure 4.14. Square location

65	Figure 4.15. Square plan
66	Figure 4.16. Square section
68	Figure 4.17. Grove locations
69	Figure 4.18. Grove plan
72	Figure 5.1. Expansion of concept

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Part 1 - Introduction

For over half of a century, societies have focused on building monuments to the automobile, shaping our cities—and our lives—around them. Many developed countries have begun to reduce their dependence on the car, and have started also to consider the needs and safety of other street users like pedestrians and cyclists. In the Netherlands, for example, 31% of people consider biking their primary mode of transportation.¹ The United States lags behind, with Americans having the highest rate of car ownership in the world in 2007.² More than 75% of all trips in the country are made by car, and this figure is consistent across socioeconomic and demographic groups.³

These patterns are related to available infrastructure and the choices that they offer people. In general, the vast majority of transportation funding in the United States goes toward infrastructure specifically or primarily for cars, which often leaves networks for walking or cycling incomplete, decrepit, or non-existent.

There are growing efforts in this country to make our cities more accessible for pedestrians. Americans are still enamored with their cars, but there is a great host of reasons why they should support the creation of more walkable spaces.

1.1 Explaining Walkability

The walkability of an area is the degree to which the environment is accommodating of people walking, visiting, and spending time in an area. Walkability is livability. Every effect that walkability has on a neighborhood and every item that makes a neighborhood walkable are the same things needed to make that space livable.

The degree to which an area is walkable depends primarily on the characteristics of the built environment. One index examines an area's land use mix, street connectivity, net residential density, and retail floor area ratios to measure walkability.⁴ These are essential pieces of the walkability puzzle, but the actual form and characteristics of these pieces is just as important for creating walkable environments as their presence. As an extreme example, a neighborhood could have excellent street connectivity, but if all of the streets are unpaved gravel and there is no vegetation, the presence of the streets is almost useless; nobody will want to walk them. There are also considerations for walkability that do not directly involve the

1 European Commission. *Eurobarometer: Future of Transport Analytical Report*. March, 2011. pg 7. https://web.archive.org/web/20140303132418/http://ec.europa.eu/public_opinion/flash/fl_312_en.pdf.

2 Ralph Buehler, "Transport Policies, Travel Behavior, and Sustainability: A Comparison of Germany and the U.S." (PhD. diss., State University of New Jersey, 2008).

3 Buehler, "Transport Policies."

4 Lawrence D. Frank, James F. Sallis, Terry L. Conway, James E. Chapman, Brian E. Saelens, and William Bachman, "Many Pathways from Land Use to Health: Associations between Neighborhood Walkability and Active Transportation, Body Mass Index, and Air Quality," *Journal of the American Planning Association* 72, no. 1 (2006): 75-87.

built environment. The demographic makeup of a neighborhood's residents is an example of a non-built environment factor. Demographics play a part in walkability because different groups of people have different walking habits. They may walk for different reasons, meaning the speed, destinations, and time of day of their walks could vary. When creating walkable spaces, it is important to consider the existence and quality of walking infrastructure as well as the walkers themselves.

1.2. Value of Walkability

Walkability is closely related to the concept of livability. Every one of the means and ends of walkability contribute to making places more livable. Jeff Speck mentions in *Walkable City* that, "After several decades spent redesigning pieces of cities, trying to make them more livable and more successful, I have watched my focus narrow to this topic as the one issue that seems to both influence and embody most of the others. Get walkability right and so much of the rest will follow."⁵ Few other concepts have so strong an influence on city livability as does walkability.

Walkability leads to vibrant public environments by creating places that people want to spend time in and live in. This is part of a positive feedback loop in which street life and more pedestrians engender numerous social, economic, and environmental benefits, which in turn beget more street activity. This has a plethora of benefits for a community, some of which will be addressed in the next section. Walkable places tend to be nicer, but they are also more efficient. The purpose of cities is to bring people and places closer together. The term "location efficiency" is used to describe places with higher density and multiple land uses in close proximity—a key feature of walkable neighborhoods. Jobs, errands, food, and entertainment are all closer to the homes of residents. When there is a mix of land uses in a compact, walkable area, people save time, money, and energy getting to and from locations. Thus, walkability has social benefits by creating better spaces for people, and economic and environmental benefits by being more efficient than car-oriented places.

1.2.a. Social Benefits

Walkability is an important factor in the social fabric of a community, individual and community health, and community safety.

Walkable neighborhoods are more socially equitable neighborhoods. Nearly everybody can walk or use a wheelchair and it costs nothing, but not everybody can easily drive. People may have personal disabilities or financial situations that either outright prevent them from driving or cause driving to be a burden and source of stress. The costs associated with car use and ownership are inflexible, while the cost of food, for example, is flexible. This means that for many low-income American families, unexpected car maintenance costs can be a major strain

5 Speck, *Walkable City*, 4.

and lead to unhealthy lifestyles due to a lack of healthy food.⁶ Walkability puts all residents on equal footing and gives lower-income residents more peace-of-mind.

Walkable spaces, in contrast to car-oriented spaces, create opportunities for increased social interaction. As the Danish urban designer Jan Gehl says, “life takes place by foot”.⁷ When getting around by car, there is little opportunity for social interaction apart from yelling at others in traffic. A walk in the city, however, is a forum for any number of social activities that take place, such as chance encounters with friends or children playing with a stranger’s dog. Possibly as a result of this, studies find that people in more walkable neighborhoods tend to have better social lives. A University of New Hampshire study found that, “[people] living in more walkable neighborhoods trusted their neighbors more; participated in community projects, clubs and volunteering more; and described television as their major form of entertainment less than survey participants living in less walkable neighborhoods.”⁸ These kinds of results are compelling, although it should be recognized that self-selection bias, where more socially outgoing people are more likely to choose walkable neighborhoods for their homes, may have affected the results.

The impact that walkability can have on individual and community health is one of the most compelling arguments in favor of walkable urban spaces given the public health trends of recent decades. The mental and physical health of many residents can be improved if their environment makes walking convenient and enjoyable, especially if it is a daily or near-daily occurrence. A number of influential studies and books have concluded in recent years that there is a strong connection between walkability and public health, because of physical activity and the reduced risk of motor vehicle accidents.

In recent years, walking 10,000 steps each day is becoming ubiquitous health advice, almost replacing the old adage, “an apple a day keeps the doctor away”. Environments that are walkable can help people meet the Surgeon General’s recommended 30 minutes of moderate physical activity per day. In doing this, people can avoid the numerous health risks associated with physical inactivity and car use—after all, cars are convenient and provide door-to-door transportation, reducing users’ need for self-mobility. The health risks people can avoid include chronic diseases like obesity, cardiovascular diseases, type II diabetes, certain cancers, anxiety, and depression.⁹ Other ailments like heat stroke can occur when people attempt to walk in urban environments that are hostile to walking. These ailments are also easily preventable with urban design that is amenable to walkability. Dr. Richard Jackson and his colleagues concluded

6 J. Harrington, S. Friel, C. Thunhurst, A. Kirby, and B. Mcelroy, “Obesogenic Island: The Financial Burden of Private Transport on Low-income Households,” *Journal of Public Health* 30, no. 1 (2008): 38-44.

7 Jan Gehl, *Cities for People* (Washington, DC: Island Press, 2010), 119.

8 Shannon Rogers, John Halstead, Kevin Gardner, and Cynthia Carlson, “Examining Walkability and Social Capital as Indicators of Quality of Life at the Municipal and Neighborhood Scales,” *Applied Research in Quality of Life* 6, no. 2 (2011): 201-13.

9 Chanam Lee and Anne Vernez Moudon, “Neighborhood Design and Physical Activity,” *Building Research & Information*, 36:5 (2008): 396.

in their book *Urban Sprawl and Public Health* that with adequate public transportation and a sufficient amount of urban trees to reduce heat-island effects, cases of heat stroke could be prevented.¹⁰ Mental stability also benefits from regular walking in place of driving. A German study concluded that an hour spent driving triples the risk of heart attack in the following hours.¹¹ When people choose to walk instead of drive, they are gaining the health benefits of walking, but they are also avoiding the health detriments associated with cars.

The built environment can also dramatically improve health by reducing the number of pedestrian injuries and fatalities due to motor vehicle collisions. Collisions are largely the byproducts of the character of the built environment. In the same book, Dr. Jackson and his colleagues found that motor vehicle-pedestrian accidents are easily preventable with a properly considered and constructed built environment. Basic pedestrian amenities like sidewalks, markings for pedestrian crossings, and good urban form that improves visibility for drivers and pedestrians decrease vehicle-pedestrian collisions.¹² If such simple things can decrease vehicle-pedestrian collisions, more dramatic improvements to the pedestrian experience could help even more.

Experienced and perceived safety is crucial for life in the city. By creating street life, walkable spaces have crime-preventative effects. Jane Jacobs describes the importance of “street watchers” and “eyes on the street” in her book *The Death and Life of Great American Cities*. She states that, “public peace... is kept primarily by an intricate, almost unconscious, network of voluntary controls and standards among the people themselves, and enforced by the people themselves.”¹³ As a simplification, more people in an area means more casual enforcement, and an increase in real and perceived safety.

1.2.b. Economic Benefits

Given that a destination is within reasonable walking distance, walking is the most economical means of transportation. Walking costs nothing and the use of public transportation—which may be a part of a commute partially done by walking—comes with minimal costs. In contrast, there are many costs associated with driving, such as the costs of the car itself, insurance costs, repair costs, and parking fees. Driving can cost people a significant amount of their total income. US households in what the US Department of Transportation considers auto-dependent locations spend 25% of their annual income on transportation. On the other hand, American families living in “location efficient environments” spend 9%

10 Jeff Speck, “Our Ailing Communities: Q&A: Richard Jackson,” *Metropolismag.com*, October 11, 2006, <http://www.metropolismag.com/October-2006/Our-Ailing-Communities>.

11 Jeff Mapes, *Pedaling Revolution: How Cyclists Are Changing American Cities* (Corvallis, OR: Oregon State University Press, 2009), 239.

12 Jeff Speck, “Our Ailing Communities: Q&A: Richard Jackson,” *Metropolismag.com*, October 11, 2006, <http://www.metropolismag.com/October-2006/Our-Ailing-Communities>.

13 Jane Jacobs, *The Death and Life of Great American Cities* (New York, NY: Random House, 1961), 32.

of their household income on transportation.¹⁴ This difference in transportation spending is associated with families making fewer or shorter car trips and walking, bicycling, and using public transportation.¹⁵ Living in a walkable area and walking or taking transit instead of owning a vehicle and driving could save the average American more than \$10,000 per year. In practice, the results of walkable neighborhoods will certainly be less dramatic, given that people will likely choose to own cars almost regardless of how often they use them. Portland, Oregon gives an idea of the economic impacts of driving less. In *How Walkability Raises Home Values in U.S. Cities*, Joe Cortright says that Portland's vehicle miles traveled per person has been in decline since 1996, resulting in Portland residents driving on average 20% less than people in other metropolitan areas.¹⁶ According to Cortright, this 20% reduction adds up to \$1.1 billion in savings every year for Portland residents. On top of this already huge sum of money, the time saved from spending less time in traffic is calculated to be worth an additional \$1.5 billion.¹⁷

Being able to keep this money and use it on things other than transportation is great for residents, but it is also great for the local economy. In the case of Portland, most of that \$2.6 billion would be going to car manufacturing companies and transnational oil companies if Portland residents drove more—and walked less—since 84% of the cost of owning a car leaves the local economy.¹⁸ Instead, Portland residents could spend the money they saved at local establishments like shops and restaurants. The money saved due to walkability and driving less is much more likely to directly benefit the local economy than the costs associated with driving.

1.2.c. Environmental Benefits

Pedestrian travel uses the fewest resources and has the least adverse effects on the environment out of all forms of transport. There are local and global environmental benefits to be gained by creating walkable places and driving less.

Car use is the single greatest contributor to our total carbon output.¹⁹ Efforts to reduce energy use like driving hybrid cars or building “green” homes are worthwhile, but their impacts pale in comparison to the effectiveness of walkability. A recent EPA study concluded that even

14 US Department of Transportation, Federal Highway Administration. “Transportation and Housing Costs.” Last modified January 3, 2014. http://www.fhwa.dot.gov/livability/fact_sheets/transandhousing.cfm.

15 Chuck Kooshian and Steve Winkelman, “Growing Wealthier: Smart Growth, Climate Change and Prosperity,” *Center for Clean Air Policy*, January, 2011.

16 Cortright, Joe, “How Walkability Raises Home Values in U.S. Cities,” *CEOs for Cities White Paper*, August, 2009, <http://community-wealth.org/content/walking-walk-how-walkability-raises-home-values-us-cities>.

17 Cortright, Joe, “How Walkability Raises Home Values in U.S. Cities,” *CEOs for Cities White Paper*, August, 2009, <http://community-wealth.org/content/walking-walk-how-walkability-raises-home-values-us-cities>.

18 Piedmont-Palladino, Susan. “The Space-Time-Money Continuum.” *National Building Museum*. 2011. Accessed July 10, 2015. <http://www.nbm.org/about-us/national-building-museum-online/june-6-intelligent-cities-forum.html>.

19 Speck, *Walkable City*, 52.

the most “green” home in a sprawling location is less energy efficient than the least “green” home in a walkable neighborhood.²⁰ The simple reason for this is that location efficient, or walkable, areas allow residents to drive less.

It is not just emissions from car use that walkability helps to reduce. The actual carbon footprint that is the result of our car dependency includes,

emissions from the construction of the vehicles; the embodied energy of streets, bridges and other infrastructure; the operation and repair of this infrastructure; the maintenance and repair of the vehicles; the energy of refining fuel; and the energy of transporting it, together with the pipes, trucks and other infrastructure that is required to do so.²¹

These add another 50% more pollution than car emissions alone. Everybody understands that by reducing our reliance on cars, we consume less energy (i.e. gas, etc.) and help to improve the environment, but reducing our reliance on cars also has the long-term effect of reducing the need for the construction and maintenance of much of our car-related infrastructure.

People likely appreciate being environmentally friendly more as a bonus rather than a major reason for adjusting their behavior and creating and living in walkable neighborhoods, yet walkability has a strong connection to the local environment. Local air quality and noise pollution can be improved with increased walkability. Air pollution largely caused by car use is on the rise in the US as indicated by the rising rate of asthma cases.^{22,23} Residents of the five US cities with the highest rates of asthma drive 27% farther each day than residents of the five cities with the lowest asthma rates.²⁴ These facts support the intuitive notion that reducing car use in a neighborhood will improve local air quality. Cars are also the leading cause of noise pollution in cities. A study measured and compared decibel levels on a pedestrian-only main street in Venice and an ordinary street with vehicle traffic in Copenhagen and found that the background noise of the street with vehicle traffic was roughly three to ten times louder than that of the pedestrian street.²⁵ Walkable spaces with fewer or no cars make for much more pleasant environments as interpreted by one’s nose and ears.

Infrastructure for cars, like streets, is far less efficient than infrastructure for walking or bicycling. These non-motorized modes of transportation do not consume city space and crowd out other uses like large streets do. Two 11.5 foot wide sidewalks or a pedestrian street 23 feet wide have the capacity to move 20,000 people per hour. Two six foot wide bicycle paths accommodate 10,000 bicycles per hour. A two-lane, two-way street that is roughly 26 feet wide

20 Jonathan Rose Companies, “Location Efficiency and Housing Type: Boiling it Down to BTUs,” Environmental Protection Agency, March, 2011.

21 Michael Mehaffy, “The Urban Dimensions of Climate Change,” *Planetizen*, November 30, 2009, accessed August 3, 2015. <http://www.planetizen.com/node/41801>.

22 Speck, *Walkable City*, 44.

23 Thomas Gotschi and Kevin Mills, “Active Transportation for America: The Case for Increased Federal Investment in Bicycling and Walking,” *railstotrails.org*, October 20, 2008, <https://www.railstotrails.org/resourcehandler.ashx?id=2948>.

24 Speck, *Walkable City*, 44.

25 Gehl, *Cities for People*, 153.

can only take up to 2,000 cars per hour. The situation is the same for parking. Pedestrians require no “parking”, and ten bicycles can fit in the same amount of space as a single car.²⁶ These figures illustrate the point that building spaces for pedestrian and bicycle traffic before car traffic saves city space. All of the space saved by not building disproportionately large streets could be used for more valuable things like public green spaces or commercial uses, making communities more attractive and more economically robust.

The classification of the numerous benefits of walkability into the three categories of social, economic, and environmental benefits helps to more easily grasp the concepts, but it is also somewhat arbitrary. In reality, all of the stated benefits of walkability have positive effects in many potential categories, mentioned or not in this thesis. For example, the reduction of crime that tends to come with walkable spaces has been listed as a social benefit, but it also has positive effects on a neighborhood’s economy, since businesses are more able to thrive when their patrons feel safe. Likewise, the outwardly environmental issue of noise pollution also has significance for a neighborhood’s social character. When there is less background noise caused by car traffic, people are more likely to meet and hold conversations in public places. Over the long term, the health benefits of walkability also become economic benefits. A portion of the money saved by the general population due to improved health will go into the local economy. The benefits of walkability may stretch farther than they appear to on the surface.

Now that we have addressed the general concept of walkability and stressed its vast benefits to the community, let us examine the City of Bellevue, Washington and apply the concept to the city’s downtown neighborhood.

1.3 About this project

Bellevue, Washington has grown tremendously in every aspect over the past several decades. Downtown Bellevue specifically has become a major center for employment and entertainment for the region. Forecasts show the neighborhood’s population and number of jobs growing for the foreseeable future. However, downtown Bellevue was built for the car and its current paradigm is not sustainable; its car-centrism is not amenable to future growth. Walking and bicycling are typically only tolerable experiences in the neighborhood. Downtown Bellevue can avoid pitfalls and reap many benefits by improving its walkability.

This thesis applies the urban design principles of walkability to the core of downtown Bellevue. The goal of this thesis is to offer a recommendation in the form of a design for creating a downtown core that is ideal for walking, and thereby promotes the wellbeing of residents and the growth of the Bellevue economy. Arriving at a design for a walkable downtown core involved examining the current experience of non-motorized transportation in the area, considering the current and future conditions and people of the area—residents and visitors alike, and considering the goals of city and regional plans for the area. After developing an understanding

26 Gehl, *Cities for People*, 105.

of these factors, goals were established and the design process began.

1.4 The need for this project

At this point in time, downtown Bellevue stands at a threshold. There are major opposing trends and future developments facing the neighborhood that will need to be reconciled, lest the city lose its reputation as a successful powerhouse. Meeting many of the City of Bellevue's goals for downtown as laid out in city plans can be accomplished while tackling the problems current trends present.

Creating a more walkable Bellevue is also creating a more livable and sustainable Bellevue. Livability is connected to the realm of transportation, and specifically transportation choices. Former US Secretary of Transportation Ray LaHood said of livability, "Livability means being able to take your kids to school, go to work, see a doctor, drop by the grocery or Post Office, go out to dinner and a movie, and play with your kids at the park—all without having to get in your car."²⁷ Transportation infrastructure, housing, and commercial development must be coordinated to provide people with choices for how to get from one location to another, and the more efficient and affordable these choices are, the more they will engender a livable environment.

Population and job growth in downtown Bellevue is perhaps the neighborhood's most pressing issue today. In 2010, downtown Bellevue had almost 10,000 residents and about 50,000 jobs.²⁸ By 2030, projections estimate that there will be 19,000 residents and nearly 80,000 jobs in the area. This will result in a daytime population of 100,000, compared with the 2010 daytime population of 68,000. This is an increase in resident population of essentially 100% and an increase in jobs and daytime population of over 50% each.

Even with the use of a transportation demand management program, the City already has difficulty managing traffic downtown. Downtown Bellevue alone is expected to have ten intersections with failing levels of service by 2030. This means there will be more cars producing more pollution and noise and acting as potential threats to pedestrian safety in 2030. These are reasons enough to create pleasant, safe paths for people to walk and bike along in downtown. But we do not need to wait until 2030 before we start seeing the negative impacts of traffic congestion in the area. In 2011, the reliability and speed of transit service was already being negatively affected along streets like Bellevue Way and N.E. 8th St., according to Sound Transit.²⁹ Creating a more walkable environment downtown would encourage people to live and work downtown and encourage others to take transit more often. It would also help to avoid car-pedestrian collisions in the area because of improved pedestrian safety measures. The time to

27 US DOT. Ray LaHood. <http://www.dot.gov/livability>

28 City of Bellevue, *Major Drivers — Long Range Capital and Operating*, (Bellevue, WA, 2007), 2-5, <http://www.bellevuewa.gov/pdf/City%20Council/PackageExtendedStudySession6-18-072a3.pdf>.

29 Sound Transit, *Purpose and Need for East Link Project*, (Seattle, WA, 2011), 1-6, http://www.soundtransit.org/Documents/pdf/projects/eastlink/EIS_2011/02_Chapter1_PurposeAndNeed.pdf.

build a walkable downtown Bellevue is now, before these trends take a toll on the efficiency and reputation of the area.

Sound Transit, the Puget Sound regional transit authority, has begun construction preparatory work for the East Link Extension, a light rail line running from Seattle to Redmond with stops in and around downtown Bellevue.

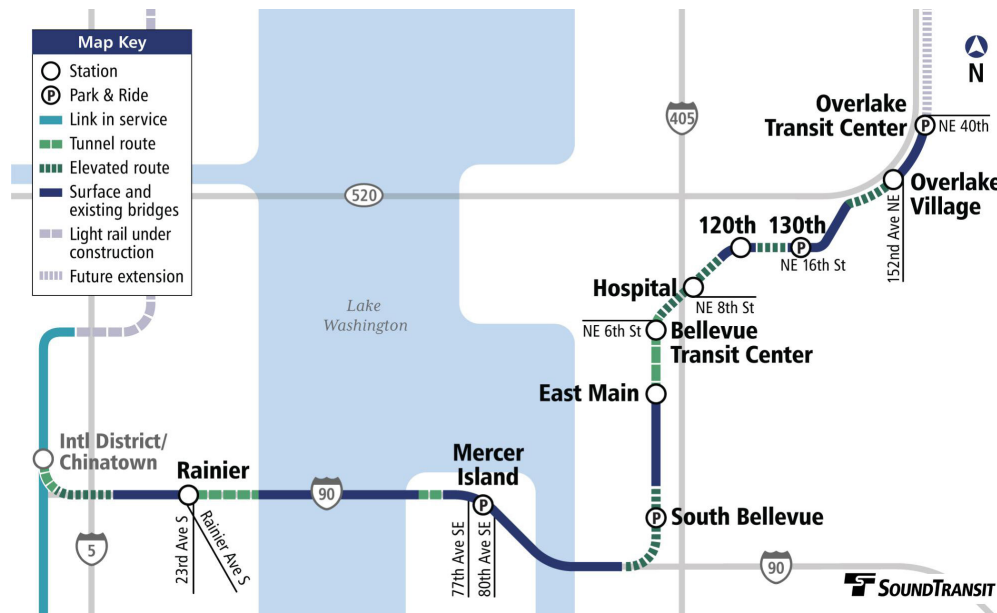


Figure 1.1. Map of East Link light rail extension. Source: Sound Transit.

The Bellevue Downtown Station, located just north of Bellevue City Hall, is expected to see 6,500 daily riders by 2030.³⁰ These transit users will need an enjoyable and safe way to get to their ultimate destinations from the light rail station, which will be discussed in greater detail later. A pleasant walk or bicycle ride to and from the station would encourage more transit users and reduce the number of cars in the area while promoting a positive image of downtown Bellevue. Walkability plays a supporting role in the effectiveness of public transportation. This is an important way in which walkability has an indirect positive impact on the health of the environment. The attractiveness of public transport systems is improved when users feel that walking to and from their buses or trains is safe and convenient.³¹

30

31 Jan Gehl, *Cities for People* (Washington, DC: Island Press, 2010), 7.

Downtown Subarea Plan explains the Great Place Strategy for the area:

To remain competitive in the next generation, Downtown Bellevue must be viable, livable, memorable, and accessible. It must become the symbolic as well as functional heart of the Eastside Region through the continued location of cultural, entertainment, residential, and regional uses located in distinct, mixed-use neighborhoods connected by a variety of unique public places and great public infrastructure.³³

A properly developed walkable space can easily accomplish every one of the Great Place goals. Moreover, the City has been working to reduce the number of people driving—by reducing the proportion of single-occupancy vehicles—in the downtown area since 2005 through its transportation demand management projects.³⁴ A walkable downtown core will be more livable due to having fewer of the negative effects of cars and having a concentration of destinations for activities like shopping and eating. It will be a memorable center for the region.

The dramatic future growth of the area and meeting the goals of city plans is more than sufficient justification for the value of the topic of this thesis, but there is a final, most crucial reason. The people of Bellevue want walkability. At the end of 2014, the City of Bellevue conducted a survey of Bellevue residents, workers, students, employers, and property managers asking questions about modes of transportation and the reasons respondents chose them. When asked why they chose to drive alone for their commutes, all of the most common responses were related to the convenience of using a personal vehicle (see Figure 1.3.).³⁵

33 City of Bellevue Department Planning and Community Development, *Downtown Bellevue Subarea Plan*, (Bellevue, WA, 2010), 79, http://www.ci.bellevue.wa.us/pdf/PCD/SP04.DowntownPlan_03.pdf.

34 City of Bellevue, *Transportation Demand Management Plan 2015-2023: Preliminary Draft*, (Bellevue, WA, 2015), 86, https://www.bellevuewa.gov/pdf/Transportation/Small2BellevueTDMPlanPublicReviewDraft_rev080315_KJ_4.pdf.

35 City of Bellevue, *Transportation Demand Management Plan 2015-2023: Preliminary Draft*, (Bellevue, WA, 2015), 29, https://www.bellevuewa.gov/pdf/Transportation/Small2BellevueTDMPlanPublicReviewDraft_rev080315_KJ_4.pdf.

Q: What are your reasons for driving alone for commuting to work or school? (Choose up to 5.)

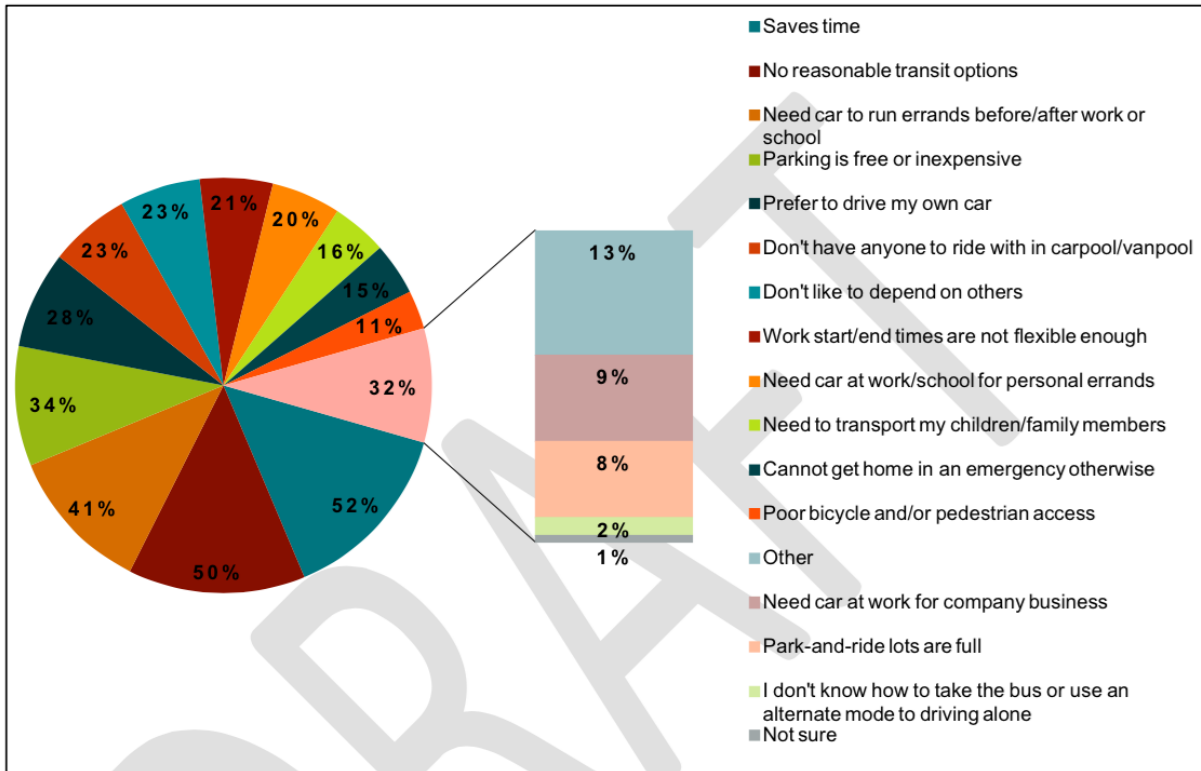


Figure 1.3. Responses of Bellevue people regarding the reasons for their mode of commute. Source: City of Bellevue.

People in Bellevue really want convenience in their commute, and those who drive do so because it provides the most convenience for them in the current transportation paradigm. Just 45% of downtown Bellevue workers and residents drive alone for their commute, considerably lower than the national average of 76%.^{36,37} Moreover, only 23% of Bellevue workers and residents who drive alone would not use other modes of transportation. In theory, only 10% of future workers and residents of downtown Bellevue would still choose to drive alone to work in an environment conducive to walking and taking public transportation.³⁸

³⁶ Choose Your Way Bellevue, *Survey of Downtown Commuters & Residents*, (Bellevue, WA, 2011), 11.

³⁷ Brian McKenzie, *Who Drives to Work? Commuting by Automobile in the United States: 2013*, United States Census Bureau, August, 2015, <http://www.census.gov/hhes/commuting/files/2014/acs-32.pdf>.

³⁸ That survey was of all Bellevue residents. Downtown residents are younger than other Bellevue residents on average and the downtown population will continue to become younger in the near future (City of Bellevue, *Downtown Livability Initiative CAC Final Report*, 4). Young people are especially receptive to alternative (to driving alone) modes of transportation (Jeff Speck, *Walkable City*, 17), meaning that perhaps even more than 90% of downtown workers and residents would choose to walk or use other alternative modes of transportation.

Part 2 - Downtown Bellevue

A holistic understanding of downtown Bellevue is just as important for making design recommendations as an understanding of the current pedestrian experience. The area's history, role in the region, land use and transportation patterns, people, and future changes all need to be considered as part of the design process. Oversight of any one of these things could result in the failure of an otherwise successful design.

2.1 History of Downtown Bellevue

The area that is now downtown Bellevue was first settled by European-Americans who travelled across Lake Washington from Seattle in 1869. Bellevue's fertile soil and abundance of land soon supported a strong community centered around agriculture.¹ Much of what is now downtown Bellevue consisted of large farms and strawberry fields, which would later influence the area's street grid and large blocks (see Figure 2.1.). Until the construction of the Lake Washington bridges, the area now known as Old Bellevue was the center of activity. Main Street in Old Bellevue in particular featured an eclectic collection of independent businesses and civic buildings like the Main Street School.²

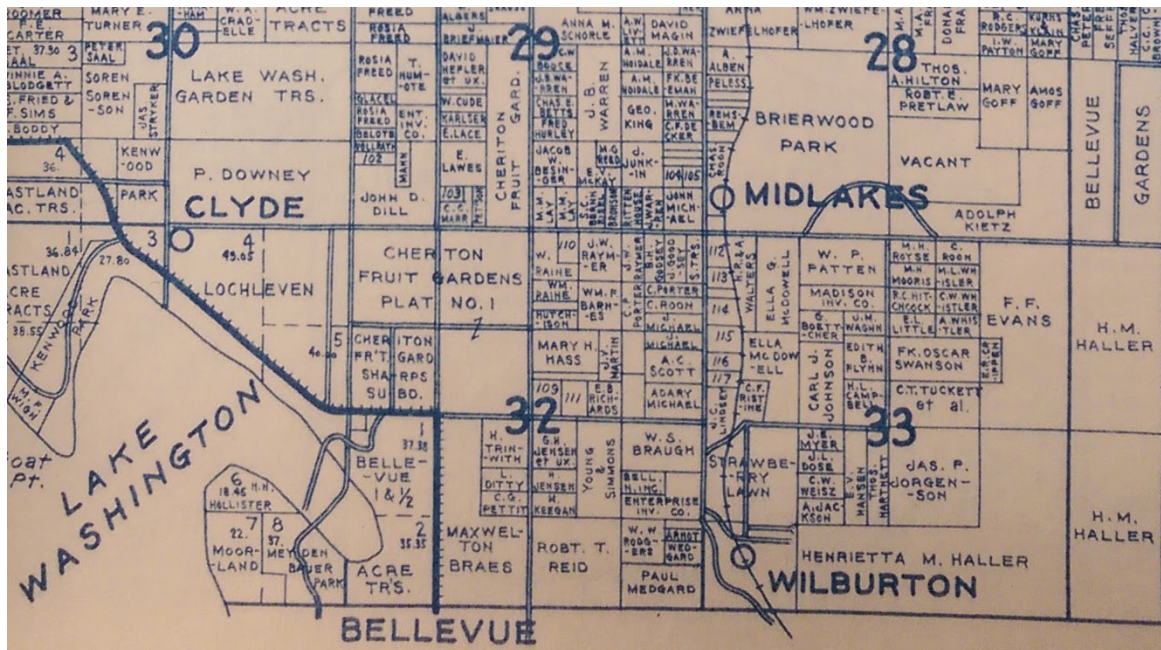


Figure 2.1. Map from 1926 showing large parcels and names of farm properties in and around what is today downtown Bellevue. Source: Metsker Atlas.

1 Lucile Saunders McDonald, *Bellevue, Its First 100 Years* (Renton, WA: Partners West Publishing, 1984), 44.

2 Eastside Heritage Center, "Early Bellevue Walking Tour," October, 2013, 19, <http://www.eastsideheritagecenter.org/pdf/EH-WalkingTourBrochure-WEB.pdf>.

The Lake Washington Floating Bridge was completed in 1940 and connected Seattle to Mercer Island, which was already linked with Bellevue via the East Channel Bridge. This connection led to drastically reduced commute times between Bellevue and Seattle.³ The trend of suburbanization swept the nation soon after and the area capitalized on its new “close, but not too close” location in relation to Seattle. It enticed new residents with a car-dominated way of living that featured large streets, large parcels, and plenty of parking (see Figure 2.2.).

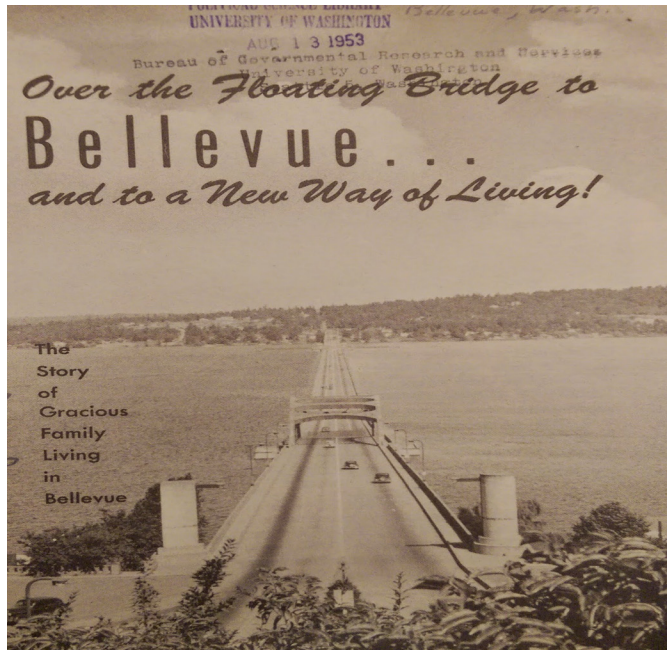


Figure 2.2. Cover of a Bellevue Chamber of Commerce brochure. Bellevue came to its own during the age of the automobile, meaning the city was shaped around the car. Source: Bellevue Chamber of Commerce.

The City of Bellevue was incorporated in 1953 with 5,950 residents.⁴ A decade later in 1963, the Evergreen Point floating bridge carrying State Route 520 was completed.⁵ This further connected Bellevue to Seattle and resulted in major growth, city planning, and development in the 1960s, an era when the private vehicle was heavily favored in urban planning practice, often without any consideration for pedestrians.⁶ The unfortunate timing of this major growth period meant that the area’s car-centric development patterns were heavily perpetuated and solidified.

In the 1980s and 1990s downtown Bellevue saw dramatic growth. High-rise buildings for

³ Megan Martha Carlisle, “Bellevue: A new city with a rich history,” June 20, 2012, accessed Aug 03, 2015, <http://www.webcitation.org/68YoBEelr>.

⁴ City of Bellevue, *Comprehensive Plan: Introduction & Vision*, (Bellevue, WA, 2015), 21, http://www.ci.bellevue.wa.us/pdf/PCD/01_Intro_and_Vision_FINAL_20150727.pdf.

⁵ Washington State Department of Transportation, “SR 520 - Floating Bridge Facts,” 2015, accessed May 11, 2015, <http://www.wsdot.wa.gov/Projects/SR520Bridge/About/BridgeFacts.htm>.

⁶ Feet First, *Downtown Bellevue Walking Audit Report*, January, 2012, 8, http://www.ci.bellevue.wa.us/pdf/Transportation/Bellevue_Walk_Audit_Report_Final_2_7_2012.pdf.

commerce and civic projects were being built and Bellevue Square Mall—built in the 1940s—was expanding. The growth of this period led to the street network hindering vehicle circulation because of increased demand.⁷ Growth has continued over the last several decades, and downtown Bellevue has become home to some of Washington State’s largest and fastest-growing companies.⁸

2.2 Downtown Bellevue’s Regional Role, the Edge City

“Downtown Bellevue is a large and growing district that is a nationally recognized example of a suburban activity center maturing into a metropolitan growth center.”⁹

Today Bellevue is no longer a suburb, but an edge city whose downtown is the major employment center and shopping and entertainment destination for Seattle’s Eastside. In his seminal work, *Edge City: Life on the New Frontier*, Joel Garreau defines edge cities as cities that have 5 million square feet or more of leasable office space, have 600,000 square feet or more of leasable retail space, have more jobs than residents, are perceived by the population as one unified place, and were not generally considered cities before the 1960s.¹⁰ Downtown Bellevue is mainly responsible for this status. Downtown Bellevue has 84 buildings with office space, accounting for more than 9 million square feet of leasable office space.¹¹ Downtown also has 4.5 million square feet of retail and entertainment space, and more jobs than residents.¹²

Downtown Bellevue has had major success in its leading role, as evidenced by the fact that downtown Bellevue is the most difficult place in the country to find class A office space, according to real estate company Jones Lang LaSalle. Downtown Bellevue’s vacancy rate for class A office space is 3.9 percent, the lowest in the country.¹³ Downtown Bellevue’s 9 million square feet of office space is tightly concentrated within a radius of about half of a mile and makes up nearly 60% of the city’s total office space.¹⁴ The remaining office space in the city is dispersed, leaving downtown as the single major concentration. Rents for office space were also 9.2 percent higher in 2014 than a year before—an increase in rent that was second only

7 City of Bellevue, *Final Report on the Downtown Plan Update*, (Bellevue, WA, 2003), 1-1, https://www.bellevuewa.gov/pdf/PCD/Downtown_Plan.pdf.

8 City of Bellevue, “City Profile - Commerce,” accessed August 2, 2015, <http://www.ci.bellevue.wa.us/commerce.htm>.

9 PSRC. Bellevue Downtown. 2013 Regional Centers Monitoring Report. <http://www.psrc.org/assets/266/rgc-profile-Bellevue.pdf>

10 Joel Garreau, *Edge City: Life on the New Frontier* (New York, NY: Anchor Books, 1992), 51.

11 CoStar

12 Bellevue Downtown Association, “About Downtown Bellevue,” accessed August 2, 2015, <http://www.bellevuedowntown.org/downtown>.

13 Marc Stiles. “Bellevue’s office market is the tightest in the country”. Puget Sound Business Journal. Mar 17, 2014 <http://www.bizjournals.com/seattle/blog/2014/03/bellevue-s-office-market-is-the-tightest-in-the.html>

14 CoStar

to San Francisco's.¹⁵ Downtown Bellevue has momentum, so it will be important for the city to continue making downtown Bellevue a place that is as attractive as possible for future residents, successful companies, and their employees.

2.3 Organization, Land Use, and Transportation

Officially, downtown Bellevue is a “subarea”—essentially a neighborhood—of the city. There are plans and policies that apply specifically to the downtown subarea. The Downtown subarea itself can be broken down further into nine districts, the borders of which are clearly bounded by major arterial streets (see Figure 2.3.).

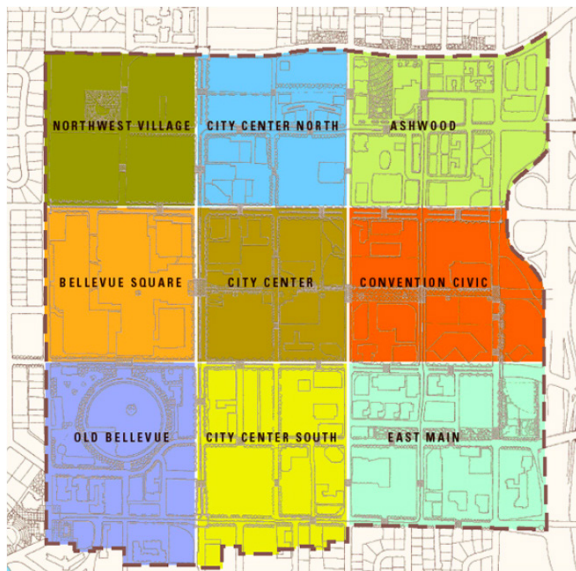


Figure 2.3. The districts of the Downtown subarea. Source: City of Bellevue Downtown Subarea Plan.

The three central east-to-west districts together are collectively known as the Eastside Center District (see Figure 2.4.). This larger district has arguably the most well-defined identity of all downtown districts and the City considers it the “symbolic and functional center” of the Eastside.¹⁶ To limit the scope of this thesis, the boundaries of the Eastside Center District will act as the design intervention area, given the significance and density of attractions of the district.

15 Marc Stiles. “Bellevue’s office market is the tightest in the country”. Puget Sound Business Journal. Mar 17, 2014 <http://www.bizjournals.com/seattle/blog/2014/03/bellevue-s-office-market-is-the-tightest-in-the.html>

16 City of Bellevue, *Downtown Subarea Plan*, 94.

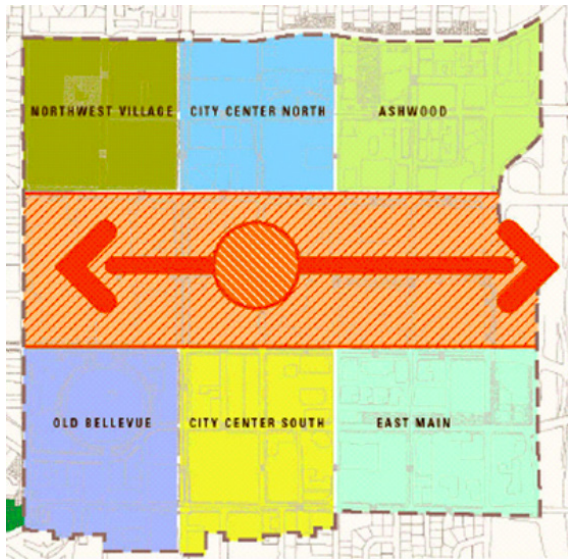


Figure 2.4. The Eastside Center District along with the other downtown districts. Source: City of Bellevue Downtown Subarea Plan.

The Eastside Center has the highest concentrations of employment and population (see Figure 2.5.) and the Downtown Subarea Plan states that, “the Eastside Center is within walking distance to all of Downtown’s key features.”^{17, 18} The plan identifies these features as the Bellevue Collection (made up of Bellevue Square, Lincoln Square, and Bellevue Place), the King County Regional Library, Ashwood Park, the Bravern, City Center Plaza, Downtown Park, and Old Main Street (see Figure 2.6.).

17 City of Bellevue, “2010 Employment and Population Totals by TAZ.”

18 City of Bellevue, *Downtown Subarea Plan*, 97.

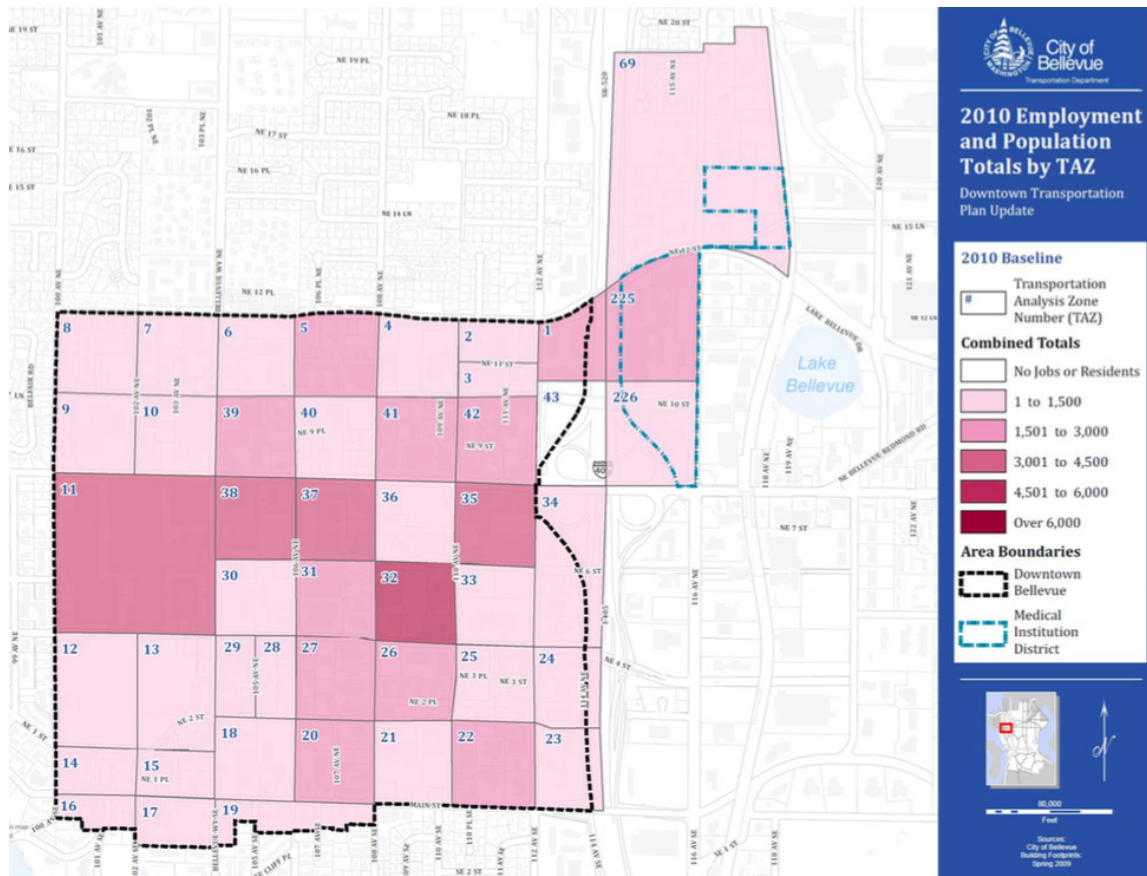


Figure 2.5. Employment and population totals in given divisions of downtown Bellevue. Source: City of Bellevue.



Figure 2.6. Key features of downtown Bellevue as identified by city plans, indicated by green markers. Source: author.

While car use and parking is distributed throughout downtown, transit use—the second most common mode of transportation, accounting for 21% of commutes for residents and employees—is concentrated around the Bellevue Transit Center (see Figure 2.7.). Although the transit center is in the Eastside Center District, it is still almost half of a mile or more from many of downtown Bellevue’s major attractions. The future downtown Bellevue light rail station will be located to the east of the transit center, even farther from downtown attractions. Many studies have been done on maximum and average walking distances for the general public.^{19,20} Most research suggests that practical walking distances should be at most a half-mile, or even just a quarter-mile. Many organizations and government departments suggest that distances up to a half-mile are reasonable, with some using a quarter-mile as an upper limit for what is reasonable.²¹ This means that for people arriving in downtown via the future Bellevue Downtown Station, many destinations will be at or beyond the upper limit for walking distances. It is impractical to relocate both the transit center and the future light rail station so that transit riders have more convenient access to their destinations, but a more walkable downtown can be created to encourage transit use and make transit users’ walks more pleasant.

19 U.S. Department of Transportation National Highway Traffic Safety Administration and the Bureau of Transportation Statistics, *National Survey of Pedestrian and Bicyclist Attitudes and Behaviors*, (2002), <http://www.nhtsa.gov/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/810971.pdf>

20 California Department of Transportation, *BART’s First Five Years; Transportation and Travel Impacts*, (1979), DOT-P-30-79-8.

21 The Trust for Public Land, “Why a ten-minute walk?,” accessed May 19, 2015, <https://www.tpl.org/why-ten-minute-walk>.

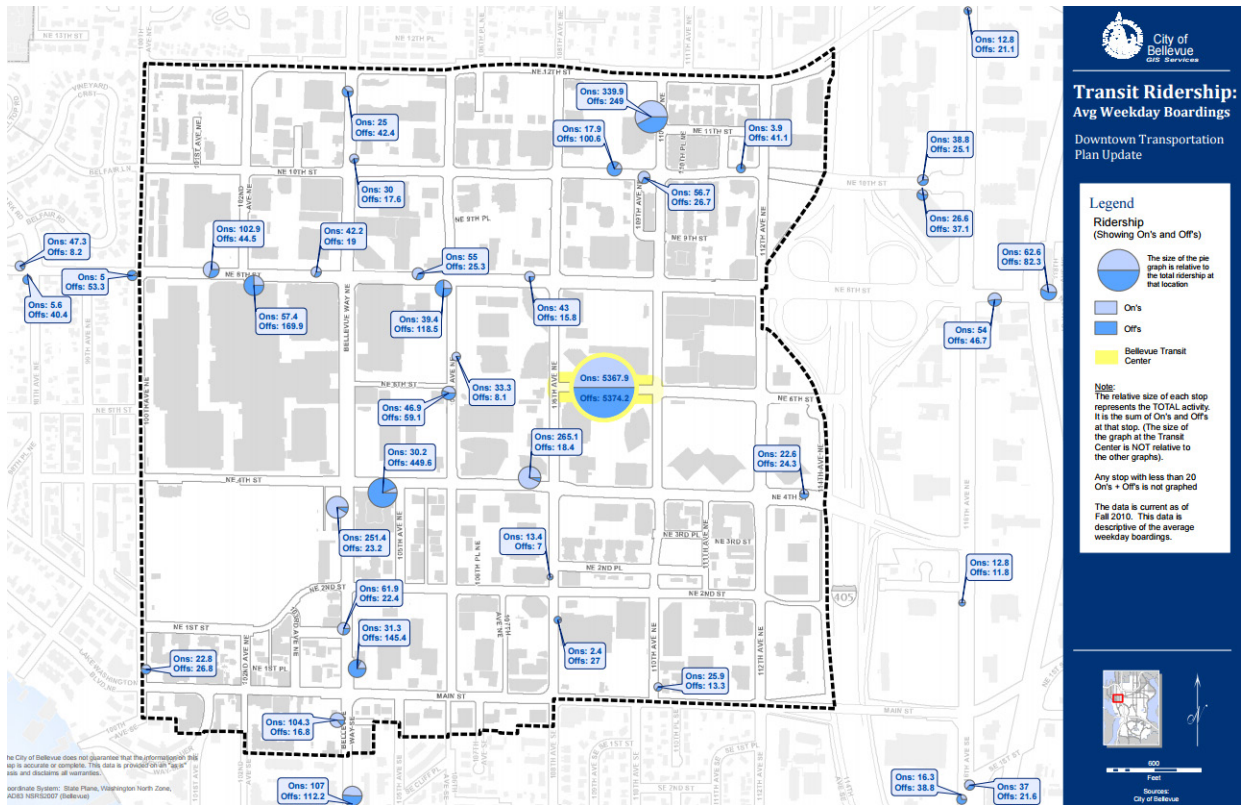


Figure 2.7. Transit ridership map showing the largest concentration of trip beginnings and ends occur at the Bellevue Transit Center. Source: City of Bellevue Downtown Transportation Plan Update.

Downtown Bellevue and the Eastside Center District will see major changes in the near future. The area is experiencing another building boom and a number of new commercial and residential buildings and towers will be built over the next decade or so. Some of these developments will likely become new cornerstones of the subarea, like the expansion to the already successful Lincoln Square, and some are infill projects that will replace old, small suburban-typology buildings and surface parking lots with office towers, like Bellevue Center and Rockefeller Bellevue Tower. These developments are what will accommodate downtown Bellevue’s rapidly increasing population and job capacity. Along with investments in the right infrastructure, they will help to improve walkability in the area and reduce car dependence.

The single most impactful change to downtown Bellevue for the near future may be the development of the East Link light rail transit line. As previously mentioned, the East Link line will stretch from Seattle and Mercer Island to Redmond’s Overlake area, and feature a downtown Bellevue station located just north of Bellevue City Hall in the Eastside Center District. Bellevue Downtown Station is expected to open along with the rest of East Link in 2023. Downtown Bellevue should see an increase in transit ridership after the opening of East Link.

In 2010, downtown Bellevue had a little more than 14,000 daily transit riders.²² Sound Transit, the regional transit authority, estimates that by 2030 Bellevue Downtown Station alone will accommodate 6,500 riders per day. This figure shows that people are willing to change their transportation habits if doing so is convenient. It includes many future riders who may currently drive alone to work, but does also include some riders who previously used a bus.

The future residents, employees, and new transit riders in downtown Bellevue will benefit from appealing pedestrian infrastructure. Their use of pedestrian infrastructure will also beget more pedestrians and transit riders.

2.4 Demographics

Today, downtown Bellevue has a little over 10,000 residents and a daytime population of about 70,000.²³ This is a small proportion of Bellevue's total population of just over 130,000 people, but most of the city's growth in the near future will be concentrated in the downtown.²⁴ While quite sparsely populated by North American downtown standards, downtown Bellevue is the city's densest neighborhood with 3,812 people per square mile in 2010.²⁵

Downtown Bellevue has recently been attracting younger and more diverse residents. Downtown Bellevue saw a 335% increase in its population under 18 years of age between 2000 and 2010.²⁶ The neighborhood also has a high proportion of foreign-born residents. Thirty-six percent of downtown residents were born in another country.²⁷ It is likely that the majority of these foreign-born residents originally come from Asian countries, because in downtown households that speak a language other than English at home, 54% speak an Asian language.²⁸ Residents of the neighborhood are highly educated. About 60% of downtown residents aged 25 and older possessed a bachelor's degree or higher in 2010.²⁹ Just 2% of residents aged 25 and older do not have a high school diploma.

The transportation habits of downtown residents and employees are particularly relevant to this thesis. Choose Your Way Bellevue conducted a survey of downtown residents

22 City of Bellevue Department of Transportation, *Transit Market*, (Bellevue, WA, 2010), p. 1, http://www.ci.bellevue.wa.us/pdf/Transportation/DTP_Transit_Market_and_Ridership.pdf.

23 City of Bellevue, *Major Drivers — Long Range Capital and Operating*, (Bellevue, WA, 2007), 2-5, <http://www.bellevuewa.gov/pdf/City%20Council/PackageExtendedStudySession6-18-072a3.pdf>.

24 City of Bellevue, "City Profile," accessed June 28, 2015, <http://bellevuewa.gov/profile-intro.htm>.

25 City of Bellevue, *Neighborhood Demographic Profiles*, (Bellevue, WA), 3, http://www.ci.bellevue.wa.us/pdf/PCD/Neighborhood_Demographic_Profiles.pdf.

26 City of Bellevue, *Neighborhood Demographic Profiles*, (Bellevue, WA), 3, http://www.ci.bellevue.wa.us/pdf/PCD/Neighborhood_Demographic_Profiles.pdf.

27 City of Bellevue, *Neighborhood Demographic Profiles*, (Bellevue, WA), 9, http://www.ci.bellevue.wa.us/pdf/PCD/Neighborhood_Demographic_Profiles.pdf.

28 City of Bellevue, *Neighborhood Demographic Profiles*, (Bellevue, WA), 10, http://www.ci.bellevue.wa.us/pdf/PCD/Neighborhood_Demographic_Profiles.pdf.

29 City of Bellevue, *Neighborhood Demographic Profiles*, (Bellevue, WA), 15, http://www.ci.bellevue.wa.us/pdf/PCD/Neighborhood_Demographic_Profiles.pdf.

that commute to other locations (37% of respondents), commuters to downtown (61% of respondents), and people who lived and worked in downtown (2% of respondents).³⁰ As stated earlier in this thesis, the survey indicated that only 45% of downtown Bellevue workers and residents drive alone for their commute. Twenty-one percent of respondents ride a bus for their commute and 10% carpool. These numbers out of context may not seem to suggest the success of future pedestrian-oriented infrastructure, but downtown workers and residents utilize alternative modes of transportation to driving alone far more than national averages.

In the near future, the population of downtown will continue to grow significantly. It is estimated that over the next 20 years, 75% of Bellevue's population and employment growth will occur in downtown.³¹ This means there will be about 19,000 residents in the neighborhood by 2030.³² Moreover, while downtown residents are already younger than other Bellevue residents on average, this distinction will only become more pronounced.³³ This trend holds promise for the development of pedestrian-centric infrastructure because young people are especially receptive to alternative modes of transportation.³⁴

2.5 The Issues: Walking in Downtown Bellevue

“Generally speaking, the cities with the smallest blocks are the ones best known for walkability, while those with the largest blocks are known as places without street life—if they are known at all.”³⁵

The walking experience of downtown Bellevue varies greatly, but walking is often unappealing. In rare cases, pedestrians have a safe and relatively interesting environment in which to walk (see Figure 2.8.), but some streets still feature sidewalks that are narrow, put pedestrians against ugly parking lots, dull walls, or a combination of these traits (see Figure 2.9.).

30 Choose Your Way Bellevue. *Survey of Downtown Commuters & Residents*. Bellevue, WA, 2011.

31 Bellevue Downtown Association, “About Downtown Bellevue,” accessed August 2, 2015, <http://www.bellevuedowntown.org/downtown>.

32 City of Bellevue, *Major Drivers — Long Range Capital and Operating*, (Bellevue, WA, 2007), 2-5, <http://www.bellevuewa.gov/pdf/City%20Council/PacketExtendedStudySession6-18-072a3.pdf>.

33 City of Bellevue, *Downtown Livability Initiative CAC Final Report*, 4.

34 Jeff Speck, *Walkable City* (New York, N.Y.: Farrar, Straus and Giroux, 2012), 17.

35 Speck, *Walkable City*, 164.



Figure 2.8. Sidewalks along a small portion of Bellevue Way feature cover and some greenery. Source: author.



Figure 2.9. A narrow and unpleasant sidewalk environment along 106th Ave NE. Source: author.

Downtown Bellevue is, for the most part, comprised of 600-foot long superblocks, referred to as such because they are about twice as long as a typical block length in a North American downtown setting.³⁶ These superblocks are one of the major issues with the downtown Bellevue walking experience. Moreover, they are the cause of other major issues like the area's harrowing streets, scarcity of public open space, and lack of pedestrian-oriented businesses.

The long block lengths of superblocks mean that pedestrians have fewer choices for paths and fewer opportunities to alter their routes than in areas with blocks of typical lengths. These choices are not insignificant. Rather, they are vital for making walking interesting and inviting because they shorten the distances between destinations and are more stimulating because they offer pedestrians more varied environments.³⁷ The long block lengths of superblocks also keep pedestrians at greater distances from each other and keep drivers in their cars for longer periods of time, decreasing the level of social interaction between people. Lastly, they present pedestrians with a straight and seemingly endless path ahead of them because of their length, lack of directional variety, and lack of interesting experiences along the way.³⁸ Walking in such an environment—or even contemplating it—is tiring.

Superblocks are accompanied by networks of streets that are more sparsely laid out. Naturally, when blocks are larger, there are fewer streets in a given area.³⁹ Yet, regardless of block size, an area is likely to have the same level of vehicle traffic. This means that areas with fewer streets will need to also have larger streets to accommodate the same level of traffic. Larger streets are more dangerous because they are harder for pedestrians to cross and they are easier for drivers to speed on.⁴⁰ They are also less pleasant due to the increased noise and exhaust resultant from the greater number of cars they accommodate. All of these factors make the large streets accompanying superblocks hostile environments for pedestrians.

We have discussed the effects of downtown Bellevue's large streets on the pedestrian experience. Land uses along sidewalks and other pedestrian spaces also need to be considered. Only small extents of the sidewalks in downtown Bellevue offer pedestrians any sort of interesting sidewalk frontage. They are typically presented with uninteresting parking lots or dull building walls with little detail and no opportunity for engagement (see Figure 2.10.).

36 Feet First, *Downtown Bellevue Walking Audit Report*, January, 2012, 6, http://www.ci.bellevue.wa.us/pdf/Transportation/Bellevue_Walk_Audit_Report_Final_2_7_2012.pdf.

37 Speck, *Walkable City*, 165.

38 Gehl, *Cities for People*, 127.

39 Arnis Siksna, "The effects of block size and form in North American and Australian city centres," *Urban Morphology* (1997): 19-33.

40 Speck, *Walkable City*, 166.



Figure 2.10. Sidewalk along NE 8th St. The monolithic Bellevue Square looms over pedestrians while offering nothing to engage with physically or visually. Source: adapted from Google Streetview.

Surface parking lots are a result of downtown Bellevue’s former suburban paradigm. They will gradually be redeveloped as it becomes economical to do so, given today’s higher property values. The dull building walls so ubiquitous in downtown are an indirect result of the superblock street-grid. Superblocks tend to result in fewer, but larger parcels, which in turn leads to large “fortress” developments that subtract from street life by focusing on internal circulation and amenities and disregarding street-facing sides of buildings.⁴¹ This dissolves a sense of community by reducing the desire to walk and interact with other people and new places. Ideally, pedestrians should walk along rows of varying storefronts. They create activity and offer visual stimulus, which make walking more interesting.

The last major issue with downtown Bellevue’s pedestrian experience is an insufficient amount of public space and desirable sidewalk infrastructure such as seating. Parks are sparse in downtown Bellevue. Some would point to the existence of City Center Plaza and Compass Plaza as validation of the existing open space network. These plazas are welcome amenities for pedestrians, but they are privately-owned public spaces. They are private property, but the landowners have agreements with the city to allow public use. This is problematic for several reasons. Many people are not aware of their existence due to them not being listed in most materials relevant to public spaces and parks (see Figure 2.11.). Even when some people

41 Amis Siksna, “The effects of block size and form in North American and Australian city centres,” *Urban Morphology* (1997): 19-33.

are aware of these spaces, they may feel uncomfortable and unsure about utilizing them. The spaces are unsigned and—at least in the case of Compass Plaza—clearly on the same property as private buildings. This ambiguity means that they, just like other privately-owned public spaces, fail as spaces that are public in a full sense.⁴²

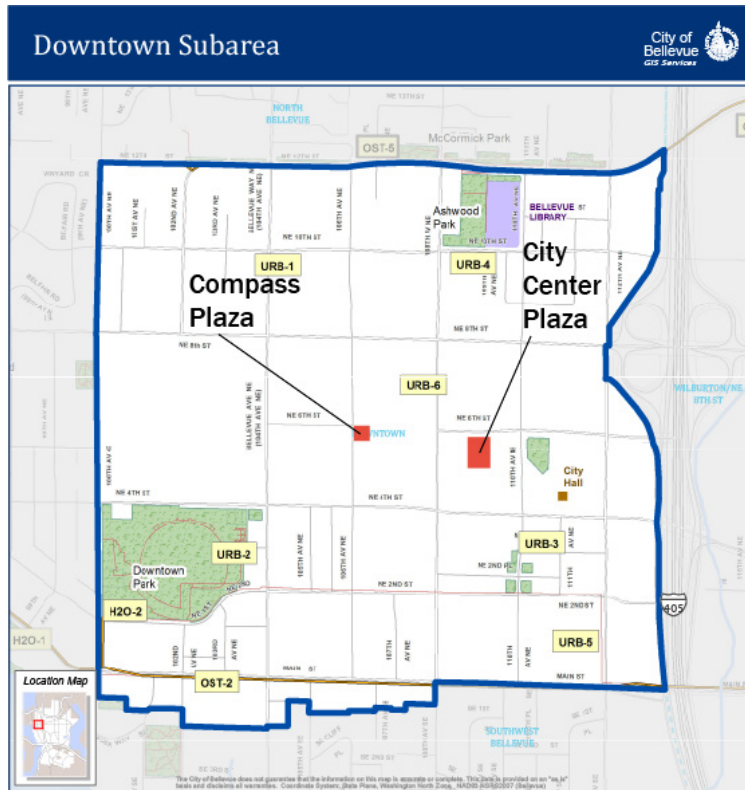


Figure 2.11. Even many official city materials fail to indicate privately-owned spaces like Compass Plaza and City Center Plaza. Icons and labels for those were added to this map by the author. Source: adapted from a Downtown Subarea Plan map.

Few sidewalks in downtown Bellevue offer anything more than a place to walk. They tend to lack cover from the elements, buffers between the pedestrian and the street, and places to rest. Without these features, walking can easily become tiresome and stressful.

Despite the aforementioned issues, downtown Bellevue does boast its pedestrian corridor. It runs west-east from Bellevue Square to the Bellevue Transit Center and Meydenbauer Center. The pedestrian corridor provides pedestrians with a safe and direct route between many downtown destinations and offices. However, the corridor does not offer pedestrians an interesting walk, it does not always protect pedestrians from the elements, and it provides few places to rest. There are only a few locations at which a storefront or restaurant is directly accessible from the pedestrian corridor. Much of the pedestrian corridor is fronted by

42 City of Seattle, “Privately Owned Public Open Spaces (POPS),” accessed July 6, 2015, http://www.seattle.gov/council/Licata/public_space.htm.

uninteresting walls or parking lots. This makes for a generally dull experience and is a missed opportunity for economic activity.

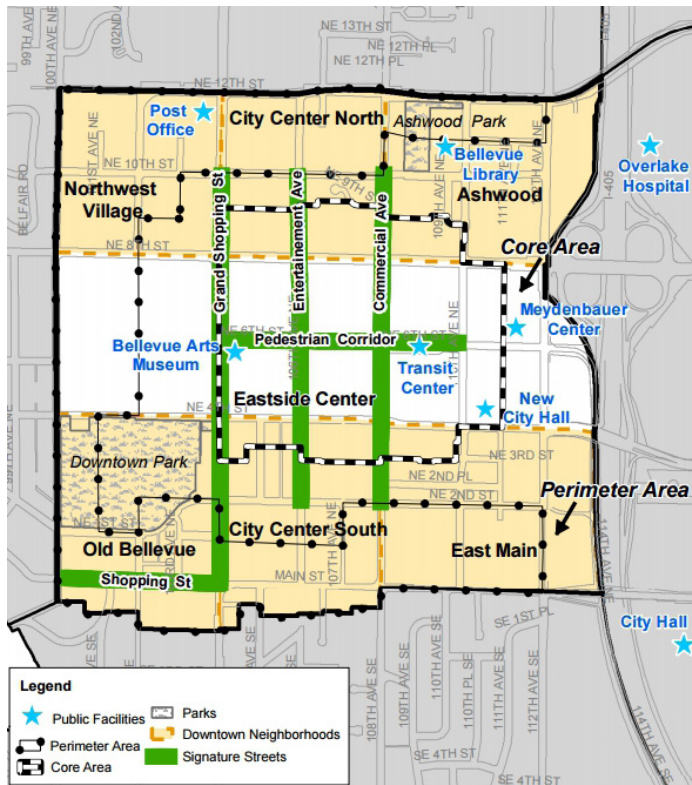


Figure 2.12. A City of Bellevue image showing the pedestrian corridor in the center of the Eastside Center District. Source: City of Bellevue Downtown Subarea Plan.

There are also stretches of the corridor that are uncovered or only feature small trees that do not provide enough cover from rain or the sun. The corridor only provides seating for resting in some locations, and when there are benches, they are not in ideal locations where people want to spend time. To be encouraged to sit, people generally require, among other things, a view.⁴³ This view can be of things like water, vegetation, fine buildings or spaces, or art. A view of people and activity, though, is usually mandatory. Two different seating locations along the corridor offer none of these views. Instead, benches face a low wall that partially obscures a large parking lot in one location, while a bench faces a dull building wall in another location (see Figures 2.13. and 2.14.).

43 Gehl, *Cities for People*, 140.



*Figure 2.13. View from a bench along the pedestrian corridor’s “street as plaza” segment.
Source: Author.*



*Figure 2.14. View from a bench along the pedestrian corridor’s “garden hill climb” segment.
Source: Author.*

Lastly, the pedestrian corridor's design could be described as piecemeal. The City describes the pedestrian corridor as having three segments, "street as plaza", "garden hill climb", and "transit central".⁴⁴

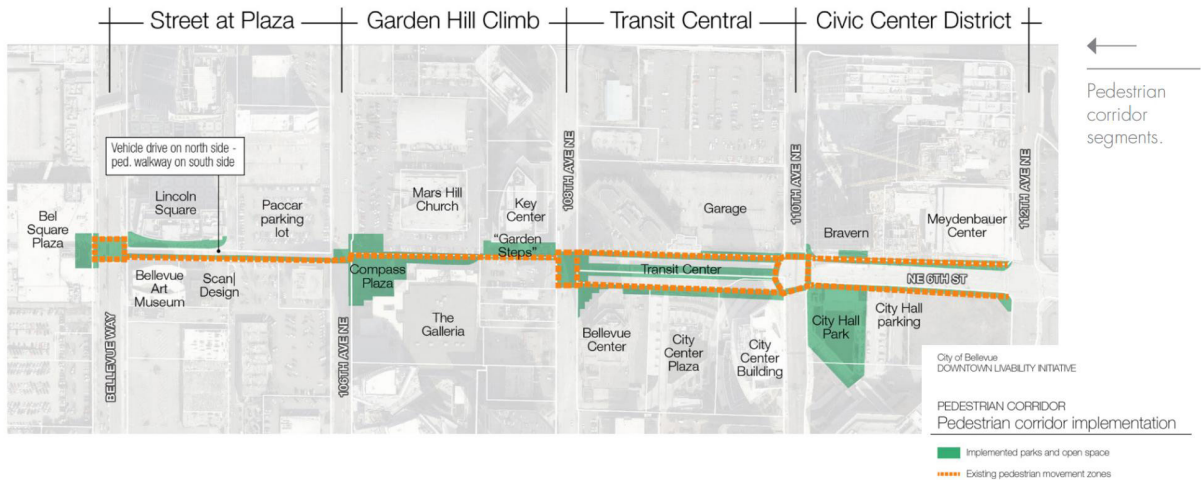


Figure 2.15. The three distinct segments of the pedestrian corridor. The “civic center district” segment does not currently exist. Source: City of Bellevue Downtown Livability Initiative.

Each segment has different features and different aesthetics of varying degrees of appeal (see figure. corridor appeal). The only unifying characteristic of the existing pedestrian corridor is its direction. This prevents the user from gaining a sense of placement in space, progress, and what to expect later in their walk. An ideal pedestrian infrastructure would have unifying themes and features to enhance users’ understanding of it and its appeal by having a stronger identity.

44 City of Bellevue Transportation Commission, “NE 6th Street Multi-Modal Corridor,” May 10, 2012, 22.

Part 3 - Remedial approach

With an understanding of the shortcomings of the downtown Bellevue pedestrian experience, we can establish goals for transforming the area into a haven for walking. It will also be important to work toward the City's plans and hopes for downtown Bellevue. It has already been determined that the current and future residents and workers of downtown should be in favor of walkability.

First we will address the basic elements of a walkable community, then adjust those elements to match the project site. Existing landmarks and other realities will be taken into account, and the basic elements will be adjusted to respond to them. The concept outline will also need to be compatible with, and ideally work toward fulfilling the goals and hopes for the area and the city in general as laid out in the plans of the City of Bellevue and regional authorities such as King County and the Puget Sound Regional Council.

3.1 The basic elements for a walkable community

Based on the assessment of the downtown Bellevue pedestrian experience from the previous section, the area's needs are clear. More route options are needed for non-motorized transportation options and more public space is needed for a variety of uses and spontaneous interactions. Safety must also be a primary consideration.

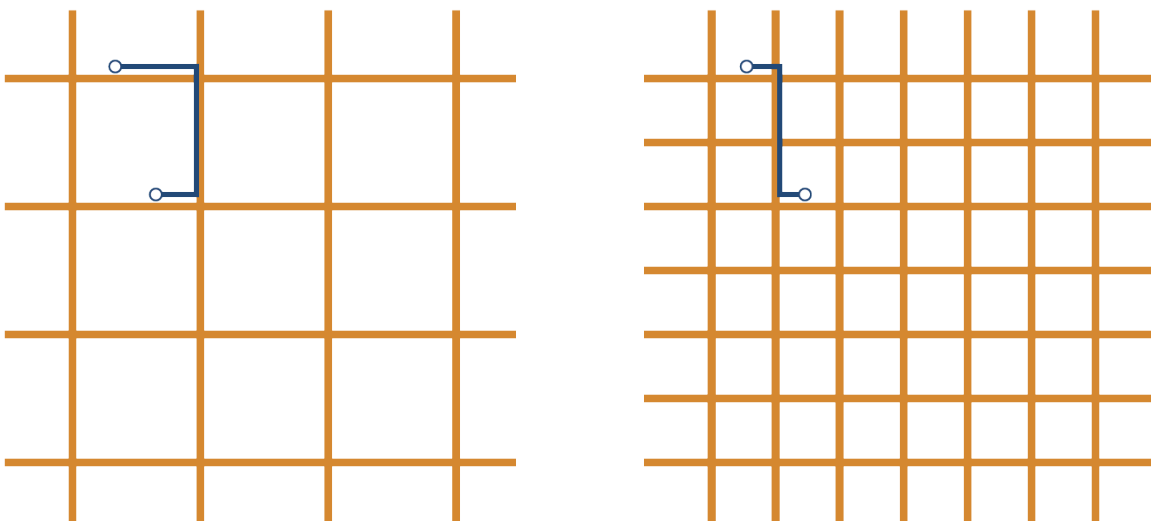


Figure 3.1. Diagram showing a simple example of the benefit of denser path networks.

A more dense network of pedestrian paths also must include more pedestrian crossings at intersections with vehicular streets. When crosswalks are few and far between as they currently are in downtown Bellevue due to the superblock grid, pedestrians often do not want

to walk far out of their way in order to reach a crosswalk. Instead, they will choose to jaywalk despite the potential dangers involved because it is the more convenient option. More street crossings for pedestrians will mean safer crossings and more complete—and therefore usable—pedestrian infrastructure.

As already described, having a sufficient amount of safe routes is a foundation, but that alone is not enough. The objective of this thesis and walkability in general is creating lively communities that encourage walking and outdoor activity. That is not achieved by places that merely allow for walking. Routes and areas designed especially for pedestrians need to provide them with activities and mental stimulus to create such a community. Retail locations, restaurants, public art, and greenery are examples of things that give pedestrians reason to make use of and enjoy a space (see Figure 3.2.).



Figure 3.2. Examples of rich and dull urban sensory experiences. Source: Cities for People by Jan Gehl.

Lastly, there is a need for more public space. A pedestrian path that features seating along its length fulfills this need to an extent, but is more suited for pedestrians taking a short break. For those who wish to spend more time in a public space talking with friends, eating, or using their laptops, for example, there needs to be an area that feels less encumbered by a constant flow of pedestrian traffic.

Putting these needs together creates a model for a more fine-grained network of safe and interesting pedestrian paths. The paths should be linked with additional pedestrian street crossings and public open spaces should be included for comfort and to act as focal points.

3.2 Consistency with City Plans

A concept such as this is supported by the general tone of Bellevue’s city plans, and many specific policies. The Downtown Bellevue Subarea Plan’s (“Downtown Plan”) Policies S-DT-45 and S-DT-58 call for the continued support for the pedestrian corridor and the creation of intimate mid-block pedestrian paths respectively.^{1,2} The same plan also states that, “there may be opportunities to improve pedestrian mobility across arterial streets with signalized mid-block pedestrian crossings.”³ The model will do precisely what the plan envisions by improving pedestrian mobility—and safety—with mid-block crossings. City plans do not explicitly mention buffering pedestrians from traffic, but the Downtown Plan does suggest the general use of landscaping, street trees, street furniture, and public art.⁴ All of those features can be used to buffer pedestrians from vehicle traffic and create inviting pedestrian settings.

Multiple policies are consistent with a concept for pedestrian paths lined with a variety of uses like retail stores and restaurants. The Downtown Plan calls for the incentivization to, “create pedestrian-scaled, diverse, and unique urban lifestyle experiences and options.”⁵ It also mentions developing the Pedestrian Corridor as a, “unifying feature for Downtown Bellevue by siting buildings and encouraging uses that add to pedestrian movement and activity,” uses that include “office, urban residential, hotel, retail, civic, and entertainment uses.”⁶

Lastly, one of the Downtown Plan’s primary goals is to, “provide urban parks, recreation opportunities, and open space within Downtown.”⁷ Part of this goal is providing appropriately scaled parks and open spaces throughout downtown. In the context of this thesis’ latent concept, this means the creation of an open space area that is not so large as to lose the intimate, human scale of the pedestrian paths.

1 City of Bellevue Department of Planning and Community Development, *Downtown Bellevue Subarea Plan*, (Bellevue, WA, 2010), 90-95, http://www.ci.bellevue.wa.us/pdf/PCD/SP04_DowntownPlan_03.pdf

2 Note, however, that policy S-DT-58 is in reference to downtown’s Northwest Village District, not the Eastside Center District. Nevertheless, the plan implicitly agrees that such an approach is an appropriate way to create a walkable, pedestrian-oriented community, which is essentially one of the Downtown Plan’s general goals.

3 City of Bellevue Department of Planning and Community Development, *Downtown Bellevue Subarea Plan*, 91.

4 City of Bellevue Department of Planning and Community Development, *Downtown Bellevue Subarea Plan*, 94.

5 City of Bellevue Department of Planning and Community Development, *Downtown Bellevue Subarea Plan*, 94.

6 City of Bellevue Department of Planning and Community Development, *Downtown Bellevue Subarea Plan*, 97.

7 City of Bellevue Department of Planning and Community Development, *Downtown Bellevue Subarea Plan*, 101.

3.3 A Note on Bicycles

This thesis focuses on walkability and pedestrians, but bicycles undoubtedly have an important role to play in a healthy transportation paradigm. Bicycling has more in common with walking than driving. Walking is the ideal means of transportation for full comprehension of one's surroundings, but when running at 7 mph, people still perceive and process sensory information, gaining a reasonable level of comprehension.⁸ Bicycling at a moderate cruising speed of 9 to 12 mph is similar to running, and cyclists still gain good sensory contact with their environment. Thus, a cyclist sharing a sufficient amount of space with pedestrians is much like a runner amidst pedestrians. Additionally, perceived potential conflict between cyclists and pedestrians in a shared space makes all users act in a manner that is more safe.⁹ It is more than reasonable to mix pedestrians and cyclists when speed is not necessarily a priority for the cyclists.

This thesis recognizes the importance of bicycles in a complete transportation paradigm. Bicycle users are considered in every aspect of the final design, whether or not they are explicitly mentioned. Some features, such as bicycle racks are specifically included for bicycle users and their value outside of pedestrian use will be addressed.

8 Gehl, *Cities for People*, 43.

9 Speck, *Walkable City*, 201.

Part 4 - The Design (Figures 4.1 and 4.2)

A City of Portland document on street design states, “larger block sizes could potentially offer more flexibility for courtyard/open space opportunities, building uses, and consistent street edge character while still maintaining a high level of connectivity and good pedestrian access.”¹ Superblocks provide large areas uninterrupted by streets with which to organize public spaces. The superblocks of downtown Bellevue, the current and historic bane of walking in the area, will be utilized to create the different elements of this concept and benefit walkability.

Broadly speaking, this design consists of spaces for moving and spaces for staying. Pathways and street crossings are the elements that fall under the umbrella of moving spaces. A bustling urban square and a collection of smaller, more intimate spaces called Groves are the elements of this concept designed as destinations and focal points. Each of these major elements will be covered in detail after an explanation of how adjacent buildings affect these elements.

¹ City of Portland, *Design Central City: Urban Design Tools*, (Portland, OR, 2010), p 62, <http://www.portlandoregon.gov/bps/article/313704>.

Figure 4.1 Overall Concept Diagram

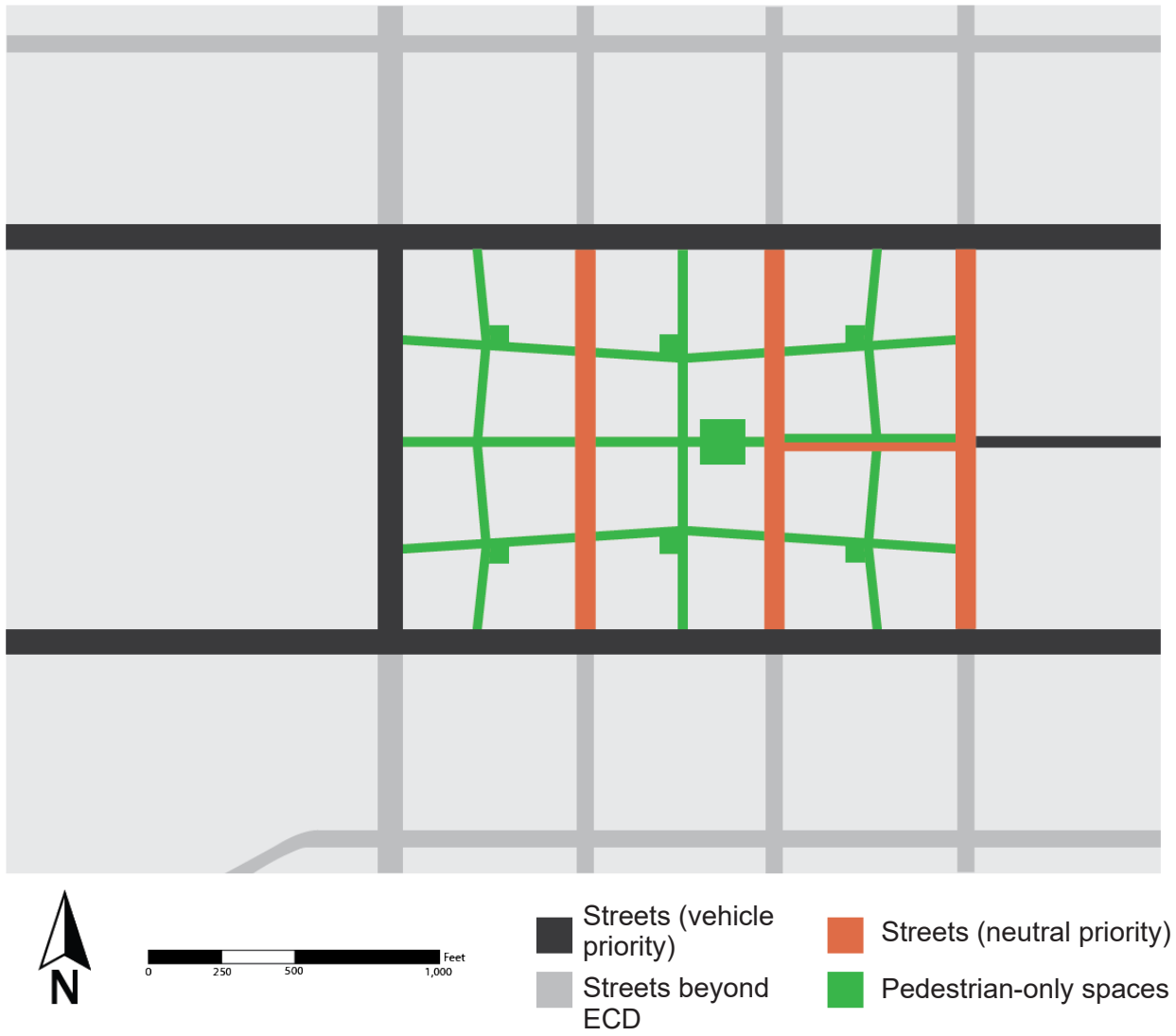
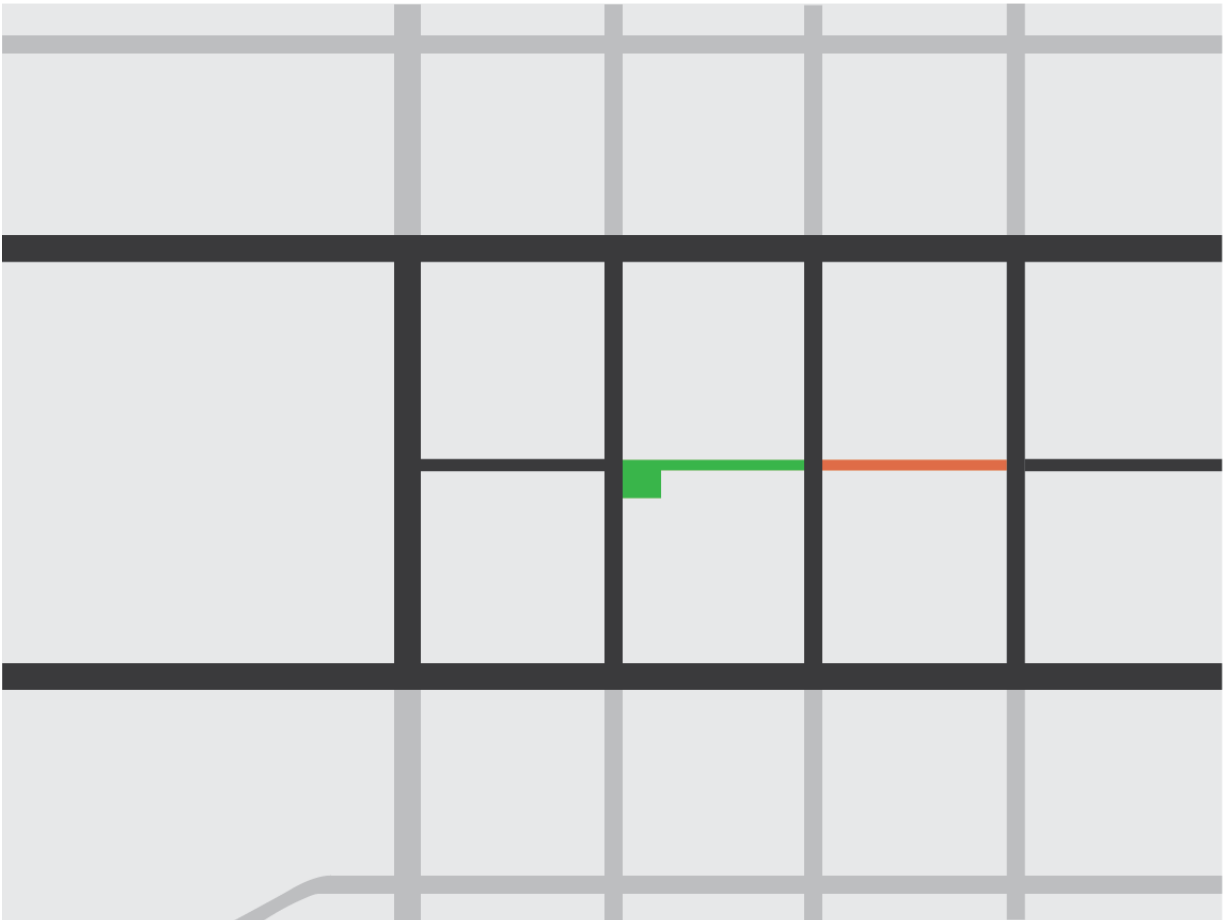


Figure 4.2 Existing Conditions



0 250 500 1,000 Feet

- Streets (vehicle priority)
- Streets beyond ECD
- Streets (neutral priority)
- Pedestrian-only spaces

4.1 The Importance of Adjacent Buildings

Buildings are also a critical component to a design for urban open spaces. Because the elements of this concept are all open spaces, they are inherently defined by the buildings surrounding them. Without buildings to give them shape and character, they do not exist. The spatial dimensions and features of adjacent buildings help to define the character of the open spaces of this concept.

Many theorists have concluded that an approximate ratio of 1:1 is ideal for the relationship between the width of a pedestrian path and the height of enclosures—or adjacent buildings.² This means that in order to maximize the comfort of pedestrians, the width of this concept's pedestrian paths should be roughly equal to the height of the adjacent building facades on either side of the paths. For this to work, the building edges come up to the property line bordering the paths; they cannot be recessed, as this would erode the consistency of the paths' dimensions. The authors of *Suburban Nation: The Rise of Sprawl and the Decline of the American Dream* state in their book that, “a fairly continuous, relatively flat street wall is one of the many preconditions to pedestrian comfort.”³ In contrast to the pedestrian paths, the open spaces in this concept will have ratios between the width of the spaces to the heights of the buildings of roughly 2:1. This is to create a consistent distinction between thoroughfare spaces like the paths and staying spaces.

If the ratios just described are to be followed strictly, the buildings in this concept would need to be between 20 and 75 feet high. These are low building heights considering downtown Bellevue is a rapidly growing regional center. To achieve these relatively low building heights in spite of the desire for high density in downtown Bellevue, the “tower-base” building typology is employed. Vancouver has made popular tower-base buildings that consist of narrow towers sitting atop wide, short bases. The base of such a building provides a “human-scaled” facade that defines the pedestrian space without being too tall, while the towers provide greater building capacity and density without significantly affecting the atmosphere of the pedestrian spaces. This maintains comfortable spatial dimensions for pedestrians and creates positive space—space that is well-defined and easily interpreted.

The ground floors of adjacent buildings are crucial to the character of a pedestrian space. The ground floor spaces of pedestrian-facing sides of buildings are comprised entirely of uses that are interesting and promote activity, like retail commercial uses including stores, restaurants, and cafes. Other uses with high levels of activity are also present, such as hotel lobby entrances and grocery stores. Regardless of the size of the buildings, each storefront—not just each building—has its own unique character. Famed urbanist Jane Jacobs states in *The Death and Life of Great American Cities*, “in architecture as in literature and drama, it is

2 Andres Duany, Elizabeth Plater-Zyberk, and Jeff Speck, *Suburban Nation: The Rise of Sprawl and the Decline of the American Dream* (New York, NY: North Point Press, 2010), 280.

3 Andres Duany, Elizabeth Plater-Zyberk, and Jeff Speck, *Suburban Nation: The Rise of Sprawl and the Decline of the American Dream* (New York, NY: North Point Press, 2010), PG#.

the richness of human variation that gives vitality and color to the human setting.”⁴ While the building facades form a straight line, this does not mean they are “flat”. The building facades could be described as “deep”. They have features that people can interact with and that form their own small spaces like columns, awnings, recessed doors, benches, and large window sills that can be used for seating. These features attract people and encourage them to stay longer. A 2003 study of Copenhagen shopping streets shows that activity is seven times higher in front of active facades than in front of passive facades.⁵ This is because these kinds of features are related to what Jan Gehl calls the “edge effect”.⁶ People find the edges of spaces the most comfortable and naturally seek them out. When these edges have features with which people can interact with—lean or sit on, for example—they spend more time there. All retail spaces along the pedestrian paths have at least some of these features. Jeff Speck believes that outdoor dining and walkway displays may be the most successful tools to create the edge effect and the retail spaces make use of these features.⁷

There are other important characteristics of the building facades. Each location features windows and doors and all buildings have ground floors with commercial ceilings at least 14-feet high. Doors are important for creating activity along the full length of a pathway as opposed to activity being concentrated in distinct locations. Windows and high ceilings catch pedestrians’ interest and allow for a sort of exploration of the space from afar, unlike solid walls that people cannot interact with.

Buildings adjacent to the various spaces in this concept exhibit all the general characteristics mentioned, but they will also have unique features depending on their locations. These unique features will be mentioned in the relevant sections.

4.2 The Paths

Connectivity and convenience are the cornerstone of this concept. They are the first considerations, and as such, they are addressed first. The infrastructure for pedestrian and bicycle transportation is comprised of a primary path called The Corridor and secondary paths that branch off and provide further route options in all directions referred to as Alleys.

4.2.a The Corridor (Figures 4.3 through 4.6)

The Corridor shares the same extent as the existing Pedestrian corridor, but similarities end with that. It is a valuable foundation for a new walkability paradigm in the area. It provides a direct route from the Bellevue Transit Center and the future Bellevue Downtown Station

4 Jane Jacobs, *The Death and Life of Great American Cities* (New York, NY: Random House, 1961), 229.

5 Gehl, Jan, Lotte Johansen Kaefer, and Solvejg Reigstad. “Close Encounters with Buildings.” *Urban Design International*, no. 1 (2006): 29-47.

6 Jan Gehl, *Cities for People* (Washington, DC: Island Press, 2010), 137.

7 Speck, *Walkable City*, 240.

on the eastern edge of the Eastside Center District, to the western edge of the district. The Corridor is completely separated from car traffic. According to Fanis Grammenos, principal of Urban Pattern Associates, recent research confirms that “directness and pleasure, as well as path independence from roads, are important attributes for enticing and enabling pedestrian movement.”⁸

The Corridor is 30-feet wide and the adjacent buildings are 40-feet high. Items 6 and 7 in the figures of the Corridor highlight key building features that enhance the “edge effect”. Those are awnings and establishment flags, respectively. The awnings are all at least 12-feet high for harmony with the heights of establishment ceilings. They provide users with cover from the elements, in addition to enhancing the edge effect by creating greater depth of building facades. Flags for establishments serve the same purposes as signs, but have several other benefits. Retail establishments do not often use flags, so they are unique in general, but they are also unique in this concept. Only establishments along the Corridor make use of them. This is one differentiation between the Corridor and the Alleys. They also have a strong impact on the “edge effect” because they not only stand out spatially, but they create movement, which is visually engaging.

Features of the path itself are designed to create a strong identity for the walkable areas and also enhance people’s sense of comfort. The Corridor’s defining feature is the green band through the center of the Corridor (item 1). The purpose of the green band is to enhance the environment of the Corridor and make users more comfortable. Its height varies from being flush with the ground to rising 1.5 feet high. Being level with the ground allows users to walk through the green band from one side of the Corridor to the other unimpeded. Raised sections create seating at the edge and enhance visual variety.

The green band is landscaped with grass and incorporates trees (item 2 in Corridor figures). The grass creates ample space for lounging and the trees act in many capacities. They help to regulate the ambient temperature of the path. In summer months, the trees can mean a difference in temperature of 5 to 15 degrees Fahrenheit.⁹ The trees also act as a carbon sink and improve air quality. Lastly, they reduce stormwater runoff and provide pedestrians with more canopy cover during rain. Trees absorb at least 70 percent of the first 0.5 inches of rainfall.¹⁰

Light columns (item 3 in Corridor figures) provide a soft glow of light during hours of darkness. They also provide visual variety and support the feeling that this environment is inspired by traditional pedestrian streets, but is itself a modern reinvention.

Small strips of permeable paving run perpendicular to the length of the green band at areas level with the ground (item 4). These make walking between the two sides of the Corridor

8 Fanis Grammenos, “Goodbye Square: the Quest for a Contemporary Urban Pattern,” *Planetizen*, August 24, 2009, accessed June 28, 2015, <http://www.planetizen.com/node/40281>.

9 Dan Burden, “Urban Street Trees: 22 Benefits,” 2006, accessed September 8, 2015, http://www.michigan.gov/documents/dnr/22_benefits_208084_7.pdf.

10 Colorado Tree Coalition, “Benefits of Trees in Urban Areas,” accessed August 4, 2015. <http://www.grantspassoregon.gov/DocumentCenter/View/1626>.

convenient for users. Their permeability also contributes to absorption of runoff water and avoids stark visual breaks in the green band by still having greenery between the individual pavers.

Item 5 highlights drains for runoff water and a gentle slope of the entire path towards these drains. The drains are covered by grating and flow to an underdrain (item 9) that also collects excess water from the green strip.

The last major feature of the Corridor are the tivolli lights (item 8) hung between the buildings on either side of the Corridor. Aside from providing light, they act as a soft ceiling for the Corridor. This is an important aspect of spatial enclosure as discussed earlier that enhances users' feeling of comfort within the space.

Figure 4.3 Corridor Location

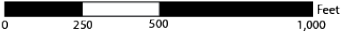
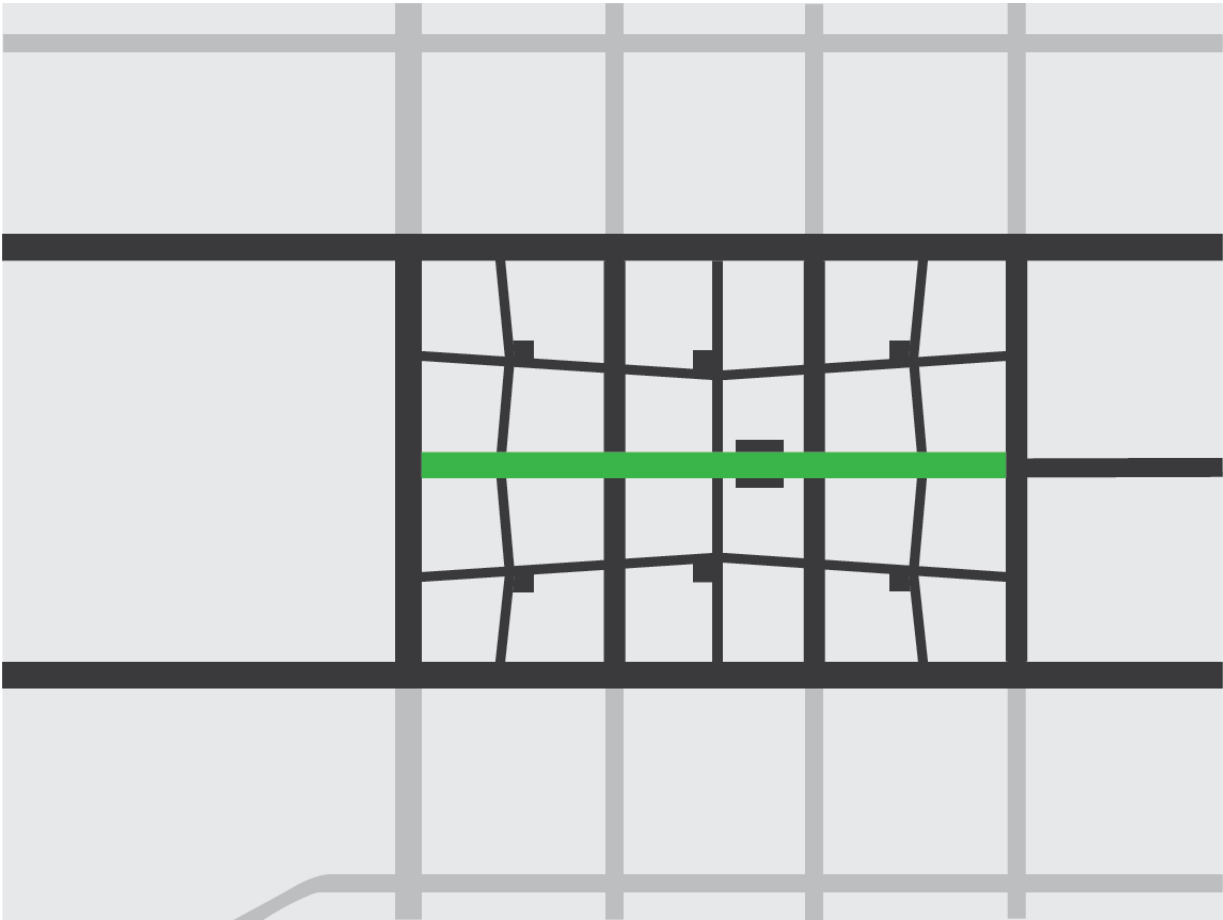
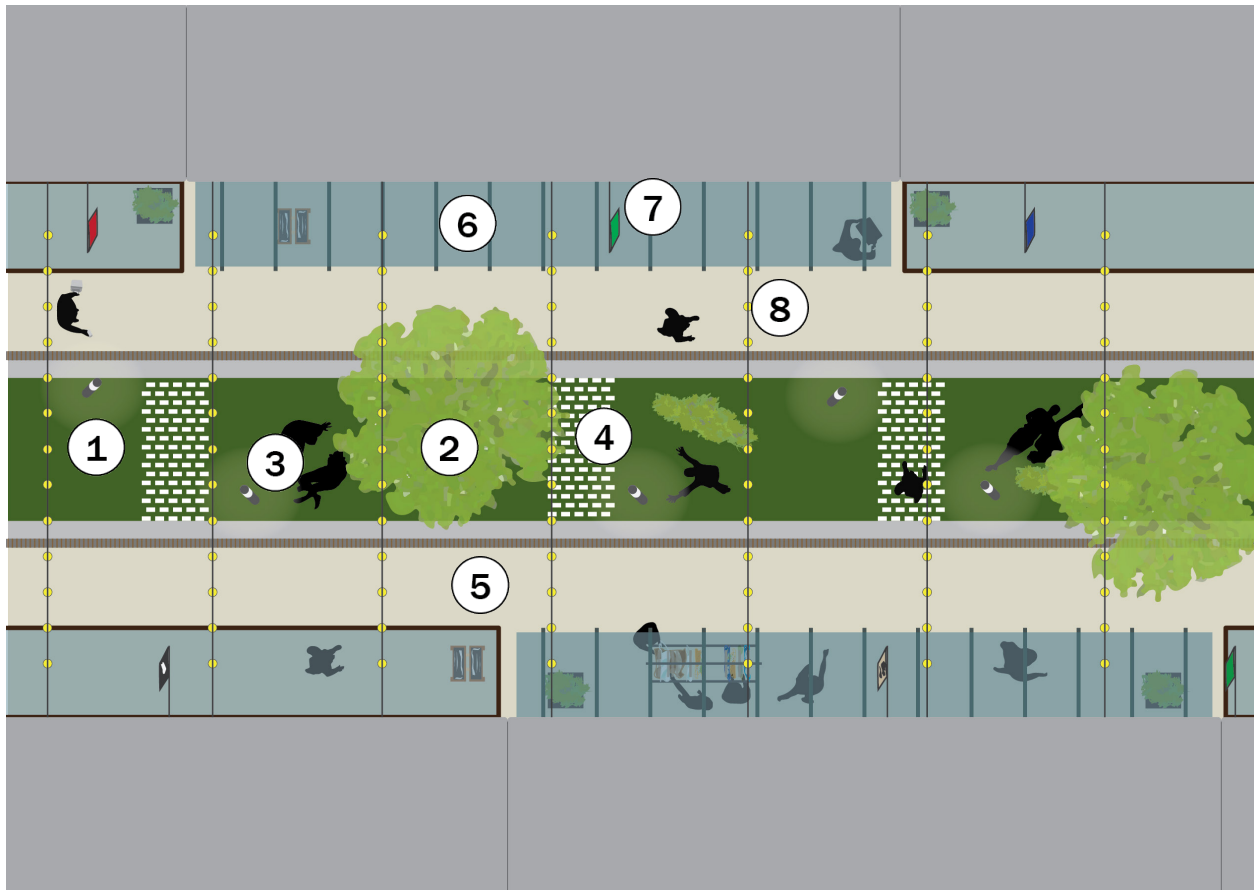
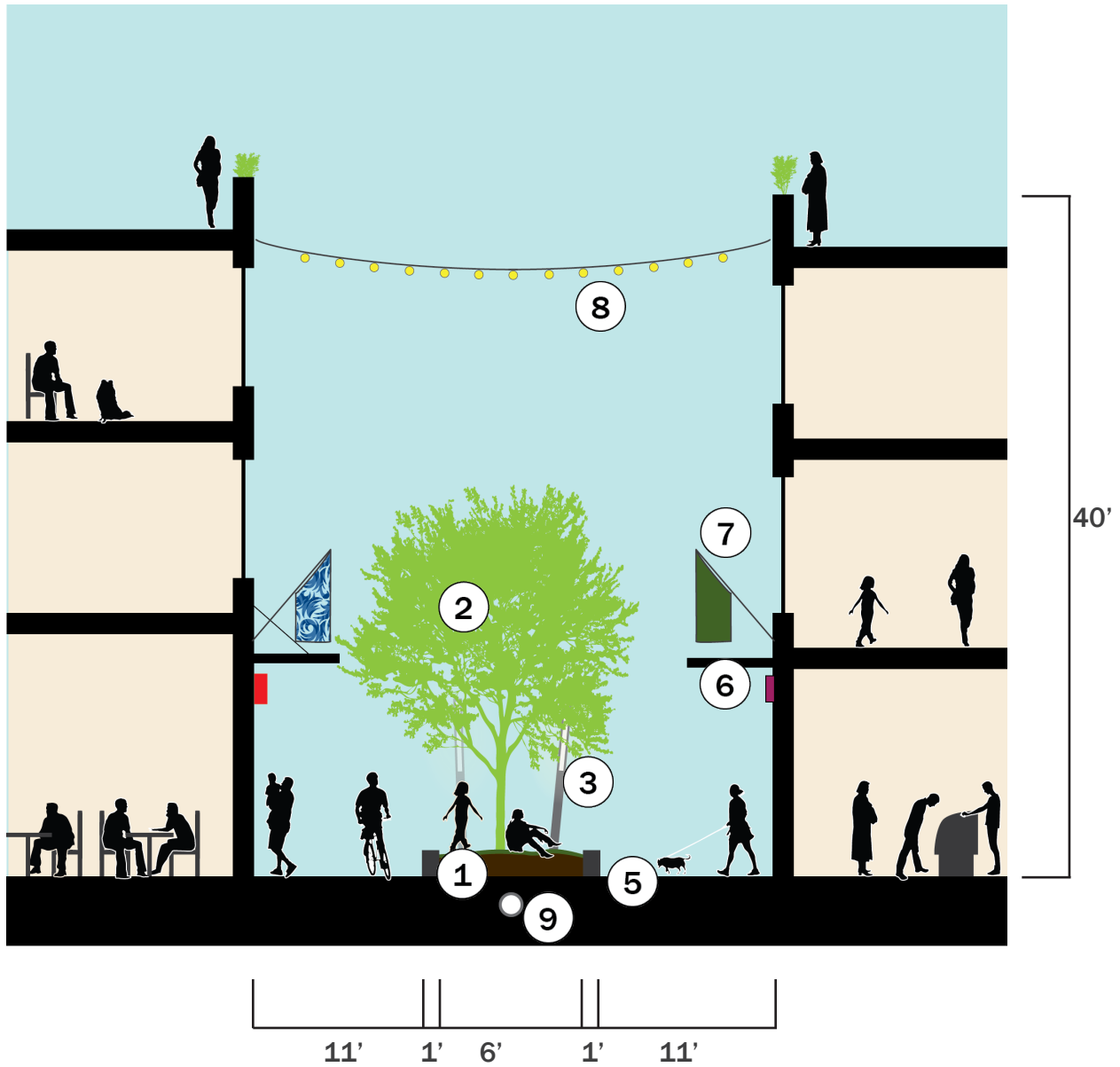


Figure 4.4 Corridor Plan



- | | |
|------------------------------|--------------------------------|
| ① Green band | ⑥ Awnings |
| ② Trees | ⑦ Flags for each establishment |
| ③ Light columns | ⑧ Tivoli lights |
| ④ Permeable paving | ⑨ Underdrain (not visible) |
| ⑤ Gentle slope toward drains | |

Figure 4.5 Corridor Section



- | | |
|----------------------------------|--------------------------------|
| ① Green band | ⑥ Awnings |
| ② Trees | ⑦ Flags for each establishment |
| ③ Light columns | ⑧ Tivoli lights |
| ④ Permeable paving (not visible) | ⑨ Underdrain |
| ⑤ Gentle slope toward drains | |

Figure 4.6 Corridor Elevation



0 10 20 40 Feet

- ① Green band
- ② Trees
- ③ Light columns
- ④ Permeable paving
- ⑤ Gentle slope toward drains (not visible)
- ⑥ Awnings
- ⑦ Flags for each establishment
- ⑧ Tivoli lights
- ⑨ Underdrain

4.2.b The Alleys (Figures 4.7 through 4.10)

The network of Alleys is carved out of downtown Bellevue's superblocks. They branch off from the Corridor and greatly extend the area of ideal pedestrian convenience from just a straight path along NE 6th St to an area of 22 square blocks, assuming typical block sizes.¹¹

They are similar in principle to the Corridor, but there are a number of points of departure to create a distinct environment. Unique features help to establish a hierarchy of the paths, with the Corridor as the central, most prominent path, and the Alleys as secondary, not necessarily in terms of importance, but in terms of grandiosity. The form of the Alleys is similar to the Corridor, but everything is pared down in scale. Most notably, the dimensions of the Alleys themselves

are more modest. The Alleys have a width of 20 feet and the heights of the buildings on either side are limited to 30 feet to match this width. The awnings of the Alleys (item 6) are at a height of 10 feet, compared to the awnings of at least 12-feet high along the Corridor.

The green band of the Corridor is replaced in the Alleys by a 2-foot-wide feature of permeable paving (item 1) to handle runoff water. Water is first absorbed by the ground, but in the event of heavy rainfall, excess water flows to an underdrain. The paving of the Alleys gently slopes (item 5) toward the center and the permeable portion just like the paving of the Corridor. Trees (item 2) smaller than those found along the Corridor line the Alleys providing the same benefits. Reversible benches (item 3) are placed intermittently along the center of the Alleys and over the permeable paving. They offer ample opportunities for users to relax regardless of the frequency of seating provided by nearby establishments. Light columns (item 4) are also used for lighting and are smaller than their Corridor counterparts.

The layout of the Alleys is also unique. The Corridor is arranged as a straight line. In theory, this gives users a long range of sight. The Alleys are designed so that they do not meet each other at right angles. The angling of the Alleys allows users to see a portion of what lies ahead of them on the path, but does not allow a full picture. This creates a subtle sense of curiosity for the users, making them more engaged with their surroundings and interested in exploring further.

The features and layout of the Alleys distinguish them from the Corridor and promote an atmosphere of greater intimacy, contrasting with the Corridor's atmosphere of expansiveness.

11 "City Blocks Differ in Size," accessed January 18, 2016, <http://www.land4ever.com/block.htm>.

Figure 4.7 Alley Locations

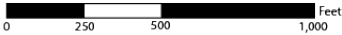
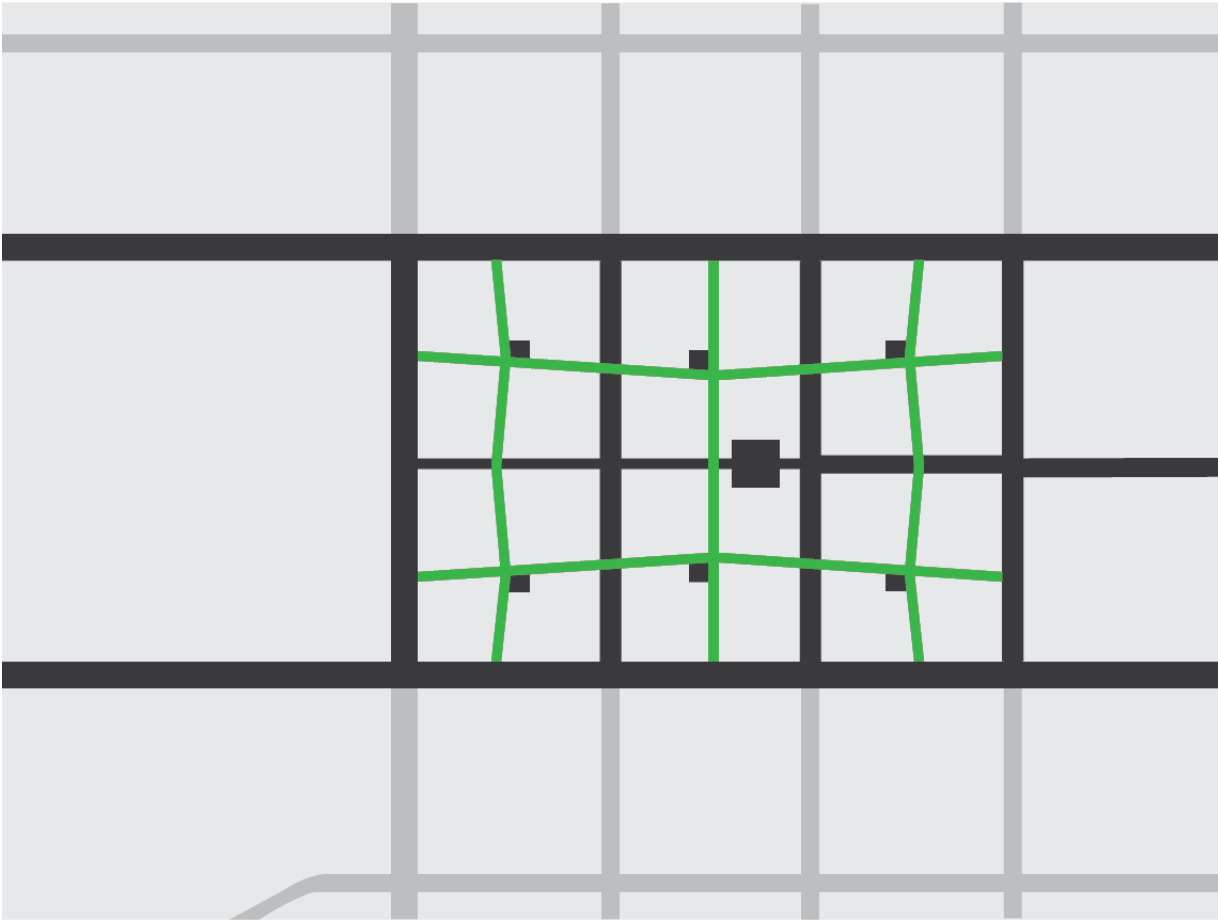
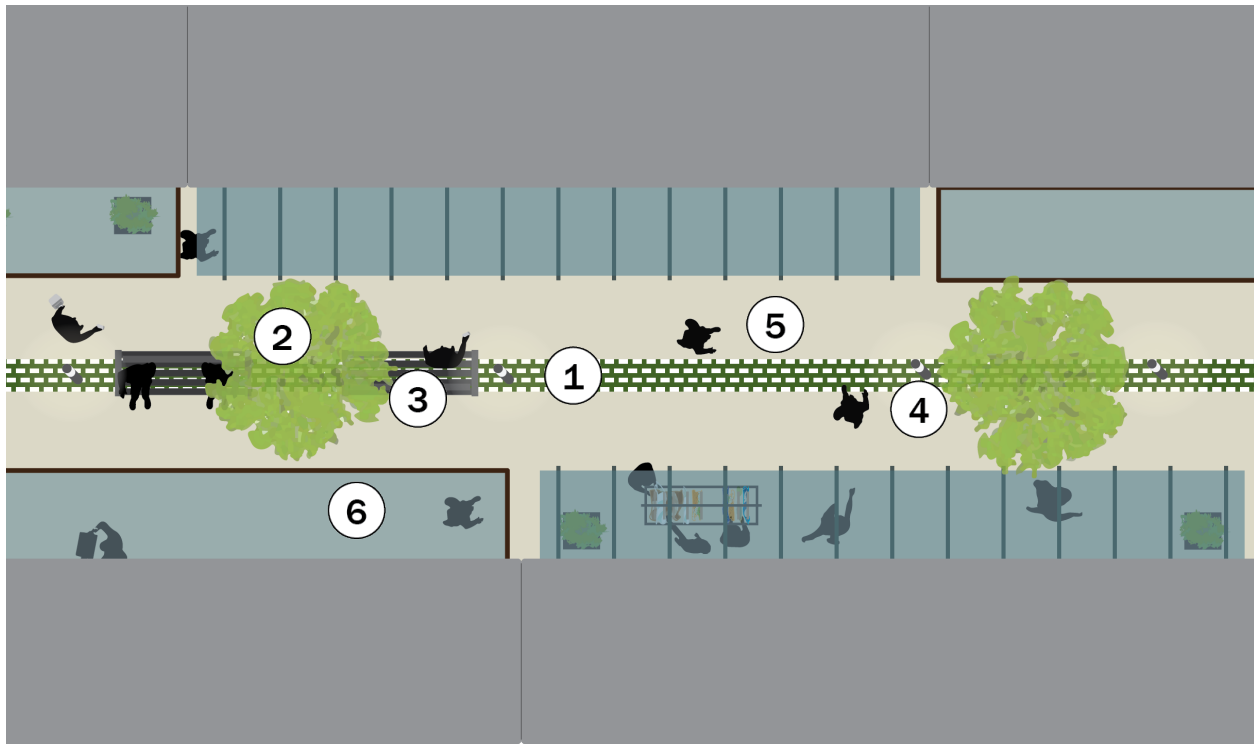
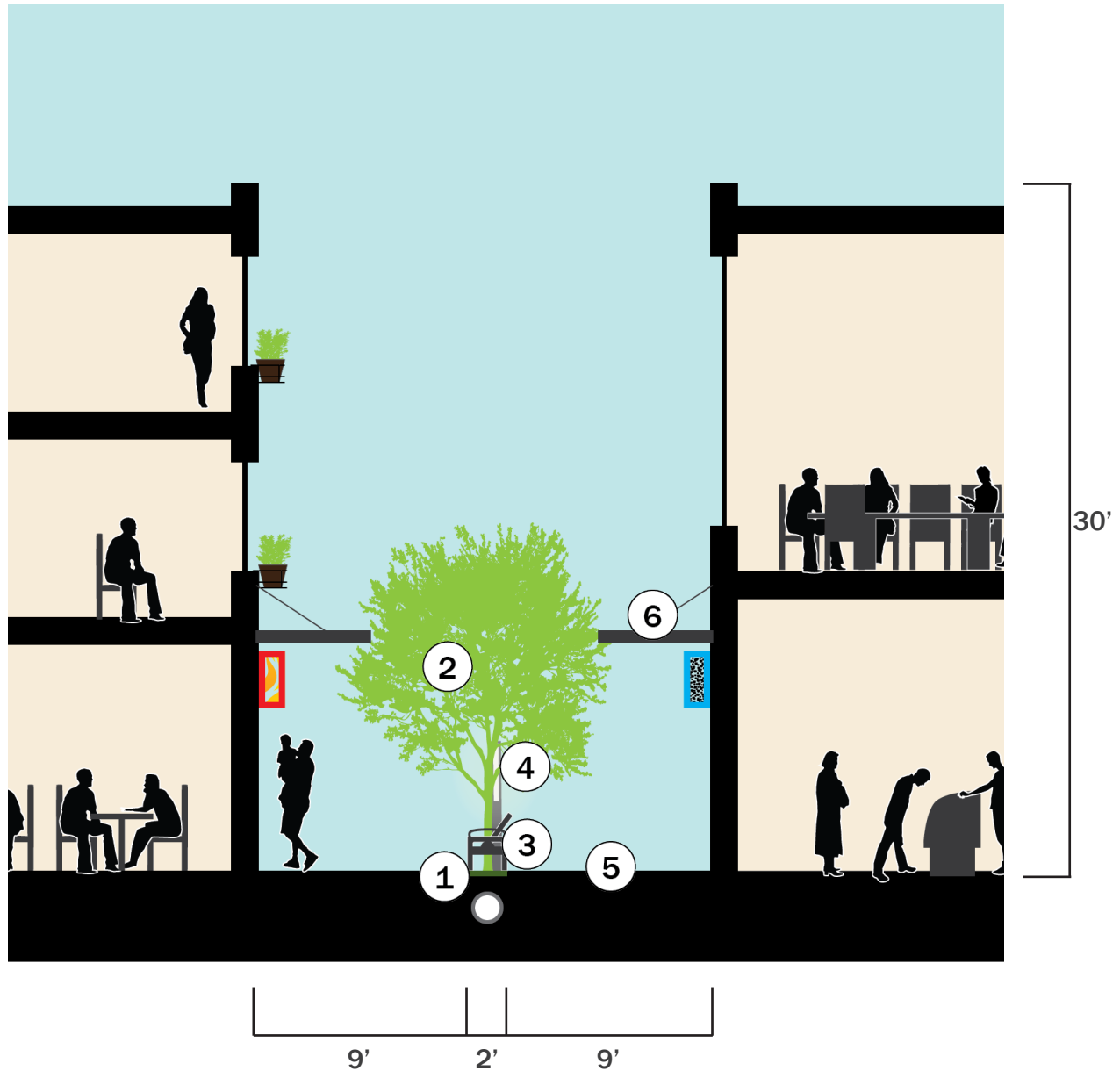


Figure 4.8 Alley Plan



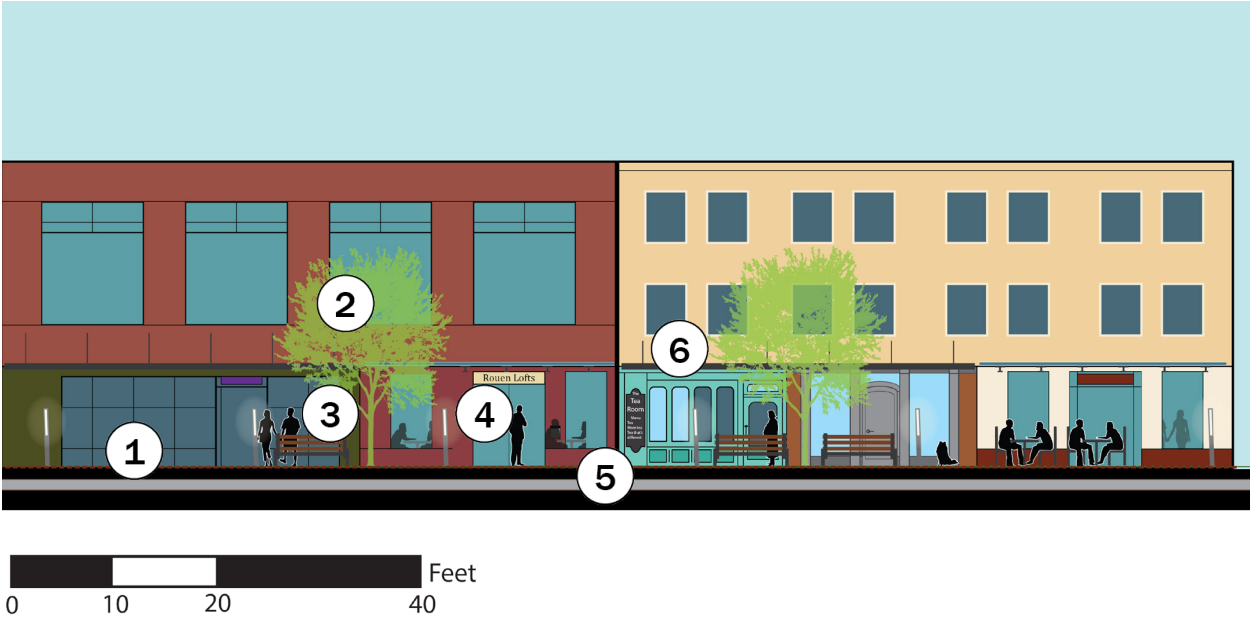
- ① Permeable paving
- ② Trees
- ③ Reversible benches
- ④ Light columns
- ⑤ Gentle slope toward permeable paving and drain
- ⑥ Awnings

Figure 4.9 Alley Section



- ① Permeable paving
- ② Trees
- ③ Reversible benches
- ④ Light columns
- ⑤ Gentle slope toward permeable paving and drain
- ⑥ Awnings

Figure 4.10 Alley Elevation



- ① Permeable paving
- ② Trees
- ③ Reversible benches
- ④ Light columns
- ⑤ Gentle slope toward permeable paving and drain
- ⑥ Awnings

4.3 The Crossings (Figures 4.12 and 4.13)

This concept features six new street crossings (shown in gold) and four improved crossings (shown in purple) in the Eastside Center District. The new crossings are mid-block crossings that connect the Corridor and the Alleys where they intersect streets carrying vehicle traffic. This will have an impact on vehicle traffic along the north-south streets in the area, but as discussed earlier, both the trend of decreasing car use and the city's desires for greater travel mode equity in downtown justify such methods to drastically improve the pedestrian experience. Furthermore, the streets on which the additional mid-block crossings are located are designated by city plans as neutral priority. The city has determined to give all right-of-way users equal priority on these streets, which should translate to adequate crossing opportunities for pedestrians and cyclists using the Corridor and Alleys.

The new crossings are designed to hinder the pedestrian experience as little as possible. They are a small part of the overall pedestrian infrastructure, but can easily leave people with a lackluster impression of the area if not designed properly. They are also the parts of the pedestrian experience that present the most danger due to pedestrians' proximity to vehicles at crossings.

The crossings avoid inconveniencing pedestrians and making them feel like their comfort is secondary to the comfort of drivers. Their signals do not require pedestrians to request permission to cross a street by way of pressing a button or activating any other device. Instead, they cycle between the signal for vehicles and the signal for pedestrians on a timer and by detecting the level of vehicle traffic. In a major pedestrian area such as this, the comfort of pedestrians must take priority over that of drivers, at least on streets that are not designated as being auto-biased (see Figure 4.11.).



Figure 4.11. Diagram showing the mode priorities of downtown streets. Source: City of Bellevue Downtown Subarea Plan.

All of the new and improved street crossings feature dedicated-cycle signal patterns. This means that pedestrians have a dedicated phase during which only they are permitted to use the crossing. This is an inherent feature of mid-block crossings where a pedestrian path and a vehicle street intersect, but is not commonly found at typical intersections where two streets carrying vehicle traffic meet. Dedicated-cycle signal patterns help to avoid conflicts between vehicles and pedestrians, since they do not use the intersection at the same time. This is especially helpful for avoiding conflicts between turning vehicles and pedestrians. In typical intersections, cars making turns through a crosswalk might conflict with crossing pedestrians. The logic behind this type of intersection is much the same as the logic of implementing barriers between moving car traffic and sidewalks, or completely separating the paths of pedestrians and cars. When cars and pedestrians are separate, both are safer.

There are professionals in traffic engineering and related fields who are skeptical of the effectiveness of mid-block crossings.¹² Some claim they present a higher risk than not having

12 Center for Urban Transportation Research, "Pedestrian Safety at Midblock Locations," *Florida Department of Transportation*, September, 2006, http://www.dot.state.fl.us/research-center/Completed_Proj/Summary_PL/FDOT_BD544_16_rpt.pdf.

them at all. It is entirely possible that mid-block crossings are not always appropriate, but other data and truths accepted by urban designers suggest that they can be beneficial. A 2011 report on bicycle and pedestrian collisions with vehicles in Boulder, Colorado showed that mid-block crosswalks accounted for less than ten percent of accidents between cars and bicycles or pedestrians.¹³ Meanwhile, crosswalks at intersections accounted for nearly forty percent of accidents.

The design of the crossings is consistent with the other parts of the pedestrian infrastructure. They are the same width as the pedestrian path it connects, preventing pedestrians from having to cluster together at a bottleneck. They feature the same style of pavers to indicate that they are part of the same network as the paths and open space. However, the paving at crossings (item 1) is uniquely colored and arranged in a pattern that conveys information about the crossing to users. This helps pedestrians and cyclists take note that they are at a crossing with vehicle traffic and must use caution. The paving pattern uses a circle to indicate the center of the intersection. Partially overlapping that, the intersection is divided into quadrants corresponding to the directions of travel possible for all intersection users, including vehicles. Quadrants corresponding to directions of travel for pedestrians are identified by red pavers. Other quadrants use dark pavers, suggesting a street with vehicle traffic continues in that direction. Red pavers also create lines bounding the sides of the intersection, suggesting to pedestrians not to travel further to the side, just as the stripes of a traditional crosswalk suggest not to stray to the side.

Standard truncated dome detection tiles (item 2) are placed ahead of the crossing along its full width on both pedestrian sides. These further help to identify the intersection for users and clearly mark its edge.

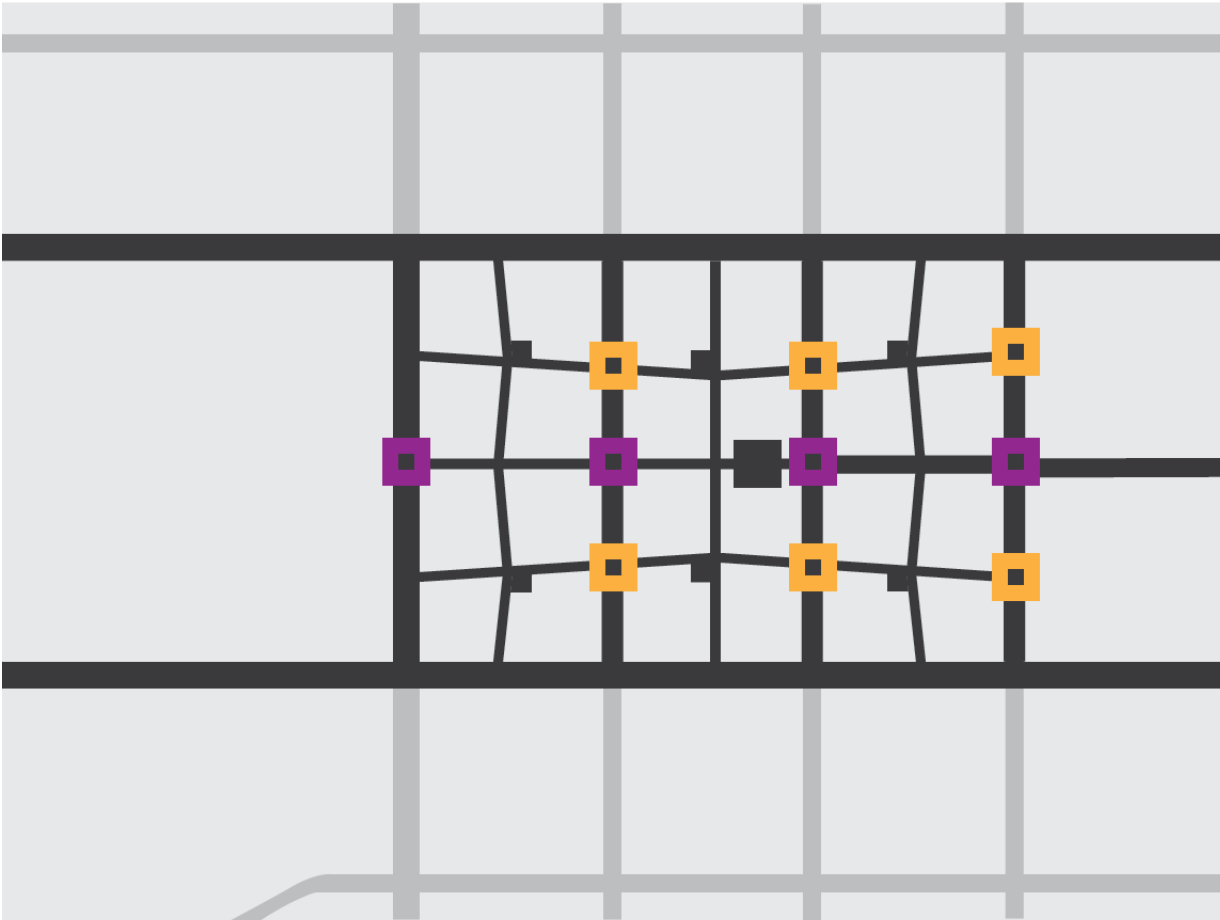
At intersections between pedestrian paths and streets (as opposed to two vehicle streets), bollards (item 3) are placed between the pedestrian realm and the crossing to protect pedestrians in the unlikely event that a vehicle attempts to enter the pedestrian paths. They feature signals facing pedestrians on the paths that indicate whether it is currently their crossing phase or the crossing phase for vehicles. Some bollards are retractable to allow service vehicles to enter, for example.

The entire intersection is raised, with the slope upwards from the street grade shown as item 4. The intersection grade is level with the pedestrian paths for user convenience and to indicate to vehicle traffic to use caution. Embedded in the slope are flashing caution lights (item 5) that also alert vehicles. Bill Cowern, a Boulder traffic engineer associated with the previously mentioned report from the city, has asserted that mid-block crosswalks featuring flashing lights are statistically more safe than crosswalks at intersections.

Bold stop bars (Item 6) indicate to vehicles to stop well ahead of the crossing to ensure enough distance between them and pedestrians. Lastly, standard traffic signals (item 7) are employed to direct vehicle traffic.

13 Heath Urie, "Boulder study sheds light on bicycle, pedestrian accidents," *Daily Camera*, February 4, 2012, accessed June 28, 2015, http://www.dailycamera.com/ci_19895363.

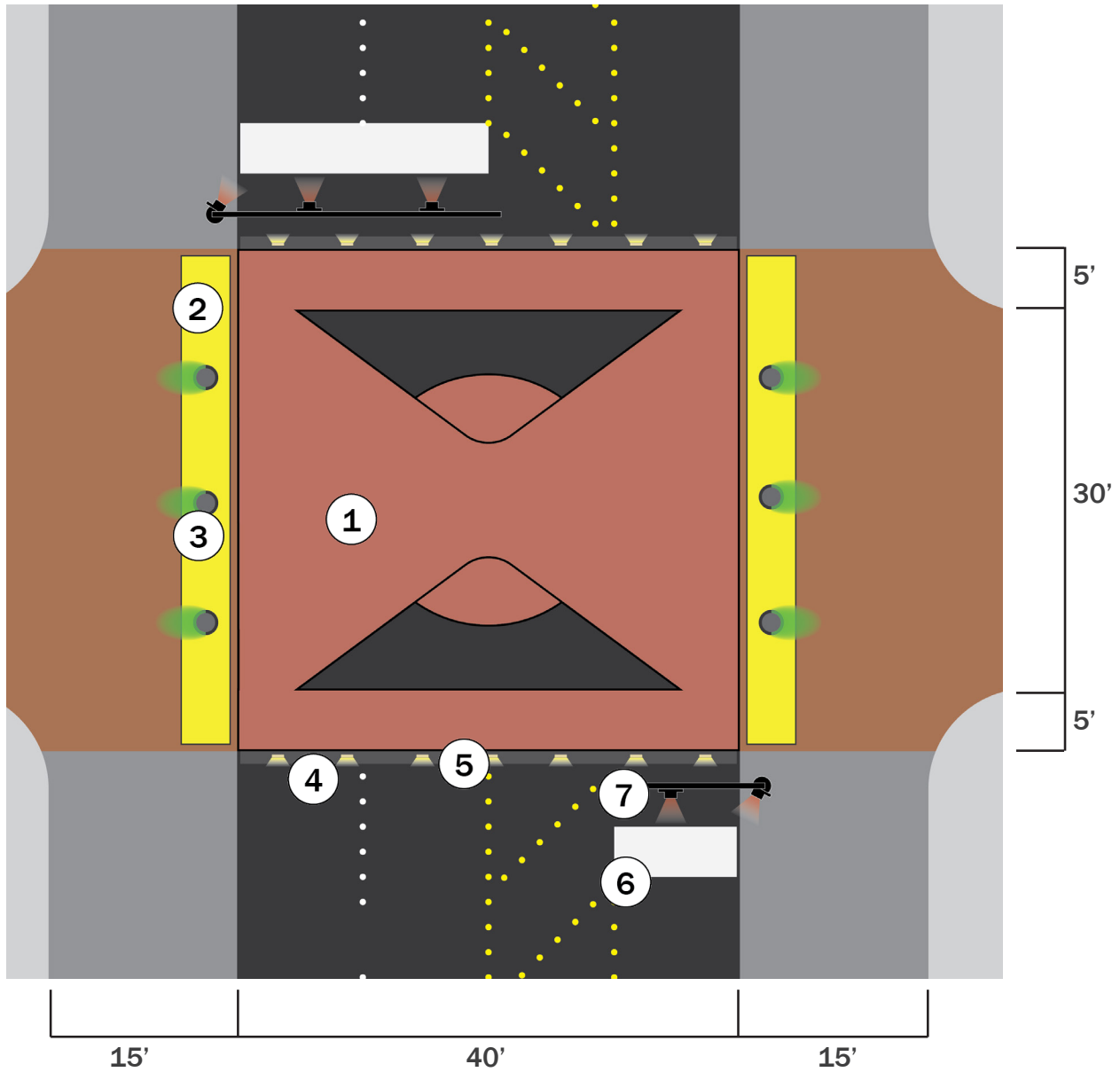
Figure 4.12 Crossing Locations



0 250 500 1,000 Feet

- Improved existing crossings
- New mid-block crossings

Figure 4.13 Crossing Plan



- ① Paving pattern conveys directionality
- ② Truncated dome detection tiles
- ③ Bollards with pedestrian signals
- ④ Slope between street grade and crossing grade
- ⑤ Flashing caution lights
- ⑥ Painted stop bar
- ⑦ Traffic signal

4.4 Open Space

The Eastside Center District needs well-defined, urban open spaces in the heart of activity. Downtown Park is a valuable asset, but it is out of the way, located several blocks away from the western end of the Corridor. It is also a grassy park, meaning an urban public square could meet needs not met by Downtown Park.

This concept features two types of public open spaces. The Square and the Groves are designed to thematically mirror the Corridor and the Alleys. The Square is the largest open space and provides a relatively expansive space for a wide variety of activities and the potential to host large public events. A collection of smaller and more intimate spaces called Groves are located throughout the pedestrianized Eastside Center District. They mean that people in the area are never far from secluded respite.

4.4.a. The Square (Figures 4.14 through 4.16)

The Square is located just west of 108th Ave NE and it is centered along the axis of the Corridor. This location is in close proximity to the major transportation hubs and is directly in the center of the Eastside Center District, and the whole of downtown Bellevue by extension. The Square has sides 150-feet. The facades of the buildings fronting the Square are 55-feet in height. The Square has these dimensions for a number of reasons. They allow pedestrians to appreciate the facades of all of the buildings surrounding the Square at ideal distances, which is important for giving the Square a strong identity. According to numerous influential urban design theorists, buildings are best seen at a distance of about twice their height.¹⁴ All of the buildings in the Square would be visible at the ideal distance from multiple points within the Square. The ratio between the width of the space and the height of the buildings is approximately twice that of the paths, clearly defining the Square as a gathering space rather than a thoroughfare. The Square's dimensions and the organization of its features, which will be discussed later, give it bilateral symmetry. This helps pedestrians understand that the Square is a waypoint between destinations beyond either of its ends.¹⁵

It is important for urban open spaces to evoke a sense of enclosure. The Square maintains a strong sense of enclosure by having its corners be fully built up, as corners are the pieces of a form most crucial to its identity.¹⁶ The Corridor meets the Square at its sides, rather than at its corners. Predictably, the Square has 30-foot gaps between enclosing buildings in these two locations. Trees partially fill in the gap between the buildings at these locations to further enhance the sense of enclosure.

The ground floors of the buildings enclosing the Square are recessed 10 feet (item 1) so that the upper floors are either cantilevered or resting on columns. This creates a strong

14 Cliff Moughtin, *Urban Design: Street and Square* (Oxford, U.K.: Architectural Press, 2003), 101.

15 Cliff Moughtin, *Urban Design: Street and Square* (Oxford, U.K.: Architectural Press, 2003), 87-101.

16 Ron Kasprisin, *Urban Design: The Composition of Complexity* (New York, NY: Taylor & Francis. Kindle Edition., 2011), location 1650.

edge effect and piques users' curiosity in a way that is distinct from how it is accomplished along the paths. This "edge" gives users sitting or standing along the perimeter of the Square a strong sense of shelter while also allowing them to observe all of the activity in the center of the Square. This covered "edge" also protects users from the elements. Restaurants located around the Square can use the sheltered space for outdoor dining. They may extend their outdoor dining area into the Square and cover it with umbrellas or awnings.

A large maple tree anchors the activity and space of the Square (item 2). Many existing urban squares feature statues as their central focus. Bellevue's history of logging and its location in the Pacific Northwest suggest using a tree as a focal point may be more appropriate. Naturally, the maple tree provides a degree of shelter and adds to the character of the Square. While this is an urban environment, natural features are never far away in the Pacific Northwest. A large circular wooden bench surrounds the base of the maple that gives users a comfortable place to relax and observe their surroundings.

There is no available data on the number of dogs in Bellevue, but by 2010 nearby Seattle had one of the highest rates of dog ownership in the country. The city had over 150,000 dogs for a population of about 600,000.¹⁷ As of February of 2015, King County Metro also appears to be the only public transportation authority in the United States that officially allows pet dogs of all sizes on buses.¹⁸ Given the area's affinity for dogs, a fenced dog run (item 3) is located in the northeast corner of the Square. There are rows of step seating on the north and east sides of the dog run for people to sit and watch the activity of the space.

A small field for general use (item 4) is similarly situated in the southeast corner of the Square. There are also rows of step seating along the south and east sides of this field.

To ensure that children and families will be interested in the Square and the pedestrian experience as a whole, a play area (item 5) is located between the maple tree and the western entrance to the Square. This area features light columns of varying heights and water jets coming out of the ground that give children a fun and engaging area to play in. The play area is also visually appealing for all users of the space.

Space is available for food trucks (item 6) to the east of the maple tree. When food trucks are not present, there is more space open for any number of activities. The space for food trucks and the play area are located in line with the entrances from the Corridor so that people along the Corridor will be able to catch a glimpse of these features and become more interested in the Square.

Restaurants can use space north and south of the maple tree for outdoor dining (item 7) and in the two western corners of the Square, public seating with tables (item 8) is available. This seating is ideal for people with food from the food trucks or for people using laptops, for example.

17 Brenda Cooper, "Seattle's 'Smart City' Thinking Should Include Dogs," *Crosscut*, February 11, 2015, accessed February 13, 2016, <http://crosscut.com/2015/02/seattles-smart-city-thinking-include-dogs>.

18 Brenda Cooper, "Seattle's 'Smart City' Thinking Should Include Dogs," *Crosscut*, February 11, 2015, accessed February 13, 2016, <http://crosscut.com/2015/02/seattles-smart-city-thinking-include-dogs>.

The shape and sections of the Square are designed for it to feel full, but not chaotic. Different uses are organized, but generally designated for specific areas.

Figure 4.14 Square Location

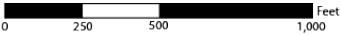
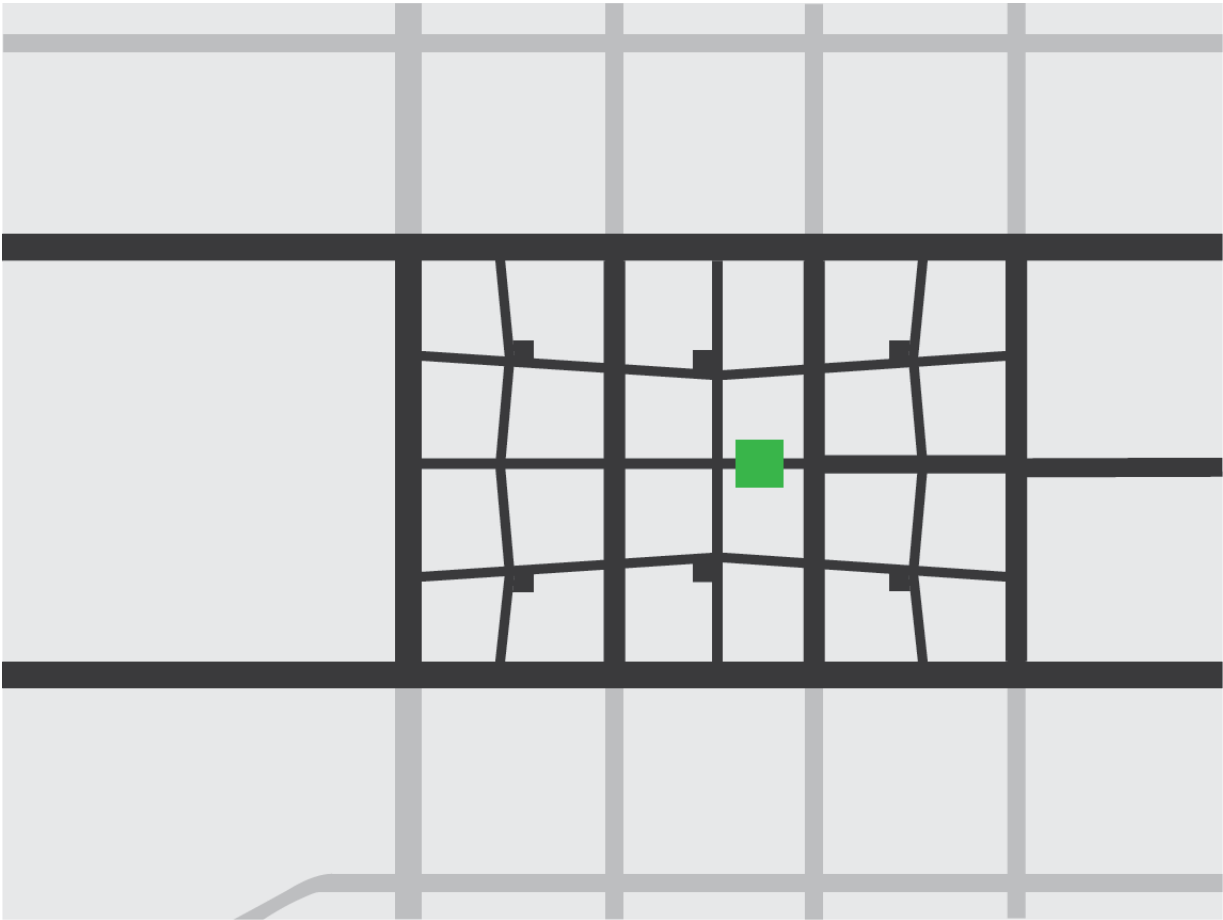
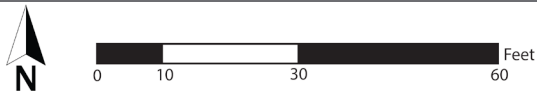
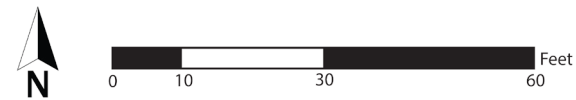


Figure 4.15 Square Plan



- ① Ground floors recessed 10 feet
 - ② Maple tree and circular bench
 - ③ Fenced dog run
 - ④ Small field for general use
 - ⑤ Fountain play area
- ⑥ Food truck space
 - ⑦ Outdoor dining space
 - ⑧ Seating with tables for general public

Figure 4.16 Square Section



- ① Ground floors recessed 10 feet
- ② Maple tree and circular bench
- ③ Fenced dog run
- ④ Small field for general use
- ⑤ Fountain play area
- ⑥ Food truck space (obscured)
- ⑦ Outdoor dining space
- ⑧ Seating with tables for general public (not visible)

4.3.b. The Groves (Figures 4.17 and 4.18)

There are six Groves located at the intersections of different Alleys. They are roughly square in shape, with two 50-foot long sides meeting at a right angle. The other two sides are defined by the edges of the Alleys and are nearly 50-feet long. In contrast to the Square, which acts as a central focal point, the Groves are somewhat off to the side, physically and thematically. Paths do not directly flow into them.

The Groves are intended to be somewhat variable in nature. Some may feature green walls or other physical features along the sides adjacent to the Alleys to help define the shape of the Grove (item 1). Others may open up more to the intersection by only using a line of alternately-colored pavers to define the borders of the Grove.

Each Grove has space that can be utilized by nearby restaurants and other establishments for outdoor dining (item 2). The low-key murmur and bustle of restaurants and cafes defines the ambiance of the Groves. Large umbrellas and space heaters (item 3) may be present for the comfort of users, depending on weather conditions. They also add to the Grove's sense of enclosure.

As one possibility, a Grove may have a bench in the corner (item 4) with a bookshelf built-in above the backrest. This bookshelf acts as a lending library, further suggesting the intimate nature of the Grove.

A belt of space (item 5) is left open along the enclosing buildings for easy access to surrounding establishments. This also helps to prevent the space from feeling overly crowded. The namesake of the Groves is the collection of trees (item 6) that provide a uniform and dense canopy. As is the norm for this concept, the surrounding restaurant facades are equipped with awnings (item 7).

The design of the Groves, from their offset locations to their small seating and reading areas, offers an escape for users who would like the benefits of a walkable, urban environment, but would also like a degree of tranquility.

Figure 4.17 Grove Locations

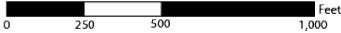
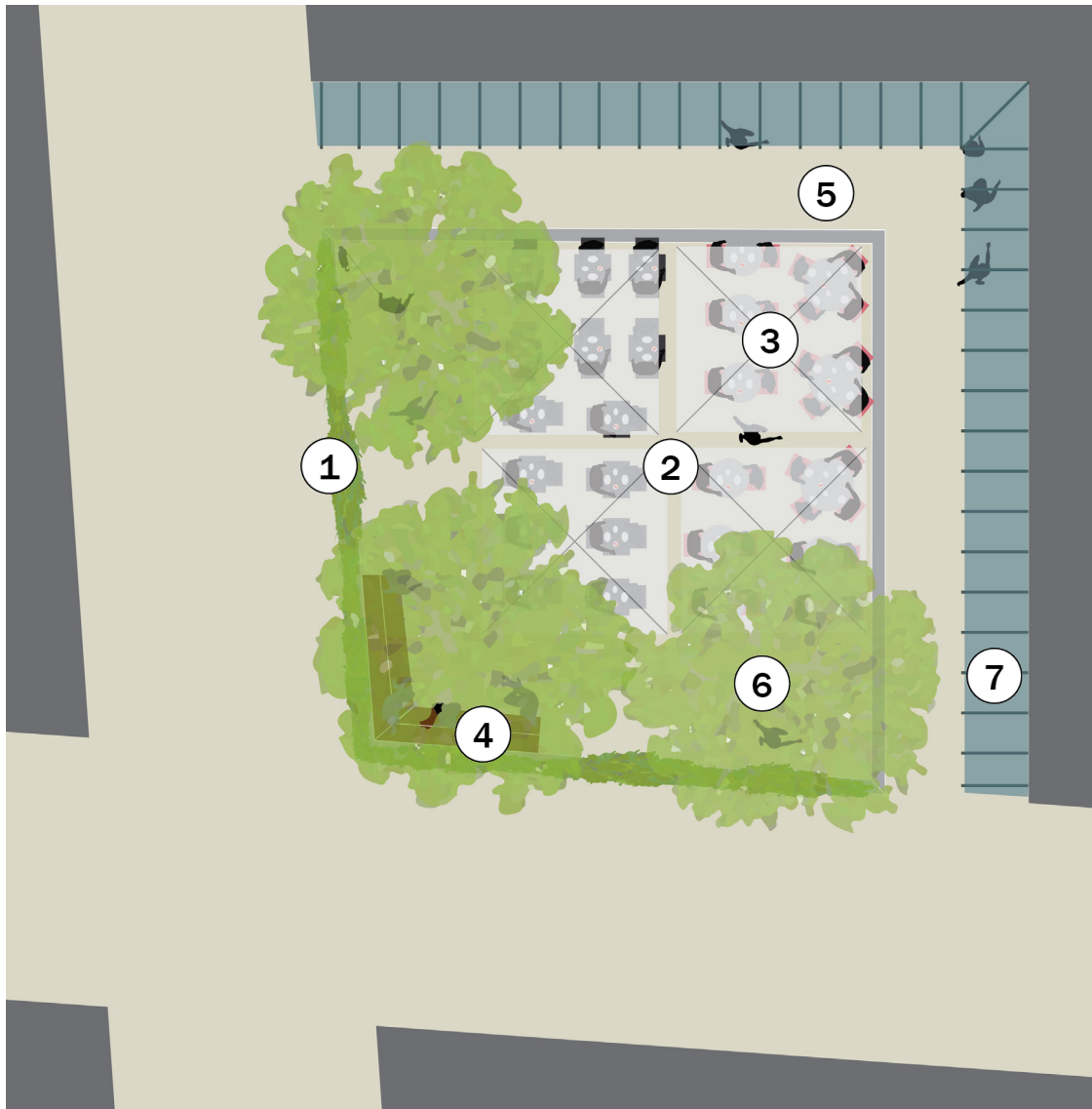


Figure 4.18 Grove Plan



- N** 0 10 20 40 Feet
- ① Border of Grove
 - ② Outdoor dining space
 - ③ Large umbrellas and space heaters
 - ④ Bench and bookshelf
 - ⑤ Open space
 - ⑥ Trees
 - ⑦ Awnings

Part 5 - Conclusion

Each element of this concept has a distinct and well-defined purpose. The Corridor is the axis from which all other elements are organized and that people may use to most directly travel from one end of the district to the other. The Alleys give users a variety of route options in getting to their destinations. The new and improved crossings help to balance the priorities of pedestrians and vehicles, improve safety, and keep the pedestrian infrastructure as unified as possible. The Square acts as the focal point where a variety of activities and sights can be found. The Groves give users secluded spaces in an unlikely urban fabric.

Features inherent to each of the concept's elements improve downtown Bellevue's economy, the environment, and social equity. The concept creates many locations for highly-trafficked commercial spaces. An abundance of trees and permeable surfaces improve air quality and reduce the amount of wastewater requiring processing. And all of this concept's spaces are publicly owned and intended for public use, which will benefit people of all socioeconomic backgrounds, given the ease of access to downtown due to the Bellevue Transit Center and, in the near future, the Bellevue Downtown Station.

5.1 Making it work

Several topics, while important and relevant, were only briefly mentioned because they fall outside of the scope of this thesis. This section will acknowledge the importance of these topics and explain their general absence from the body of this thesis.

Guidelines and zoning regulations would be an integral part of making a concept like this function properly. They are outside of the scope of this design thesis, so there is no mention of them in the chapter discussing the concept. However, they would be important for ensuring that the elements of a concept such as this one are built and maintained as they were envisioned. Guidelines and regulations can help developers build buildings that are conducive to pedestrian activity and comfort. The privately-owned buildings adjacent to open spaces are of paramount importance since private properties must function in harmony with the public spaces. Awnings and other building features support people in the public space, and the public space generates traffic for private properties.

Guidelines and regulations would also play a role in guaranteeing that the walkable Eastside Center District is socially and economically equitable. This is a concept of public spaces, and as such it is important that people from all socioeconomic backgrounds find the spaces easily accessible. Affordable housing mandates should be authorized to guarantee that an acceptable portion of lower-income people can call the area home. There must be concurrency of basic services as well. Lower-income people and those disadvantaged in other ways—such as the physically handicapped and non-English speaking foreign-born residents—need easy access to basic amenities like grocery stores, schools, daycares, and post offices. Ensuring that all of these things are present in the new walkable Eastside Center District is a

worthy topic for a future project.

Improvements to the existing streets in the Eastside Center District were addressed generally, but also not covered as a part of the design presented in this thesis. Improving car-oriented streets for use by pedestrians and cyclists—referred to as “complete streets” projects—is a popular, and thus thoroughly covered topic. There is little need to describe such improvements in detail, as they would not be so distinct from any number of nearly identical street improvement projects throughout North America. Nevertheless, it would be a worthy use of resources to improve conditions on the north-south streets of the Eastside Center District, especially given the City’s plans to promote them as major streets for shopping, entertainment, and commerce.

The level of pedestrian traffic is another consideration related to the existing streets in the area. As mentioned earlier in this thesis, this concept can only function effectively given sufficient population and employment density in the area and downtown Bellevue in general. If these spaces were built without a high enough population or employment level in the area, they might become derelict. Alternatively, even if there is enough activity to support these spaces, there could still be insufficient population density to continue to support activity on the existing streets with vehicle traffic. It would be a step backward to remove pedestrian activity from where it already exists.

5.2 Next Steps

With this design as a basis, there are numerous related endeavors that can be pursued with the goal of improving walkability in and around downtown Bellevue.

The final design presented in this thesis would dramatically improve the walkability and livability of the core of downtown Bellevue. The Eastside Center District is not the only place of significance in downtown Bellevue. The City has plans to densify all of the downtown districts, and the area would benefit from a more far-reaching quality pedestrian network.¹ Expanding this concept further into the other downtown districts is a logical solution (see Figure 5.1). Developing a design for walkability from the Eastside Center District across NE 8th St to the north and across NE 4th St to the south would likely be a significant undertaking due to the high traffic volumes of those streets. Those streets are also designated as having vehicle priority in City of Bellevue planning documents, meaning that city policies may need to change before such plans could be considered. Nevertheless, that could be an important next step for furthering walkability in the rapidly growing downtown subarea.

The City of Bellevue has plans to develop quality waterfront public space along Meydenbauer Bay. When complete, this space should be an excellent amenity and further reason for investing in pedestrian infrastructure throughout the downtown core districts. Main Street in Old Bellevue is a considerable distance from the future downtown Bellevue light rail

¹ City of Bellevue Department Planning and Community Development, *Downtown Bellevue Subarea Plan*, (Bellevue, WA, 2010), http://www.ci.bellevue.wa.us/pdf/PCD/SP04.DowntownPlan_03.pdf.

station and many the attractions of the downtown core. The city will want to encourage residents and visitors to Bellevue to visit both of these great areas. The design presented in this thesis addresses the issue of creating a walkable Eastside Center District. A future project could address the issue of connecting this area to an anticipated future waterfront park.

Similarly, there are proposals for creating a pedestrian bridge between downtown Bellevue and the Wilburton neighborhood across I-405. The work of this thesis could be expanded upon to create a design for an ideal pedestrian connection between the two neighborhoods.

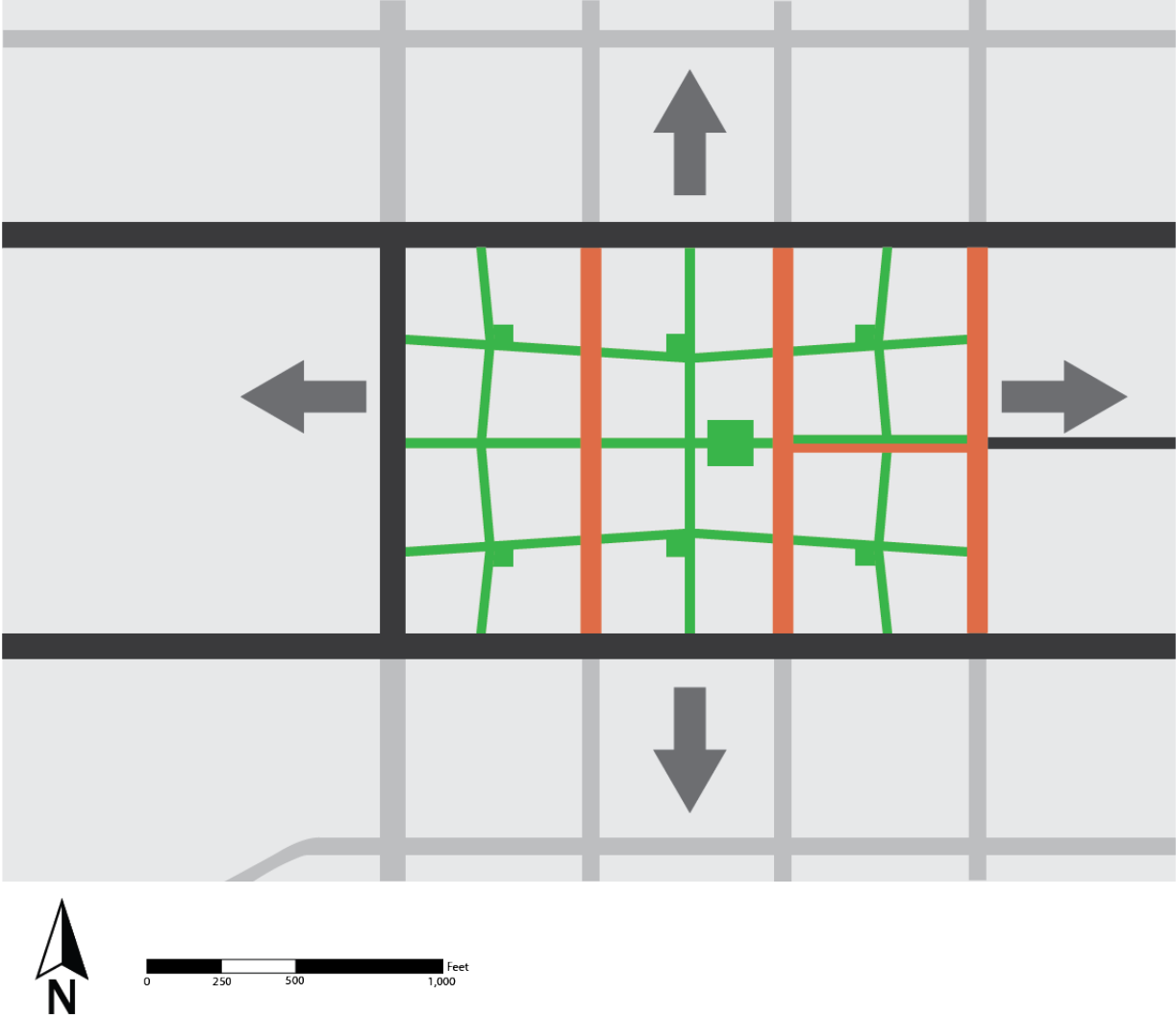


Figure 5.1. Expansion of concept.

5.3 Final remarks

The final design of this thesis only focuses on improving walkability in the core of downtown Bellevue, the Eastside Center District. This district makes up just one-third of the land area of the city's smallest neighborhood by land area, but improving walkability in the Eastside Center District is an important first step in reducing the city's dependence on single-occupancy vehicles. The district has the highest building density, so improving walkability there has a larger impact than doing so in any other location would. It is the heart of the city, and as such, it belongs to all Bellevue residents and it gives visitors and potential businesses their first impressions of the city. Creating a walkable downtown core in a way creates a walkable neighborhood for everybody.

This thesis presents an idealized design for improved walkability in the Eastside Center District. While this concept has no formal backing, steps in the direction made clear by this thesis must be taken by the city sooner rather than later. This concept can provide inspiration to those working to improve the conditions of downtown Bellevue.

Improving walkability in downtown Bellevue will improve the social aspects of life in the area, the downtown economy, and the environment because walking is the most energy-efficient mode of transportation and it works hand-in-hand with public transportation modes like buses and the coming light rail line. Hopefully in the future, downtown Bellevue will be highly walkable, with bustling pedestrian paths weaving through and connecting every block. People from all over the city and the region will be able to take an easy ride on the light rail to Bellevue Downtown Station, or stroll into the area from any of the nearby neighborhoods and spend a day safely walking through all kinds of engaging public spaces, stores, restaurants, and attractions.

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